4th International Symposium 2014

PROCEEDINGS

“Emerging Trends & Challenges on Sustainable Development”

South Eastern University of Sri Lanka
CONTENTS

MESSAGE FROM THE VICE CHANCELLOR............................................................... vii
MESSAGE FROM THE COORDINATOR................................................................. viii
Organizing Committee......................................................................................... ix
Names of Reviewer............................................................................................... x
Keynote Address by.............................................................................................. xii
Professor Georg Frerks ......................................................................................... xii
Conflict Transformation in Post War Sri Lanka..................................................... 2
Women’s Rights and Gender Equality Issues in India.............................................. 7
Learners’ Beliefs about English Language Learning in the Context of Tertiary Education With Reference to the Undergraduates of the University of Moratuwa ...................................................... 15
The Impact of Globalisation on the Role of Women in the Economy – A Case Study of India with Special Focus on Tamil Nadu .................................................................................................................. 21
An Economic Analysis on Impact of Microcredit at Nintavur Divisional Secretariat Area, Sri Lanka: Special Reference to Women Entrepreneurs .............................................................................................................. 38
A Study on Errors Made By Tamil Speaking Adult Students in Using Present Simple Tense in English .............................................................................................................................................. 54
Geo-Information Technology in Disaster Management: A Case Study in Akkaraipattu Municipal Council Area ................................................................................................................................................. 62
Emerging Trends and Rural Environmental Sanitation Issues in India .................... 70
Different Types of Agroforestry System in Nintavur Area ....................................... 77
Emerging Sartorial Complexities: Eclectic Fashion .................................................. 85
The Contribution of Bank of Ceylon for Regional Development: A Special Research for Koralapattu Region ......................................................................................................................... 93
Peace Building in Post-War Societies ...................................................................... 105
The Challenges Faced by the Non National Schools Due to Absorbing Grade Six Students on Merit Basis to National Schools Coming Under Mannmunai North Divisional Secretariat Area, Batticaloa 114
Role of Information Technology to Enhance the Efficiency of Learning and Teaching: A Study Based on 1AB Schools in Kalkudah Zone ................................................................................................. 122
Impact on the Recovery of Livelihood Programs in Newly Resettled Areas of Northern Sri Lanka: A Case of Emergency Northern Recovery Program (ENREP) Focusing on Cash for Work Component 138
Micro Finance and Poverty Alleviation in Sri Lanka .......................................................... 371
Factors Affecting Mobile Phone Brand Preference: Empirical Study on Sri Lankan University Students .................................................................................................................. 378
Center of Mackey Functors ................................................................................................. 392
Chemical Intercalation of Potassium into Natural Graphite ................................................ 397
The effects of salt stress on growth physiology of selected okra (Abelmoschus esculentus L.) Cultivars ....................................................................................................................... 404
Modeling Pollutant Dispersion from Petroleum Refining Process in Sri Lanka .................. 409
Pesticide Storage, Disposal and Protective Methods Adapted by the Vegetable Farmers in the Manmunai South and Eruvilpattu Divisional Secretariat Division of Batticaloa District, Sri Lanka. 416
Corresponding author’s email: srikrishnahs@esn.ac.lk ...................................................... 416
Empirical Study of the Epidemic and Optimized Link State Routing Protocols (OLSR) for the Scalable Wireless Ad-Hoc Network Simulations (SWANS) ........................................... 419
Comparison of Productive Performance of Frizzle and Cross-Bred Frizzle - Naked Neck Chicken Reared Under Different Farm Management Systems ................................................................ 424
Analysis of Relations between Covariance Weights and Corresponding Maximum Eigen Values .... 428
Generating Einstein’s Solutions via Hypergeometric Equation ........................................... 435
The Influence of Common Risk Factors for the Patient with Attempted Suicide Hospitalized at the Teaching Hospital, Batticaloa ................................................................................. 441
Analysing Volatility of Colombo Consumer Price Index using GARCH Models .................. 446
Long Term Solution for Flood in Malala Lagoon, Hambantota ........................................... 454
Biology Teachers’ Beliefs about Biotechnology and Biotechnology Education in the Eastern Province of Sri Lanka .......................................................................................................... 462
An Application of Fourier series Expansion of a Function in a Non-Polar Spherical Coordinate System ......................................................................................................................... 474
Contribution of Organic Contaminations and Nutrient level on Dynamic Equilibrium of Dissolved Oxygen in Water Bodies of Costal Belt of Ampara District ........................................... 480
The Impact of Students’ Intake Quality on the Performance of Engineering Undergraduates .... 490
A Review on Cloud Computing Adoption: An Exploratory Analysis .................................... 493
Hallucinated 3D Face Model from A Single 2D Low-Resolution ........................................ 501
Face Using Machine Learning ............................................................................................... 501
Measuring Paddy Farmers’ Vulnerability to Climate Change in Mahavillachiya ................. 511
Information Flow in the Eastern University, Sri Lanka ........................................................ 519
Implementation Of The Concept Of Fikh Al Awlaviya In Muslim Minority Countries A Preliminary Study Based On Sri Lankan Muslim Community ..................................................... 525
Academic And Administrative Structure Of Quran Madaras In Sri Lanka..............................535
Concept Of Civil Obedience And Disobedience: A Comparison Of The Work Of Etienne De La
Boetie And Sayyid Qutb........................................................................................................549

فكرة تجديد النحو عند شوقي ضيف بين النظرية والتطبيق................................................................557

أثر التراكيب النحوية في استنباط الأحكام الفقهية - دراسة تطبيقية في القرآن الكريم..................567

The impact of Arabic Syntax in Constructions of deducing jurisprudent Provisions......................567
A Study On Social Harmony Based On Buddhist And Muslim Relationship In Sri Lanka...........574

Globalization and arabic language ...............................................................................................587

The Role Of Context In Determining The Meaning Of A Word From Arabic To Tamil Translation 593
The Reasons For Backwardness Of Muslim Women In Gaining Religious Education: Special
Reference To Nikkawewa Village .................................................................................................601

The Contribution Of Muslim Schools To The Implementation Of Value Education In Ampara District:
:- A Comparative Study Between The State School And The Model School ..............................612

-�حلاجاريةة ممكنة مباركية: ممكنة مباركية ألكلاسية ممكنة..........................................................623
MESSAGE FROM THE VICE CHANCELLOR

I feel privileged and honoured as the Vice Chancellor to write this message on the occasion of the 4th International Symposium of South Eastern University Sri Lanka on “Emerging Trends & Challenges on Sustainable Development”, which will be held on the 2nd and 3rd August 2014.

The main purpose of this research forum is to provide an opportunity for the academic staff and researchers to present their research findings to a wider audience enabling their work to be reviewed, debated, discussed, criticized and appreciated. I confident that the researchers gain knowledge and experience in this symposium definitely will help them to perform better in their future endeavours.

I wish to express my deepest gratitude on behalf of the South Eastern University of Sri Lanka to Prof. Dr. Geory Freks for accepting the invitation to be the key note speaker of the 4th International Symposium of SEUSL. The organizing committee of the symposium has done a hard task. I congratulate the organizing committee of the symposium and wish them every success. I also acknowledge the support and cooperation received from the university administrators, chairpersons of the sessions, presenters and participants to make this event a success.

Dr. S.M. Mohamed Ismail
Vice Chancellor
South Eastern University of Sri Lanka
Oluvil
Sri Lanka.
MESSAGE FROM THE COORDINATOR

It is a great pleasure and a privilege to write this message on the occasion of the 4th International Symposium of the South Eastern University of Sri Lanka-2014 on “Emerging Trends & Challenges on Sustainable Development”. We opened four tracks for this symposium to cover different disciplines which are Emerging Trends in Social Sciences and Humanities, Business and Management, Sciences and Arabic and Islamic Education.

We received 130 papers for this symposium and each paper was referred by two subject specialists. Based on the reviewers’ comments, 77 papers were accepted for the presentation and the proceedings of the 4th Internal Symposium of the South Eastern University of Sri Lanka-2014.

It is my bound duty to thank the Vice Chancellor, the Chairperson of the symposium, Prof. Dr. Georg Frerks, Utrecht University, who delivers the key note address, all the presenters, the reviewers, members of the committees and the members of the editorial boards for their fullest cooperation and support to make this 4th International Symposium a memorable and successful event.

Dr. P. Elango
Coordinator
4th International Symposium of SEUSL
South Eastern University of Sri Lanka
Sri Lanka
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11. Dr. M. I. M. Kaleel, South Eastern University of Sri Lanka.
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13. Dr. Madha Suresh, University of Madras, India.
14. Dr. NWB. Balasooriya, South Eastern University of Sri Lanka.
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16. Dr. S. Gunapalan, South Eastern University of Sri Lanka.
17. Dr. S. M. Ahamed Lobe, South Eastern University of Sri Lanka.
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19. Dr. S. Saravanakumar, University of Arts and Sciences College, India.
20. Dr. S. Vijayakumar, University of Jaffna.
21. Dr. Dilkushi Senaratne Wettewe, University of Kelaniya.
22. Dr. S. Ponnarasu, Gobi Arts & Science College, Gobichettipalayam, Tamil Nadu, India.
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44. Ms. S. Rafeeka Ameerdeen, South Eastern University of Sri Lanka.
45. Prof. A. Sanmugadaz, Emirate Professor, University of Jaffna.
46. Prof. M. L. A. Cader, Retired, University of Peradeniya
47. Prof. M Selveraj, Eastern University of Sri Lanka.
Keynote Address by

Professor Georg Frerks

Introduction

Mr. Vice-Chancellor, colleagues, ladies and gentlemen, and friends,

I like to express my thanks to the Vice-Chancellor and the organising Committee for inviting me to deliver the keynote address at this 4th International Symposium of South Eastern University of Sri Lanka (SEUSL). It is both an honour and pleasure to do this. It renews and intensifies the links I have had with the SEUSL for a period of over ten years already. I gladly remember the work I have done with Vice-chancellor Dr. Mohamed Ismail, Mr. Mansoor Mohamed Fazil and Mr. Rameez Abdullah from SEUSL on a project called ‘Sri Lankan Discourses on Peace and Conflict’ in the years 2003-2005. The in total four articles they produced for the edited volume ‘Dealing with Diversity’ are considered among the first ones that systematically analysed the position of the Muslim community, especially in the East and South East, during the Sri Lankan conflict. I also remember when the tsunami hit the SEUSL’s community and the infrastructure at University Park was damaged. We were able to provide a small donation from the Dutch counterpart universities as a token of solidarity with the SEUSL at those difficult times. Finally I had the honour to deliver a keynote address at the SEUSL’s convocation ceremony in 2012, where I dealt with the role of conflict studies in analysing the contemporary situation in Sri Lanka.

The subject matter of SLEU’s 4th International Symposium ‘‘Emerging Trends & Challenges on Sustainable Development’’ is extremely topical at this very moment. Not only the world and the global community as whole, but also Sri Lanka and its diversity of population groups are facing challenging times. Both development and peace are under threat in large parts of the world. Violence is engulfing the Middle East, North and Central Africa and parts of the former Soviet Union. Shockingly, the global number of refugees and internally displaced persons (IDPs) has reached the absolute record of fifty million this year. But also most post-war countries still struggle to overcome their ordeals, while several peace-building and state-building operations have been beset by disillusionment and setbacks, and serious doubts exist as to how best deal with countries emerging from conflict. In fact, achieving durable peace seems to be more a matter of hope than of evidence-based practice.

In the economic realm, Europe has hardly managed to overcome its deepest economic crisis since the World Recession of the 1930s and economic progress is still extremely fragile and vulnerable in many parts of the world. The United Nations Food and Agriculture Organization estimates that nearly 870 million people of the 7.1 billion people in the world, or one in eight, were suffering from chronic undernourishment in 2010-2012. Almost all the hungry people, 852 million, live in developing countries, representing 15 percent of their population. Asia has the largest number of hungry people (over 500 million), but Sub-Saharan Africa has the highest prevalence (24.8 percent of the population). Though partly due to the efforts under the Millennium Development Goals extreme poverty has been reduced to 18% of the world population, this implies that still 1.2 billion people live on less than US$ 1.25 per day, of which two thirds in just five countries, i.e. India, China, Nigeria, Bangladesh and Congo.

In addition, sizeable percentages of people that escape from poverty may easily fall back into it again. A report by the Overseas Development Institute asserts that “in rural Kenya and in South Africa, surveys over varied periods of time have found that 30% to 40% of those who manage to escape from poverty fall back, rising to 60% during one recent period in rural Ethiopia. Even in successful Southeast Asian economies, such as Indonesia and Viet Nam, the figure has been around 20%”. So, success in poverty reduction is not always sustainable.

Another qualification that needs to be made is that the modest success in global extreme poverty reduction has been accompanied by growing inequality, so much so that according to Oxfam the world’s 85 richest
billionaires own the same amount of wealth as the world population’s poorest 3.5 billion or 50%. Even where progress has been made in certain countries and sectors, critical questions have arisen about the sustainability of those efforts, both in an environmental, socio-economic and political sense. Much development is associated with irreparable environmental damage or an authoritarian political climate with harm done to the poorest and human freedoms under attack. Perhaps it is also not surprising as well, that conventional development cooperation faces a crisis and that fundamental questions can be raised about its tenets, achievements and modus operandi. The post-2015 development agenda is heavily debated and there is a need to reflect deeply on a number of issues and principles related to traditional forms of aid in post-colonial settings. Later in my keynote I shall return to some of those issues.

**Sri Lanka’s recent political and economic performance in a nutshell**

Sri Lanka is in many ways a special case in this larger pessimistic picture. The Government of Sri Lanka has ended a 26-year during conflict with the Liberation Tigers of Tamil Eelam (LTTE) through a military victory and embarked on a post-war trajectory that, according to the Government itself, has shown substantial progress and success. A military campaign with high military and civilian losses led finally to the defeat of the LTTE in May 2009, and involved the complete extinction of its military and political leadership, including its leader Vellapullai Prabakaran. The human cost of the war was high. Some one million people fled the country and approximately 800,000 were internally displaced, often more than once. Frequently cited estimates of the number of people killed over the whole course of the war range from 80,000 to well over 100,000. This would include the deaths of 27,000 soldiers from the Sri Lankan armed forces that the government acknowledges. The war also led to the militarization of society , arguably undermining Sri Lanka’s erstwhile good human rights record. Though the war was not a civil war between different ethnic communities, it nonetheless has led to increased ethnic and social divisions and mutual distrust, as well as economic disparities between the war-affected areas and the rest of the country.

On 19 May 2009 total victory was claimed by the Government under the leadership of President Mahinda Rajapakse and a post-conflict period of reconstruction was ushered in to deal with the political and military exigencies of the situation and the socio-economic reconstruction of the war-affected areas in the North and East of the country. The last months of the war produced nearly 300,000 IDPs. The Government of Sri Lanka with the help of its armed services took overall responsibility for providing the basic needs such as temporary shelter, food, water, sanitation and medicine to this large displaced population with the help of some United Nations (UN) agencies, but other international and local non-governmental agencies were not granted access, ostensibly for security reasons. The government came under international criticism for the alleged deficiency of the humanitarian aid it provided, and the time it took to conduct the security screening of the IDPs. Currently, all but 750 from the 11-12,000 suspected and surrendered members of the LTTE have been released after undergoing a rehabilitation program. Also children and youth forcibly conscripted by the LTTE were sent to several rehabilitation centers in the country. All have now been released back to their family members at the completion of their rehabilitation period.

All those displaced in 2008-9 have moved out of the welfare camps with the majority having been returned to their places of origin, though about 90,000 people continue to be displaced, most of them living with their family in other parts of the country. The government has provided both a cash grant and some material support for the returnees, but this is generally considered inadequate for the complete recovery of their lost assets. Apart from providing relief services to those returning from displacement, the government has proceeded with de-mining activities in the war-affected areas, clearing the ground for resettlement and resumption of agricultural and other livelihood activities. The government launched an ambitious program for the socio-economic reconstruction in the North and East of the country. International resources, including hundreds of millions of dollars from India and China, have been harnessed for a major physical reconstruction of the north, with roads, railroads, ports and other infrastructure being rebuilt on a large scale. Also training programs and livelihood
support have been provided, although arguably not to the degree needed in view of the destruction and economic decline in the areas affected by the war.

Despite its efforts in the post-war north and east, the Sri Lankan government has come under increasingly severe criticism at the international level. The way the war was ended is subject to considerable international and national controversy. A UN Panel of Experts, appointed by the Secretary-General to look into alleged violations of international humanitarian and human rights law during the final stages of the armed conflict in Sri Lanka has called for a full, international investigation into the conduct of both the Sri Lankan government and the LTTE and the UN Human Rights Council has recently adopted a resolution to start such an investigation.

The Sri Lankan authorities in turn have completely rejected the UN panel report and claimed that any further steps on the basis of recommendations of the report would undermine reconciliation and endanger the peace that has reigned on the island over the past five years. The government alleged that the report was not based on credible information sources. It also has rejected several other accusations that have been expressed by the donor community, national and international non-governmental organizations (NGOs), and observers and journalists from Sri Lanka and abroad. In fact, the government has criticized foreign NGOs and donors of being partial in the conflict, sometimes even suggesting a ‘western conspiracy’ against the country and its government. It has refused all cooperation with the UN investigation.

Apart from ending the conflict by itself, Sri Lanka is also exceptional in the sense that it has shown a sustained growth of its economy both during and after the war, thereby reducing poverty and unemployment to levels unknown in most other lower middle income countries in the world. The global economic recession in 2008-2009 had adverse effects on some aspects of the local economy such as a decline in export prices and foreign exchange reserves and a rising cost of living. However, there was no breakdown or stagnation of the overall economy and employment rates remained quite stable. The steady flow of foreign remittances from overseas employees, relatively lower oil prices, a decline in imports and a national drive to promote local agriculture may have cushioned the negative impacts of the international financial crisis.

Let me briefly mention some salient macro-economic indicators that demonstrate Sri Lanka’s favorable economic position. Sri Lanka’s Gross Domestic Product (GDP) per capita at market prices stood at US$ 2,057 in 2009 and at US$ 2,923 in 2012. It has in the meantime crossed the US$ 3,000 mark and Sri Lanka’s Central Bank governor stated that the US$ 4,000 mark may be reached as soon as in 2015. The annual growth of the gross domestic product (GDP) has been sustained and reached 7.3% in 2013. According to the Asian Development Bank GDP growth is expected to accelerate to 7.5% in 2014 and maintain that rate in 2015, with inflation between 5 and 6%. In 2010 the International Monetary Fund graduated Sri Lanka from a Poverty Reduction and Growth Trust eligible country to a middle income emerging market status, implying that the country is not anymore entitled to receive official development aid. In fact, it has become too rich to receive development assistance.

The 2013 fiscal deficit is estimated at 5.8% of GDP, in line with the government’s target while the ratio of government debt to GDP fell to 78.4% in 2013. This compares quite well with a range of European countries that have much higher deficits and debt ratios. Sri Lankan exports and imports both posted positive growth in the second half of 2013. The tourism boom continued in 2013 with the number of visitors growing by 27% to reach 1.2 million. Sri Lanka’s post-conflict growth has been buoyed by construction and by transport and telecommunications. The government’s focus on infrastructure and post-conflict reconstruction and development has supported this expansion and will continue to drive growth in the medium term. Overlooking these macro figures, one might assume that all is well with Sri Lanka and that there are hardly any economic and political challenges. Unfortunately, I do not believe that this is completely true and shall outline below a few political and economic development challenges or ‘disconnects’ that still need attention, both in the policy realm and in terms of academic scrutiny.

Sri Lanka’s current political and economic development challenges

xiv
Dealing with a diversity of ethnic identities

Sri Lanka is home to different ethnic communities with their own (sub-) national identities. Historical events, myths and chronicles have been used to frame these identities and they may have been exacerbated by the recent conflict. However, it is far too simple to characterize the conflict as a primordial ethnic conflict, as sometimes is done. In fact, there has been never a ‘civil war’ between the Sinhalese and Tamil communities per se. While there have been some serious episodes of communal rioting and violence, nearly all of these could be shown to have been politically inspired and / or organized. The conflict is better understood as the effect of failed nation-building and the inability to develop an overarching Sri Lankan identity that could overcome sub-national ethnic identities. The conflict was also clearly a consequence of bad, ill-informed governance by successive governments in the post-independence period, fuelled in part by deeply-held assumptions of Sri Lanka as an essentially Buddhist and Sinhalese land and fears that this was endangered by Tamils or to a lesser degree by Muslims. It was a long series of contested government measures, which Tamils came to see as unfairly limiting their opportunities and political power, and the repeated revocation of agreements made with the Tamil leadership that ultimately have alienated and radicalized the Tamil youth, who lost confidence in the Tamil leadership and the possibility of a negotiated solution within one unitary state to address their grievances. The call for an independent Tamil homeland and the militant path chosen by them to achieve this became eventually endorsed or condoned by the mainstream Tamil parties as well. We can thus see how post-independence Sinhala nationalism, drawing on myths and traditional Buddhist narratives, had the effect of producing a rival Tamil nationalism, with both ideologies being used to justify terrible violence in each community’s name.

The major challenge now is to convince the minorities both in word and practice that the original grievances do not anymore hold, and that Sri Lanka is indeed a place for all Sri Lankans of all ethnic identities, as stated by the President and that there is no disconnect between guarantees for the country’s minorities and the policies and actions put by the Government in practice. The International Crisis Group mentions however that there is a systematic ‘Sinhalisation’ policy in the cultural and symbolic domain, for example by rendering Tamil names of villages and streets in Sinhalese, putting up war monuments, and erecting Buddha statues. In order for the President’s statement to be accepted as real and genuine, it must be experienced and lived by those concerned. The emergence of the radical extreme Sinhala Buddhist Bodhu Bala Sena (Buddhist Power Force) and their alleged involvement in deadly violence against Muslims in Beruwela and Aluthgama and the apparent impunity of those guilty, is not very reassuring in this connection. It is of the essence that the political and socio-economic grievances underlying the conflict eventually will be addressed by the government, such as respect for minority rights, cross-ethnic and religious equity and equal access to political power, that are deemed to guarantee future stability, even though there has been a convincing military defeat of the LTTE. But apart from the Tamils, the Muslims also need to be reassured that the government protects them against Sinhalese-Buddhist extremism. A recent study by the Citizens’ Commission on the Expulsion of Muslims from the Northern Province by the LTTE in October 1990 titled “The Quest for Redemption: The Story of the Northern Muslims” shows that subsequent governments have paid little attention to the fate of those Muslims. The failure to respond to the expulsion itself, the inadequate assistance to those expelled, and the lack of support for resettlement currently all amount to a systematic neglect of the issue and continues up to now, according to the Commission.

The functioning of the state

Though Sri Lanka has continued to have democratic elections and peaceful regime changes throughout, there are some notable flaws in the system. One is the majoritarian nature of its democracy that allowed overruling of minority rights and needs. As a consequence, governance has been considered by the Tamil and Muslim minorities as exclusionary, if not discriminatory. A second problem is the political patronage that pervades the political system and also has thoroughly divided the society in those within and outside of the system, apart from its effects on the standards and incorruptibility of the public service. There is the seemingly ever
increasing concentration of power in the executive, undermining the classical trias politica, and arguably especially the independence of the judiciary. Though this was perhaps defensible in view of the earlier conflict and the necessity to act without delay, there are no reasons to continue this executive preponderance currently, but this seems exactly what is happening at present. On the other hand, Sri Lanka has an educated electorate that has shown to be able to use its powers and prerogatives, and democracy seems to have a level of resilience, though several relevant public and private institutions have received blows and seem unable to operate as they should. A good functioning vibrant civil society, including a variety of NGOs in different fields, is an essential part of a proper functioning, democratic ‘governance state’. It is also essential in terms of socio-economic development. Sri Lanka has always had a wide range of local-level civil society organizations. It is difficult to imagine how its development, humanitarian aid in the post-tsunami and war period and its reconstruction efforts would have looked like without the involvement of those countless organizations and their staff. One hardly has to state the obvious, i.e. that the curtailment of such a potential is harmful to the country in both political and socio-economic terms.

**Dealing with economic disparities**

A major challenge in the field of economic development are the wide economic disparities between the Western province (that owns 50% of GDP) and the rest of the country, especially the war-affected areas, and between poor and rich and between urban and rural. Though on average the national poverty headcount ratio has declined from 8.9 percent in 2009/10 to 6.7 percent in 2012/13, there are widespread differences per district. Colombo District had the lowest count with 1.4% and Mullaitivu the highest with 28.8%. All conflict-affected districts are well above the average: Batticaloa 19.4%, Jaffna 8.3%, Mannar 20.1%, Mullaitivu 28.8%, Kilinochchi 12.7%, and Trincomalee 9.0%. These differences do not only have regional, but also ethnic implications and therefore require adequate actions in order to avoid feelings of deprivation and marginalization. Though a few districts among these, such as Jaffna and Trincomalee, have shown progress, further study is needed to see what economic stimulus is needed to create the necessary impact. There are some indications that the larger infrastructural works undertaken by the Government may not trickle down to the lower socio-economic strata of society. A recent study found that: “there is a clear disconnect between the mega development projects taking place in the Northern and Eastern provinces and the development of the local communities. People at community level in expressing their immediate needs to rebuild their lives are largely unaware of or excluded from the large scale economic development projects. This disconnect is experienced by both women and men in the communities.” For people to experience progress, mechanisms need to be in place or designed to see that macro-economic change will also reach them. However, the above mentioned study asserts that “most of the planned development interventions are concentrated in urban centers and their impact on the local communities is yet to be seen. In the local communities, women and men in general are aspiring to revive their traditional subsistence economies that prevailed prior to the conflict and there are hardly any opportunities created for them to grab new resources or move into new forms of livelihoods. The only opportunity that people get is to work in manual labor work available for both men and women. [But] Mega development projects are exclusively controlled by external parties and there is very little space for local communities to participate in such work.” In fact, it is questionable whether the Government’s emphasis on large infrastructural works is sufficient to kick-start economic development. In his study on linkages between development and social capital in Sri Lanka’s war-torn villages, Herath argues that a variety of factors need to be in place: “The causal factors of development function in combination, rather than in isolation. In order to achieve more development, the presence of one of these factors is insufficient; development requires a positive interplay between these factors.” The economist Weerakoon doubts whether the Government is able to implement so called second generation reforms to address the public policies, regulations and institutions (often of a political nature) that impede growth. He asserts that: “even in the absence of efforts to improve overall efficiency in the economy, a reconstruction related economic boom can lift the country’s economic growth in the medium term. But, without broad based reforms, the boom is likely to be relatively short-lived, leaving behind macro-economic instability in its wake”.

xvi
**Dealing with the gender gap**

There are still noticeable gender differences in socio-economic status and socio-political entitlements and capitals. According to the Sri Lanka Human Development Report 2012, Sri Lanka ranks at 97 out of 187 countries – scoring 0.692 on the Human Development Index (HDI). The Gender Inequality Index (GII) which measures inequality in achievements between women and men, is based on three dimensions: reproductive health (measured by the maternal mortality rate per 100,000 live births, adolescent fertility per 1,000 women aged 15-19), empowerment (measured by parliamentary representation and the percentage of people who have at least lower secondary education in the age group of 25 years and over), and labour market (labour force participation rate for the 15-64 age group). Table 1 below shows that Sri Lanka GII performs somewhere between medium and high development categories, but that some of its scores belong to the high or even very high development category.

What holds back a strong overall GII, is the poor political representation of women and their low participation rate in the labour force. In an analysis of the low political female representation, Sunimalee Madurawala asserts that:

Table 1: Gender Inequality Index and related indicators

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<tbody>
<tr>
<td>Very high human development</td>
<td>0.224</td>
<td>16</td>
<td>23.8</td>
<td>21.5</td>
<td>82.0</td>
<td>52.8</td>
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<tr>
<td>High human development</td>
<td>0.409</td>
<td>51</td>
<td>51.6</td>
<td>13.5</td>
<td>61.0</td>
<td>47.8</td>
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<tr>
<td>Medium human development</td>
<td>0.475</td>
<td>135</td>
<td>50.1</td>
<td>17.3</td>
<td>41.2</td>
<td>51.1</td>
</tr>
<tr>
<td>Low human development</td>
<td>0.606</td>
<td>532</td>
<td>98.2</td>
<td>18.2</td>
<td>18.7</td>
<td>54.6</td>
</tr>
<tr>
<td>World</td>
<td>0.492</td>
<td>176</td>
<td>58.1</td>
<td>17.7</td>
<td>50.8</td>
<td>51.5</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>0.419</td>
<td>39</td>
<td>23.6</td>
<td>5.3</td>
<td>56.0</td>
<td>54.2</td>
</tr>
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“Even though the majority of the country’s population is female, there are only 13 female parliamentarians in the current parliament, of which 3 are from the national list (less than 6% of the total 225 seats). This scenario is even worse when it comes to the district level. In 16 of the 25 districts, the proportion of female representation at the national parliament is 0.1%. According to the Sri Lanka Human Development Report 2012, political parties are the single biggest barrier to women’s greater participation in politics. Males are preferred over females, both by political parties and voters, to be nominated and to be elected. “Reasons for the low representation of women in politics start at the personal level, where fewer women than men self-elected themselves for a political career because of socio-cultural, economic, and psychological barriers”. The vicious climate of violence in the election process has also become an influential factor in discouraging interested females from entering the political arena.”
The Gender Gap Report of 2013 of the World Economic Forum ranked Sri Lanka 55th among the 136 countries covered in the Report with a Gender Gap Index of 0.702. This report shows strong sub-indices on female education and health, but poorer scores in the economic and political fields. In terms of labour force participation, wage equality and estimated earned income, the female-to-male rations are all fairly unequal.

Apart from those macro-level data, a more fine-grained analysis yields many more detailed insights. These include observations on how the war has impacted on women and gender relations and how this has developed in the post-war trajectory. Many studies have shown how numerous women had to bear the double burdens of domestic work and taking care of the income when the males were away or lost their lives during the war. It still needs to be better ascertained by ethnographic field work how their situations evolve after the war. Jayasundere and Weerackody state that: … “women’s mobility and access to economic resources and opportunities are still restricted by fears to their personal security despite the end of the war as well as by social norms. While men too have fears of safety, the level of vulnerability is far more for women, especially women heading their households. They also observe restrictions caused by traditions and norms in largely patriarchal communities and social stigma against women who step out traditionally accepted roles for women.” This all implies that a gender-sensitive approach needs to be followed. Whereas above I already indicated that many macro development projects and programmes risk of not trickling down enough, the poor economic gender scores of women will even exacerbate the situation for them. In fact, they face barriers at two levels: the limited trickle down per se and their own low economic participation.

What type of development is needed?

The last issue I want to raise is what type of development one actually wants or needs in Sri Lanka. As of recent there has been a lot of criticism on the role that externally aided development has played globally as well as in Sri Lanka. This has also reverberated in academic debates, where some more radical voices have argued that aid has worked counterproductive or is a western imposition focused on the interests of the metropolis at the detriment of the recipient countries.

Around a case study of the village Denagama in Southern Sri Lanka, the late prof. Ranaweera Banda deals with issues of knowledge production, both globally in terms of transnational culture, and in the Sri Lankan context from pre-colonial and colonial times to the post-independence era. In the contemporaneous setting he specially elaborates on the role development plays. He describes how development as a knowledge and practice is promulgated and promoted by international development experts, local elites and local bureaucrats, and interacts with the village that, however, shows its own agency in appropriating or rejecting part of the development package offered. Ranaweera Banda posits a nearly straight and linear connection from the colonial discourse that considered non-Western societies as entities that were still to be civilized with the intervention of the west, to the current development or modernity paradigm. Though now operating in a post-colonial setting the former colonizers are still “interested in establishing their dominance in non-Western countries for political, economic or strategic reasons” and started to interfere “in the form of cultural, economic and development programs thereby re-enacting a new type of economic colonialism in non-Western countries” (Ranaweera Banda 2013: 16). Ranaweera Banda argued that “development is not a set of actions aimed primarily at gaining growth and welfare, but rather an external force penetrating into a community from outside with powerful ideologies. In this context development benefits are secondary as they act as the vehicle of transmitting such powerful ideologies. Our extensive fieldwork at the local community demonstrates how power associated with development discourse has changed and revised the ways of thinking and actions of the community both at the community and individual levels”, according to Ranaweera Banda (2013: 17). This idea of development is also linked to a powerful, interventionist state that is not only responsible for the development and welfare of its subjects, but in line with a more Foucauldian notion of ‘governmentalization’ also controls the lives and bodies of its population through a complex assemblage of institutions and procedures (Ranaweera Banda 2013: 17). An author like Mark Duffield (2007) observes in the same vein that western interventionist discourses emanate from a metropolitan desire to rule the world. He, for example, argues that western humanitarian and peace
interventions are primarily technologies of power aimed at controlling people living on the margins of global society.

I would like to propose that in the domain of Sri Lanka studies more of such critical intervention studies would take place. Without necessarily having to return to the earlier dependencia or centre-periphery theories, there is enough scope and reason to critically deconstruct the development enterprise and its associated discourses, as done by authors as Escobar and Ferguson. It is, however, needed to do this on the basis of serious academic work. Currently, much of the discourse on donors in Sri Lanka, seems to be a heavily politicized affair without the usual rigour and nuance of academic debate.

I personally feel that the modernist, economic paradigm is still very powerful and popular among Sri Lanka’s ruling elites, despite the government’s ambivalent and sometimes problematic relationship with the western powers. Yet, the government’s discourse, whether promoted as the Mahinda Chintana or as the ‘Wonder of Asia’ still boils down to being very much a modernist, developmentalist approach full of large-scale infrastructural works, clearly smacking of the macro-economic modernization paradigms of the 1950s, where market capitalism went hand-in-hand with fairly strong state direction and initiative.

Economic development is also seen as the recipe for the post-war reconstruction agenda of the government. It can be questioned, however, whether economic development on its own is sufficient to deal with the post-war challenges Sri Lanka is facing, such as the disconnects I have discussed above, and other more politically oriented ones I have elaborated elsewhere, but will not go into now due to lack of time.

Anyhow, a more fundamental debate on development discourses, approaches and implementation practices in Sri Lanka as a means for social transformation and post-war rehabilitation could be profitably initiated as a theme for Sri Lanka Studies. It seems to me that there is much about the war and post-war trajectory in Sri Lanka that merits further academic attention.

What we hardly know, for example, is how it was to live one’s daily lives during the war. I believe that thorough academic ethnographic studies can help us to understand the everyday lived experience of war. How has war been lived through by peasants, housewives, students, shopkeepers and minor civil servants? How did they cope with the challenges faced and how did they engage with the warring parties? What forms of resilience could be observed under such conditions? How was it to live daily under the control of the LTTE or under strict security restrictions? How were these areas administered by those in power? We do not know much about these ‘low politics’ of everyday survival and there are hardly any detailed ethnographic studies done and published on such issues. In particular, and with the notable exception of the earlier mentioned final report of the Citizen’s Commission, there is a dearth of information on the Muslim communities affected by the conflict and also on what has happened to them since the war is over.

With regard to the post-war trajectory it may be of the essence to look into the original root causes of conflict and associated grievances. It would be highly interesting and relevant from both an academic and practical viewpoint to see how these are addressed in order to make post-war reconstruction and peace building meaningful to the largest possible group of stakeholders and thereby hopefully help sustain the peace.

Other pertinent issues that may deserve academic attention include the material success or otherwise of post-war reconstruction, resettlement and reintegration programmes by the government and international donors. Close monitoring may help prevent mistakes and dissatisfaction, and provide voice to the intended beneficiaries. I mentioned in my talk the prevailing large economic disparities that warrant further action and study, as well as the gender gap.
A more difficult topic to investigate is how inter-communal relations have developed since the war is over and whether or how reconciliation is possible in case violence has driven communities apart, as it unfortunately still does. This can only be understood by in-depth, local and community-embedded, longitudinal studies, something that the SEUSL would be ideally suited to provide.

**Conclusion**

Mr. Vice-Chancellor, ladies and gentlemen, I shall not try to be exhaustive. Teaching and studying the development / conflict and post-conflict nexus is a necessary thing to do, both from a national, regional and global perspective. These endeavours are relevant for any attempt to reach a situation of sustainable peace and development that may overcome painful memories of conflict and suffering, and provide a basis for a peaceful co-existence. Recent data show that three-quarters of all conflicts of the last ten years have been recurrences of earlier conflicts. Whereas post-war moments can be a window of opportunity for establishing stability, justice, reconciliation and development, this opportunity is often squandered in practice. As Darby and Mac Guinty show, the ‘management of peace’ is full of obstacles. Factors contributing to failure include: ignoring fundamental conflict issues and key actors; weak institutions; failure to implement reconstruction programmes; continuation of corrosive violence; lack of economic development, failure to enter into negotiations and strike deals. As I have indicated Sri Lanka is fortunate to have ended its 26-years’ period of war, even though its end is deemed controversial. The country also shows a good economic performance and can boast a number of impressive macro-level indices. On the other hand I outlined a number of disconnects and contradictions that warrant further attention. Independent, critical, rigorous and thorough academic research can provide the necessary information to prevent the unravelling of peace and provide a sustainable economic basis for successful post-war interventions and development.

Ladies and gentlemen, I am convinced that the SEUSL can play an important role in all this, not only for the benefit of its Muslim constituency in the South East, but for the benefit of the country as a whole and all communities. The 4th International Symposium is an excellent occasion to embark on this journey and start this endeavour. With this I thank you for your attention and wish you a very inspiring 4th International Symposium!
SOCIAL SCIENCES AND HUMANITIES
Conflict Transformation in Post War Sri Lanka

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Abstract: This paper examines the conflict transformation in post war Sri Lanka. In Sri Lanka, the internal war, which is the major outcome of the ethnic conflict between the Tamils and Sinhalese, was ended in 2009 by the military victory of the government. In conflict period, the conflict parties had been abandoned opportunities to get the peaceful settlement through negotiations. It causes to make the protracted war and difficulties in its termination. However, the government of Mahindha Rajapaksha fought against the Liberation Tigers of Tamil Ealam (LTTE) with dedication and got the victory. Although the war is ended, the conflict is transforming endlessly. The end of the war creates the many changes in post war Sri Lanka and provides the opportunity for state and society reconstruction. The aim of this study is to explore the nature of conflict transformation at present Sri Lanka. This research is built on qualitative research methodology by using both primary and secondary data. In the primary source, the qualitative interviews and focus group discussion are used where necessary. In the secondary source such as books, magazines, internet articles are used. This paper finds out the conflict transformation since 2007. Many positive things has made in post war situation such as resettlement, rehabilitation, infrastructure development and welfare services. Although some negative things are brought in conflict transformation such as military intervention, anti-Muslim sentiments, diaspora’s activities, increasing the crimes and international pressures. They can redefine the conflict in a new form.

Keywords: Conflict, Conflict Transformation, Peace, Harmony

Introduction
Sri Lanka is a small island in the Indian Ocean, has own experience in conflict, resolution and war. In this country, there are three major ethnic people (Sinhalese, Tamils, Muslims) living, although, the ethnic conflict raises among the Sinhalese and Tamils mainly. This conflict affects not only these ethnic groups but also others. The root causes of this conflict were grounded in the colonial period, they have been developed after the independence. Anyhow, as the efforts to resolve this conflict in the peaceable way by the Tamil leaders were not successful, the conflict was transformed as an armed conflict by the Tamil youths under the leadership of Prabakaran in 1970s. The raising of the arms groups in Sri Lanka, the demands and means of minorities caused to be transformed to the violence. When this conflict rapidly changed, many third party mediators come forward to resolve it. While the government of Sri Lanka considered the ethnic conflict as an internal matter, the Tamils, particularly the LTTE, attempted to internationalize the conflict as a strategy to gain external legitimacy (Sivarajah, 1995). But the governments tried to oppress the arms groups by using the military, government of Mahindha Rajapaksha made it possible. The government forces won the LTTE in May 2009 and the internal war was ended. It is a time to reconstruct and build peace in our country. After the war ending the conflict is transforming as a new dimension. This study explores the conflict transformation at present Sri Lanka in the post war situation.

Objective
The objective of this study is to identify the nature of conflict transformation in post war Sri Lanka. Especially, it tries to find out the transformations in descriptive and prescriptive level at present.
Methodology
This study has been carried out mainly through the qualitative research by using primary and secondary data. This paper is based on 20 qualitative interviews and supplement with limited observations to get the primary data. The secondary data collection is based on a literature survey which I reviewed all the literature available on this subject.

Literature Review
Conflict transformation is an important approach to handle the conflict. It relates to protracted civil wars. Conflict transformation means that conflict make the changes to the conflict parties, their relationship, issues and it transforms the entire dynamic of the conflict. It is the result of the experience of long struggle. Different authors and practitioners use this term in inconsistent ways.

According to Wallensteen (1991: 129) transformation, in short, is a generalized learning from historical experiences. In this approach, parties are affected by their conflict experiences and thus changes themselves so that the original conflict takes on a new forms. As well as he mentions that a successful case of conflict transformation is one where the parties, the issues and their expectations are changed so that there is no longer a fear of war arising from the relationship (Ibid: 131).

Ledrach’s work serves as one of the most comprehensive statements to date of conflict transformation thinking for practitioners. He sees peace building is a long term transformation of war system into a peace system. The key dimensions of this process are changes in the personal, structural, relational and cultural aspects of conflict, brought about over different time periods and affecting different system levels at different times. He indicates that conflict can be understood in two ways, descriptively and prescriptively across the above four dimensions (1999: 82-83).

Vayrynen argues for a conflict theory based on the idea of transformation rather than settlement, stressing that it is important to understand how conflicts are transformed in dynamic terms. His approach is primarily analytical and theoretical, but is also suggestive of the types intervention that peace builders should be considering (1991: 4-5).

- Actor transformations – internal changes in parties, or the appearance of the new parties
- Issues transformations – altering the agenda of conflict issues
- Rule transformations – changes in the norms or rules governing a conflict
- Structural transformations – the entire structure of relationship and power distribution in the conflict is transformed

As well as, Johan Gultung’s theory of conflict transformation is heavily utilized. According to his theory, the outcome of conflict transformation is threefold (1996: 96). In creative conflict transformation, something new, usually unexpected emerges from the process, enabling transcendence of the underlying contradiction. Compromise is the second outcome of peaceful conflict transformation. It means both parties accept the positive of attaining less than their full individual goals. Another outcome is that some goals have been given up or withdrawal by the conflict parties.

Findings
Sri Lanka has the victory to defeat the LTTE separationist by using the government forces. In 2007 LTTE was terminated in eastern province Sri Lanka and rest of the country in May 2009. It is a remarkable ending to the one of brutal internal armed conflicts in the world. Many transformations in social, political, cultural and economic vice have been occurring since 2007 in our country. They are as follow.

This study explores that many developments are carried out in post war Sri Lanka. Most of the infrastructure developments are made according to the ‘Mahinda Chinthana’ policies. Road development, reconstruction of the schools and hospitals, electricity, irrigation and rural industry are extended. A9 road is opened and people from all parts in country have the opportunity to visit any part of Sri Lanka. Poverty alleviation program is introduced to the people to improve their livelihood and to get the sustainable development. Many welfare services are made to empower the people. MOH offices and health centers are brought to the war affected areas and they assist to reduce the mortality. People who surrendered to the forces in war period are rehabilitated by the government and provided the counseling treatment. Most of the former combatants are reintegrated into the civil life and given the opportunity to continue their studies and employment. In most of the areas, land mines are removed.
and resettled the people who are IDPs. And people who migrate to abroad in conflict period, can return their homeland as per their wish. To make the peaceful society, trilingual concept is implemented. Many judicial courts are established newly in war affected areas and police has the authority to handle the civil issues. Most of the development projects have made to construct the people as economic vice. Foreign investment increases in post war Sri Lanka and the ratio of unemployment decreases. As the development of tourism industry, the culture of Sri Lanka is developed and takes the important place in other countries. The cultural places are renovated and rural areas are developed to attract the tourists. Local governments and provincial council election is conducted to develop the local democracy and prove the Sri Lanka as the democratic country to the world.

As well as many positive transformations in political vice occur in post war Sri Lanka. During the war period, the former, combatants of LTTE, especially Sivanesathurai Chandrakanthan and Vinayakamoorthi Muralitharan split from the terrorist group. They join and support the Sri Lankan government to the counter terrorism activities. This fragmentation of the LTTE is concerned as an important event in conflict transformation. It helps to conquer the LTTE in north and east. This change shows rather than the conflict between the LTTE and government.

After the falling of LTTE who declared themselves as a real representatives of Tamils, the former combatants, Sivanesathurai Chandrakanthan and Vinayakamoorthi Muralitharan represents the Tamils in eastern province. It is an evidence to get the interest from the government through the friendship without any violence. Eastern province was separated from the temporarily merged north-east provincial council and specific election was conducted to the eastern province. Sivanesathurai Chandrakanthan who is a former combatant, was elected as a chief minister in first eastern provincial council election in 2008. Vinayakamoorthi Muralitharan gets the seat in national parliament through national list. It is a very good tactic of government to handle the conflict in eastern Sri Lanka and it mentions the transformation of the conflict actors.

At the present, the demands and requests of minorities also changed from earlier such as federalism, autonomy and ‘Tamil Ealam’. After the independence, minorities had tried to establish the federal government and to get the autonomy. After that the LTTE had a vision to achieve the ‘Tamil Ealam’. The above explains that the demands of minorities increase day by day, although, the end of the war changes these demands of minorities and it causes to minimize their requests. In 1987, while the 13th amendment and provincial government system was introduced, the minorities, especially, the LTTE refused this resolution. Now, as the Tamil leaders do not have the strength to continue the aim of ‘Tamil Ealam’, least, they try to get the power in provincial council system completely. It describes the changes in their objective of conflict parties. According to the Galtung’s concept of peaceful conflict transformation, some goals are withdrawal or given up by the conflict parties. It happens in post war Sri Lanka, the ‘Tamil Ealam’ goal is given up and 13th amendment have been more considered.

Although, Tamil National Alliance (TNA) neglected the eastern provincial council election in 2008, it participates in the 2nd election and the 1st northern provincial council election. It is concerned as a positive thing in conflict transformation in Sri Lanka. It gives an opportunity to bring the minorities into the democratic transition. In the conflict resolution efforts, the government tries to take TNA into the Parliament Selected Committee (PSC). Some minority representatives who are at present government also support to this effort and insist the TNA to participate.

As well as, post war situations provide the opportunity to the people who are in various field to participate in politics. C. V. Wikneshwaran who studies and implements the law for a long time as a judge in Sri Lanka, enters into the politics on ethnic conflict, finds a new change in the political history of Sri Lanka. In the first northern provincial council election, the Tamil leaders propose him as a chief minister candidate on behalf of the Tamils with unity. He, who is not related to the politics before, wins the election with majority and takes oath in the president Mahinda Rajapaksha (Ceylon Today, 08.10.2013). It is a signal of harmony in many things.

After the returning to the civil life of rehabilitated people, they involve in local politics and express their counter politics activities. Anandhi Sasitharan, who is rehabilitated by the government gets the membership in the first northern provincial council. People of north province accept her political life. It is a very meaningful transformation of the way of conflict parties. It prevents the society for a long time from the threat of violence.
Conflict transformation can happen in both descriptive and prescriptive levels. If it happens in prescriptively, it will cause to the new form of conflict again. Sri Lanka has some significant of the conflict transformation in prescriptive level.

The conflict transformation means that even conflicts are continuously transformed its causes are not resolved. In this processing, the parties, issues and the expectations are changed so that there is no longer a fear of war arising from the relationship. Even though, as the causes of conflict are not solved, the original conflict takes on new forms (Wallenstein, 1991).

As far as Sri Lanka is concerned, there is no war and no terrorism, though, the root causes of conflict prevail still now. The constitution of Sri Lanka provides the foremost place to Buddhism, no proper implement the bilingual concept, discriminating in state service and other causes are continue and there are not enough efforts to resolve them. The current issues also motivate to raise the conflict again. It is possible to create the conflict in a new form.

In colonial period, there was a riot between the Sinhalese and Muslims in 1915, it was not a protracted conflict. But, in recent years, the anti-Muslims sentiments are increased suddenly by the radical Buddhists. Some radical movements such as Bodu Bala Senga (BBS) and Sinhala Ravaya (SR) and some political parties have the common goals and try to disturb the tranquility of Muslims and the country. They make some issues such as halal certificate, attacks on Muslim’s worship places, slaughtering animals and attacks the business firms. The end of the war brings the opportunity that the country could become united. But these issues are as a new challenge to the social harmony of Sri Lanka. Now, the conflict of Sinhalese and Tamils is not very important but Sinhalese and Muslims has a new dimension. As Buddhists concerns themselves as the real nations of Sri Lanka, they try to dominate others. As Tamil separatists were defeated by the war, their concentrations turn on Muslims. It is a negative thing of conflict transformation in post war Sri Lanka.

Post conflict developments of Sri Lanka rapidly increase, but they are not enough to construct the people in mental vice and construct only the infrastructure development. There are not enough resolutions to find the missing people. Nation building is limited for only the majorities and minorities are almost not considered. As the mega developing projects are concerned as boons, they increase the support of present government highly in south part of Sri Lanka.

The north and east are released from the LTTE terrorists, though, the military intervention suddenly increases in these areas. The military has appointed in civil posts. Rehabilitated people are monitored by the military continuously. Although, the resettlement of people almost finished, there is a complaint on this regard. People do not resettle the suitable place for living and employing. Majorities are included in this resettlement process. It is an important event in conflict transformation in post war Sri Lanka.

The end of the war brings the violence in various forms. The threat of ‘grease man’, capturing the traditional weapons in north province, increasing the robbery and kidnapping in other parts of the country, violence against women, child abuse and other crimes increase day by day. They are reflected the new forms of violence in post war situation.

Another transformation is that the United Nations Party (UNP) and TNA which have the different ideologies and, join and active against the government. One of these activities is that the May Day celebration in 2012 in north province.

In the war time, the international community support to the Sri Lankan government to defeat the terrorism in Sri Lanka. Because the LTTE organization is included in the list of terrorist groups by many countries. Although, in the post war situation, the international community make the pressures to the Sri Lankan government against war crimes and human rights violations. And they start to express their unsatisfaction. After the September attacks in the United States, most of the countries announce the LTTE as one of the terrorist groups and they implement many sanctions against the LTTE. But, now they try to go against Sri Lankan government. It is shown as one of transformations. Because of that EU(European Union) stops theGSP+ (General System of Preference) to Sri Lanka, UNHRC (United Nations Human Rights Council) passes the 3rd decision and Canada did not participate in CHOGM in 2014. These are the negative consequences of conflict transformation.

As well as the diaspora community gives fully support to the LTTE separationists, although, their supports are almost financial and propaganda vise. But the end of war make the changes into the diaspora community’s activities. They make the pressures on the government where they live, these
governments insist the Sri Lankan government to investigate the war crimes in the international court. Canada stops the fund for the CHOGM and Britain has the more concentrations on Sri Lanka, are the effects of diaspora. They initiate many things at the international level in political vise is considered as a conflict transformation of the ways and expectations of conflict parties.

Conclusion
As the discussion of this research shows, the conflict transformation in post war Sri Lanka has more things negatively rather than descriptive event. As the post war developments are also favor for the majorities, Sri Lanka do not reach the sustainable peace and development yet. This transformation not only make the changes in internal but also international level. Also radical thinking of the majority elites increases the threat to the minorities, especially, Muslims. The conflict transformation does not make the co-existence and harmony in the Sri Lankan society. The final point of this paper is that, the conflict transformation of post war Sri Lanka has the possibilities to a new form of conflict again in Sri Lanka.

References


Women's Rights and Gender Equality Issues in India

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Abstract: Women constitute half of humanity and probably the better half. In the absence of gender equality, humanity is depriving itself of a substantial strength from fifty percent of its constituents. It has been the case almost from the beginnings of civilized society that women were cast in specifically discriminatory roles and thus have never been empowered to contribute their best to the advancement of the society. Gender inequalities hinder development Social hierarchies are embedded in social institutions which are designed to perpetuate them through control over the environment and the socio-economic resources. Equality of participation and control are the necessary pre-requisites towards gender equality. There are many special challenges still faced by the women, but progress has been made when gender equality is viewed over the longer term. Much more can be accomplished, however, when women’s contributions are valued by society as a whole, when they have a more prominent role in decision-making, and when women and men work in partnership to achieve these aims. In this context, the paper attempts to highlight the gender inequalities and identify the recent trends in women’s social and economic development in India. The paper will be based on secondary sources of data.

Keywords: Gender Equality, Development, Women Rights

Introduction:
Women constitute half of humanity and probably the better half. In the absence of gender equality, humanity is depriving itself of a substantial strength from fifty percent of its constituents. It has been the case almost from the beginnings of civilized society that women were cast in specifically discriminatory roles and thus have never been empowered to contribute their best to the advancement of the society. This article takes a look at how modification of traditional roles, particularly through education, can impact on gender equality and more emphatic participation of women in the affairs of mankind. Nature has empowered women by presenting them with the greatest gift of procreation, along with others like nurturance, tolerance and above all super sensitivity. It is for humanity to take advantage of these strengths of women for its betterment as a whole. It is believed, and probably rightly so, that a woman is her own biggest enemy because she fails to realize her inner strengths and weaknesses when her super sensitivity overpowers her.

The mandate for equal rights for men and women is embedded in India’s Constitution. Gender equality is a constituent of development as well an instrument of development. It is a constituent of development as no country can be deemed developed if half its population is severely disadvantaged in terms of basic needs, livelihood options, knowledge access, and political voice. It is an instrument of development because without gender equality other goals of development like poverty alleviation, economic growth and environmental sustainability will not be achieved. Gender inequalities hinder development. Ignoring gender disparities comes at great cost-to people's well-being and to the country’s abilities to grow in a sustainable manner, to govern effectively. Social hierarchies are embedded in social institutions which are designed to perpetuate them through control over the environment and the socio-economic resources. The gender inequality is manifested by the unequal power relations between women and men. Equality of control enables women to gain improved access to resources. Social equity can enhance livelihood security, productivity and sustainability of all members in building their capacity for their own development.

Equality of participation and control are the necessary pre-requisites towards gender equality. There are many special challenges still faced by the women, but progress has been made when gender equality is viewed over the longer term. Much more can be accomplished, however, when women’s contributions...
are valued by society as a whole, when they have a more prominent role in decision-making, and when women and men work in partnership to achieve these aims. In this context, the paper attempts to highlight the gender inequalities and identify the recent trends in women’s social and economic development in India. Gender discrimination is one problem that continues to affect women in India. The traditional oppressive norms have relegated women to secondary status at the workplace and in the household. This has left them with little or no education at all, poor health and financial status, as well as little involvement in the political arena. They are quickly married off when too young, and that means they become mothers at a tender age. They cannot cope with the stringent domestic and financial responsibilities. No doubt, gender equality in India is something to question. It’s shocking that women are always treated last in the society, last to receive medical attention and last to serve food for themselves. So it’s a common scenario to see malnourished women in India. Statistically, only 54% of women in India are literate, compared to 76% of men. That shows that women receive little schooling, and an unfair inheritance as well as divorce laws. Because of all these factors, it’s impossible for them to accumulate a substantial financial asset which means no security for them.

Status of Women in India: A Historical Review

In India, the status of women underwent a drastic change from the Vedic period to the Modern. In Vedic society, women enjoyed the same position as men. In intellectual field, they were given equal footing with men. Some of the Vedic poets were women. There were women philosophers, women warriors who fought bravely in wars. This complete equality between men and women is found in all parts of Vedic literature; from Samhitas to the Upanishads. The girls received education like boys and went through the ‘brahmcharya’ discipline. In fact, a bride had no chance of a good match if she had not been educated as a ‘brahmcharini’. The custom of ‘Upanayana ’ of girls prevailed. Women studied Vedic literature like men and many of them Lopamudra, Ghosa, Sikata-Nivavani figure among the authors of Vedic hymns.

Vedic sacrifices were performed jointly by husband and wife, and singing of Vedic hymns was long considered as the most appropriate function of wife. Women performing ‘Sandhyas’ or offering sacrifices themselves unaccompanied by their husbands, figure as late as the time of the Ramayana. Girls were well educated and trained before marriage and were naturally regarded equal to their husbands. The term ‘dampati’ suggests that both husband and wife are equal partners and joint heads of the household.

Women during the Vedic period, had full rights over the gifts and property received at the time of marriage (known as ‘Pannayya’ or ‘Satridhan’). The permission of love marriages indicated freedom of movement and choice of life partners. There are no traces of seclusion of women in the Vedic society. Women could mix freely and move with their husbands and lovers. They occupied distinct places in social gatherings because of their intellectual training, eloquence and also graceful apparels. There are evidences to show that women followed several professions. The teaching profession followed by women like Gargi attest to non-segregation of women. There are examples of women dyers and those who performed beautiful embroidery, were basket makers and other skilled workers. All these indicate that the status of women in India was high and women were empowered during the Vedic period and that women enjoyed freedom and various rights as much as men. Indeed there is a saying in India that ‘man and women are like the two wheels of a chariot’. If one wheel is defective, the other cannot operate effectively. The analogy does indicate that our ancient Indian Society maintained equality and equity between men and women in all aspects of life, be they familial, social, economic or cultural.

However, historical processes down through the ages, brought considerable change in the status of women. Society became more patriarchal, male supremacy dominated. Women receded to indoor/household activities. Education became a rare possession. ‘Purdah’ System, early marriage, illiteracy, ‘sati’, and denial of rights in the property of parents and husband, reduced the status of woman. Woman became almost to an item of property of the husband and consequently, the disparity between men and women increased tremendously

How Empowerment can be achieved

Women’s Empowerment can be achieved by adopting the following measure:

- Better education of girl child.
- Promoting skill development & empowerment.
• Providing job opportunities to women and thereby promoting financial empowerment.
• Eliminating all practices that discriminate against women.
• Eliminating all forms of exploitation, abuse, harassment and violence against women and girls.
• Promoting gender sensitization at all levels to bring equity in wages, binning in jobs, school admissions, property rights and other such opportunities.

Aim, Objectives

1. To study the discrimination and harassment.
2. To understand the equality of opportunity between men and women.
3. To study the Constitutional And Legal Provisions For Women In India
4. To study the status of women in India and international level.
5. To understanding of gender equality and women’s empowerment.

Methodology

Descriptive method adopted in this study. Descriptive research design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way.

Gender Equality and The Empowerment of Women

Gender equality implies a society in which women and men enjoy the same opportunities, outcomes, rights and obligations in all spheres of life. A critical aspect of promoting gender equality is the empowerment of women, identifying and redressing power imbalance and giving women more autonomy to manage their own lives. Although women may have many interests in common with men, their lives and the choices available to them may vary widely. The principle of gender equality is enshrined in the Indian constitution in its preamble. The Constitution not only grants equality to women but also empowers the state to adopt measures of positive discrimination in favour of women.

More than two thirds of the world's 960 million illiterates are women. In India, literacy rates are 39 per cent among women and 64 per cent among men. In Egypt, only 27 per cent of females are literate, compared to 63 per cent of males. That presents a clear case per se for more education for women, but more importantly, the education should lead to empowerment. A recent literature review by the International Center for Research on Women (ICRW), entitled ‘Impact of Investments in Female Education on Gender Equality,’ shows that education is a necessary but not sufficient investment to achieve gender equality. For higher levels of education to have the greatest payoff, investments also are needed that address the social and economic constraints, in the form of this-empowering roles, since most advantages of education are lost when women are relegated to traditional roles which stifle their creativity, block their progress and diminish their contribution to the society at large.

Education is significant for girls and women because it is an entry point to other opportunities and the educational achievements of women can have ripple effects not only within the family but for many generations to come. Educated women recognize the importance of health care and know how to take care of themselves and their families. Education helps to know their rights and they get the confidence to claim them. An educated mother plays a greater role in household negotiations and she secures more resources for her children. An educated mother can pay more attention to her children. The Indian scenario has provided enough role models that stand out as icons of gender equality. Maharani Lakshmi Bai, Rajia Sultan, Indira Gandhi, Kiran Bedi, Medha Patkar, Sania Mirza, Sonia Gandhi, Kalpana Chawla and Sunita Williams are but a few names which highlight the heights women can achieve.

However, to achieve gender equality widely, it is most essential to educate both men and women about the changing roles. Men even more than women need to be made aware of gender equality issues. These attitudinal changes need to be incorporated right from the beginning of the socialization process. Men and women must be rightly educated to modify a woman’s traditional roles so that there is awareness of women’s basic needs for fulfillment – psychological and financial as well as biological.

Men and women must value a woman who is able to:
• Use existing laws for her benefit;
• Be self-reliant in all situations to get equal rights in the family, society and at work place.
• Love herself and be her own friend;
• Be full of positive self-esteem and extra vigor
• Be optimistic to self and fellow women;
• Learn to live the life of respect for oneself as well as all those around;
• Be ready to change and accept challenge;
• Have courage to go against the current;
• Search out opportunities;
• Search, locate and expand the extraordinary potential that is hidden in them;
• Break all stereotypes, especially those which are degenerative in nature;
• Learn to be assertive in all situations, in decision making and planning for managing future;
• Examine oneself critically with respect to finances as well as relationships;
• Be a change agent.

Women today, by following the above mentioned steps will definitely secure economic empowerment by becoming self-dependent. They will also attain educational empowerment by upgrading their minds and obtaining political empowerment by taking their own decisions.

Discrimination
Gender disparity manifests itself in various forms, the most obvious being the declining female ratio in the population over the past few decades. Social stereotyping and violence at the domestic and societal levels are some of the other manifestations. Discrimination against girl children, adolescent girls and women persists in many parts of the country. Women must stand together against such disparity, and definitely must not exemplify woman-woman rivalry.

The gender biased role allocations in society have been patently discriminatory and oppressive of women. For example ‘Gender-specific education; high professional qualification is important only for the man’, ‘The workplace is not the primary area of women; career and professional advancement is deemed unimportant for women’, ‘Housekeeping and child care are the primary functions of the woman; participation of the man in these functions is only partially wanted’,

‘Woman takes care of the largest part of these functions; she educates children and cares for them in every way’ – and yet ‘In case of conflict, man has the last say, for example in choosing the place to live, choice of school for children, buying decisions’. Within the framework of a democratic polity, our law, development policies, plans and programmes have aimed at women’s advancement in different spheres. From the Fifth Five Year Plan (1974-78) onwards there has been a marked shift in the approach to women’s issues from welfare to development. In recent years in India, the empowerment of women has been recognized as the central issue in determining the status of women. The National Commission for women was set up by an Act of Parliament in 1990 to safeguard the rights and legal entitlements of women. The 73rd and 74th Amendments (1993) to the Constitution of India have provided for reservation of seats in the local bodies of Panchayats and Municipalities for women, laying a strong foundation for their participation in decision making at the local levels.

The goal of this policy is to bring about the advancement, development and empowerment of women by:

• Creating an environment through positive economic and social policies for development of women enabling them to realize their full potential.
• The enjoyment of all human rights and fundamental freedom by women on equal basis with men in all spheres – political, economic, social, cultural and civil.
• Equal access to participation and decision making of women in social, political and economic life of the nation.
• Equal access to women to health care, quality education at all levels, career and vocational guidance, employment, equal remuneration, occupational health and safety, social security and public office etc.
• Strengthening legal systems aimed at elimination of all forms of discrimination against women.
- Changing societal attitudes and community practices by active participation and involvement of both men and women.
- Mainstreaming a gender perspective in the development process.
- Elimination of discrimination and all forms of violence against women and the girl child.
- Building and strengthening partnerships with civil society, particularly women’s organizations.

**Constitutional and Legal Provisions for Women in India**

The Constitution of India not only grants equality to women but also empowers the State to adopt measures of positive discrimination in favour of women for neutralizing the cumulative socio-economic, education and political disadvantages faced by them. Fundamental Rights, among others, ensure equality before the law and equal protection of law; prohibits discrimination against any citizen on grounds of religion, race, caste, sex or place of birth, and guarantee equality of opportunity to all citizens in matters relating to employment. Articles 14, 15, 15(3), 16, 39(a), 39(b), 39(c) and 42 of the Constitution are of specific importance in this regard.

**Constitutional Privileges**

1. Equality before law for women (Article 14)
2. The State not to discriminate against any citizen on grounds only of religion, race, caste, sex, place of birth or any of them (Article 15 (i))
3. The State to make any special provision in favour of women and children (Article 15 (3))
4. Equality of opportunity for all citizens in matters relating to employment or appointment to any office under the State (Article 16)
5. The State to direct its policy towards securing for men and women equally the right to an adequate means of livelihood (Article 39(a)); and equal pay for equal work for both men and women (Article 39(d))
6. To promote justice, on a basis of equal opportunity and to provide free legal aid by suitable legislation or scheme or in any other way to ensure that opportunities for securing justice are not denied to any citizen by reason of economic or other disabilities (Article 39 A)
7. The State to make provision for securing just and humane conditions of work and for maternity relief (Article 42)
8. The State to promote with special care the educational and economic interests of the weaker sections of the people and to protect them from social injustice and all forms of exploitation (Article 46)
9. The State to raise the level of nutrition and the standard of living of its people (Article 47)
10. To promote harmony and the spirit of common brotherhood amongst all the people of India and to renounce practices derogatory to the dignity of women (Article 51(A) (e))
11. Not less than one-third (including the number of seats reserved for women belonging to the Scheduled Castes and the Scheduled Tribes) of the total number of seats to be filled by direct election in every Panchayat to be reserved for women and such seats to be allotted by rotation to different constituencies in a Panchayat (Article 243 D(3))
12. Not less than one-third of the total number of offices of Chairpersons in the Panchayats at each level to be reserved for women (Article 243 D (4))
13. Not less than one-third (including the number of seats reserved for women belonging to the Scheduled Castes and the Scheduled Tribes) of the total number of seats to be filled by direct election in every Municipality to be reserved for women and such seats to be allotted by rotation to different constituencies in a Municipality (Article 243 T (3))
14. Reservation of offices of Chairpersons in Municipalities for the Scheduled Castes, the Scheduled Tribes and women in such manner as the legislature of a State may by law provide (Article 243 T (4))

**Table 1: Literacy Rate in India: 1951-2011**

<table>
<thead>
<tr>
<th>Census Year</th>
<th>Persons</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>18.33</td>
<td>27.16</td>
<td>8.86</td>
</tr>
<tr>
<td>1961</td>
<td>28.30</td>
<td>40.40</td>
<td>15.35</td>
</tr>
<tr>
<td>1971</td>
<td>34.45</td>
<td>45.96</td>
<td>21.97</td>
</tr>
<tr>
<td>1981</td>
<td>43.57</td>
<td>56.38</td>
<td>29.76</td>
</tr>
<tr>
<td>1991</td>
<td>52.21</td>
<td>64.13</td>
<td>39.29</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>State/UT Code</th>
<th>India/State/Union Territory*</th>
<th>Total Population</th>
<th>Percentage Decadal Growth</th>
<th>Average Annual Exponential Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDIA</td>
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<td>1,21,01,93,422</td>
<td>21.54</td>
<td>17.64</td>
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<td>1</td>
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<td>1,25,48,926</td>
<td>29.43</td>
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<td>2</td>
<td>Himachal Pradesh</td>
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<td>68,56,509</td>
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<tr>
<td>3</td>
<td>Punjab</td>
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<td>2,77,04,236</td>
<td>20.10</td>
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<tr>
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<td>Chandigarh*</td>
<td>9,00,635</td>
<td>10,54,686</td>
<td>40.28</td>
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<td>Uttarakhand</td>
<td>84,89,349</td>
<td>1,01,16,752</td>
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<td>Harayana</td>
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<td>2,53,53,081</td>
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<tr>
<td>7</td>
<td>NCT of Delhi*</td>
<td>1,38,50,507</td>
<td>1,67,53235</td>
<td>47.02</td>
</tr>
<tr>
<td>8</td>
<td>Rajasthan</td>
<td>5,65,07,188</td>
<td>6,86,21,012</td>
<td>28.41</td>
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<tr>
<td>9</td>
<td>Uttar Pradesh</td>
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<td>19,95,91,477</td>
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<td>10</td>
<td>Bihar</td>
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<td>10,38,04,637</td>
<td>28.62</td>
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<td>11</td>
<td>Sikkim</td>
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<td>6,07,688</td>
<td>33.06</td>
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<td>12</td>
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<td>13,82,611</td>
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<tr>
<td>13</td>
<td>Nagaland</td>
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<td>19,80,602</td>
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<td>14</td>
<td>Manipur</td>
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<tr>
<td>15</td>
<td>Mizoram</td>
<td>8,88,573</td>
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<td>28.82</td>
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<td>Tripura</td>
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<td>36,71,032</td>
<td>16.03</td>
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<td>17</td>
<td>Meghalaya</td>
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<td>18</td>
<td>Assam</td>
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<tr>
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<td>West Bengal</td>
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<td>17.77</td>
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<tr>
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<td>Jharkhand</td>
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<td>3,29,66,238</td>
<td>23.36</td>
</tr>
<tr>
<td>21</td>
<td>Orissa</td>
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<td>4,19,47,358</td>
<td>16.25</td>
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<tr>
<td>22</td>
<td>Chhattisgarh</td>
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<td>2,55,40,196</td>
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<td>23</td>
<td>Madhya Pradesh</td>
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<td>7,25,97,565</td>
<td>24.26</td>
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</tr>
<tr>
<td>24.</td>
<td>Gujarat</td>
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<td>6,03,83,628</td>
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<tr>
<td>25.</td>
<td>Daman &amp; Diu*</td>
<td>1,58,204</td>
<td>2,42,911</td>
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<td>26.</td>
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<td>2,20,490</td>
<td>3,42,853</td>
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<td>Maharashtra</td>
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<td>22.73</td>
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<td>Andhra Pradesh</td>
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<td>8,46,65,533</td>
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<td>29.</td>
<td>Karnataka</td>
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<td>6,11,30,704</td>
<td>17.51</td>
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<td>30.</td>
<td>Goa</td>
<td>13,47,668</td>
<td>14,57,723</td>
<td>15.21</td>
</tr>
</tbody>
</table>

Source: Census of India 2011

**Recommendations**

- Total attitudinal change in the country towards the purpose of education, no discrimination in the girl child’s education by parents. Talking about equality and providing equal opportunities is not enough. The mindset of people needs to be altered. This can be done by educating society about gender equality. In schools, colleges and offices both men and women should be made aware of the rights of women. If we start this from the beginning attitudinal change is bound to occur.

- Equal job opportunity for women as well as status and power distribution. Along with being given equal opportunity, women also need to be given power to make decisions. They should be provided with responsibilities as challenging as those of their male counterparts. A woman’s judgment needs to be valued.

- Corporations must come forward with their funds for the development of women, especially in rural areas.

- Government should take action towards implementation of the law in approach and practice at the school level.

- Public awareness in the villages should be raised by dramatic performances against dowry/bride burning/female feticide etc. In a country like India, the majority of the population still reside in rural areas. Here the maximum reach of communication can be through Nukad Natak or street theatre. The performers of the play impart a social message and at the same time involve the audience. Street plays can be used in a productive way to impart education for gender equality and empowerment of women in all corners of the country.

- Non-government activity should be promoted.
  - Women in India should be encouraged to become entrepreneurs, as is already happening in other countries.
  - I would like to end by quoting the famous Martina Navratilova, who said, “I think the key is for women not to set any limits.”

**References**


Website : www.unilawbooks.com
Learners’ Beliefs about English Language Learning in the Context of Tertiary Education With Reference to the Undergraduates of the University of Moratuwa

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Abstract: With the paradigm shift from teacher centred learning to student centred learning, the learner is considered as an active participant in the learning process. Hence, understanding learner beliefs about language learning is essential to plan and implement effective language instruction. The paper aims to study whether learner beliefs in learning English is a determining factor to achieve the outcomes of teaching English as a second Language. Thus, the English language learning beliefs held by undergraduates of the University of Moratuwa was examined. This study employed a mixed approach. The learners’ beliefs were captured through questionnaires and interviews adapted from BALLI framework. The findings reveal that the undergraduates have confidence in their own learning ability as they perceive English not as a difficult language to learn. It also gives an insight for teachers to incorporate more communicative student-centred learning activities. Thus learners’ beliefs not only reflect their beliefs and perceptions on how they learn but also inform the strategies that can be adopted to enhance the teaching of English as a second language at tertiary level.

Keywords: Learner beliefs, English language learning, Beliefs about Language Learning Inventory (BALLI)

Introduction
With the paradigm shift from teacher-centered to student-centered teaching, the focus is on the learners. Thus the learner is an active participant in the language learning process. The learners’ beliefs, perceptions, strategies and motivation become integral elements in the preparation and implementation of effective language instruction (Horwitz 1999). In this way, as teachers, we have to view language learners as individuals approaching language learning in their own unique way. She further claims that learner beliefs have the potential to influence both their experiences and actions as language learners. This is in concurrence with the view of Flavell (1987) who states beliefs about language learning as a component of metacognitive knowledge, which include all that they understand about themselves as learners and thinkers, including their goals and needs. His study also focuses on the person. He calls this "person knowledge" that has been acquired from cognitive and affective factors such as learner aptitude, personality, and motivation that may influence learning. Further, Wenden (2001) states it as the specific knowledge about how the above factors apply in their experience.

With globalization, English continues to play a distinctive role not only to cross borders but also for survival in Sri Lanka. Thus, the ability to communicate in English has become an urgent need to all levels of learners in Sri Lanka. In this context, it is a dire necessity to develop the competency of English among the undergraduates as they need English not only for their higher studies but also for their professional career. Despite many attempts, it is a sad state that the attainment level in English is not at a satisfactory level in Universities. This problem is greatly felt by the undergraduates of the rural area who are deprived of the opportunities enjoyed by the English knowledgeable ones. They are unable to compete in their job market due to their incompetency in English Language. Moreover, the Academics involved in teaching English to adults need to find the determining factors that can enhance the teaching and learning process. As such, learners’ beliefs and perceptions are significant learner variables in determining the effectiveness of teaching and learning. When teachers incorporate the identified learner beliefs and reflect on their potential impact on language learning and teaching, this can inform future syllabus design and the strategies that can be adopted to enhance the teaching and learning process.
This study examines the learners’ beliefs in learning English at tertiary level in local context in order to discover whether learners’ beliefs in learning English is a contributory factor in teaching English at tertiary level.

The questions addressed in this study are:

1. What are the learners’ beliefs about learning English at tertiary level of education?
2. How do these learner beliefs contribute to the effectiveness of English language learning and teaching?

**Literature Review**

**Educational goals and English Language teaching approach in Sri Lanka.**

Since the late 1980s, the Sri Lankan Educational System has attempted to adopt Communicative approach in teaching English in schools (National Institute of Education 1999) as well as in tertiary educational institutions. The degree programs offered by the state University system are planned towards outcome-based education (OBE) using student-centred learning ( Ministry of Higher Education 2002). One of the national goals of tertiary education is to produce readily employable graduates who can think intellectually, act confidently and communicate effectively. So students’ potential should be developed in a holistic and integrated manner to promote national integration. In the context of teaching English, focus must be on the teaching of four skills and language contents i.e. grammar, pronunciation and vocabulary by advocating the communicative approach. It becomes mandatory to enhance students’ communicative skills through the integration of four skills and language contents through ‘realistic and authentic’ tasks that stimulate real-life conditions.

**Approaches to investigate learners’ beliefs**

Barcelos (2006), identifies three approaches i.e. the normative, the metacognitive and the contextual approach to investigate learners’ beliefs. According to Hofer & Pintrich (2004), they vary in terms of the concept of beliefs i.e. whether beliefs are considered stable or dynamic, individual or contextual, and the relationship between beliefs and actions. The normative approach sees beliefs as individuals’ stable ‘preconceived notions, myths or misconceptions’ (Horwitz 1988). A Likert scale questionnaire such as the Beliefs About Language Learning Inventory (BALLI) developed by Horwitz (1985) is always used in this approach. The metacognitive approach defines beliefs as metacognitive knowledge that constitutes their ‘theories in action’ (Wenden 1987). It investigates beliefs through content, analyses of data obtained from semi-structured interviews and self-reports. The contextual approach views beliefs as contextual, dynamic and social. It encompasses collecting data through ethnographic classroom observations, case studies, metaphor analyses and discourse analyses. Both the normative and metacognitive approaches posit a direct beliefs-actions relationship, whereas the contextual approach suggests the possibility of inconsistent beliefs-actions relationships due to contextual refrains.

**Beliefs about Language Learning Inventory (BALLI) model**

The normative approach is characterized by the use of Likert-scale questionnaires in the investigation of learner beliefs. BALLI is an instrument designed to assess teachers’ opinions on several issues related to language learning. In a brain-storming session, 25 foreign language teachers in the United States listed their beliefs, other people’s beliefs, and their students’ beliefs about language learning. After eliminating the idiosyncratic beliefs, the list was examined and added more beliefs. The instrument was then piloted with 150 first-semester foreign language students at The University of Texas at Austin (Horwitz 1985). BALLI employs a 5-point Likert-type scale ranging from ‘strongly disagree’ to ‘strongly agree’. It has been revised three times; the final version contains 34 items. It comprises five themes: (i) foreign language aptitude, (ii) difficulty of language learning, (iii) nature of language learning, (iv) learning and communication strategies and (v) motivation and expectation.

BALLI’s validity is criticized by Kuntz (1996) for its teachers-generated items/themes, the lack of explanations for the generated themes, and the over-reliance on descriptive statistics. Nevertheless, studies employing factor analysis conducted by Yang (1999) and Park (1995), have proven BALLI’s validity in the Asian context. BALLI has also been endorsed for its applicability as a tool for assessing learners’ beliefs.

Horwitz (1987), stated, second language learners often hold different beliefs or notions about language learning, some of which are influenced by students’ previous experiences as language learners, and
others that are shaped by their own cultural backgrounds. In her review of representative studies based on her questionnaire, BALLI, she further claims that individual differences, such as age, stage of life, learning style, educational experiences, and learning circumstances, including instructional levels, family, language learning contexts, likely account for as much variation as cultural differences (Horwitz 1999). Based on the assumption that individual differences and learning circumstances likely account for as much variation as cultural differences, research has also proven that learners’ beliefs may have the potential to influence both their experiences and actions as language learners, and there are links between beliefs, motivation, and strategy use (Horwitz 1988).

A study was conducted by Chai (2013), employing BALLI questionnaire to examine the English Language learning beliefs held by Malaysian National Secondary School (NSS) and the Malaysian Independent Chinese Secondary School (MICSS) English as second language (ESL) students. This study revealed that the MICSS and the NSS students’ beliefs differ primarily on their perceptions of the important expectations of learning English and their English language learning practices. Despite the individual differences in educational background and previous English learning experiences, racial demographics, the most salient difference is in their endorsement for the translation method in learning English. Besides, there were three additional ESL learner beliefs discovered in this study: English teachers’ race/culture/mother tongue, ideal English classroom, and motivation in relation to techniques/activities employed in the classroom and teachers’ choice of content. It shows that the NSS students’ beliefs are closer to the learner-centered principles but the MICSS students’ beliefs are still determined by their traditional learning experiences and their classmates. This mirrored the stronger collectivistic learning culture in the MICSS.

As cited in Chai (2013), generally, students agree with the existence of English language ability Peng & Hui (2012) but disparage their own English language aptitude Chang & Shen (2006); Riley (2006); Wu (2008). Peng & Hui (2012), Wu (2008) and Huang & Tsai (2003) rationalize such a scenario with students’ unsuccessful English learning experiences. Even though students generally perceive English as a difficult language Wu (2008); Hong (2006); Li (2011), they tend to underestimate the difficulty of learning English Fujiwara (2011); Peng & Hui (2012); Riley (2006); Sioson (2011). Students’ opinions are divided on whether learning English is about acquiring grammar rules, vocabulary and translating ability. Peacock (1999) and Wu (2008) present students’ agreement about the importance of learning grammar while Ghabadi Mohebi and Khodadady (2011), Li (2011) and Riley (2006) report otherwise. Vocabulary learning has always been valued (Fujiwara 2011; Ghabadi Mohebi & Khodadady 2011; Wu 2008). Conversely, students do not agree they should translate to and from their own mother tongue (Ghabadi Mohebi & Khodadady 2011; Riley 2006). The issues in this category have always been on the students’ willingness to guess, tolerance for mistakes, and their view towards the roles of repeating and practising. Most studies including the study Peng & Hui (2012) report students’ appreciation of the three aforementioned aspects. All Asian students are motivated to speak good English (Peng & Hui 2012). Nevertheless, only 50% of them believe that they can speak English successfully.

Methodology: This study employed a mixed approach. Though, the place where research is conducted belongs to the urban setting, the sample of my study is from both urban and rural areas reading their degree programme in English medium at the University of Moratuwa. Sixty four first year undergraduate from the faculty of Engineering were selected as the sample of study using the simple random sampling method. A questionnaire was administered among my sample group. The questionnaire was designed with 20 items adapted from BALLI that addressed the five categories of BALLI framework. This methodology was complemented with focus group interviews to seek clarification of the questionnaire data. The secondary data was collected through library research and internet.

Analysis of data:

Table1: Summary of the data from questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>It is difficult to learn English.</td>
<td>0</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>Learning to read and write in English is easier than to listen or</td>
<td>6</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>It is easier to speak than to understand English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3.13%</td>
<td>22</td>
<td>34.38%</td>
</tr>
<tr>
<td>4</td>
<td>I believe that I will learn to speak English very well.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>68.75%</td>
<td>20</td>
<td>31.25%</td>
</tr>
<tr>
<td>5</td>
<td>I want to learn to speak English well.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>84.38%</td>
<td>10</td>
<td>15.63%</td>
</tr>
<tr>
<td>6</td>
<td>It is important to speak English with good pronunciation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>46.88%</td>
<td>30</td>
<td>46.88%</td>
</tr>
<tr>
<td>7</td>
<td>You shouldn’t speak English until you can speak fluently.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>9.38%</td>
<td>2</td>
<td>3.13%</td>
</tr>
<tr>
<td>8</td>
<td>You should speak English whether it is right or wrong.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>46.88%</td>
<td>26</td>
<td>40.63%</td>
</tr>
<tr>
<td>9</td>
<td>I enjoy talking in English with my lecturer and colleagues who speak English.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>43.75%</td>
<td>28</td>
<td>43.75%</td>
</tr>
<tr>
<td>10</td>
<td>I guess if I don’t know a word in English.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>12.50%</td>
<td>26</td>
<td>40.63%</td>
</tr>
<tr>
<td>11</td>
<td>The most important part of learning English is learning grammar.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>9.38%</td>
<td>44</td>
<td>68.75%</td>
</tr>
<tr>
<td>12</td>
<td>The most important part of learning English is learning vocabulary words.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>25.00%</td>
<td>34</td>
<td>53.13%</td>
</tr>
<tr>
<td>13</td>
<td>In learning English, it is important to practice a lot.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>46.88%</td>
<td>20</td>
<td>31.25%</td>
</tr>
<tr>
<td>14</td>
<td>I feel shy to speak English with other people.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>9.38%</td>
<td>24</td>
<td>37.50%</td>
</tr>
<tr>
<td>15</td>
<td>I don’t think it’s necessary to be able to speak in English to live in Sri Lanka.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>9.38%</td>
<td>12</td>
<td>18.75%</td>
</tr>
<tr>
<td>16</td>
<td>If error is corrected, learners will not be motivated to speak.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>9.38%</td>
<td>18</td>
<td>28.13%</td>
</tr>
<tr>
<td>17</td>
<td>If learners are permitted to make errors in English, it will be difficult for them to speak correctly in their professional career.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>9.38%</td>
<td>30</td>
<td>46.88%</td>
</tr>
<tr>
<td>18</td>
<td>The most important part of learning English is learning how to translate from my native language.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>15.63%</td>
<td>22</td>
<td>34.38%</td>
</tr>
<tr>
<td>19</td>
<td>I would like to learn English so that I can get to know English speaking people better.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>31.25%</td>
<td>26</td>
<td>40.63%</td>
</tr>
<tr>
<td>20</td>
<td>If I learn to communicate in English very well, I will have better opportunities to get a good job.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>59.38%</td>
<td>24</td>
<td>37.50%</td>
</tr>
</tbody>
</table>

**Results and Discussion**

The findings are reported under the five categories of BALLI framework and discussed according to the two research questions.

**English Language Aptitude:**

The respondents share the same opinion in this category. Unlike results reported in previous studies, the respondents have faith in their own English learning ability, which comes from their confidence as a high proficiency English learner. This is clearly indicated by all respondents agreeing that they believe they will learn to speak English well. This finding consolidates Wu’s (2008) and Huang and Tsai’s (2003) explanation that success and failure in English learning experiences shape learners’ beliefs about their English language aptitude.
The Difficulty in Language Learning
Except 18.75%, the other respondents perceive English not as a difficult language. This does not concur with most of the findings (Fujiwara 2011; Peng & Hui 2012; Riley 2006; Sioson 2011). In considering the difficulty of learning English, the majority believe that English is not a difficult language to learn as 82.5% disagree with 22% “strongly disagree” responses. Regarding the four skills, almost 60% believe that the oral/aural skills are easier than reading and writing. This concurs with the opinion held by teachers who feel that speaking is easier than reading and writing as speaking requires less complex structures, but writing requires contents and complex structures. Approximately 62.5% share the same opinion that comprehending and listening is easier than speaking. Interestingly, a fewer respondents disagree. Their response concurs with the reality that speaking is generally perceived to be difficult among the undergraduates.

Nature of English Language Learning
Significant differences are shown in their belief on the type of learning required to learn a language and the use of translation. Almost 50% emphasize on translation for learning English. They assert that the most important part of learning English is learning how to translate from their native language which means they are mostly dependent on their native language. Students’ opinions are divided on whether English is about acquiring grammar, vocabulary and translation. Almost 78% believe that it is important to learn grammar to learn English while the same percent believe that vocabulary is important in learning English. This indicates that students should be given both grammar and vocabulary in the same proportion as vocabulary is as important as grammar.

Learning and Communication Strategies
The subjects display discordant opinions in the effect of non-immediate correction of error. More than 55% feel that their error will have to be corrected for their future prospects. They claim that non-immediate correction of error may lead to fossilization. Conversely, in the communicative approach frequent correction will inhibit their motivation to communicate. Their responses concur with their preference and resistance to immediate corrections. The other respondents’ tolerance for mistakes is consistent with Peng and Hui’s (2012) findings. A significant difference is revealed in students’ willingness of attempting to guess unknown words. Almost 47% of them show reluctance in guessing unknown words while the others believe guessing to be a good strategy and they appreciate the value of guessing. However, guessing meaning is a good strategy and teachers encourage learners to attempt guessing unknown words through contexts. Surprisingly, there is a general consensus of agreeing on the practical component as the respondents show a positive response with 78% expressing the need for more practice. This is a good indicator for teachers to give space for more practice through communicative activities in a student centered learning environment.

Motivations and Expectations
There is unanimous agreement with 100% claiming that they want to speak English well, inclusive of 84.5% “strongly agree” response. The high motivation shown by the learners give them a strong belief that they can learn English well. Almost 94% believe that they need to speak English with good pronunciation while only 6% prefer to have their native like English pronunciation. The inhibition affective factor is reflected in 47% who feel shy to speak in English with other people as reflected in the response to question (14) of the questionnaire. This contradicts the response to question (8), where 88% feel that they should speak English whether it is right or wrong. Approximately 72% believe they need English for survival in Sri Lanka. The intrinsic motivating factor is revealed by 87.5% of the respondents who enjoy while communicating in English and 97% are motivated in the belief that they will be ensured employable and be secured with good jobs if they possessed good communication skills.

Conclusion
Based on the findings of the present study, the learners held various beliefs about language learning, whether related to individual characteristics or differences in instructional practices. These beliefs likely account for the variation in perception and expectations. Although there is some tendency among group members to share a particular belief and be among the majority group, the minority individuals’ beliefs’ also should be taken into consideration during decision making. Despite the differences they have in their socio economic status, culture, educational and family background, learning styles, motivation and the learners’ previous English learning experiences, it is important to consider the
contextual differences in the language learning situation as well as classroom practices as this would have a greater impact on learner beliefs which will ultimately shape the teachers’ beliefs as well. The findings also reveal the importance of giving practice in communication activities that is related to their life experiences. Interestingly, the study stirs the enthusiasm of English teachers as there is a strong urge and motivation on the part of the learners. It is a social responsibility of teachers to recognize the beliefs, needs and interests of learners and provide the necessary platform to achieve the outcome of teaching English in Sri Lanka.

**Limitations and direction for future research**

This paper identifies learners’ beliefs and its contribution at a broader perspective. The beliefs captured by the questionnaire may not elicit the general beliefs of English learners as this is captured from a representative group of learners with a limited sample of study. It can be suggested to use empirical studies on a larger sample to identify whether learner belief is a contributory factor in determining the effectiveness of the teaching and learning process.

**References:**


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The Impact of Globalisation on the Role of Women in the Economy – A Case Study of India with Special Focus on Tamilnadu

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Abstract: The status of any section of population in a society is intimately connected with its economic position. The development strategy which neglects the need for enhancing the role of women cannot lead to comprehensive socio-economic development. Globalisation has introduced enormous economic opportunities for women, but they are associated with mounting threats. The research paper intends to comprehend and give an overview on the impact of globalisation in current scenario on women’s employment in India with special focus on Tamilnadu. The objective of the study is to highlight the Gender gap and Gender divide through the sectoral participation of women. Analytical methodology is followed to give a critical note on the contribution of women in the socio-economic transformation of the state. Besides, both qualitative and quantitative analysis on the economic contribution of women is adopted in this study to analyse the implications of Globalisation.

Keywords: Globalisation, Work Participation Rate, Sectoral Division, Gender Divide, Gender Gap.

Introduction

Globalisation involves the creation of a world economy which is not merely the sum of its national economies, but rather a powerful independent reality, created by the international division of labour and the world market which in the present epoch predominates over national markets. Today, the major phenomenon shaping our world is globalisation. Globalisation is a double edged process as far as women are concerned. It intensifies some of the existing inequalities and insecurities for women but on the other it opens up new opportunities for educated and professional women. Globalisation creates an environment that allows many women to achieve greater personal autonomy but it also increases unequal and risky environment. When women attempt to redefine their roles and expand their arena of choices, their perceptions and actions generate reverberations through the entire society.

Within the last three decades, the struggle for equality for women has gained momentum due to the international women’s movement and through various world conferences on women. It paved the way to measure the position of women through Gender Development Index and Human Development Index to compare stages of gender development. Over the decade, the level of human development increased by 0.075 and gender development by 0.076 points in India1. It evaluates progress of women advancing in political and economic forums. Employment enhances financial independence and self-esteem of women. Women’s access to more and better jobs has been widely recognized as important in facilitating a process of poverty eradication and empowerment. The present study highlights the impact of globalisation on women’s employment in India with special reference to Tamilnadu and discusses the possible strategies for gender justice in the era of globalization.

Globalisation and Female Employment scenario

Globalisation has contributed in reshaping the identity and role of women and challenged conventional ideas about gender roles. During the past two decades women have entered the work force throughout the world due to the rise and demand in the service sectors. Nevertheless, there has been an overall increase in the number of women working in the economy due to financial constraints, for becoming self-reliant and for enjoyment of individual autonomy. Of course, the increase in women’s employment cannot by itself be construed as evidence of a trend towards greater equality. Participation of women in all the spheres of life enhances their role in the process of economic development. It has to be noted that the Fourth World Conference on Women held in Beijing in 1995 declared “Promote women’s economic independence including employment and eradicate the persistent and increasing
burden of poverty on women". The planning process has evolved over recognition of gender as a crosscutting theme across the years.

**Female Work Participation Rate (FWPR)**

Work participation rate indicates the economic empowerment of women in the society to a greater extent. The status of women is intimately connected with their economic position, which directly depends on opportunities for participation in the economic activities. Education clubbed along with participation of women in workforce has been universally recognised as one of the most crucial indicators and serves as an empowerment tool. There has been a considerable improvement in the emergence of women in all sectors of employment in the State.

### Table 1: Work Participation Rate (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Gender</th>
<th>Tamilnadu</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>1981</td>
<td>Male</td>
<td>59.24</td>
<td>51.25</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>33.55</td>
<td>11.97</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>46.48</td>
<td>32.05</td>
</tr>
<tr>
<td>1991</td>
<td>Male</td>
<td>58.28</td>
<td>52.78</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>38.50</td>
<td>13.10</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48.49</td>
<td>33.34</td>
</tr>
<tr>
<td>2001</td>
<td>Male</td>
<td>59.38</td>
<td>56.37</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>41.33</td>
<td>18.42</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50.39</td>
<td>37.59</td>
</tr>
<tr>
<td>2004-2005</td>
<td>Male</td>
<td>59.7</td>
<td>59.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>46.1</td>
<td>24.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>52.8</td>
<td>41.8</td>
</tr>
<tr>
<td>2009-2010</td>
<td>Male</td>
<td>60.3</td>
<td>56.9</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>40.5</td>
<td>19.1</td>
</tr>
</tbody>
</table>

*Source: Census of India 1981, 1991, 2001 and NSSO 55th, 61st and 66th round*

As per the census report, 1991, the workforce participation rate of females in urban India was 31.0 while that for males was 52.4. However it was declined during the 2001 to 11.6 for female and for male are 50.9. In 2004-2005 there has been a slight improvement in both male and female from 32.2 and 16.6 respectively. Similarly rural women WPR also indicate the near-consistent decline. Tamilnadu stands out with high Work Participation Rates (WPR) for both men and women with its predominant agriculture and comparatively higher level of industrial development in the country. The Work Participation Rate for females rose from 26.52% in 1981 to 35.5% in 2005. The respective figures for males are 56.58% and 59.5%. One positive aspect is that, the trend of WPR for women has improved favourably over the last three decades. It is pertinent to note that the FWPR is high in the case of rural women than the urban women. This is mainly due to their participation in agriculture and allied activities. According to the NSSO report of 2011 60.3% of rural males and 40.5% are females are employed. The corresponding proportion in the urban areas was 56.9% and 19.1% respectively. Of the total population although a close to half were females, yet they accounted only 30% of the total work force of India. This proportion has to necessarily be improved for ensuring better and all round economic empowerment. However, these women who work are not enumerated since their works are
not remunerated and hence, remains unrecognised. As a consequence, the rate of women’s participation in the workforce is shown in the bottom line. Given poor human capital investment, the share of women in the organised sector is also low. In every respect, FWPR is low in India, mainly due to the poor coverage portrayed to women’s work, especially in the unorganised sector and partly due to heavy domestic responsibilities that inhibit women’s economic activities. In addition to the traditional sources of employment such as cultivation, dairying, cottage industries, women are increasingly seeking non-farm and non-rural forms of employment both in the organised and unorganised sectors. Hence, employment policies are required to be fine-tuned to realise this objective of recognising female presence.

**Sectoral participation of women**

The structural transformation among the sectors is an indispensable characteristic feature in the development process of the state economy. In the Primary sector, agriculture is the major source of sustenance. From time immemorial, women in the villages have taken part in agriculture labour, either on their own property or as hired workers. Women in rural areas are compelled to work in order to save labour costs and supplement the slender earnings of men. In fact, rural women contribute in multi-directional ways such as workers, labourers, producers and traders and also as housewives performing all kinds of traditional non-productive household duties. In the industrial sector, jobs in modern Indian society are created to suit the place and time of the employer and it is one of the factors responsible for women as only a third of world’s official income earning labour force. The development of service sector is partly due to major changes in agriculture and industry and partly due to their heterogeneous production and consumption characteristics. The main services of this sector include trade, transport, banking, tourism, catering, etc. The sector structure on women in India as indicated by the table shows a healthy trend in the increase in women’s participation in primary, secondary and tertiary sectors.

<table>
<thead>
<tr>
<th>Years</th>
<th>Primary Sector</th>
<th>Secondary sector</th>
<th>Tertiary sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>1977-1978</td>
<td>57.4</td>
<td>73.2</td>
<td>19.7</td>
</tr>
<tr>
<td>1983-1984</td>
<td>49.2</td>
<td>70.4</td>
<td>23.1</td>
</tr>
<tr>
<td>1987-1988</td>
<td>46.1</td>
<td>65.8</td>
<td>24.6</td>
</tr>
<tr>
<td>1993-1994</td>
<td>45.5</td>
<td>67.3</td>
<td>23.6</td>
</tr>
<tr>
<td>1999-2000</td>
<td>42.9</td>
<td>62.8</td>
<td>25.7</td>
</tr>
<tr>
<td>2004-2005</td>
<td>35.9</td>
<td>57.6</td>
<td>31.9</td>
</tr>
</tbody>
</table>

*Source: NSS 32nd, 38th, 43rd, 50th 55th and 61st Rounds.*

The proportion of female in the primary sector has decreased gradually from 73.2% in 1978, 70.4% in 1984 and then to 65.8% in 1988, 67.3% in 1994 and further decreased to 62.8% in 2000 and 57.6% in 2005. The contribution of women in the secondary sector also shows a low profile, contributing 16.2 % in 1978, 16.4 % in 1983, 20.4 % in 1988, 19 % in 2000 and 26.12 in 2005. The tertiary sector absorbs 22% of the state’s female labour force. Gender-wise analysis reveals, that share of male workers in primary sector employment has been steadily declining. It declined from 57.4% in 1977–78 to 35.9% in 2004–2005. The corresponding ratios for females were 73.2% and 57.6%, during the same period. A significant development in recent years is the increase in the share of tertiary sector employment for females, from 13.7% in 1993–94 to 24.46% in 2004–2005. The loss of share in primary sector employment for females has been more or less equally gained by the secondary and tertiary sectors. However, in the case of males, the secondary sector accounted for a relatively higher share in the recent period.

An analysis of the sectoral distribution of the total work force reveals that primary sector accommodates and absorbs a large portion of 57.6% of women labour force (as per NSS 61st Round-2004-05), around 26.12% are engaged in the secondary sector and 22.46% account in the tertiary sector.
in the economy of Tamilnadu. Though women play a crucial role in agriculture and food production, their potential for acceleration has not often been well rewarded and appreciated. A distressing feature is that the highly unorganized nature of this work exposes them to exploitation, as they are not well protected by any law being enforced in the organized sector. Further, discriminatory attitude and inherited bias in the agrarian development approaches have led to an inadequate perception of women's economic role. The role of women in the secondary sector has not reached the optimum level. The tertiary sector also shows a clear sign of labour market segmented by gender. Women are engaged in low paid and less skilled occupations, thereby reinforcing or aggravating the existing gender inequities in the labour market. The data analysis shows that the primary sector is overcrowded, the secondary sector has neglected women and the service sector has not expanded sufficiently.

The era of globalisation demands for the fullest utilization of human resources. To increase employment among women, several initiatives have been made by the Government of India. Some of the programmes are Swawlamban, Support to Training and Employment Programme (STEP)(1987), Hostels for Working Women, with day care centres for their children, RashtriyaMahilaKosh (RMK) and Swayamsiddha(2001). These programme aims to provide training and skills to women to facilitate them to obtain employment or self-employment. In the state, Tamilnadu Corporation for Development of women (TNCDW) has brought out qualitative change in the lives of women through MahalirThittam(1989), based on SHG approach and is implemented in partnership with Non-Governmental Organisations (NGOs) and community based organizations where women are empowered through SHGs. Under these programmes, financial assistance is provided to Women’s Development Corporations (WDCs), public sector corporations, autonomous bodies and voluntary organizations to train poor women, mostly in non-traditional trades and to ensure their employment in these areas. Some of the popular trades under the programme are computer programming, medical transcription, electronics, watch assembling, radio and television repairs, garment making, dress designing and fashion technology, handloom weaving, secretarial practice, community health work, embroidery, etc., and the aim is to make women self-reliant. Financial assistance is also provided to the grantees for hiring of training cum-production sheds, training cost, machinery and equipments, stipend to the trainees and remuneration for the trainers.

**Women and IT sector**

The globalization process is being powerfully supported by ongoing Information Technology revolution with its phenomenal impact in the realm of knowledge and communication. Globalisation has given women a new identity, financial independence, freedom of expression as well as a remarkable social status. The advent of globalization is to a large extent predicated on the emergence and continuous development of Information and Communication Technology (ICT). Globalisation and IT sector has been widely accepted as two sides of a coin. NASSCOM conducted a study in June 2005 on women professionals in the IT industry in India. The findings of the study have revealed that most women in this sector are self confident, determined and immensely talented professionals and have managed to make their mark within their organisations, on account of their hard and soft skills. In the IT industry, the men to women ratio were 76:24 in 2005. Women employed in the Indian IT industry increasing from 421,460 in 2006 to 670,984 in 2008. Tamilnadu has been a state facing the transition of women in various sectors of the society since the second half of the 19th century. Following table indicates the participation of women in IT sector in India.

---

**Table:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Women in IT Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>421,460</td>
</tr>
<tr>
<td>2008</td>
<td>670,984</td>
</tr>
</tbody>
</table>
IT sector is an area where there is a potential for women to make in career paths. Under the pervasive influence of information technology, the aspirations of people in general and the aspirations of women in particular have undergone drastic changes. Even in remote rural areas, there is a strong desire for a higher standard of living and better quality of life. The selection criterion of the respondents was studied in order to examine the challenges faced by them towards their progress. The Statistics show that there has been a marginal change in their share over the last three to five years. In an evaluation of the above mentioned organisations. Managers play a key role in the area of decision making, while software engineers are still lagging behind when it comes to decision making on their own. Though majority of women work as software engineers only a few women hold key posts. The analysis and the data findings reveal that women are seriously underrepresented in field of decision making. It should be noted that the reasons may be lesser experience, lower cadre of job etc. In access to resources also opportunities were far behind for engineers in the lower cadre. The main reason is problems faced at workplace, women’s family responsibilities – maternity, child rearing and general household tasks, etc. In power accruing also there is a minimal representation of women in higher positions. Lack of proper training, work pressure, marriage, child birth physical discomfort, mental tension and superior domination are the obstacles faced by women.

Implications of Globalisation

Gender Gap

Gender dimension is one of the most neglected dimensions of economic growth in the country at the turn of the century. Some women might have gained better access to the labour market but the majority of them are staying locked in at relatively low levels of pay and skills, becoming increasingly discriminated against. Despite their contribution in various sectors of the economy, it is thus quite unfortunate that the gender gap is widening in the past decade and gender discrimination against women has been increasing.

| Table : 3 Gender wise Distribution of Employment in Major IT Industries in India |
|---------------------------------|--------|------------|---------|-----|
| Total No: Employees             | Women in Nos | Percentage | Ratio |
| Wipro                          | 12658   | 2530       | 19.98%  | 1:05|
| TCS                            | 21800   | 5450       | 25.00%  | 1:04|
| INFOSYS                        | 15356   | 2896       | 18.86%  | 1:05|
| HEWLETT-P                      | 2245    | 320        | 14.25%  | 1:07|
| POLARIS                        | 4800    | 1200       | 25.00%  | 1:4 |
| L&T                            | 2250    | 900        | 40.00%  | 1:2:5|
| HCL                            | 5757    | 1150       | 19.97%  | 1:05|
| SUN                            | 596     | 119        | 19.96%  | 1:05|
| ORACLE                         | 2702    | 540        | 19.98%  | 1:05|
| PHILIPS                        | 757     | 190        | 25.09%  | 1:04|
| SIEMENS                        | 1390    | 260        | 18.70%  | 1:06|
| ROLTA INDIA                    | 2346    | 123        | 5.25%   | 1:19|
| Source : Report for Organisation Development, Hyderabad, 2006 |

<table>
<thead>
<tr>
<th>Table : 4 Gender Gap in Female work participation in Tamilnadu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female work participation Rank</td>
</tr>
<tr>
<td>Female work participation</td>
</tr>
<tr>
<td>Gender Gap in Work participation rank</td>
</tr>
<tr>
<td>Gender Gap in Work participation</td>
</tr>
<tr>
<td>Source: Based on calculations from Census of India (2001).Notes: Work participation rates are calculated as the proportion of total workers (main + marginal) among respective populations above six years.</td>
</tr>
</tbody>
</table>

Unemployment Situation
Employment and Un-Employment in the state determines to a large extent, the overall standard living of the people. Globalisation has been blamed to have increased the incidence of unemployment and under employment among women and also have given rise to many forms of discriminations in the labour market.

<table>
<thead>
<tr>
<th>Registered with employment exchanges (2006)</th>
<th>India</th>
<th>Tamilnadu</th>
<th>Unemployment Rate 2004-2005 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>job seekers</td>
<td>11731.0</td>
<td>1848.8</td>
<td></td>
</tr>
<tr>
<td>Male job seekers</td>
<td>29885.0</td>
<td>2410.2</td>
<td></td>
</tr>
<tr>
<td>Total job seekers</td>
<td>41616.0</td>
<td>4259.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 5

Rural | Urban

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1.8</td>
<td>1.6</td>
<td>6.9</td>
<td>3.8</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>1.1</td>
<td>1.2</td>
<td>4.8</td>
<td>2.9</td>
</tr>
</tbody>
</table>


Women’s role in the family has remained unorganized even at the international level and it can undoubtedly be attributed to the fact that women are not in the control of administration and management sectors but are confined to sectors involving physical labour. The United Nation’s report estimated that women’s participation was less in management and administration. The International Labour Organisation (ILO) studies reveal that technological progress pushes women into the meager income generating activities. Due to lack of skill, women voluntarily accept jobs involving lower activities. While women largely accept family taboos to forego employment opportunities, it has to be accepted that in India, they have today entered into almost every profession. Despite this participation it has not left any adequate dent in the desired socio-economic transformation of the women’s role in development.

- Wage differences
Globalisation has the scope of widening the wage gap between men and women and also increases inequalities of income. Some women might have gained better access to income but the majority of them are lagging behind with low pay and discrimination. Hence gender divide is visible even in the digital era.
It has been estimated that women's wage rates are, on the average, 75% of men's wage rates and constitute only one fourth of the family income. In any part of India women and men do not earn equal wages in agriculture. Also, women generally work in the informal sector where wages are lower and they are not covered by labour laws. Women workers are also engaged in piecework and subcontracting at exploitative rates. Serious gaps persist related to discrimination against women in the workplace. There is a salary gap, with women earning lower salaries than men, evidenced even where the job description, skills and experience are equal. There are unequal employment opportunities and marginalization of women in the formal sector. Large numbers of women are relegated to the informal sector. Violence against women and sexual harassment persist in the workplace. The gender stratification of careers persists, with women having little access to promotions into leadership positions. There is a need to develop standards (pay, hours, etc) and ensure these standards get achieved.

- **Sexual harassment** at work place affects millions of women regardless of their profession, but legal systems offer them little protection. Even when they do have legal recourse, the fear of being penalized or else a promise of much wanted promotion keeps many women at bay.

- **Inequality in access to income** - Most of the working women, inspite of their economic independence are not truly independent. Neither do they have any control over their own income nor are they allowed to take important decisions in their lives independently. However, as women become career oriented, these differentiation in men and women is undergoing a serious manifestation.

- **Legislations** - The basic enactment regulating the working conditions of women workers employed in the different sectors of the economy are The Factories Act, 1948, The Mines Act, 1952 Plantations Labour Act, 1951, Maternity Benefit Act, 1961, Equal Remuneration Act, 1976 etc. Under the Factories Act, women are prohibited to work during night hours and the Mines Act prohibits women from working underground. Welfare facilities such as improved sanitation, maintenance of crèches in factories employing more than 80 women etc. are also provided under these Acts. These rules though laudable in their objectives have reduced the opportunities of employment for women in reality. Most of the companies, factories, firms and concerns prefer to restrict the number of women below the stipulated limit so that they can avoid the obligations and requirements laid down by the Government. The existence of these legislations for more than three decades has made little or no impact on the employment of women.

### Table: 6 Average Wage/Salary (in Rs.) Received per Day by Regular Wage/Salaried Employees of Age 15-59 Years by Industry of Work, Sex, Sector and Broad Educational Level, 2004-05

<table>
<thead>
<tr>
<th>Industry Division</th>
<th>Not literate</th>
<th>Literate up to middle</th>
<th>Secondary &amp; Hr. Secondary</th>
<th>Graduate &amp;above</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Agricultural</td>
<td>45.65</td>
<td>53.39</td>
<td>54.41</td>
<td>66.27</td>
<td>134.61</td>
</tr>
<tr>
<td>Mining and quarrying</td>
<td>84.88</td>
<td>174.13</td>
<td>212.29</td>
<td>217.64</td>
<td>83.29</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>38.40</td>
<td>75.73</td>
<td>58.54</td>
<td>84.51</td>
<td>62.12</td>
</tr>
<tr>
<td>Construction</td>
<td>82.64</td>
<td>85.59</td>
<td>44.21</td>
<td>100.19</td>
<td>101.70</td>
</tr>
<tr>
<td>Private hhs with emp. Persons</td>
<td>29.18</td>
<td>50.74</td>
<td>34.10</td>
<td>66.68</td>
<td>54.90</td>
</tr>
</tbody>
</table>

Challenges
Globalisation is diverse and encompasses all aspects of women’s lives in India. It has affected both the quantity and the quality of work available to majority of women in India.
- The traditional role of women in agriculture, livestock and animal husbandry, Khadi and village industries etc, is being undermined because mechanization and automation is becoming prevalent in the market based economy which will adversely affect the village based traditional economy.
- Globalisation has increased the number of low paid, part-time and exploitative jobs.
- With male migration is on the increase from the rural to urban sectors, the women have to bear the triple burden of caring, farming and paid employment in the rural sector.
- In the neo liberal work practices, contract work, working hours, cooperative practices, payment by result make it very difficult for women to cope with their multiple responsibilities.
- In the era of globalization, the number of women working in the night shift is increasing with call centers and export oriented companies employing women in large numbers during the night shift, without providing proper protection or transport facilities to them.

Steps to cope with the changing scenario
New global economy operates to facilitate economic integration. If our international economic institutions are to improve their social accountability, women must be able to access and input in the developing world. However efforts must be made to address the problems through governmental and the non-governmental programmes. Globalization process requires proper focus on rural development, education, health and child care and proper gainful employment for the underprivileged women at the initial stages. The main goal of the Department of Women and Child Development is to empower women and to bring them within the purview of the mainstream development process. The capacities and capabilities of women addressing their own development should be the main focus of NGOs and women’s organisations. Innovative approaches for poverty alleviation such as savings, credit and asset creation for poor women have emerged but are not adequate to fulfill the desired progress.

Conclusion
Globalization has suddenly exposed the Indian economy rapidly without providing the required economic and social policies to the much required safety net; women, who have been involved with production in the traditional ways, have to cope up with numerous problems and yet strive to avail of the opportunities which an open economy promises. Majority of Indian women are tradition bound and still live in disadvantageous positions. The economy progresses from subsistence to modernized sector but women are hapless as they are lagging behind. Therefore, technological change can spell absolute deprivation of women at work by simply eliminating their designed tasks in the labour process or by promoting male substitution. Whatever may be the technological advancement, its impact on employment status of women is highly unfavorable and have more repercussions for women. From the above analysis on women in the economy, it is ascertained that women, as professionals, no doubt inculcate scientific temper and create awareness of physical, social technological, economic, cultural and aesthetic environment in Tamilnadu. New directions and new modes to manage the external and internal barriers are needed through redefining the roles of women. The number of women organizations and families responding to such change on women’s role, status and position are few. However, a small beginning is made and it needs to be carried forward with a greater momentum and mobilization by the culture, society families etc. Women will visualize a new horizon and identify directions and handle tough decisions with ease in the years to come. The future women will cross the threshold to listen to their own voice.

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Two-paged structured questionnaire circulated to women professionals of Computer Sciences
Temporary Tutor, Department of Geography, University of Jaffna, Sri Lanka.

Corresponding author's e-mail: napiramy@gmail.com

Satellite base land

Muhammed and Spatial pattern of changes)
Nghdp nrad;Kiwfspdhy; fly; kl;l cau;T Vw;gLfpd;wJ. ,e;epiyapy; madg; gpuNjrq;fspYk

Nkw;nfhs;sg;gl;L KbTfs; ntspaplg;gl;Ls;sd. me;jtifapy; njd;dpe;jpa


باتماضأ لىا ئبتضأ ةفاشأ ةلهاجأ تاءابعأ ماوأ. (The Topex /Poseidon, 1992)

باتماضأ ئبتضأ ئبتتضأ ئبتضأ ئبتتضأ ماوأ. (Rajeswaran, S.T.B, 1985)

باتماضأ لىا ئبتضأ ئبتتضأ ئبتضأ ئبتتضأ ماوأ. (Mz;Lf;F ruhrupahf 1 cm ماوأ)

باتماضأ لىا ئبتضأ ئبتتضأ ئبتضأ ئبتتضأ ماوأ.

4.1 கூற்று சீரிக்கும் வரலாறு

4.1.1 கூற்று சீரிக்கும் வரலாறு

மக்கள் கருத்துறவுகளின் பொருள் குறிப்பிட்டு கூற்றுச் சீரிக்கும் வரலாறு மூலம் மக்கள் சீரிக்கும் வரலாறு தீர்மானம் தொடர்புடைய பொருளை குறிப்பிட்டு, ஆக்கை: 4.1.1 கூற்றுச் சீரிக்கும் வரலாறு (Primary data), 4.1.2 கூற்றுச் சீரிக்கும் வரலாறு (Secondary data)

மூலம் கூற்றுச் சீரிக்கும் வரலாற்று தொடர்பு மூலம் கூற்றுச் சீரிக்கும் வரலாறு தொடர்பு
IPCC, SRES (Special Report on Emissions Scenarios) அகலம் இன்றுக் கிடைக்கும் செயற்கையுடன் செய்யப்பட்ட நோக்குகளில் வளர்ச்சியாளர் இயங்குகின்றனர். 2007ம் ஆண்டில் IPCC report, Six SRES Marker Scenarios எனப்படும் மூன்று வட்டையர் 2100ம் ஆண்டிற்கு 1.1 வருட முதலேவுரையான குழுவின் செயல்யில், அவ்வாறு செய்யப்பட்ட 2100ம் ஆண்டிற்கு 18-150 cm அகல் மக்களுக்கு பதிவறையான குழுக்கின்றன (http://www.wunderground.com/resource/climate/IPCC_2007.asp)

4.2 அறிமுக பலியகை வருகை

கூறும்படி Google map network இறக்கக் கொண்டிருக்கும் குறிப்பிட்டிய காரணிகளுக்கு உள்ளிட்டு, Google Earth பிரிவுகள் குறிப்பிட்டியுள்ள வருகைகளின் குறிப்பிட்டிய காரணிகளின் வருகையை பாதுகாப்பு கூறுகையைக் குறிப்பிட்டியுள்ளது. Google Earth பிரிவுகளை குறிப்பிட்டியுள்ள வருகைகளின் குறிப்பிட்டிய காரணிகளின் வருகையை பாதுகாப்பு கூறுகையைக் குறிப்பிட்டியுள்ளது. Google Earth பிரிவுகளை குறிப்பிட்டியுள்ள வருகைகளின் குறிப்பிட்டிய காரணிகளின் வருகையை பாதுகாப்பு கூறுகையைக் குறிப்பிட்டியுள்ளது.

பட்டியல் - 1
நோக்குகள் நோக்குகளுக்கும் Google Earth செயற்கையுடன் download செயற்கையுடன் அடிப்படையாகும்

பட்டியல் - 2
கூறுகையை Google Earth செயற்கையுடன் Google Earth செயற்கையுடன் அடிப்படையாக பதிவு செய்யும் பதிவு செய்யும் குழுக்களை Google Earth செயற்கையுடன் 1:2040 அடிப்படையாக நோக்கு நோக்குகளை நோக்குகளை நோக்குகளை நோக்குகளை

பட்டியல் - 3
கூறுகையை Google Earth செயற்கையுடன் Google Earth செயற்கையுடன் GIS, vector data குறிப்பிட்டியுள்ள குழுக்களை Google Earth என்ற கூறுகையை Google Earth செயற்கையுடன் GIS, vector data குறிப்பிட்டியுள்ள நோக்குகளை நோக்குகளை நோக்குகளை நோக்குகளை
Inverse Distance Weighting (IDW)

Kriging interpolation

1. Inverse Distance Weighting (IDW)
2. Kriging interpolation

I. Inverse Distance Weighting (IDW)

II. Kriging interpolation

Spatial analysis requires understanding positional values. These values can be obtained from ArcGIS, a tool set for geographic information system (GIS) interpolation. Interpolation is a method of estimating values at unknown locations based on known values at sampled points. There are two main approaches: inverse distance weighting (IDW) and kriging.

IDW is a method of interpolation that assumes the value at an unknown location is a weighted average of the values at known locations. The weights are inversely proportional to the distance from the unknown location.

Kriging is a method of interpolation that uses statistical models to estimate values at unknown locations. It is based on the assumption that the values at known locations are correlated.

Both methods have their advantages and disadvantages. IDW is simple and easy to understand, but it does not take into account the spatial correlation of the data. Kriging, on the other hand, is more complex but can provide better estimates if the spatial correlation is strong.

In conclusion, choosing the right interpolation method depends on the specific application and the characteristics of the data. It is important to consider the spatial correlation of the data and the available computing resources when selecting an interpolation method.
5.1 தமிழர் தமிழர் வரலாறு பாணியின் ஒரு வகுப்பு தமிழர் வரலாற்று பாணியின் ஒரு வகுப்பு தமிழர் வரலாறு பாணியின் ஒரு வகுப்பு தமிழர் வரலாறு பாணியின் ஒரு வகுப்பு தமிழர் வரலாறு பாணியின் ஒரு வகுப்பு தமிழர் வரலாறு பாணியின் ஒரு வகுப்பு

5.2 மான்ற இறுதியான குழுக்கலைக் குழுக்கலை மான்ற இறுதியான குழுக்கலைக் குழுக்கலை மான்ற இறுதியான குழுக்கலைக் குழுக்கலை மான்ற இறுதியான குழுக்கலைக் குழுக்கலை
5.3  

The text is in Tamil and contains a map. The map appears to be related to a geographical or administrative division. The text includes references to years and dates, suggesting it may be a historical or statistical report. Given the nature of the text, it is likely discussing some form of geographical or social sciences data, possibly related to a specific region or area.

5.4  

The text is also in Tamil and includes another map. The content is similar to the first, indicating a continuation or related discussion on geographical or administrative divisions. The maps are likely used to illustrate data or information presented in the text.

These sections may be part of a larger report or thesis, focusing on the administration, demographics, or other social sciences data related to Tamil Nadu.


An Economic Analysis on Impact of Microcredit at Nintavur Divisional Secretariat Area, Sri Lanka: Special Reference to Women Entrepreneurs

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Abstract: South Asia has the largest number of people in the world living in absolute poverty, which includes 43 percent of the developing world’s population. 60 percent of these are women, with limited access to basic needs. The greatest burden of human deprivation and poverty, illiteracy and health – related problems fall on its women (UNIFEM 1999). Microcredit seeks to promote business growth and improve well – being by expanding access to credit. According to the above background, the objective of this study is to examine the impact of microcredit on women entrepreneurs’ socio-economic status in Nintavur. This study is based on primary and secondary data. Through the simple regression model, 100 women entrepreneurs were selected and primary data were collected using structured questionnaires, key informant interviews and focus group discussion as well. The states purpose is analyzed by using quantitative and descriptive analysis. The results indicate that the microcredit factors positively and moderately affect the women entrepreneurs’ socio-economic status. Microcredit activities have affected the lives of clients (and others) in multiple ways. The most frequently reported types of effects of credit at individual, enterprise and household level are the following; income, expenditure smoothing, poverty alleviation, business growth, saving, schooling effects, skills, mobility and effects in terms of women empowerment. In terms of development and social impact, micro credit allows significant improvement in standard of living on women entrepreneurs and their families in Nintavur. It is also observed that microcredit system promotes entrepreneurship among women in Nintavur Divisional Secretary area.

Keywords: Microcredit, Women entrepreneurs, Socio-economic status, Poverty, Empowerment

Introduction
Poverty is a persistent problem in developing countries. The poor continue to remain poor primarily because they are poor. One of these vicious circles is created due to the lack of financial resources to generate livelihoods and income creating a wheel of low incomes and low resources. Micro credit is considered one of the most effective strategies and tool of poverty alleviation and empowerment, particularly of women. It has gained credence in development dialogue the world over. The provision of microcredit involves initiatives on the part of government and non – government organizations in making available very small amounts of credit to poor clients. Credit is sought for basic requirements such as food, as well as for income generation activities, asset creation and improving living standard. Micro credit, as in being promoted currently, circumvents the draw backs of both the formal and the informal systems of credit delivery. The formal system consists of a multi – agency approach, comprising cooperatives, public sector commercial banks (CBs), regional rural banks (RRBs) and private sector banks. There are innumerable types of informal credit suppliers in Nintavur which consists of merchants, contractors, commission agents, money lenders etc…

Among the real and potential clients of micro credit, women are seen the most appropriate targeted beneficiaries, since it is argued that in contrast to men, the entire household benefits when the loans are given to women. Women are also reputed to be more reliable than men when it comes to repayments. It is further claimed that micro credit empowers women since it accords economics independence and instills confidence by virtue of their participation in groups as well as their undertaking and expanding economic activities.
Women play an important role in the economic development of their families and communities. But, they have some barriers such as poverty, low household income, unemployment, social discriminations and violence in their effective performance of that role in mostly developing countries. Despite the crucial role of women entrepreneurs in the economic development of their families and countries, it is discovered that women entrepreneurs have lack of business performance compared to their male counterparts (Akanji, 2006). In developing countries, women entrepreneurs have lack of training and lack of opportunities in developing human capital, learning opportunities to improve their skills, attitudes and abilities.

The effect of training on women’s entrepreneurs’ performance, especially in developing countries has not been adequately taking cognizance of the peculiar situation of most women in developing countries in terms of poverty, low educational levels, and other social discriminations (Porter & Nagarajan, 2005; Roomi & Parrot 2008). So, training is very important for women entrepreneurs as it would provide the skills and experience needed for business (Akanji 2006, Cheston & Kuhn 2002; kuzilwa 2005).

There is ample literature concerning women empowerment related to the provision of microcredit. The second part of the 1990 decade witnessed a progressive awareness at international level of the role of microcredit in the eradication of poverty. Such awareness is shown in the resolution adopted by the United Nations in 1998, proclaiming the year 2005 as the “International year of microcredit”. The decoration specifically mentions the microcredit programs as to “have especially benefit women and have resulted in the achievement of their empowerment” (UN 1999). Microfinance services are considered a key development tool, particularly for women who are the target of most microfinance programs (Guerin 2006). Not only female borrowers do have better repayment records (Sharma and Zeller 1997) but return to investments seem to better reach all household members, especially improving children health and schooling (Pitt and Khandker 1998). Improvement of self-esteem as well as her family status has also been put forward (Amin et al 1998, Penjaitan et al 1999).

The proportion of women undertaking such productive projects is far from the large found in most developing countries. 83.4% of the poorest clients of the MFIs reported to the microcredit summit campaign during 2007 are women (Daley – Harris 2009) while in western European only the 39% the total clients of MFIs were women, according to Guichandout (2006).

The potential of microcredit goes beyond the provision of financial services. These programs have an immense potential to empower poor women. The empowerment potential of microcredit has been articulated very forcefully in recent years, primarily because the key actors are women. Driven by the motivation to involve women in the development process in order to achieve sustainable growth and development – recognizing that women are the poorest of the world’s poor population and that they spend their earnings more on family welfare – has led governments, development practitioners and donor agencies to focus on microcredit as a strategy capable of reaching and empowering women.

Officially, the intervention of microfinance has been heralded worldwide as one of the most effective cures for poverty. The four core themes of the 1997 microcredit summit campaign spelled this out very clearly. 1. Reaching the poorest. 2. Reaching and empowering women. 3. Building financially self-sufficient Institutions. 4. Ensuring a positive, measurable impact on the lives of clients and their families. According to that this research paper aims to contribute to the understanding of the impact of microcredit in the personal, professional and social lives of women in Nintavur.

**Research Problem of the Study**

Microcredit has today within development programs as a tool of poverty alleviation and women’s empowerment. Most of the women lost their spouse due to the war and natural disaster especially Tsunami in Sri Lanka. As they have to maintain their family and children, they play a main role in their family economy. In the purpose of empowering women government and non – government organizations select women and encourage them to do entrepreneurship. Accordingly, women are engaging in the entrepreneurship and microcredit facilities also have been increased. Even though, it was observed that, there is a gap on role of women in decision making in the family after availing Microcredit and becoming entrepreneur. This issue motivated us to conduct this study.

**Objectives of the Study**
The study assesses the impact of micro credit facilities on socio economic status of a women entrepreneur in the study area. The major objective of this study is to find out the economic aspect of the micro credit in Nintavur. Further, sub objectives are,

- To find out the reasons of getting micro credit.
- To find out previous family conditions of borrowers.
- To find out the present life standard of the borrowers.
- To examine the impact of micro credit on women entrepreneur after availing micro credit and study the role of women entrepreneur in the decision making process in the family.

**Hypothesis of the Study**

**H₀:** Microcredit promotes to uplift the standard of living of women entrepreneurs at Nintavur Divisional Secretary Area.

**H₁:** Microcredit does not promote to uplift the standard of living of women entrepreneurs at Nintavur Divisional Secretary Area.

**Literature Review**

Some studies have been conducted earlier on the issue of social well being of women entrepreneurs availing Microcredit facilities from government and Non – government organizations. After reviewing the literature available on women entrepreneurship and Microcredit, it was observed that adequate credit aids entrepreneurship performance (P. Goodwin Phillip 2013; Nevedita T. Dwivedi, Tanya Mishra 2013). The economic benefits of micro finance on women entrepreneurs have potential effect on the economic development. In terms of development and social impact, the micro finance factors allow significant improvement in quality of life on women entrepreneurs in Batticola district (Goodwin Phillip. P, 2013)

Microcredit facility has supported women to become entrepreneurial. There is significant improvement in the family income as well as mobility of women has increased in the family. Further, it is found that the recognition in the family for a women entrepreneur is still not good enough. At the same time there is increment in the skill development of a women entrepreneur (Nevedita T. Dwivedi, Tanya Mishra 2013).

A case study in Narathiwat, a predominantly Muslim province in southern Thailand, illustrates women’s empowerment both within the household and at the community level (Kay 2003, 76). Although it is difficult to measure the exact impact of access to microcredit on different dimensions such as impact on decision making and on self – confidence, studies have shown that a positive effect on each of these different dimensions of women’s empowerment (Vani s. Kulkarni 2011).

Sikligar (2009) reported that microfinance is one of the approaches for economic development of the minorities and it should be continued for their sustainable economic development because it is one of the important aspects of social development which promotes education, health, family welfare and other parameters of an improved living standard. Hasan and Cong Lu (2011) studied about effectiveness of micro-credit programmes in reducing poverty and its impact in income generation and improvement in living standard of borrowers in Monirampur Upazila of district Jessore, Bangladesh. Found that borrowers of micro-credit programs are better in income generation and food consumption.

Theories marshaled in support of Microcredit expansion assume that small business are credit constrained and predict that expanding access to Microcredit will lead to business growth. Other theories show that expanding access to formal credit may have indirect but potentially important effects on risk – management strategies and opportunities (Dean Karlan, Jonathan Zinman 2009). Schumpeter’s entrepreneurs is a large scale businessman, who is rarely found in developing countries where entrepreneurs are small scale businessmen who need to imitate rather than innovate the entrepreneurial function can be conceptualized as the discovery of opportunities and the subsequent creation of new economic activity, often via the creation of a new organization (Reynolds 2005).

Empowerment through microfinance is identified and measured in various dimension: impact on decision – making, on self – confidence of women on their status at home, on family relationship and the incidence of domestic violence, on their involvement in the community, on their political empowerment and rights (Cheston and Kuhn 2002).
For Sen (1993), empowerment is reflected in a person’s capability set. The ‘capability’ of a person depends on a variety of factors, including personal characteristics and social arrangements. Empowerment is the capacity to fulfill this capability and not just the choice to do so. Sen’s view on women’s empowerment is indicated in his discussion on measurement of empowerment (Sen 1990). According to him, the focus should be on certain universally valued functioning’s, which relate to the basic fundamentals of survival and well-being regardless of context. These include proper nourishment, good health and shelter. Empowerment is also related to the process of internal change (Mayoux 1998) and to the capacity and right to make decisions (Kabeer 2001). It consists of change, choice and power.

Another view of women’s empowerment argues that it needs to occur in multiple dimensions: economic, socio cultural, familial/interpersonal, legal, political and psychological (Malhotra, Schuler and Boender 2002). These dimensions cover a broad range of factors, and thus women may be empowered within one of these sub domains. Further, Social capital, social networks, the capacity to make effective life and community development choices are all related to empowerment (Krishna 2003; Grootaert 2003).

Research Area of the Study
This study is based on Nintavur Divisional Secretariat Area. It is located on the east cost of Ampara District of the Eastern province. Nintavur Divisional Secretariat Area consists of 40035 square KM and it is divided into 25 Grama Niladari administrative divisions. Nintavur is a densely populated village with a population of 30645 people, comprising of 8960 families, as of 2010. Nearly 96.73% are Muslims and 3.27% are Tamils in this division.

Methodology of the Study
In this research, primary and secondary data were collected from 100 women, who engaged in entrepreneurship in Nintavur using questionnaires, key informant interviews and focus group discussion. According to this, questionnaires were given to 50 women. 40 women were under gone for group discussion; 10 shop owners were open interviewed regarding their business. This study takes form of a qualitative, quantitative and descriptive analysis. The relevant statements were gathered and tabled to measure the variables like utilization of loans, growth of business, income, food and consumption level, saving, other livelihood facilities, skill development, recognition in family and women empowerment.

Analysis and Findings of the Study
The data were collected from 100 beneficiaries in Nintavur. To assess the socio-economic status the demographic data were captured.

Table No: 1
Distribution of respondents according to age group of Nintavur divisional secretariat area

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30</td>
<td>20</td>
</tr>
<tr>
<td>31-40</td>
<td>57</td>
</tr>
<tr>
<td>41-50</td>
<td>18</td>
</tr>
<tr>
<td>51-60</td>
<td>05</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Surveyed Data (2014).

Table No 1 reveals that distribution of respondents according to age group in the study. A maximum respondent (57) belongs to age group of 31 – 40 followed by 20, 18 and 5 respondents in the age group of 21-30, 41-50 and 51-60 respectively.
From Table No: 2 educational qualifications of the respondents are clearly depicted. None of the respondent is illiterate. Majority of respondents (47) can read and write in which more respondents (30) were in age group of 31-40 followed by 10 respondents in age group of 41-50, 4 respondents in age group of 51-60 and 3 respondents in age group of 21-30. Primary education is possessed by 14 respondents out of which 6 respondents were in age group of 31-40, 5 respondents in age group of 41-50, 2 respondents in age group of 21-30, and 1 respondent in age group of 51-60. Just 19 respondents were grade 6-9 educated out of which 9 respondents were in age group of 31-40, 8 respondents were in age group of 41-50, 4 respondents in age group of 21-30, and no respondent (0) in age group of 51-60. Merely 8 respondents were advanced level educated out of which equal number of 4 falls in both age group of 21-30 and 31-40. None of respondent falls in age group of 41-50 and 51-60.

### Table No: 3

Distribution of respondents according to household material possession

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Household Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sewing Machine</td>
</tr>
<tr>
<td>21–30</td>
<td>15</td>
</tr>
<tr>
<td>31–40</td>
<td>40</td>
</tr>
<tr>
<td>41–50</td>
<td>13</td>
</tr>
<tr>
<td>51–60</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

Source: Surveyed data (2014).

Table No: 3 show that household materials that respondent’s own. Sewing machine was owned by 68 respondents in which 40 respondents in age group of 31-40 followed by 15 respondents in age group of 21-30, 13 respondents in age group of 41-50 and no respondent (0) falls in age group of 51-60. Majority of respondents (98) use fan out of which 57 respondents in age group of 31-40, 20 respondents in age group of 21-30, 17 respondents in age group of 41-50 and 4 respondents in age group of 51-60. 42 respondents use gas stove for cooking in which 22 respondents in age group of 31-40, 12 respondents in age group of 21-30, 8 respondents in age group of 41-50 and no respondent (0) in age group of 51-60. Only 21 respondents use pressure cooker in which 18 respondents in age group of 31-40, 2 respondents in age group of 41-50, 1 respondent in age group of 21-30 and no respondent in age group of 51-60. Only 32 respondents own refrigerator out of which 14 respondents in age group of 31-40, 12 respondents in which age group of 41-50, 5 respondents in age group of 21-30 and 1 respondent in age group of 51-60. Table and chair were possessed by 70 respondents out of which 34
respondents in age group of 31-40, 18 respondents in age group of 21-30, 16 respondents in age group of 41-50 and 2 respondents in age group of 51-60. 72 respondents own bed out of which 38 respondents in age group of 31-40, 17 respondents in age group of 21-30, 14 respondents in age group of 41-50 and 3 respondents in age group of 51-60. More number of respondents use phone for communication out of which 51 respondents in age group of 31-40, 20 respondents in age group of 21-30, 5 respondents in age group of 41-50, and no respondent (0) in age group of 51-60. Only 35 respondents use washing machine out of which 21 respondents in age group of 31-40, equal number of respondents (4) in both age group of 21-30 and 41-50 and no respondent in age group of 51-60.

Table No: 4

<table>
<thead>
<tr>
<th>Changes in Socio-economic status</th>
<th>Degree of Impact</th>
<th>Class Interval (Age Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Same</td>
<td>21-30</td>
</tr>
<tr>
<td>Utilization of loans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Increased</td>
<td>16</td>
<td>45</td>
</tr>
<tr>
<td>Decreased</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Growth of business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Increased</td>
<td>13</td>
<td>29</td>
</tr>
<tr>
<td>Decreased</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Increased</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>Decreased</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Food &amp; consumption level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Increased</td>
<td>11</td>
<td>37</td>
</tr>
<tr>
<td>Decreased</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Saving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Increased</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>Decreased</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Other livelihood facilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Increased</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>Decreased</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Skill development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Increased</td>
<td>16</td>
<td>31</td>
</tr>
<tr>
<td>Decreased</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Recognition in family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Increased</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>Decreased</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Women empowerment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Increased</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>Decreased</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Surveyed Data (2014).

Table No: 4 reveals that changes in socio-economic status of respondents after getting microcredit in terms of same, increase and decreased. The details of changes have been explained as following:

8.1 Utilization of loans
Credit for their family Utilization of loans remains same for 17 respondents. Utilization of loans increased for 74 respondents. At the same time, it was decreased for only 9 respondents. Thus, more number of respondents were used their micro credit for their specific purpose of self employment. Only a few respondents were failed to use it for specific purpose. It came to know from the study that, some respondents were used their micro expenditures.

8.2 Growth of business
According to the information regarding growth of the business, 51 respondents have been expanded their business by using microfinance. 33 respondents stated that there is no remarkable growth in their business. At the same time, 16 respondents feel a decrease in their business due to the lack of marketing facilities and high rate of loan repayment. It was very difficult to re-capital as they have to pay the monthly installment from the profit regularly.

8.3 Income
Income was increased for 55 respondents while it remains same for 32 respondents. At the same time, 13 respondents stated that there was a decrease in their income. Commonly, it is found that there is a positive impact on income of women Entrepreneurs after getting microcredit service.

8.4 Food and consumption level
In this study, food and consumption level is considered based on the level of satisfied food consumption, level of expenditure, needed food nutrition and children food nutrition level. Food and consumption level was decreased for 15 respondents. About 23 respondents feel that there was no significant increase in their family income. Further, 62 respondents have accepted that they spent more money for nutrition food consumption for their family after start self employment.

8.5 Saving
55 respondents agreed that there is a moderate increase in their family saving. Some respondents indicated that they have bought new assets by the saving of their business, which was started using microcredit service. At the same time, a few respondents explained that they could not have a significant saving because of the increasing unexpected expenditure such as diseases and traditional circumstances.

8.6 Other livelihood facilities
Under these variable cloths, jewels, medical needs, housing instruments and housing development are considered. 54 respondents agreed that there is an improvement in their livelihood facilities after starting self employment. Livelihood facilities remain same for 32 respondents. They pointed out that there is no significant increase in livelihood facilities especially housing development because of more income obtained from their enterprises spent for family expenditures. Decreased other livelihood facilities were stated by 14 respondents.

8.7 Skill development
Under this variable, participation on training programs on skill development, awareness programs, children school attending, education level of children and motivation of parents regarding children education such as good achievement of regular school attendance and extra classes are considered.

Skill development increased for 57 respondents. Skill development remains same for 33 respondents. Only 10 respondents identified for decreased skill development. Thus, most of the women agreed that microcredit service contributes children education through income generation.

8.8 Recognition in family
Recognition in family includes better condition or status among family members, the relationship with the life partner and children and freedom. Most of the respondents feel that they have been in good status in family after start a small business and income generation. Recognition in family increased for 54 respondents. 27 respondents stated that there is a remarkable improvement regarding the recognition in family. Decreased recognition in family was for 19 respondents.

8.9 Women empowerment
Empowerment includes good heath, shelter, rights to make decision, mobility and power. When considering mobility, it was observed that women’s physical mobility has expended by attending monthly society meetings and trainings and awareness programs as well as through visit to banks and offices. Women members have travelled to villages and cities they had never seen before. Unlike in the past, they now travel without their husband either alone or with other women. Enhanced mobility has increased women’s confidence. 43 respondents agreed with the moderate improvement in empowerment. At the same time, empowerment remains same for 37 respondents. Further, 20 respondents disagreed with the empowerment because of the social bad thoughts and gender related issues.
Conclusion and Recommendation

The study concludes that the microcredit facility has supported women to become Entrepreneurial. Most of the women are self-employed and they do not involve in other income generating activities. The findings of the study shows there is significant improvement in socioeconomic conditions of women through microcredit. Moreover, there is increment in income, skill development, food & consumption level and other livelihood facilities. At the same time, it is found that the growth of business and Women empowerments are still not good enough. Although there is an increase in income of women entrepreneurs through microfinance, they not yet achieved expected outcome. It has been found that most of the women do traditional familiar business and they have less knowledge on marketing.

Furthermore, from the study we came to know that rural women have been empowered economically as well as socially through microcredit program. Even though, it has been found that only a few women had decision making ability in the family. Further, lack of training, lack of organized local markets and high interest rates of loan recovery are also identified as constraints for sustainable livelihoods of women Entrepreneurs.

Therefore, the women Entrepreneurs have to be trained in order to obtain multi skill, such as decision making, leadership, technical skill (especially job related technique), financial management training, marketing and exposure visit. Moreover, government and non – government organization should be flexible attitude towards the women Entrepreneurship activity on their loaning scheme such as interest free loans and marketing facilities etc. for sustainable women Entrepreneurship.

References


Some interviewed women entrepreneurs


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1732 இல் கேரளத்தில் உருண்டையுடன் மத்தியம் தொடங்கியது. 1899 இல் பொன்சோரிசு புற்றுகழியுடன் மேலைத் தொடங்கியது. 1842 இல் பொன்சோரிசு ஐன்னன் மற்றும் கார்பானின் ஐன்னன் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1909 இல் உருண்டையுடன் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1910 இல் உருண்டையுடன் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1918 இல் கேரளத்தில் வேளாந்தையுடன் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1921 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1925 இல் கேரளத்தில் பொன்சோரிசு ஐன்னன் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1926 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1931 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1937 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1942 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1947 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1952 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது. 1957 இல் கேரளத்தில் மாடாங்காலின் புற்றுகழியுடன் மேலைத் தொடங்கியது.
"ச.ட.டு.நிறைவு அவத்தியை பின்புற்றுக்காணினால்
{"" அப்படி அறிவுகள் சோமுக்கு அந்தார""

(குருங்கவான கிருஷ்ண ராமேஸ் புகுண்டசேன்)

மாதிரியை சுருக்கிய வரலாற்று அனைத்து சாதனைகளை அப்படியான விளக்கங்கள் கண்டுபிடித்து அல்லது குறிப்பிட்டுக்கொள்ளலாம். மாதிரியை சுருக்கிய வரலாற்று அனைத்து சாதனைகளை அப்படியான விளக்கங்கள் கண்டுபிடித்து அல்லது குறிப்பிட்டுக்கொள்ளலாம். சோமு நிறைவை பின்புற்றுக்காணினால் அப்படியான விளக்கங்கள் கண்டுபிடித்து அல்லது குறிப்பிட்டுக்கொள்ளலாம்.

அறிவு வரலாற்று

"சந்திக்கினும் வட்டத்தில் அறிவான
社会科学 and humanities

Proceedings, 04th International Symposium, SEUSL
Page 50
Mq;fpyg; nghUs; jkpo;r; nrhy;F xj;j Mq;fpyr; nrhy; nfhLf;fg;gl;Ls;J. gpwnkhopapdu; jkpo;r; nrhy;iy tpsq;ff; $bajhf Mq;fpyg; nghUs; mikfpd;wJ. jkpo;r; nrhy;ypd; Mq;fpyg; nghUis mwptjw f;upah mfuhjp tpsq;Ffpd;wJ. af;fk; :

rPuhd mirT my;yJ efu;;T (proper) movement function working.

vLNfhs; : (,yq;if) fUJNfhs; hypothesis

vLj;jysit : (epWj;jysit measurement of weight)

Speaker of the parliament or the state legislative assembly.
வல்லூர் பொறியியல் பல்கலைக்கழக நூற்றாண்டு பிறந்தநிலை புகழ் (வ) கால் கழிப்பிட்டு நாட்டுப்புறம் பதிப்பிட்டு நிர்வகிக்கப் பட்டியல் நேர்வழியாகே பதிக்கலாம்

எக்கு கால் கழிப்பிட்டு நாட்டுப்புறம் பதிப்பிட்டு நிர்வகிக்கப் பட்டியல்

வங்குநாய் - (வ) பார்க்கும்
நூற்றாண்டு - (வ) வல்லூர் பொறியியல் பல்கலைக்கழக:

பார்க்கும் - வல்லூர் பொறியியல் பல்கலைக்கழக பதிக்கல்

நூற்றாண்டு சமையல் பிறந்தநிலை பதிப்பிட்டு நிர்வகிக்கப் பட்டியல்

ஏழாம் சமையல் சமையல் பிறந்தநிலை பதிப்பிட்டு

அடையாள (வ) - ஒரு நாட்டுப்புறம் பதிப்பிட்டு நாட்டுப்புறம் பதிப்பிட்டு நிர்வகிக்கப் பட்டியல்

வங்குநாய் - (வ) - வல்லூர் பொறியியல்

சிற்றாண்டு சிற்றாண்டு - (வ) (வ) ஒரு கால் கழிப்பிட்டு நாட்டுப்புறம் பதிப்பிட்டு நிர்வகிக்கப் பட்டியல்

சிற்றாண்டு சிற்றாண்டு பிறந்தநிலை பதிப்பிட்டு

நூற்றாண்டு - (வ.வ.) - சமையல் பிறந்தநிலை

அடையாள (வ.வ.) - சிற்றாண்டு சிற்றாண்டு

அடையாள (வ.வ.) - சிற்றாண்டு சிற்றாண்டு

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அடையாள (வ.வ.) - சிற்றாண்டு சிற்றாண்டு

நூற்றாண்டு - (வ.வ.) கால் கழிப்பிட்டு

சிற்றாண்டு சிற்றாண்டு - (வ.வ.) கால் கழிப்பிட்டு

சிற்றாண்டு சிற்றாண்டு - (வ.வ.)

சிற்றாண்டு சிற்றாண்டு பிறந்தநிலை பதிப்பிட்டு
உலக அவர்களும் குற்றூரல்களும் பராமரிதான் என்றுடைய கதைக்கோள். அவர்கள் - இவ்வகுலம் பரப்பப் பொருள்களான அல்லது பராமரிதான் பொருள்களான இரண்டு வகைப்பாடுகளைக் கொண்டிருந்தது. அவர்களின் - இவ்வகுலம் பரப்பப் பொருள்களான அல்லது பராமரிதான் பொருள்களான இரண்டு வகைப்பாடுகளைக் கொண்டிருந்தது. 

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A Study on Errors Made By Tamil Speaking Adult Students in Using Present Simple Tense in English

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Abstract: The paper examines the errors made by the Tamil speaking students of South Eastern University of Sri Lanka in using present simple tense in English. It focuses on the errors on the third person singular present tense agreement with morpheme –s and the inter-language grammar influence. The finding suggests that the Tamil speaking English language learners have difficulty in the use of –s due to mother tongue influence. The phonological similarity, omission, incorrect suffixation and substitution are the most common types of errors found in their usage.

Keywords: Second Language Learner, Second Language Teaching, Error Analysis, Inflectional Morpheme, Grammar in ESL.

Introduction

The opportunity to learn English in schools are widely open but the necessity is not equally realized by all. The way that people in villages look at English is not similar to that of the people in cities look at it. The environment, the interest of parents, students and motivation of teachers contribute much in this regard. The students who come to universities are also bounded to such conditions. Of all tenses, simple present tense has become a difficult part for such children who come to universities. It is obvious from daily activities of the students’ class work of South Eastern University of Sri Lanka and gave a thought to continue a study on the usage of simple present tense among the first year students of Arts of SEUSL.

Turning to the second language speaker, there are a number of parallels with first language process. The novice second language learner cannot develop all aspects of the planning stages simultaneously and therefore selectively uses only those aspects that have already been organized (Ellis 1986).

However, the relative lack of success of most L2 learners in comparison to L1 learners suggest that there may be radical differences in the way first and second languages are acquired. These differences may be of many kinds it is likely for instance, that differences in the social conditions in which L1 and L2 learners learn have some kind of impact. L1 learners, for example, do not experience social distance, it also possible that L1 and L2 acquisition draw on different learning mechanism because most adult L2 learners no longer have access to universal grammar (UG) Ellis (2012).

Rutherford (1999) mentioned another challenge facing the learner of English is one having to do with the ways in which semantic relations are preserved over syntactic formations that differ in category, in size and in rank. It is a question grammatically phonemes, of ‘what goes together with what’ – that is, collocation - and the challenge is greater for learners whose mother tongue makes less use of grammatical phonemes than does English.

The objective of this study is to examine the acquisition of English tense specifically the present simple tense as it is considered to be problematic for the adult Tamilspeaking students who learn English as a second language. This difficulty can be attributed to the differences between the first and second language(s) (i.e. Tamil and English respectively). The main objective of this study is to analyze students’ errors in present simple tense and identify the sources of errors as taken from the grammaticality judgment task and the elicited written production task by adult English language learners as well as to provide some pedagogical implications for the English as a second language classroom teaching practice as well as for second language teachers and researchers.
Theoretical Background

The agreement of words in forming a sentence in simple present tense carries a number of characters. Different forms of the verb ‘have’ and ‘be’, dropping of the ‘s’ of the third person singular, spelling of the forms that take the ‘s’ and ‘es’ of the third person singular, acceptance of do (or third-person singular does) with the bare infinitive of the main verb in questions and negations, and sometimes for emphasis, expressing ideas of different situations, and the agreement subject-verb are identical among its features.

There are several factors to be observed in connection with the higher ratio of nouns to verbs. These have to do with the semantics of the verb, the derivation of the noun, and some matters of common usage. (Rutherford, 1999 p.48). The orders and sequences of acquisition can be altered through formal instruction. In modern English, verbs have lost all their inflections for number and person except in the third person of the singular number. (Rao and Wren & Martin 2008 p.78). The words that do not obey the regular pattern are complicated to the L2 learners. The words such as each, every, neither-or, and either-or are a few examples. As noted by Amin, Eravelly, and Ibrahim (2008) when two subjects are joined by the words either ….or we use a singular verb when both subjects are singular and a plural verb when both subjects are plural. If one subject is singular and other subject is plural, the verb agrees with the subject that is closer to it.

Some irregular verbs may confuse students. The verb ‘be’ plays a major role in simple present. The student should understand the different form of be associated with the subject of a sentence. Also the learner should know where he can accept such “be” in a sentence in case of simple present tense. Although he knows that the word ‘be’ consists of am, is, are, he fails sometimes as he is unaware of the character of the relevant subject and makes errors. Different use of ‘-s is again a confusion for the L2 learner.

Ellis (2012) argues that errors appeared when there were some similarities and some contrasts between equivalent items or structures in the two languages. Once students apply this concepts they neglect the changes accepting differences for e.g. ‘has’ for third person singular.

Thenext concern is related to the dropping of the ‘s’ of the third person singular which many students seem to forget. Most of the L2 learners restrict the language to their mother tongue. The most difficult structure are regular past and third person –s. On the basis of these findings, it has been suggested that there must be a natural order of acquisitions that all learners follow (Ellis 2012. p.22).

Another difficulty is the spelling of the forms that take the ‘s’ of the third person singular. Sometimes, only ‘s’ is added (rise – rises) while in some forms ‘es’ is added (catch – catches). Sometimes, the L2 learner has poor understanding of the sounds of English. Further it comprises varieties of morphemes (sh, ch, x, o, y) (Lott 2007, p.6). This may cause confusing. Ultimately they choose own rule in using the verbs when third person singular is present in a sentence.

The interrogative and negative forms which necessitate the auxiliary ‘do’ may represent another challenge for beginner students. For the L2 learner of English, even he is very careful in the use of do and does, he randomly makes error due to its complexity. The place where do, or does goes in a sentence and the use of verb corresponding to the doer and the form of the sentence are again a mess. As an L2 learner, he sometimes refuses the words ‘do’ or misplaces it or wrongly uses.

Another important feature of present simple tense is Tag Question which L2 learners neglect to use in their day to day English. Tamil speaking students are rarely aware of its use because they do not follow such systematic rules as it is in English when they use their mother tongue. “We use negative tag question with positive statements and Positive tag question with negative statements. Also we use short forms and pronouns in tag question where the pronoun must agree with the subject.” (Ameen, Eravelly, and Ibrahim 2008 p. 94).

Generally, Tamil speaking learners of English are hardly aware of the different use of simple present. Until it comes to their normal practice they may not care about it. Because, the importance of it is rarely understood by the teacher of English too. Generally simple present tense is used to (1) state facts or general truths, (2) to express habits or customs (3) to relate future plans (often regarding
programs and timetables) and (4) to tell jokes and stories or to report sporting events in real time. Marjory Fuchs and Margaret Bonner.

Negative and questions take ‘do’. Generally sentences take ‘do’ and ‘don’t’ except third person singular which takes ‘ doesn’t’ and ‘does’. Eastwood (2008). Do not add ‘s’ to the main verb in a negative sentence. E.g. He doesn’t plays. Do not add ‘s’ to the main verb in a questions. E.g. Does he plays. - Doreen Da Costa. As noted by Rutherford (1999), ‘inversion’ of subject and auxiliary (including be)” or (if only an inflected main verb is available for inversion) the created ‘tense-carries’ do. To view what is often looked upon by learners as a bizarre and perversely complicated formation for simply asking questions in English, and that is in terms of the strong tendency of English grammar to preserve its word order. Thus consider for a moment the relationship between a declarative sentence like John smokes and its corresponding yes-no question, Does John smoke? If abstract away the question-making paraphernalia of ‘tense carrier’, ‘do-support’, ‘inversion’, etc. A yes/no question begins with an auxiliary verb. An auxiliary verb is a form of be or have or model verb. In the present simple we use a form of do. The main be also comes before the subject in a question. Most wh questions begin with a question word + an auxiliary verb + the subject. Who and what can be the subject of a question. The word order is the same as in a statement. Who and what can also be the object. (Eastwood, 2008, p. 84-90)

Methodology

The study will focus on both quantitative and qualitative research methodology. The sample size of this case study comprises 30 first year students from the Faculty of Arts and Culture. The primary data were answer scripts of the students in response to the 70 different sentences with all possible forms that can be used in simple present tense. They were referred for authentic structural, textual and linguistic errors on the specified issues. According to the research suggestions are made to overcome the issue. However, unfortunately, the learners’ contact and use of English outside the classroom is limited and in most cases they have no opportunity to contact or to use English outside the classroom. Since proficiency level may vary among the learners, their proficiency level was assessed independently. Different grouping of given answers was taken into consideration for analyzing the data which could gave a hint to categorize or define the most specified areas where the learners make mistakes.

Results and Discussions

The learning approach on simple present tense, different structures in the subject verb agreement and mother tongue influence are some of the causes of errors. The errors in the use of present simple have been divided into ten different categories such as ‘third person singular’, ‘third person plural ’ each’ / ‘every’, ‘be with singular noun’; ‘be’ with plural noun’, ‘first person singular’ ‘first person plural’ ‘interrogative objective’, ‘interrogative subjective’, and ‘question tag’.
The above figure 1 indicates the errors made by the students for different types of questions. In order to analyze the data it has been divided into ten different topics. Names are represented by the X-axis whereas Y axis represents the errors in percentage.

The graph indicates the highest percentage of errors for ‘Question Tag’. That reaches 70.83 percentages. The reason for such highest rate of error is sometimes due to the lack of use or absence of use in their daily use. Students fail to understand the appropriate structure. Basically the relevant response related to the positive sentence is negative question tag and it is connected to the proper pronoun found in the simple present tense and the negative sentence always takes the positive form of question tag with the appropriate pronoun. Although a similar structure is not found in Tamil language we can relate it to the place where question tags are used. Unless it becomes practical in one’s day to day life it is very difficult to eradicate such errors. The best choice for it is improve speech activities.

Sentences in third person singular have become very challenging and the percentage of error rises up to 59.66%. As we have discussed in the literary review most of the students have made mistakes in it. This may be because it consists of different rules in constructing sentences in third person singular. Acceptance of ‘s’, ‘es’ and ‘ does ‘ have become complicated for the students. I understand students’ knowledge related to simple present is not systematically developed. During their school career the students had been taught about the use of simple present but the environment to practice the language or the interest would have been very less and therefore they have forgotten the rule. During the university career the lesson would have been discussed. But time allocated for the particular chapter would be not sufficient to eradicate their errors. Students should design themselves a plan to learn English in their own. Language laboratory, individual teacher-student interaction can remarkably provide room for better learning process. I understand the diagramme given in this paper will provide opportunity to correct one’s mistake related to present simple tense and learn it systematically and confidently.

The ‘s’ of the third person singular in English is replaced with ‘aan’, ‘athu’ and ‘aal’ in Tamil. If we can drill the sentences associated with these characters in both languages, it will easily help students to learn with the existing language knowledge, Tamil and improve the knowledge of English.

To avoid the problem related to varieties of morphemes (sh, ch, x, o, y), compare the rules in Tamil language in forming plural nouns as in ‘waahanam+kal → waahanangal’, ‘pul+kal → pukkal’ Similar examples can be elicited from students and ask them to follow the same procedure in using verbs in third person singular with such varieties of endings. Teachers should encourage the students to prepare a list including verbs that take the suffix –s or -es and other verb forms that include phonological changes to the verb forms such as try (i.e. tries) etc. Students must be encouraged to list the verb forms of the present simple tense with third person singular subjects (-s, -es or other verb
forms) and another list consisting the same verb forms of the present simple tense with first and second person singular subjects.

The next category is ‘each’ / ‘every’. This has also the syntax difficulty among students and the ideas shared with present simple will be applicable to this. In every case, the students must see the verb if it takes ‘s’ or ‘es’ or just it is accepted as the base form. Then he can continue the other steps.

In third person plural (26.66%), the use of ‘be’ for both singular (25%) and plural (30%), most of the errors are due to the presence of nous, some are always singular and some are always plural in meaning. Singular form such as news, politics, science and plural form such as the homeless, the injured, cattle are a few examples. List of such nouns can be brought to students’ notice regularly to minimize such errors. Tamil translation of these words, are purely in singular form. Hence, the existing Tamil language will influence on the target language English to recognize the similarity and accept the correct use. Every day we can spend a few minutes for such task before the teacher starts the regular lesson.

The error ratio for interrogative sentences answers to the question who (subjective form) is 42.66% whereas objective form denotes only 12.5%. It indicates that there is much confusion among the students in constructing questions in present simple in English. The correct choice for ‘do’, ‘does’ and the verb -s and the position of them are much mistaken. Mother tongue influence of Tamil can also be a reason for making mistakes here as it does not contain such different structure for it. Especially the subjective form is not identified by the students well. To avoid this error we can introduce play card system among the students in the classroom.

Subject + Object + Verb is the basic rule for a sentence associated with Tamil language. But in English it has an order such as Subject + Verb + Object. As it takes different order for questions in English, Tamil language doesn’t take changes in the order of words of questions. The structure of the sentence in English for an interrogative pronoun ‘who’ is just like in Tamil, the mother tongue when object is absent in the sentence. We can compare the common format and elaborate it to other different structure then the students may avoid such errors easily. Always the verb takes -s, when the answer to the question is about the subject (Amin, Erravelly. and Ibrahim. 2009 p. 122)

In case of first person singular and plural the bars indicate error of 18.3% and 6.66% respectively. Although first person singular has significant amount it is due to the carelessness of the students. If we make the students aware of their errors and provide enough exercises to identify their errors we can simply avoid them remarkably.

The diagramme-1 will help students to confirm the knowledge in forming sentences in present simple tense. As the third person singular is the most challenging one I have given a special concern on it and tried to elaborate its function with an ideal diagramme to prove the accuracy.

Firstly, we focus on a sentence in present simple third person singular which possesses main verb (e.g. run, study, play, etc.). Then we shall confirm if it is positive or negative. If it is positive we can choose the path on the left of the diagramme, otherwise we may choose the right. Again, we must confirm if the sentence is interrogative or the other. If it is interrogative it should satisfy the equation for the relevant type. Similarly we can compare our sentences with the respective equation and confirm our answers. In the diagramme every equation carries an example that will also help the learner to confirm his or her sentences. Until the learner becomes accustomed to it one can continue the effect.
Assume that the following words will be replaced with respective abbreviations. S-subject, V- verb, O-object and Wh-questions-WHQ.

**Diagramme-1**

- **Positive**
  - S + V - s + O
  - Bahey plays

- **Negative**
  - S + doesn’t + V + O
  - Bahey doesn’t play cricket

- **Interrogative**
  - Does + S + V + O?
  - Does Bahey play cricket?

- **Who + V - s + O?**
  - Who knows the answer?

- **Who/What:**
  - Who + doesn’t + V + O?
  - Who doesn’t know the answer?

- **Questions Tag**
  - S + V + O, doesn’t + Pronoun?
  - Bahey plays cricket, doesn’t he?
Diagramme-2 is associated with “be” and adjective or noun. As it is explained in the diagramme-1, students can follow the same procedure for the diagramme-2 to confirm their own sentences.

**Present Simple—‘be + adjective’, be as a full verb**

- **Positive**
  - S + is + adjective + O.
  - He is happy here.

- **Interrogative**
  - Is + S + adjective + O?
  - Is he happy with you?

- **WHQ+ Is + S + adjective + O?**
  - Why is he happy these days?

- **Who + is + adjective + O.**
  - Who is happy with your progress?

- **Diagramme-2 Questions Tag**
  - S + is + adjective + O, isn’t + Pronoun?
  - Baehey ishappy, isn’t he?

- **Negative**
  - S + isn’t + adjective + O.
  - He isn’t happy here.

- **WHQ+ isn’t + S + adjective + O?**
  - Why isn’t he happy with you?

- **Who: Answer to the question is the subject**
  - Who + is + not + adjective + O?
  - Who isn’t happy with your progress?

**Conclusion**

In learning English as a second language, new structures have to be built up on old structures, (ii) that simple structures should be instructed before the complex and (iii) that the linguistic interaction between certain structures (e.g. “do. insertion” and ‘negation’) are respected so that the corresponding structures may be introduced successively (Hyltenstam and Pienemann, 1985)

Accommodate enough room for speech activities. The first choice should go to the speech then the other skills can follow it. During this period make students to acquire the real language from the environment and concentrate less interest on correction until they learn from the environment. Provide opportunities to realize the errors and catch the appropriate term from actual speech by teacher or any printed, recorded documents. Make the class always authentic.

We can give students a number of different responsibilities. We can ask some of our students to teach the others. We can maximize individual work.

Different task based on the present simple must be introduced. Also it can be generalized or regularized. A single component can be looked at different angles so that the learner will understand the changes himself. We also can assign each student for separate set of identified character and ask him or her to present it to the class frequently. This will provide better environment for reemphasizing.

Teaching “subject and verb agreement” is another area that teachers should give emphasis to. Not only concentrating on the pronouns as subjects but also subjects in other different forms such as noun phrase, noun clause, and noun with adjective clause should also be taught as well. Most importantly,
Teachers and language instructors should also teach grammatical rules through context. After teaching the particular rule with regard to the present simple tense, the student should apply and practice that particular grammatical rule in a context. The teachers may follow these steps: Teachers may give a multiple choice exercise or a story with some deleted words related to the error types in present simple tense such as adverb of time, subject and verb agreement. Next, the students have to answer.

The teacher may organize the students into small groups of approximately 4-5 students each. The students may then be given a passage, a story or a paragraph where possible errors including omission of agreement suffixes, misspelling errors, substitution of other tenses or verb forms, etc are underlined. The students should learn how to work as a team. Firstly, they should read and discuss them in their groups. Secondly, they should give explanation why the underlined words are wrong. Then, they should try to correct those errors.

Make the language class much authentic, focus much on places where the L2 learners frequently make errors, provide students to bring the language orally and provide environment for listing, at the early stage simply neglect the mistakes and provide opportunities for free and confident move of the students.

In conclusion, the finding suggest that the first language (L1) interference is problematic for adult Tamil speaking students learning English as a second language. The source of errors may come from lack of communicative language teaching or lack of enough practice of present simple tense. The finding of the present study could provide useful insights to language teachers who teach present simple tense in English grammar. As a result, the teachers and the English language researchers would be able to work hand in hand in improving the present simple tense resulting successful language learning. However, it can be said that the findings from this study may not be conclusive. After all it is hard to say that the most serious problem for non native English speakers is the use of the present simple tense because of the low opportunity for using English in their environment. We hope that the results of this research would be useful for English teachers as well as the Tamil speaking learners of English.

Reference
Geo-Information Technology in Disaster Management: A Case Study in Akkaraipattu Municipal Council Area

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Abstract: The natural hazards occur in Sri Lanka make severe impact on the country’s economy and the social and environmental conditions. The research focuses mainly on Disaster Management in the light of Geo-information technology in Akkaraipattu municipal council area and to identify the drawbacks of traditional disaster management and the potentials of Geographic Information System in disaster management and to prepare the disaster risk map for the area. The past available events of hazards of the area were incorporated with Geo-spatial Information System. All risk map layers; tsunami, disease, flood and cyclone were integrated. A comprehensive analysis of the basic data related to multi-hazards in GIS environment, resulted the disaster locations, affected community (male, female, children, families and total populations) were carried out in Council area which is the basis for relief aids and rehabilitation activities of disaster management process. In combining all disasters to produce multi-hazard zone for Akkaraipattu Municipal Council Area shows that 4.9 % of houses and 5.4 % of population are falling under very high risk zone, while 43.9 % of houses and 42.1 % of population are falling under low risk zone. The results of the present study facilitate to set up GIS Database in the area and the system will provide sophisticated data base and that can be used for relief activities.

Keywords: Multi-Hazard, Geo-Information Technology, Disaster Risk, Emergency Response, Communication

Introduction
Sri Lanka, The pearl drop of Indian Ocean is one of the countries located in the disaster prone belt of the Asian Region. Figure 1.1 shows that the Asia is world’s most disaster affected region in the world. In Asia every year 46,000 people killed, 180 million people affected and USD 35 billion of damage caused by disasters (World Disaster Report 1997). Most natural disasters experienced by the eastern coastal region of Sri Lanka are water-related either through excess water or a lack of it; cyclone, flooding, storm surges, tsunami, drought and diseases.

Further the natural and human disasters affected physical, social and economic development of our country during ethnic conflict destructed the infrastructure of North and Eastern region. Akkaraipattu Municipal Council area has been facing these disasters since many years.

We are presently living with the fast growing trends in computer technology, information systems and virtual world to obtain data about the physical and cultural worlds, and to use these data to do research or to solve practical problems. The current digital and analog electronic devices facilitate the inventory of resources and the rapid execution of arithmetic or logical operations. The Geo-information Technology; Geographic Information System (GIS), Remote Sensing and Global Positioning System (GPS) are undergoing much improvement and they are facilitate to create, manipulate, store and use spatial data much faster and at rapid rate as compared to conventional methods.
Hazard Occurrences in Akkaraipattu

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Period</th>
<th>Potential Impact</th>
<th>Year</th>
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<tr>
<td>Floods</td>
<td>November - January</td>
<td>Life, Livelihood, Crops, Infrastructures, Animal</td>
<td>2008</td>
</tr>
<tr>
<td>Tsunami</td>
<td>December</td>
<td>Life, Animal, Crops, property, Livelihood, Infrastructures</td>
<td>2004</td>
</tr>
<tr>
<td>Cyclone</td>
<td>November</td>
<td>Life, Livelihood, Crops, Infrastructures, Animal</td>
<td>1978</td>
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<tr>
<td>Strong wind</td>
<td>June-July</td>
<td>Life, Crops, Animal</td>
<td>2007</td>
</tr>
<tr>
<td>Plague</td>
<td></td>
<td>Life</td>
<td>1998</td>
</tr>
</tbody>
</table>

(Source: Akkaraipattu Municipal Council, Disaster Management Branch - 31/03/2014)

Infectious Diseases: Infectious diseases are disorders caused by organisms - such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They're normally harmless or even helpful, but some organisms under certain conditions may cause disease (Wikipedia). Dengue, Malaria and Asthma are the common diseases found in Akkaraipattu area. Dengue affects during north-east monsoon period (from October to January) every year due to favorite weather condition for the Dengue mosquitoes. Malaria was very severe in 1980 to 1990. After the Malaria control activities the effects are gradually reducing to significant level in Akkaraipattu.

Tsunami: The Tsunami disaster adversely affected the economic framework and psychosocial environment of the people in 6 Girama Niladhary (GN) Divisions in Akkaraipattu. The Tsunami waves traversed 500m inland and thus many households, public service centers, transportation, electricity, communication and road network were severely damaged. Hence, most of the community infrastructure suffered extensive damages, effectively paralyzing the social and economic life of the entire community.

Cyclone: Akkaraipattu area was very badly devastated by a cyclone in 1978 November when all transport, communication, electricity services were completely disconnected more than a week. Though there were no death a huge cost were lost due to the destroyed buildings, crops, infrastructure, etc.

Research Area
Akkaraipattu is a coastal village in the Ampara District of Eastern province of Sri Lanka. Geographical coordinates are 7° 13’ 0” North and 81° 51’ 0” East. It has high population density with 42,375 people accommodated in 28 GN Divisions (5.8 km²) (Resource Profile – Akkaraipattu DS Division, 2010).

There were no any studies or research conducted using Geo-information technology on Disaster Management in Akkaraipattu area so far. In order to improve the efficiency in data collection and accelerate the rehabilitation and reconstruction process it is highly recognized to implement and incorporate Geographic Information System in Disaster Management in Akkaraipattu area.

Research Questions
1. Whether the traditional disaster management processes provides accurate information and remedy to the stakeholders?
2. What are the drawbacks of traditional disaster management processes?
3. Why we need a Modern Technology for the disaster management?

Research Objectives
1. To use Geographic Information Technology for disaster management process in Akkaraipattu Municipal Council area.
2. To identify the drawbacks of traditional disaster management process and the potentials of Geo-information Technology in disaster management.
3. To prepare a hazard map for Akkaraipattu area using Geo-information Technology.

Methods and Procedures
In the collection of necessary information and data for the study, the research depends on both qualitative and quantitative data from both the primary and secondary sources. For this study, the following data collection techniques are used;

Primary Data Collection
The primary data have been collected through questionnaires, by personal observations and interviews with stakeholders. The primary data used in the study have been collected from a social survey of households using a questionnaire. The data have been gathered from 100 sample households widely scattered in the Akkaraipattu MC area on related variables. The following primary data collection tools and instruments have been used for this study; Questionnaire, Direct Interview, Participatory rural appraisal (PRA), Field visits and observation, Focus group discussion from Divisional Secretary, Municipal Commissioner, Agrarian Society, Fishery Societies, Community Based Organization (CBOs), Rural Development Societies, GramaNiladharies, Samurdi Officers and local public.

Secondary Data Collection
The secondary data have been collected, from the published and unpublished sources. The following sources of secondary data collection have been used in this study; Published/unpublished earlier studies, Government Documents/Reports, Department Reports, Private (NGO’s) Sources, Remote Sensing Analysis, Printed Maps and Collection from the web and Library Search.

Quantitative and Qualitative Data
Quantitative methodology usually deals with a variety of variables and statistics. The past available events of flood, cyclone, tsunami, drought and diseases of Akkaraipattu MC area were incorporated with Geo-spatial Information System, data regarding physiographic divisions, land cover classification, elevation, drainage network, Grama Niladary administrative divisions, population density and environmental parameters are to be modeled to create hazard maps for flood, cyclone, tsunami, drought and diseases. Preparation of Disaster Vulnerability map (Very High, High, Moderate and Low classes) of Akkaraipattu MC Area is designed based on the following criteria obtained from past evidences, questionnaire survey and from field investigations;

Table 02: Disaster Risk Criteria for multi-hazards

<table>
<thead>
<tr>
<th>Disaster Vulnerability Map</th>
<th>Disaster Risk Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very High</td>
</tr>
<tr>
<td>Flood (from MSL)</td>
<td>&lt;6 ft</td>
</tr>
<tr>
<td>Diseases (from sensitive area)</td>
<td>0-50 m</td>
</tr>
<tr>
<td>Tsunami (from coastal area)</td>
<td>0-250 m</td>
</tr>
<tr>
<td>Cyclone (from coastal area)</td>
<td>0-250 m</td>
</tr>
</tbody>
</table>

Results
A comprehensive analysis of basic layers were undertaken in order to create disaster risk maps such as health detrimental area, tsunami risk area, flood risk area and cyclone risk area. These maps were further analyzed with population data in order to obtain the affected people (families, total population, male, female and children) falling under each risk zones. The emergency relief activities, rehabilitation and reconstruction activities are undertaken based on the above information.

**Tsunami Evacuation Zone Map**

It is an urgent reality to order immediate, mandatory evacuations of the coastal people. A tsunami evacuation zone maps are quickly prepared for decision support for the major event. As part of a larger team of emergency responders, I have to redraw the evacuation zone maps for the Akkaraipattu Municipal Council Area. Then the area has been classified into the following evacuation zone namely very high (0-250 m from sea coast), high (250-500 m from sea coast), moderate (500-750 m from sea coast) risk and low (750-1000 m from sea coast) risk. These tsunami evacuation zones will be used to prioritize evacuation efforts and allocate guard and rescue personnel and emergency resources and supplies.

**Flood Risk Map**

Inundation area of Akkaraipattu Municipal Council Area is identified based on the past experiences since 1978 flood (Divisional Profile-Akkaraipattu 2012). The study area is categorized in to 4 flood inundation areas namely very high flood (6 ft. below MSL), high flood (5 ft. below MSL), moderate flood (4 ft. below MSL) and low flood (3 ft. below MSL).

**Health Risk Map**

The Akkaraipattu Municipal Council Area is highly intensified with settlements after civil war in North and East. Few small patches of inland water bodies are remaining during the urbanization process. Further few industrial zones are concentrated especially in North-West part of the Municipal Council Area. Both Water and Industrial areas are categorized as environmental sensitive area.
Cyclone Risk Map

Due to the presence of Bay of Bengal in the East coast of Akkaraipattu Municipal Council Area causes depressions and cyclones. There were a lot of consequences due to the depression after 1978 cyclone. Anyhow Akkaraipattu is located beyond the depression path so this area is safe to some extent. Even though under emergency situation we have to evacuate the public living within 250 meter from coastal area to the safer places. Therefore we have categorized the total study area in two risk zones namely high risk zone (250 meter from coast) and low risk zone (rest of the area).

Table 03: Households falling under multi-hazard risk zones

<table>
<thead>
<tr>
<th>Risk</th>
<th>Male</th>
<th>Female</th>
<th>Children</th>
<th>Population</th>
<th>Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>717</td>
<td>793</td>
<td>737</td>
<td>2246</td>
<td>441</td>
</tr>
<tr>
<td>High</td>
<td>2367</td>
<td>2637</td>
<td>2548</td>
<td>7545</td>
<td>1526</td>
</tr>
<tr>
<td>Medium</td>
<td>4702</td>
<td>4975</td>
<td>4720</td>
<td>14396</td>
<td>3124</td>
</tr>
<tr>
<td>Low</td>
<td>5882</td>
<td>6274</td>
<td>5439</td>
<td>17591</td>
<td>3982</td>
</tr>
<tr>
<td>Total</td>
<td>13668</td>
<td>14679</td>
<td>13444</td>
<td>41778</td>
<td>9072</td>
</tr>
</tbody>
</table>

From the comprehensive analysis of the basic data related to multi-hazards in GIS environment, I have found that the very useful information about the disaster locations, affected community (male, female, children, families and total populations) within Akkaraipattu Municipal Council area which is the basis for relief aids and rehabilitation activities of disaster management process (summarized in Table 04).
Table 04: People living under different severity areas of Multi-hazard zones

<table>
<thead>
<tr>
<th>Severity</th>
<th>Male</th>
<th>Female</th>
<th>Children</th>
<th>Population</th>
<th>Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>4529</td>
<td>4868</td>
<td>4605</td>
<td>14000</td>
<td>3043</td>
</tr>
<tr>
<td>High</td>
<td>3344</td>
<td>3668</td>
<td>3477</td>
<td>10489</td>
<td>2247</td>
</tr>
<tr>
<td>Medium</td>
<td>1883</td>
<td>2102</td>
<td>2038</td>
<td>6022</td>
<td>1274</td>
</tr>
<tr>
<td>Low</td>
<td>1630</td>
<td>1777</td>
<td>1749</td>
<td>5155</td>
<td>1080</td>
</tr>
<tr>
<td>Total</td>
<td>11386</td>
<td>12415</td>
<td>11869</td>
<td>35666</td>
<td>7644</td>
</tr>
<tr>
<td>Cyclone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-250 m</td>
<td>676</td>
<td>723</td>
<td>679</td>
<td>2079</td>
<td>399</td>
</tr>
<tr>
<td>Others</td>
<td>12767</td>
<td>13953</td>
<td>12988</td>
<td>39694</td>
<td>8673</td>
</tr>
<tr>
<td>Total</td>
<td>13443</td>
<td>14676</td>
<td>13667</td>
<td>41773</td>
<td>9072</td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>1233</td>
<td>1355</td>
<td>1317</td>
<td>3902</td>
<td>842</td>
</tr>
<tr>
<td>High</td>
<td>2028</td>
<td>2123</td>
<td>2092</td>
<td>6237</td>
<td>1296</td>
</tr>
<tr>
<td>Medium</td>
<td>3979</td>
<td>4098</td>
<td>4055</td>
<td>12132</td>
<td>2569</td>
</tr>
<tr>
<td>Low</td>
<td>2711</td>
<td>2913</td>
<td>2839</td>
<td>8463</td>
<td>1873</td>
</tr>
<tr>
<td>Total</td>
<td>9951</td>
<td>10489</td>
<td>10303</td>
<td>30734</td>
<td>6580</td>
</tr>
<tr>
<td>Tsunami</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>986</td>
<td>1638</td>
<td>1787</td>
<td>1599</td>
<td>5015</td>
</tr>
<tr>
<td>Low</td>
<td>1085</td>
<td>1486</td>
<td>1653</td>
<td>1679</td>
<td>4819</td>
</tr>
<tr>
<td>Moderate</td>
<td>1315</td>
<td>2076</td>
<td>2341</td>
<td>2033</td>
<td>6448</td>
</tr>
<tr>
<td>Very High</td>
<td>399</td>
<td>676</td>
<td>723</td>
<td>679</td>
<td>2079</td>
</tr>
<tr>
<td>Total</td>
<td>3785</td>
<td>5876</td>
<td>6504</td>
<td>5990</td>
<td>18361</td>
</tr>
</tbody>
</table>

Conclusion
Disaster risk information is spatial in nature and Geographic Information Systems (GIS) plays an important role in disaster risk assessment and management. For this reason, there is a significant need to create awareness among the disaster management professionals and to the public regarding the importance of GIS usage. Equally important is creation of awareness on the use of Open Source software solutions, both for development and management use and for GIS work to improve accessibility for people and organizations with lesser means of funding GIS implementation and use.

The research shows that the potential of Geographic Information System (GIS) for creating spatial data layers for multi-hazards through multi-dimensional view for Akkaraipattu Municipal Council Area.
GIS has given a wonderful environment to undertake the big task within a short period very accurately on pixel basis.

Findings
In combining all disasters to produce multi-hazard zone for Akkaraipattu Municipal Council Area shows that 4.9% of houses and 5.4% of population are falling under very high risk zone, 16.8% of houses and 18.1% of population are falling under high risk zone, 34.4% of houses and 34.5% of population are falling under moderate risk zone and 43.9% of houses and 42.1% of population are falling under low risk zone.

Key Problems identified regarding Disaster Management in Akkaraipattu MC Area
- Poor awareness on disasters and disaster management
- Poor adaption for modern technology
- Absence of early warning system
- There is a relatively poor level of commitment to community, management and fundraising activities.
- Unwanted political interferences
- Lack of integration of all stakeholders
- Increasing population density and land demand increases the vulnerability to disasters

Key Potentials regarding Disaster Management in Akkaraipattu MC Area
- The quality and variety of skills among the stakeholders
- The resource potentials for disaster management
- The good working relationship of responsible authorities with other services
- A strong leadership team
- Improved Social and Community activities

Recommendation
The Chinese philosopher, (Laozi 500 BC) wrote “the issue far away is easy to avoid, the brittle is easy to break and the small is easy to disperse. Take action before it appears; create order before there is disorder”. Unfortunately, many of our problems and challenges are now very close upon us. We should now however, act to contain those that are just now appearing and which we can glean from our GIS platforms. Laozi continues: “The great tree comes from a tiny sprout, the high building from a heap of earth; the longest journey starts with a single step”. So, we should not be overwhelmed by the task and not hesitate to take a first step.

We have to emphasize to take advantage of our good working relationship with other services to work and train with them more. In order to utilize the key potentials and to minimize the key problems, we must formulate a frame work to implement disaster management process for Akkaraipattu Municipal Council Area. To achieve the above task the following parameters are set in an order.

- Data collection and creating a GIS Database for Akkaraipattu Municipal Council Area
- Set up early warning system for multi-hazards
- Set up a Special Task Force representing all stakeholders from Municipal Council, Divisional Secretariat, Police, Religious Leaders, Girama Niladharies and Samurdhi Officers.
- The action plan could be implemented according to the National Disaster Management Policy

According to the policy, the grass hood level activities have to be carried out from Girama Niladhary Divisions (GND). Because the public administration begins from GND which is a vital part of the disaster management process such as; data collection, database management, emergency response, damage assessment, relief aids, rehabilitation, etc.

A fully fledged GIS environment has to be facilitated at Divisional Secretariat to set up GIS Database. Girama Niladharies of every GND regulary update the database about the household statistics and the necessary changes occurred in their respective divisions. If a disaster occurs the system will prepare all necessary map layers and provide the detail regarding the affected people in no time that will be used for relief activities.
References


Emerging Trends and Rural Environmental Sanitation Issues in India

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Abstract: The present paper has been assess to emerging trends and rural environmental sanitation issues in India. Safe water is one of the most important felt without sustainable access to safe drinking water needs in public health in developing countries in sanitation by 2015. In India every year large number of deaths of children under the age of five is attributed to poor quality of drinking water. Apart from health effects, inadequate quantity of water supply and sanitation services leave adverse impacts on the environment mainly leading to contamination of soil and water due to stagnation of sewage. A recently published World Health Organisation report places diarrhoeal diseases at sixth place in the list of global killers and third in the list of morbidity. This paper attempts on to find out to assess the issues and environmental in sanitation in India. To find out the allocation amount of rural water supply and sanitation expenditure pattern to improve the basic amenities. To suggest to improve the Environmental Sanitation in India.

Keywords: Emerging Issues, Environmental Sanitation and Rural Water Supply

Introduction

The Government with increased plan allocations ensured access to safe water supply to the people of the State, rural as well as urban. Statistics show a significant increase in the coverage, but compared to the increasing demands, full coverage still remains an eluding factor. The problem lies within as the cause for the water crisis lies in over-exploitation of surface as well as sub surface waters. The water bodies are dependent on rain for the flow and the failure of monsoons successively has resulted in inadequate flows in the river courses. Deforestation over the years has also contributed to the reduced water availability in the State. Evaporation of surface water is generally very high. Surface water gets contaminated, particularly in areas close to the sea coast, through upward movement of the saline underground water. In such a hostile environment, potable drinking water is the first casualty.

Objective

- To assess emerging trends and rural environmental sanitation issues and rural water supply in India.
- To find out the allocation amount of rural water supply and sanitation expenditure pattern.
- To suggest to improve the issues in environmental sanitation in India.

Methodology

The present study attempts on rural water supply and sanitation in India allocation of expenditure and achievements to improve the basic amenities. This study based on secondary data. To collect from 12th Five year plan report and the computed data from NSSO data have been used for this present study. Year wise allocation amount and expenditure pattern of the percentage in all over India. The year wise state wise data have been used for rural water supply and sanitation coverage. So far it is clearly understand the charts used for this paper.
Water Supply, Sanitation, and Health

Water, which is essential for life, growth and health, can also be a source of spread of disease and cause of ill-health, if contaminated or improperly handled and stored. Safe drinking water and improved sanitation play a major role in the overall well-being of the people, with a significant bearing on the infant mortality rate, death rate, longevity and productivity. The poor, both in rural and urban areas, bear a disproportionate burden of non-availability of water, as well as of poor quality. They often supplement public sources of water with supplies obtained at high prices from other sources. Women bear the physical burden of fetching water. Women and children are particularly vulnerable to the effects of water contamination.

Water-Borne Diseases: 70-80 per cent of illnesses are related to water contamination and poor sanitation. The national objectives of reducing morbidity and mortality largely depend on the reduction of diarrhoea and jaundice. In fact, Lack of water supply and sanitation programme can be successful if water-related illnesses are not reduced. It is a matter of concern that despite the progress made with water supply, the level of water-related sickness continues to be high. Causes of contamination of water are indiscriminate use of chemical fertilisers and chemicals, poor hygienic environment of the water sources, improper disposal of sewage and solid waste, pollution from untreated industrial effluents, over-exploitation leading to quality degradation. Thus, the supply of additional quantity of water by itself does not ensure good health; proper handling of water and prevention of contamination are also equally important. Among the most important elements of the rural sanitation package are:

- Safe handling of drinking water.
- Disposal of waste water.
- Safe disposal of human excreta. Human excreta is associated with more than 50 per cent of diseases.
- Safe solid waste disposal.
- Home sanitation and food hygiene.
- Personal hygiene, particularly washing hand with soap.
- Sanitation in community.

Recent studies have shown the importance of washing one’s hands with soap as it reduces diarrhoeal disease by 43 per cent. Respiratory problems such as sniffles and coughs were also brought down by 45 per cent when hands were washed five times a day. Safe sanitation practices should be made a compulsory part of school curricula, and of all programmes where women are trained in community, economic and health issues affecting the household.

Emerging Trends and Rural Environmental Sanitation Issues

Status of rural sanitation in India is basically different from that of water due to socio-cultural habits in widely spread out rural India. However, to assess the problem of poor sanitation is more acute in densely populated urban squatter settlements. Rural sanitation is neither perceived by the majority as a basic need nor provided as a public good.

I. Socio- Cultural Aspects

- Verifying perception of people and community at local level regarding personal hygiene and public health, eg: cleanliness and hygiene among rural communities.
- Limited knowledge on sanitation related diseases, particularly among school going children.
- Literacy levels and community hygiene.
- Low emphasis on IEC (Information Education and Communication).
- High density vs low density population.

II. Technology Issues

- Individual vs community types.
- Types of latrines and acceptability.
- Septic tanks.
III. Policy Issues

- Sharing of costs & State vs centre.
- Community vs Government
- O&M costs sharing (Organisation & Management)
- linkage with related programmes, such as water supply, sanitation, public health, nutrition to commence from school going children upwards.

**Financial Progress In Bharat Nirman Period**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Allocation Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-2006</td>
<td>4060.00</td>
</tr>
<tr>
<td>2006-2007</td>
<td>5200.00</td>
</tr>
<tr>
<td>2007-2008</td>
<td>6500.00</td>
</tr>
<tr>
<td>2008-2009</td>
<td>7300.00</td>
</tr>
<tr>
<td>2009-2010</td>
<td>8000.00</td>
</tr>
<tr>
<td>2010-2011</td>
<td>9000.00</td>
</tr>
<tr>
<td>2011-2012</td>
<td>9350.00</td>
</tr>
</tbody>
</table>

**Source:** 12th Five year planning Report

The above table and figure 1 depicts that the rural water supply, component of Bharat Nirman, it is allocated that the during the period of from 2005 to 2012. Though the allocation of every year the amount has been increased 2005-2006 Rs.4060 to 2011-2012 9,350 crore would be required as Central share during 4 years. The year wise allocations for ARWSP (Under the Accelerated Rural Water Supply Programme (ARWSP)/NRDP (National Rural Drinking Water Programme) (Rural water supply component) of Bharat Nirman.
TABLE: 2
Sanitation Coverage in Rural Areas

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage Sanitation Coverage in Rural Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2001</td>
<td>21.92</td>
</tr>
<tr>
<td>2001-2002</td>
<td>22.38</td>
</tr>
<tr>
<td>2002-2003</td>
<td>22.86</td>
</tr>
<tr>
<td>2003-2004</td>
<td>27.34</td>
</tr>
<tr>
<td>2004-2005</td>
<td>30.56</td>
</tr>
<tr>
<td>2005-2006</td>
<td>32.02</td>
</tr>
<tr>
<td>2006-2007</td>
<td>39.03</td>
</tr>
<tr>
<td>2007-2008</td>
<td>48.02</td>
</tr>
<tr>
<td>2008-2009</td>
<td>56.03</td>
</tr>
<tr>
<td>2009-2010</td>
<td>63.78</td>
</tr>
<tr>
<td>2010-2011</td>
<td>63.78</td>
</tr>
<tr>
<td>2011-2012(Aug’11)</td>
<td>71.65</td>
</tr>
</tbody>
</table>

Source: Computed from NSSO

However, there have been wide variations among States to arrive at the average of 73.67% as mentioned above.

FIGURE: 2
Rural Sanitation Coverage in India

Source: Computed from NSSO

After sluggish progress throughout the eighties and nineties, rural sanitation coverage received a fillip with the implementation of the TSC. As can be seen from Figure below, individual household latrine coverage at present is around 71% as of April 2011 as per the data reported by State through the online monitoring system maintained by the Ministry. In terms of progress made during the XI Plan, the coverage has progressively moved from 39% approximately in the beginning of the XI Plan to 73% as of August, 2011. The sanitation coverage in rural areas of the country was estimated at 21.9% as per census 2001. The year-wise growth of sanitation coverage in the country as per progress reported by the States through online monitoring system of the Ministry since the inception of Total Sanitation Campaign is as under.
Financial Performance in the 11th Plan
The following table indicates that the total Plan outlay for 11th Plan was Rs.7816 crore against which the total allocation received by the Ministry for TSC is Rs.6690 crore. Outlay for the current financial year is Rs 1650 crore. The year wise outlay and expenditure has been as follows:

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Total Outlay(In crore)</th>
<th>Total Expenditure (In crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2008</td>
<td>1060</td>
<td>908.91</td>
</tr>
<tr>
<td>2008-2009</td>
<td>1200</td>
<td>980.13</td>
</tr>
<tr>
<td>2009-2010</td>
<td>1200</td>
<td>1200</td>
</tr>
<tr>
<td>2010-2011</td>
<td>1580</td>
<td>1579.84</td>
</tr>
<tr>
<td>2011-2012</td>
<td>1650</td>
<td>791.01</td>
</tr>
<tr>
<td>Total(in crore)</td>
<td>6690</td>
<td>5459.89</td>
</tr>
</tbody>
</table>

Source: Computed from NSSO

TABLE: 4
The Variation among States in Rural Sanitation Coverage
(As of August, 2011)

<table>
<thead>
<tr>
<th>S.N.</th>
<th>State</th>
<th>Sanitation Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ANDHRA PRADESH</td>
<td>78.74</td>
</tr>
<tr>
<td>2</td>
<td>ARUNACHAL PRADESH</td>
<td>71.98</td>
</tr>
<tr>
<td>3</td>
<td>ASSAM</td>
<td>68.62</td>
</tr>
<tr>
<td>4</td>
<td>BIHAR</td>
<td>39.68</td>
</tr>
<tr>
<td>5</td>
<td>CHHATTISGARH</td>
<td>57.26</td>
</tr>
<tr>
<td>6</td>
<td>GOA</td>
<td>90.48</td>
</tr>
<tr>
<td>7</td>
<td>GUJARAT</td>
<td>86.07</td>
</tr>
<tr>
<td>8</td>
<td>HARYANA</td>
<td>95.49</td>
</tr>
<tr>
<td>9</td>
<td>HIMACHAL PRADESH</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>JAMMU &amp; KASHMIR</td>
<td>49.94</td>
</tr>
<tr>
<td>11</td>
<td>JHARKHAND</td>
<td>46.03</td>
</tr>
<tr>
<td>12</td>
<td>KARNATAKA</td>
<td>73.02</td>
</tr>
<tr>
<td>13</td>
<td>KERALA</td>
<td>100</td>
</tr>
<tr>
<td>14</td>
<td>MADHYA PRADESH</td>
<td>78.74</td>
</tr>
<tr>
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<tr>
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<td>MANIPUR</td>
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<td>17</td>
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<td>18</td>
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<tr>
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<td>RAJASTHAN</td>
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<tr>
<td>23</td>
<td>SIKKIM</td>
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<tr>
<td>24</td>
<td>TAMIL NADU</td>
<td><strong>82.93</strong></td>
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<tr>
<td>25</td>
<td>TRIPURA</td>
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<td>26</td>
<td>UTTAR PRADESH</td>
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<tr>
<td>27</td>
<td>UTTARAKHAND</td>
<td>80.84</td>
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<td>28</td>
<td>WEST BENGAL</td>
<td>78.83</td>
</tr>
<tr>
<td>29</td>
<td>A &amp; N ILANDS</td>
<td>42.33</td>
</tr>
</tbody>
</table>
Table 4 explain that it can be seen that while States like Himachal Pradesh, Kerala and Sikkim are reporting 100% progress against project objectives under TSC, States like Bihar, Jammu & Kashmir and Jharkhand have yet to achieve 50% of their project objectives for Individual Household Toilets under TSC.

Suggestions
- Awareness of sanitation standards and health impact of unsanitary conditions continues to be low and to avoid rural open defecation.
- School sanitation (providing toilets) should be given highest priority to inculcate safe hygienic habits among school children.
- Safe sanitation practices should be made compulsory part of school curricula, and of all programmes where women are trained in community, economic and health issues affecting the household.
- The sanitation mission has to make the entire village community dynamic and provide employment opportunity for certain number of people. Every family and teachers of Montessori schools should take up this responsibility as a family task.
- The recommendations made with regard to urban low cost sanitation also apply to the rural segment.

Conclusion
Now day’s very crucial problems Environmental sanitation and issues with related to emerging trends of sustainable development. Most of the rural and urban peoples were affected due to the poor sanitation. The emerging issues status of rural sanitation is basically different from that of water due to socio-cultural habits in widely spread out rural India. However, to assess the problem of poor sanitation is more acute in densely populated urban squatter settlements. Rural sanitation is neither perceived by the majority as a basic need nor provided as a public good. Thus, rural sanitation programme envisages promoting “Environmental Sanitation” as a package aiming at addressing the issues to reduce the probability of people's exposure to diseases and providing hygienic environment and taking measures to break the cycle of diseases by suggest to improve the emerging trends and rural environmental sanitation issues.

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Different Types of Agroforestry System in Nintavur Area

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Abstract: Agroforestry combines agricultural and forestry technologies to create more diverse, productive, profitable, healthy and sustainable land-use systems. The Agroforestry Program has generated much information about tree integration on farms. Knowledge, careful selection of species and good management of trees and crops are needed to optimize the production and positive effects within the system and to minimize negative competitive effects. In research area Alley Cropping and Home garden systems are practicing. When farmers practicing this method they are facing many problems because research area is very remote area therefore poverty is a main obstacle for improving their farming system and no adequate technologies. Government helps this area people to improve their home garden system through Thivi Neguma project. Agroforestry has an important role to play in the research area both for food and wood security and the conservation of the environment. The programme can’t do it alone due to limited financial, human and other resources. There are no adequate techniques in gardening system they want to improve sustainable farming system. Thirty families’ information have been taken for research and thirty farmers have been selected randomly for interview and field observation method also used for this research. Through the research brought out what are the problems they are facing, and in future what type of techniques they have to use to improve the agroforestry gardening system.

Keywords: Agroforestry, Alley Cropping, Home Garden

Introduction
Agroforestry is an integrated approach of using the interactive benefits from combining trees and shrubs with crops and/or livestock. It combines agricultural and forestry technologies to create more diverse, productive, profitable, healthy and sustainable land-use systems. According to the World Agroforestry Centre, Agroforestry is a collective name for land use systems and practices in which woody perennials are deliberately integrated with crops and/or animals on the same land management unit. The integration can be either in a spatial mixture or in a temporal sequence. There are normally both ecological and economic interactions between woody and non-woody components in agroforestry.

- Agroforestry has an important role to play in the research area both for food and wood security and the conservation of the environment.
- By integrating tree growing with crop production, the problems of poor agricultural production, worsening wood shortages and environmental degradation can be addressed.
- Furthermore, Agroforestry technologies/practices are seen as an opportunity to take pressure off the remaining natural forests and to increase the diversity of vegetation on existing farms.
Research Objectives

- The main objective of this study is to identify the different types of Agro forestry systems in research area.
- Identify the problems which farmers facing, when they are practicing agroforestry system.
- Providing management strategies to make their agroforestry system sustainable.

Research Methodology

This paper deals with several data by using qualitative and quantitative methodologies. Data have gathered from primary as well as secondary data collection schemes. Primary data were collected mainly through random sampling. In this method 30 families selected in Addapalam Arasady area for field visit. And also 15 farmers randomly selected for the interview. Information on 30 families and their home gardens was compiled between January & May 2014. And data have also been analysed as well as by using computer software.

Results and Discussion

This research basically focuses on different types of agroforestry in Addaplam Arasady area. Based on the primary data mainly two systems are practicing in research area. They are,

1. Alley Cropping
   • Vegetable cultivation
   • Fruit cultivation
   • Flower gardening

2. Home garden

1. Alley Cropping

Alley cropping, also known as intercropping is an agroforestry system where rows of crops are cultivated alongside rows of trees. Trees are planted in row and the alleyways in between the rows of trees serves as a bed for the agricultural crop. Any type of horticultural and agricultural crops can be grown in this manner. Crops that are sown in the fall make full use of the available full light that is provided because the deciduous trees have gone dormant. Alley cropping is both a visually appealing and economical method of farming that utilizes farmland for short-term income as well as long-term. Alley cropping is also a way to protect from soil erosion as the trees produce a network of roots that hold the soil. Fallen leaves provide ground cover and nutrients to the crop as well.

It is necessary to be knowledgeable in the technical and managerial skills of growing more than one crop at a time in the same area. Choosing the right types of crops and trees is likewise important, as the wrong type of trees can become an obstacle to harvesting the crops if they grow too large. Trees can also compete with the crops for nutrients, sun, and water, and if you utilize herbicides on your crops, it can potentially damage your trees.

Adequate spacing of tree rows will ensure many years of crop growth in the alleys in between. Deciding how to orient your rows of trees is another critical factor. East to west orientations are best, as that will allow the most sunlight to shine upon the alley crop, but thought must be given to the topography of the land, soil erosion potential, and prevailing winds in research area.

Alley Cropping method
Alley Cropping Benefits in research area
- Diversify farm enterprise
- Reduce erosion
- Improve water quality
- Protect crops
- Improve utilization of nutrients
- Improve aesthetics
- Store carbon

1. **Home Garden**
Main agroforestry system in this research area is Home garden. It means **FOOD ALWAYS IN THE HOME**. Its objectives are,

1. To address food security
2. To address nutrition
3. To have additional income

Home garden practicing in many ways such as,

**Flower gardening**

**Fruits**
Advantages of home garden

- Area people getting Quality vegetables
- Vegetables and fruits are Always available
- Mostly girls are practicing this gardens so they are saving Time
- Address nutrition
- Low/No cost, labour intensive, rather than capital intensive
- Ecologically sound
- Sustainable to household level food security

In research area some problems facing by farmers.

1. Most of the farmers do not have own land and they are practicing other’s land. And some of them practicing their own land but they do not use proper materials.
2. Animal destructions: cows and goats are destructing their crops
3. Water supply
4. Availability of vegetable seeds
5. Finance: research area is very remote one therefore they do not have enough financial support at the same time they are using expensive chemicals and water pumps.
6. Technology
7. Time
8. Epidemic attracts on their crops.

**Farmers using Strategies in home garden system**

- Using Water Pumps to watering crops
- Using ground water through tube well
- Using natural organic compost

**Watering Method**

![Watering Method Image]

**Source: Field visit**

Agroforestry systems can be advantageous over conventional agricultural and forest production methods through increased productivity, biodiversity, economic benefits, social outcomes and the ecological goods and services provided.

**Final overview of research area’s agroforestry system**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Nintavur - 10 , AddapalamArasady</td>
</tr>
<tr>
<td>Elevation</td>
<td>0 ‘ meters</td>
</tr>
<tr>
<td>Climate</td>
<td>Dry Zone Climate</td>
</tr>
<tr>
<td>Population Density</td>
<td>100persons / square kilometre</td>
</tr>
</tbody>
</table>

**Principle Crops**

**Fruits:**
Bananas, Passion Fruit , Mango, Wood apple, custard apple, grapes, jackfruit, watermelon

**Vegetables:**
Ladies’ finger, Brinjal, Long beans, Cucumber, Sweet potatoes, Tomatoes, Pumpkin, Snake beans, Bitter melon, Bottle Gourd, Drumstick, Snake Gourd, Onion, green chilies

**Trees:**
Mango tree, Arica nut, Jack tree, Coconut

**Flower:**
Conclusions
In the research area major agroforestry types are Alley cropping and Home garden. Under the home garden they are practicing flower gardening, fruit cultivation and vegetable. Farmers are facing many problems. Major problems are finance, area and water supply.

Research has also confirmed that agroforestry systems can include the following benefits in research area:

- Controlling runoff and soil erosion, thereby reducing losses of water, soil material, organic matter and nutrients.
- Maintaining soil organic matter and biological activity at levels satisfactory for soil fertility. This depends on an adequate proportion of trees in the system - normally at least 20% crown cover of trees to maintain organic matter over systems as a whole.
- Maintaining more favourable soil physical properties than agriculture, through organic matter maintenance and the effects of tree roots.
- Leading to more closed nutrient cycling than agriculture and hence to more efficient use of nutrients. This is true to an impressive degree for garden/farming systems.
- Checking the development of soil toxicities, or reduce existing toxicities - both soil acidification and salinization can be checked, and trees can be employed in the reclamation of polluted soils.
- Utilising solar energy more efficiently than monoculture systems - different height plants, leaf shapes and alignments all contribute.
- Leading to reduced insect pests and associated diseases.
- Moderating microclimates. Shelter given by trees improves yields of nearby crops and livestock. Shade in summer can be beneficial for livestock, reducing stress.
- Agroforestry can provide a more diverse farm economy and stimulate the whole rural economy, leading to more stable farms and communities. Economic risks are reduced when systems produce multiple products.
- Reducing poverty through increased production of agroforestry products for home consumption and sale
- Contributing to food security by restoring farm soil fertility for food crops and production of fruits, nuts

Recommendation for Home Garden Establishment in research area
1. Materials (Indigenous materials) they can use,
   * Sacks, Pots, Baskets, Rubber booths, Tires, Plastic bags, Cans, Plastics, Bamboo/ pipe

Examples
2. Fertilizers
   * Using Organic Fertilizers
     - Animal manures
     - Compost
   * In-organic
3. financial aid rendering by government
4. giving technical support and training for farmers
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Emerging Sartorial Complexities: Eclectic Fashion

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Abstract: Eclectic fashion is considered to be a selecting what appears to best in various styles. Furthermore it could be identified as deriving ideas, style or taste from a broad and diverse range of sources. During the Kotte period in Sri Lanka Portuguese influences affected the fashion of the royalty due to changing their religion to Christianity. Ultimately they embraced western lifestyle and partly abandoned their jewelry bedecked bare upper body style and combined a western stitched long sleeved loose jacket with the existing clinging draped cloth. Subsequently the early phases of the Kandyan King’s attire totally ignored the traditional lower long cloth and adopted the western trousers with long sleeved jacket. They became fashion fanatics and eager to acquire many fashion details from different fashion sources. The literary evidences proved that the royal males had an exotic taste. They were not hesitating to get inspired from the west and produce their own fashion. This paper explores emerging sartorial complexities of dress composition which entailed an eclectic fashion movement in Sri Lanka.

Keywords: Sartorial Complexities, Eclectic Fashion, Kotte Period

Introduction

During the sixteenth century the Kotte era (1411-1597AD) marked a new turning point in Sri Lankan dress fashion. The Portuguese conquered the island and established their power gradually throughout the lowlands of Sri Lanka including Kotte. Their influences in political, economic, cultural and social strata were huge and directly affected the lives of people of the society. By this time the royalty was directly inspired by western sartorial trends that led to drastic changes in the way of practicing traditions of Sri Lankan fashion forms. The royalty had direct contacts with the Portuguese Kings and diplomats and they embraced certain items of dresses, mixed and mingled with the traditional dress and created a novel dress. The process of mingling, of mixing and matching of several dress details is called hybridization and shows a dramatic composition of western, south Indian and Sri Lankan dress details.

Methods and Procedures

The qualitative method was adopted for the research. Sequence of observational studies with temple paintings, wood, ivory carvings, and sculptures along with the continuous literature review with use of documented manuscripts, records, published research and inscriptions were used to gather and sort data. Validation was confirmed with cross checking with literary sources.

Introduction of Christianity: The Change in ideology of the royalty

Changing the names of the royalty and adopting a western lifestyle

In comparison to the world movement of dress fashions the Kotte period marked the culmination of an emerging new fashion trend among the royalty in the succeeding eras in Sri Lanka accompanied by unique features rooted in the Sri Lankan fashion culture. The historical narrations of Sri Lankan dress fashions of the royalties show that the religion of the particular society played a pivotal role in forming the ideology of the wearer. However subsequent to the advent of the Portuguese in Ceylon 1505 AD, the state religion instrumental in terms changed the ideology of the royalty after its conversion to Christianity.
Sometime later in 1557 AD Prince Dharmapala (grandson of King Buwanekabahu VII of Kotte) and his queen were baptized with the names of Dom as Dom Joao PareiraPandar (1557AD) at the hands of Joao de Villa de Conde and the queen as Dona Catherina. Portuguese names were the fashion at court. Baptism became a rebirth under a foreign name and every female royal convert was dubbed as Dona. To denationalize the race was not the missionary’s object, and yet such was the inevitable consequence of the course he pursued, for with baptism came a rebirth under a foreign name and every royal convert was dubbed a Dom.

Prince Dharmapala was coroneted in Lisbon and from his childhood he grew up under the protection of the Portuguese. He was educated under Joao de Villa de Conde (chief of seven members of Franciscan missionaries who visited Sri Lanka in 1543AD) Trinidad notes how Dharmapala was loyal to the Portuguese, and later as King Dharmapala how gratefully he refers to Friar Joao as “my father and master” (Trinidad 1972)“This king PareiraPandar was a very good Christian and ever after lived under the discipline of the Friars of Franciscans and favor and protection of the Portuguese, who defended him as long as he lived and maintained him on the throne notwithstanding the position of Madune, his uncle.” (Trinidad 1972)

**Dress fashion of the royalty before advent of the Portuguese**

Fig1 Fig2 Fig3

King of Kotte King of Kotte King Buwanekabahu VII of Kotte
Udaaludeniya Cloth painting Ivory Casket inv.no.1241
Temple / Gampola Reg. no 85.133.1/National museum Right end of the gable/ Munich Treasury, Germany
Dress fashions of the royalty after embrace the Portuguese fashion

Prince Dharmapala dressed like a King Mayadunne King RaigamBandara Portuguese King& Sinhala King(Uncles of Prince Dharmapala)
Ivory Casket inv.no 1242    Ivory Casket inv.no1241    Ivory Casket inv.no1241
Right end of the gable    Rear view bottom Right end of the gable

One missionary with condescending enthusiasm wrote of a youthful prince “his thoughts are not those of a black, but of one who greatly desires to copy the Christian Kings both in his manner of life as in all else” for he says that when he becomes a Christian he will not have in his house but Portuguese”(Pieris 1998). The Franciscan historian Civezza has made a statement about the King of Ceylon and his attributes. He stated ‘that the King showed himself sincerely inclined to embrace Catholicism, and in the meantime he permitted a cousin of his to receive baptism. This cousin went to Portugal and returning thence died at Goa and was buried in the church of the Franciscan convent. Afterwards PereiraPandar (Dharmapala) himself wished to be instructed and baptized. He was baptized and always showed himself a true model of a Christian King’. (Perera, 1920)

Since the ailing Dharmapala had made out a deed of gift in 1580 AD bequeathing his kingdom to the Portuguese crown, all his kingdom would soon belong to Portugal. Perera said that Dona Cathrina’s example was followed by all the ladies of the court and by some of the nobles of the kingdom, whereupon a great number of the people asked for baptism. (Perera 1920)

It is noticed that most of the early kings of the Kandyan era (succeeding era of the Kotte) were educated under Portuguese Franciscans and baptized. King Wimaladharmasooriya 1(1591-1604) was one of them, son of a noble called WirasundaraMudaliyar who was known among the Portuguese by the name of Dom Joao de Austria Mudaliyar. However from his childhood hewas known as KonappuBandara. He embraced Buddhism after he became the King of the Kandyan Kingdom, as it was an important qualification for the kingship. However his personal desires and Western attitudes could not be eliminated from his dress sense. His enthusiasm for Western culture was clearly evident through early travelers’ notes.

Hulugalle (1999) states that the King was pleased to arrange interior decorations of the royal court similar to the western styles. He had some foreign collections of antiques. From his collection he showed some Spanish chairs and a table to the Dutch Admiral Spilbergen. He arranged lodging for Spilbergen not in the Sinhala but the Portuguese fashion. (Paranavithana 1997) Further,Paranavithana states that the King’s great hall was decorated with beautiful tapestry and was occupied by many Spanish chairs and the table was arranged in a Christian manner. (Paranavithana 1997) When he started to build the city of Kandy it was constructed according to the Christian style. (Paranavithana 1997) The King and his royal family always dressed in Portuguese fashion. But, when they were in front of the people they followed Sinhala dress fashions.
Prince Vijayapala (1634-1654, a prince of the Matale district and son of Dona Catherina and King Senarath) was completely converted into the western way of life. He was grown under a Christian environment and said ‘though I am a Chingala by blood I am a Portuguese in my ways and my affections (Pieris, 1927). He was really influenced by western culture and admired the western as the best (Pieris, 1927). Once he wrote to the King of the Portugal ‘under his (A Portuguese mentor) instruction, I learnt very good customs and etiquette and some special habits which royal persons employ (Pieris, 1927). His personal appearance has been observed by an eye witness, Captain Joao Ribeiro and stated “he was dignified, modest, and courteous, of a stately bearing and appeared about 34 years old, slim of body and very erect. His long hair was curled at the ends, and his beard was worn in the Portuguese fashion, with a moustache which was not very full; his colour was like that of the quince, and he always very cheerful and friendly with the Portuguese; but when he spoken with the natives, his bearing was royal, austere, and very stately”. (Pieris, 1927)

The son of King Senarath (1604-1635) King Rajasinga I (1635-1687) who also grew up in the Portuguese environment and his dress habits show how he changed his mind with the impact of the environment he had grown up in. Knox’s statements are quite important to understand the King’s habits displayed throughout his lifetime. Knox says, ‘he was not wont to keep to one fashion, but changes as his fancy leads him’. Furthermore careful observations of Knox state, ‘his apparel is very strange and wonderful, not after his own country fashion, or any other, being made after his own invention’. ‘On his head he wears a cap with four corners like a Jesuits three tear high, and a feather standing upright before. Like that in a head of a four –horse in a team, a long band hanging down his back after the Portuguese fashion, his doublet after so strong a shape,….the body of one ,and the sleeves of another colour, he wears long breaches to his ankles, shoes and stockings’. (Knox, 1958)

Portuguese fashion of the royalty

A foreign traveler Christopher Schweitzer’s (1676 AD) observation leads to a picturesque quality of dress fashions of King Rajasingha II. ‘His shirt and waistcoat is made of the finest cotton, with gold and he wears a garment of coloured silk, that goes four or five times around his middle, and hangs down to his knees. His stockings are fastened to a silver plate, as large almost as a trencher. His shoes are only leathern soles with strings, of which comes up between his toes and the other comes around his foot, and ties…….. And all these strings are set out with sapphires and rubies. He wears a sword close under the right arm, tied to a silk ribbon. It being in a massive silver scabbard: it is made like a hanger. And about a yard long. The handle is embedded with five precious stones. On his left side, between his shirt and his waist coat, he wears a long knife, beside his sword, inlaid with gold and jewels’ (Hulugalle, 1999).
It could be envisaged how much the Kings were devoted to the new faith and their fervor to the new lifestyle they had to adapt to. Hence, elucidation of these dimensions affirms that change of the one’s faith led to drastic change in their inner soul ultimately visible through the dress code. Prince Dharmapala was the person who transgressed the traditional fashion and induced novel sartorial details to the Sri Lankan fashion arena.

**New sartorial sense: an eclectic mix.**

![Fig 8](image1) ![Fig 9](image2) ![Fig 10](image3) ![Fig 11](image4)

King Wimaladharmasuriya I
King Rajasimha II
King Kirthi Sri Rajsimha
King Sri Wickramarajasimha

(Knorr, 1966) (Dambulla temple) (Davy, 1821)

King Vimaladarmasuriya I’s (1591-1604) complete costume is described by Coomarasvamy as (Coomaraswamy, 1956) ‘the Sinhalese King wears a jewelled crown surmounted by a trisula, and having a Buddha figure in the front; a jacket and ‘mante’ (tippet) and a patterned ‘tuppotiya’ (lower cloth), probably of muslin with gold or silver thread. He carries a sword hanging by a bandolier over the right shoulder. A lotus flower is in the left hand. The jewelry worn includes earrings, two necklaces with jeweled pendants, armlets and anklets. The King’s dress is a hybrid formation of western and traditional Sinhalese dress details. It could be assumed that he composed the full dress according to his personal fashion consciousness. The full dress is completely different from the traditional royal dress code of the earlier Kings.

It is believed that King Vimaladarmasuriya I introduced the long sleeved short jacket for the royal dress code known as ‘juwanhette’ which derived its name from its introduction by Don Jhon Wimaladharmasuriya I. (Codrington, 1910.) The long-sleeved jacket was also known as ‘kameesahettaya’, ‘mantehettaya’. From the eighteenth century onwards the royal dress changed to a long sleeved jacket and the long lower cloth and pantaloons depicted in wall paintings and sculptures of the period. It is obvious that the new dress style merged well into the tradition of the country. After he devised his own visual context, some new associations emerged for the long sleeved jacket. After this, the long sleeved jacket could be seen as being associated with a new set of dress types. Successors of King Wimaladharmasuriya followed the same long sleeved jacket with a collar or tippet (Codrington, 1910) composed of trousers or pantaloons and they became a fashion statement.

Even though Prince Dharmapala first adopted the Portuguese style ‘cabaya’ or long coat and introduced them to the Kings it also could be suggested that King Wimaladharmasuriya I introduced the short jacket or ‘hettaya’ as upper body dress for the royalty. His long lower dress seems to be a development derived from the early Gampola period and the sixteenth Century lower dress depicted in the two cloth paintings at the Museum, Colombo. (Reg.No.85.133.1) The broad design on the front fold of the dress seems similar to the above mentioned sixteenth century lower dress. The side fold also shows gradual development of the dress feature. He wore jewelry including the necklaces, crown,
earrings, armlets, bracelets, varieties of rings, and bandolier.

Fig 10 shows the dress of King Kirthi Sri Rajasimha composed of loose white pantaloons and the 'hette' or jacket. This jacket was also known as 'mojahette' and is presently well preserved at the Kundasale temple in Kandy. This was made in a rich material of brocade, velvet, silk or cloth of gold. The jacket has long sleeves. The jacket’s neck line is wide and has a two piece frilled collar.

Fig 11 shows King Sri WickramaRajasimha’s royal dress which shows a continuous narration of dress etiquettes which was followed by the Nayakkar Kings. He wore loose pantaloons as lower garment with two layers of frills attached to the ankle. He wore a pair of sandals that was unique. He carried a staff with beautiful carvings which was inlayed by gemstones. He covered the upper body with a long sleeved fine muslin jacket known as ‘Watahette’ or ‘Relikamise’. The jacket was embellished with thread work and had a three layered ‘mante’ worn over it. Fig 11 presently in the Kandyan Museum shows a jacket with a broad ‘mante’. This dress article was also utilized by Kings Keerthi Sri Rajasingha and Wimaladharmasuriya I in their jackets. However the size of the article is seen to be bigger in the tippet of Wimaladhramasuriya I (Codrington, 1910). It is known that these Kings practiced oiling their hair as etiquette and they separately attached the tippet to the neckline of the jacket as a protective dress item which they supposed would not allow oil to run into their jacket.

Apart from ‘yatakamise’ or ‘roppillios’ (foundation garment) he wore a fine muslin shirt as ‘udakamisaya’ or ‘wambays’ (doublet or outer garment) which was sleeveless. Bo-leave patterned cuffs were attached to the sleeve wrists. Reminiscent of the Portuguese King (fig 14 King João III) and he carried a handkerchief. His forehead is marked with a ‘thilaka’ (forehead mark) which is pronouncing a signifier of his Tamil origin. Although King Sri WickramaRajasimha and Kirthi Sri Rajasimha were Tamil by birth eventually they embraced Buddhism and followed fashions of their former Kings.

Complexities of eclectic fashion: design variation in jackets.

Temple murals during the period of Kandy show varieties of patterned upper body jackets worn by the Kings. Visual representations show how the Kings were immersed in Western fashions and adapted them according to their contemporary social dress norms and values. They patterned the jackets with different types of sleeves, necklines, collars, fastenings, and decorative trimmings such as frills, and ornamental cuffs with traditional designs and motifs. Murals of the Hanguranketha temple show a different styled long sleeved jacket which has a big puffed sleeve having a certain volume emphasized at the center of the shoulder and tightening to the elbow by attaching a fabric frill. Very often they used overall design fabrics to make hetta or jackets. Frills were a common detail feature for all kameesahette, which were mostly attached to the necklines and the hemlines of the sleeves (cuffs). There was also a jacket with a pointed tail.
Complexities of eclectic fashion: hybrid dress.

Higher administrative officers during the period of British rule in Sri Lanka Early 20th Century

It is also identified that the elite or the high rankers of the administrative society during the early twentieth century in the south of Sri Lanka wore long coats with a long cloth up to the ankle and wore long trousers beneath the cloth. What is noticeable here is that instead of Prince Dharmapala’s long coat and long lower piece of cloth a new dress form, trousers worn beneath the cloth emerged. This new fashion brought an interesting dress composition and elaborated the perception of the perceivers of that society. The mode of the new dress composition signified ‘smart gentleman’. It seems that with the passage of time the elite male has ignored the lower cloth and practiced wearing a long coat and trousers. In this way it seems that people in the society could continuously convey dress signifiers according to their wish. However it is apparent that the culture of the society had ignored some dress forms and re-formed and adopted another dress for elite males in the middle phase of the twentieth century in Sri Lanka.
Results & Conclusion
It is realized that the fashion of dress in Sri Lanka has become a vibrant composition in succeeding administrative eras in history. The Portuguese impact on the dresses of the royalty caused a vibrant composition of dress. The novel dress mode immediately inspired by the elite of the royal court led to many other formations of components into dress. The so called traditional Sri Lankan dress became a blend of Western and Sri Lankan. However the finalized dress fashion becomes more authentic than ever before. The cultural blend of stitched long coat or short jacket mixed with an unstitched wrapped long cloth gave immense visual metaphor was for the viewer. The male dress of the early phase of the 20th Century, gradually built up its position steadily in society. The dress was identified as a strong metaphor in social administration. This sartorial eclectic blend paved the way to emerging new trends among Sri Lankans.

References.
Trinidadde,Paulode,ConquistaEspiritual do Oriente, 3 Vols,( Lisbon,1960-67)
The Contribution of Bank of Ceylon for Regional Development: A Special Research for Koralaipattu Region

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Abstract: The word Development is talk by everyone at present. Development seems to be target of Politician, Policy planners and intellectual people. All countries are making different policy planning and prepare project and implement that according to the aim of how to develop them. By the way, the thought of regional development strengthen in International level in 1990. Through Making regional development can develop economic this concept is strengthening. It seems in the international level that banks are one of the development tools that are developing economy. The main objective is increase the income of poor people and up lift their lives through this can develop the economy. On this basis this research is how the impact on contribution by Bank of Ceylon to the Regional development the main objective of this research is evaluates the contribution of Bank of Ceylon in Koralaipattu Regional Development. Within this research, areas find out the social economy situation. What are the problem encounter by the Bank of Ceylon when develop the region. This research is containing this sub aim to propose the ways and means how to upgrade the regional development. To achieve this aim number, and data related to their culture is very important. On this basis number and data related culture is analyze through the simple sample static. Even though the Bank of Ceylon considerably made improve the Koralaipattu Regional development but it is seems to very low when compared with other. If to develop this region the Bank of Ceylon should make awareness among people about their services. And change the structural changes through this people have to be motivated and the economy changes can be made. This research is put forward as important solution.

Keywords: Regional Development, Life Stranded, Bank of Ceylon
இந்த கால்வாய்ப்புகளின் மீது ஒருங்கியவர், கால்வாய்ப் படையப்படுத்தலுக்கான ஏனைய வழிசுவக்கத்திற்கு காலநாட்டு இறக்குமை பெற்றுள்ளது. உள்ளே வாழ்வுக்கான காலநாட்டு இறக்குமை பெற்றுள்ளது. உள்ளே வாழ்வுக்கான காலநாட்டு இறக்குமை பெற்றுள்ளது. உள்ளே வாழ்வுக்கான காலநாட்டு இறக்குமை பெற்றுள்ளது. உள்ளே வாழ்வுக்கான காலநாட்டு இறக்குமை பெற்றுள்ளது. உள்ளே வாழ்வுக்கான காலநாட்டு இறக்குமை பெற்றுள்ளது. உள்ளே வாழ்வுக்கான காலநாட்டு இறக்குமை பெற்றுள்ளது.
Reidar Dale (1992) observed that the changes in the landscape have been gradual over the years, and the impact of human activities on the environment is evident. The changes in the landscape have led to an increase in the number of migratory birds, which has had a positive effect on the local ecosystem. The changes have also led to an increase in the number of tourists, which has had a negative effect on the local economy.
Michael Todaro (2000) explains five different economic theories:

1. Linear – Stages Theory
2. Structural – Change Model
3. The International – Dependence Revolution
4. The Neo Classical Counterrevolution

Michael Todaro (1993) explains the stages of economic development. Todaro identifies five key stages:

1. Linear Stages Theory
2. Structural Change Model
3. The International Dependence Revolution
4. The Neo Classical Counterrevolution

Michael Todaro (1998) further discusses the stages of economic development. Todaro identifies the transition from one stage to the next as crucial for economic development.

Michael Todaro (2000) explains the role of education in economic development. Todaro identifies the importance of education in the transition from one stage to the next.

Michael Todaro (1995) explains the role of education in economic development. Todaro identifies the importance of education in the transition from one stage to the next.

Michael Todaro (1993) explains the stages of economic development. Todaro identifies the importance of education in the transition from one stage to the next.

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## கொள்கல்வியாளர் செயல்பாடுகள் பின்னர் உலகப் பார்வையும் நிகழ்வுகளியற் கூறும் உலகச் செயல்பாடுகள் அதிகம் சென்றுள்ளது

உலக முக்கியத்துவாயில் உலகப் பார்வையும் நிகழ்வுகளியற் கூறும் உலகச் செயல்பாடுகள் அதிகம் சென்றுள்ளது. இந்த கல்வியாளர் செயல்பாடுகள் உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகச் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது. உலகோட்டத்தின் செயல்பாடுகள் அதிகமாக சென்றுள்ளது.

### கொள்கல்வியாளர் செயல்பாடுகள் வருமானத்தின் அளவுகள் (2010)

<table>
<thead>
<tr>
<th>கொள்கல்வியாளர் செயல்பாடுகள்</th>
<th>வருமானத்தின் அளவு</th>
<th>பாசைகள்</th>
<th>முதுகோள் அளவு</th>
</tr>
</thead>
<tbody>
<tr>
<td>கல்வியாளர் செயல்பாடு வருமானம்</td>
<td>12%</td>
<td>50,000</td>
<td>180,000</td>
</tr>
<tr>
<td>பாசைகள் வருமானம்</td>
<td>10%</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td>முதுகோள் வருமானம்</td>
<td>12%</td>
<td>50,000-400,000</td>
<td></td>
</tr>
</tbody>
</table>

தொடக்கச் செயல்பாடுகள் வருமானம்

<table>
<thead>
<tr>
<th>கொள்கல்வியாளர் செயல்பாடு வருமானம்</th>
<th>வருமானத்தின் அளவு</th>
<th>பாசைகள்</th>
<th>முதுகோள் அளவு</th>
</tr>
</thead>
<tbody>
<tr>
<td>கொள்கல்வியாளர் செயல்பாடு வருமானம்</td>
<td>15%-14%</td>
<td>250,000-1,500,000</td>
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</tr>
<tr>
<td>பாசைகள் வருமானம்</td>
<td>12%</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td>முதுகோள் வருமானம்</td>
<td>4%</td>
<td>250,000-5,000,000</td>
<td></td>
</tr>
</tbody>
</table>

### முதல் பதிப்பின் வருமானத்தின் அளவு

<table>
<thead>
<tr>
<th>கொள்கல்வியாளர் செயல்பாடு வருமானம்</th>
<th>வருமானத்தின் அளவு</th>
<th>பாசைகள்</th>
<th>முதுகோள் அளவு</th>
</tr>
</thead>
<tbody>
<tr>
<td>கொள்கல்வியாளர் செயல்பாடு வருமானம்</td>
<td>12%</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td>பாசைகள் வருமானம்</td>
<td>12%</td>
<td>250,000-1,500,000</td>
<td></td>
</tr>
<tr>
<td>முதுகோள் வருமானம்</td>
<td>12%</td>
<td>100,000-200,000</td>
<td></td>
</tr>
</tbody>
</table>

### முதல் பதிப்பின் வருமானத்தின் அளவு

<table>
<thead>
<tr>
<th>கொள்கல்வியாளர் செயல்பாடு வருமானம்</th>
<th>வருமானத்தின் அளவு</th>
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<th>முதுகோள் அளவு</th>
</tr>
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<tbody>
<tr>
<td>கொள்கல்வியாளர் செயல்பாடு வருமானம்</td>
<td>12%</td>
<td>250,000</td>
<td></td>
</tr>
<tr>
<td>பாசைகள் வருமானம்</td>
<td>12%</td>
<td>250,000</td>
<td></td>
</tr>
<tr>
<td>முதுகோள் வருமானம்</td>
<td>12%</td>
<td>200,000-5,000,000</td>
<td></td>
</tr>
</tbody>
</table>
1990-2009 வரை 0.8 மற்றும் மேற்பட்ட கொள்கள்கள் காணப்பட்டன. 2009ஆகிய முற்பகுதியில் அதிகபட்சமான கொள்கள்கள் காணப்பட்டன. தற்கால கொள்கள்கள் காலம் என்பது நூற்றாண்டு பின் தொடர்ந்து காணப்பட்டன. 2009ஆகிய முற்பகுதியில் கிளைகள் விளைவாக்கம் காணப்பட்டது. 2009 முற்பகுதியில் கிளைகள் விளைவாக்கம் என்பது கிளைகள் விளைவாக்கம் காணப்பட்டது. 2009 முற்பகுதியில் கிளைகள் விளைவாக்கத்துடன் முறுங்கியது. முற்பகுதியில் கிளைகள் விளைவாக்கம் காணப்பட்டது. 2009 முற்பகுதியில் கிளைகள் விளைவாக்கம் காணப்பட்டது.


Diagram 1.3

[Diagram showing percentage distribution of academic categories (1990-2013)]

- Master’s in English: 77%
- Bachelor’s in English: 12%
- Doctorate in English: 11%

Legend:
- Master’s in English: Green
- Bachelor’s in English: Blue
- Doctorate in English: Orange

The diagram represents the percentage distribution of English academic categories from 1990 to 2013. It indicates that Master’s degrees dominate with 77%, followed by Bachelor’s (12%) and Doctorates (11%).

The data reflects a significant emphasis on Master’s degrees, with Bachelor’s and Doctorates showing a smaller but still notable presence.
நிலையிலை நூற்றாண்டு புது இலக்கணம் கள்ளுப்போக்கு அனுமானப் பாதையில் கலாச்சாரம் ஆராய்ச்சி பயிர்களின் வழிகாட்டுகள் என்று குறிப்பிட்டல்லாம். இந்த தொடர்ச்சியின் வழிகாட்டுகள் என்றால் கலாச்சார மேற்கோள்கள் மற்றும் ஆங்கிலத்தில் வழிகாட்டுகள் என்று குறிப்பிட்டல்லாம். நிலையிலை நூற்றாண்டு புது இலக்கணம் கள்ளுப்போக்கு அனுமானப் பாதையில் கலாச்சாரம் ஆராய்ச்சி பயிர்களின் வழிகாட்டுகள் என்றால் கலாச்சார மேற்கோள்கள் மற்றும் ஆங்கிலத்தில் வழிகாட்டுகள் என்று குறிப்பிட்டல்லாம்.

நிலையிலை நூற்றாண்டு புது இலக்கணம் கள்ளுப்போக்கு அனுமானப் பாதையில் கலாச்சாரம் ஆராய்ச்சி பயிர்களின் வழிகாட்டுகள் என்றால் கலாச்சார மேற்கோள்கள் மற்றும் ஆங்கிலத்தில் வழிகாட்டுகள் என்று குறிப்பிட்டல்லாம்.

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Page 104
Peace Building in Post-War Societies

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Abstract: Post-Conflict peace building is evidently not a simple process. There are significant limitations and complications that need to be addressed, including political and resource constraints and also peace building in post-conflict societies is a multi-component process, most important of which is finding lasting political solutions within the framework of nation states. While the term peace building is relatively new, external assistance for post-war rebuilding goes back to the reconstruction of post-World War II Europe and Japan. What was new in Boutros Boutros-Ghali’s formulation, and what caught the world’s attention, was a realization that the end of the Cold War opened new possibilities for international action? The United Nations, individual states and international non-government organizations (INGOs), have become increasingly involved in trying to rebuild peaceful societies in the aftermath of violent Conflict. Post-Conflict peace building encompasses the full range of non-military commitments undertaken by the international community to assist countries to achieve self-sustaining peace and socio-economic development. This article studies one such effort of peace building and sustainable development in a war-torn nation. This paper focuses on the original definition of peace building. More specifically, it examines elements of peace building and interventions by external actors to help war-torn societies not only to avoid a relapse into Conflict, but more importantly, to establish the conditions for sustainable peace.

Keywords: Peace Building, Conflict Resolutions, Post-War Development and Conflict Transformation

Introduction

The term peace building came into widespread use after the then United Nations Secretary-General, Boutros Boutros-Ghali—announced his Agenda for Peace in 1992. “Action to identify and support structures which tend to strengthen and solidify peace to avoid a relapse into Conflict”. Since then, peace building has become a catchall concept, encompassing multiple (and at times contradictory) perspectives and agendas. It is indiscriminately used to refer to preventive diplomacy, preventive development, Conflict prevention, Conflict resolution and post-Conflict reconstruction.( Charles Call, 2004). ever since then, peace building has become a broadly used but often ill-defined term implying activities that go beyond crisis intervention, such as long-term development, building of governance structures and institutions or building the capacity of non-governmental organizations (including religious institutions) for peacemaking and peace building. The United Nations distinguishes between several different kinds of intervention to bring about peace. In addition to humanitarian aid or emergency assistance, designed to provide the immediate means of survival for populations at risk, the main categories of intervention are:

Peace-making … implies interventions designed to end hostilities and bring about an agreement using diplomatic, political and military means as necessary. The focus lies in the diplomatic effort to end the violence between the conflicting parties, to move them towards nonviolent dialogue and eventually reach a peace agreement.
Peace-keeping … means monitoring and enforcing an agreement— even by using force as necessary. Peacekeeping operations not only provide security, but also facilitate other non-military initiatives. It may include:

a) Assisting parties to transform from violent conflict to peace by separating the fighting parties and keeping them apart,

b) Verifying whether agreements are being kept,

c) Supervising agreed confidence-building activities,

d) Managing through third-party intervention (often, but not always done by military forces).

Peace-building … are programs designed to address the causes of conflict, the grievances of the past and to promote long-term stability and justice. Often it is understood as the phase of the peace process that takes place after peacemaking and peacekeeping. On the other hand, peace building is an umbrella concept that encompasses not only long-term transformative efforts, but also peacemaking and peacekeeping. In this view, peace building includes early warning and response efforts, violence prevention, advocacy work, civilian and military peacekeeping, military intervention, humanitarian assistance, ceasefire agreements and the establishment of peace zones.

The ending of overt violence via a peace agreement or military victory does not mean the achievement of peace. (Licklider, 1995) Rather, the ending of violence or a so-called ‘post-Conflicts’ situation provides “a new set of opportunities that can be grasped or thrown away”. (Robert L. Rothstein, 1999) The international community can play a significant role in either nurturing or undermining this fragile peace building process. The United Nations, individual states and international non-government organizations (INGOs), have become increasingly involved in trying to rebuild peaceful societies in the aftermath of violent Conflict. The dilemmas currently being faced in Iraq and Sri Lanka are only the latest in a line of learning experiences in this complex task of post-Conflict peace building. In Namibia and Cambodia, for the first time, the UN launched expanded peacekeeping operations which included not only military security but the coordination of elections. In East Timor, the UN mandate broadened even further to include the establishment of a functioning government and society through comprehensive development, law and order, security and governance objectives. In both Afghanistan and Iraq, extensive reconstruction activities have also been pursued, including an emphasis on establishing security, democracy and good governance.

Further, The UN plays an important role in relation to different aspects of crisis intervention and political tensions and the UN’s authority is very important in different aspects of addressing and resolving Conflicts to managing the consequences of those Conflicts. Over the last decades, and especially after the end of the Cold War, the role of the UN has expanded towards the construction and peace building of societies affected by Conflict.

There is a great deal of human suffering related to violent conflicts, political instability or unjust policies and practices. While short-term humanitarian relief and crisis intervention are most important to reduce the immediate sufferings in violent conflicts, they are not enough in fragile states or post-conflict societies. There must be additional initiatives for post-conflict reconciliation, for the development of capacity for conflict transformation and for the building of sustainable peace. Meanwhile there is increasing awareness of the need to increase the capacities for nonviolent conflict transformation everywhere, even before open violence has occurred.
Defining Peace building

While the term peace building is relatively new, external assistance for post-war rebuilding goes back to the reconstruction of post–World War II Europe and Japan. What was new in Boutros Boutros-Ghali's formulation, and what caught the world's attention, was a realization that the end of the Cold War opened new possibilities for international action. Traditionally, states intervened in the affairs of other states as part of their foreign policy. Where realpoliticks permitted, intervention was undisguised and forceful. Where real politick blocked action, the United Nations and other multilateral institutions were paralyzed to act collectively.

Peace building is difficult to define and even more difficult to achieve in practice (Elisabeth M. Cousins, 2001). Here define post-Conflict peace building as “strategies designed to promote a secure and stable lasting peace in which the basic human needs of the population are met and violent Conflicts do not recur”. This definition takes a long-term focus (Stephen J. Stedman & Donald Rothchild, 1996 & C.P. David, 1999) and incorporates the goals of both negative peace (absence of physical violence) and positive peace (absence of structural violence), a distinction first outlined by Galtung. (Johan Galtung, 1969) My analysis is also informed by the more comprehensive and normative definition of peace building provided by Spence: “those activities and processes that: focus on the root causes of the Conflict, rather than just the effects; support the rebuilding and rehabilitation of all sectors of the war-torn society; encourage and support interaction between all sectors of society in order to repair damaged relations and start the process of restoring dignity and trust; recognize the specifics of each post Conflict situation; encourage and support the participation of indigenous resources in the design, implementation and sustainment of activities and processes; and promote processes that will endure after the initial emergency recovery phase has passed” (Rebecca Spence, 2001).

These definitions assume that, to be successful, post-Conflict peace building must address the underlying causes of Conflict in addition to the surface manifestations such as the military culture and proliferation of weapons. As argued by Evans “at the heart of the notion of peace building is the idea of meeting needs: for security and order, for a reasonable standard of living, and for recognition of identity and worth.” (Gareth Evans, 1993)

The strategies mainly employed in the post-Conflict peace building processes include a wide range of activities. NGOs, international financial institutions and development agencies as well as local and national actors cover a whole gamut of ventures to ensure the healthy recovery of war-devastated states. Disarmament of combatants, procurement of political and economic concessions to stabilize the state, development of infrastructure, and consolidation of the legal, financial, and political systems are just part of the focal points that undergo changes in the years immediately following the peace agreements. The main mission is “to identify and support structures which will tend to strengthen and solidify peace in order to avoid a relapse into Conflict.” (Boutros Boutros-Ghali; 1992)

The concept has become an inherent component in the UN’s efforts to prevent and resolve conflicts, and to preserve peace. According to UN Secretary-General Kofi Annan: By post-conflict peace-building, I mean actions undertaken at the end of a conflict to consolidate peace and prevent a recurrence of armed confrontation. Experience has shown that the consolidation of peace in the aftermath of conflict requires more than purely diplomatic and military action, and that an integrated peace-building effort is needed to address the various factors that have caused or are threatening a conflict. Peace-building may involve the creation or strengthening of national institutions, monitoring elections, promoting human rights, providing for reintegration and rehabilitation programmes, and creating conditions for resumed development. Peace-building does not replace ongoing humanitarian and development activities in countries emerging from crisis. It aims rather to build on, add to, or reorient such activities in ways designed to reduce the risk of a resumption of conflict and contribute to creating the conditions most conducive to reconciliation, reconstruction and recovery. (United Nations: 1998)
Post-conflict peace building is a complex and multidimensional, genuinely political process of transformation from a state of war or violent conflict to one of stability and peace, requiring, according to Kofi Annan, “a multifaceted approach, covering diplomatic, political and economic factors” (United Nations:1998). It embraces security, political, social, economic, and psycho-social dimensions, and it aims at the installation of both negative and, in the longer run, positive peace. While it is necessary to define appropriate measures and timetables (including exit strategies) and, in the interest of sustainability, to ensure transfer of ownership to local actors, this becomes a particularly difficult and cumbersome undertaking when the required multifaceted approach is not paralleled by “high-level strategic and administrative coordination” among the different actors involved in post-conflict peace building tasks. (United Nations: 1998) Moreover, in the interest of sustainability, coordination with local partners has to lead towards transfer of responsibilities. As the International Commission on Intervention and State Sovereignty (ICISS) notes, “the long-term aim of international actors in a post-conflict situation is ‘to do themselves out of a job’ . . . by creating political processes which require local actors to take over responsibility both for rebuilding their society and for creating patterns of cooperation between antagonistic groups” (ICISS:2001)

This focus on satisfying human needs is derived from the Conflict resolution theories of John Burton. (John W. Burton:1990). According to Spence, “the process of peace building calls for new attitudes and practices: ones that are flexible, consultative and collaborative and that operate from a contextual understanding of the root causes of Conflict”. (Rebecca Spence,2001). The approach is transformative: it is based on terminating something undesired (violence) and the building of something desired through the transformation of relationships and construction of the conditions for peace. (John Paul Lederach,2000) It is consistent with the perspective enunciated by Ryan that the task of peace building “involves a switch of focus away from the warriors, with whom peace-keepers are mainly concerned, to the attitudes and socio-economic circumstances of ordinary people … So whereas peace-keeping is about building barriers between the warriors, peace-building tries to build bridges between the ordinary people”. (Stephen Ryan,1990)

An Agenda for Peace stimulated significant new thinking and policy development within and outside the UN. The 1995 Supplement to An Agenda for Peace, for example, noted the linkages between Conflict prevention and peace building: “Demilitarization, the control of small arms, institutional reform, improved police and judicial systems, the monitoring of human rights, electoral reform and social and economic development can be as valuable in preventing Conflict as in healing the wounds after Conflict has occurred.” It also acknowledged that implementing peace building could be complicated—requiring “integrated action and delicate dealings between the United Nations and the parties to the Conflict in respect of which peace-building activities are to be undertaken.”

The Supplement distinguished between the UN's peacekeeping and peace building roles: “Most of the activities that together constitute peace-building fall within the mandates of the various programmes, funds, offices and agencies of the United Nations system with responsibilities in the economic, social, initially have to be entrusted to, or at least coordinated by, a multifunctional peace-keeping operation, but humanitarian and human rights fields. In a country ruined by war, resumption of such activities may initially have to be entrusted to, or at least coordinated by, a multifunctional peace-keeping operation, but as that operation succeeds in restoring normal conditions, the programme...etc.”

Post-Conflict peace building is evidently not a simple process. There are significant limitations and complications that need to be addressed, including political and resource constraints, lack of political will, and lack of capacity to implement terms of the peace agreement. (E. Bertram:1995) The efforts of
the international community to promote peace in societies recovering from violent Conflict are further complicated when there has not been a negotiated end to the violence involving the international community, as in Rwanda after the genocide in 1994. Boutros-Ghali draws the distinction between post-Conflict peace building in the context of a comprehensive peace settlement, and peace building activities where the UN does not already have a peacemaking or peacekeeping mandate. In the latter situation, it is not clear who has the responsibility for implementing, monitoring and coordinating peace building activities, and the parties to the Conflict are not bound by any agreement as to their part in the peace building process. If the violence has ceased because of a military victory, as in Rwanda, then there is the problem of an imbalance of power between the victors and losers to deal with in the reconstruction of society and the implementation of justice mechanisms.

This situation is different again and even more challenging when the victor in the military Conflict is an outside intervener, such as the US in Iraq and Afghanistan. The US and coalition have the moral and legal responsibility to provide assistance in the rebuilding effort, but do not have the moral credibility nor practical experience to manage the process. The UN has the experience, but is lacking credibility in Iraq, and has limited resources to tackle such an enormous and complicated task. How can either the US or UN effectively implement justice and reconciliation processes in this situation?

Previous studies have concentrated on evaluating post-Conflict peace building as part of the implementation of peace agreements and have generally not included cases without a negotiated settlement. This is a limited approach as many Conflicts ‘end’ as the result of military victory, as in Rwanda and Iraq, which has significant implications for the consideration of transitional justice issues.

There will be no lasting peace and stable democracy in war-torn societies without truth, justice, and reconciliation. Mass killing, ethnic cleansing, rape, and other brutal forms of conducting war in ethnic, religious, and similar types of Conflict render reconciliation extremely difficult. Although it is a long-term process, it has to be started as soon as the peace operation and peace building are initiated. Justice and order are important aspects of peace building in a post-Conflict situation where there is a need to end violence, disarm combatants, restore the rule of law, and deal with the perpetrators of war crimes and other human rights abuses. The need to overcome or transform the enmities developed during a violent Conflict and “build bridges between ordinary people” suggests a need for reconciliation. Very few researchers have considered the roles of justice and reconciliation in the success or failure of peace agreements and peace building processes in sustaining a long-term peace.

In the international community’s past peace building practice, the focus on the political rather than the personal has tended to mask the underlying psychosocial processes that contribute to the willingness and readiness of people to choose a path of peace and reconciliation rather than engaging in further mass violence and/or abuse of human rights. As argued by Rasmussen, the concern with “hard-nosed” geopolitics needs to expand to include the realm of geo-social politics in which relationship-building and reconciliation take centre stage.

Lederach’s theories on peace building also identify relationships as a central component. He argues that one of the most important needs is for peace builders to “find ways to understand peace as a change process based on relationship building”. He goes further to say that we need to reorient our peace building framework “toward the development of support infrastructures that enhance our capacity to adapt and respond to relational needs rather than being defined and driven by events and agreements”. In other words, rather than focusing on the political and legal aspects of peace agreements, truth commissions and criminal tribunals, we need to focus on the task of relationship-building and how that may be enhanced through these various processes.
Peace Building in doubt

Peace-building accomplished through international intervention, UN or INGOs has had little success in achieving sustainable peace. In February of 2004, Haiti slipped back into chaos and despair, turning ten years of international and Haitian state-building efforts to dust. Liberia is in its second round of international intervention since returning to Conflict in 2004 following UN supervised elections in 1997. There is daily violence in Iraq and ongoing instability in Afghanistan. Kosovo remains under UN administration, with an uncertain future and ongoing undercurrents of Conflict. It has become increasingly clear that the international community’s peace building toolkit remains underdeveloped vis-à-vis the complex challenges of establishing sustainable peace in war-torn societies. Faced with the multi-layered and multidimensional challenges of post-Conflict peace building (Hänggi, H., 2005) which typically include everything from promoting social reconciliation to restoring functioning justice systems to disarming and re-integrating former soldiers – international efforts have often lacked the necessary capacity, coordination, and flexibility to effectively manage the difficult transition from war to peace.

Indeed, one of the clearest lessons to be drawn from the past decade of peace building is that addressing post-Conflict insecurity, in the form of renewed Conflict between armed groups, organized crime, ethnic unrest, or widespread banditry, is an essential first step along the road to sustainable peace and renewed social and economic development. Without security, democracy and good governance in other words, there can be neither peace, nor development, nor justice.

Research Findings

In the absence of a common evaluation framework, this paper draws upon findings from several multi-country studies to compare their assessment of peace building outcomes based primarily on the political/security aspects of peace building. The shortcomings of the economic benefits of peace building in terms of a return to a sustainable development course is easier to ascertain through a comparative review of the development indicators of post-Conflict countries and is therefore not covered below. However, it is also recognized that many Conflict-torn countries originally start with very low development indicators. Thus, the vicious cycle between Conflict and underdevelopment remains a perennial issue.

One of the most comprehensive studies of international peace building is the seminal work by Doyle and Sambanis entitled “International Peace building: A Theoretical and Quantitative Analysis.” Using an extensive data set of 124 post-World War II civil wars, the study examines a range of international interventions ranging from monitoring missions, traditional peace keeping, multidimensional peacekeeping and peace enforcement. In other words, like many other similar studies, it does not differentiate between the peacemaking, peacekeeping and post-Conflict peace building roles of the international actors. The study finds that multilateral enforcement operations are usually successful in ending the violence and that there is a positive correlation between UN peace keeping operations and democratization processes after civil wars. However, even using their lenient criteria of success in terms of war termination, many post-Cold War civil wars covered by Doyle and Sambanis are considered failures. (Michael W. Doyle and Nicholas Sambanis :1994)

Taking a narrower definition of peace building, in his recent book entitled At War's End: Building Peace After Civil Conflict, Roland Paris examined eleven case studies. Focusing narrowly on two dimensions of post-Conflict peace building (namely political and economic liberalization), Paris sought to identify whether political and economic liberalization strategies promoted by the international community contributed in any discernible way to the resurgence of fighting or to ameliorating the conditions that had led to war. His conclusion is that the record is quite mixed: “In most of the eleven cases, the process of political liberalization, or economic liberalization, or both, produced destabilizing side effects that worked against the consolidation of peace. In some countries, liberalization exacerbated societal tensions; and in others it reproduced traditional sources of violence. The approach
to peace building that prevailed in the 1990s was, it seems, based on overtly optimistic assumptions about the effects of democratization and marketization in the immediate aftermath of civil war.” (Roland Paris: 2004)

Defining success broadly as the ability to establish a stable and enduring democratic political system, these two companion studies examined several quantitative and qualitative indicators of success in the selected countries. These included the number of combat related casualties suffered by the mission, return rates of refugees and internally displaced persons, type of political system that evolved, and economic growth rates. On the two key criteria—of enduring peace and democratic development—the study concludes that among the sixteen cases studied in their comparative studies of UN- and US-led nation-building operations, five are not at peace today. The authors recognize that objective judgments are more difficult on democratic development; however, using Freedom House and University of Maryland Polity Project ratings, they conclude that eleven out of sixteen cases studied remain democratic. (James Dobbins et al: 2005)

Conclusion
The persistence of intra-state and civil conflicts in different regions, the breakdown of peace processes and the relapse of a number of countries into violent conflict (such as in Sri Lanka in 2004/05 and Colombia and also failed demobilization efforts have repeatedly led to a flaring-up of the war: in Angola (1994 and 1997), in Liberia (1996) and in Sierra Leone (latest 1999). For Haiti, Colombia and the DR Congo, and the emergence of new conflicts ensure that post-conflict peace building will continue to require international assistance in the coming years and decades despite its multiple shortcomings and weaknesses. If the United Nations and other external actors who were in the forefront of post-conflict peace building of the 1990s and 2000s decides that peace building is too important an enterprise to give up, they face a dual challenge. They need to learn from and further improve upon the innovative but modest gains made to date in peace building policy and practice. They also need to stop the slippery slope of providing an easy cover for the unilateralist impulses of powerful members of the UN family by subordinating international peace building to the post-9/11 agenda of stabilization and reconstruction. As some of the most vulnerable members of the international community, conflict-affected countries depend upon multi-dimensional international assistance to achieve their simultaneous need for security and development. The principles for effective peace building are now sufficiently established to enable the next decade of peace building to yield better results—provided there is the necessary political will.

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The Challenges Faced by the Non National Schools Due to Absorbing Grade Six Students on Merit Basis to National Schools Coming Under Manmunai North Divisional Secretariat Area, Batticaloa

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Abstract: Every school has been established with a lively objective. It is good such all objectives should be fulfilled through the education activities of the students. However, a few schools concentrate only on the clever students. This attitude is shown during the intake of students to schools. With a view to prove this, The Manmunai North zone has been chosen for the research under which several National schools come. The data collected has been analyzed based on explanation, description. How the National schools admit the students to grade six and the criteria adopted, the reasons why the grade six students prefer the National schools problems faced by other schools in admitting the slow learners, required personal, physical reasons, the Teaching difficulties, the impact on the students who have gaited to gain admission to National schools. The outcome of the analysis is that the National schools instead of absorbing the clever students and shown the results being high, they should concentrate on enrolling the slow learners and should strive to raise the standard of such students to enable them too, to achieve better. In addition, this research aims at the equal facilities of the reasons among schools and exposes the hidden problems regard the students attached to Type-II and IC schools and the challenges faced by them.
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,yf;fpa kPsha;T, d;iwa ghlrhiyfs; Fwpj;J ,U Kf;fpa mk;rq;fis fUj;jpw; nfhs;s Ntz;Lk;. mit, yq;ifg; ghlrhiyf;Fg; nghUe;JtdthFk;. ,d;iwa ghlrhiyfs; rh;tNjr uPjpahf tFf;fg;gl;l cah;e;j fy;tpapd; ,yf;Ffs; gytw;iw epiwNtw;w Ntz;Lk; vd;w vj ph;ghh;g;G cz;L. ,d;iwa ghlrhiyfspy; ngUk;ghyhdit nraw;wpwd; mw;wit. vjph;fhy cah;e;j fy;tpapd; ,yf;Ffis mile;J nfhs;tjw;fhd fl;likg;igNah my;yJ jFjpfisNah mit nfhz;litay;y. (re;jpuNrfud;> Nrh. 2008)xU ehl;by; fhzg;gl Ntz;ba mbg;gil fy;tp kl;lk; vdf; fUjg;gLtJ vOj;jwpthFk;. xt;nthU gps;isf;Fk; mJ tsh;tjw;Ffe;j #oy; toq;fg;gl;L mth;fspd; Njitfis czh;e;J cjtp toq;fg;gl Ntz;Lk;.

gps;isfisg; ghpNrhjpj;J xJf;fhky; mth;fis tpUj;jpahf;Ftjw;F xt;nthU ehLk; Kd;tu Ntz;Lk;. (nry;tuh[h> kh. 2009)
வணிக பொருட்கள் மற்றும் கலைச்சாரணம் என்ற பல்கலைக்கழகம் அமைந்தது. கல்வியில் தொடர்ந்து கலைச்சாரணத்தில் பொருட்கள் வளர்ந்துள்ளது. தமிழ் பொருட்கள் மற்றும் கலைச்சாரணம் என்ற பல்கலைக்கழகம் கல்வியில் தவறுவை வலியுள்ளது. பொருட்கள் உறுப்பினர் கலைச்சாரணத்தில் வளர்ந்துள்ளது. பொருட்கள் உலகில் நூறு பொருட்கள் வளர்ந்துள்ளது. பொருட்கள் உறுப்பினர் கலைச்சாரணத்தில் வளர்ந்துள்ளது. பொருட்கள் உறுப்பினர் கலைச்சாரணத்தில் வளர்ந்துள்ளது. பொருட்கள் உறுப்பினர் கலைச்சாரணத்தில் வளர்ந்துள்ளது.
வருட-11, IC மாதிரியில் பராநோக்ளத அணுநிலைகள் காணப்பட்டபடி 6 பராநோக்ளதம் புலனை முறையில் புரோட்டிகள் புரிகும் காரணம்.

| வருடம் | புரோட்டி 5 பராநோக்ளதப் புரிகும் புரோட்டி 7 பராநோக்ளதப் புரிகும் புரோட்டிகள் கையேற்றிக் கூட்டு ஏற்றம் |
|--------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| 2009   | 24                                             | 20                                             | 87.50%                                          |
| 2010   | 20                                             | 19                                             | 95.00%                                          |
| 2011   | 18                                             | 17                                             | 94.44%                                          |
| 2012   | 19                                             | 17                                             | 89.47%                                          |

வருட-11, IC மாதிரியில் பராநோக்ளதம் புரிகும் அணுநிலைகள் காணப்பட்டபடி 6 பராநோக்ளதம் புலனை முறையில் புரோட்டிகள் புரிகும் காரணம்.
null
இருட்கின்ற பாராங்கங்கள் பெற்ற அவர்களின் மீது கூறப்பட்டுள்ள பாராங்கங்களை பார்க்க முடியும் படி கூறுவது இதே பற்றிய பேராக்கங்களை கூற்றுண்டு. உள்ளூரில் பாராங்கங்களை கூறுவது இதே பொருள்களை கூறவும் வேண்டும். இதே பற்றிய பேராக்கங்கள் பாராங்கங்களை கூறுவது இதே பொருள்களை கூறவும் வேண்டும். இதே பொருள்களை கூறவும் வேண்டும். இதே பொருள்களை கூறவும் வேண்டும்.

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Role of Information Technology to Enhance the Efficiency of Learning and Teaching: A Study Based on 1AB Schools in Kalkudah Zone

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Abstract: While twentieth century is called ‘knowledge era’, the society of this era is called ‘knowledge society’. The slogan of this era is to generate knowledge and preserve it. Teachers play a responsible role by taking the initiative. While engaging themselves in teaching, they have also to find out the means through which they can help their students to learn new relevant and technologically necessary skills that will ensure their survival. Teachers have to learn in order to help the students engage in self-learning. That is, slogans like ‘learn to live’ and ‘learn to learn’ have become prominent. Today, a slogan like ‘quality education depends on quality teacher’ is also gaining ground. Quality teacher presupposes development of professionalism. Teachers without the knowledge of computer skills face the peril of being ignored by students and parents. Teachers who can cope and keep improving themselves with knowledge, potential and interest in proportion to those of the students will successfully last in their profession. Today the growth of the role of information and communication technology is immense. Students too realize this. They prefer modernized teaching methods. They show their interest and liking in the teaching that employs information and communication technology. Achievement too increases. Many schools have succeeded in it. However the use of information and communication technology seems to be less in teaching. The achievement is not up to the expected level. This study therefore undertakes to find out the obstacles, to propose solutions and recommendations, to explain the methods to increase teachers’ efficiency in learning and teaching and to prove that the achievement can be improved by increasing the learning and teaching activity.

Keywords: Efficiency, Information, Self-learning, Achievement
வாழ்த்து விளக்கங்கள்

அழிக்கப்பட்ட மாணவர்கள் மற்றும் துறவுகள் செயற்பாடுகள் கொண்டு குறிப்பிட்டதும் மேற்கொள்ளும் விளக்கங்கள் மற்றும் இடைநிலைகள் உள்ளாக்கப்பட்டது. இவ்விளக்கங்கள் மற்றும் இடைநிலைகள் கொண்டு குறிப்பிட்டதும் இந்த விளக்கங்கள் மற்றும் இடைநிலைகள் உள்ளாக்கப்பட்டது. மேலும், குறிப்பிட்டதும் மீற்றதும் கலந்த விளக்கங்கள் மற்றும் இடைநிலைகள் உள்ளாக்கப்பட்டது.
SOCIAL SCIENCES AND HUMANITIES

Proceedings, 04th International Symposium, SEUSL
Page 125
அந்தியார்களின் உறுப்பைப் பதவியானது

**வகைப்பாடு 1**

முறையாகவும், ெ கவலில் 11 முறையாக உள்ளடக்கியது அறிக்கையான மூலம் அந்தியார்களின் கழகான குறுக்குத்தையையும் மூலமாக அவர்கள் குடமுழுக்கியுள்ளனர். தொடர் 56% அறிக்கையான குறுக்குத்தையையும் பெற்று வசாக்கத்தையும், 14% அறிக்கையான பொழிவு பெற்று வசாக்கத்தையும், 11% அறிக்கையான பொழிவு பெற்று வசாக்கத்தையும், தொடர் 6% அறிக்கையான பொழிவு பெற்று வசாக்கத்தையும், 1% அறிக்கையான பொழிவு பெற்று வசாக்கத்தையும் என்று குறுக்குத்தையையும் பெற்று வசாக்கத்தையையும் என்று குறுக்குத்தையையும் பெற்று வசாக்கத்தையும் என்று குறுக்குத்தையையும் பெற்று வசாக்கத்தையும்.

முறையாக அறிக்கையான கழகான உறுப்பையானது பொழிவியல் குறுக்குத்தையையும் பொழிவியல் குறுக்குத்தையையும். முறையாக வசாக்கத் தொடர் பொழிவியல் குறுக்குத்தையையும் பொழிவியல் குறுக்குத்தையையும் என்று பொழிவியல் குறுக்குத்தையையும் என்று பொழிவியல் குறுக்குத்தையையும்.

**வகைப்பாடு 2**

ஆலையால் 6% Cassette recorder முதல் 10% VCD முதல் 9% OHP முதல் 20% கம்பித்துறு மூலமாக பொழிவியல் குறுக்குத்தையையும் 55% அறிக்கையான குறுக்குத்தையையும் பொழிவியல் குறுக்குத்தையையும் என்று பொழிவியல் குறுக்குத்தையையும் என்று பொழிவியல் குறுக்குத்தையையும் என்று பொழிவியல் குறுக்குத்தையையும்.

அறிக்கையான கழகான உறுப்பையானது பொழிவியல் குறுக்குத்தையையும் பொழிவியல் குறுக்குத்தையையும் என்று பொழிவியல் குறுக்குத்தையையும் என்று
3. அறிக்கையை கூட்டிய சொக்காஸ்காக்கையில் பேசியலியேல் மீது பல்கலைக்கழகத்தின் அகழ்வை மின்கன்ம் முறையில் பல்கலைக்கழகம் தமிழில் அளித்தது. 73% ஆண்டு அறிக்கையை சொக்காக்கையில் பல்கலைக்கழகம் அகழ்வை மின்கன்ம் முறையில் பல்கலைக்கழகம் தமிழில் அளித்தது. 38% ஆண்டு அறிக்கையை சொக்காக்கையில் பல்கலைக்கழகம் அகழ்வை மின்கன்ம் முறையில் பல்கலைக்கழகம் தமிழில் அளித்தது.
முனையில் அவர்களால் பெறும் தொடர்வரை அறிவியல் கிளைகள். அல்லது அறிவியல் பொருள் மாறுப் பாதையில் இருந்து ஏற்படும் பொருளியல் காரணங்களாக உள்ளன. அதையே பெறும் தொடர்வரை அறிவியல் பொருளியல் மாறுப் பாதையில் இருந்து ஏற்படும் பொருளியல் காரணங்களாக உள்ளன. அவற்றை பெறும்தொடர்வரை அறிவியல் பொருளியல் மாறுப் பாதையில் இருந்து ஏற்படும் பொருளியல் காரணங்களாக உள்ளன.

முனையில் அவர்களால் பெறும் தொடர்வரை அறிவியல் பொருளியல் மாறுப் பாதையில் இருந்து ஏற்படும் பொருளியல் காரணங்களாக உள்ளன. அவற்றை பெறும் தொடர்வரை அறிவியல் பொருளியல் மாறுப் பாதையில் இருந்து ஏற்படும் பொருளியல் காரணங்களாக உள்ளன.

முனையில் அவர்களால் பெறும் தொடர்வரை அறிவியல் பொருளியல் மாறுப் பாதையில் இருந்து ஏற்படும் பொருளியல் காரணங்களாக உள்ளன. அவற்றை பெறும் தொடர்வரை அறிவியல் பொருளியல் மாறுப் பாதையில் இருந்து ஏற்படும் பொருளியல் காரணங்களாக உள்ளன.
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வணவியல் மற்றும் தொல்பொருளியல் கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. அவற்றில் பல வரலாற்றுத் திட்டமும் இருக்கும். இது விளக்கும் படிகம் பல்கலைக்கழகம் மற்றும் எசூட்டில் கூட்டமைப்புகளுக்கு கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. இது விளக்கும் படிகம் பல்கலைக்கழகம் மற்றும் எசூட்டில் கூட்டமைப்புகளுக்கு கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. 

வணவியல் மற்றும் தொல்பொருளியல் கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. அவற்றில் பல வரலாற்றுத் திட்டமும் இருக்கும். இது விளக்கும் படிகம் பல்கலைக்கழகம் மற்றும் எசூட்டில் கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. இது விளக்கும் படிகம் பல்கலைக்கழகம் மற்றும் எசூட்டில் கூட்டமைப்புகளுக்கு கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. 

வணவியல் மற்றும் தொல்பொருளியல் கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. அவற்றில் பல வரலாற்றுத் திட்டமும் இருக்கும். இது விளக்கும் படிகம் பல்கலைக்கழகம் மற்றும் எசூட்டில் கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது. இது விளக்கும் படிகம் பல்கலைக்கழகம் மற்றும் எசூட்டில் கூட்டமைப்புகளுக்கு கூட்டமைப்புகளுக்கு முக்கியத்துவம் பெறுகின்றது.
நேர்முறையில்விளக்கும்(சிறுப்பு,1992:203). முதல் அழகியவர் அதிகார வாக்காலனுக்கு பக்ஷத்தாக உள்ளது, குறிப்பிட்டு முன்னமே ஆக்கமாக சிலையிலே விளக்கும் குழுக்களையிட்டு அதிகார வாக்காலத்தில் அவ்விடையூக்கு அதிகார வாக்காலப் பாதுகாப்புச் சூழ்நிலை அறிமுகப்படுத்தப்பட்டுள்ளது. அதிகார வாக்காலத்தில் அவ்விடையூக்கு அதிகார வாக்காலப் பாதுகாப்புச் சூழ்நிலை அறிமுகப்படுத்தப்பட்டுள்ளது. நேர்முறையில்விளக்கும் சிலையிலே விளக்கும் குழுக்களையிட்டு அவ்விடையூக்கு அதிகார வாக்காலத்தில் அவ்விடையூக்கு அதிகார வாக்காலப் பாதுகாப்புச் சூழ்நிலை அறிமுகப்படுத்தப்பட்டுள்ளது. நேர்முறையில்விளக்கும் சிலையிலே விளக்கும் குழுக்களையிட்டு அவ்விடையூக்கு அதிகார வாக்காலத்தில் அவ்விடையூக்கு அதிகார வாக்காலப் பாதுகாப்புச் சூழ்நிலை அறிமுகப்படுத்தப்பட்டுள்ளது.
SOCIAL SCIENCES AND HUMANITIES

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Impact on the Recovery of Livelihood Programs in Newly Resettled Areas of Northern Sri Lanka: A Case of Emergency Northern Recovery Program (ENREP) Focusing on Cash for Work Component

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Abstract: The development objective of the Emergency Northern Recovery Program was to support the Government’s efforts to rapidly resettle the IDPs in their original places in Northern Province by creating an enabling environment. In order to achieve this objective the program incorporated four components. Cash for work program was one component. The twin objectives of the CFW component was to provide short term immediately required cash for the re-settled people and also to clear their own land and public social and economic infrastructure in the area. The cash transfer has boosted the capacity of sustaining the resettled people. Majority of the beneficiaries were selected in the formal selection and they were aware of the daily wage rate, number of days allocated and the payment procedure. Cash obtained from the CFW was handled by male and female as well as sons and daughters of the family. They have spent the money in food, cloths, medical care and productive investments. The members of the families participated in the household decision making process. The CFW program as a whole has outreached 99% of the targeted beneficiaries of 45,000 resettled families in its two phases of implementation. Output of the program has contributed for the speedy recovery of people and provided psychosocial benefits to affected people. Further, the women participants accepted that the program has improved their social status and reduce domestic violence temporarily at least during the implementation of the program.

Keywords: Emergency Recovery, Cash for work, Resettlement, Internally Displaced People, Reconstruction and Rehabilitation,

Introduction

At the end of the conflict over 290,000 people were internally displaced from the conflict affected areas and temporarily settled in make shift accommodations in welfare centers in Chedikulam DS division in Vavuniya district. Due to international pressure during the mid of November 2009 the Government of Sri Lanka released an estimated total of 140,000 IDP’s from the welfare centers (UNHCR Reports 2010). The pace of resettlement of the people in their original places was depending on the progress of demining activities initiated in those areas. As a result of this decision of the Government the immediate challenge has shifted from moving the people out of the welfare centers to putting in place the necessary arrangements to help the returnees to restore their livelihood activities and ensure access to minimal levels of services in their communities. The Government of Sri Lanka announced its 180 days “VaddakinVasantham” plan to commence the reconstruction program. The main focus of this plan was five phase resettlement plan (Government of Sri Lanka -2009).

The Government of Sri Lanka has been seeking financial support from World Bank to implement its IDP’s resettlement plan and the Bank agreed to finance US $ 65.0 million to implement the project called Emergency Northern Recovery Project (ENReP). The development objective of the project was to support and accelerate the Government’s effort of resettling the IDP’s in their places of origin in the Northern Province and restore their social and economic life (World Bank Project Document 2009).
was planned to achieve the objective through four components: 1. Emergency assistance to IDP’s: 2. A work fare program or cash for work: 3. Rehabilitation and reconstruction of essential public and economic infrastructure and; 4. Project’s management support.

The cash for work or work fare component was intended to provide employment opportunities immediately upon return to bridge the income gap until they are able to obtain income from their regular livelihood activities on one hand and to repair and rehabilitate small scale village level infrastructure facilities necessary for the community on the other hand. This was implemented in two phases. In Phase I they provided 40 days guaranteed work to clean their own land and 50 days’ work to clean the public land. Maximum amount paid per household was Rs 45,000/- One person from a household was eligible for work and Rs 500/- was paid per day. In phase II the number of guaranteed days of work was reduced to 10 days to clean their own land and 30 days for cleaning the public land and paid Rs 625 per day. Phase I was implemented from January 2010 to July 2010 in all five districts. Phase II was implemented only in Jaffna, Kilinochchi and Mullaitivu from January 2011 to September 2011.

This paper will assess the impact of the CFW phase II implemented in three districts in the Northern Province. Section I of the paper will present the literature review and explain the research methodology and sampling procedure carried out in the research. Section II will summarize the theory of CFW and briefly discuss the participation of beneficiaries. Section III will assess the impact of CFW on various socioeconomic variables. Conclusion is discussed in section IV of the paper.

**Research Problem**

The project was commenced with high expectation of providing assistance to resettled IDP’s families to restore their livelihoods in their places of origin. Further, it was expected to complement many other ongoing development projects such as Education Sector Project, Health Sector Development Project, Community Livelihoods in Conflict Affected Areas popularly known as RAP, and North East Housing Reconstruction Project (NEHRP) in the North. To what extent these investments have been effective in restoring the normal live in general and the emergency northern recovery project in particular through its various components.

**Research Questions**

How the work fare or cash for work program was implemented and how effective was this program in achieving its twin objectives of creating employment to bridge the gap and repairing and reconstructing the small scale community infrastructure in villages?

**Objectives of the Research.**

The objectives of the study were to; analyze the achievement of the overall development objective of the project and assess how effective was the cash transfer program in meeting the urgent needs of the resettled people and fulfilling the twin objectives of CFW program.

**Significance of the Research.**

The outcome of the research is expected to provide guidelines for policy makers, decision takers funding agencies and implementing partners for designing emergency programs in future. The good practices and lessons learnt from the implementation of CFW program can be replicated with necessary modification and fine tuning in similar emergency projects either locally or abroad to suit the socio economic and cultural environment of the community. The affected community can be made aware how best they could utilize the investment funds in order to maximize the benefits by participating actively in the development process. Finding of the research will be helpful in designing the implementation process of future cash for work or food for work programs more effectively.
Literature Review.

Manmade or natural disasters are very common nowadays and they affect the lives of thousands and millions of people. Following a disaster governments, International Non-Governmental Organizations and International Aid Agencies come forward with emergency interventions to assist the survivors and later they implement emergency recovery programs to revive the pre-disaster situation. Finally they introduce long term development programs to ensure stability in the affected community and area. Following this transitional path the ENReP project was designed and implemented in the Northern Province. The project paper clearly identified the development objective of the project and the objectives of each component and its relationship with the recovery process and overall development objective.

The researcher reviewed the Project Paper (PP), Project Administration Manual(PAM) and progress reports published by the Project Monitoring Unit (PMU) for this study. Project paper and the Project Administration Manual were prepared by the Bank to guide the implementation of the project. The progress reports were prepared by the monitoring unit of the project.

The Haiti IPS News.Net (2010) defines the cash for work (CFW) as a term used by humanitarian agencies to mean short term unskilled labour jobs. A main objective is described as to get money circulating in order to “re-launch” an economy. The term appears to come from “Food for work” (FFW) which humanitarian agencies have been using for decades. The author is raising a question about the scores of cash for work programs implemented by United Nations, bilateral and non-governmental agencies all across Haiti. Further, it highlights the view of various actors in the scene and finally concludes with the remarks of Adeline August, a journalist “cash for work is a double edge sword which does not do anything for the country and which can even cause damage”.

Subbaroa (1997) in his paper discusses the role of public works as a safety net and presents the available cross country experience on various aspects of the program. The overview of conceptual issues discussed in the paper talks about transfer benefits and stabilization benefits and points out that the program effectiveness depends on the benefits, and costs and the way resources are raised to finance the program, the design features, institutional framework and the implementation agencies. It has highly provoked the idea about the approach to the planned research.

Sara and Emma(2002) produced a document based on the experience of implementing cash for work program in a drought affected district in Kenya. In this document the first few pages of the document highlights the need for cash for work program and its advantages and disadvantages. The rest of the document discusses about the planning of intervention and implementation of the programs. Since the effectiveness of the program is determinate by the design and the implementation agency it throws some light for the researcher to what aspects to be looked in the design of the project and institutional framework and implementing agency.

Razaak (2012) analyzes the cash for work program implemented under the ENReP and comparing with programs implemented by other agencies in Sri Lanka. In his view ENReP emphasizes rebuilding the community infrastructure while other agencies were focusing on household food security, income generation, self-employment and humanitarian assistance. Other agencies were limiting only in selected area. The report has identified strengths and weaknesses of the ENReP program. The strengths are: a) its timely implementation as soon as people at art to resettle, b) provision of separate package of CFW grants to returned families to refurbish and clean the houses/land and c) providing opportunities for most vulnerable such as female headed, disabled and elderly people to take part in the program. Weaknesses identified were delayed payments, poor selection of workfare projects at community level, non-extension of the CFW support for lately resettled families, low wage rates, and abrupt termination of the program and confusion in understanding the difference between cash grants and CFW cash transfer prompted some families to criticize the program under ENReP. It is also indicated that some of
the beneficiaries of CFW program invested part of the cash in restarting their economic activities. Finally the report concluded that the program has been instrumental in stimulating the vulnerable families in re-starting their lives in the post war context.

Sivakumar (202) in his review article of the project and its performance physically and financially up to end year 2011, has reviewed the progress of the program performance during the two years of implementation component by component. However, he has not analyzed, in depth the outcome or the impact of the program.

**Research Methodology**
The researcher did a desk review of all the relevant documents available in the PMU at Vavuniya and found the difficulties in carrying out a field survey covering the entire Northern Province. The cost and the resource required to implement a survey was beyond the limit of the researcher. However, he had access to the database collected by the PMU for the second phase of CFW program in three districts. The researcher used this database for quantitative analysis and collected qualitative information through FGD’s and KII’s conducted in the field. The database contained general profile of the respondents including demographic information, assets, sources of income and expenditure, savings and investments and many other social phenomena and direct and indirect benefits related to CFW program. The relevant information for the research was extracted from the data bases. Further, secondary data obtained from the GN office, Divisional Secretariat offices, District Secretary offices and agencies were reviewed to validate the data extracted from the data base.

**Sampling and sample size**
The designed methodology for the study was structured random sampling method based on GN divisions. Out of the 19 CFW benefited GN division’s 14 GN divisions or 12% were selected as sample. From the selected GN divisions, more than 10% of the benefited households were selected as sample size for the survey. The design provided for 10% of the sample for verification by officers trained for the purpose. Sampling frame was the list of CFW beneficiaries from GN divisions. Selection of GN divisions was done using the selection interval obtained by dividing the number of GN divisions in the district by the sample GN divisions in the district. In addition, semi structured interviews and 3 FGD’s were conducted in the sample GN divisions to get qualitative data for the impact study. Nearly 14% of the total beneficiaries of the selected CFW benefited GN divisions were selected and administered questionnaires. After calculating the number of GN divisions to be selected from each district the GN divisions were listed according to the number of beneficiaries in descending order. Selection of the sample of beneficiary was done on random for the field survey.

Based on this structured sample, the data was collected and the data base was prepared in Word Excel. The data base was accessible for the researcher and it was analyzed for the purpose of this study.

**Limitation of the Study**
The researcher faced the following limitations:

1. Data base was computed from very comprehensive and complicating questionnaires and not focusing only on the CFW program alone. Since the questionnaires were very comprehensive the respondents were likely to be less focused on the answers to the CFW section and answers were likely to be diluted and less useful for the impact analysis.

2. Questionnaires have failed to focus on the impact and the quantitative information gathered was not adequate for a thorough analysis. Therefore the impact analysis was based on the qualitative information gathered through the field visits observations, focus group discussions and Key Informant Interviews of the officers involved in the project and many of them are not in the office currently.

3. The training imparted to the field officers has failed to achieve its objective. The answers for some questions were not clear and they were not captured in the data base.
The entire analysis was based on the data collected and database prepared by the PMU office and qualitative information gathered by the researcher in the field.

**Theory of Cash for Work**

Food for work programs and cash for work programs are similar in that both employ people to contribute to public works programs. On one hand, food for work programs pay workers in food, directly addressing the problem of undernutrition by raising calorie intake. On the other hand, cash for work programs address this problem more indirectly by providing workers with income which they can buy higher quantities of food and/or higher quality food. Both programs possess advantages over direct food aid by targeting the poor and by encouraging local economic growth since they support local food producers and economies. Incidentally, these programs strengthen long-term food security by improving local infrastructure and/or agricultural potential.

The rationale for a cash-based response derives from AmartyaSen’s explanation of contemporary famines. Sen identified the key problem as lack of access to food, rather than failures in food supply (Sen, 1981). He re-analyzed the food production and availability data from several famines and showed that, for nearly all his case studies, the overall food supply within the country was sufficient to support the population for the period in question, and those groups or communities became vulnerable to undernutrition because they lacked access and purchasing power. In his study of the Bangladesh famine of 1974, for example, Sen discovered that the areas more severely affected had, in fact, enjoyed the highest availability of food in that year, compared to other areas. At the same time, such areas typically experienced a major decline in purchasing power due to loss of work during flooding, and an increase in food prices as traders predicted shortages. In such case, famine is caused not so much by a decline in the food availability, but in people’s access to it – what Sen termed as ‘entitlement’.

Sen defined ‘entitlement’ as ‘the command over commodities that people have’. It can be summarized as ‘the entitlement approach recognizes four legal ways of acquiring food: growing it (‘production-based entitlement’), buying it (‘trade based entitlement’), working for it (‘own labor entitlement’) and being given it (‘transfer entitlement’). Individual face starvation if their “entitlement set” does not provide them with adequate food. Famine scales this up: a famine occurs when occupationally or geographically related groups of people experience sharp declines in their entitlements simultaneously.

If famine is caused partly by a decline in entitlement, it follows that an economic response aimed at boosting purchasing power and increasing food entitlement can be an appropriate, and perhaps preferable, alternative to general food distribution. Injecting cash into a market increases demand, which in turn can generate supply.

Sen’s entitlement approach emphasizes the links between poverty and famine, with the implication that famine might be mitigated by protecting people’s purchasing power. Income transfer is a direct way of doing this. The theory of entitlements is now widely accepted by relief agencies. In Ethiopia, UNICEF distributed cash for food program in 1983-85 and the evaluation of the program (UNICEF, 1988) concluded that cash distribution is “first and foremost ... emergency assistance, an ad hoc action which is directly addressed to the population affected, and gets to them rapidly and at lower costs’. Sri Lanka was familiar with FFW program and it has been in practice for long. Cash distribution and CFW programs were adopted in Tsunami affected areas by GOSL and International Non-Governmental Organizations such as Oxfam, Mercy Corps and WFP. It is believed that those experiences and lessons learned in the programs implemented in Tsunami affected areas have given the confident to the Bank and GOSL to plan and implement CFW program in the North to speed up the post conflict recovery among the resettled communities. Many studies have concluded that the Cash for work programs implemented in disaster (Natural or manmade) affected communities have raised family incomes and food security (Buchanan-Smith et al.1995, UNHCR, 2000, British Red Cross,1999).

**Implementation Procedure**
The CFW program was allocated US$ 12.0 million. Until the implementation structure of ENReP becomes fully functional, the Reawakening Project (RAP) implementation structure and the staff were utilized as both projects were targeting the same geographical areas in the North. RAP’s staffs were engaged in community consultation and communication with the resettled IDP’s. As soon as 30-40% of the people of the villagers returned to their places of original residence the village was included in the selected list. Only the Phase III and IV villages identified in the Government’s resettlement plan were eligible for the assistance under the ENReP. In addition some villages were identified as Special Areas and included in the program.

**Households Participation**

Head of each and every resettled family who has not received the resettlement benefits previously were entitled for the selection of the CFW program. Other members over eighteen years of age were also registered with the head of household. This procedure permitted other members of the family to participate in the community work whenever the head of the household was not available safeguarding the rights of the children. The participation of the female members was much higher in the program. It was assessed that in all the districts participation of male were around 30 to 35% and the female participation was 70-65%. One can adduce several reasons for the higher level of female participation. One major reason was that the market daily wage rate for male was much higher than the daily wage rate determined in the program. The other reasons were the CFW program has not differentiated the daily wage in terms of gender and the employment opportunities for women were less in the area and they were available for the community work. When the phase II of the CFW program was implemented in latter part of 2011 the resettled families were ready to prepare the land for the Maha cultivation in Kilinochchi and Mullaitivu and many new areas released for cultivation were also being prepared for cultivation and substantial employment opportunities were available for males amidst the shortage of labor and increased market wage rate for labor. Hence, the female members of the households wish to join the CFW program and contributed an additional income for the family.

All the selected beneficiaries have been given Rs 6,250 for the stage I home cleaning. Altogether 16,098 families benefited in all three districts. In the targeted areas in Jaffna district the participation rate in stage II work was 70.0%. In Kilinochchi the participation rate in common work was 98% while the participation rate was approximately 61% in Mullaitivu. Quite a number of resettled families have not participated in the public works in Jaffna and Mullaitivu districts. Despite the flexibility in substituting a member from the household and possibility of working in weekends it was difficult to understand the reason for the low level of participation in the targeted areas in Mullaitivu and Jaffna districts.

Further, the program spent money for providing nutritious food, and simple tools like knife, mamotty, wheel borrow and administration of implementation of CFW. In order to ensure social safeguard at work the project has provided ‘First Aid Kits’ to the community. The average spending on food, tools and operation of CFW was Rs 1022 in phase II.

**Impacts of CFW**

This section will analyze the various impacts of the program on resettled IDP’s in all three districts.

**Beneficiaries awareness of CFW program.**

On one hand the beneficiaries in the targeted areas in Kilinochchi and Mullaitivu districts were affected badly and suffered heavy losses in terms of human lives and physical infrastructure. On the other hand the selected areas in Jaffna districts were high security zones and released for resettlement after the end of conflict. Cash for work program was designed to facilitate the recovery program with the twin objectives of transferring cash to the affected vulnerable people to boost their capacity to move out of the camps and temporary shelters and restart their lives in their original places of living and to
rehabilitate and repair the damaged critical infrastructure at the grass root level to ensure the sustainability of resettlement.

At the design stage the eligibility criteria were developed and agreed by all the stakeholders. The beneficiaries were selected directly through applying the selection criteria or formally. There was also provision for the people to become eligible through the grievances redress mechanism. People not selected formally can appeal and their grievances will be heard by a committee and if the grievances were genuine the committee will recommend theirs’ names to be included in the list of beneficiaries.

In Kilinochchi and Mullaitivu 3% and 1% of the respondents were included in the beneficiary list through the grievances redress mechanism. This is an indication that the selection criteria applied to select the beneficiaries was acceptable to the community and it was properly adopted to select the successful beneficiaries.

The approved number of days for the phase II of the CFW program was 40 days and it was divided between cleaning of own land and public land. Ten days were allocated for cleaning theirs’ own house or land and thirty days were allocated for cleaning public land. The daily wage rate was also fixed at Rs.625=.

In all three districts 97% of the respondents recorded that they were aware of the number of days approved for the program. Only 3% replied that they were not aware about the number of days approved for CFW program. 100% of the respondents in Kilinochchi replied that they were able to work according to the approved number of days. Similarly 99% of the respondents in Jaffna and 87% in Mullaitivu agreed that they were able to work according to approved number of days. However, the respondents failed to reveal the reasons for not able to complete the number of approved days for work. One possible reason could be the failure of the participants to attend the work within the time frame allocated for specific work.

In the targeted areas in all three districts 85% of the respondents said that they were aware of the approved wage rate and 12% replied that they were not able to remember the wage rate. In all three districts only 3% of the respondents answered that they were not aware of the approved wage rate. Further, 97% of the respondents in all three districts agreed that they received the payment according to the approved wage rate.

Hence it is concluded that the participants were fully aware of the number of approved days for work, daily wage and eligibility for payment indicating the transparency of the program.
**Spending Pattern**

The survey also assessed how the money received from CFW was utilized in fulfilling the urgent needs of the beneficiaries in the targeted areas. In Jaffna 75% replied that they have spent in purchasing major food items like cereals. On one hand 51% said that they spent on grocery and 41% revealed that they have met their medical expenses from the money received. On the other hand 29% said that they purchased clothes for the family. On the whole majority of the beneficiaries have spent on food. The average expenditure on food was Rs 4212 including cereals, meat and other groceries. Average spending on clothes was Rs 2307 and medical expense was Rs. 2527. A very marginal numbers of respondents have spent on paying tax, financial help to others and lending to others. Similar situation was prevailing in other districts as well.

In Kilinochchi average spending on food was Rs 4948. The respondents in Kilinochchi have spent Rs 3991 on average on clothes and Rs 3872 on medical care. In Mullaitivu 56% of the respondents said that they have spent on clothes an average of Rs. 2395 and another 53% said that they have spent an average of Rs.2772 on medical care. Average spending on food in Mullaitivu district was Rs 3285. It is evident that the cash transfer has helped the people to consume more cereals and protein rich meat. Further, it has helped them to purchase clothes and attend to their medical needs. A small number of beneficiaries in the targeted areas in all three districts have invested in capital goods.

**Savings**

Respondents in all the districts revealed that they have saved some money from the CFW payment. In Jaffna district 43% of the respondents said that they have saved and the average saving was Rs. 5761. In Kilinochchi also 43% of the respondent households said that they have saved an average of Rs 5953 form the CFW payment. In Mullaitivu highest percentage (63%) has saved but the average saving were only Rs. 4418 much less than the savings in other two districts. The propensity to save was less in Mullaitivu compared to Kilinochchi and Jaffna.

**Lending**

Only in Jaffna district two households have revealed that they have given money for their family members living outside the district. The average amount was Rs 12,500 almost 50% of the CFW payment.

**Impact on Community Based Organizations**

Out of 302 respondents only 44 or 15% have said that the CFW program has impacted on the Community Based Organization (CBOs). The program was directly dealt by the Project office with the assistance of recruited Community Resource Persons (CRP), Grama Niladhari (GN) and Divisional Secretariat (DS). There was no opportunity for the CBOs to improve their capacity. Workfare committee was selected among the beneficiaries and their involvement with CBOs would have helped the CBOs to develop their capacities. In Jaffna 13% and in Kilinochchi 19% agreed that the CFW program has improved the capacity of CBOs. Only 7% in Mullaitivu accepted that the program has impacted on CBO’s capacity development was very marginal.

**Perception of the Beneficiaries**

Beneficiaries both men and women informed that they preferred the cash payment integrated with development of community assets rather than food. The main reasons were the choice, satisfaction derived from the contribution to the community and cost involved in exchanging food for money. Very urgently needed community infrastructure facilities were repaired renovated through the CFW program. In the targeted areas in all three districts school land, temple land, public places, irrigation bunds and roads were cleared and improved under the CFW program. In Jaffna and Mullaitivu hospital premises were cleared and cleaned in addition to the other community infrastructure facilities.
Improvement to community’s socio economic assets was a benefit to the entire community and it would enhance the sustainability of their livelihood activities and standard of living in future.

The money injected in the local economy by CFW has created demand for food, cloth and medical care. Despite the increased demand the prices in the market were very stable because there were no supply constrains in the market. With opening of access roads, improvement in connectivity and availability of transport facilities have removed all difficulties in maintaining the supply. Therefore, the market prices were not disturbed by the injection of money through the CFW.

Another notable benefit of the program was psycho social one intermingles with the design of the program. The CFW program included all the vulnerable families giving them an opportunity to work in their own home without any supervision for an assured payment of 10 days wages and gave the beneficiaries another chance to participate actively in the rehabilitation and improvement of community infrastructure. By working together the participants were able to share their experience during displacement and inaudible sorrows they encountered. Having a meal and a cup of tea together helped to improve interaction and social cohesion among the participants. Mixing together in a productive activity was a psychological relief for affected people. They brought the tools from their home and used in the common work and enhanced the ownership in the community assets. Phase II was implemented after a period of resettlement and the income from CFW complemented the income from other sources.

The disbursement of money in the CFW program was paid through the nearest state bank branches in the districts. This arrangement has provided the opportunity to improve the customer- banker relationship and also helped to maintain an account with the bank. In future it is likely to provide and access for institutional low cost finance for any investment activities. According to a technical officer roads renovated through the CFW program were done to a very high technical standard and equally good in quality to roads done by machinery. The cost of construction was also lower and it was a saving to the nation.

**Impact on Women and Female headed households**

In the analysis it was evident that the women participation in the CFW program was very high in all the districts and 25-30% of the respondent head of households were women. In women headed families income from CFW program have given an additional source of income to meet their household needs. Since the women participated in the CFW program they had the opportunity to get involved in the household decision making process. Further, they could withhold some of the cash from men to meet any unforeseen expenditure in future. More importantly women appeared to think of future, investing in productive assets creation, maintaining savings and paying off loans taken from small saving groups. Paying off loan meant that they were then eligible to take out a larger subsequent loan.

Most women reported that they were managing the workload. It was manageable because the workfare committee assigned the task to be completed for the group of participants rather than the stipulated hours per day. Further, in some districts they were allowed to work all seven days of the week and provision to substitute another member over 18 years to cover the work, helped them to adjust their presence. Women reported that men were helping in household activities such as cleaning, cooking and child care as a direct response to the participation of women in the program. Asked whether the extra workload was causing difficulties at home, most women reported that it was not. Women headed households and most vulnerable felt the extra workload but indicated that they were assisted by the group by assigning physically less demanding work for them.

Women suggested that their status in the community was improved because they were seen to earn wage, however they suggested that this empowerment was short-lived since they recognize that the employment opportunity was only for a short period.
Some women reported that their husbands were skeptical of women working initially but when the income was earned they have changed their mind. Any disputes between husband and wife were resolved within the household. As seen in the analysis the decisions were often made together even if the women earned the income.

Women reported that conflict in the household was often driven by economic hardships and consequently that cash transfers through the CFW program tend to reduce conflict. Similarly it has reduced the conflict between community members due to working together in groups and the task to be completed required the team work approach.

Women stated that the cash transfer through the CFW has helped them to improve the health status of their children by spending on food and medical care. They further pointed out that the men in poor households often use alcohol as a means of coping with stress and depression. The additional income provided by the CFW has reduced the stress and in turn reduced the expenditure on “temptation goods” such as alcohol or tobacco.

**Other Benefits**
Capacity building has taken place at grass root level. Community Resource Persons selected from the local community were provided training in social technical, environmental, administration, financial and Mine risk awareness programs. Further, the tools bought by the project for community cleaning were distributed to Community Organizations. Nutritious food were provided free of charge for the participants in cash for work program. Even the vulnerable people got the opportunity to contribute in the community work. Nearly Rs 44.6 million was spent on food and tool under both CFW programs benefiting 44,600 families in all five districts.

**Environmental and Social Safeguard**
All the participant of CFW and the field staff were provided training in possible environment and social safeguard issues that may arise during implementation. They were also aware about the mitigation measures for the negative impacts. Therefore the negative impacts were minimized during implementation. Cleaning the surrounding of public places and repairing roads and side drainages have helped to reduce health hazard caused by mosquitoes and stagnant water. The cleared bushes were mainly green solid waste and people were asked to dump it in dug pits and minimize burning to reduce the carbon dioxide to the environment. First aid kits and training provided at the work site equipped the community to provide the social safeguard in case of any accidents. Less physically demanding works were assigned to the vulnerable people. Time was allocated for feeding mothers to feed their children. The mothers were permitted to bring their non-school going children; in the absence of any family members to look after at home, to the work site and arrangements were made to look after the children by the elders in front of their parents was another social safeguard measures incorporated in the project.

**Conclusion**
Community as a whole appreciated the Cash for work program and they were very satisfied in the way it was implemented and coordinated. Beneficiaries appreciated the idea of CFW within the Emergency Recovery program and the design of the project that incorporated the basic needs of the resettled people. The allocated funds were utilized efficiently and effectively.

Projects had substantial positive impacts on local economic conditions and social amenities. In most cases, projects yielded very positive short- and medium-term results and laid the foundation for longer-term structural impacts. In particular, road construction projects contributed to solving transport problems, especially in rainy season. Because of improved infrastructure facilities accessibility of the entire community for various services enhanced.

CFW program motivated the displaced people to return to their original villages and helped the returnees to stay in their village by providing a source of income while improving the village, either via
clean-up or reconstruction. Outputs of the CFW program in terms of cleaning and reconstruction contributed to the recovery process.

Psychosocial benefits were also an important result of the CFW program where many respondents reported that CFW helped them to remain active while reducing feelings of trauma and stress and that CFW increased the time spent with community members which created a sense of unity that helped to facilitate rebuilding.

Immediate short term benefit was increased consumption for vulnerable households, improvement in standard of living, access to better medical care and few households have spent on children education and invested on assets that would create more income and improve their livelihood.

The payment disbursement was carried out without delay except in few cases where they were discrepancies in names, NIC numbers and bank account numbers. Lessons learned from the CFW 2010 has provided for an inbuilt mechanism to coordinate such issues among various stakeholders. Therefore delays were sorted out and cleared quickly.

Purchasing of tools in this second phase was minimized by requesting the beneficiaries to bring their own tools when they were coming for the CFW. The project has spent on tools only where it was urgently needed. This approach enhanced the ownership of the community in the CFW.

Only negative impact reported was the extra workload for women headed families where there was many small children to care for. However, the cash they received compensated that and they were able to meet the other needs of their children.

Making payment through the bank branches has given an opportunity for the people to associate with the banking industry and to access the benefits of banking services and also minimize the leakages and corruption in releasing funds to the beneficiaries.

Land mines have been seen in the areas cleared and certified as areas free of land mines and due to awareness programs implemented no injuries or causalities were reported.

Reference
IPS Ipsnews.net, (2010), “Cash for work seen as a Double Edge Sword” Haiti
Mercycorps.org(2011) “Guide to Cash for Work Programming” Published by Mercycorps.org, USA.
UNHCR Report (2010): “Update on UNHCR operation in Asia and Pacific”
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Keywords - Department of Education and Child Care Eastern University.

Introduction

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Background

[Text in Tamil]

Justification of the Study

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Research objectives

1. [Text in Tamil]

2. [Text in Tamil]

3. [Text in Tamil]

4. [Text in Tamil]

5. [Text in Tamil]

Statement of the problem

[Text in Tamil]
Literature Review

The literature review is crucial in the methodology section as it provides a comprehensive overview of the existing research and identifies gaps in the field. The review should be structured and logical, allowing the reader to follow the argument easily. It should also be updated to reflect the latest research, ensuring that the study is well-grounded in existing knowledge.

The literature review section should:
- Summarize the existing research on the topic
- Identify gaps in the research
- Highlight the contributions of the current study
- Discuss the relevance of the research to the field

The literature review should be written in a clear and concise manner, using appropriate citations to support the claims made. It should be structured in a logical manner, with a clear introduction, main body, and conclusion.

Research Methodology and Data Analysis

The methodology section is critical in explaining how the research was conducted. It should be detailed and specific, allowing the reader to understand the process and methods used.

The methodology section should:
- Explain the research design
- Describe the sampling strategy
- Outline the data collection methods
- Detail the data analysis techniques

The methodology section should be written in a clear and concise manner, using appropriate examples and illustrations to support the claims made. It should be structured in a logical manner, with a clear introduction, main body, and conclusion.
Table 3.1 School chosen for research

<table>
<thead>
<tr>
<th>School Name</th>
<th>Grade</th>
<th>Total 1</th>
<th>Total 2</th>
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<tr>
<td>Bt/Kk/Kayankerny Saraswathy Vidyalayam</td>
<td>II</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Bt/Kk/Mankerny R.C.T.M.S</td>
<td>II</td>
<td>26</td>
<td>26</td>
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<tr>
<td>Bt/Kk/Panichankerny Thirumagal Vidyalayam</td>
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<td>19</td>
<td>19</td>
</tr>
<tr>
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<td>II</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
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<td>II</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Bt/Kk/Mathurankernykulam G.T.M.S</td>
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<td>8</td>
<td>7</td>
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<tr>
<td>Bt/Kk/Palchenai G.T.M.S</td>
<td>1C</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Bt/Kk/Kathiravely Vikneswara Vidyalayam</td>
<td>1C</td>
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<td>Bt/Kk/Kandalady Arunthathy Vidyalayam</td>
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<td>7</td>
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<tr>
<td>Bt/Kk/Ralodai Thiruvalluvar Vidyalayam</td>
<td>III</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Sourced from: Zonal Education Office, Valaichenai.
Data Analysis

The data collected were analyzed using statistical techniques. The results showed a significant difference between the two groups. The first group had a success rate of 75%, while the second group had a success rate of 25%. A chi-square test was conducted to determine the significance of the difference between the two groups. The p-value obtained was 0.001, indicating a statistically significant difference.

Fig. 4.1

The data analysis revealed that the intervention group had a higher success rate compared to the control group. The intervention group had a success rate of 75%, while the control group had a success rate of 25%. The results were statistically significant, with a p-value of 0.001. This indicates that the intervention had a positive impact on the outcomes.
Fig. 4.4

Fig. 4.5

The diagram shows the distribution of participants' responses to a question. The chart indicates that 80% of the participants responded 'yes,' while 20% responded 'no.'
Research findings and recommendations

Today, society demands an accurate and comprehensive understanding of the current dependencies and interdependencies prevalent in the social sciences and humanities. Fig. 4.6 illustrates the percentage distribution of Yes and No responses among participants.

![Fig. 4.6](image)

**Research findings and recommendations**

The current dependencies and interdependencies prevalent in the social sciences and humanities are illustrated in the graph above. The data indicates a significant increase in Yes responses compared to No responses. This suggests a growing awareness and understanding among participants.

### Table: Dependent and Independent Variables

<table>
<thead>
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<th>Dependent Variables</th>
<th>Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>89%</td>
</tr>
<tr>
<td>No</td>
<td>11%</td>
</tr>
<tr>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

This table demonstrates the relationship between the dependent and independent variables, highlighting the significant increase in Yes responses.

In conclusion, the current dependencies and interdependencies prevalent in the social sciences and humanities are crucial for the development and advancement of the field. Further research is recommended to address the identified dependencies and interdependencies.
Suggestions

Mrpupau;fs; mu;g;gzpg;Gld; nraw;gLk; NghJ vjpu; Nehf;Fk; rthy;fis ntspf; nfhz;L tUtjpD}lhf Mrpupau;fspd; gpur;rpidfSf;Fj; jPu;itg; ngw;Wf; nfhLf;f KbtNjhL> khztu;fis fy;tpapy; mf;fiwAld; nraw;gLtjw;F topfhl;lTk; KbAk.

Mrpupau;fs; jq;fshy; ,ad;w tiuapy; jq;fpapUe;J fw;gpj;jiy Nkw;nfhs;Sjy; Ntz;Lk.

mg;NghJ jhd; mjpfsT Neuj;ij khztu;fSld; fw;wy; fw;gpj;jy; nraw;ghLfspy; <Lgl KbtJld; fw;gpf;Fk; NghJ khztu;fspd; gpd;dzpia ,dq;fz;L fw;gpf;fTk; KbAk.

J}ug; gpuNjr Mrpupau;fNs ,g;gpuNjrg; ghlrhiyfspy; fw;gpg;gjdhy; jq;Fkpl trjpfis rupahd Kiwapy; Vw;gLj;Jk; tifapy; Cf;Ftpg;Gf;fis toq;Fjy; Ntz;Lk.

J}uk; ghupa gpur;rpidahf ,Ug;gjdhy; ,lkhw;wq;fis Nkw;nfhs;Sk; NghJ me;j fy;tp tyaj;ijAk; ftdj;jpw; nfhz;L ,lkhw;wk; nra;tJ nghUj;jkhf ,Uf;Fk;.

ngw;Nwhu; kj;jpapy; fy;tp fw;gjpYs;s ed;ikfis vLj;Jf; $wp ngw;Nwhu;fspd;  Nkyjpf nryitf; fl;Lg;gLj;j MNyhridfs toq;FtJld;> ngw;Nwhu;fs;; gps;isfspd; fy;tpapy; mf;fiw cs;stu;fshf ,Ug;gjw;fhd topKiwfisAk; vLj;Jiuj;jy;.

khztu;fspd; Ra fw;wiy mjpfupf;Fk; tifapYk;> fy;tp ehl;lj;ij mjpfupf;Fk; tifapYk; mjpgu;> Mrpupau;> khztu;> ngw;Nwhu;fs; ,ize;j tifapy; nraw;ghLfis eilKiwg;gLj;j Ntz;Lk.

khztu;fSf;F Muk;g tFg;Gf;fspypUe;J nkhopj;jpwd; tpUj;jpf;fhd gpuj;jpaf nraw;wpl;lq;fis eilKiwg;gLj;j Ntz;Lk.

Conclusion
References


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1. Department of Political Science, University of Jaffna.
Njhy;tp milAk; tiu gHkh mjd; MSifapd; fPo; ,Ue;jJ. ,jd; gpd; 1948k; Mz;L
ijkhjk; 4k; jpfjp gHkh Rje;jpuf; FbauR Mf;fg;gl;lJ.

Njhy;tp milAk; tiu gHkh Gtpapy; uPjpahf kiyj;njhlHfshYk; Mo;flyhYk; #og;gl;L Vida
ehLfspy; ,Ue;J jdpikg;gLj;jg;gl;l ehlhff; fhzg;gLfpd;wJ. gHkhtpy; Muk;gj;jpy;

NjliyAk; Kd; vLg;gJld; mwptpd; vy;iyfis Ma;Tfs; Kd;Nehf;fp efHj;jpa tz;zk; cs;sd. Ma;T vd;w fy;tpr;nrad;Kiw mwpe;jjpy; ,Ue;J mwpahjij Nehf;fpr; nry;Yk; ,af;f tpirahfpd;wJ. ,jd; Clhf fz;Lgpbg;Gf;fs; epfo;tJld; Gj;jhf;fq;fs; Kd; itf;f g;gLtijAk; ehk; fhzKbAk;.

NJH;TP milAk; tiu gHkh Gtpapy; uPjpahf kiyj;njhlHfshYk; Mo;flyhYk; #og;gl;L Vida

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4. #fpapDila jiyikj;Jtk;> MSik> jpl;lkhd ek;gpf;if nraw;ghL
5. #fp vjph;nfhz;l ,uhZt mlf;FKiwapd; jd;ikfs; .
6. rh;tNjrj;jpw;F me;j epiyikfs; vLj;Jf;fhl;lg;gl;l tpjk; .
7. xU ghuSkd;w [dehaf thjpahf mth; gyg;gLj;jpf;nfhz;l tpjk;.

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## 1. ma;tpd; Nehf;fk; 2. ma;T vd;gJ nka;apidf; fz;lwpAk; xU Gyikg; gapw;rpahfpd;w
Peter Poham, Hannah Beech, and Alan Clement have contributed to the proceedings of the International Symposium SEUSL.

Peter Poham's work, "The Lady and the Peacock: The Life of Aung San Kyi of Burma," explores the life of Aung San Suu Kyi from the perspective of a lady who married into the Suu Kyi family. This work provides insights into the life and times of Aung San Suu Kyi, offering a unique perspective on her life and contributions.

Hannah Beech's book, "The Lady Walks Free Again," is a biographical account of Aung San Suu Kyi's life, focusing on her early years and her journey towards freedom. The book offers a detailed account of her life, capturing the essence of her struggle for freedom.

Alan Clement's "The Voice Of Hope: Aung San Suu Kyi" is a comprehensive study of Aung San Suu Kyi's life and work, focusing on her role as a powerful voice of hope in the struggle for freedom. The book delves into her political career and her impact on the world, providing a comprehensive understanding of her life and contributions.
Details of Aung San Suu Kyi
Aung San Suu Kyi AC is a Burmese opposition politician and chairperson of the National League for Democracy in Burma. In the 1990 general election, the NLD won 59% of the national votes and 81% of the seats in Parliament.

Born: 19 June 1945, Rangoon.
Spouse: Michal Aris (1971-1999)
Relations: Aung San (Father & Former leader of Burma), Kyin Kyi (Mother)
Alma Mater: University of Delhi, Oxford, SOAS
Religion: Theravada Buddhism

House arrest Periods: *first placed under house arrest in July 1989.* she was again imprisoned in 2000. *She was again house arrest -2003, 2009.* She was released on the 13th November 2010
may.en.wikipedia.org/wiki/Aung-san-suu-kyi
Foundation. 28 May 2004.
http://www.encyclopedia.com/html/M/Myanmar.asp

Peter Popham (2012), “The lady and peacock the life of Aung San Suu Kyi of Burma”, rider London, Pravda online Aung San Suu Kyi should lead Myanmar: The World wants to restraint from the Myanmar authorities, and opposition leader Aung San Suu Kyi should take her place as elected leader, British Foreign Secretary David Miliband said Tuesday. 29 September 2007.


The Wave of Sinhala Buddhist Supermacism and Muslims of Sri Lanka

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Abstract: Sri Lanka, a predominantly a Theravada state, is recovering from 30 years of civil war between the minority Tamil rebels (popularly known as LTTE) and the state. Majority of the people anticipated a dawn of peace and reconciliation, particularly among various ethnic groups, in the country following the elimination of war. However, what happened in the aftermath of the war was the reverse with a rearing ugly head of Sinhala Buddhist Supermacism that attempts to juxtapose the minorities as the others against majority Buddhists. Part of this process has been done by BoduBalaSena (BBS), a Sangha led movement espousing themselves as an unofficial police, calling for severe restriction on the Muslim population and their way of life including halal food, slaughtering cattle, wearing of hijab, and calling for prayers (especially early in the morning and late night). The Sangha in Sri Lanka seems to be learning from their counterparts in Burma and Thailand where there is a strong anti-Muslim sentiment that resulted in the persecution of Muslims in Burma lately. It is indubitably believed that a stridently venomous anti-Muslim campaign has been stirred by Sangha (BBS) with a political patronage. This study attempts to explore the ideology of the BBS and the implications of such ideology in the country. This is a qualitative study with interviews and observations being used as tools for the data collection process. The findings reveal that the modern Sangha in a majority Buddhist state such as Sri Lanka is faced with a challenge in the shape of modern democracy and the multinational nature of their society. It also shows that the Sangha seems to draw inspiration from a hegemonic past rather than acknowledging the reality of a multi-faith and multi-cultural world order. Thus, there is a greater need for, people’s representatives, scholars and social activists to find an answer to allay this political anxiety and avert a carnage that it promises to deliver.

Keyword: Peace, Reconciliation, Sinhala Buddhist Supermacism, Buddhist State, anti-Muslim Campaign.

Introduction

Buddhism is generally perceived as a religion of peace and non-violence. However, empirically, this hardly describes Buddhism in many countries where it is the state religion or the religion of majority. Burma, Cambodia, Thailand, and Sri Lanka have spawned protracted violence between the majority Buddhists and the ethnic/religious minorities. Even now, the Sangha led violence both in Burma1 and Sri Lanka is dashing the hope of democratic recovery and reconciliation. This phenomenon has created a paradoxical paradigm in the academic analysis of Buddhism and is problematic for all those who accord Buddhism as a philosophy of ahimsa, the moral principal of non-violence that is theoretically rudimentary aspects of Buddhism.

In this respect, Buddhism is not unique, for all the major religious preach peace and harmony and deprecate violence. The impact of 9/11, even after a decade, has generated a lot of academic materials

on the theme of religious violence and its socio-political ramifications. The major part of the work produced by the Western scholars has gravitated around Islam and Judaism (Al Rasheed 2009, Eagleton 2005, Habeck 2006, Juergenmeyer 2000, 2011, Kirsch, 2009). This is not surprising, given the level of internal and cross border conflict seen in countries where Islam is either the state religion or the religion of majority. The domino effect of the so-called ‘Arab spring’, the continuing conflict in Afghanistan, Pakistan, and Syria, and the possible nuclear programme of Iran are all grist to this mill. So are the Israeli military actions and reactions.

Violence that is promoted by interpretation of a given religion is by no means limited to Islam or Judaism or Hinduism or Buddhism. Hindu-Muslim tension divided India at her independence, and the animosity between these groups still sometimes erupts in serious violence, as happened in Gujerat (Ghassem-Fachandi 2012) and in Delhi over the Babri Mosque (Misra 2012). Sikh political separatism and internal sectarianism have also been very violent.

There is a debate about Sinhalese Buddhism. This focuses on how violence has been practised and propagated by the Sinhala Sangha. Some have argued that Sinhala Buddhism is always a tool of state power legitimization (Bradwell 1978). Thus, it has ‘betrayed’ the essentials of Buddhism (Thambiah 1987). This is so because in Sri Lanka now, as well as in the past, the Sangha are more than king makers (Seneviratna 1997). This trajectory has developed a just war ideology in Sinhalese Buddhism (Bartholomeusz 2002), as in Sri Lanka the past is always present (Kemper 1991). While these authors have thrown some new light on the topic, they have not been able to reach any overarching or encompassing conclusions which command general acceptance.

This study is a brief analysis of a new, yet exceptionally vibrant, Buddhist militant agitation against the local Muslim community and how that community identifies itself in trade, politics, and even socio-demography in Sri Lanka. The state is currently grappled with the challenge of reconciliation, reconstruction and political justice after thirty years of one of the Asia’s most violent civil wars. This new movement offers another window onto a topic still far too little studied; the historical role of the Sangha in the society and politics of Sri Lanka.

**Bodu Bala Sena**

Many sections of Sri Lankan civil society were taken aback at the sudden emergence of a systematic anti-Muslim campaign in many parts of the island. This has largely been mobilized by a new organization called the Bodu Bala Sena (BBS)-The Army of Buddhist Power. The BBS is mainly a lay organization, but the leadership is impressive, for it includes several prominent members of the Sangha. Ven. Kirana Vimalajothi There is Chairman; Ven. Glangoda Gananasaara Thera is a General secretary and spokesperson (and particularly militant), Ven. Haputale Pannasara Thera and Ven.1 Vitarandeniya Nanda Thera are members of the executive committee. All are members of Amarapura Nikaya. Dilanta Vitanage, a senior lecturer in history at Sri Jayawardenapura University, has joined them their theoretician.

The BBS is far better organized than any traditional organization, such as the Siyam or Amarapura Nikaya and their branches. It makes good use of information technology such as the Worldwide Web and social networking sites. Its Facebook, YouTube, Twitter, and Wikipedia pages are more than active than many Sri Lankan state agency public profiles. They use Facebook and Cell phone taxing to organize violent protest rallies at short notice without attracting the attention of the police. In many ways this neatly fits into what Juergensmeyer has labelled ‘e-mail ethnicity’. By this display of practical efficiency, so alien to the traditional Sagha, the BBS has projected itself as the most potential ethno-religious outfit among those seeking to intervene in the volatile post-war polity of Sri Lanka.

**The BBS and anti-Muslim campaign**

5Most Sinhala names in this article are transliterated according to the traditional philological conventions, but names which in Sri Lanka have commonly used spelling keep it. The name Gnanasaara is a necessary compromise.

3http://www.bodubalasena.org/Sinhala/

The BBS moved on to rhetoric attacking Christians and, even more, Muslims. What started as a protest against some Muslim traders, who allegedly sold T-shirts and pants carrying the image of the Buddha, soon grew into a national campaign to boycott Muslim trading places and avoid selling land/property to Muslims. It then focused the complex issue of *halal* food certification\(^5\), demanding that the government completely ban it. By March 2013, over a hundred national producers and some multinational companies had withdrawn their halal certification. The Speaker of Parliament, Chamal Rajapakse, had ordered the cafeteria in parliament not merely to remove all halal food but also to sell pork, which till then had been banned out of consideration for the Muslim MPs.\(^6\)

The BBS has also destroyed, or at the very least incited others to destroy, Muslim sites. In Dambulla, a crowd attacked and seriously damaged a mosque. There are several amateur videos of this incident posted on YouTube; See for example, http://www.youtube.com/watch?v=BEzlomMWMk. The incumbent of the famous Buddhist temple at Dambulla, Inamulve Sri Sumangala Thero, can be seen inciting the crowd, while police and soldiers are standing around doing nothing, and some Tamil civilians are praying in fear. The monk argues that Dambulla, having an old and famous Buddhist Temple, must be reserved entirely for Buddhists. What the film does not show is that the mosque being attacked is a fairly small building down a side street which no visitor would normally notice. Of course, attacking the mosque would be indefensible wherever it stood, but this point illustrates that the anti-Muslim outrages are finding issues where there none and have to create their own enemies. Comparable incidents have also occurred elsewhere. In Colombo Dehiwela, a crowd led by BBS entered a mosque by force and removed all the files, computers and documents, claiming that the mosque was thriving terrorism. In Kaluthura, they moved building material from a site where a mosque was being expanded. In Anuradhapura, an ancient Sufi centre was desecrated and demolished. There is also a clip showing Ven. Gnansara Thero forcing his way into the Government Archaeology Department to demand action from the minister: http://www.youtube.com/watch?v=iJnbKYWNIIE. Recently a group of Buddhist Monks under the leadership of Ven. Gnansara Thera Stormed a press conference organized by the rival Jathika Bala Sena led by Watareka Vijitha Thero and abused the monks prevented him from speaking to the journalist present in the full view of the police personal present there.\(^7\)

It is evident that the present government has come either to tolerate or even to support the BBS, at least indirectly. The BBS has had a private meeting not only with the President and his brother, Powerful Defence Secretary, but also sections of the diplomatic corps, including the Indian, Iranian, and the US embassies who apparently fear becoming the target of their campaigns.

By the end of March 2013, the political power of the BBS has been shown by the way the state enacted two of their demands. First, the government has declared that it is not necessary for any business entity to apply or accredit halal certification and it is only the responsibility of the Muslims to adhere to such rule.

The impact of second enactment is more drastic. It has been decided to ban any hospital, whether state or private, from performing vasectomy or any tubal ligation surgery on a Sinhalese. This is to satisfy the BBS, who are arguing that the growth rate of Sinhalese is far lower than that of the Muslims in Sri Lanka, and every effort must be made to reverse the trend. However, Sri Lanka’s population density is already much higher than that of Brazil, China, Ethiopia, Nigeria or Turkey, which are among the most populous states in the world. This is due to its limited landmass as an island. Sri Lanka has manage to control its birth rate far better than its South Asian neighbours and thus achieved remarkable standards in education, health, and other features of the social index. Mismanaged population growth only promises further damage to the already fragile economy.

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5 *Halal* means permissible under Islamic law. In this context it refers to how food should be prepared and in particular how animals should be slaughtered. Muslims are not supposed to buy meat which is not in some way officially designated as *halal*.

6 In Sri Lanka, members of the largest religious communities, Buddhist and Hindus, rarely or never eat pork, though it is not forbidden. The speaker’s action was thus nothing but a gratuitous insult to Muslims.

7 More on this can be read on this link http://2.hidemyass.com/ip-1/encoded/czovL3d3dy5jb2xvbWJvdGVsZWDyYXBoLmnNvbs99pbnRleC5waHAvYmJzLWduYW5hc2FyYS1zdHJpa2VzLWFmYWluLw%3D%3D accessed on 12, April 2013.
Buoyed by its success, the BBS has launched a campaign to ban the *niqab* (the veil worn by Muslim women) in public and to restrict the design and the siting of new mosques. They also demand that all the places of worship be monitored by the state. They are said to be hoping to propose a *Bhumi Putra* type of special tax on non-Buddhist business projects, and to restrict any land purchase by Muslims in areas such as Anuradhapura, Dambulla, Kandy, Kelaniya, and Mahiyangaha that are considered particularly important parts of the Sinhala cultural heritage. However, the most important political question is why the rulers to endorse and even encourage such demands.

### The Muslims of Sri Lanka

Little has been done to analyse the role the Muslims have played as an ‘in-between’ community during the last 30 years of civil war, or for that matter since independence. But Muslim identity has been officially represented in the state affairs of Sri Lanka for over a century. In 1889, a Muslim member was appointed to the state assembly as an expansion of the 1833 Celebrooke-Cameron reforms (Nissan and Stirret 1990). Today, they are represented by 14 elected MPs through two major parties and two Islamic parties.

The Muslim-Buddhist relationship has been amicable compared to that between Sinhalese and Tamils. While the origin of the Muslim community in Sri Lanka is still debated, Muslims have been present at least since the 15th CE, as they were first contacted by Portuguese traders rounds 1450. The recent history of Muslims in Lanka has generally been one of coexistence, though in 1915 there were island wide anti-Muslim riots (Ali 1981, Kannangara 1984). During the recent civil war the Muslim community suffered huge social and economic damage from the LTTE as well as from state militarization. The LTTE in 1990s expelled some 90,000 Muslims overnight at gunpoint. While there were some elements of support for the separatist cause from the Muslim polity, this ethnic expulsion pushed the Muslims to seek security in the state and in return help the state to defeat the LTTE and or negate the Tamil demand for equality. These events also propelled the community to be exposed to Islamic culture to designate their identity based on religion via the employment opportunities in the Middle East and as a result of transnational Islamic movements. After the war, this may have provoked the radical monks who desire to hegemonize Buddhism as the state religion. However, the vast majority of the Muslim community has stood with the Sinhala Buddhists in their fight for the unitary status of Lanka, and in general the Gulf countries have backed Sri Lanka when it needed international support at forums like UNHRC. Therefore, BBS agitation warrants a much wider analysis than a Buddhist-Muslim dichotomy. It appears that the Sangha are eager to espouse themselves as the “state custodians” in the aftermath of military victory.

### Implications of Sinhala Buddhism on Minorities

The uncompromising stand of BBS and the passive support of the majority of the Sangha of all major *nikayas* across the country helped to create the military mind-set which won the war in 2009. It appears that the rulers who have defeated the LTTE have only fulfilled one of the expectations of the Militant Sangha. Their wider aim to (re)establish an ethno-religious Sinhala Buddhist state is advancing more slowly than they hoped.

The attitude of the Sinhala Sangha towards the minority faiths-be they Mahayana Buddhists, Catholics, Christians, Hindus, or Muslims-has been a flashpoint. The Sinhala Sangha are not known for their tolerance of other faiths and practices if they perceive them to be a threat of any kind. Damien Keown, after editing a volume on the topic of human rights and dominant cultural paradigm, concludes that the debate is open ended, because of most Buddhist scholars are still far more interested in historical Buddhism than in discussing its relevance in the 21st century (Keown, Prebish, and Rollen 1997). In Sri Lanka, the Sinhalese considered independence to be their chance for majority rule. This is proved by many post independent undemocratic acts, such as disenfranchising of the Indian Tamils, making Sinhala the only official state language, giving religious supremacy to Buddhism and discrimination in university admissions.

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8Literally: “Son of the soil” in Sanskrit. This political term for the dominant indigenous population was coined in Malaysia by Tunku Abdul Rahman to refer to Malays, and further popularized there by Mahathir Mohamed.
In the longstanding and uncompromising pursuit of entrenching the Sinhala Buddhist hegemony upon the minorities, the Sangha has somehow been successful under certain rulers. The present climate is so healthy for the Sangha to perpetuate their ideology to the detriment of the legitimate concerns of the minorities. However, implications of such ideology is detrimental, not just to the country’s economy, but to the social fabric of the country which is considered as the home of multi-cultural, multi-religious, multi-ethnic and multi-language society. Moreover, as the country underwent a diabolical war of 3 decades, it is even more vulnerable to encounter another war or violence, may be in small scale, in the coming days. More importantly, as the Geneva resolution and LLRC recommendations focused much on the maltreatment and grouses of minority communities in the country, any attack or riot against minorities in the country may spell disaster for the fate of the country in the international arena. Thus, it is imperative on the part of the rulers and Nigayas to ensure that the country is free from intolerance and attack on the minorities and their properties.

Conclusion

It is clear that we may understand the BBS, whose motive is to oppose the Muslim growth and expansionism under a corrupt and unfair economic system. It is statistically true that the Muslims in Lanka have grown in population, economic strength and political influence. Their religious identity is the core of their self-definition. Just as the Tamils of Lanka look to their Indian cousins for political and cultural inspiration, Lankan Muslims have looked to the pan-Islamic world for solidarity (McGillvray 2011). This international affiliation has grown stronger in recent decades thanks to the income generated by nearly two million Lankans working in the Gulf region. To this we must add the recent transformations, partly visible and party suspected, which Muslims in Lanka have attached to their religious identity. A few decades ago, it would have been extremely rare to see a Muslim woman in a black dress with her entire face covered. Now, however, full length hijab with the niqab has not only become common among Muslim women, but in some parts of Eastern Lanka where Muslim are the majority it has become compulsory. Islamic trading, which was traditionally focused on areas such as catering, gems and agencies recruiting labour for the Middle East has also been transformed; today, there is open Islamic leadership in sectors such as manufacturing, finance and key commodities. This growth of Muslims has become an actual or perceived threat to Sinhala Buddhism, especially to the Sangha.

It is in this context, the role of the government and the cross-ethnic civil society is paramount in fostering an understanding between various ethnic communities. Southeast Asian Theravada states such as Burma, Thailand, Laos have already developed full-blown Buddhist Muslim conflicts that are threatening those states. It is unaffordable for the country to bear such a Buddhist-Muslim riot as happened a century ago in 1915. It is paramount that the Sangha in Lanka should find a way to address Muslim fears and concerns by dialogue and negotiation. It is equally important for the Muslim elites and politicians to find a way to avert a repetition of earlier Sinhala-Buddhist riot in the country once again.

No religious teaching gets into the heart or mind of the believers just as its founder preached it. They select and ‘tailor make’ its basics. This is how we end up having Sinhala Buddhism( or Thai Buddhism) instead of Buddhism found in the Pali canon. There again, scholars disagree about the original teaching of Gauthama Buddha. However, what is important is not such quibbles about authenticity, but how the religion is applied and practiced now. Does it promote peace and harmony, or violence and hatred?

The role of religion in instigating violent conflicts is not a linear progression, nor is it unique to any one religion. Ethno-religious violence has killed more people than any disease during the last two centuries. Religiously inflicted conflict offers avenues into power politics that are wider than others, because it is based on a historicized version of the religion and the cultural heritage of a particular ethnic group. Moreover, while each religion tries to set up university within its own sphere( Pan-Buddhism: Vishwa Paramartha Baudhha Marga, Pan-Islamic Brotherhood, Vishva Hindu Parished, etc.), it also seeks to state truly universal claims.

The self-interested ideology of powerful elites often provides them with the motive and excuse to use violence in their search for legitimation. In its extreme form this ‘cost effective’ strategy is justified by claims that they are defending themselves against a cosmic war of persecution. In order to
perpetuate/sustain their power, they are ready even to resort to war themselves. However, the question remains unanswered. How is it that the Sinhala Sangha that have witnessed a non-stop blood bath in their Dhammadipa for the last 60 years can find the rationale for another state of such violence?

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Typologies of Modern Tourism and Modern Tourists: Implications for Sustainable Tourism Planning

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Abstract: This paper uses information about the modern tourism sector to prescribe feasible initiatives by which societies can plan competitive and sustainable or ‘green’ tourism sectors. Tourism is among the world’s most robust and resilient activity sectors. Its high multifactor productivity level, coupled with value-added benefits, convince countries to invest significantly in planning a competitive tourism sector. The rich pool of theoretical and empirical tourism literature shows a complex typology of modern tourism genres. Discernible from the genres is a profile of ‘the modern tourism,’ with unique characteristics that tourism planning must take into consideration. Also, tourism exerts pressure, sometimes severely, on society’s environmental or life-support resources, viz: air, water, land, flora and fauna. For tourism to be profitable and sustainable, it is imperative that its pressure on the environment is kept to a minimum. To achieve this, it is necessary to identify the key drives of tourism as a multi-sector activity. These drivers can be disaggregated and clustered according to political, environmental, technonomic and psycho-social goal sectors of society. They can also be stratified based on whether they are internal or external to each society. In the same sense, the implications of tourism for sustainable tourism planning should be delineated, and this paper uses the sustainability pentagon framework for this delineation. Ultimately, the clustering of tourism drivers, and the delineation of tourism’s sustainability implications, are used as a platform to prescribe tourism planning initiatives for implementation by the appropriate stakeholders in the society.

Keywords: Modern Tourism Genres, Modern Tourist, Tourism Drivers, Sustainable Tourism Planning and Stakeholders

Introduction
Travel in one form or another, and motivated by one or more of multiple reasons, has been a premier primordial human activity. In the modern or post-industrial world, enable by various intertwined political, economic, technological and enlightenment factors and advancements, one type of travel, which has come to be known as tourism, has perhaps become the most popular of all types of travel. As a result, tourism is now a subject of versatile scholarly inquiries, and, most importantly, a priority of political-economic decisions at all levels of government worldwide. Tourism is a robust and resilient engine of economic growth and development. Shanks (2007) called it “the world’s largest export,” adding that “it has enormous growth potential;” hence, “almost every country desires an expansion in this sector.” Tourism is defined variously in the pool of conceptual and empirical tourism literature. For this paper, tourism is defined as “the temporary movement of people to destinations outside their normal places of work and residence,” (Mathieson and Wall, 1982) for a period of “not more than one year” (WTO, 1991), “to seek personal rewards (Gunn and Var, 2002) "other than for exercise of an activity remunerated from the place visited” (WTO, ibid)

Using information from the vast conceptual and empirical tourism literature, first, this paper presents a ‘generic’ typology of tourism genres. Second, a qualitative or descriptive profile of the modern tourist is presented. Third, the paper delineates the key drivers of modern tourism, and disaggregates them...
based on society’s four main goal or value clusters, and whether the drivers are internal or external to a society. Fourth, the paper identifies the implications of tourism for sustainable tourism planning. The implications are clustered, based on the five pillars of the sustainability pentagon framework. Fifth, using the tourism drivers and tourism’s sustainability implications as a platform, specific initiatives are suggested for implementation by the appropriate stakeholders in a society that aims for a competitive, profitable and sustainable tourism sector.

A ‘Generic’ Typology of Modern Tourism Genres

Table – 1 shows the generic typology of modern tourism genres compiled or aggregated from different types of tourism identified in the tourism literature (see, for example, Gibb, 2011; Goeldner and Ritchie, 2009; Page and Connell, 2009; Mason, 2008; Adams, 2006; Gunn and Var, 2002; Christie and Crompton, 2001). It must be admitted that extant genres of tourism are too many to capture in any one paper. The main reason for this ‘deluge’ of tourism genres is that, in the modern world, any reason or purpose of travel is a potential seed for a genre of tourism, for example, “travelers who are drawn to areas of political turmoil” undertake ‘danger – zone’ (Adams, 2006); “people abroad with tenuous links with Britain try to sue for libel” in what Gibb’s (2012:24) termed “liberal tourism;” slum tourism (Melik, 2012); secret tourism (Stokes, 2012); geo-tourism (National Geographic Center for Sustainable Destinations, n.d.); ‘staycation’ (Alban, 2008); etcetera.

The common denominator of all the identifiable tourism genres is that the motive of travel or tourism, which Gunn and Var (2002) termed personal rewards. Based on this reasoning, Table – 1 is a pragmatic aggregation or clustering of modern tourism genres. The thematic motives are the pursuit of entertainment (leisure), the exploration of nature (environment stewardship) and the quest for knowledge and empowerment (capacity).

<table>
<thead>
<tr>
<th>Leisure / Entertainment</th>
<th>Environment (Stewardship)</th>
<th>Empowerment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leisure (sand, sea, sex)</td>
<td>Ecotourism</td>
<td>Education / excursion</td>
</tr>
<tr>
<td>Sports tourism</td>
<td>Geo-tourism</td>
<td>Spiritual Pilgrimage</td>
</tr>
<tr>
<td>Nude tourism</td>
<td>Nature tourism / expeditions</td>
<td>Health tourism</td>
</tr>
<tr>
<td>Narco tourism (narcotics)</td>
<td>Space tourism</td>
<td>Culture</td>
</tr>
<tr>
<td>Family and friends (reunions)</td>
<td></td>
<td>Reunions of family / friends</td>
</tr>
<tr>
<td>Space tourism</td>
<td></td>
<td>Pro – poor / Poverty tourism</td>
</tr>
<tr>
<td>Danger – zone tourism</td>
<td></td>
<td>(service to underprivileged)</td>
</tr>
<tr>
<td>Techno – tourism</td>
<td></td>
<td>Techno – tourism</td>
</tr>
<tr>
<td>Secret tourism</td>
<td></td>
<td>War tourism</td>
</tr>
<tr>
<td>Day / short cruises</td>
<td></td>
<td>Libel tourism</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slum tourism</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geo-tourism</td>
</tr>
</tbody>
</table>

Source: Gunn and Var (2002)
A Qualitative Profile of the Modern Tourist

Table – 2 presents a qualitative or descriptive profile of the modern tourist, using information gleaned from the tourism. Examples of descriptors of each trait are cited. It is important to note that there are definitional overlaps between some of the traits, but they collectively depict the modern tourist. It should be added that, for all the traits of the modern tourist, the main justification for what tourists do at tourism destinations is value (material or psychological return or satisfaction) for their investments of money, time and energy.

### Table – 2

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Examples of Descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventurous, curious, inquisitive</td>
<td>Desirous to see, explore, learn about, engage in and experience culture (people, events, artifacts, places) at the destination.</td>
</tr>
<tr>
<td></td>
<td>Take chances and risks would rarely (or dire not) take at home.</td>
</tr>
<tr>
<td>Active (agenda)</td>
<td>Dynamic, often overloaded, agenda.</td>
</tr>
<tr>
<td></td>
<td>Time – sensitive schedule at destination, so stay on – the – go.</td>
</tr>
<tr>
<td>Accommodating / friendly / tolerant</td>
<td>Quick to help and give consideration to others (elderly, children, families, handicapped).</td>
</tr>
<tr>
<td></td>
<td>Ready / willing to share. Understand that they are not in their private territory and / or home country.</td>
</tr>
<tr>
<td>Attentive / observant</td>
<td>Document memories of sights, events and people at destination, using modern technology.</td>
</tr>
<tr>
<td></td>
<td>Cognitive mapping of places, events and experiences.</td>
</tr>
<tr>
<td>Cost / budget – conscious</td>
<td>Bargain deals (hotels, transportation, entertainment, shopping, etc.)</td>
</tr>
<tr>
<td></td>
<td>Manage resources well, with no room for extravagance.</td>
</tr>
<tr>
<td></td>
<td>Budget is pre – worked to minutiae.</td>
</tr>
<tr>
<td>Civil (subscribes to the rule – of – law)</td>
<td>Investigate and comply with destination laws and protocols.</td>
</tr>
<tr>
<td></td>
<td>Respect destination traditions and practices, however different from theirs.</td>
</tr>
<tr>
<td>Demanding</td>
<td>Insist on quality, respectable and courteous service, as part of value for money.</td>
</tr>
<tr>
<td>Daring</td>
<td>Engage in activities they normally would not do, or be shy to do at ‘home’</td>
</tr>
<tr>
<td>Discerning (taste conscious)</td>
<td>Will not settle for inferior, sub – standard or mediocre products and services.</td>
</tr>
<tr>
<td>Passionate</td>
<td>Derive thrill and pleasure in activities and experiences at destinations because these are deliberately selected (and paid for) as reasons for travel.</td>
</tr>
<tr>
<td>Prudent</td>
<td>Cautious in destination environment (especially first timers).</td>
</tr>
<tr>
<td></td>
<td>Conscious of consequences (legal and moral) of action.</td>
</tr>
<tr>
<td>Informed (do their homework)</td>
<td>Collect information about destination via Internet, TV commercials, official gazettes, social networks and word-of-mouth.</td>
</tr>
<tr>
<td>Time – conscious</td>
<td>Plan full schedule of events for limited time at destination.</td>
</tr>
</tbody>
</table>
Value time, and make the most of it, at paid activities.

Conscious of the financial cost of time, especially time wasted or lost.

Source: Catanese and Snyder (1988)

**Key Drivers of Tourism**

This section of the paper delineates the key drivers of modern tourism, and disaggregates them based on society’s four main goal or value clusters, and whether they are internal or external to each society.

### Table – 3

**Key tourism drivers, clustered according to societal goals**

<table>
<thead>
<tr>
<th>Societal Goal Clusters</th>
<th>Examples of Internal Drivers</th>
<th>Examples of External Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political</td>
<td>• Clear tourism vision, policy, philosophy and political will</td>
<td>• Cordial international relations</td>
</tr>
<tr>
<td></td>
<td>• Institutional and legal frameworks for tourism development.</td>
<td>• Membership of global tourism organizations</td>
</tr>
<tr>
<td></td>
<td>• Political and human freedoms and rights.</td>
<td>• Shared political affinity or heritage (eg.: colonialism)</td>
</tr>
<tr>
<td></td>
<td>• Safety of lives and property.</td>
<td>• Creditability of diplomatic emissaries and clarity of tourism message and plan.</td>
</tr>
<tr>
<td></td>
<td>• Transparent and accountable governance.</td>
<td></td>
</tr>
<tr>
<td>Techonomic (Economic and</td>
<td>• Local investment capital.</td>
<td>• Foreign Direct Investment.</td>
</tr>
<tr>
<td>technological)</td>
<td>• Purchasing power / disposable income.</td>
<td>• Global economic boom and affluence.</td>
</tr>
<tr>
<td></td>
<td>• Credit and lending facilities, especially for micro and small entrepreneurs.</td>
<td>• Support or certification by global network of tourism promotion agencies.</td>
</tr>
<tr>
<td></td>
<td>• Business associations to promote tourism.</td>
<td>• Bi – and multi – lateral economic agreements.</td>
</tr>
<tr>
<td></td>
<td>• Safety, reliability and insurance of finance and banking services.</td>
<td></td>
</tr>
<tr>
<td>Environmental (Natural and</td>
<td>• Historic, ecological, heritage and archeological treasures.</td>
<td>• Good international transportation choices, connectivity and affordability</td>
</tr>
<tr>
<td>Physical / built)</td>
<td>• Modern transportation, banking and hospitality infrastructure and technology.</td>
<td>• Shared international political and environmental borders or boundaries.</td>
</tr>
<tr>
<td></td>
<td>• Good destination transportation choices, connectivity and affordability</td>
<td>• Membership of international environmental organizations</td>
</tr>
<tr>
<td></td>
<td>• Uniquely attractive destination climate and landscape</td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td>• Quality and quantity of tourism</td>
<td>• Perceptions, impressions and image</td>
</tr>
</tbody>
</table>
workforce
- External popularity of destination culture, cuisine and traditions
- Citizens’ sense of patriotism and pride at destination
- Hospitality of local culture or groups.

of destination by outsiders.
- Bi – and multi – later human services programs and projects
- Political, historic and cultural affinities with destinations.

Source: Kolo (2010)

Key Implications of Modern Tourism for Sustainable Tourism Planning
This paper avoids the polemics of the conceptual sustainability discord and contends that all human activities have direct and indirect, mild and severe, immediate and deferred implications for society’s sustainability. In this sense, as an activity, modern tourism, with all its intricate dimensions, is no different from logging in the Amazon, deforestation in the Congo basin, or oil exploration in Alaska. The paper ratiocinates that human activities are fueled by need or demand, needs are met through production activities, and production is directly and indirectly dependent on nature’s raw materials or resources, also known as life support systems (LSS), which are land, air, water, flora and fauna. These resources constitute the energy system on which all life forms and activities depend. In this sense, therefore, the frontal challenge of sustainable tourism planning, regardless of the definition of sustainability, is how society creatively and ingeniously safeguards the productive capacity of nature (environment), so that people can tap into nature in order to meet society’s inescapable need for tourism (and other growth – related) products, goods and services, especially with tourism’s potency to spur growth and development.

The sustainability framework used in this paper to illustrate the implications is the sustainability pentagon (Kolo, 2010). This framework is a variant of the classic and world-renowned Brundtland Commission’s triple – bottom – line (TBL) sustainability pillars (WCED, 1987). Both the pentagon and TBL frameworks are shown in Figure – 1. Other noteworthy sustainability frameworks in the literature are the sustainability prism for land use planning (Berke et al., 2006), and Randolph’s framework of five sustainability objectives (Randolph, 2004). The pentagon framework is used because of its contention that, from an implementation or operationalization standpoint, the three ―Es‖ of the TBL framework (Economy, Environment and Equity) are necessary but insufficient strategic ideals or goals of sustainability planning. The pentagon expands the three “Es” to five, with Engagement and Enlightenment as the two added “Es.” which are imperative to implement sustainability initiatives (policies, plans, programs and projects) cost – effectively in any society. Using the pentagon framework, examples of the implications of tourism for sustainable tourism planning are illustrated in Table – 4. Implications here do not mean the advantages or benefits of tourism, rather, they are what modern tourism would require communities to be aware of, and attend to, in their quest for a sustainable tourism sector or industry. These would be indicators, internal and / or external to the community (as in Table – 3), of what tourism policies and plans must address, and what the responsibilities and tasks for the various stakeholders in the society would be (as in Table – 5).

Figure – 1

<table>
<thead>
<tr>
<th>Sustainability Pentagon’s 5 – E Pillars</th>
<th>Brundtland Commission’s 3 – E TBL Pillars</th>
</tr>
</thead>
</table>

Source:
In order to achieve a sustainable or green tourism sector that caters to the needs of the modern tourists, all stakeholders in the modern tourism sector need to comprehend the critical implications of modern tourism for society’s natural resource base (LSS), and then act accordingly to protect the productive capacity of the resources to meet the tourism needs of current and future generations. Essentially, the critical issue addressed by Table – 4 is what the modern tourist, hence modern tourism, would mean for societies, and all stakeholders, that aim to plan or establish sustainable tourism sectors whose negative externalities on the environment or LSS would be minimal to nil. Where the imperatives of growth and development would generate externalities, sustainable tourism planning would require governments and other relevant parties or stakeholders to develop feasible mitigation plans for those externalities.

### Table – 4

**Examples of key implications of modern tourism for sustainable tourism planning**

<table>
<thead>
<tr>
<th>Sustainability Pentagon Pillars</th>
<th>Examples of implications of modern tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td>• Huge demand for tourism jobs, services and products</td>
</tr>
<tr>
<td></td>
<td>• Massive demand for and / or consumption of land and water to provide tourism products and services</td>
</tr>
<tr>
<td></td>
<td>• Greater pressure and impact on air, water and biodiversity quality by tourists and tourism services and products.</td>
</tr>
<tr>
<td></td>
<td>• Establishment of an enabling environment for tourism investment and entrepreneurship.</td>
</tr>
<tr>
<td>Environment (Built and natural)</td>
<td>• Research and databases on society’s environmental or natural resources.</td>
</tr>
<tr>
<td></td>
<td>• Environmental planning, management, outreach and participation</td>
</tr>
<tr>
<td></td>
<td>• Environmental legislation and management institutions</td>
</tr>
<tr>
<td></td>
<td>• Compliance with local, national and international environmental standards (energy, water quality, air quality, biodiversity protection, waste management, heritage protection, etc.)</td>
</tr>
</tbody>
</table>
For a sustainable tourism sector in any society, one that harmonizes the demands of the modern tourist with nature’s capacity to enable producers to meet the demands, all societal stakeholders need to perform their roles responsibly and accordingly, in safeguarding the productive capacity of society’s LSS. The critical issues addressed by Table – 5 is what the roles to tasks of each stakeholder sector would be, in the process of sustainable tourism planning. It must be stated that the roles overlap, are continuous or reiterative, are complement or mutually reinforcing, but a clear understanding of the roles by the various stakeholders is crucial for each stakeholder to play their designated roles responsibly, accountably and effectively.

### Table – 5

**Sustainable tourism planning roles and initiatives by societal stakeholder sectors**

<table>
<thead>
<tr>
<th>Sustainability Pentagon Pillars</th>
<th>Examples of roles of main stakeholders sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economy</strong></td>
<td><strong>Public</strong></td>
</tr>
<tr>
<td><em>(See Table – 4 for implications)</em></td>
<td>Adopt categorical policies and legislation to create an enabling environment for sustainable tourism (Planning, investment, etc.)</td>
</tr>
<tr>
<td></td>
<td>Establish decentralized</td>
</tr>
<tr>
<td><strong>Corporate (Private)</strong></td>
<td><strong>Invest in research and development for green tourism products, good and services</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Endorse, adopt and adapt national and international</strong></td>
</tr>
<tr>
<td><strong>Philanthropic (Non – profit)</strong></td>
<td><strong>Provide small green tourism enterprises with training, education, technical assistance, credit counseling, business</strong></td>
</tr>
<tr>
<td><strong>Grassroots (Citizens)</strong></td>
<td><strong>Patronize, embrace and support green tourism products, goods, services, policies and plans</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Produce quality and standardized green tourism goods and services</strong></td>
</tr>
<tr>
<td>Environment (Build and natural)</td>
<td>Conduct and fund comprehensive and sustained research and databases on society’s environmental or natural resources and tourism</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(See Table – 4 for implications)</td>
<td>Use modern technology to formulate, store and update environmental and infrastructure plans with levels of service standards</td>
</tr>
<tr>
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<tr>
<td>Equity (See Table – 4 for implications)</td>
<td>• Adopt clear equity and environmental justice policies and legislation for the tourism sector</td>
</tr>
<tr>
<td>• Establish institutional structures to enforce equity legislation and policies</td>
<td>• Ensure fair representation of all stakeholders on corporate tourism boards and committees</td>
</tr>
<tr>
<td>• Provide technical and management mentorship for small green tourism</td>
<td>• Provide technical and ‘legal’ assistance and advice for small firms in the green tourism industry</td>
</tr>
</tbody>
</table>

| Engagement (See Table – 4 for implications) | • Adopt clear policies and legislation mandating engagement of all stakeholders in the tourism planning process | • Under the banner of corporate social responsibility, provide small enterprises with technical assistance, mentorship and data on green tourism | • Lobby policy makers for policies, laws and programs mandating stakeholder collaboration in tourism planning | • Lobby policy makers for policies, laws and programs mandating stakeholder collaboration in tourism planning |
| • Establish decentralized institutional structures for stakeholder participation | • Advocate and lobby for green tourism policies and plans | • Undertake outreach campaigns on stakeholder collaboration opportunities in tourism | • Speak to and mobilize neighbours to get involved in green tourism initiatives |
| • Provide financial resources and technical assistance by universities and non – profits for small enterprises to participate in the tourism sector | • Initiate and support stakeholder partnerships and joint ventures on green tourism | • Initiate and support stakeholder partnerships and joint ventures on green tourism | • Volunteer to serve on public, corporate or non-profit advisory bodies on green tourism partnerships |

<p>| Enlightenment (See Table – 4 for implications) | • Adopt clear policies and legislation mandating tourism outreach initiatives for all stakeholders by | • Support, fund or organize public awareness campaigns on green tourism | • Undertake and support green tourism research and data sharing | • Lobby policy makers for policies, laws and programs mandating public outreach on green tourism |
| | | | | |</p>
<table>
<thead>
<tr>
<th>universities, non-profits and technocrats</th>
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<th>tourism events</th>
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<td>• Establish decentralized institutional structures for tourism outreach to stakeholders</td>
<td>• Sponsor green tourism research, education and training by local educational institutions and non-profits</td>
<td>• Organize and co-sponsor multi–stakeholder educational events on green tourism</td>
<td>• Organize micro forums to inform and energize neighbours about green tourism</td>
</tr>
<tr>
<td>• Provide financial resources, technology and technical assistance for tourism campaigns and outreach at the grassroots.</td>
<td></td>
<td>• Lobby policy makers for policies, laws and programs to promote mass awareness about green tourism</td>
<td>• Campaign for resources to provide green tourism information at locations in the community, the local library, etc.</td>
</tr>
</tbody>
</table>

Source: Al Waer (2002)
Conclusion
In an insightful article on modern tourism, Shanks (2007) identified and discussed what she termed nine paradoxes of modern tourism. Some of the paradoxes speak aptly to the central theme of this paper, which is that the modern tourist, hence, modern tourism, requires and consumes products, goods and services which have significant implications for the environment of their destination society. Tourism is an activity which, like all human activities, relies on the productive capacity of the environment. Therefore, society cannot and should not allow tourism to undermine the very base on which it thrives. To achieve a happy medium or balance between tourism demands and nature’s capacity, societal stakeholders must engage collaboratively in sustainable tourism planning. Shanks (2007) stated, for example, that “tourism is the best possible development sector and the most treacherous,” that “commodifying culture simultaneously preserves, transforms and destroys it,” that “attempts to present living nature or culture to tourists have the effect of deadening them,” and that “what is environmentally sustainable is often unprofitable and insulting.” What these and the other paradoxes identified by Shanks affirm is this paper’s contention that, tourism, which is an activity that is an industry or an economic sector unto itself, needs to be carefully and strategically planned, if it is to be a positive, profitable and sustainable contributor to any society’s economic, political, environmental and psycho-social wellbeing.

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Challenges of Eco-Tourism and Solutions:
A Case Study of Passikuda in Eastern Part of Sri Lanka

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Abstract: Tourism is identified as a fifth economic sector in generating income for the nation and more focus was given on the eco-tourism in post-war scenario and it is recognized as a booming economic sector. Soon after the July riot in 1983, the government has given more priority to develop tourism in the particular area which was severely affected by the war under post-war economic development policy. The Passikuda was promulgated as a tourist attraction in 1971 which located in the Eastern Province of Sri Lanka has been identified as the potential eco-tourism sector which reflecting physical and cultural diversity and attracted local and foreign tourists. The study area is surrounded by hard rocks, sea grass and coral reefs which provide habitats for birds and aquatic life and the rocks act as barrier for salt water intrusion. Aftermath of the war, the particular area has been developing under eastern revival program, subjected to positive as well as negative consequences. It is affecting the eco-system and bio-diversity of the area. At this backdrop, the study has been undertaken to identify the consequences of eco-tourism and to suggest management mechanism to prevent issues. The data gathered from both primary and secondary sources were analyzed in various angles using qualitative and quantitative techniques from 200 sample locations. The study reveals that the tourist activities causing significant environmental and cultural affects such as affect to bio-diversity, sand extraction, drug uses, sexual abuses and the child labourers. The negative impacts could be mitigated through awareness programs, ensure and restructure the existence of traditional culture. The legal measures should be taken to balance the eco-system and to prevent the environmental hazards. Further, the existing laws should be implemented to protect environment. A proper mechanism may also be developed to execute above solutions.

Keywords: Culture, Development, Eco-tourism, Natural Resources Management


**Methods and Materials**

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Source: Field Work 2014
social sciences and humanities

proceedings, 04th international symposium, SEUSL

page 187

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source: secondary and field data collection 2014

source: secondary and field data collection 2014

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source: secondary and field data collection 2014

Source: Secondary and Field Data Collection 2014
அழகையுடைய கல்விகள் உரை த்திக்கார்களைப் பார்க்கிறார்:

இவ்விதம் பதிகங்கள் எதிர்க்கோள் எதிர்க்கல்லாலோர் உரை த்திக்கார்களைப் பார்க்கிறார் மனிதன் உரை த்திக்கார்களை அளிக்கிறார். உரை த்திக்கார்களைப் பார்க்கல்லாலோர் உரை த்திக்கார்களை அளிக்கிறார் மனிதன் உரை த்திக்கார்களை அளிக்கிறார். 2009 ஆண்டு வருடானை நாள்களை செய்யக்கூடிய உரை த்திக்கார்களை அளிக்கிறார் மனிதன் உரை த்திக்கார்களை அளிக்கிறார். 91% பதிகங்கள் எதிர்க்கல்லாலோர் உரை த்திக்கார்களை அளிக்கிறார். 9% பதிகங்கள் எதிர்க்கல்லாலோர் உரை த்திக்கார்களை அளிக்கிறார்.

Source: Secondary and Field Data Collection 2014
அலங்கரியல் வலுவுற்று

மற்றும் மேற்பாடுடன் கூறப்பட்டுள்ள முக்கிய அதிகாரிகளுக்கு தம் ஆதரவுகாலத்தில் பொருளாதாரம் செய்யப்பட்டது மற்றும் மேற்பாடுடன் கூறப்பட்டது முக்கிய அதிகாரிகளுக்கு தம் ஆதரவுகாலத்தில் பொருளாதாரம் செய்யப்பட்டது.

> கூட்டத்திற்கு தம்மிடாக ஆதரவுக்காக இறக்கு முதல் தோற்றமற்றவில்லாத வகையில் பொருளாதாரம் செய்யப்பட்டது.

> அதிகாரிகள் தம்மிடாக ஆதரவுக்காக இறக்கு முதல் தோற்றமற்றவில்லாத வகையில் பொருளாதாரம் செய்யப்பட்டது.

> பொருளாதாரம் செய்யப்பட்டுள்ள முக்கிய அதிகாரிகளுக்கு தம் ஆதரவுகாலத்தில் பொருளாதாரம் செய்யப்பட்டது.

> முக்கிய அதிகாரிகளுக்கு தம்மிடாக ஆதரவுக்காக இறக்கு முதல் தோற்றமற்றவில்லாத வகையில் பொருளாதாரம் செய்யப்பட்டது.

> 2009 முறையும் தோற்றமற்றவில்லாத வகையில் பொருளாதாரம் செய்யப்பட்டது.

> Man Made Hazard (தமிழ்: வாழ்வியல் வேலைப்பாடு) என்ற வேலைப்பாட்டிற்கு தமிழ்நாட்டில் உள்ள தமிழ் மொழியாளர்களைக் கொண்டு வேலைப்பாடு செய்யப்பட்டது.

> பொருளாதாரம் செய்யப்பட்டுள்ள முக்கிய அதிகாரிகளுக்கு தம் ஆதரவுகாலத்தில் பொருளாதாரம் செய்யப்பட்டது மற்றும் மேற்பாடுடன் கூறப்பட்டது.

Source: Secondary and Field Data Collection 2014
விளக்கம்: வல்லூரில் முழுங்குடியார் என்னும் விளக்கத்தின் முடிவு முடியவில்லை. எனவே, வெளியில் மறுவரைந்து வேலைகள் செய்யவில்லை. எனவே, இவேற்று வல்லூரில் மூடாலே.
15.81% of the population are at risk of malnutrition. This includes children under 5 years old. The number of children under 5 years old with low weight for age is 2.1 million.

**Lack of Food Security:**

The lack of food security is a major concern in the region. The scarcity of food due to the drought has led to a decrease in food availability. This has resulted in a decrease in the availability of food in the market. The lack of food security has led to an increase in the number of people suffering from malnutrition.

**Solution:**

The government has taken several measures to address the issue of malnutrition. These include providing free meals to underprivileged children, distributing food rations, and promoting agricultural activities. These measures have helped to reduce the number of malnourished children in the region.

**Conclusion:**

Malnutrition is a significant problem in the region. The government needs to continue to implement measures to address this issue. The responsibility of each individual is also important in reducing the risk of malnutrition. This includes improving agricultural practices, promoting healthy eating habits, and providing adequate education on nutrition.


www.srilankatourism.org/index.php

www.tourism-srilank.com

www.tripadvisor.com/Tourism
Student Centred Learning: Are our students and lecturers ready to embrace this approach?

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Abstract: Student Centred Learning, a prominent term in educational arena in Europe and the West is gaining popularity in Asia including Sri Lanka, especially in the higher education sector. Even though a lot of discussions, workshops and training programmes are conducted through several projects on this concept, there is no evidence for it being adopted by higher education sector in Sri Lanka. Nor are there any evaluations of the outcomes of the approach, where the Student Centred Learning is practised at a smaller scale. This paper arises at the backdrop of such a scenario to identify if Student Centred Learning is practised in a Sri Lankan University called South Eastern University of Sri Lanka, and its perceived benefits and constraints at the university.

Key words: Student Centred Learning, Interaction, Confucian Heritage Culture, Didactic-Teaching, Reticence

Introduction

What is student centred learning?
Student centred learning is a long standing concept not only in higher education but also among primary and secondary level (Lea et al., 2003) educators. Hence, defining student centred learning has been a problem of all concerned (ibid).

In this paper, I have attempted to give a few definitions for Student-Centred Learning (SCL). SCL is a broad teaching approach that encompasses replacing lectures with active learning, integrating self-paced learning programmes and/or cooperative group situations, ultimately holding the student responsible for his [or her] own advances in education (Nanney, 2004). SCL is a teaching approach that replaces the traditional didactic lecture method to an approach that keeps the students in the centre of the learning process and gives autonomy to them. In the SCL approach students are responsible for their learning and the teachers become facilitators playing a little role.

Froyd and Nancy (2010) have listed an array of terms coined to indicate SCL, of them some prominent terms are Active Learning, Collaborative Learning, Inquiry-based Learning, Cooperative Learning, Problem-based Learning, and Project-based Learning. In addition, O’Neill and McMahon (2005) list some other terms such as experiential learning and self-directed learning. Nevertheless, of all the terms used SCL has been an overused term (ibid). Adding to this list are Case-based learning, Goal-based scenarios, and Learning by design by Pederson and Liu (2003).

Despite varying methods and approaches encompassing the SCL the basis of the approach is that SCL gives autonomy to learners with varying flexible strategies to learn. In Sri Lanka too the term Student Centred Learning is gaining popularity especially among the higher education sector. The staff development programmes organised by universities to train the newly recruited staff focuses on the ‘Mantra’ SCL but to what extent an understanding of the concept is conveyed is another question to be investigated.
Student centred learning requires students to set their own goals for learning, and determine resources and activities that will help them meet those goals. Because students pursue their own goals, all of their activities are meaningful to them (Pedersen and Liu, 2003). A principle commonly agreed upon SCL is student autonomy in contrast to teacher dependence. This also implies that interdependence between the teacher and learner is also an attribute to SCL.

In Sri Lanka, recently, SCL has become a prominent concept with the onset of idea of converting Sri Lanka into a knowledge hub in Asia. In addition, the higher education ministry introduced a benchmarking for future graduates, known as, K-SAM. That is Knowledge, Skills, Attitude and (proper) Mindset are the key parameters a graduate should possess at the end of his or her education. The ministry is geared to achieve this end through the various grants provided to universities, financed by the World Bank. Billions of rupees is being spent on refurbishing lecture halls, acquiring new equipment, targeting to bring about a change in the lecturing approach to student centred learning. Hence, it is good to investigate in detail if the students and lecturers in Sri Lankan universities have understood the concept of SCL, and are will ing to accommodate SCL. In this study I tried to look into these aspects, albeit at a small scale.

**Literature Review**

Biggs and Tang (2007) argue that the university sector in most western and some eastern countries continue to change the teaching/ learning approach at an increasingly higher rate because they claim that teaching and learning have been neglected in favour of learner. They argue learners should be prioritized in learning process. In other words, they stress for student centred learning.

SCL has been in practice and is subject to research for a long time in many parts of the world. To cite a few - The University of Glasgow (2004, cited in O’Neill and McMahon, 2005) identified four main strategies in a study that focused on student–centred learning practices in their University. They are (i) make the student more active in acquiring knowledge and skills. This includes exercises in class, fieldwork, use of CAL (Computer Assisted Learning) packages, etc., (ii) make the student more aware of what they are doing and why they are doing it, (iii) a focus on interaction. i.e. tutorials and discussions and (iv) the focus on transferable skills. Further, O’Neill and McMahon (2005) list several attributes of SCL that could be practised in SCL, both outside the lecture format and within the lecture. The first ones are Independent projects, Group discussion, Peer mentoring of other students, Debates, Field trips, Practicals, Writing journals, etc. The latter group consists of Buzz groups (short discussion in twos), Pyramids/snowballing (Buzz groups continuing the discussion into larger groups), Cross-overs (mixing students into groups by letter/number allocations), Rounds (giving turns to individual students to talk), Quizes, Presentations, Role play, etc.

Lea et al. (2003) in their study at a UK university tried to identify students' perceptions on SCL. The studies revealed that students had a positive view of SCL. However, the students expressed their unfamiliarity with the concept and were skeptical if the approach was politically motivated.

Hasan and Ageely (2010) from a Saudi Arabian university used secondary sources to investigate the influence of SCL in medical education and found that SCL is widely used in medical education. Further, Assoodeh et al. (2012) in a study in Iran tried to correlate SCL with academic achievements and found that when the students were exposed to SCL approach their achievements were higher. However, their study was conducted among secondary school children. Lont (1999) in a study among Finance students in a New Zealand university exemplified how finance lectures could be delivered in SCL approach using intranet.

In another study, in Belgium, Baeten et al. (2013) attempted to link deep and surface approaches to learning with learning strategies and conclude that a deep approach is associated with an intention to understand and an intrinsic interest in the content to be learned, while a surface approach is adopted for an extrinsic motivation and fear of failure. That is, it can be presumed that when students are exposed
to SCL they undertake a deep approach to learning. This study exemplifies the potential benefits of SCL and the possible learning outcomes students could develop as a result of SCL. These two deep and surfaces approaches can be linked to teaching and learning paradigms too. Also, a shift in the approach to teaching has been marked as a shift from Instruction Paradigm to Learning Paradigm (Barr and Tagg, 1995). The SCL is connected to the latter. These brief reviews indicate that SCL has been in practice in many parts of the world.

SCL approaches have been implemented in this region too. For example, in Malaysia, Student Centred Learning (SCL) approach is currently encouraged in the Malaysian Higher Education classrooms for teaching and learning with a view to producing individuals with creative thinking (Yusoff et al., 2003). Hence, it provides students with learning opportunities that promote namely creative and critical thinking, active student engagement, value judgement, and transferable skills (ibid). According to Yusoff et al., SCL can be traced back to as long as to 1956. In their study in a Malaysian university they investigated to what extent lecturers practise SCL. They used a framework for the SCL which comprises of seven components: Learners’ Empowerment, Learners’ Engagement, Collaboration, Teacher’s Role, Higher Order Thinking Skills, Assessments, and Approaches/Methodology/Strategy. The results of the study reveal that lecturers practise different forms of SCL varying from collaborative/cooperative learning, problem based learning, to debate and action research, in a decreasing frequency. In addition, SCL can be an alternative approach when universities face limited staff resources (Janor et al., 2013).

Since the Sri Lankan government has introduced a qualification benchmarking called KSAM. The SCL can be the means of achieving this KSAM. This is similar to the Malaysian MQF (Malaysian Qualifications Framework) which includes eight attributes, according to a recent study by Janor et al. (2013). Those attributes include: (i) knowledge; (ii) practical skills; (iii) social skills and responsibilities; (iv) values, attitudes and professionalism; (v) communication, leadership and teamwork skills; (vi) problem solving and scientific skills; (vii) information management and lifelong learning skills; and (viii) managerial and entrepreneurial skills. Hence, Janor et al. believe that SCL can lead to achieve the MQF.

In a study in Vietnam, Thanh-Pham (2010) identified several practical difficulties in implementing SCL in Vietnamese education sector. He quotes:

> Vietnamese educators are dedicated to importing various Western teaching and learning approaches, especially a student-centred approach and see these approaches as ‘standards’ for local education reforms. This happened because they believe that a student-centred learning approach promises to provide local students with new skills required by the labour market like independence, creativeness, activeness and cooperativeness. In many ways, such advanced approaches can be considered a fashion. (Thanh-Pham, 2010: 22)

Even though Thanh-Pham accepts the idea of SCL, he warns that other local constraints also should be taken into consideration when implementing such huge educational change.

In a Sri Lankan study for a Master’s thesis, Dahanayake (n.d.) investigated the secondary level classes for practicing SCL. His findings reveal that even though teachers and students have a positive attitude towards SCL, the approach is yet to be practised at a greater scale. Hence, studies on tertiary sector are yet to appear in Sri Lanka.
Theoretical underpinning

The epistemological background of SCL is connected to sociocultural approach to learning, originated from the work of Vygotsky. Vygotsky’s sociocultural theory of development treats that learning and development happen in social interaction. Sociocultural theory argues that the role of language and interaction between the teacher and the learners is important for the L1 as well as L2 learners (Mercer, 2001). The importance of dialogic interaction in learning has been emphasised in sociocultural perspectives on learning in both L1 and L2 contexts (Navaz, 2012). Hence, Li (2012) explains that Vygotsky’s sociocultural theory stipulates that formal and conceptual knowledge emerges from a repertoire of daily experience and interaction with adults and peers. Li further explains that constructivism as a learning theory makes learning meaningful. The core constructivist perspectives are as follows: (a) learning is a self-directed process - knowledge is constructed rather than directly received; (b) instructor as facilitator; (c) learning as a sociocultural process. These are the basis on which SCL is built.

Biggs and Tang (2007) echo the same view that constructivism can take several forms such as social and cognitive. The latter was the result of Piaget who considered learning is a mental process, whereas Vygotsky considered it a social process. Nevertheless, Biggs and Tang emphasise that the learners construct knowledge with their own activities, building on what they already know. Teaching is not a matter of transmitting but of engaging students in active learning, building their knowledge in terms of what they already understand. Biggs and Tang believe that:

We prefer constructivism as our framework for thinking about teaching because it emphasizes what students have to do to construct knowledge, which in turn suggests the sort of learning activities that teachers need to address in order to lead students to achieve the desired outcomes. In conceptualizing outcomes-based teaching and learning, constructivism works for us. (Biggs and Tang, 2007: 21)

Similarly, Duffy and Cunningham (1996) explain that constructivism has come to serve an umbrella term for SCL approaches and hence the key concerns of the constructivism are (i) learning is an active process of constructing rather than acquiring knowledge and (ii) instruction supports construction of knowledge but not communication of knowledge.

The foregoing brief review indicates that constructivism could be a suitable theory to explain the underlying theory for SCL. Hence, interaction is a key parameter in implementation of SCL. Moreover, the underlying principle of SCL is being engaging students in learning-teaching process and also it can be described as ‘inside out’ to an ‘outside in’ approach (Lea et al., 2003). In the former, students make the decision of what is required of them, while the latter stipulates that outside authorities make decisions for the students. Hence, students are more attracted to inside-out approach which meets their learning needs and SCL provides a platform for this learning.

Methodology

This study attempted to investigate the aspects of SCL in a quantitative manner at SEUSL; the practice of SCL, the perceived benefits and constraints. For this purpose, a questionnaire has been designed for students to investigate their perceptions of SCL. In addition, views of the lecturers also were accommodated, albeit at a small scale to triangulate the students’ views.

Students from three faculties were randomly selected as convenient samples. Second and third year students were selected from Faculty 1 and 2. The names of the faculties were not revealed due to ethical considerations. In Faculty 3, first year students were selected. In Faculties 1 and 2, L1 is used for instruction, whereas in Faculty 3 English is used as a medium of instruction. The number of students who participated in this survey are given in table 1 below.
Table 1: Number of students who participated in the survey

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</table>

A questionnaire survey was administered. The questions were read by an administrator and the meanings were explained. Students were given freedom to answer the questionnaire which was in English in any language of their choice. Lecturers were contacted face to face or via telephone. The following research questions were formulated:

1. What do the students understand by the term Student Centred Learning? Is SCL practised in their respective faculties?
2. What are the perceived benefits of SCL and constraints in practicing SCL in the university?
3. What do the students perceive of classroom interaction?
   3.1 Do the students ask questions?
   3.2 Do the students answer questions?
   3.3 What factors do influence classroom interaction?

10 lecturers from those three faculties were consulted/interviewed to get their views on SCL.

Findings

I. What is Student Centred Learning?
Surveyed students reported what SCL means as given below:
- From Faculty 1 and 2:
  Students are responsible for their own learning with little help from the lecturers/teachers.
  In SCL students are given focus. In SCL students carry out all learning activities themselves.
  A learning activity to gain additional knowledge and enthusiasm.
  An activity to acquire additional knowledge and skills, while motivating them to learn with eagerness.
- Faculty 3:
  With little guidance from lecturers student find the information using library and internet.
  Students talk 75% in the lecture.
  Students are given chance to tell something about the subject.

II. What is students’ perception of practicing SCL in their faculties?
In Faculties 1 and 2, 90% of the students mentioned that SCL is practised in their faculties. In contrast, in Faculty 3, 58% mentioned that SCL is not practised. Of the surveyed students 5% reported that they don’t know if SCL is practised or not.

III. What are the activities connected to SCL in their respective faculties?
Of those students who marked SCL is practised in their faculties detailed in what ways SCL is practised. I give them below for Faculties 1 and 2, followed by 3.
1. Reference Work – Students are given keynotes only and asked to refer books and find detailed notes. Sometime lecturers provided only the areas of study and asked students to do reference work.
2. Use labs – Here students refer to their work at the IT lab for the IT subject. They sometime prepare projects and programmes for this subject.
3. Presentations – Many students mentioned that they are asked to do presentations in their classes. This includes individual and group presentations.
4. Research project – Students are asked to do small scale project studies and submit reports but this does not cover the final year dissertation.
5. Group work – This covers assignments and presentations too.
6. Debates – Students are asked to make debates on selected topics dividing them into groups.
7. Teaching practise (Faculty 2) – For certain subjects students are asked to conduct micro teaching practices.

In Faculty 3:
In this faculty many students mentioned about the presentations and quiz tests. These are conducted as part of their Continuous Assessments (CAs). In addition, some others mentioned that group activity as examples for SCL. Even though in this faculty nearly half of the study time is spent on practicals none of the students mentioned it as an activity for SCL.

IV. What are the advantages of SCL?
As advantages of SCL students listed the following. Nevertheless, these advantages should be treated as potential advantages because students who had stated that SCL is not practised in their faculty listed this advantages too.

Students get to know new things and also at the same time develop skills to search and find new things. They also consider that it enhances their understanding of concepts. SCL is assumed to be enhancing knowledge and skills of students. For example, they mentioned they produce CDs and write computer programs for the IT subject.

The students perceive that they develop abilities to work independently. This includes their leadership skills and personality development too. Some students feel that their stage fear is eliminated through presentations and also their shyness to talk is reduced.

In addition, some other reasons mentioned by the students were that through SCL higher relationship between lecturers and students could be maintained. Another advantage, as reported by the students, is assessing students could be easy.

V. What constraints and practical problems do students and lecturers face in practicing SCL?
1. Lack of resources – students reported that there are not adequate resources like multimedia projectors, computers and internet facilities.
2. Fear of approaching lecturers – Students stated that they fear to approach lecturers or even they think that a confrontation may arise if students take the lead role that is stipulated by SCL approach. This comes from the value that lecturers should not be challenged in the classroom. A few students also mentioned that when questions are asked the lecturers respond to them harshly so that they do not dare to ask questions again. However, this claim should be verified in future studies. As a whole, students feel that there is lack of understanding between lecturers and students so that practising SCL may be impossible.
3. Some students also feel that when the responsibility of learning falls heavily on the shoulders of students their stress will increase and also it may lead to dropouts and absenteeism.
Asking Questions
Eighty percent of the surveyed students reported that they do not ask questions in the classroom. As a reason some of the students mentioned that they understand all the concepts that are taught in the classroom, but this claim needs further clarifications.
As some other reasons for not asking question students mentioned the fear and shyness to ask questions. As mentioned earlier, students fear to ask questions because they assumed that it could be treated as challenging the authority of the students. In addition, due to language problems also students from Faculty 3 avoided asking questions. Time constraint is another factor that hampered asking or answering questions in lectures. Students reported that time is not allocated for asking or answering questions in lectures.

Answering Questions
In contrast to asking questions, 70% of the students mentioned that they answered questions in lectures.

Suggestion to improve interaction:
Students suggested that increasing the relationship between lecturers and students is a good measure to increase interaction. When the lectures behave friendly with students, students will tend to talk more in the classroom. In addition, students should be trained and guided to talk in the classroom. Giving opportunities to ask questions and make presentations, group activities are also important. They also suggested that giving prior knowledge of the subject will encourage students to interact in the classroom.

In Faculty 3, students suggested that lecturers should focus on all the students equally and give opportunities to all students. They alleged that lecturers’ attention fall on the talkative students. Also they requested that lecturers should not reply in a harsh tone. However, these allegations are limited to one or two lecturers and verification was not possible as students did not reveal the names of these lecturers. Further, they stressed the necessity to establish a friendly atmosphere in the classroom. Students wanted to get more group activities too. They also mentioned that exam oriented teaching should be avoided in lectures.

VI. What are lecturers’ view on SCL?
A few lecturers consulted accepted that presently their faculties do not practise SCL but at the same time agreed that SCL is an important concept for the development of students. Time constraint and the necessity to complete the syllabi within the time frame are the hindering factors if someone wants to practise interactive or collaborative teaching. They stressed that lecturers need proper training before implementing SCL.

They also blamed that students are not cooperative for collaborative learning and stated that students do not answer questions even though they ask questions. A few of the lecturers are also aware of the friendly atmosphere and mentioned that students try to maintain a distance from them that they rarely approach lecturers to clarify any subject related problems. The interviewed lecturers did not accept that they answer the questions in a harsh manner.

Discussion
The findings reveal that students in Faculty 1 and 2 assume that SCL is practised in their faculties, while the majority from Faculty 3 denies its occurrence. However, these acceptance and denial cannot be taken as a good indication of SCL because so far there is no clear understanding of what SCL is among the students and lecturers. SCL can be practiced through different forms such as Active Learning, Collaborative Learning, Cooperative Learning, Problem-based Learning, etc. But, at this university, students and a few interviewed lecturers think that the way lectures are conducted as SCL, considering classroom discussions, leaving out the fact that it is a holistic approach that encompasses many different approaches as listed above.
At SEUSL, even though lecturers and students think that asking and answering question is SCL in reality it may be a single component of SCL. I compare both approaches side by side as discussed by Pedersen and Liu (2003) in table 2. The key differences between the two approaches include goals, roles, assessments, and student interactions.

From this comparison we can easily identify that at SEUSL most characteristics favour traditional teacher centred approaches. Nevertheless, one cannot argue that SCL is not practised at SEUSL at all. Students’ revelations show us that there are different practices leading to SCL along the line but they need to be streamlined.

Table 2 – Differences between the approaches

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Student Centred Approaches</th>
<th>Traditional Teacher Centred Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal of student activity</td>
<td>students work to provide a response to a central question. Have students’ ownership over their process</td>
<td>students work to meet the objectives set by the teacher</td>
</tr>
<tr>
<td>Role of the teacher</td>
<td>the teacher presents the central question (issue, case, problem), and then works as a facilitator as students determine the nature of the response they will develop, and then formulate and carry out a process to develop that response.</td>
<td>In teacher-directed instruction, the teacher sets learning objectives, and then plans a set of activities designed to help learners meet those objectives.</td>
</tr>
<tr>
<td>Assessment</td>
<td>Open ended assessment techniques that are designed to involve students in examining their own learning, focusing their attention on their learning needs and changing understanding rather than on a grade.</td>
<td>teachers use assessments to determine grades, which in turn are used to motivate students.</td>
</tr>
<tr>
<td>Interaction</td>
<td>Collaborative learning emphasizes students’ self-governance of their interactions, allowing them to make decisions about with whom they work, and how.</td>
<td>Teacher directed</td>
</tr>
</tbody>
</table>


Another issue aligned with practicing SCL is the forms of evaluation conducted at SEUSL. At this university end semester written examinations are still popular. For these examinations, students tend to memorize the lecture notes and reproduce at the examinations. Present allocation of marks for continuous assessments⁹ (CAs) is not sufficient, though the new proposals warrant a higher proportion of CAs. It is believed that when assessments are targeted on high level knowledge students tend to work more – to engage in active learning practices. In contrast, if the assessments focus on lower level knowledge students are believed to adopt a surface learning approach (Thanh-Pham, 2011). For example, if the teachers administer MCQ type tests in classes students tend to work alone and try to find the answer as soon as possible. This is true for their end semester assessments and their study

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⁹ Forms of evaluations (e.g. assignments, presentations, reports, etc.) that exclude end-semester written examinations,
approaches too. That is, if assessments are focused on testing the memory of the students, they would not spend time on group or collaborative learning. As far as this university is concerned serious note should be taken to revise the assessments and evaluation in order to facilitate the practice of SCL. On the other hand, increasing the continuous assessment marks to higher level may not be possible either because of the students’ passive attitude and interdependence.

The findings further reveal that the shortage of resources may hamper the implementation of SCL. Students reported that equipment like multimedia projectors, computer and internet facilities are inadequate. Moreover, lecture hall seating arrangements are also structured for lecture mode but not for group activities. Nevertheless, with the pouring funds into this university and to Sri Lankan universities in general via various projects infrastructural facilities and equipment can be acquired in near future.

Another major concern expressed by the surveyed students was that of related to culture of students and lecturers. For SCL there should be higher level of classroom interaction between lecturers and students and among the students. Students in this study reported that they feared to ask questions or answer questions in the classroom. They also feared that there could be a possible confrontation with lecturers if the students take the lead role. In addition, They claimed that there is no cordial relationship between lecturers and students. A previous study by the researcher (Navaz, 2012, 2013) indicated that students in Sri Lankan universities are passive and reluctant to participate in classroom discussions. That is, if SCL to be introduced students’ passive behaviour should be changed. In a previous study by the researcher, two major reasons were indicated for students’ passive behaviour. They are the influence of the school environment and the cultural influence. These two parameters are more important as they deal with students' attitude and therefore I discuss them below.

Influence of the school environment
In the absence of any studies at tertiary level with regard to students’ classroom participation, I refer to study at school level. This study reports that the reasons for the passive behaviour of students are the teacher dominance and teacher centred classrooms in schools throughout their entire school life (Premawardhena, n.d.). Based on this it can be argued that the students who did not have much chance to interact in the classroom and are ‘trained’ to be passive may continue in their reticence at university too.

Therefore, one reason that explains the university students’ reluctance to interact may be the long term passive learning they have been used to in the schools and when they enter university the twelve years of persistent behaviour may not change easily. Flowerdew et al. (2000) also explain that ‘students have passive learning styles inherited from the secondary school system’ (p. 125) and I take up their point below for further discussion.

Students in this study also reported that they feel shy to talk in the classroom. Though no Sri Lankan studies have reported on students’ shyness, in Malaysian ESL school classrooms, Harun (2009) reports that students were shy to answer because they feared that other students would laugh at them. Harun’s finding was similar to the findings of this study.

Cultural influence
In addition to this passive behaviour inherited from school learning, there is another belief among students that lecturers should not be challenged. In a previous study (Navaz, 2012) the researcher found that students considered that asking questions while the lecture was going on as inappropriate behaviour and they also thought this could even be an insult to the lecturer.

With regard to the claim I have made above that Asian students are passive in the classroom, Flowerdew and Miller (1995) claimed that the reluctant attitude of Asian students in participating in classroom discussions is believed to be culturally linked to Confucianism. These claims were made
based on a study conducted among Cantonese-speaking Chinese tertiary level students taught by NS lecturers. Flowerdew and Miller note that the values of Confucianism emphasise that lecturers’ authority should be respected; lecturers should not be questioned, etc. In addition, they claim that Chinese students adopt a receptive role in class and look to the teacher to provide the information needed to successfully pass the course. Further, they consider, it is because of the Confucian values the students are rooted in, that they do not want to expose themselves in a weak position. That is, if they answer questions, they may face the risk of giving a wrong answer, they may worry that their English is wrong, or they do not want to be considered by others as showing off.

With regard to Confucian culture, Biggs (1996) describes Confucian Heritage Culture (CHC). The countries, or the educational systems, in East and Southeast Asia are considered to be influenced by CHC (e.g. China, Taiwan, Singapore, Japan, etc.). These CHC classes are assumed to be authoritarian; students are accustomed to rote learning. However, Biggs, based on several other studies, argues that CHC students are not rote learners. He calls this consideration of rote learners a ‘western misperception arising from a mistaken interpretation of a repetitive effort’ (p. 63). That is, repetitive learning has been misunderstood as rote learning, according to Biggs. Biggs also considers that CHC learners are able to perform at high cognitive levels in academic tasks and are deep learners, if deep learning is defined as handling the task meaningfully.

Moreover, some researchers have challenged the view of Asian students as reticent, for example by Flowerdew and Miller, as an overgeneralisation (e.g. Cheng, 2000). Cheng argues that the reticence of Asian students is not cultural, reluctance or passivity but that it is situation specific. He states that the reticence arises mainly due to methodological differences in the classroom as well as the language proficiency of students in ESL classes. Cheng explains that those Asian students studied in teacher controlled classrooms where students were trained to be passive and, as a result, they may not ask questions of the teachers. In addition, when these students learn in a foreign environment, which is different from the Asian environment, these students may not ask questions because of their limited language skills.

Similar to this argument, Littlewood (2000) states that students from Asian countries would like to learn through active participation and there is little difference in the attitude to learning between Asian students and European students, even though there are differences at individual student level. Littlewood (2000), similar to Cheng, argues that students in Asian countries do not see the teacher as an authority figure who should not be questioned.

Based on the foregoing discussion we can assume that there is reticence among the Asian students but it does not need to be permanent. These Asian students when study in foreign universities along with the western students they perform better than the western students. As a result of the Vietnamese study also a similar view was expressed. The researcher quotes:

[...] it is easy to understand why Vietnamese students are very familiar with accepting knowledge transmitted from the teacher and feel reluctant to express their own ideas in discussions. To change the traditional worldview, there need to be new thoughts about the role of the teacher in transforming knowledge. (Thanh-Pham, 2010: 31)

In addition to the issue of passive behaviour, students mentioned some other problems too connected to practising SCL. Students in this study feared that leaving the burden of teaching and learning on the shoulders of students may increase their stress level. There is high probability that students will resist to this approach when implemented. Lea et al. (2003) expressed a similar view as a result of their study among a higher educational institute in UK. In their study students feared ‘about an approach that lacked structure, guidance and support in the name of being student-centred’ (p. 12).
Another issue is, in the absence of proper guidance and guidelines, lecturers may find difficulties to manage the lessons and deliver SCL successfully. In this study, students in Faculty 3 complained that lecturers should focus on all students equally rather than paying attention to only talkative students. Lea et al. also pointed out that ‘a failure to focus upon what the student does may potentially lead to a division within the class, between those who are able to rise to the challenge of a more student-centred approach and those who are not’ (p. 12-13). That is, any new model that deviates from the traditional didactic teaching approach may be looked upon suspiciously and even loses support from both students and lecturers. Nevertheless, proper training, planning and guidance may lead to success.

In this study it was revealed that students perceive different concepts with SCL. Sometimes students expressed their fear that students may not attend lectures. This fear arises from their understanding of the concept of SCL in which they assumed that students do not need to come to lecture, instead they have to find their own notes in the library or internet. Similarly a few lectures also expressed that SCL always involves group discussions. In reality we have seen that SCL is an approach that encompasses different student centred learner activities without limiting to a single method.

As Napoli (2004) claims student-centred learning is not simply about classroom interaction. He argues that it has implications for curriculum and syllabus design, and assessment and requires a whole change of culture within an institution including syllabus and curricula. If it is the lecturer who should decide his or her mode of delivery of lectures according to SCL, will he or she be in a position to do this? It will be a crucial decision to make what individual activities or methods to use in a lecture that is to be delivered as SCL. We cannot have ‘one size fit for all’ approach. Then the vital question comes ‘who designs this?’ McKenna (2013) also warns that when designing SCL approaches pedagogic elements should be taken into consideration. He argues that there is little consideration of how the disciplinary knowledge is constructed and what norms and values underpin such constructions.

It is unfortunate that those who dictate from higher position forget to tell the constraints and practical difficulties connected to SCL. Higher authorities do not treat students as a vital entity that they should accept this. They think that lecturers have to adopt this new approach getting rid of their old traditional lecture method. Lecturers should also be convinced this new approach is really beneficial for all.

Any change in the educational activities should be implemented through a collaborative effort between those who propose change and those who implement it (Macnab, 2003). Teachers may adopt change under the right conditions such as an innovation which is practical, has support from the top and other teachers, and is backed up by sufficient resources (Fullan, 2001). Therefore, when implementing SCL one needs to consider the issues discussed above.

Limitations of the study and future considerations

This study focussed on the perception of the students and limited discussions with them. In addition, only a few lecturers’ views were accommodated that a very detailed picture of the situation was not obtained. A wider generalisation of findings is not possible either. Nevertheless, in the absence of any studies (published) at tertiary level, I consider this study as a precursor to a more in-depth study in the process of investigating SCL in Sri Lankan universities.

With the limitations of the study in mind, I would like to reiterate the following challenges the educational administrators and higher authorities who are keen on establishing SCL in Sri Lankan universities should take into consideration.

1. Our students have been trained to be passive in classrooms. Making them to be part of educational discussion will be a huge task for the lecturers and also for students themselves. This transformation may take a longer time than we assume. Therefore, a gradual stage by stage or subject-wise introduction of the SCL would be an alternative to consider.
2. Limited resources and larger class sizes in Sri Lankan situation indicate that we cannot adopt any western model to our situation abruptly. Western-developed practices are often supported by structural conditions and cultural values that are not always found in Asia (Thanh Pham, 2011). As mentioned earlier our lecture halls are structured to conduct the lectures in a traditional way and restructuring them and providing necessary equipment are mandatory pre-requisites for SCL. Moreover, unlike western classes, in Sri Lanka, we have more than 200 students for some lectures. In these situations implementing learning strategies to suit SCL warrants careful attention. Hence, a modification of SCL to meet the local needs may be necessary.

3. As SCL is a new and alien concept careful designing in a holistic manner is necessary. The SCL should encompass curricula, materials, methods and evaluation too. Rather a focus on lecture delivery only for SCL may not be a success, even may lead to failures in the approach. The lecturers need guidance and training and careful monitoring of implementation is also necessary.

Reference


The Low Attainment Level of the History Subject at the G.C.E. (O/L) Examination and Its Background: A Study Based on 1C Schools in the Eravur Pattu Division of the Batticaloa Education Zone

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Abstract: Education is the most important device formulated by man to make himself perfect. At a time when history is forgotten and denied, it becomes necessary for everyone to discover and learn their history. It is the school education system that should serve as a motivation to initiate such concerns in history in everyone. However awareness on the subject of history, in respect of Batticaloa, is found to be very rare. In this context, this study is undertaken to find the attainment level of the subject of history in the 1C schools in the Eravur Pattu Division, identify the causes and recommend solutions. Various problems influence student learning and affect the attainment level. This study aims at raising the attainment level by finding the problems and recommending solutions. Four 1C schools from the Eravur Pattu Division were selected on the basis of random selection. When the attainment level of history subject is compared to that of other subjects, it has been found to be low. Subject-related ambiguity, teaching methods, qualification of teachers, students’ environment, the mindset that the subject of history is difficult, lack of supervision, etc. are found to be the causes. The attainment level can be raised by appointing trained teachers, conducting extra practice classes for students, using novel teaching methodology, providing sufficient training to teachers, introducing techniques in teaching and developing the use of supplementary materials.

Keywords: Attainment, History Subject, Improvement of Attainment Level

“அறிவு மற்றும் மதிப்பு வழிபட்டியல் கருத்தியல் பட்டியலை மேற்கொள்ளும் மக்களின் மூலமாக மாற்றம் செய்யப்பட்டுள்ளது. எனவே கூறும் பட்டியல் கருத்தியல் பட்டியலின் மூலமாக மற்ற விகாரங்களுக்கு மாற்றம் செய்யப்பட்டுள்ளது. எனவே கூறும் பட்டியலை மற்றும் மூலமாக மாற்றம் செய்யப்பட்டுள்ளது. எனவே கூறும் பட்டியலை மற்றும் மூலமாக மாற்றம் செய்யப்பட்டுள்ளது.”

10 மாதிரியாை, 2005. (விளக்கத் தமிழ், பகுதி, பகுதி. புலிடேட்டேட்டு, பகுதி:13
நிகாவா முலையிலுள்ள பேச்சு என்பது போல மீண்டும் நீங்கள் பயன்படுத்தக்கூடாது. நிகாவாவுடன் பேசுவதற்கு காரணமாக நீங்கள் பயன்படுத்தக்கூடாது. அதாவது நீங்கள் பயன்படுத்தக்கூடாது பேசுவதற்கு. நிகாவாவுடன் பேசுவதற்கு காரணமாக நீங்கள் பயன்படுத்தக்கூடாது. அதாவது நீங்கள் பயன்படுத்தக்கூடாது பேசுவதற்கு. நிகாவாவுடன் பேசுவதற்கு காரணமாக நீங்கள் பயன்படுத்தக்கூடாது.
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<tr>
<th>குணாலம்</th>
<th>பொறியியல்</th>
<th>பாராமேரிங் சான்றுகள்</th>
<th>வருவாய்</th>
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உயிரியல் பொறியியலாளர்கள்:
முன்னணி செயலார் சிறுமி அவளின் புரோக்கம் எழுக்கு - 6 (புரோக்க எழுக்கு - 11) முன்னணி செயலார்கள் புரோக்கவமல்லாம் கூடிய நாளிலும் தலைவர்களாகவும் செயலியர்களாகவும் செயலியர்களாகவும் மற்றும் புரோக்கக் கூடியான அசூர அனைன்யா பாராமேரிங் சான்றுகளின் கூறுகளை வெளிப்படுத்தும் அதிகம் கூறுகளின் தொடரும் பாதிக்கும் பாராமேரிங் சான்றுகள் 1நவீனப்படுத்தும் முன்னளிரும் ஆலத்துவமான கற்றுடன், அதிகம் கூறுகளையும் வெளிப்படுத்தும் முன்னளிரும் பாராமேரிங் சான்றுகளின் அளவு பாராமேரிங் சான்றுகளின் விளைவுபடுத்தும் முன்னளிரும்

- குறைந்த புரோக்கப்படுத்த பாராமேரிங் சான்றுகள் என்கிறது (என்றும்) 
- புரோக்கம் பாராமேரிங் சான்றுகள் என்றும். 
- பாராமேரிங் சான்றுகள் புரோக்கம் என்றும். 
- பாராமேரிங் சான்றுகளின் விளைவுபடுத்த முன்னளிரும் 

அப்ஸ்டில் பொறியியலாளர்
மண்டல கைவான ஏற்றுமன் புரோக்கக் கூறுகள் முன்னளிரும் என்றும், அதிகம் கூறுகளையும் வெளிப்படுத்தும் முன்னளிரும் 

- அப்ஸ்டில் பொறியியலாளர் பாராமேரிங் சான்றுகளின் விளைவுபடுத்த முன்னளிரும் 
- பாராமேரிங் சான்றுகள் என்றும் 
- பாராமேரிங் சான்றுகளின் விளைவுபடுத்த முன்னளிரும் 

துறவு முன்னளிரும் என்றும்.
நாம் இருக்கும் செய்விகளினரின் செய்விகள் மற்றும் துவாரத்தைக்கூறும் செய்விகள்.

- பாகாட்சிக் அக்ஷரங்களின் அதிகரிப்பு புதுப்பியல்.
- நேர்ப்பாட்டை மூலம் வருவியல் மற்றும் கருத்துறுத்தலைக் காண்பிக்கவும்.
- பார்வோ வசதிக்கான வீரராக வருவியல் புதுப்பியல்.
- கருவியலுக்கு பணத்தட அறிக்கைகள் உருவாக்குணர் பின்னமேகுக் கருவியலைக் காண்பிக்கவும்.

11. இணைக்கும் இலக்கியங்கள் (2008), கலாச்சாலையாவுக்கு, கலாச்சாலை வாழ்வாக
12. இணைக்கும் இலக்கியங்கள் (2007), கலாச்சாலையாவுக்கு, ஜீன்று சோட்டூர் (பு) ஓர், நோன் மார்ப்
The image contains a page from a document discussing the social sciences and humanities. The text is in Tamil, and the content discusses the progression and analysis of certain metrics over the years 2009 to 2012. The page includes a chart with data points for each year, indicating changes and trends. The chart is labeled with the years and shows a comparison between different categories or metrics. The text on the page provides additional context and analysis based on the data presented in the chart.
ஆதிபுராணத்தில் 20% மாதம் மாதங்கூக்கு படையும் அறிச்சந்தை விளக்கும் படையும் மாதத்தில் மாதங்கூக்கு மாதக்கு அறிச்சந்தை வெளியான 80% அறிச்சந்தையையம் மாதங்கூக்கு படையும் மாதத்தில் விளக்கினாடைகளும் புநர்முகமாகிவிட்டத்தக்க ஆராதனைகளே.

ஆதிபுராணத்துக் கைவரிகளின் பல்முக்கியமான விக்கோக்காலப்படும் காலப்பிட்டித்தம். அது குறுக்கு அதிபுராணத்தில், காலப்பிட்டிகள், ஆதிபுராணத்தின் குறுக்குக்காலப்படும் காலப்பிட்டிகளை? என்று உள்ளாண்டு புனரிட்டே போரம் அந்தூரை புனரிட்டே போரம் புனரிட்டே போரம் உள்ளாண்டு காலப்பிட்டிகளை?

![Diagram](image1)

6.2 வல்லை: கட்ட அம்சம்

மாதங்கூக்கு கைவரிகளின் பல்முக்கியமான விக்கோக்காலப்படும் காலப்பிட்டித்தம். ஆதிபுராணத்தில் குறுக்கு அதிபுராணத்தில், காலப்பிட்டிகள், ஆதிபுராணத்தின் குறுக்குக்காலப்படும் காலப்பிட்டிகளை?

ஆதிபுராணத்தில் கைவரிகளின் பல்முக்கியமான அதிபுராணத்தில் காலப்பிட்டித்தது. multimedia, விக்கோக்காலப்படும் காலப்பிட்டித்தது. என்று உள்ளாண்டு புனரிட்டே போரம் உள்ளாண்டு காலப்பிட்டிகளை?

![Diagram](image2)

6.3 வல்லை: கட்ட அம்சம்

மாதங்கூக்கு பல்முக்கியமான விக்கோக்காலப்படும் காலப்பிட்டித்தது. ஆதிபுராணத்தின் குறுக்கு அதிபுராணத்தில் காலப்பிட்டித்தது. multimedia, விக்கோக்காலப்படும் காலப்பிட்டித்தது. என்று உள்ளாண்டு புனரிட்டே போரம் உள்ளாண்டு காலப்பிட்டிகளை?

![Diagram](image3)

6.4 வல்லை: கட்ட அம்சம்
காந்திப்பிளையுடன்

ஆயுர்வேதக் காரணிகளின் பல்கலைகள் காலச்சாரங்கள் மற்றும் அதிசயியின் பல்கலைகள் விளையாட்டில் 39% ஆகும். கிருத்தக்காலத்துக்கு அகழியுள்ள கருத்துக்களில் 61%. கூறியுள்ளார்.

அதன் பட்டியல் வரலாற்றுத் தொடர் செயல்பாடு, வீரிகள் நாட்டின் கருத்துக்களில் இரும்பிமபிக்க கருத்துக்கள் பல்கலைகள் விளையாட்டில்.

முற்போது பார்வீத கருத்துக்களில் செய்யப்பட்டுள்ள சுற்றுப்புறச் சார்பினர் மற்றும் நோய் செயல்பாடுகள் காண்பிற்கட்டும்.
களாழி போக்காளையின் மூலச் செயலைக் கருதவில்லை. அவர்கள் கூறியுள்ள என்றால் மூலச் செயலை என்றால், ஹங்காரசார போக்காளைகளுக்கு செயல்படும் காலத்தில் முன்னர் நூற்றாண்டு பாய்ந்து விளக்கும் அதிகாரச் செயல் மற்றும் போக்காளைகள் கூறியுள்ள என்றால், என்று பார்க்கிறோம்.

முற்போக்காளை அமெரிக்சு போக்காளையின் செயலைக் கருதவில்லை. போக்காளையின் மூலச் செயலைக் கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளை�ின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளை�ின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளை�ின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் செயலை கருதவில்லை. போக்காளையின் மூலச் 


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சொற்றொடர்கள்:

நூறு பக்கங்களையிலுள்ள முக்கிய தொகுப்புகள் பல்வேறு பாரம்பரியங்களின், மாநிலத் தொகுப்புகளின் மற்றைய மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவாக கூறியது. அதற்கான் பல்வேறு பாரம்பரியங்கள் மற்றும் மெய்யூற்றிய சிதற்சொற்றொடர்கள் பல்வேறு பாரம்பரியங்களின் மற்றைய மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது.

அத்தில் பல்வேறு பாரம்பரியங்களின் மற்றைய மெய்யூற்றிய சிதற்சொற்றொடர்களை பல்வேறு பாரம்பரியங்களின், மெய்யூற்றிய சிதற்சொற்றொடர்களின் மற்றைய மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது. அதற்கான் பல்வேறு பாரம்பரியங்கள் மற்றும் மெய்யூற்றிய சிதற்சொற்றொடர்கள் பல்வேறு பாரம்பரியங்களின், மெய்யூற்றிய சிதற்சொற்றொடர்களின் மற்றைய மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது.

மெய்யூற்றிய சிதற்சொற்றொடர்கள் காலம் மற்றும் தொகுப்புகள் மற்றைய மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது. அதற்கான் பெரும்பான்மையான் பாரம்பரியங்களின், மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது.

மெய்யூற்றிய சிதற்சொற்றொடர்கள் காலம் மற்றும் தொகுப்புகள் மற்றைய மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது. அதற்கான் பெரும்பான்மையான் பாரம்பரியங்களின், மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது. அதற்கான் பெரும்பான்மையான் பாரம்பரியங்களின், மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது. அதற்கான் பெரும்பான்மையான் பாரம்பரியங்களின், மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது. அதற்கான் பெரும்பான்மையான் பாரம்பரியங்களின், மெய்யூற்றிய சிதற்சொற்றொடர்களை நினைவு செய்யும் பண்புடையது.
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3. Ibid.

SOCIAL SCIENCES AND HUMANITIES

Proceedings, 04th International Symposium, SEUSL
Page 218
1. Cathartic Method (Free Association)
2. Dream Analysis

Cathartic Method


Dream Analysis

(Meier, 1980: 390).


The Effects of Internet Usage on Youths’ Socio Ethical Behavior: 
An Applied Ethical View

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Abstract: Internet is a vast system of computers that are networked or linked together to exchange information. It is a network of networks which shares global resource that is not owned or regulated by anyone. Internet is not only about computers, it’s about people, communication and sharing information. Historically there are different methods of information sharing yet internet and computers make us realize how the world is narrowed down to a village. With the arrival of the internet, world communication took a giant leap which leads to a way of overcoming physical boundaries like distance to allow minds to meet by having conversations with peoples across the world. The world today depends and thrives on information. Information not being global is of little use and internet gives us the ability to access varies kinds of information around the globe at any given time. At the same time, the social networks such as facebook, twitter and etc. change the behavior of youths sometimes in negative ways in certain situations. This questions the ethics of a person. Ethics is a principle which tells what is right and wrong. Everybody knows it’s wrong to lie, cheat, steal and etc. However, some people do not know that disadvantages of using social networks leads into behavior disorder. Nowadays most of the youths are addicted to social networks like facebook, twitter, and etc. and we could also see the rate of cybercrime increasing. This creates more practical problems in the society. My view of this research is to give youths’ erroneous usage of internet and facebook usage. The outcome of this analysis is that most of the youths are using internet and facebook for unfavorable information. The research is based on analytical, evaluation and distributive methods. The suggestion has been presided.

Keywords: Internet, Facebook, Behavior Disorder, Immoral
ஏதுமான்னிகள் வேறுபாட்டுக்கு தீர்க்கப் பயன்படுத்தமுற்படுத்திய பணியில் ஒன்றை குறிப்பிடுகிறது. விளக்கம் நீரியே மறுத்தவர்களுக்கு தம்செடாய்த்து வருகின்றன. இந்தப் பணியில் அல்லது தம்செடாய்த்து வருகின்ற பணியில் ஒன்றை விளக்கம் குறிப்பிட்டு வருகின்றன. தம்செட நீரியே மறுத்தவர்களுக்கு தம்செடாய்த்து வருகின்ற பணியில் ஒன்றை விளக்கம் குறிப்பிட்டு வருகின்றன. விளக்கத்தின் பகுதியில் அல்லது தம்செடாய்த்து வருகின்ற பணியில் ஒன்றை விளக்கம் குறிப்பிட்டு வருகின்றன. தம்செடாய்த்து வருகின்ற பணியில் ஒன்றை விளக்கம் குறிப்பிட்டு வருகின்றன.
1. குறுக்குறிக்குட்படுத்தி
2. குறுக்குறிக்குட்படுத்தி...
வெறுத்துற்கள் மனிதக் கல்வியில் பல்வேறு தொழில்முறைகள் மற்றும் தொழில்முறைகள் விளக்கப்பட்டுள்ளன. இவற்றுடன் இணைக்கப்பட்டுள்ள ஒவ்வொரு தொழில்முறையும் மற்றும் தொழில்முறையும் விளக்கம் மற்றும் தொழில்முறைகளின் விளக்கம் என்று குறிப்பிட்டிருப்பது. இவற்றுடன் இணைக்கப்பட்டுள்ள ஒவ்வொரு தொழில்முறையும் மற்றும் தொழில்முறையும் விளக்கம் மற்றும் தொழில்முறைகளின் விளக்கம் என்று குறிப்பிட்டிருப்பதற்கு பிற்கு பண்பாடுகள் வைக்கப்பட்டுள்ளன.  

இல்லாத தொழில்முறையில் பல்வேறு தொழில்முறைகள் மற்றும் தொழில்முறைகள் விளக்கப்பட்டுள்ளன. இவற்றுடன் இணைக்கப்பட்டுள்ள ஒவ்வொரு தொழில்முறையும் மற்றும் தொழில்முறையும் விளக்கம் மற்றும் தொழில்முறைகளின் விளக்கம் என்று குறிப்பிட்டிருப்பது. இவற்றுடன் இணைக்கப்பட்டுள்ள ஒவ்வொரு தொழில்முறையும் மற்றும் தொழில்முறையும் விளக்கம் மற்றும் தொழில்முறைகளின் விளக்கம் என்று குறிப்பிட்டிருப்பதற்கு பிற்கு பண்பாடுகள் வைக்கப்பட்டுள்ளன.
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Mortgage Aerodromes

The increase in the number of aerodromes has raised many challenges, particularly in the context of the economic development of the country. The challenge is to determine the number of aerodromes required to achieve the economic development of the country. The government of Sri Lanka is the largest owner of aerodromes in the country. The government has been spending a large amount of money on the maintenance and development of aerodromes. However, the number of aerodromes is not enough to meet the demand for the economic development of the country.

The government of Sri Lanka has been spending a large amount of money on the maintenance and development of aerodromes. However, the number of aerodromes is not enough to meet the demand for the economic development of the country. The government has been investing in the development of aerodromes. However, the number of aerodromes is not enough to meet the demand for the economic development of the country.

The government of Sri Lanka has been investing in the development of aerodromes. However, the number of aerodromes is not enough to meet the demand for the economic development of the country. The government has been investing in the development of aerodromes. However, the number of aerodromes is not enough to meet the demand for the economic development of the country.
GDPR = f (DK, DFI, FK, L)

\[ Y = \alpha + \beta_1 L + \beta_2 K + \beta_3 F + \beta_4 (\text{T} \times \text{F}) + \varepsilon \]

\[ Y = A \, \phi (K, L, F, \Omega) \]

\[ \text{Yt} = \alpha + \beta_1 \text{Lt} + \beta_2 \text{Kt} + \beta_3 \text{FDIt} + \beta_4 (\text{TPt} \times \text{FDIt}) + \varepsilon_t \]
\[ Y = f(A, K, L) \] 

\[ GDP = f(FDI, DI, LF, TTE) \]

\[
\begin{align*}
GDP &= \beta_0 + \beta_1 FDI_t + \beta_2 DI_t + \beta_3 LF + \beta_4 TTE_t + u_t \\
GDP &= \beta_0 + \beta_1 \log FDI_t + \beta_2 \log DI_t + \beta_3 \log LF + \beta_4 \log TTE_t + u_t \\
\log GDP &= \beta_0 + \beta_1 \log FDI_t + \beta_2 \log DI_t + \beta_3 \log LF + \beta_4 \log TTE_t + u_t \\
\log GDP &= \beta_0 + \beta_1 FDI_t + \beta_2 DI_t + \beta_3 LF + \beta_4 TTE_t + u_t
\end{align*}
\]

The model for GDP is estimated using the regression equation (1) where GDP is the dependent variable and FDI, DI, LF, and TTE are the independent variables. The results indicate that all the variables are statistically significant at the 0.01 level. The R-squared value of the model is 0.85, indicating a good fit. The estimated coefficients are as follows: \( \beta_0 = 1.0 \), \( \beta_1 = 0.5 \), \( \beta_2 = 0.3 \), \( \beta_3 = 0.2 \), and \( \beta_4 = 0.1 \).

For the logarithmic transformation, the model is given by (2) where \( \log GDP \) is the dependent variable and \( \log FDI_t \), \( \log DI_t \), \( \log LF \), and \( \log TTE_t \) are the independent variables. The results show that all the variables are statistically significant at the 0.01 level. The R-squared value of the model is 0.83, indicating a good fit. The estimated coefficients are as follows: \( \beta_0 = 1.0 \), \( \beta_1 = 0.5 \), \( \beta_2 = 0.3 \), \( \beta_3 = 0.2 \), and \( \beta_4 = 0.1 \).

The estimated coefficients for the original model are: \( \beta_0 = 1.0 \), \( \beta_1 = 0.5 \), \( \beta_2 = 0.3 \), \( \beta_3 = 0.2 \), and \( \beta_4 = 0.1 \).

The estimated coefficients for the logarithmic model are: \( \beta_0 = 1.0 \), \( \beta_1 = 0.5 \), \( \beta_2 = 0.3 \), \( \beta_3 = 0.2 \), and \( \beta_4 = 0.1 \).

The results indicate that all the variables are statistically significant at the 0.01 level. The R-squared value of the model is 0.85, indicating a good fit. The estimated coefficients are as follows: \( \beta_0 = 1.0 \), \( \beta_1 = 0.5 \), \( \beta_2 = 0.3 \), \( \beta_3 = 0.2 \), and \( \beta_4 = 0.1 \).

The estimated coefficients for the logarithmic model are: \( \beta_0 = 1.0 \), \( \beta_1 = 0.5 \), \( \beta_2 = 0.3 \), \( \beta_3 = 0.2 \), and \( \beta_4 = 0.1 \).
சரணாமரங்களால் முன்னணியாக மாணவர்கள்தான் முதல் முடிக்கும் குழுவாய்ந்த முயற்சிகளை பகிர்த்து கொண்டுள்ளனர். இவ்வகுருவின் இடைவாண்ட வருடா போன்றவையும் கேதரியாகவும் விளக்குவது. இதனைப் பின்னர் வலர்ந்து காண்களை வருவது.

**சிலையறிவு துறையில் அமையும் பயிர்பிட்டு துறையில் பந்த்ராயிக்குப் பார்க்க (1978-2012)**

Source: Central Bank of Sri Lanka, 2013

**சிலையறிவு துறையில் அமையும் பயிர்பிட்டு துறையில் பந்த்ராயிக்குப் பார்க்க (1978-2012)**

Source: Tourism Development Authority (2012)
Nfzy; nghUj;Jif tiuglj;jpd; gb nkhj;j cs;ehl;L cw;gj;jpf;Fk;> Rw;Wyhj;Jiw

Ntiy tha;g;G> Copadg; gil > cs;ehl;L KjyPL> ntspehl;L Neub KjyPL

vd;gtw;wpf;fpilapy;

Neh;j;njhlh;G fhzg;gLtij NkYs;s tiuglq;fs; fhl;Lfpd;wd.

Kernel Fit (Epanechnikov, h= 1.e+06)

Kernel Fit (Epanechnikov, h= 1.e+06)

Kernel Fit (Epanechnikov, h= 1.e+06)

Kernel Fit (Epanechnikov, h= 1.e+06)
### Table: Regression Results

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Coefficient (β)</th>
<th>t Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1159572</td>
<td>-2.881463</td>
<td>0.0073</td>
</tr>
<tr>
<td>FDI</td>
<td>-7.704932</td>
<td>-2.832599</td>
<td>0.0088</td>
</tr>
<tr>
<td>DI</td>
<td>3.176549</td>
<td>16.76916</td>
<td>0.0000</td>
</tr>
<tr>
<td>LF</td>
<td>130.9696</td>
<td>1.93324</td>
<td>0.0642</td>
</tr>
<tr>
<td>TTE(-2)</td>
<td>8.147321</td>
<td>3.391018</td>
<td>0.0022</td>
</tr>
<tr>
<td>AR(1)</td>
<td>0.615907</td>
<td>3.366759</td>
<td>0.0024</td>
</tr>
</tbody>
</table>

- R-Sq(adj) = 99.7%, Prob(F-statistic) = 0.0000
- *1% Critical Value
- **5% Critical Value

The regression results indicate a strong fit for the model, with an R-Sq(adj) of 99.7% and a Prob(F-statistic) of 0.0000, suggesting a high level of significance. The coefficients for each predictor are statistically significant at the 1% and 5% levels, indicating a strong relationship between the predictors and the dependent variable.
Increasing Student Talk Time In The Esl Classroom: An Investigation of Teacher Talk Time and Student Talk Time

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Abstract
Creating an environment where learners are no longer dependent on the teacher is the main reflection of a learner centered classroom. In a language learning classroom, students learn the skills to read, write, listen and speak. The best way to learn and teach a foreign language is to use that language. The purpose of communicative language teaching approach is to communicate in the target language or to use it in communication. In the communication there must be interaction between teacher and student or student and student. According to my colleagues and my experience, though the door for classroom interaction is very open students’ participation is very poor in some classes. This paper attempts to test this hypothesis and provides some systematically tested ways to increase the amount of Student Talk Time (STT) which leads to a learner centered approach.

Key words: teacher talk time, learner centered classroom, communicative approach

Introduction
It is often discussed that both teachers and students should participate actively in language classes. Especially, in communicative EFL classes students need ample opportunity to practice the target language so that the teacher should reduce the amount of their talk. Researching on the student and teacher talk time always produce new approach and insides to teach a language. Most teachers believe that the students have to receive as much opportunity to speak as is possible when learning English as a target language. This idea is especially true in the EFL classroom, where students don't live in an English-speaking country. In such cases, the students may only have the chance to practice English as a conversational tool during the lesson. But whatever the situation, it is true the more students speak in English, the better English speakers they become.

Purpose of the Study
A language teacher must design her/his lessons to make participation of all most all the students in a classroom so his/her lesson plan has to include a certain percentage for teacher talk time (TTT) and student talk time (STT) to teach each skill. In a learner centered classroom, TTT must not exceed the expected percentage. In some cases student involvement is not very privileged. So that, though they have more knowledge in structure they are unable to apply that in the real communication. Whether it is oral or written, communication is the main target of a language. This study tests the hypothesis that the students’ participation is poor and collects students' attitudes towards increasing student talk time. Further it intends to bring together their views regarding classroom interaction methods.

Limitations of the Study
This study was conducted among the students of Faculty of Arts and Culture. According to the common view of the teaching faculty of the first year Arts students, those students who are divided into ten ability groups are very much forward and coorporative not only in elicitation but also in doing spoken activities. But the condition with other faculty students is questionable. I hope further research must be carried out comparing the percentage of student talk time of different faculty students to examine this situation.
Benefits resulting from the study
The analysis of the research shows that students have positive attitudes towards increasing STT which leads to a learner centered approach that most of the educators welcome. So the findings of the study open a new path to the curriculum designers, material producers, lesson planners, language trainers and teachers to integrate more STT in their lesson planning. This sort of research can inspire other language teachers to conduct research in their classrooms because it is considered to be an important tool for professional development. Contrary to what had been hypothesized, this research has revealed the positive attitudes of the learners towards increasing the amount of STT.

Literature Review
Teacher talk time (TTT) refers to how much the teacher talks during a lesson. However, this will vary according to the stage of the lesson. For example, the teacher needs to speak more when starting a new lesson. When he continues the same lesson next time he may speak less as students need ample opportunity to practice the new material. In a common view, the teacher must roughly limit his speaking to 20% to 30% of the class time allowing the students to make use of the language.

Allwright (1982, p. 10) said that teachers who ‘work’ too much in the classroom were not teaching successfully. He mentioned that a good language teacher is able to ‘get students to do more work’ in the classroom. Nunan, (1999, p. 209) also indicated that continuous teacher talk during the lessons did not develop students’ listening comprehension and communication skills. Nunan (2003, p. 55) proves the earlier fact, mentioning that “Research has repeatedly demonstrated that teachers do approximately 50 to 80 percent of the talking in classrooms.”

As far as a learner centered classroom concerned, to practice the target language Student Talk Time (STT) be supposed to be around 80% during the course of the lesson (Nunan, 1991). Consequently it is needed to incorporate the learner centered approach into the existing curricula in all disciplines not only in the international level but also in local context. In a foreign or second language classroom, for instance a teacher introduces a new lesson (even to make it more learner centered classroom teacher can give students the choice of selecting what they are going to learn) such as talking about the daily routine. To introduce the new vocabulary connected with the routine first teacher can elicit the vocabulary from the students then the teacher will focus on the form of making sentences with present simple tense in affirmation and negation.

To introduce a new grammar lesson teacher can spend 60 to 80 teacher talk time, whereas the next day she/he can get practice with the students to talk about their daily routine. This time, more than 60 to 80 percentages of talk would be done by students. It is reasonable for a teacher to allocate a different percentage of time to teach grammar, vocabulary, reading, spoken and listening activities. Nunan highlights it mentioning, “Of course, whether or not it is considered a good thing for teachers to spend 70 or 80 percent of class time talking will depend on the objectives of a lesson and where it fits into the overall scheme of the course or programme” (Nunan, 1991, p. 190).

It is notable to consider about what Nilton (2011) discusses regarding Nunan’s suggestion is very much suitable to present here. He explains that if the focus of the lesson is not conversational for example the lesson is to write an essay or description, a student may expect a period of TTT to lecture on the processes involved in the construction of a paragraph, then they will follow a silent period to employ the techniques they have learnt to construct a composition production.

Nilton (2011) accepts that though he practices 60 to 80 percentages or 40 to 60 percentages of teacher talk time (TTT) respectively for elementary and intermediate levels when he teaches oral communication, these figures are beyond the adequate level TTT.
If there is more talk by the teacher, students become passive and their involvement in the classroom participation would be very less. This is what was experienced in the traditional chalk and talk method.
Students’ use of the language must be further promoted for a high range of qualitative thought once they become capable to respond/communicate in simple necessary discussions. They have to be able to communicate, critically observe, analyze, and practice with the new language in a successful learning environment.

Much research on TTT has focused on its quantity (amount) and/or quality (effectiveness). These studies have provided new insights into the ways EFL/ESL teachers teach in the classroom.

**Learner Centered Approach**

In the current era, the term ‘learning’ leads the term ‘teaching’. It is not teaching a language alone it depends on learning and learning. That is why to increase the learning environment, learner centered approach (LCA) is needed to imply in learning and teaching a new language.

In a teacher centered classroom, teachers are working more. They ask the questions, they call on students, they add detail to their answers. They offer the examples. They organize the content. They do the preview and the review. On any given day, in most classes teachers are working much harder than students. Therefore it is observable that students develop sophisticated learning skills without the chance to practice and in most classrooms the teacher gets far more practice than the students. However, LCA engages students in the hard, messy work of learning.

Again it includes explicit skill instruction. In an LCA environment students are taught how to think, solve problems, evaluate evidence, analyze arguments and generate hypotheses which all these learning skills are essential to be familiar in a discipline. LCA encourages students to reflect on what they are learning and how they are learning it. Further it motivates students by giving them some control over learning processes. Research proves that students can learn from and with each other in collaboration in a classroom. Teachers experienced in LCA work to develop structures that promote shared commitments to learning. They see learning individually and collectively as the most important goal of any educational experience.

Understanding LCA will help to identify the area of the current study that a learner-centered approach involves less teacher talk and more opportunity for students to speak in the L2 classroom. The following trends in LCA elaborate that the amount of teacher talk and student talk time plays a key role in determining whether or not one's teaching methodology is in track with an LCA.

The best way to make students’ participation is elicitation in the classroom in a learner centered approach lesson. Language learning is not like listening to constant lecture they have to involve in the classroom further students have inborn ability to acquire a language. They have knowledge and experiences of life and language which can contribute greatly to the learning process. When introducing new structure it is very important to elicit answers from students rather than pouring knowledge. Rutherford's explanation supports the same idea that the more learners contribute in the L2 classroom, the more they are likely to learn (Rutherford, 1987, p. 7). So, teachers must never underestimate the ability of their students. Through a lively discussion with the students the teacher will introduce a lesson appreciating their ability and correcting their erroneous understanding. According to the answers given to the 10th question of the survey, 40 students accepted that through open ended teacher questioning they can improve their communicative skill while 28 students chose that they can improve it through closed ended teacher questioning.

The focus of an LCA lesson is on learners' experience and interests. Therefore, when selecting a topic for a discussion it must be according to the students’ interest. Nunan (1989) explains the same like if, however, teachers use the course book as an aid for the completion of tasks related to the students'
areas of interest and experience, the students are more likely to become involved in the lesson, thereby learning more (Nunan, 1989).

In learning a second language or a foreign language, paying much attention to the correctness ought to be avoided. Because in a learner centered approach, communication is the prime source not the accuracy. If a teacher constantly corrects the mistakes then the students will not be able to open their mouth further. Hence, the attempts of the students will be stopped. A good teacher will not interrupt the students when they are practicing, it is better to take a note on the mistakes of the whole class and give feedback correcting them without pointing out the particular student who did the mistakes at the end of the session. The above mentioned principles portray the process of learner centered approach.

**Method**

To have a survey a questionnaire was distributed among fifty first year students of the Faculty of Arts and Culture who are following the second semester for the academic year 2011/2012. The models were selected among four hundred students consisting of both gender and multi ethnics. They are mixed ability students whose results in the last English Language examination have varieties of grades like A, B, C and D. They are in their early twenties. They were free to answer the questions. Though the students are unaware of the terms TTT and STT through the simple questions asked in the questionnaire they were able to answer them very easily.

**Analysis of the data**

Thirty students; among those who have A+, A or A- grades like to improve their spoken skill while twenty-six students want to improve their writing skill and grammar. Ten students want to improve only grammar. Those who want to improve grammar or writing have lower grades for English language in the semester end examination.

For the third question “Do you like to talk in the English language classroom?” beside one, forty-nine students it means 98% of the students like to talk. It shows a very positive attitude of the students towards STT. Next question requires the reason being fond of talking. The following chart explains their needs to talk clearly.

(Figure 1 - Reasons for why students need to speak in English)

As the figure one shows 50% of the students like to talk in the classroom as they can improve their spoken skill and get fluency in a second language. They like to talk with peers and the teacher some students hesitate to talk to the teacher.
Again figure two shows a positive attitude of students towards increasing interaction in the classroom. 46% of students like to interact both with teachers and their friends. 31% want to talk only among peers. They might be afraid of doing mistakes in front of teacher, getting a low grade, appearing stupid, did not do homework or do not know the correct answer. A few of them suggested having functions where students would be able to show their talents on stage.

Thirty-nine students responded that lecturers very often or often or sometimes give the opportunity to interact in the classroom while only one student responded that they never give chances. The above situation again elaborates that students also like to interact in the classroom, even the teacher encourages them to use it. Therefore, the motivation to have an interactive lesson is welcomed by both student and teacher. For the eleventh question “How effective is teacher student interaction in your ESL classroom?” 58% and 40% of the students expressed that it is very good and good respectively while only 2% of them commented that it is fair. As a whole we can come to a conclusion that students have a positive attitude towards increasing STT and they like to have a more learner centered approach in language acquisition with the support of their teachers.

Discussion
Language acquisition includes skills like listening, speaking, reading and writing if a learner wants to get familiar with a foreign or second language he must be good at in all these skills. So far in Sri Lankan education system only the writing and reading skills are tested in the G.C.E. Ordinary Level and Advanced Level examinations. The government is incorporating spoken activities in the text books and they are going to test it in the G. C.E. Ordinary Level in 2015 providing fifteen marks for oral. Therefore, many students not only from the Faculty of Arts and Culture but also from other faculties face problem in speaking. Though they scored good performance in structured grammar questions they score less marks in communicative based questions. As they have been trained to pass the written examination in the general examinations, they face many challenges in acquiring fluency in spoken.

University students become more aware to enhance their spoken ability. They know even though they get degrees in Tamil medium, they have to face any sort of interviews in English. As their responses to the fourth questions suggest, they like to use the opportunity to talk in English in English language teaching classrooms besides which they do not have chances to talk outside. In Sri Lanka despite the fact that English is considered as a second language the environment is limited only to the classroom. Therefore, many of the students prefer to exploit the opportunity in the ESL classroom fruitfully. So the need for concentrating on spoken variety is very important.

There are five important principles for teaching speaking. The first is to manage the classroom where all students want to participate reducing TTT and increasing STT. Then the learners' participation must
be high. The third is to provide communication opportunities with a variety of activities. Then let them talk what they want to talk about. Then encourage them to use their second language outside the classroom. Finally give appropriate feedback (Nunan, 2003).

Several speaking activities were introduced by scholars like Ur (2005), Harmer (2012) and Nunan (2003); among them this research highlights Ur's interaction patterns such as group work, pair work, individual work, closed-ended teacher questioning (IRF) open-ended teacher questioning, choral responses, collaboration, student initiates teacher answers, full-class interaction and self access. Further knee to knee conversation, face to face variation, tiny talks, show and tell the inventors’ seminar, twenty questions, picture cards, acting from a script, play-scripts, acting out dialogues, communication games, prepared talk, questionnaires, role-play and Carol's quick quest are some other practices (Harmer, 2012).

**Conclusion**
The survey suggests that many students prefer to have much interaction in the classroom and they advocate it is very effective. As the current trend in education acknowledge learner centered approach, it is enhanced to increase the student talk time seeing that, it allows the teacher to restrict his speaking to vital areas of the lesson, students to speak more. Therefore, the students have more chances to experiment with and personalize the language and to rely on their skills. Further, they have added opportunity for interest and challenge. For that reasons it is clear that the class greatly benefits from limited talking by the teacher. Implying the activities recommended by the language scholars will facilitate to increase the student talk time.

**References**

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எண்ணின் வரையறை: தினசரி தொகுதியில் மேலும் பெரும் அளவு கொண்டவைகள் அல்லது அளவு பெருமானாக கொண்டவைகள் ஆவியம் தொலைபெயர் தொலைவு வடிவில் வெளியிட்டபட்ட வகையான நூற்றுநிலைகளுள் ஒன்று. இது குறிப்பிட்டு, மேலும் தினசரியில் தொடர்பு இயங்குவதற்கு காரணமான தினசரி வேளாநிலை பெருமானாக கொண்டவைகள் அல்லது ஆற்றல் நேரத்தில் காணப்பட்டுள்ள வகையான நூற்றுநிலைகளுடனே உருவாய்கின்றது. செயற்கையாக தினசரியில் தொடர்பு இயங்குவதற்கு காரணமான தினசரி வேளாநிலை காணப்பட்டுள்ள வகையான நூற்றுநிலைகளுடனே உருவாய்கின்றது. இதன் படி தினசரியில் தொடர்பு இயங்குவதற்கு காரணமான தினசரி வேளாநிலை காணப்பட்டுள்ள வகையான நூற்றுநிலைகளுடனே உருவாய்கின்றது.

எண்ணின் உரைப்புறம்: கண்டுபிடித்த தொடர்பு வழியில் மேற்கொண்ட அளவுகள் இடையில் மேற்கொண்ட அளவுகளையும் அமைந்து வழிநிலைகளை பராமரித்துள்ள வகையான நூற்றுநிலைகளுடனே உருவாய்கின்றது. இதன் படி தினசரியில் தொடர்பு இயங்குவதற்கு காரணமான தினசரி வேளாநிலை காணப்பட்டுள்ள வகையான நூற்றுநிலைகளிடையே அமைந்து வழிநிலைகளை பராமரித்துள்ள வகையான நூற்றுநிலைகளுடனே உருவாய்கின்றது. செயற்கையாக தினசரியில் தொடர்பு இயங்குவதற்கு காரணமான தினசரி வேளாநிலை காணப்பட்டுள்ள வகையான நூற்றுநிலைகளுடனே உருவாய்கின்றது. இதன் படி தினசரியில் தொடர்பு இயங்குவதற்கு காரணமான தினசரி வேளாநிலை காணப்பட்டுள்ள வகையான நூற்றுநிலைகளுடனே உருவாய்கின்றது.
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page 240
உலாணமலாயில்

மேலும் ஒரு காரணத்தைக் கொண்டு பிந்தைய விளக்கங்கள் 25 அல்லது இன்னொத்த மூலமான பின்னைத்தரங்களை வருடமாக தெரியவும் பொருளாயில் கூறுவது போன்ற பின்னைத்தரங்களை என்னும் மூலம் இல்லாது தெரியவும்

ஒருவர் நூற்றாண்டையும் கவுன்று தனித்துவமான புராணப் பாதுகாப்பு நான் ஆக்கிரமிப்பு மாற்றும் மூலம் இல்லாது தெரியவும்

இணையத்தில் ஒரு இணையத்தில் குறுக்கு தனித்துவம் புராணப் பாதுகாப்பு, புராணப்பு போன்ற புராணப் பாதுகாப்பு, என்று பொருளாயில் கூறுவது போன்ற பின்னைத்தரங்களை என்னும் மூலம் இல்லாது

சிற்றூட்டினால் காணப்பட்டவை பெரும்பான்மை புராணப் பாதுகாப்பு, புராணப்பு போன்ற புராணப் பாதுகாப்பு, என்றால்

பொருளாயில் கூறுவது போன்ற பின்னைத்தரங்களை என்னும் மூலம் இல்லாது

அம்சத்தை ஒரு காரணத்தைக் கொண்டு பின்னைத்தரங்களை என்னும் மூலம் இல்லாது

முதலில் பின்னைத்தரங்களை என்னும் மூலம் இல்லாது

உலாணமலாயில் நூற்றாண்டையும் கவுன்று தனித்துவமான புராணப் பாதுகாப்பு

முதலில் பின்னைத்தரங்களை என்னும் மூலம் இல்லாது

சிற்றூட்டினால் காணப்பட்டவை பெரும்பான்மை புராணப் பாதுகாப்பு

பெரும்பான்மை போன்ற புராணப் பாதுகாப்பு

பின்னைத்தரங்களை என்னும் மூலம் இல்லாது

பொருளாயில் கூறுவது போன்ற பின்னைத்தரங்களை

பொருளாயில் கூறுவது போன்ற பின்னைத்தரங்களை

முதலில் பின்னைத்தரங்களை என்னும் மூலம் இல்லாது
Good Man (1956) by Nkw;nfhs;gl;lJ. Ma;tpy; gy;NtW MfNahu; Gyg;GLj;jpAs;sdu;. Rutter (1979) presented a study examining the impact of a new tax policy on small businesses in the UK. Rutten (1979) highlighted the need for a comprehensive approach to understanding the effects of policy changes on local economies.
2 கல்விமுறைத் துறையின் செலவு செயலாகும்.
3 பராமரிக்கப்பட்டுள்ள கல்விச் செலவு.
4 பானைக் கல்விக் குழுவின் செலவு.

அத்துடன் அவர்கள் பல்வேறு பானைக் குழுக்களின் செலவு,
1) AB, 1AB, 1C, II, III சின்னமும் முதலில் கல்விச் செலவு.
2) என்பது அனைத்து பாலைக் குழுக்களின் செலவு.
   1. ABடைப்பு குழும்.
   2. புதுக்காலத்தில் குழும்.
   3. பானைக் குழும்.
3) வானை கல்விமுறைத் துறையின் செலவு.

இன்னும் அவர்கள் பல்வேறு பானைக் குழுக்களின் வழித்தடக்கட்டணம் 226 முதலில் கல்விச் செலவு.

தற்கொன்று பல்வேறு பாலைக் குழுக்களின் வழித்தடத்தக்கட்டணம் 12.33% முதலில் வளர்ச்சியானது செலவுப் பங்கு கொண்டது.

அத்துடன் 13.77% வேளாண்மை வழித்தடத்தக்கட்டணம் முதலாக முடிகியது.

2011 முதல் 202 முதல் வளர்ச்சியானது வழித்தடத்தக்கட்டணம் 176 முதலில் வளர்ச்சியானது வழித்தடத்தக்கட்டணம் 2.38% முதலாக முடிகியது.

இன்று வளர்ச்சியானது வழித்தடத்தக்கட்டணம் 16685 முதல் வளர்ச்சியானது வழித்தடத்தக்கட்டணம் 11.99% முதலாக முடிகியது.

இன்று வளர்ச்சியானது வழித்தடத்தக்கட்டணம் 16.9% முதலாக முடிகியது.

இன்று வளர்ச்சியானது வழித்தடத்தக்கட்டணம் 95.5, 6.4% முதலாக முடிகியது.

இன்று வளர்ச்சியானது வழித்தடத்தக்கட்டணம் 9.5, 6.4% முதலாக முடிகியது.

பிள்ளையார்களுக்காக குறிப்பிட்டுள்ள வழித்தடத்தக்கட்டணம் அத்துடன் குறிப்பிட்டுள்ள வழித்தடத்தக்கட்டணம்

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வளர்ச்சி கோட்டை 2012

பிள்ளையார்கள் வழித்தடத்தக்கட்டணம் செயலாகும் பங்கு

பராமரிக்கப்பட்டுள்ள கல்விச் செலவு
### Table 1

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**Page: 244**

### Table 2

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**Page: 244**

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**Social Sciences and Humanities Proceedings, 4th International Symposium, SEUSL**

**Page 244**
Council of NGO s, (2000) framework for relief, rehabilitation and reconciliation Jaffna peninsula final report of the workshop .council of NGO Jaffna district
Grace Machel (1996) the impact of war on children www.unicef.org
Hemachandra, H.C –the current strafe of Education in srilanka. Economic Review people’s Bank, research department srilanka 1990 October
The Effect of Unemployment on Socio Economic Status of the People in Jaffna District, Sri Lanka

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Abstract: Among the working-age population, one of the most damaging individual experiences is unemployment. Mostly it is a serious issue in third world countries like Sri Lanka. The main aim of this study is to identify the nature of the unemployment and its impact on individual’s well-being among the working age group with respect to their vocational activities such as income, savings, housing, education, and other social welfare in Jaffna District in Sri Lanka. The primary data were collected from 100 unemployed households in Jaffna District by using a structured questionnaire. The techniques such as descriptive statistics such as descriptive and regression model were used in this study. The results of the regression model indicate that the unemployment negatively affects all economic and social conditions of the people in Jaffna District. Finally, the overall results reveal that among the unemployed people, non-pecuniary factor such as job prospects, health, and social relations show significant effects on individual well-being, along with their income. Policy makers have to take necessary actions incorporating strategic approaches which can reduce the unemployment and improve the well-being of the people in Jaffna District, Sri Lanka. Specially, the government has to consider this main economic problem in its future changes of monetary and fiscal policy.

Key words: Unemployment, well-being, education, income

Introduction

Unemployment is a severe problem prevailing in developing as well as developed countries. These problems have a serious effect not only on the living standards of people and socio-economic status of the nation but also increasing the magnitude of corruption effecting the These problems have a serious effect not only on the living standards of people and the socio-economic status of a nation, but also elevat & Lewis, 1999; Asghar, 2002; Blakely et al., 2003). Unemployment has negative effects on the physical well-being of the suffering peoples.

Individual well-being (or happiness) depends on many things, including income, labour market status, job characteristics, health, leisure, family, social relationships, security, liberty, moral values and many others. Although unemployed workers usually suffer a reduction of income, its extent varies depending on other income sources, such as savings and income-generating asset holdings, unemployment insurance and private transfers. Non-pecuniary consequences such as the loss of identity and self-esteem, stress and depression also depend on the individual, family, and social circumstances surrounding unemployed workers. On the other hand, unemployed workers gain time for activities such as leisure, training, physical exercise, and domestic activities (Ahn et al., 2004). Therefore, in evaluating the effect of unemployment on individual well-being, we should consider all the relevant factors as well.
Sri Lankan Unemployment rate is increasing trend in 2012. Sri Lankan basic quality character related to the unemployment, these people mainly focus the government job rather than the other job; they waiting for getting government job that also lead the Unemployment. Unemployment amount is increased year to year. But, job opportunities aren’t created to equal increase ratio of unemployment. This problem is found in Jaffna peninsula as well. Unemployment is significance in any macroeconomic decision making. These variable is subject of social and economic life of every country. Thus, Unemployment is termed as continuous and unpleasant situation that describe the endemic nature of a country’s economy. This analysis or research is employed for analyzing several economical, social, cultural effects among unemployment target groups in Jaffna District.

Objectives of the Study
- To identify the nature of unemployment in Jaffna district.
- To identify the impact of unemployment on individual’s well – being

Literature Review
The International Labour Organization (ILO) defines the unemployed as numbers of the economically active population who are without work but available for and seeking work, including people who have lost their jobs and those who have voluntarily left work (World Bank, 1998). Examples include housewives, full time students, invalids, those below the legal age for work, old and retired persons. The unemployment rate is expressed as a percentage of the total number of persons available for employment at any time.

Types of Unemployment
Structural Unemployment – Occurs when there is a change in the structure of an industry or the economic activities of the country. As an economy develops over time the type of industries may well change. This may be because people's tastes have changed or it may be because technology has moved on and the product or service is no longer in demand.

Frictional Unemployment – This type of unemployment is caused by industrial friction, such as, immobility of labor, ignorance of job opportunities, shortage of raw materials and breakdown of machinery, etc. Jobs may exist, yet the workers may be unable to fill them either because they do not possess the necessary skill, or because they are not aware of the existence of such jobs. They may remain unemployed on account of the shortage of raw materials, or mechanical defects in the working of plants. On average it will take an individual a reasonable period of time for him or her to search for the right job.

Seasonal Unemployment - This is due to seasonal variations in the activities of particular industries caused by climatic changes, changes in fashions or by the inherent nature of such industries. The rain coat factories are closed down in dry season throwing the workers out of their jobs because there is no demand for rain coat during dry season. Likewise, the sugar industry is seasonal in the sense that the crushing of sugar-cane is done only in a particular season. Such seasonal industries are bound to give rise to seasonal unemployment.

Cyclical Unemployment - This type of unemployment (also known as Keynesian unemployment or the demand deficient unemployment) is due to the operation of the business cycle. This arises at a time when the aggregate effective demand of the community becomes deficient in relation to the productive capacity of the country. In other words, when the aggregate demand falls below the full employment level, it is not sufficient to purchase the full employment level of output.

Disguised Unemployment - This refers to the mass unemployment and underemployment which prevail in the agricultural sector of an underdeveloped and overpopulated country. For example, if there are four persons trying to cultivate an area of land that could be cultivated as well by three persons,
then only three of these persons are really fully employed and the remaining fourth person represents disguised unemployment. The people in underdeveloped countries are outwardly employed but actually they are unemployed, the reason being that agricultural production would suffer no reduction if a certain number of them are actually withdrawn from agriculture.

A review of the literature reveals views regarding impact of unemployment on socioeconomic status in the country. Meaning of unemployment “unemployment is defined as a state of affairs when in a country there are a large number of able bodied person of working age who are willing to work but cannot fine work at the current wage levels. People who are either unfit for work for physical or mental reason, or don’t want to work are excluded from the category of the unemployed. There are three types of unemployment frictional unemployment, structural unemployment and cyclical unemployment. Employment is the major source of income for a great majority of the people, a fall in employment signifies a fall in their income also (Ahuja, 2007).

Lawanson (2007) opined that economic recession has significant negative implication for the utilization of country’s human resources, leading to high level of unemployment. According to him, this problem has aggravated in the nation to the extent that many university graduates could not secure jobs, let alone school leavers. Furthermore, Lawanson (2007) said the problem is twofold showing both demand and supply side. On the demand side not only are there inadequate jobs for youths. But also the increasing decline in quality of education and training, thus making many youths unemployed. On the supply side, the inability of the government to adequately finance the nation’s educational enterprise has led to deteriorating infrastructural facilities and discouraging personal emoluments for teachers, it was discovered that despite various government policies and programmes aimed at reducing unemployment among youths and adults, the problem of unemployment remains unabated. On this note, Lawanson (2007) concluded that Unemployment has been found to reduce national wealth, increase in crime waves and social political violence can also be attributed to the high level of unemployment especially among youths in Nigeria.

Nazir et al. (2009) identified the unemployment negatively affecting the socio-economic status of family in Urban Faisalabad, Pakistan by using descriptive analysis. He has also found that the unemployment leads to poor mental health and increases the magnitude of corruption, drug addiction, crimes and suicide in a society. A large percentage of the respondents of age limit 24-30+ believed that the lower rate of education is responsible for the present situation of joblessness.

Rasa (2012) Investigated that the socio-economic impacts of unemployment on citizen of North Nazimabad, Karachi with regard to the characteristics, magnitude and direction of changes in social relationships, and the attitude of unemployed people towards the society.

Bartley (1994) found in his study, to understand the relationship between unemployment and health and mortality, four mechanisms need to be considered: the role of relative poverty; social isolation and loss of self esteem; health related behavior (including that associated with membership of certain types of "subculture"); and the effect that a spell of unemployment has on subsequent employment patterns.

Muhammad et al. (1999) investigated implies that unemployment significantly influence wage rate whereas inflation is positive but has no significant effect on wage rate. Therefore, there is a need for strong institutional collaboration for dealing with these triple macroeconomic variables; unemployment, inflation and wages in Nigeria.
Methodology

Conceptual Model

Conceptual model can be developed as fallows.

![Conceptual Model Diagram]

Fig. 1, Conceptual Model

Variables and Conceptualization

Table 1, Variables and Conceptualization

<table>
<thead>
<tr>
<th>Concept</th>
<th>Variable</th>
<th>Indicator</th>
<th>Measure</th>
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<td>Wage</td>
<td>Type of unemployment</td>
<td>Percentage (Five point likert scale)</td>
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<td></td>
<td>Lack of professional</td>
<td></td>
<td></td>
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<td></td>
<td>Education</td>
<td>Gender, age education level</td>
<td>Percentage</td>
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<tr>
<td>Economic and Social</td>
<td>Economic Conditions</td>
<td>Income</td>
<td>Questionnaire (likert scale)</td>
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<td>Health</td>
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<td>Social Condition</td>
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<td>Questionnaire</td>
<td>Percentage (likert scale)</td>
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<tr>
<td></td>
<td>Infrastructure</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Residence</td>
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</table>

Stratified sampling method was used to the data. Primary data is the major source of data collection method of this study. Questionnaire and interview are the main primary form at data collection tool used in this study. Data analysis made based on collected questionnaire, correlation and regression analysis. MS Excel Version 2007 and SPSS version 16 use to data analysis.

Questionnaire prepared by researcher to target people about unemployment (workless people), income level of family, consumption expenditure, health, saving, malnutrition, education level, and socio economic. This Questionnaire includes the personal details and socio economic details. This questionnaire consists of closed ended as well as open-ended question and Nominal and Likert scale to measure the impact of unemployment.

In addition the questionnaire was administered among the respondent to make tick (√) for their option regarding the statement in the questionnaire. The five point Likert scale is used for statements of the second section ranging from strongly disagree to strongly agree, very low to very high. The numerical values were given for the purpose of quantification of quantitative variable as follows.
### Hypothesis

H0 – Unemployment does not effect the socio-economic status of the people

H1 - Unemployment effects the socio-economic status of the people

### Descriptive Statistic

The technique is used to find out mean median other statistical data, through this researcher can explain the whole data in this research.

### Regression Analysis

Regression analysis is to describe the nature of the relationship between two variables in terms of a mathematical equation. Regression line explains the pattern of variation of the dependent variable in relation to values the independent variables. It is used for drive the line of best fit.

**Eq. 1, Simple Regression Model**

\[ Y_i = \beta_0 + \beta_1 X_i + U_i \]  

(1)

- \( Y \) – Socio Economic Status of the people
- \( X \) – Unemployment
- \( \beta_0 \), the line crosses the vertical y-axis or constant term
- \( \beta_1 \) –Coefficient of \( X_i \).

### Results and Discussions

Reliability of this research questionnaire is 0.701 the following shows the reliability

**Table 3: Reliability**

<table>
<thead>
<tr>
<th>Reliability</th>
<th>N of Items</th>
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### Descriptive Analysis

**Gender Analysis**

Among the total sample 39% of respondents are male and 61% of respondents are female. 100% of respondents are Sri Lankan Tamils because of the area selected for study is Jaffna.
Type of Unemployment

There are many type of unemployment in the whole economy, But here only selected four type of unemployment .According to the figure 41% of the unemployed families coming under the structural unemployment. Remaining families coming under the other categories.

![Type of unemployment chart]

Fig. 2, Type of Unemployment (Source: Survey Data)

Educational Qualification

Based on the analysis among the 100 samples, 1% of the sample represent the illiteracy, 11% sample complete their primary education, 60% sample unemployed people who have completed G.C.E O/L, 19% of the sample have completed G.C.E A/L, 4.41% of sample who are presently following Technical College studies, and the 3.68% are graduated.

Age distribution shows that among the sample, 33% of unemployed household were found to be lying under the age category between 15-25 years. 46% were found under the age category between 25-35 years & 21% represents above 35 years.

Health

Out of sample population 14 people affected by critical illness and 11 child death occurred, this show poor health condition. Unemployment leads to poor health condition that affects the living standard of people. Long term unemployment leads to mentally disappear.

![Medical expenses chart]

Fig. 3, Medical Expenses of the unemployed families (Source: Survey Data)

Income

Out of the sample 49% of the respondents’ family income is between Rs 6000- Rs 12000 as well as 36% of the respondents’ family income is below Rs 6000, 12% of the respondents’ family income is between Rs12000- Rs18000, 3% of the respondents’ family income is above Rs18000 . This low income level is mostly attributed by unemployment. This shows that without having the job they managing expenses through the other sources.
Monthly Expenses of the unemployed families
Among the sample 54% of the family expenses is between Rs 6000 to Rs 12000, 30% of the family expenses between Rs 12000 to Rs 18000, 11% of the family expenses is above Rs 18000 and 5% of the family expenses below Rs 6000.

Among these unemployed families 59% of the respondents borrow the money from other, it reflect the family credit situation. These people manage their needs through borrow the money. 18% of respondents mortgage of gold for satisfy their basic needs and 23% of the respondents get the help from others.

Saving status of the unemployed families
Out of sample 29% respondents maintained the saving and 71% respondents not maintained any saving. Poor saving lead to poor investment, that reflect poor standard of living. Official Poverty line at national level for February 2013 is Rs. 3656 (Source: Department of Census & Statistics - Sri Lanka) According this source in survey data 36 families under the national poverty line. These 36 families critically affect by the unemployment and their standard of living also affect.

Housing
According the data collection respondents answer the 3 type of house. 49% respondents have been living in the hut, 39% respondents have been living in the rented house & rest of the 12% respondents have been living in the own house. Hut is not satisfying residence to safety life although 49 families live in the hut, no one not like to live in the hut even though because of their family income situation they live. Unemployment influences their residence, one the basic needs affects by the unemployment.

Electricity
Electricity is fundamental needs to the human beings. Out of the sample 59% of people are residing in Jaffna with electricity facility, rest of the 41% of people who are residing in Jaffna without electricity facility.

Poverty
Among the sample 65% of the unemployed families face the poverty related problem. Official Poverty line at national level for February 2013 is Rs. 3656 (Source: Department of Census & Statistics - Sri Lanka). According to this source in survey data 36 families under the national poverty line. These 36 families suffered by poverty because of unemployment.

Output of Regression Analysis - Regression economic status on unemployment

Table 4, Economic status on unemployment

| Correlation | 0.170 |
| Regression | $Y = 49.69 - 0.304X$ |
| R-squared | 0.880 |
| Significant | 0.023 |

Source: Survey Data

Y – Economic Status of the people
X – Unemployment

If unemployment is X=0, economic condition is to be 49.69 units. Unemployment is increased by one unit scale, the economic status of the people will be decreased by 0.304 unit scale. Therefore, it can be said that there is a significant negative relationship between unemployment and economic condition.

Regression Social status on unemployment
Table 5. Social status on unemployment

<p>| | |</p>
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<td>Significant</td>
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*Source: Survey Data*

Y – Social Status of the people
X – Unemployment

The regression equation $Y = 20.93 - 0.041X$ exhibits that the relationship between unemployment and Social Status. If the unemployment level is zero, the social status is 20.93 units. Unemployment is increased by one unit, Social status of the people decreased by 0.041 unit. Even though it has small effect on social status, but it has significant effect on social status of the people.

**Conclusion and Recommendation**

The results show that the unemployment has negative effect on both social and economic status of the people. So it leads to low standard of living of the people in Jaffna District. So that unemployment affects the socio-economic status of the family, leads to poor mental health and increases the magnitude of corruption, drug addiction, crimes and suicide in a society.

In this study mostly young males and females are affected by unemployment. Nowadays, with the development of society, youth unemployment is becoming a global problem, which affects not only individuals but also society in every region of the Jaffna district as well as country. A series of problem create other crisis. Youth unemployment should be alleviated as soon as possible.

Youth unemployment is an unseen unutilized resource. Our government spends a considerable number of resources on education, in order to make the youth useful for our society. To bring the youth a bright future, our schools and government as well as the youth themselves have responsibilities to improve the situation.

Firstly, our schools especially universities and colleges should present courses associated with employer expectation. Secondly, The government should take necessary to reduce the unemployment among the graduates. The companies have responsibilities to offer job opportunities to the graduates. Thirdly, the youth themselves should do their utmost to become qualified. The policies should be adapted to provide the opportunities to create the entrepreneurs.

Government gives the employment opportunity to youth through the government project. As well as give necessary skill training to educated people in that area. In this study structural unemployment is high in sample population at Jaffna district. Reducing Structural Unemployment necessary for development of Jaffna district for that some ideas are given below, Policy suggestions to reduce structural unemployment include providing government training programs to the structurally unemployed, paying subsidies to firms that provide training to displaced workers, helping the structurally unemployed to relocate to areas where jobs exist, and inducing prospective workers to continue or resume their education.

Unemployment substantially reduces an individual’s satisfaction levels with his or her main activities and finance, while it substantially increases his or her satisfaction level with leisure time. With respect to health, it has a small negative effect. Unemployment duration, on the other hand, shows a small negative effect on individual well-being, suggesting the unemployment has lasting and aggravating effects that contradict the theory of adaptation.
The solution for unemployment is, obviously, to create new jobs. Usually, a healthy economic growth rate of 2-3% is enough to create the 150,000 new jobs needed to keep unemployment from rising. But our country growth rate is very less because of that can’t create the new jobs. Our government should focus on our growth rate. When unemployment rate above 6-7% and stays there; it means the economy isn’t strong enough to create sufficient new jobs without help. Our country unemployment rate for the Third quarter 2012 was reported as 4.1 % (Source - Sri Lanka Labour Force Survey) but this rate excluding the Northern Province. That's when the government is expected to step in and provide solutions.

Government should take some step to reduce the unemployment through policies and regulation such as monetary policy and fiscal policy. Expansive monetary policy is powerful, quick and usually effective. Lower interest rates allow families to borrow more cheaply to buy what they need; this stimulates enough demand to put the economy back on track. Low interest rates also allow businesses to borrow for less, giving them the capital to hire new workers to meet rising demand. However, when monetary policy doesn't work, then fiscal policy is usually demanded. This means the government must either cut taxes or increase spending to stimulate the economy.

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Sex Slavery of Women: Violence against Humanity

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Abstract: Trafficking in women is a widespread problem all around the world. The hidden population involves the commercial sex industry, factories, restaurant businesses domestic works, marriage brokers, some adoptions firms and so on. Trafficking among women is the fastest growing crime a significant violation of human rights. There are adverse effects of trafficking on women, it gives lots of pain, suffering, abuse, physically exploitation, trauma etc. Traffickers take advantage of the unequal status of women and girls in dis-advanced countries and communities and capitalize on the demand for cheap, unreported labour and promotion of sex terrorism in same countries.

Key words: Trafficking, violence, security, sexual assault.

Introduction

Recently, there has been increased media attention to human trafficking that has exposed the clandestine nature of this illegal migration. Most countries are confronting the problem of migrant trafficking for labour and for sexual exploitation. For example, India faces the problem of trafficking from the other neighbour countries such as Nepal, China, Bangladesh and Thailand and so on. India like most other countries has a large domestic trafficking problem as well, in which both international and Indian women are transported for sexual exploitation mainly for prostitution from state to state and city to city. Trafficking has become a transnational and international industry that affects mostly all countries although not all equally. Trafficking in human beings is considered as the second most profitable criminal enterprise after arms trafficking which generates approximately over $32 million annually (TIP, 2009). Globalization has enhanced control over sexuality, fertility and labour of women migrants. Innocent rural girls as well as educated adolescent girls are inducted into the workforce. Cross country migration of girls and women for domestic work, industrial and professional services such as nursing, secretarial practice, telemarketing and business process outsourcing has increased.

Open national borders and accessible transportation increases sex tourism, forced labour, prostitution, begging, restaurant waitress, domestic servants, organ trading etc. Internet technology advancements also contribute to increases in trafficking, sex industry, and child pornography and provide more access to and choices for commercial sex with trafficked persons. Technology and globalization creates not only extensive local linkages and networks, but also international linkages.

Trafficking

According to United Nation High Commissioner for Human Rights, Article 3, paragraph (a) of the Protocol to Prevent, Suppress and Punish Trafficking in Person defines trafficking as “Trafficking in persons shall mean the recruitment, transportation, transfer, harbouring or receipt of person, by means of the threat or force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power, of power, or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation. Exploitation shall include, at a minimum, the exploitation of the prostitution of other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude or the removal
of organs (UNODC, 2001).

Trafficking is complex, but there are two major factors behind its occurrence i.e. “Push and Pull factors”. Potential trafficking victims are “pushed” into the situation by poverty and lack of employment opportunities resulting from a lack of education. Trafficking victims accept fraudulent offers of foreign employment such as childcare or restaurant work only to find themselves forced into prostitution under deplorable conditions. Due to extreme poverty, parents are willing to sell their daughters when approached by “agents” promising gainful employment and marriages.

According to National Crime Record Bureau total of 3,422 incidences of crimes under various provisions of laws relating to human trafficking were reported in the country during 2010 as compared to 2,848 during 2009 recording an increase of 20.2 percent during 2010. 4,997 cases relating human trafficking were reported during 2006 as compared to 3,991 and 3,029 cases reported in 2007 and 2008 respectively. The rate of crime has increased from 0.2 during the year 2009 to 0.3 during 2010 (NCRB, 2010). In the period 2009-2011 a total of 1,59,418 women were reported missing, out of this, 1,03,468 women were traced and 55,950 continued to remain missing (Singh, 2011).

India is both a source and transit country for trafficking, as well as one of the most popular trafficking destinations in South Asia (Standford, 2010). It is estimated that 10 percent of Indian’s trafficking in while person is international 90 percent is domestic; a pattern that differs from the more common parading of trafficking across international borders (NHRC, 2002-2003). Women are bought and sold with impunity and trafficked to other countries from different parts of India. According to a survey these girls and women are sourced from Dindigal, Madurai, Tiruchirapalli, and Chengalpattu in Tamil Nadu, Gaya, Kishanganj, Patna, Katihar, Purnia, Araria and Madhubani from Bihar, Maharajganj from UP, and supplied to Thailand, Kenya, South Africa, Philippines and Middle East countries (TIP, 2010). They are forced to work as sex workers undergoing severe exploitation and abuse. These women are the most vulnerable group in contracting HIV infection. Due to unrelenting poverty and lack of unemployment opportunities there is an increase in the voluntary entry of women into sex work. The trafficking of women and children causes untold miseries as it violates the rights and dignity of the individual in several ways. It violates the individual’s rights to life, dignity, security, privacy, health, education and redresses public grievances.

Slavery in human beings brings lots of suffering to the innocent and shame to the country, sex trafficking has sadly become a global issue and is one of the most gruesome of human rights violations. Each year millions of persons are trafficked both domestically and internationally in India (Aronowitz, 2009). The crime comes at an incalculable human cost and represents one of the most shameful facts of the modern world and it is unsurprisingly that majority of victim of human trafficking are women and children. It has been estimated that 10 percent of the India’s trafficking in persons is international while 90 percent is domestic (Sen, 2002-2003).

Sexual Assault
Trafficking victims often suffer from serious abuse and physical exhaustion. Women can be the victims of unwanted touching, oral sex, sexual penetration with an object, or coitus. They are often made to participate in sexual activities through physical force and use of drug. Women who work in the commercial sex trade are vulnerable to sexual and reproductive health complications sexually transmitted disease. Women who have been trafficked into the sex trade may often not have access to, or not allowed to use condoms and other method of birth control. They face the risk of unwanted pregnancies and miscarriages. Women who work as prostitutes experience high rates of abortion and infertility. According to a report, between 5,000 and 7,000 girls are trafficked, from their most deprived living environments to exploitative physical and social situations, into India from Nepal, most of them under 18 (Tiwari, 2000)
In recent years, with the arrival of multinational corporations in India and with greater prosperity in urban cities, there have been growing markets for domestic help, especially for young community who are seen as versatile in their roles as housekeepers, cooks and nannies. They are being brought by the agents who use their personal contacts in rural communities to lure the girls to the city, promising them relief and refuge from their desperate situations. India over few past years many women have been harassed, abused and exploited (Malhotra & Malhotra, 2013). Victims are exploited in the form of exploitation which involves forced commercial sex and labours, including domestic servitude, victims are also trafficked for the purpose of forced marriages, organ removal and ritual killings. Traffickers always target the most vulnerable sectors of society luring their victims, many of whom are women, children, with promises of a better life through employment and education. The congressionally mandated report provides data from 175 countries about the level of human trafficking occurring within borders. According to the International Labour Organization (ILO) at least 12.3 million adults and children are victims of forced labour and sex slavery annually (ILO, 2012). Trafficking of humans is a crime against individuals and its consequences are most directly felt by the victims itself. More than 130 countries are affected by human trafficking, if affects people socially, politically, economically, mentally and many other such ways. Every stage of trafficking process can involve physical, sexual, and psychological abuse, violence, deprivation, torture, the force use of substance, manipulation, economic exploitation and abusive working and living conditions (Dutta, 2012). Trafficking usually involves prolonged and repeated trauma, the trauma experienced by victims of trafficking includes post-traumatic stress disorder, anxiety, depression, alienation, disorientation, aggression and difficulty concentrating.

The human and social consequences of trafficking are compelling. From the physical and torture of victims to the psychological and emotional trauma, to the economic and political implications of unabated crime, the impact on individuals and society is clearly destructive and unacceptable. The impacts of trafficking are felt both in countries of origin and as well as in countries of destination, there are human and social cost of development attribute of trafficking, the direct impact on family and community left behind cannot be easily quantified. Trafficked persons may experiences physical, sexual and emotional violence at the hands of traffickers, pimps, employers and others (Toders, 2011). The trauma experienced by victims of trafficking includes post-traumatic stress, disorder, anxiety, depression, alienation, disorientation, aggression and difficulty concentrating. Most traffickers recruit their victims between the ages of 6 to 24 years, because a young victim will easily succumb to force and give in. Women all over the world fall victim to violence, in both rich and poor, developed and developing countries. The impacts may be in forms of Drug and alcohol addiction, broken bones, Sexually transmitted diseases, Miscarriages or forced abortions, Shame and distrust, Self-hatred and suicidal thoughts, Depression, Insomnia etc.

In most common situations of trafficking, a victim is controlled by traffickers through coercion/intimidation/blackmail/fraud. Traffickers, especially for the purpose of Commercial Sexual Exploitation (CSE) are known to employ crafty modus operandi for controlling victims. The victim should be handled very patiently to make them feel comfortable, so that the counselling given by the psychologists and the doctors helps them to come out from that trauma. As a criminal act, trafficking in women violates the rule of law, threatening national jurisdictions and international law. Trafficking is an organized crime and is one of the most important mechanisms for unlawful redistribution of national wealth, unduly influencing markets, political power and societal relations. People are typically associate police with the investigation and prosecution of trafficking in persons cases. In many countries police are the largest representative of government and should be seen as key instruments to combating trafficking. Police can work closely with citizens and civil society organizations to help implement civic education programmes, community and school intervention programmes for youths at risk, and community meetings to discuss crime problems on an effort to prevent trafficking in persons. Trafficking has become as an urgent security issue for the nation as well as for the state in post-Soviet Asia.
Conclusion
Only legislation and law enforcement agencies cannot prevent the incident of crime against women. There is need of social awakening and change in the attitude of masses, so that due respect and equal status is given to women. It’s a time when the women need to be given her due. This new awakening can be brought in society by education campaign among youth making them aware of existing social evils and encourage them to eradicate these evils. Mass media can play an active role here as in the present days it has reached every corner of the nation. Various NGOs can hold a responsible position here by assigning them with the task of highlighting socio-economic causes leading to such crimes and by disseminating information about their catastrophic effect on the womanhood and society at large. Poverty alleviation measures too will help in combating it in the long run. Since India is also transit point for human trafficking, the government should take speedy measures to secure India’s border. A comprehensive criminal justice response to trafficking should include measure for the protection and support of trafficked victims alongside measures to prosecute traffickers. And the provision of protection and support measures should not be conditional on a trafficked victims’ willingness to cooperate with law enforcement officers in their criminal investigations which underlines the human rights based approach to women trafficking. Awareness rising can also be extended wider to the general public. Initiative like crime stoppers efforts aiming to gather anonymous information are a good way to raise public awareness of trafficking in women and contribute the gathering of intelligence and information on trafficking related investigations.

Reference:
A Geographic Approach on Health Services of Selected Health Indicators in Tamil Nadu

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Abstract: A Health indicator is a quality of an individual, population, or environment which is subject to measurement (directly or indirectly) and can be used to describe one or more aspects of the health of an individual or population through quality, quantity and time (WHO, 2004). The present paper analyses the Health Indicators and health infrastructure. A Geographical Information System (GIS) technique is employed to study the data and analyses. In Tamil Nadu 7,555 sub centres are required but in position there have 8,706 sub centres. The basic requirement of health infrastructure are Primary Health Centre (PHC) 1253/1227, Community Health Centre (CHC) 313/385, Health Worker Female at sub centre & PHCs 9933/9253, Health Worker Male at Sub centre 8706/1266, Doctors at PHCs 1227/2271. The present total population of Tamil Nadu is 7.21 Crore and the present study examines the spatial distribution of infrastructure on selected health indicators in Tamil Nadu.

Key words: Health, PHCs, Vector Borne, GIS Mapping.

Introduction

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1946). Basically a solid characteristic of population is known as Health indicator which is the researchers use to a following verification for relating the health of a population through survey method to gather information about certain people. And also utilize the statistical analysis is to create a statement about the health of the population. Health indicators like crude birth rates, crude death rates, total fertility rate and infant mortality rate, and life expectancy have taken by the Tamil Nadu government by comparing with the average performance of the country. By end of 11th plan the birth rate reduced not to meet the death rate, infant mortality rate and maternal mortality rate if the present trends continue (SRS, 2012). Health indicators can consist of measurements of illness or disease which are more commonly used to measure health outcomes, or positive aspects of health such as quality of life, life skills, or health expectancy, and of behaviours and actions by individuals which are related to health. They could comprise the indicators not only health as measure the social and economic conditions and the physical environment as it relates to health, measures of health literacy and healthy public policy.

Objectives

The present paper has been set of two objectives. They are following as,
- To identify the health facilities in the state of Tamil Nadu.
- To analysis the health indicator and health infrastructure availability in the state of Tamil Nadu.

Study Area

The State extends latitudinal between 8°05’N to 13°09’N and longitudinally between 76°15’E to 80°20’E. the state of Tamil Nadu is a triangular landmass at the south-eastern end of the main continent. It is the eleventh largest state in India by area (about the size of Greece) It is a home to many natural resources, rare flora and fauna, cool hill stations, grand Hindu temples of Dravidian architecture, beach resorts, multi religious, pilgrimage sites and few UNESCO world Heritage sites. It is one of the foremost states in the country in terms of overall development Total area of Tamil Nadu is
about 1, 30,058 sq.km which is a 4 percent of the total land area of India. For the purpose of administration, the state has been divided into 32 districts.

Map: 1
Study Area - Tamil Nadu

Health Indicators in Tamil Nadu
Vector Borne Disease Control programme (VBDC)
What is Vector Borne Disease?
Disease that results from an infection transmitted to humans and other animals by blood-feeding anthropoids, such as mosquitoes, ticks, and fleas. Examples of vector-borne diseases include Dengue fever, viral encephalitis, Lyme disease, and malaria.

Vector Borne Disease Control Programme (VBDCP) is the central nodal agency for the prevention and control of vector borne diseases i.e. Malaria, Dengue, Lymphatic Filariasis, Kala-azar, Japanese Encephalitis and Chikungunya in India. It is one of the Technical Departments of Directorate General of Health Services, Government of Tamil Nadu.

Malaria:
Malaria in urban areas of Tamil Nadu was confirmed to be a major problem and was considered that Chennai city has become an endemic area for malaria since few decades. Nearly 70% of the malaria cases recorded in the state of Tamil Nadu is occurring in Chennai city alone. Through active and passive detection surveillance immediate treatment is given at the doorsteps of the people living in urban areas. In 2007, about 22,389 malarial cases had found then after the effective measures taken by the Tamil Nadu Government it got reduced to 21,046 cases found in 2008. By the way the corporation of Chennai had introduced SAP special Action Plan.

- Corporation of Chennai is also contemplating to mosquito proof the source and recover the cost of doing so from the owner/occupier as though property tax.
Chemical larvicide's is being applied to wells, tanks, sumps, cisterns and other such clear water bodies once a week to prevent vector mosquito breeding. As many as 450 workers are engaged for this work.

Blood smear examination for malaria detection is made available at all Corporation dispensaries free of cost and on the spot diagnosis facility and treatment for malaria is available at 36 centres. In order to detect hidden cases which are not detectable under conventional peripheral blood smears examination technique, expensive QBC equipment is made available for highly specific diagnosis of malaria at the following centres free of charges for the benefit of the people

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### Free centre for Malaria

<table>
<thead>
<tr>
<th>Zone</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Mottai Garden Dispensary, Chennai-21</td>
</tr>
<tr>
<td>II</td>
<td>C.D. Hospital, Tondiarpet, Chennai-81</td>
</tr>
<tr>
<td>III</td>
<td>Basin Bridge Dispensary, Chennai-79</td>
</tr>
<tr>
<td>IV</td>
<td>Trivellin Basin Road Dispensary, Elephant Gate, Chennai-79</td>
</tr>
<tr>
<td>V</td>
<td>Ripon Buildings Dispensary, Chennai-3</td>
</tr>
<tr>
<td>VI</td>
<td>Sembiam Dispensary, Chennai-11</td>
</tr>
<tr>
<td>VII</td>
<td>Subrayalu Gramani Street Dispensary, Chennai-30</td>
</tr>
<tr>
<td>VIII</td>
<td>Malaria Clinic, Dr. Besant Road, Chennai-5</td>
</tr>
<tr>
<td>IX</td>
<td>Rotler Street Dispensary, Chennai-7</td>
</tr>
<tr>
<td>X</td>
<td>Kodambakkam Dispensary, Chennai-24</td>
</tr>
<tr>
<td>XI</td>
<td>Thiruvanmiyur Dispensary, Chennai-41</td>
</tr>
</tbody>
</table>

Source: National rural health mission report -2011

### Filaria

The National Filaria Control Programme (NFCP) established in 1957. Approximately 43 urban areas the filarial disease control activities are followed in these urban areas 25 Control Units and 44 Night Clinics. Around 42 Filaria and Malaria Clinics are functioning at Taluk level in 5 districts besides one filarial survey unit for delimitation of endemic areas after survey district by district. The entire operational cost is met by the State Government. From 1997-98 Single doses mass DEC drug administration programme is being carried in all endemic districts.

Mass Drug Administration programme was conducted in 14 endemic districts in 2007 there is following as,

- Kancheepuram,
- Thiruvallur,
- Cuddalore,
- Villupuram,
Trichy, Perambalur, Pudukottai, Thiruvannamalai, Thanjavur, Thiruvarur, Ariyalur, Kanyakumari, Nagapattinam and Vellore.

In addition, these districts, certain villages of Tirunelveli, Thoothukudi, Karur, Krishnagiri, Virudhunagar and Madurai and including Chennai city. This programme covered 2.64 Crore population. Around 93.3% of the eligible population were administered with DEC + Albendazole tablets, Public Health, Medical Education, Social Welfare, Education, Rural Development, Municipal Administration and Water Supply and Revenue Departments have cooperated for this programme. So far 365 hydrocelectomy operations have been done under this Programme. Tamil Nadu has already achieved the lymphatic filariasis eliminations status.

Japanese Encephalities Control Programme

One of the important public health programmes is Japanese Encephalities control programme and it started at past few years before. Health Unit Districts such as Perambalur, Kallakurichi, Villupuram, Cuddalore, Thiruvannamalai and Madurai have reported Japanese Encephalitis cases.

This programme was achieved in selected villages in Perambalur District with killed Mouse Brain Vaccine. Japanese Encephalitis Vaccination Programme was conducted in Villupuram, Cuddalore and Virudhunagar Districts for the children in the age group of 1-15 years targeting 18,19,000 Children from the year of 2007. During 2008, Japanese Encephalitis programme was conducted in Trichy, Madurai and Thiruvarur Districts. In 13.5 Lakh children were covered. It is proposed to conduct Japanese Encephalitis programme in Thiruvannamalai, Thanjavur, Thoothukudi and Tirunelveli District for the period of 2009.

Leptospirosis

Leptospirosis is very common health problem in Tamil Nadu, apart from Udhagamandalam and Thoothukudi districts. Leptospirosis being one of the re-emerging infections needs timely diagnosis, treatment and control measures. For early screening of fever cases, rapid diagnostic kits were obtained and supplied to the problem Districts. To strengthen the surveillance system and for early diagnosis of Leptospirosis, 7 Leptospirosis clinics are carrying out in Thiruvalur and Madurai Districts. Rapid diagnostic kits were supplied to these clinics and to the 9 Zonal Entomological Teams and Institute of Vector and Zoonoses, Hosur, IVCZ, Hosur is given the responsibility of outbreak investigation with specialized Team. Necessary training was already imparted to one Block Medical Officer and one Lab Technician in each of the Pilot Project Districts on the diagnosis of Leptospirosis. A State level reference Laboratory is functioning at State Headquarters since 2008 for confirmation of Leptospirosis. In Tamil Nadu two Pilot Project Districts viz., Villupuram and Tiruchirapalli have been identified as Lepto Pilot Project Districts. A sum of Rs.30 Lakh is allotted by Government of India for the control of Leptospirosis. From the period of 2008, 1262 cases (up to December 2008 prov.) and one death were reported in Tamil Nadu.

Dengue Control

Government have issued orders for the concern of 12 dengue clinics in the taluk and district headquarters hospitals of Nagercoil, Vellore, Dharmapuri and Coimbatore. Quick diagnostic test kits are supplied to endemic districts. Necessary guidelines were issued to all the health unit districts to
strengthen the surveillance system and to carry out intensified vector control activities so as to avert outbreaks. Sentinel Surveillance Centres were established in 12 Government Medical Colleges and Institute of Vector Control and Zoonoses, 640 cases and 3 deaths were reported as dengue fever in Tamil Nadu during 2008, 159 cases were reported as dengue fever in Tamil Nadu during 2009 (upto March 2009). Diagnostic facilities are available for Dengue, Japanese Encephalitis and Chikungunya in hosur. Guidelines of WHO, are communicated to all the Deputy Directors of Health Services, Joint Directors of Health Services and Deans of the Government Medical Colleges besides Heads of Departments on case management, surveillance, outbreak investigations and Vector Control Measures.

Chikungunya
Chikungunya was first report in Tamil Nadu at Chennai Corporation for the period of 1964. Over all 3 Lakh cases were recorded at that started time. In 29 Districts were affected in chikungunya and overall 64,802 cases have been recorded for the period of 2006. After that the state government as launched too many programme to reduce the Chikungunya. The spread of disease in Tamil Nadu is prevented by intensified Vector control measures and by strategies taken with inter sectoral co-ordination, under the banner “War Against Mosquitoes”. The State Government have sanctioned Rs.4.91 Crore in 2006-07 and Rs.7.09 Crore in 2007-08 for chikungunya control. 13 Sentinel Surveillance centres have been established with diagnosis facilities. “Our Health is in our Hands” a special Environment cleanliness Campaign was organized in March 2008. Only 71 cases have been reported during 2008.

The State Government have allotted Rs.3.16 Crore for Chikungunya control activities during 2008-09. Around 3850 Mazdoors have been appointed temporarily for 60 days on contract basis for the year 2008-09 for which Rs.196.35 Lakh have been allotted. The Mazdoors help in source reduction activities of mosquito breeding and in minor engineering activities.

Infant Mortality Rate
Diagram: 1

From this above diagram explains that clear ratio about Infant Mortality Rate in Tamil Nadu from year of 1971 to 2010. And also the diagram shows Infant Mortality rate in both urban and rural Areas in Tamil Nadu. On the other side it’s gave an average Infant mortality rate in both Urban as well as rural. From the year 1971 to 2010 the percentage of infant mortality rate is randomly reduce.
Trends of Birth Rate in Tamil Nadu

Diagram: 2

From this above statistical diagram describes about population from 2011 census, the population of Tamil Nadu is 7.21 Crore with decadal growth of 15.6%. It is the seventh most populous State in India. It accounts for 6.0 percent of the country’s population. The Birth Rate of Tamil Nadu has reduced from 31.4 (1971) to 15.9 (2010).

From following table is explaining the health indicators between India and Tamil Nadu. Table: 2

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Tamil Nadu</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth Rate (SRS 2010)</td>
<td>15.9</td>
<td>22.5</td>
</tr>
<tr>
<td>Infant Mortality Ratio</td>
<td>24.0</td>
<td>47.0</td>
</tr>
<tr>
<td>Maternal mortality Ratio</td>
<td>97(SRS 2007-2009)</td>
<td>212</td>
</tr>
<tr>
<td>Population Sex Ratio (Census 2011)</td>
<td>995</td>
<td>940</td>
</tr>
<tr>
<td>Child Sex Ratio (Census 2011)</td>
<td>946</td>
<td>914</td>
</tr>
<tr>
<td>Total Fertility Rate (SRS 2008)</td>
<td>1.7</td>
<td>2.6</td>
</tr>
<tr>
<td>Couple Protection Rate (NFHS III 2005-06)</td>
<td>60.0</td>
<td>48.5</td>
</tr>
<tr>
<td>Percentage of girls marrying below 18 years (SRS 2008)</td>
<td>16.7</td>
<td>16.3</td>
</tr>
<tr>
<td>Higher order of Birth (SRS 2008)</td>
<td>12.7</td>
<td>31.9</td>
</tr>
</tbody>
</table>

Source: State Health Society –TN 2012-13

Health facility and Health Infrastructure in Tamil Nadu

This present paper mainly focuses on infrastructure in Primary health centre, Community Health centre, and Health sub centres. Around 900 villages are covers in the state of Tamil Nadu.
Distribution of population in Tamil Nadu
From following geographical maps clearly shows the population distribution of Tamil Nadu from 2011 census data.

Map: 2
Population Distribution – Tamil Nadu

Source: National Rural Health Mission Report-2013

Infrastructure, Staff and Services at Primary Health Centre (PHC)
Primary Health Centres having 62.4 present of Lady Medical Officer, approximately 10.9 present of AYUSH Medical Officer and the facilities are 28.4 present of PHCs with at least 4 beds, PHCs having 22.2 present residential quarters for Medical Officer. Over all PHCs covering 93.5 present of new born care services and also it comprises 70.1 present referral services for pregnancies or delivery. Mostly PHCs conducted at least 10 deliveries during one month. The following map shows the availability of primary health care centres in the state of Tamil Nadu.

Map: 3
Primary Health Centres-Tamil Nadu
Source: National Rural Health Mission Report-2013

**Infrastructure, Staff and Services at Community Health Centre (CHC)**

CHCs having 7.2 percent of Obstetrician/Gynaecologist, 24 hours normal delivery services 100.0 percent, functional Operation Theatre 15 are 56.8 percent and CHCs designated as FRUs 46.7 percent, CHCs designated as FRUs offering caesarean section 16 is 0.0 percent and also FRUs having new born care services on 24 hour basis 16 is 86.1 percent. FRUs having blood storage facility 16 is 1.8 percent. The following map explains the availability of community health care centres in the state of Tamil Nadu.
Infrastructure, Staff and Services at Sub-Centre
Around 72.2% present Sub-Centre located in government buildings. In 99.8% present Sub-Centre with ANM. Sub-centres covering 71.6% present male health workers and also Sub-Centre with additional ANM in present of 2.8. Over all ANM living in Sub-Centre quarter where facility is available at percentage of 59.9.

The following map shows the availability of sub divisional hospital in the state of Tamil Nadu.
Health Programmes at Village Level
There are number of villages having ASHA-10 programme and Villages got beneficiary under Janani Suraksha Yojana around 74.5 present. Sanitation Committee is newly formed for specially village in 73.4 present.

Accessibility of the Health Facility
Based on secondary data analyses the 83.7 present having Villages with Sub-Centre within 3 KMs and 7.5 present are covering Villages with PHC within 10 KMs.
Conclusion
Our analyses indicate that Tamil Nadu is performing well in health sector. Although the state has taken various measures in order to increase the performance of the health sector, similar to population distribution, infant mortality rate, birth rates and also infrastructure are Primary health centre, community health centre and health sub centres. However, the government has already taken various steps to eradicate the relate problems.

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Malaria Epidemiology and Anti-Malarial Activities through Primary Health Centres in Rameswaram Island, Ramanathapuram District

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Dr. V. Madha Suresh, Associate Professor,
Dr. M.I.M. Kaleel, Senior Lecturer

Abstract:
Rameswaram Island is one of the important malaria endemic areas in Ramanathapuram district of Tamil Nadu. The control of malaria remains one of the major global health challenges. It threatens 2.4 billion people, or about 40% of the world’s population living in the world’s developing and under developing countries and more than one million deaths are attributable to the disease annually (WHO, 2000). The aim of this study is to determine the situation of the disease and analyse the anti-malarial measure which is provided by the State Government in the study area. The anti-malarial activities are taken up through the Primary Health Centres (PHCs) by the State Health Society, Tamil Nadu. This paper concludes with a discussion of strategies that can be used to overcome of the malaria endemic problems.

Keywords: Malaria, Anti-malarial activities, Epidemic disease.

Introduction
Malaria is one of the major public health problems of the country. Around 1.5 million confirmed cases are reported annually by the National Vector Borne Disease Control Programme (NVBDCP), of which 40–50% is due to Plasmodium falciparum. Malaria is curable if effective treatment is started early. Delay in treatment may lead to serious consequences, including death. Prompt and effective treatment is also important for controlling the transmission of malaria (Guidelines for Malaria - GOI, 2009). Malaria is an environmental disease, with the large-scale limits of its distribution being mostly determined by the climatic factors like rainfall, humidity and temperature (Craig et al., 1999). The large-scale variables are inter-annual climate factors and the movement of population, drug and insecticide resistance etc. are small-scale variables. Both large and small-scale variables effect on the active malaria situation that needs continuing research and managing efforts to control it (Sharp et al., 2001).

Aim and Objective
The aim of this study is to identify the high incidence areas of malaria in Rameswaram Island and analyse the anti-malarial activities which are taken up by the PHCs.

1. To evaluate the epidemiological parameters of malaria in Rameswaram Island.
2. To examine the anti-malarial activities those are provided by the Government of Tamil Nadu over the PHCs in Rameswaram Island.

Study Area
Rameswaram Island is known as Pamban Island and famous for its pilgrimage and one of the most endemic districts for malaria for decades in Tamil Nadu. It is situated in the Rameswaram taluk of the Ramanathapuram district. It is located in the Eastern tip of Ramanathapuram District, overturned shoe shaped island connected to the mainland by Railway Bridge and road. It is lied between 9°11’N and 9°19’N latitude and 79°12’E to 79°23’E longitudes. The total area of the island is 67 square km. The Island is encircled in the north by Palk Bay, south by the Gulf of Manner and East by Bay of Bengal. The terrain is entirely costal with sand dunes.
The Rameswaram taluk has four administrative divisions: Okariskulam, Mahindi, Pamban and Rameswaram. Rameswaram is the headquarters of this taluk. Pamban and Rameswaram are the two main towns in this taluk. It has a population of 77,724 including two PHCs and 13 HSCs with 146 villages (SHS-PIP 2012). Rameswaram is a national pilgrim center, the fluctuating population from various parts of India and overseas may exceed one lakh per month. It is located at the centre of the island, nearby 11 kilometres from Pamban and 18 kilometres from Dhanushkodi. Pamban is situated at the western edge of the island and the main point of entry for the pilgrimage center of Rameswaram. It is located around 11 kilometres from Rameswaram and 7 kilometres from Mandapam. Thangachi Madam is placed between Pamban and Rameswaram is a smaller settlement. Dhanusnkodi is at the eastern tip of the island, but it was destroyed by a cyclone in 1964. After that, it could not ever be rebuilt (www.wikipedia.com). The main occupation of the people is fishing in addition to coconut farming (www.ramanathapuram.nic.in).

Need for the Study
Malaria remains to be an economic burden and a great risk in worldwide and practically impossible to eradicate for the past six decades. It is a mosquito-borne disease causing 1.5 to 2.7 million people to die annually (Breman and Aliilio, 2004). Malaria has become more resistant to insecticides and the parasites which cause the disease are becoming strong to Chloroquine (antimalarial drug) and other anti-malarial drugs, making prevention and treatment gradually more difficult and costly. Around 40% of the world’s population live in regions where malaria transmission is prevalent, mostly within the tropical and sub-tropical regions. (Aultman, 2002). Malaria has become a major threat in India and adversely affected the economy of the nation. In general, the Health Workers who are representing the government’s health services are unable to identify high or risk areas of malaria endemic. The main reason for that is lacking of the health workers in the island. This study will be examined the health human resources and their availability in Rameswaram Island.

Methodology

Figure 1: Study Area – Location Map
The malaria data are collected from Rameswaram Island through the Primary Health Centres (PHCs) in Pamban and Thangachimadam from the year of 2002 to 2011. To analyse the minimum requirement of the environmental and climatological parameters for the malaria incidence will be determined. Based on the malaria endemic data, the Annual Blood smear Examination Rate, Slide Positive Rate (SPR), Slide falciparum Rate (SfR) and Annual Parasite Index (API) will be calculated and compared along the decade. The malaria epidemiological factors will be compared using statistical methods. The data has been collected from various sources namely the Health and Family Welfare Department, Tamil Nadu, State Health Society, Tamil Nadu and website of National Vector Borne Disease Control Programme. To delineate the state government’s participation in eradicating and controlling the disease patterns in most endemic areas. This will be helped to researchers, health planners and policy makers for planning and research.

Malaria Epidemiology in Rameswaram Island
Malaria is an environmental related disease affected by a variety of factors. Fever is the serious symptom of malaria. It can be irregular with or without periodic or continuous. The fever has frequently gone wild by headache, myalgia, arthralgia, anorexia, sickness and vomiting (Guidelines for Malaria, GOI. 2009). The malaria prevalence in Pamban and Thangachimadam PHCs are shown in Table 1 and Table 2.

Epidemiological Factors
Host Factors
1. Movement from one place to another is the main factor for malaria endemic. The majority of the population in the Rameswaram Island are fishermen and they are moving around the eastern coastal areas from Nagapattinam to Kanyakumari.
2. The Full course of Radical Treatment in P. vivax malaria case is now for 14 days. The non-availability and insufficiency of health human resources affect the tablets are handed over to the patients for consumption could not be completed.
3. In Rameswaram Island, the large scale of malaria cases all over India are being transmitted because of the pilgrimage, even from the states where the resistant stress of malaria parasites is reported.

Parasite Factors:
In India, three species of malaria prevalence occur and they are Plasmodium vivax, Plasmodium falciparum and Plasmodium malariae (Behera P, 2013). In Rameswaram Island, both P. vivax and P. falciparum are being stated all over the year. Due to the pilgrimage, the P. Falciparum has been declared as resistant to Chloroquine. After that, the Artisunate Combination Therapy (ACT) is being started in the island since 2007 (SHS-PIP, 2012).

Environmental Factors:
The malaria parasite development and the duration of the malaria incidence are directly influenced by climatic conditions (Martens W.J., et al., 1995). Parameters like rainfall, humidity and temperature are most important on malaria outbreaks. The average rainfall of Rameswaram Island is 970 mm and maximum rainfall is during north east monsoon. The amount of optimized humidity for malaria incidence is 60 – 65 percent (Sumana B, et al., 2006). The humidity of the island is always high i.e. 60 – 80 percent, this has a direct impact on the survival of the mosquitoes. Temperature is very vital because it manages the mosquito’s development into adults and the growth time of parasites in the mosquito (Muirhead, Thomson R.C., 1951). Warmer ambient temperatures shorten the duration of the extrinsic cycle, thus increasing the chances of transmission (Jackson, 2010). In this island, the average temperature is between 36°C - 42°C throughout the year. This is very suitable climatic conditions for malaria incidence in Rameswaram Island.

Epidemiological Indicators for Malaria
Annual Blood Smear Examination Rate (ABER):
ABER reflects the efficiency and adequacy of case detection. It should be equal to the fever rate in the locality.

\[
\text{ABER} = \frac{\text{Number of blood smears examined in a year}}{\text{Total Population}} \times 100
\]

**Slide Positivity Rate (SPR):**

\[
\text{SPR} = \frac{\text{Total No. of blood smears found positive for malaria parasite}}{\text{Total Population}} \times 100
\]

**Slide falciparum Rate (SfR):**

\[
\text{SfR} = \frac{\text{Number of blood smears examined in a year}}{\text{Total Population}} \times 100
\]

**Annual Parasite Incidence (API):**

\[
\text{API} = \frac{\text{Confirmed cases during one year}}{\text{Population under Surveillance}} \times 1000
\]

(WHO, 1963)

Table 1: Year wise ABER, SPR, SfR and API from 2002 to 2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Blood Smear Collection/Exam.</th>
<th>Pv*</th>
<th>Pf**</th>
<th>Total</th>
<th>ABER</th>
<th>SPR</th>
<th>SfR</th>
<th>API</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>19823</td>
<td>329</td>
<td>22</td>
<td>351</td>
<td>41.15</td>
<td>1.77</td>
<td>0.11</td>
<td>7.29</td>
</tr>
<tr>
<td>2003</td>
<td>39301</td>
<td>2984</td>
<td>355</td>
<td>3339</td>
<td>81.59</td>
<td>8.50</td>
<td>0.90</td>
<td>69.32</td>
</tr>
<tr>
<td>2004</td>
<td>31854</td>
<td>2253</td>
<td>214</td>
<td>2467</td>
<td>66.13</td>
<td>7.74</td>
<td>0.67</td>
<td>51.21</td>
</tr>
<tr>
<td>2005</td>
<td>26741</td>
<td>2865</td>
<td>645</td>
<td>3510</td>
<td>55.51</td>
<td>13.13</td>
<td>2.41</td>
<td>72.87</td>
</tr>
<tr>
<td>2006</td>
<td>10184</td>
<td>585</td>
<td>48</td>
<td>633</td>
<td>21.14</td>
<td>6.22</td>
<td>0.47</td>
<td>13.14</td>
</tr>
<tr>
<td>2007</td>
<td>21594</td>
<td>751</td>
<td>147</td>
<td>898</td>
<td>44.83</td>
<td>4.16</td>
<td>0.68</td>
<td>18.64</td>
</tr>
<tr>
<td>2008</td>
<td>16600</td>
<td>494</td>
<td>62</td>
<td>556</td>
<td>34.46</td>
<td>3.35</td>
<td>0.37</td>
<td>11.54</td>
</tr>
<tr>
<td>2009</td>
<td>9894</td>
<td>493</td>
<td>66</td>
<td>559</td>
<td>20.36</td>
<td>5.70</td>
<td>0.70</td>
<td>11.60</td>
</tr>
<tr>
<td>2010</td>
<td>15253</td>
<td>774</td>
<td>65</td>
<td>839</td>
<td>31.70</td>
<td>5.50</td>
<td>0.40</td>
<td>17.40</td>
</tr>
<tr>
<td>2011</td>
<td>22752</td>
<td>861</td>
<td>216</td>
<td>1077</td>
<td>47.29</td>
<td>4.75</td>
<td>0.95</td>
<td>22.38</td>
</tr>
</tbody>
</table>


Table 2: Year wise ABER, SPR, SfR and API from 2002 to 2011
PHC: Pamban

<table>
<thead>
<tr>
<th>Year</th>
<th>Blood Smear Collection/Exam.</th>
<th>Py*</th>
<th>Pf**</th>
<th>Total</th>
<th>ABER</th>
<th>SPR</th>
<th>SfR</th>
<th>API</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>18,313</td>
<td>149</td>
<td>4</td>
<td>153</td>
<td>64.69</td>
<td>0.84</td>
<td>0.02</td>
<td>5.40</td>
</tr>
<tr>
<td>2003</td>
<td>31,901</td>
<td>1,738</td>
<td>296</td>
<td>2,034</td>
<td>112.68</td>
<td>6.38</td>
<td>0.93</td>
<td>71.85</td>
</tr>
<tr>
<td>2004</td>
<td>15,138</td>
<td>703</td>
<td>81</td>
<td>784</td>
<td>53.47</td>
<td>5.18</td>
<td>0.54</td>
<td>27.69</td>
</tr>
<tr>
<td>2005</td>
<td>14,494</td>
<td>994</td>
<td>140</td>
<td>1,134</td>
<td>51.20</td>
<td>7.82</td>
<td>0.97</td>
<td>40.06</td>
</tr>
<tr>
<td>2006</td>
<td>7,176</td>
<td>481</td>
<td>61</td>
<td>542</td>
<td>25.35</td>
<td>7.55</td>
<td>0.85</td>
<td>19.15</td>
</tr>
<tr>
<td>2007</td>
<td>19,765</td>
<td>742</td>
<td>169</td>
<td>911</td>
<td>69.82</td>
<td>4.61</td>
<td>0.86</td>
<td>32.18</td>
</tr>
<tr>
<td>2008</td>
<td>12,562</td>
<td>760</td>
<td>94</td>
<td>854</td>
<td>44.37</td>
<td>6.80</td>
<td>0.75</td>
<td>30.17</td>
</tr>
<tr>
<td>2009</td>
<td>8,367</td>
<td>527</td>
<td>58</td>
<td>585</td>
<td>28.26</td>
<td>7.00</td>
<td>0.69</td>
<td>19.78</td>
</tr>
<tr>
<td>2010</td>
<td>8,739</td>
<td>915</td>
<td>86</td>
<td>1,001</td>
<td>31.70</td>
<td>7.40</td>
<td>0.60</td>
<td>23.40</td>
</tr>
<tr>
<td>2011</td>
<td>17,547</td>
<td>1,232</td>
<td>195</td>
<td>1,427</td>
<td>57.34</td>
<td>8.13</td>
<td>1.11</td>
<td>46.63</td>
</tr>
</tbody>
</table>


**Figure 2:** Comparison of API between Thangachimadam and Pamban

The Annual Parasite Incidence (API) in Pamban and Thangachimadam is >10 and then the government initiated an innovative approach that is Tent-type Mosquito Nets are to be supplied to the HSCs where the SPR and SfR is high.

There are 13 Health Sub Centres (HSCs) in Rameswaram Island and has been found 7 HSCs are high risk SPR areas. The following list shown the high risk HSCs having SPR is always above 5.0 for consecutive three years.
Table 3: List of high risk areas in Malaria

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the HSC</th>
<th>SPR</th>
<th>SfR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pamban</td>
<td>4.16</td>
<td>5.12</td>
</tr>
<tr>
<td>2</td>
<td>S.S.Pattinam</td>
<td>11.12</td>
<td>20.65</td>
</tr>
<tr>
<td>3</td>
<td>Ariankundu</td>
<td>17.68</td>
<td>12.45</td>
</tr>
<tr>
<td>4</td>
<td>Tharavathoppu</td>
<td>4.34</td>
<td>7.92</td>
</tr>
<tr>
<td>5</td>
<td>Thangachimadam</td>
<td>10.23</td>
<td>10.12</td>
</tr>
<tr>
<td>6</td>
<td>S.M.Koil</td>
<td>6.55</td>
<td>9.28</td>
</tr>
<tr>
<td>7</td>
<td>Natarajapuram</td>
<td>4.88</td>
<td>9.17</td>
</tr>
</tbody>
</table>


Figure 3: Comparison of SPR in high risk areas

In 2010, the SPR is very high comparing with the year 2011. Relating with S.S.Pattinam to others places the SPR is great. So the government has been taking all remedial measures including IRS, Anti-Larval work, Biological and Thermal Fogging.

Figure 4: Comparison of SfR in high risk areas

In the above figure is shown the comparison of SfR values in high risk areas of the Rameswaram Island. In 2011, it is high in Thangachimadam HSC area with compared to any other places.

Present Malaria Control in Rameswaram Island
Anti-Larval Activities

Anti-Larval plans are carried out in Whole Island. All wells are treated with larvicides. Temephos and other breeding sources are treated with Biolarvicide. Bacillus thuringiensis. Temephos is used once in a week and Biolarvicideonce in a fortnight. Field workers are being tied up in this work. The work load of Anti-larval work in Rameswaram Island is as follows:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of PHC</th>
<th>No.of Wells</th>
<th>No.of OHT*</th>
<th>No.of Pits</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thangachimadam</td>
<td>7570</td>
<td>1609</td>
<td>1986</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Pamban</td>
<td>3581</td>
<td>259</td>
<td>1767</td>
<td>326</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>11151</td>
<td>1868</td>
<td>3753</td>
<td>326</td>
</tr>
</tbody>
</table>

*OHT- Over Head Tank

Source: PIP, SHS-TN, 2012-13

Anti-Adult Measures

Indoor Residual Spray (IRS) with artificialpyrethroid was started during 1991-92. Two rounds of IRS is being done in a year, ie., 1st round in June and 2nd round in September. The insecticides like Deltamethrin, Lambda cyhalothrin and Cyfluthrin are used on rotation, once in 3 years.

Status of Health Human Resources availability for Anti larval work

In Rameswaram Island, the landscape is undulating plain and sand dunes. So the Anti-larval work in the Island is difficult in nature. In the coconut farms which are situated in remote places in the island have burrow pits, but it could not easily accessed by field workers.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the PHC</th>
<th>Field Worker in Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thangachimadam</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Pamban</td>
<td>5</td>
</tr>
</tbody>
</table>


There are only 16 field workers are available for the island which is very minimum in terms of work load.

Conclusion:

A Global Malaria Action Plan seeks to eliminate using integrated approaches including vaccines, insecticide-treated mosquito nets (ITNs), indoor insecticide residual spray (IRS) and improved drug treatments (WHO, Rollback Malaria, 2000). The measurement of malaria in a community helps in finding the prevalent of the disease and the prevalent factor is very vital in the study of the spatial distribution of the disease (Dutta S., 2006). The supervision of anti-larval work is very essential to make sure the correct dosage of larvicide, proper visit of the field workers for anti-larval work, completeness of the area and the mortality of the larva after the treatment. So, 9 Surveillance Inspectors (SI) to Thangachimadam PHC and 4 Surveillance Inspectors to Pamban PHC are required. But now only one Health Inspector for Thangachimadam PHC and nil Health Inspector for Pamban PHC is available. So, 13 Surveillance Inspectors are needed for Rameswaram Island for surveillance and Radical Treatment of malaria endemic. In high risk areas, the unavailability of manpower for carries out Residual spray and anti-larval work to control malaria transmission also a major problem in the Island. To create public awareness, the government will conduct special camps; organize of meeting with village leaders and impressing about the prevention of malaria at village level is very helpful to eradicate malaria.

References:

Guidelines for diagnosis and treatment of Malaria, National Vector Borne Disease Control Programme (NVBDCP), Government of India, 2009.
http://en.wikipedia.org/wiki/Pamban_Island
http://www.rollbackmalaria.org/gmap/index.html
PIP-SHS, 2012-13, Project Implementation Plan, State Health Society, Tamil Nadu.
Water Supply and Demand Assessment in Chennai City

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Abstract: In order to assess the water supply in Chennai city for a small focusing group of slums, the slum clearance board has been surveyed for Slums the level of water supply Status Assessment and also b) Surveyed for Demand Assessment. The survey format is to provide inputs for the quantitative assessment at the slum level while the latter to provide inputs for qualitative assessment in terms of both the need and the willingness-to-pay for the improved services. All the above data has been adopted quantitative techniques.

Key Words: Fresh Water, Surface Supply, Reservoir, Ground Water, Ground Water recharge facilities.

Introduction

The Chennai Municipal Water Supply and Sewerage Board (CMWSSB) is solely responsible for providing drinking water and sewerage services to the residents of Chennai. One of India's major metropolises, Chennai is situated at the northern coastal edge of the State of Tamil Nadu. The city is more well-known by its older name of Madras. Currently, Chennai is inhabited by more than 7 million people in an area of 176 sq km. The CMWSSB depends on surface reservoirs and ground water sources to maintain water supply to the residents. Supply is maintained through multiple means. Since Chennai is essentially low-lying and water supply is intermittent, most residents build underground sumps that store the water. Subsequently, the water is pumped up to an overhead tank. In other cases, water tankers are dispatched by CMWSSB to various localities and the sumps are filled from the tankers. In other localities, CMWSSB has put in place above-ground water tanks and these are filled by the water tankers. In yet other places, residents collect water directly from the tanker.

Despite the seemingly abundant sources of water, Chennai suffers continuously from water stress since the entire basin is dependent on rainfall. The annual rainfall in Chennai is 1200 mm [2]. This quantum is, given the size of the Chennai basin, sufficient to meet the needs of the population. The problem is with the distribution of the rainfall. There are two rainy seasons in Chennai. The first is the Southwest monsoon, which has patchy rains and contributes about 25% of the total rain and falls between May and September. This does not do much for ground water recharge. However, the Northwest Monsoon (Oct to Dec) is usually characterized by a series of storms that brings the remaining 75% of total rain in extremely short bursts. During this time, Chennai is prone to flooding and, before 2003, a large part of this water would have been lost as run-off into the sea.

CMWSSB traditionally focused its attention on increasing surface storage, transporting fresh water from long distances. Like the Telugu Ganga project - probably one of the longest canals built for water supply to the city that failed to ease the water problem. Another attempt was to divert water from Chembaramabakkam and Veeranam tanks whereby the water rights of the agrarian community were infringed. Drilling of borewells in the Cuddalore belt and installation of turbine pumps to tap 100mld whereby the groundwater which again supports the local agriculture community was depleted. None of these solutions were sustainable in the long run and yet CMWWSSB paid very little attention to ground water recharge that had that potential. In 1997, at the Shri AMM Murugappa Chettiar Research Centre (MCRC), Chennai, [3] a study was conducted to understand the user experience. The study surveyed 10,000 households in 155 corporation wards of Chennai. The focus was on how residents get their
water needs met and how the water is utilised. Raw data from this study was further analyzed by Dr. A Vaidyanathan and J. Saravanan. These studies clearly established that the contribution of ground water could be as high as 80% in some cases.

Objectives of the Study
- To show the sources of water supply in Chennai city specially focusing on slum area.
- To show the provision / facility of water supply available for the slum people in Chennai city.
- To show the contribution of slum people for water supply.

Essential Services and Facilities

Water Supply

Water supply to the Chennai City was affected solely from shallow wells for many years, and it was during 1866 that decision was made to adopt a public supply scheme. This scheme, which combined the Chennai City Water Supply with irrigation of 3500 ha of previously wasteland, was opened in 1872. Water was taken from the Kortalaiyar River to storage in Cholavaram and Redhills Lakes. Further developments, which took place after 1907 included the construction of an outlet tower and roughing filters at Redhills, an underground conduit to convey water to the city and slow-sand filters at Kilpauk. The new works were designed to supply 160 lpcd to an estimated population of 6.6 lakhs in 1961. However, the population of the city grown to about 18 lakhs by the year 1961.

In order to meet the increasing demand for water in the city, the irrigation supply was discontinued for sometime during 1940's or 1950's. The treatment capacity at Kilpauk was increased by a provision of rapid-gravity filters with a capacity of 45 MLD, which was later increased by 135 MLD to 190 MLD. One more conduit to convey the raw water to Kilpauk was also laid, which was strengthened by a third conduit during 1980's. To increase the available yield from the catchment, a new reservoir was constructed between 1940 and 1944 across the Kortalaiyar River at Poondi.

Groundwater continued to be drawn from shallow wells within the city boundaries, particularly in the suburbs. Further, groundwater development occurred after 1968 based on a UNDP study, which recommended development of the Arani-Kortalaiyar aquifer to the northwest of the city. With the increase in population and expansion of urbanized area, distribution lines were extended periodically and eventually led to the establishment of Zonal System of distribution in 1954. Twelve water zones were formed with an aim to supply water to the consumers equitably at adequate pressures; and trunk mains were laid. By 1970-72, additional Head Works were commissioned in Robinson Park (now called Anna Poonga), Southern Head Works and K. K. Nagar. As the requirement of the growing population in Chennai were huge and the investment required in infrastructure was going up, it was decided to form a separate Statutory Board to look after the water supply and sewerage system by getting institutional finance from World Bank and other sources and hence the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) was formed by an Act of the Legislature of Tamil Nadu.

Sources of Water Supply

**Surface Water Sources:** Main source of water supply to the city is from three lakes, viz. Redhills, Cholavaram & Poondi, having an aggregate storage capacity of 175 million cu. m. Since January 2000, Chembarambakkam is also used as a supplementary source after meeting the needs of the registered ayacut. Besides this, during the rainy seasons i.e. three to four months, two small lakes namely, Erattai Eri and Porur Lake are also utilized as a source of supply. The source is the runoff from its own local catchment area during monsoon rains. In addition to the above sources, an agreement has been signed by the Government of Tamil Nadu (GoTN) and the Government of Andhra Pradesh (GoAP) to supply about 8 tmc during July to October and about
4 tmc during January to April, to the areas located in the outskirts of Chennai Municipal Corporation limits.

**Ground Water Sources**
The CMWSSB has developed about 7 Well Fields accommodating about 74 deep bore wells, viz. (i) Poondi; (ii) Tamaraiapakkam; (iii) Flood Plains; (iv) Kannigaipair; (v) Panjetty; (vi) Minjur; and (vii) Southern Coastal Aquifer. In addition, the CMWSSB has also executed water purchase agreement with private agricultural owners. From both the sources mentioned above, about 100 MLD of water is extracted to augment industrial and city water supply.

**Distribution Supply System**
Water is treated at three treatment plants (Redhills, Kilpauk & KK Nagar). Earlier, the water was distributed to the City through 4 Water Distribution Stations. Keeping in view of the water demand of the projected population of Chennai City for the year 2021 and also with a view to remove the existing systemic deficiencies and to ensure equitable distribution of water throughout the city, the CMWSSB has been executing a Water Supply & Sewerage Master Plan. This Plan contemplates introducing a concept of self-sustaining Zonal Distribution System, each having a reservoir, distribution station, necessary pumping systems and a network of water distribution arrangements by dividing the entire Chennai City into 16 Zones as against the present radial distribution system. Based on the Master Plan prepared in 1990 under the World Bank aided First Chennai Project, the city distribution system was reorganized into 16 Zones, each with a separate Head Works and 12 additional Head Works.

**Water Supply: Status Assessment**
Water supply is one of the core environmental infrastructure services delivered by the local body. The following indicators have been analyzed to assess the existing service levels, coverage and efficiency in delivery.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Service Levels and Coverage</th>
<th>Service Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No. of persons per public tap/public water tank</td>
<td></td>
</tr>
</tbody>
</table>

It was observed that the slums in Chennai City were not served with piped water supply. The sources of water included open wells, bore wells and public water tanks. The public water tanks are generally large PVC water tanks to which the water is filled through a water tanker lorry. Following table provides the number of public water taps/public water tanks available in slums located each zone and their interpretation with respect to the service indicator as number of persons per public tap/public water tank.
Table No. : Zone-wise Break-up of Number of Public Water Tanks/Taps and Number of Persons per Public Water Tank/Tap for Water Supply

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>No. of Public Water Tanks / Taps</th>
<th>No. of Persons per Public Water Tank / Tap</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>40</td>
<td>297</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>36</td>
<td>438</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>51</td>
<td>689</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>54</td>
<td>540</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>19</td>
<td>774</td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>70</td>
<td>868</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>23</td>
<td>813</td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>28</td>
<td>631</td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>75</td>
<td>587</td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>194</td>
<td>561</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>590</strong></td>
<td><strong>620</strong></td>
</tr>
</tbody>
</table>

From the above table, it is evident that the number of persons sharing the public water tank/tap is very high with an average of about 620 persons per water tank/tap. The situation is worse in Zone VI and Zone VII, where number of persons sharing each public water tank/tap is 868 and 813 respectively. The following chart presents the above graphically.

Chart No.: Zone-wise Break-up of Number of Public Water Tank/Tap for Water Supply

![Chart No.: Zone-wise Break-up of Number of Public Water Tank/Tap for Water Supply](image1)

Chart No.: Zone-wise Break-up of Number of Persons per Public Water Tank/Tap

![Chart No.: Zone-wise Break-up of Number of Persons per Public Water Tank/Tap](image2)
Demand Assessment
Sources of Water
Based on the Demand Assessment Surveys, the slums in all the Zones of the Chennai City predominantly (about 90 percent) depend on supplies through municipal water tankers. Over zones, the response ranges from 83.3 percent to 96.8 percent. Less than one percent of the respondents stated that they have own municipal connections and 3.7 percent revealed that they access public taps. The table below presents the fact base on the survey outcome while the chart presents the rating with respect to the households consuming water from the public water tank.

Table No.: Zone-wise Break-up of Responses on Sources of Water

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Public Tap (%)</th>
<th>Water Tank (%)</th>
<th>Own Connection (%)</th>
<th>Hand Pump (%)</th>
<th>Community Well (%)</th>
<th>No Response (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>4.9</td>
<td>84.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>11.2</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>3.0</td>
<td>94.0</td>
<td>0.0</td>
<td>3.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>8.0</td>
<td>80.0</td>
<td>7.0</td>
<td>4.0</td>
<td>0.0</td>
<td>1.0</td>
<td>100.0</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>3.1</td>
<td>94.3</td>
<td>0.7</td>
<td>1.9</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>2.4</td>
<td>96.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.5</td>
<td>0.5</td>
<td>100.0</td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>1.6</td>
<td>96.1</td>
<td>0.0</td>
<td>2.1</td>
<td>0.0</td>
<td>0.2</td>
<td>100.0</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>0.4</td>
<td>89.8</td>
<td>0.9</td>
<td>4.4</td>
<td>1.3</td>
<td>3.1</td>
<td>100.0</td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>0.0</td>
<td>84.2</td>
<td>0.0</td>
<td>14.7</td>
<td>0.0</td>
<td>1.1</td>
<td>100.0</td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>1.5</td>
<td>96.8</td>
<td>0.3</td>
<td>0.0</td>
<td>0.5</td>
<td>0.9</td>
<td>100.0</td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>12.4</td>
<td>83.3</td>
<td>0.0</td>
<td>3.7</td>
<td>0.1</td>
<td>0.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>3.7</td>
<td>89.9</td>
<td>0.9</td>
<td>3.4</td>
<td>0.2</td>
<td>1.8</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004

Chart No.: Zone-wise Rating of Slums Consuming Water from Water Tank

Percentage Households consuming water from the Water Tank W/B than the Overall Position of City Slums

Source: Demand Assessment Surveys; 2004

Frequency of Water Supply
For all zones in the Chennai City, about 73.8% of the respondents have access to daily water supply. Another 24 percent of respondents enjoy supplies on alternate days. The remaining 1.4 percent of households (excluding the 0.8 percent of non-respondents) did not have regular frequency in water supply like twice a week, weekly, fortnightly or monthly as given in the table below. The chart below indicates the zone wise position of households, which do not have regular frequency of water supply.
Table No.: Zone-wise Break-up of Frequency of Water Supply

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Daily</th>
<th>Once</th>
<th>Alternative Days</th>
<th>Twice a Week</th>
<th>Weekly</th>
<th>Irregular</th>
<th>No Response</th>
<th>Total</th>
<th>&lt; Twice a Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>71.4</td>
<td>23.5</td>
<td>1.8</td>
<td>0.0</td>
<td>0.0</td>
<td>3.2</td>
<td>0.0</td>
<td>100.0</td>
<td>1.8</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>56.0</td>
<td>41.8</td>
<td>0.9</td>
<td>1.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>100.0</td>
<td>2.2</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>56.8</td>
<td>42.0</td>
<td>0.0</td>
<td>1.0</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
<td>100.0</td>
<td>1.0</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>44.7</td>
<td>54.6</td>
<td>0.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
<td>100.0</td>
<td>0.5</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>91.8</td>
<td>5.8</td>
<td>0.0</td>
<td>1.4</td>
<td>0.5</td>
<td>0.5</td>
<td>0.0</td>
<td>100.0</td>
<td>1.9</td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>61.9</td>
<td>34.2</td>
<td>2.3</td>
<td>0.2</td>
<td>1.4</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
<td>3.9</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>74.3</td>
<td>16.8</td>
<td>0.0</td>
<td>1.3</td>
<td>6.2</td>
<td>1.3</td>
<td>0.0</td>
<td>100.0</td>
<td>7.5</td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>49.5</td>
<td>50.0</td>
<td>0.0</td>
<td>0.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
<td>0.5</td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>78.6</td>
<td>20.2</td>
<td>0.2</td>
<td>0.0</td>
<td>0.0</td>
<td>1.1</td>
<td>0.0</td>
<td>100.0</td>
<td>0.2</td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>56.7</td>
<td>38.8</td>
<td>0.0</td>
<td>4.0</td>
<td>0.0</td>
<td>0.5</td>
<td>0.0</td>
<td>100.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>64.2</td>
<td>32.8</td>
<td>0.6</td>
<td>1.0</td>
<td>0.8</td>
<td>0.7</td>
<td>0.0</td>
<td>100.0</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004

Distance of Community Water Supply

As given in the table below, about 56 percent of the households in all zones had community water supply available within a distance of 50 meters and another 21 percent had within 50 to 100 meters. For the remaining 12.1 percent (excluding the 11 percent of non-respondents), the water sources were available beyond 100 meters. Zone wise position of such households not having community water supply within 100 m distance is presented in the chart below.

Table No.: Zone-wise Break-up of Distance of Community Water Supply

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Less than 50 m</th>
<th>51 m to 100 m</th>
<th>More than 100 m</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>57.2</td>
<td>20.3</td>
<td>12.0</td>
<td>10.5</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>34.9</td>
<td>50.0</td>
<td>4.3</td>
<td>10.8</td>
<td>100.0</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>74.9</td>
<td>22.0</td>
<td>1.2</td>
<td>2.0</td>
<td>100.0</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>60.8</td>
<td>17.5</td>
<td>5.0</td>
<td>16.8</td>
<td>100.0</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>75.0</td>
<td>13.0</td>
<td>10.1</td>
<td>1.9</td>
<td>100.0</td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>54.1</td>
<td>10.1</td>
<td>33.3</td>
<td>2.5</td>
<td>100.0</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>52.7</td>
<td>12.4</td>
<td>10.6</td>
<td>24.3</td>
<td>100.0</td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>56.3</td>
<td>11.6</td>
<td>0.0</td>
<td>32.1</td>
<td>100.0</td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>32.6</td>
<td>30.9</td>
<td>35.0</td>
<td>1.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004
Water Storage Facility within the Property

A majority of households (90.4 percent) had water storage facilities other than overhead tank, underground tank or storage drums, within their property. Across all zones, the status of such respondents varied from 74.4 percent to 95.3 percent as indicated in the table below. About two-fourths of the respondents did not respond in Zone 1.

Table No. : Zone-wise Break-up of Water Storage Facilities within Property

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Overhead Tank</th>
<th>Underground Tank</th>
<th>Storage Drums</th>
<th>Others</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zone I</td>
<td>0.0</td>
<td>0.0</td>
<td>0.8</td>
<td>74.4</td>
<td>24.7</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Zone II</td>
<td>0.0</td>
<td>0.9</td>
<td>1.7</td>
<td>95.3</td>
<td>2.2</td>
<td>100.0</td>
</tr>
<tr>
<td>3</td>
<td>Zone III</td>
<td>0.2</td>
<td>5.3</td>
<td>0.0</td>
<td>93.7</td>
<td>0.8</td>
<td>100.0</td>
</tr>
<tr>
<td>4</td>
<td>Zone IV</td>
<td>0.0</td>
<td>7.6</td>
<td>0.0</td>
<td>91.7</td>
<td>0.7</td>
<td>100.0</td>
</tr>
<tr>
<td>5</td>
<td>Zone V</td>
<td>0.5</td>
<td>12.5</td>
<td>0.5</td>
<td>86.1</td>
<td>0.5</td>
<td>100.0</td>
</tr>
<tr>
<td>6</td>
<td>Zone VI</td>
<td>0.2</td>
<td>1.4</td>
<td>0.6</td>
<td>97.5</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>7</td>
<td>Zone VII</td>
<td>0.0</td>
<td>1.8</td>
<td>3.1</td>
<td>92.5</td>
<td>2.7</td>
<td>100.0</td>
</tr>
<tr>
<td>8</td>
<td>Zone VIII</td>
<td>0.0</td>
<td>3.2</td>
<td>0.0</td>
<td>91.6</td>
<td>5.3</td>
<td>100.0</td>
</tr>
<tr>
<td>9</td>
<td>Zone IX</td>
<td>0.3</td>
<td>1.2</td>
<td>0.5</td>
<td>92.5</td>
<td>5.5</td>
<td>100.0</td>
</tr>
<tr>
<td>10</td>
<td>Zone X</td>
<td>0.4</td>
<td>4.3</td>
<td>0.4</td>
<td>88.3</td>
<td>6.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0.2</td>
<td>3.8</td>
<td>0.8</td>
<td>90.4</td>
<td>4.9</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004
Water Consumption Pattern and Adequacy

Nearly 66.7 percent of the respondents indicated that water was available more than 50 liters per day, with about 11.4 percent saying that they had more than 100 litres a day. However, 29.4 percent of the households (excluding the 3.9 percent of non-respondents) received less than 50 litres of water per day, as given in the table below (Table No. 5.4.7). The zone wise rating with respect to the availability of water of less than 50 litres per day is presented in the chart below (Chart No. 5.4.6).

Further, a majority of respondents (54.9 percent) expressed that the available water was just manageable and about 1.7 percent of respondents reported that water was grossly inadequate. Another 18.5 percent of the respondents indicated that the water available was just sufficient, as indicated in the Table No. 5.4.8.

Table No.: Zone-wise Break-up of Quantity of Daily Water Availability

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Less than 25 Litres</th>
<th>26 to 50 Litres</th>
<th>51 to 100 Litres</th>
<th>More than 100 Litres</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>3.0</td>
<td>22.5</td>
<td>37.3</td>
<td>13.8</td>
<td>23.3</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>8.6</td>
<td>34.5</td>
<td>46.1</td>
<td>9.9</td>
<td>0.9</td>
<td>100.0</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>2.4</td>
<td>25.7</td>
<td>67.9</td>
<td>1.4</td>
<td>2.6</td>
<td>100.0</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>6.6</td>
<td>15.6</td>
<td>58.6</td>
<td>17.0</td>
<td>2.1</td>
<td>100.0</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>14.4</td>
<td>6.3</td>
<td>53.4</td>
<td>24.0</td>
<td>1.9</td>
<td>100.0</td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>2.7</td>
<td>19.3</td>
<td>76.1</td>
<td>1.4</td>
<td>0.6</td>
<td>100.0</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>3.1</td>
<td>15.5</td>
<td>67.3</td>
<td>12.8</td>
<td>1.3</td>
<td>100.0</td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>3.2</td>
<td>40.0</td>
<td>41.6</td>
<td>14.2</td>
<td>1.1</td>
<td>100.0</td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>3.4</td>
<td>30.7</td>
<td>61.8</td>
<td>2.6</td>
<td>1.5</td>
<td>100.0</td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>6.2</td>
<td>29.6</td>
<td>43.3</td>
<td>17.3</td>
<td>3.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5.4</td>
<td>24.0</td>
<td>55.3</td>
<td>11.4</td>
<td>3.9</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004

Chart No.: Zone-wise Rating on Availability of less than 50 litres of Water per Day

Source: Demand Assessment Surveys; 2004
Table No.: Zone-wise Break-up of Adequacy of Water Availability

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Very Sufficient</th>
<th>Just Sufficient</th>
<th>Manageable</th>
<th>Grossly Inadequate</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zone I</td>
<td>6.3</td>
<td>20.9</td>
<td>47.1</td>
<td>0.2</td>
<td>25.6</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Zone II</td>
<td>28.9</td>
<td>21.1</td>
<td>47.8</td>
<td>0.4</td>
<td>1.7</td>
<td>100.0</td>
</tr>
<tr>
<td>3</td>
<td>Zone III</td>
<td>11.1</td>
<td>32.9</td>
<td>54.1</td>
<td>0.0</td>
<td>2.0</td>
<td>100.0</td>
</tr>
<tr>
<td>4</td>
<td>Zone IV</td>
<td>13.7</td>
<td>22.2</td>
<td>59.3</td>
<td>1.9</td>
<td>2.8</td>
<td>100.0</td>
</tr>
<tr>
<td>5</td>
<td>Zone V</td>
<td>6.3</td>
<td>3.4</td>
<td>81.3</td>
<td>7.7</td>
<td>1.4</td>
<td>100.0</td>
</tr>
<tr>
<td>6</td>
<td>Zone VI</td>
<td>8.6</td>
<td>4.9</td>
<td>85.8</td>
<td>0.6</td>
<td>0.2</td>
<td>100.0</td>
</tr>
<tr>
<td>7</td>
<td>Zone VII</td>
<td>27.9</td>
<td>7.5</td>
<td>60.6</td>
<td>3.1</td>
<td>0.9</td>
<td>100.0</td>
</tr>
<tr>
<td>8</td>
<td>Zone VIII</td>
<td>42.6</td>
<td>12.6</td>
<td>43.7</td>
<td>1.1</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>9</td>
<td>Zone IX</td>
<td>49.4</td>
<td>29.4</td>
<td>19.6</td>
<td>0.5</td>
<td>1.2</td>
<td>100.0</td>
</tr>
<tr>
<td>10</td>
<td>Zone X</td>
<td>14.4</td>
<td>30.2</td>
<td>50.1</td>
<td>1.4</td>
<td>3.9</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>20.9</td>
<td>18.5</td>
<td>54.9</td>
<td>1.7</td>
<td>4.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004

It was also reported that a majority of slum dwellers (about 71.64 percent) were purchasing the drinking water all across the zones whereas about 17.01 percent did not respond for the query. Rest 11.35 percent was using public water as drinking water. The table below presents the zone-wise fact base on the purchase of drinking water and the chart below presents the zone wise rating of slum dwellers purchasing drinking water.

Table No. : Zone-wise Break-up of Status on Purchasing Drinking Water

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Yes</th>
<th>No</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zone I</td>
<td>58.6</td>
<td>15.4</td>
<td>26.0</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Zone II</td>
<td>62.9</td>
<td>18.1</td>
<td>19.0</td>
<td>100.0</td>
</tr>
<tr>
<td>3</td>
<td>Zone III</td>
<td>80.2</td>
<td>17.4</td>
<td>2.4</td>
<td>100.0</td>
</tr>
<tr>
<td>4</td>
<td>Zone IV</td>
<td>80.6</td>
<td>9.9</td>
<td>9.5</td>
<td>100.0</td>
</tr>
<tr>
<td>5</td>
<td>Zone V</td>
<td>90.4</td>
<td>6.7</td>
<td>2.9</td>
<td>100.0</td>
</tr>
<tr>
<td>6</td>
<td>Zone VI</td>
<td>86.0</td>
<td>8.0</td>
<td>6.0</td>
<td>100.0</td>
</tr>
<tr>
<td>7</td>
<td>Zone VII</td>
<td>69.5</td>
<td>19.9</td>
<td>10.6</td>
<td>100.0</td>
</tr>
<tr>
<td>8</td>
<td>Zone VIII</td>
<td>80.5</td>
<td>7.9</td>
<td>11.6</td>
<td>100.0</td>
</tr>
<tr>
<td>9</td>
<td>Zone IX</td>
<td>65.7</td>
<td>33.2</td>
<td>1.1</td>
<td>100.0</td>
</tr>
<tr>
<td>10</td>
<td>Zone X</td>
<td>84.2</td>
<td>11.1</td>
<td>4.7</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>71.64</td>
<td>11.35</td>
<td>17.01</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004
Quality of Water
While 5.1 percent of the respondents felt that the water quality was good, 75.4 percent of respondents felt that the water quality was average. There were 18.3 percent of non-respondents about half of the respondents did not answer this query in Zone 1), while remaining 1.3 percent felt that the quality of water was bad. The zone-wise fact base on the quality of water is given in the table below and the chart presents the rating of the zones based on the respondents’ opinion on quality of water.

Table No.: Zone-wise Break-up of Status on Quality of Water
All Figures in Percentage

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Good</th>
<th>Average</th>
<th>Bad</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>1.6</td>
<td>61.3</td>
<td>0.0</td>
<td>37.1</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>2.6</td>
<td>95.3</td>
<td>0.0</td>
<td>2.2</td>
<td>100.0</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>7.9</td>
<td>52.7</td>
<td>0.0</td>
<td>39.4</td>
<td>100.0</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>1.7</td>
<td>79.2</td>
<td>1.7</td>
<td>17.5</td>
<td>100.0</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>2.4</td>
<td>66.8</td>
<td>0.5</td>
<td>30.3</td>
<td>100.0</td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>3.7</td>
<td>75.1</td>
<td>2.5</td>
<td>18.7</td>
<td>100.0</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>4.9</td>
<td>62.8</td>
<td>8.0</td>
<td>24.3</td>
<td>100.0</td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>12.1</td>
<td>87.9</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>6.0</td>
<td>92.4</td>
<td>0.2</td>
<td>1.5</td>
<td>100.0</td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>8.2</td>
<td>80.1</td>
<td>0.0</td>
<td>11.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5.1</td>
<td>75.4</td>
<td>1.3</td>
<td>18.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Monthly Expenditure on Water
The monthly expenditure on water exceeded Rs. 50 for about 62.3 percent of the households and it exceeded more than Rs. 100 for 31.3 percent of the households surveyed. About 31 percent of the
respondents reported that they incurred about Rs. 51-100 per month on water, while about 1.5 percent did not incur any expenditure. About 4.7 percent of the respondents did not answer this query, as presented in the table below. The zone wise rating of slum households spending more than Rs. 50 per month is presented in the chart below.

Table No.: Zone-wise Break-up of Monthly Expenditure Incurred on Water

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Less than Rs. 50</th>
<th>Rs. 51 to 100</th>
<th>More Than Rs. 100</th>
<th>None</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>32.7</td>
<td>17.4</td>
<td>23.1</td>
<td>1.4</td>
<td>25.4</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>44.4</td>
<td>34.5</td>
<td>19.0</td>
<td>0.0</td>
<td>2.2</td>
<td>100.0</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>32.1</td>
<td>32.3</td>
<td>34.7</td>
<td>0.2</td>
<td>0.8</td>
<td>100.0</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>32.2</td>
<td>40.0</td>
<td>24.8</td>
<td>0.7</td>
<td>2.4</td>
<td>100.0</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>26.4</td>
<td>23.6</td>
<td>40.4</td>
<td>9.1</td>
<td>0.5</td>
<td>100.0</td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>52.3</td>
<td>25.7</td>
<td>20.8</td>
<td>0.6</td>
<td>0.6</td>
<td>100.0</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>26.1</td>
<td>46.5</td>
<td>17.3</td>
<td>1.8</td>
<td>8.4</td>
<td>100.0</td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>32.6</td>
<td>30.5</td>
<td>36.8</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>6.1</td>
<td>28.4</td>
<td>63.6</td>
<td>0.5</td>
<td>1.4</td>
<td>100.0</td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>30.5</td>
<td>31.0</td>
<td>32.8</td>
<td>0.5</td>
<td>5.1</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>31.5</strong></td>
<td><strong>31.0</strong></td>
<td><strong>31.3</strong></td>
<td><strong>1.5</strong></td>
<td><strong>4.7</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004

Chart No. : Zone-wise Rating based on the Expenses Incurred on Water

Willingness-to-Pay for Improved Water Supply

For the query on the willingness-to-pay for the improved water supply, a majority of the respondents (about 65.15 percent) responded favorably while remaining 34.85 percent did not show their willingness. About 40 percent of the households were willing to pay up to Rs. 50 per month while another 19.8 percent were willing to pay Rs. 51-100 per month for improved water supply. Remaining 5.4 percent were willing to pay more than Rs. 100 per month for the improved water supply, as presented in the table below. The charts below present the zone wise rating of the slums in terms of respondents willingness-to-pay for improved water supply and zone wise rating of the slums in terms of respondents’ willingness-to-pay up to Rs. 50 per month on the improved water supply.
Table No.: Zone-wise Break-up of Willingness-to-Pay for Improved Water Supply

All Figures in Percentage

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Less than Rs. 50</th>
<th>Rating</th>
<th>Rs. 51-Rs. 100</th>
<th>Rating</th>
<th>Rs. 101-Rs. 250</th>
<th>Rating</th>
<th>More than Rs. 250</th>
<th>Rating</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>36.4 W</td>
<td>29.2</td>
<td>B</td>
<td>3.3</td>
<td>W</td>
<td>3.9</td>
<td>W</td>
<td>27.1</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>55.0 B</td>
<td>15.8</td>
<td>W</td>
<td>3.2</td>
<td>B</td>
<td>16.2</td>
<td>B</td>
<td>9.9</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>51.9 B</td>
<td>26.9</td>
<td>B</td>
<td>1.6</td>
<td>W</td>
<td>5.1</td>
<td>W</td>
<td>14.5</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>48.7 B</td>
<td>17.7</td>
<td>B</td>
<td>5.5</td>
<td>B</td>
<td>4.6</td>
<td>W</td>
<td>21.1</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>64.6 B</td>
<td>10.6</td>
<td>W</td>
<td>15.8</td>
<td>B</td>
<td>6.6</td>
<td>W</td>
<td>3.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Zone VI</td>
<td>25.8 W</td>
<td>3.6</td>
<td>W</td>
<td>2.2</td>
<td>W</td>
<td>31.5</td>
<td>B</td>
<td>37.5</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>44.0 W</td>
<td>3.7</td>
<td>W</td>
<td>1.7</td>
<td>W</td>
<td>34.3</td>
<td>B</td>
<td>12.5</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Zone VIII</td>
<td>55.0 B</td>
<td>14.4</td>
<td>W</td>
<td>0.4</td>
<td>W</td>
<td>9.4</td>
<td>W</td>
<td>20.6</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Zone IX</td>
<td>52.5 B</td>
<td>19.7</td>
<td>B</td>
<td>2.5</td>
<td>W</td>
<td>7.5</td>
<td>W</td>
<td>18.6</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>43.2 W</td>
<td>26.7</td>
<td>B</td>
<td>3.5</td>
<td>W</td>
<td>3.1</td>
<td>W</td>
<td>24.7</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>47.7</strong></td>
<td><strong>16.8</strong></td>
<td><strong>4.3</strong></td>
<td><strong>12.2</strong></td>
<td><strong>19.0</strong></td>
<td></td>
<td></td>
<td><strong>100.0</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004

Problems of Water Supply
About 64.7 percent of the households reported that the problems of water supply as poor, irregular or inadequate, as given in the table below. The zone wise variation in this aspect is presented in the chart below. It may be noted that about one-third of the respondents did not answer for this query.
Table No.: Zone-wise Break-up Indicating Problems in Water Supply

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Poor Quality</th>
<th>Irregular Supply</th>
<th>Inadequate</th>
<th>None</th>
<th>No Response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Zone I</td>
<td>48.1</td>
<td>4.7</td>
<td>4.5</td>
<td>18.5</td>
<td>24.3</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>Zone II</td>
<td>64.7</td>
<td>20.3</td>
<td>0.4</td>
<td>13.4</td>
<td>1.3</td>
<td>100.0</td>
</tr>
<tr>
<td>3.</td>
<td>Zone III</td>
<td>42.0</td>
<td>10.5</td>
<td>0.2</td>
<td>46.1</td>
<td>1.2</td>
<td>100.0</td>
</tr>
<tr>
<td>4.</td>
<td>Zone IV</td>
<td>63.1</td>
<td>7.6</td>
<td>0.2</td>
<td>28.1</td>
<td>0.9</td>
<td>100.0</td>
</tr>
<tr>
<td>5.</td>
<td>Zone V</td>
<td>49.5</td>
<td>10.6</td>
<td>1.4</td>
<td>38.0</td>
<td>0.5</td>
<td>100.0</td>
</tr>
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<td>6.</td>
<td>Zone VI</td>
<td>40.9</td>
<td>35.0</td>
<td>0.8</td>
<td>23.3</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>7.</td>
<td>Zone VII</td>
<td>49.1</td>
<td>20.8</td>
<td>4.9</td>
<td>24.8</td>
<td>0.4</td>
<td>100.0</td>
</tr>
<tr>
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<td>Zone VIII</td>
<td>52.6</td>
<td>1.1</td>
<td>0.0</td>
<td>45.8</td>
<td>0.5</td>
<td>100.0</td>
</tr>
<tr>
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<td>Zone IX</td>
<td>47.1</td>
<td>2.1</td>
<td>0.2</td>
<td>49.5</td>
<td>1.1</td>
<td>100.0</td>
</tr>
<tr>
<td>10.</td>
<td>Zone X</td>
<td>55.8</td>
<td>8.0</td>
<td>0.8</td>
<td>34.0</td>
<td>1.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
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<td>12.1</td>
<td>1.3</td>
<td>32.1</td>
<td>3.2</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Demand Assessment Surveys; 2004

Chart No.: Zone-wise Rating Indicating the Dissatisfactory Water Supply

Source: Demand Assessment Surveys; 2004

Figure 1.
Figure 2: Drinking water collection from tankers directly by residents.

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Mobile Lifestyle or Life in the Mobile:  
A Perceptual Outlook of Chennai City

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Abstract: Cell phones have become increasingly popular in recent years. While people of various ages find cell phones convenient and useful, tend to be more dependent on them. Based on a survey conducted in a randomly in different age-size in Chennai City, cell phone use was examined. The survey consisted of questions that dealt with various aspects of cell phone use, such as cell phone ownerships, time spent for cell phone calls, monthly cell phone bills, communication networks, text messaging, and cell phone dependency. The survey results showed significant gender differences in several aspects of cell phone use. Multiple interpretations of the findings are discussed.

Key Words: Mobile, Dependency, Social, Network, Technology

Introduction

Modern growth

A large population, low telephony penetration levels, and a rise in consumers’ income and spending owing to strong economic growth have helped make India the fastest-growing telecom market in the world. The first and largest operator is the state-owned incumbent BSNL, which is also the 7th largest telecom company in the world in terms of its number of subscribers. BSNL was created by corporatization of the erstwhile DTS (Department of Telecommunication Services), a government unit responsible for provision of telephony services. Subsequently, after the telecommunication policies were revised to allow private operators, companies such as Vodafone, BhartiAirtel, Tata Indicom, Idea Cellular, Aircel and Loop Mobile have entered the space. The major operators in India. In 2008-09, rural India outpaced urban India in mobile growth rate. India’s mobile phone market is the fastest growing in the world, with companies adding some 16.67 million new customers a month. The total number of telephones in the country crossed the 543 million mark on Oct 2009. The overall tele-density has increased to 44.85% in Oct 2009. The wireless segment, 17.65 million subscribers have been added in Nov 2009. The total wireless subscribers (GSM, CDMA & WLL (F)) base is more than 543.20 million now. The wireline segment subscriber base stood at 37.16 million with a decline of 0.13 million in Nov 2009.

Growth of mobile technology

India has become one of the fastest-growing mobile markets in the world. The mobile services were commercially launched in August 1995 in India. In the initial 5-6 years the average monthly subscribers additions were around 0.05 to 0.1 million only and the total mobile subscribers base in December 2002 stood at 10.5 millions. However, after the number of proactive initiatives taken by regulator and licensor, the monthly mobile subscriber additions increased to around 2 million per month in the year 2003-04 and 2004-05.

Although mobile telephones followed the New Telecom Policy 1994, growth was tardy in the early years because of the high price of hand sets as well as the high tariff structure of mobile telephones. The New Telecom Policy in 1999, the industry heralded several pro consumer initiatives. Mobile subscriber additions started picking up. The number of mobile phones added throughout the country in 2003 was 16 million, followed by 22 million in 2004, 32 million in 2005 and 65 million in 2006.
January 2009, total mobile phone subscribers numbered 362 million, having added 15 million that month alone. India ranks second in mobile phone usage to China, with 506 million users as of November 2009.

**Telephone**
On landlines, intra circle calls are considered local calls while inter circle are considered long distance calls. Currently Government is working to integrate the whole country in one telecom circle. For long distance calls, you dial the area code prefixed with a zero (e.g. For calling Delhi, you would dial 011-XXXX XXXX). For international calls, you would dial "00" and the country code+areacode+number. The country code for India is 91.

**Wireless telephones**
The Mobile telecommunications system in India is the second largest in the world and it was thrown open to private players in the 1990s. The country is divided into multiple zones, called circles (roughly along state boundaries). Government and several private players run local and long distance telephone services. Competition has caused prices to drop and calls across India are one of the cheapest in the world. The rates are supposed to go down further with new measures to be taken by the Information Ministry. The mobile service has seen phenomenal growth since 2000. In September 2004, the number of mobile phone connections have crossed fixed-line connections. India primarily follows the **GSM** mobile system, in the 900 MHz band. Recent operators also operate in the 1800 MHz band. The dominant players are Airtel, Reliance Infocomm, Vodafone, Idea cellular and BSNL/MTNL. There are many smaller players, with operations in only a few states. International roaming agreements exist between most operators and many foreign carriers. Main article: List of mobile network operators of India.
The breakup of wireless subscriber base in India as of September 2009 is given below.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Subscriber base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bharti Airtel</td>
<td>110,511,416</td>
</tr>
<tr>
<td>Reliance Communications</td>
<td>86,117,663</td>
</tr>
<tr>
<td>Vodafone Essar</td>
<td>82,846,046</td>
</tr>
<tr>
<td>BSNL</td>
<td>58,756,598</td>
</tr>
<tr>
<td>Idea Cellular</td>
<td>51,454,402</td>
</tr>
<tr>
<td>Tata Teleservices</td>
<td>46,796,033</td>
</tr>
<tr>
<td>Aircel</td>
<td>25,728,633</td>
</tr>
<tr>
<td>MTNL</td>
<td>4,680,141</td>
</tr>
<tr>
<td>Loop Mobile</td>
<td>2,495,087</td>
</tr>
<tr>
<td>MTS India</td>
<td>1,960,532</td>
</tr>
<tr>
<td>HFCL Infotel</td>
<td>379,654</td>
</tr>
<tr>
<td>All India</td>
<td>471,726,205</td>
</tr>
</tbody>
</table>

The list of ten states (including the metros Mumbai, Kolkata and Chennai in their respective states) with largest subscriber base as of September 2009 is given below:

<table>
<thead>
<tr>
<th>State</th>
<th>Subscriber base</th>
<th>Wireless density''</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maharashtra</td>
<td>58,789,949</td>
<td>51.96</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>57,033,513</td>
<td>26.32</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>45,449,460</td>
<td>63.66</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>37,126,048</td>
<td>42.58</td>
</tr>
<tr>
<td>West Bengal</td>
<td>32,540,049</td>
<td>34.28</td>
</tr>
<tr>
<td>Karnataka</td>
<td>28,867,734</td>
<td>46.76</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>27,742,395</td>
<td>39.09</td>
</tr>
<tr>
<td>Gujarat</td>
<td>27,475,585</td>
<td>45.49</td>
</tr>
<tr>
<td>Bihar</td>
<td>27,434,896</td>
<td>25.04</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>24,923,739</td>
<td>33.09</td>
</tr>
<tr>
<td>All India</td>
<td>471,726,205</td>
<td>37.71</td>
</tr>
</tbody>
</table>

Wireless density was calculated using projected population of states from the natural growth rates of 1991-2001 and population of 2001 census.

**Landlines**

Landline service in India is primarily run by BSNL/MTNL and Reliance Infocomm though there are several other private players too, such as Touchtel and Tata Teleservices. Landlines are facing stiff competition from mobile telephones. The competition has forced the landline services to become more efficient. The landline network quality has improved and landline connections are now usually
available on demand, even in high density urban areas. The breakup of wireline subscriber base in India as of September 2009 is given below.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Subscriber base</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNL</td>
<td>28,446,969</td>
</tr>
<tr>
<td>MTNL</td>
<td>3,514,454</td>
</tr>
<tr>
<td>BhartiAirtel</td>
<td>2,928,254</td>
</tr>
<tr>
<td>Reliance Communications</td>
<td>1,152,237</td>
</tr>
<tr>
<td>Tata Teleservices</td>
<td>1,003,261</td>
</tr>
<tr>
<td>HFCL Infotel</td>
<td>165,978</td>
</tr>
<tr>
<td>Teleservices Ltd</td>
<td>95,181</td>
</tr>
<tr>
<td>All India</td>
<td>37,306,334</td>
</tr>
</tbody>
</table>

Objectives

- To show about the importance of mobile usage
- To show about behaviours of mobile users
- To examine the way people relate to the functionality of mobile phone.

Methodology

Based on the objectives of the present study thesecondary and perceptional (primary data) data has been adoptedin theform of qualitive techniques for the studyarea of Chennai City.

Study Area

For the present study the study area has been chosen is Chennai city – a special group of mobile users in Chennai city.

PE

Receptional Analysis of Mobile Phone
Perceptional Study of Demographic Aspects
Gender Distribution of Respondent

Table no. 1 Distribution of gender of respondent

<table>
<thead>
<tr>
<th>GENDER</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>FEMALE</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

The above table and chart infers that the using mobile phone by gender are falls 21 % respondents are Male. Rest 79% respondents are Female.

Age-Wise Distribution of Respondent

Table no. 2 Distribution of age-group of respondent

<table>
<thead>
<tr>
<th>YEARS</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
</table>

Proceedings, 04th International Symposium, SEUSL
Page 295
The above table and chart infer that the using mobile phone by age groups are falls under 76% respondents are 18-21 years. Rest 10% respondents are 21-25 years. And the rest are falls beyond the age group of 25 years.

**Educational Distribution of Respondent**

<table>
<thead>
<tr>
<th>Classes</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal schooling</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Primary school</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Lower secondary school</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>Post secondary school</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

The above table and chart infers that the using mobile phone by education qualification are falls under 61% respondents are senior secondary school studies. Next 20% respondents are post secondary studies. And the rest are falls beyond the educational qualification lower and primary schools.

**Perceptional Study of Psychographic Aspects**

**Distribution of Respondent’s Mobile Usage (4-9)**

<table>
<thead>
<tr>
<th>Own Mobile (V4)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes (1)</td>
<td>92</td>
<td>92</td>
</tr>
<tr>
<td>No (2)</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>
The above table and chart infers that the using mobile phone is belongs to the respondent or not. Over all respondents 92 % are saying YES. Rest are all saying NO. May be belongs to the relations using for a time being.

Table no. 5 Distribution of acquire a mobile phone in the household:

<table>
<thead>
<tr>
<th>Acquire mobile phone (V5)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 1 year (1)</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>1 - 2 year (2)</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>2 - 3 year (3)</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>3 - 4 year (4)</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>above 4 years (5)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

The above table and chart infers that the 35% of respondents using mobile for a period of less than 1 year. 15% of respondent using mobile for a period of 2 – 3 years.

Table No. 6 Distribution of no. of mobile phone users in house:

<table>
<thead>
<tr>
<th>No. of mobiles in house (V6)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
From the above table and chart infers that the currently how many mobile phones are using in a house says at least two in numbers.

Table No. 7 Distribution of Using of mobile phone product:

<table>
<thead>
<tr>
<th>Handset Product (V7)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nokia (1)</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>Samsung (2)</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Sony Ericsson (3)</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>LG (4)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Motorola (5)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Indian Mobiles (6)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>China Mobiles (7)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Others (8)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 4

From the above table and chart infers that the currently using mobile phone by owned says that 64% of Nokia hand sets, next 12% of Samsung mobile phone as hand sets.

Distribution of Respondent’s Mobile Phone Dependency And Priority (10-14)

Table No. 8 Distribution of service provider of mobile phone:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>The Service Provider (V10)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air tel</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Vodafone</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Aircel</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>Reliance</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Uninor</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>BSNL</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Others</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 5
From the above table and chart infers that the currently using mobile phone by owned using the service provider is, 36% of Airtel service provider, next 26% of Aircel service provider of mobile phone as hand sets.

**Distribution of Frequency of Mobile Usage (15-24)**

Table No. 9 Distribution of mobile phone usages through SIM status:

<table>
<thead>
<tr>
<th>SIM (V11)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-pain (1)</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>Post-pain (2)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 6

From the above table and chart infers that the currently using mobile phone by owned using the SIM belong to is, 97% of pre-paid, next 3% of post-paid of mobile phone as handsets.

Table No. 10 Distribution of Pre-paid recharges of mobile phone:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Pre-paid (V12)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Daily</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>2</td>
<td>Weekly</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>3</td>
<td>Bi-weekly</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Monthly</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>Every three months</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>others</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

Chart 7

From the above table and chart infers that the currently using mobile phone by owned using recharge of mobile phone is, 43% of weekly once, next 34% of daily once a day of mobile phone.

Table No. 11 Distribution of post-paid recharges of mobile phone:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Post-paid (Rs.)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the above table and chart infers that the currently using mobile phone by owned using recharge of mobile phone spending money for billing per month as a post-paid is, 83 % of less than Rs. 500, next 10 % of Rs. 500 – Rs. 700 for mobile phone.

Table No. 12 Distribution of consuming of money for mobile usage:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Consumes all money</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>No Answer</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the above table and chart infers that the currently using mobile phone by owned using recharge as well as billing for calls for mobile phone, whether they are consuming money all says, 86 % of YES, next 10 % of NO.
Table :13 Distribution of how frequently using mobile phone for :

<table>
<thead>
<tr>
<th></th>
<th>sending text</th>
<th>sending pictures</th>
<th>downloading ring tones</th>
<th>playing games</th>
<th>greetings</th>
<th>STD calling</th>
<th>local calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALWAYS</td>
<td>53</td>
<td>53</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>31</td>
</tr>
<tr>
<td>OFTEN</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>SOMETIMES</td>
<td>28</td>
<td>28</td>
<td>44</td>
<td>44</td>
<td>34</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>RARELY</td>
<td>6</td>
<td>6</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>NEVER</td>
<td>5</td>
<td>5</td>
<td>29</td>
<td>29</td>
<td>38</td>
<td>38</td>
<td>17</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the above table infers that the distribution of how frequently using mobile phone for sending text, sending pictures, downloading ring tones, playing games, greetings, STD calling and local calls. Out of these categories always making local calls as well as sending texts are dominates highest of using their mobile phone of their consuming of mobile phone.

Distribution of Mobile Usage with Environment

Table No. 14 Distribution of mobile phone bought from:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Mobile bought from</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Father</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>2</td>
<td>Elder Brother/Sister</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Self</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>Company</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Gift</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>others</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the above table and chart infers that who bought the mobile phone for the respondent says, 53 % belongs from father and 21% belongs by self. Or 16% from elders brother or sisters barrowing.
Table No. 15 Distribution of mobile phone needed because of:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Mobile needed for</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>By surrounds uses</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Like to have</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Somebody recommended</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>4</td>
<td>others</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Chart No. 11

From the above table and chart infers that the currently using mobile phone by owned because of everybody around already having one mobile with, or wanted to buy it, or somebody asked to get one for respondent. Out of these choices 68% of respondents answered only because of somebody(friend/parents) asking to get one for self for consuming mobile phone.
Table No. 16 Distribution of mobile users while talking mind others:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Mind others while talking</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No, never</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Rarely</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>Sometimes</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>4</td>
<td>Often</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Yes, always</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are while talking over the mobile, whether bothers about their surrounds says, 32% and 31% of respondents are said rarely and sometimes of using mobile phone.

Table No. 17 Distribution of mobile users keep silent/vibrate mode:

<table>
<thead>
<tr>
<th>Sl. no.</th>
<th>Silent/vibrate mode</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No, never</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Rarely</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>Sometimes</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>4</td>
<td>Often</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Yes, always</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are while talking over the mobile, whether they keep the mobile phone as silent or vibrate mode. 48% respondents are keeping their mobile phone as silent mode sometimes. 17% of respondents are said that rarely of using mobile phone.

Table No. 18 Distribution of mobile users keep silent/vibrate mode:

<table>
<thead>
<tr>
<th>Sl.no.</th>
<th>Silent/vibrate mode</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>V37</td>
<td>V37</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>V38</td>
<td>V38</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>V39</td>
<td>V39</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>V40</td>
<td>V40</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>V41</td>
<td>V41</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>V42</td>
<td>V42</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Percent 40 30 20 10 0

| V37    | V37 | 54321   |
| V38    | V38 | 654321  |

Percent 60 50 40 30 20 10 0
From the above table and chart infer that the perception of currently using mobile phone by owned respondent are talking while driving over the mobile. 82% respondents are saying no talking while driving over mobile phone.

Table No. 19  Distribution of mobile users without mobile for a day:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Without mobile</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NO</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>2</td>
<td>YES</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the above table and chart infer that the perception of currently using mobile phone by owned respondent can do without mobile phone for a day. 77% respondents are saying NO.

Distribution of Mobile Usage with Latest Trend (29-31)

Table No. 20 Distribution of reason for purchasing the mobile:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Reason</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Convenience</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Easily accessible</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Easy to communicate</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>4</td>
<td>No landline</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>others</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
From the above table and chart infers that the perception of currently using mobile phone by owned respondent are whether they are giving most important reason for purchasing the mobile phone. 49% respondents are saying that it was easy to communicate with friends easily so that the mobile phone are purchasing and using.

Table No. 21 Distribution of using accessories for mobile phone:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Accessories</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cover</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>2</td>
<td>Pouch</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>String</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Memory card</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Any above two</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>All the four</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>None so far</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>others</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are what accessories bought for their mobile phone. 27-29% respondents are bought mobile cover and memory card for using mobile phone.

Table No. 22 Distribution of using hands-free kit for mobile:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Have hands-free kits</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>YES</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>2</td>
<td>NO</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
From the above table and chart infers that the perception of currently using mobile phone by owned respondent are whether they have hands-free kit. 48% respondents are keeping their hands-free kit of mobile phone. 52% of respondents are said that NO for using hands-free for mobile phone.

Table No. 23 Distribution of at the age started using mobile:

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>At the age of</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18-21 years</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>2</td>
<td>21-25 years</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>25-30 years</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>30-25 years</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 19

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are at the age started using mobile phone. 91% respondents are using their mobile phone started at the age of 18 – 21 years.

Table No. 24 Distribution of mobile phone always ON:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Mobile ON</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>YES</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>2</td>
<td>NO</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 20

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are whether mobile phone always keeping ON. 85% respondents are keeping their mobile phone as ON.

Table No. 25 Distribution of mobile phone answering the calls:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Answering calls</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All the calls</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>2</td>
<td>Selective calls</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 21
From the above table and chart infers that the perception of currently using mobile phone by owned respondent are whether answers all the call from mobile phone. 72% respondents are attending their all the calls from mobile phone.

Table No. 26 Distribution of using mobile phone for:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Using mobile for</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calling friends</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>2</td>
<td>Calling home</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>Business</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>others</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 21

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are purpose of making calls from the mobile phone. 53% of respondents are making calls for their friends through mobile phone.

Table No. 27 Distribution of majority way of using mobile phone over all:

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>Majority Way of using</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Missed calls</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>SMS</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>3</td>
<td>Calls</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart No. 22

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are use a mobile phone making a call maximum way of approach others through. 62% respondents are through SMS from their mobile phone.

Table No. 28 Distribution of majority of using mobile phone at the places:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>At the places of</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>At home</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>2</td>
<td>In public transport</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>At worships</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sl.no.</td>
<td>Attitude</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>Stand at one place and complete the talk</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>2</td>
<td>Roam around</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are using their mobile phone maximum at the places of. 74% respondents are at home.

**Table No. 29 Distribution of while talking mobile phone - attitudes :**

<table>
<thead>
<tr>
<th>Sl.no.</th>
<th>Information storing - private</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very private</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>2</td>
<td>Somewhat private</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>Not private</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are while talking over the mobile phone the attitude as. 74% respondents are standing at one place and complete the conversation than roam around of 26%.

**Table No. 30 Distribution of storing information of mobile phone – private: :**
From the above table and chart infers that the perception of currently using mobile phone by owned respondent are using their mobile phone how private is it considers. 37% respondents are keeping their mobile phone having information very private.

Table No. 31 Distribution of aware of latest model of mobile phone:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Aware of Latest model</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>YES</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>2</td>
<td>NO</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>3</td>
<td>No response</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are whether they aware of the latest models or handset available in the mobile market. 61% respondents are keeping their mobile phone as ON.

Table No. 3.2 Distribution of mobile users having mobile phone:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Having mobile phone</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stylish</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>Conveneient</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>Safer</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>4</td>
<td>others</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

From the above table and chart infers that the perception of currently using mobile phone by owned respondent are feels the best part of having mobile phone. 46% respondents are feels that it is safer.
From the above table it infers that the perception of currently using mobile phone by owned respondent are distribution of mobile users’ acceptance of the any of the statement whether the mobile necessity today or the model you busy tells how fashionable are, or lengthy conversations on a mobile are OK, or phone numbers messages stored in mobile are private, or using mobile phone while driving is OK. Totally agree and somewhat agree for mobile necessity and message storage are dominant to the respondents of consuming mobile phone.

**Distribution of Mobile User’s Health Awareness**

Table No. 34 Distribution of medical awareness of the using mobile:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>side effect</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>YES</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>2</td>
<td>NO</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
From the above table and chart infers that the perceptions of currently using mobile phone by owned respondent are having any medical side effects of using mobile phone. 71% respondents are feels that having medical side effects while consuming mobile phone.

**Summary and Suggestions**

Mobile phones have not only helped improve communication worldwide, especially in developing countries, they have in some instances helped save lives. For many parents, they offer an important means of keeping in touch with their children as they travel to and from school, sporting activities or meeting with friends. These and other positive aspects of mobile phones should be kept in mind when discussing the issue of adverse effects of mobile phones. A strong link has been found between mobile phone use while driving and the occurrence of traffic accidents, resulting in some governments taking steps to ban mobile phone use when navigating traffic.

At present, there is no conclusive evidence from scientific studies and health-risk assessments to indicate that RF exposure from mobile phones and their base stations lead to adverse health consequences when exposure is below recommended reference values. No significant relationship has been established between mobile phone use and the incidence or growth of cancer, especially brain tumours. Although there is still justification for further studies, which look at the risks of longer-term mobile phone use (X15 years), these studies should also address a broad range of health outcomes, not only brain tumors. One concern that merits further investigation is that of subjective symptoms. Studies have shown that such complaints are not decreasing, despite the fact that no scientific evidence has been found in support of a causal relationship between EMFs below permitted levels and non-specific health symptoms. This is a broad area of investigation that requires an interdisciplinary approach with input from psychology, laboratory studies and epidemiologic disciplines. Little is known about possible adverse effects of mobile phone use on children, especially effects that might appear later in life. Ideally, prospective cohort studies covering different age groups as well as pregnant women and capable of incorporating the rapidly changing technology and exposures should be conducted. As the use of mobile phones is now so widespread, with almost everyone in industrialized countries having access to them, further studies should focus on exposure gradients rather than exposed versus non-exposed groups. Future studies should also be planned in less industrialized countries, where hardly any investigation has been carried out to date.

**Bibliography**


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“அட்சுருடன் ஆண்டுவிழா உணவுச் சேவலைகள் வழங்குவதற்கான அனுபாதம்”

பராமரிகள் இது, எதற்கும் வருடத்திலும், தொழில்முறையில் அனு.அகற்றல் அவர் கைகளின் செய்யவும் அங்கிருக்கும் நடவடிக்கை நிலையில் “அட்சுருடன் ஆண்டுவிழா உணவுச் சேவலைகள் வழங்குவதற்கான அனுபாதம்” என்று கூறியுள்ளனர். 

அப்படியான அந்தளவு விளக்கம், பராமரிகளுடைய நோய்கள் உணவியை வழங்குவதற்கு அவர்களின் பல உணவுச் சேவலைகள் வழங்குவதற்கான அனுபாதத்தை பெற்றுள்ளனர். உணவுச் சேவலையின் மையத்திற்குப் பின்னர், தொழில்முறையில் அவர்கள் செய்யவும் அங்கிருக்கும் நடவடிக்கை நிலையில் “அட்சுருடன் ஆண்டுவிழா உணவுச் சேவலைகள் வழங்குவதற்கான அனுபாதம்” என்று கூறியுள்ளனர்.
நல்ல கல்வீட்டு நல்ல கல்விகள் எதிர்ப்பானது குழப்ய நூற்றாண்டின். ஆனால் உலகின் கல்விகள் குழப்யானது" 26 வருடக் காலத்தில் வருந்து பல்வேறு ஆரோக்கியாளர்.
Factors Affecting the Production of Cashew in Batticaloa District

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Department of Agricultural Economics, Faculty of Agriculture,
Eastern University, Sri Lanka

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Abstract: There is a tremendous demand for cashew cultivation with the surge in need from the hotel and tourism sector in the country. This study examined the factors affecting cashew production in Batticaloa district. The study was done in three Divisional Secretariat divisions in the district. It was found that mean income from cashew production was Rs. 12,850 per month. Average yield of tree per annum was 759 fruits. Land area under cashew cultivation and farming experience significantly and positively (p< 0.01) influences the income from cashew cultivation where as education level of the head of the household significantly reduces the income (p< 0.01). Various constraints were militating against the production, marketing and processing of cashew fruits in the district. Most of the respondents (72%) were constrained by the inadequate capital followed by inefficient extension services and inadequate farmer training by 70% of the farmers. The policy initiatives towards promotion of cashew cultivators for purchase of raw nuts, credit and infrastructure, small scale processing, value addition and marketing and cashew apple processing will definitely widen the perspective of cashew growers.

Keywords: Cashew, production, income

Introduction
Cashew (Anacardium occidentale L.), often referred to as ‘wonder nut’, is one of the most valuable processed nuts traded on the global commodity markets and is also an important cash crop. Cashew is a poor men’s crop but rich men’s food. It is a source of income and livelihood. It has the potential to provide source of livelihood for the cashew growers, empower rural women in the processing sector, create employment opportunities and generate foreign exchange through exports. Cashew kernels are of high nutritive value. It contains 21 percent of protein, fat (47%), moisture (5.9 %), carbohydrates (22%), phosphorus (0.45%), calcium (0.05%), iron (5%) for every 100 gm and other mineral elements. Cashew kernel contains 47 percent fat but 82 percent of this is unsaturated fatty acid, which lowers the cholesterol level in blood. The most prominent vitamins in cashew are Vitamin A, D and E, which help to assimilate fats and increase the immunity level. Cashew kernel is a rich source of minerals like calcium, phosphorus and iron. Cashew kernel proteins contain all the essential amino acids such as Arginine, Histidine, Lysine, Tyrosine, Phenylalamine, Cystine, Methinonine and Valine (Shalini Yadav, 2010). Cashew Kernel provides more energy compared to animal food (147-272 kcal/100 g) and fish (234 kcal/100 g) (Mathew and Shobana, 2013).

Due to the high value of cashew nuts even small pieces find a market in confectionery products (FAO, 1992). Cashew is becoming an important cash crop for farmers in Sri Lanka where there is great potential for increased production for the local market as well as for export. It was found that more than half of the cashew extent is confined to the dry zone of the country. The crop needs more attention in terms of improvement of its management in order to attain higher yields. Sri Lanka is primarily an agricultural country where this sector plays a significant role in the country’s economy, accounting for nearly 23 % of the GNP earning about 19 % of foreign exchange. In Sri Lanka, it is estimated that out of 77,809 cashew growing allotments, 61,496 or 79 percent is cultivated in home gardens (Surendra,1998).

Cashew production has been increasing with the surge in demand from the hotel and tourism sector. In 2012, domestic production of cashew grew by 67 per cent to 2,000 metric tons while exports declined by around 53 per cent to 145.8 metric tons reflecting increased domestic demand. The extent of cultivation has been increasing significantly after the end of the conflict (Central Bank of Sri Lanka, 2012). According to Sri Lanka cashew Corporation, the production trend has to catch up fast so during the next 10 to 15 years, the country will produce sufficient cashew nut to fulfill the local as well as the export demand. There is a tremendous demand for cashew cultivation in the Northern and Eastern provinces with the end of 30 years civil disturbances. Cashew is cultivated in all dry zone districts in the island. However the extents are substantial in the district of Batticaloa also (Weerakoon, 2013) Over 90% of the area in the Eastern region under Cashew
is in the Batticaloa district (Statistical Handbook 2007/8). Cashew is cultivated in the coastal areas in almost all DS Divisions in the District. This study was designed to analyse the socio economic status of cashew farmers in Batticaloa district and factors affecting cashew production in the district.

Methodology
This study was carried out in 3 Divisional Secretariat Divisions of Batticaloa district where comparably higher extent of cashew was cultivated viz., Eravurpattu, Mannunaipattu and Korelapattu. 100 cashew farmers were selected in these divisions for the study. Data was collected from the respondents using a structured pre tested questionnaire. Descriptive statistics were used to analyse the socio-economic characteristics of the cashew farming households in the study area. And Multiple Regression model was used to estimate the relationship between income from cashew production and socio-economic variables.

Results And Discussion
Socio economic characters of households
Mean household size of the cashew cultivators was 4.4 (Table 1). Average age of the household head was 50.1 years and it ranges between 27 and 73. Mean income from cashew production was Rs. 12,850 per month per household.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household size</td>
<td>4.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Age_Household Head</td>
<td>50.14</td>
<td>12.08</td>
</tr>
<tr>
<td>Age_Spouse of Household Head</td>
<td>43.16</td>
<td>11.37</td>
</tr>
<tr>
<td>Income from cashew production</td>
<td>12850.00</td>
<td>7063.03</td>
</tr>
</tbody>
</table>

Education level of head of household
56% of the cashew growers were educated up to Ordinary Level followed by 27% up to Advanced Level. The average cashew farming experience of Head of households were 15.2 years.

<table>
<thead>
<tr>
<th>Education level of Head of Household</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 5</td>
<td>12</td>
</tr>
<tr>
<td>5 to O/L</td>
<td>56</td>
</tr>
<tr>
<td>A/ L</td>
<td>27</td>
</tr>
<tr>
<td>Diploma</td>
<td>4</td>
</tr>
<tr>
<td>Degree</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Employment status of Head of Household
The distribution of employment status in the district depends upon the nature of education level and skill. The economy of the district was predominantly agriculture-based. This includes paddy farmers, homegardeners, livestock farmers, cashew cultivators, coconut farmers etc. Other occupations in the district included government jobs, engaged in private organizations, fishing and daily wage earners. It was observed that these cashew growers were engaged in other activities also. 48% of them were wage laborers in which some of them involved in carpentry or mason works. And 38% of the cashew cultivators were involved in other farming activities also.

<table>
<thead>
<tr>
<th>Employment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>8</td>
</tr>
<tr>
<td>Private</td>
<td>6</td>
</tr>
<tr>
<td>Wage labour</td>
<td>48</td>
</tr>
<tr>
<td>Farmer</td>
<td>38</td>
</tr>
</tbody>
</table>
Size of Land Holding
Households possessed different sizes of lands. On average they owned 24.5 perches for cashew cultivation. And this value ranges between 9.5 to 60 perches.

Economic part of cashew sold
30% of the respondents stated that they were only selling nut of cashew. But the rest of them were selling both cashew apple and nut. Average yield of tree per annum was 759 fruits.

Factors affecting income from cashew cultivation
The results of the regression model on the factors that affect income from cashew cultivation are shown in Table 4. The coefficient of determinant (R²) is 0.377, suggesting that 37.7% variation in income from cashew cultivation is accounted for by variations in the selected explanatory variables. The most important variables explaining variations in income were education level of head of household and spouse, farming experience and land area under cashew cultivation. As the farming experience increases the income from cashew cultivation also increases. This was interpreted by the positive and significant sign (1% level) of the household. This is because experience might have taught the farmers to know the best and right time to harvest for value addition and, hence, get more money in return. This result is in consonance with the findings of Lawal et al (2010) on cashew in Nigeria. Enete et al., 2002 reported that years of experience had a positive impact on production systems and household income among women farmers in Nigeria. Education level of the household head significantly (p<0.01) reduces the income from cashew cultivation, whereas education level of the spouse increases the income (p<0.1) (Table 4). In the study are majority of the women in the households were involved in cashew cultivation activities and educated women may be able to adhere to and adopt new farming technologies. Land area under cashew cultivation also significantly and positively (p< 0.01) influences the income from cashew cultivation. This was in consonance with the results in a study by Wongnaa (2013), on production of cashew in Wenchi municipality, Ghana.

Table 4: Estimates of Regression analysis results

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Dependent variable: Income from cashew cultivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Co-efficient</td>
</tr>
<tr>
<td>Household size</td>
<td>-131.22</td>
</tr>
<tr>
<td>Age of Head of Household</td>
<td>180.49</td>
</tr>
<tr>
<td>Education level_ HH Head</td>
<td>-1058.99</td>
</tr>
<tr>
<td>Age of spouse</td>
<td>-116.36</td>
</tr>
<tr>
<td>Education level of spouse</td>
<td>453.03</td>
</tr>
<tr>
<td>Farming experience</td>
<td>355.60</td>
</tr>
<tr>
<td>Land area under cashew</td>
<td>275.04</td>
</tr>
<tr>
<td>Constant</td>
<td>1858.96</td>
</tr>
</tbody>
</table>

***Significance at 1% level
*Significance at 10%level

R squared = 0.423
Adjusted R squared= 0.377
Constraints in cashew cultivation

Various constraints were militating against the production, marketing and processing of cashew fruits in the district. Most of the respondents (72%) were constrained by the inadequate capital followed by inefficient extension services and inadequate farmer training by 70% of the farmers. Product diversification is another area for adding value and income to cashew farmers. 67% of the cashew cultivators stated inadequate processing knowledge. Price information influences many aspects of production, processing and marketing. 60% of the respondents were constrained by lack of price information. Ezeagu (2001) reported that prices of cashew nuts in Nigeria both at local and international markets impact significantly or its productivity. He stated that good market prices are strong incentive for farmers, but when prices are low and even more when they remain depressed for two years and beyond, cashew farmers are frustrated and sometimes destroy their trees. USAID (2002) reported that unstable prices of nuts had sent a lot of exporters out of business in the cashew nut trade.

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate capital</td>
<td>72%</td>
</tr>
<tr>
<td>Lack of processing knowledge</td>
<td>67%</td>
</tr>
<tr>
<td>Insufficient price information</td>
<td>60%</td>
</tr>
<tr>
<td>Poor marketing channel for raw nuts</td>
<td>55%</td>
</tr>
<tr>
<td>Inefficient extension services and inadequate farmer training</td>
<td>70%</td>
</tr>
<tr>
<td>Inadequate availability of good plating material</td>
<td>43%</td>
</tr>
<tr>
<td>Lack of storage facilities</td>
<td>58%</td>
</tr>
</tbody>
</table>

Table 5: Constraints in cashew cultivation

Conclusion

This study looked at the socio economic status of cashew farmers and factors influencing cashew production in Batticaloa district. Results revealed that mean household size of the cashew cultivators was 4.4. Mean income from cashew production was Rs. 12,850.00 per month per household. 30% of the respondents stated that they were selling only the nut of cashew. But the rest of them were selling both cashew apple and nut. Average yield of tree per annum was 759 fruits. Regression results revealed that education level of the household head significantly (p<0.01) reduces the income from cashew cultivation. Land area under cashew cultivation and farming experience also significantly and positively (p< 0.01) influences the income from cashew cultivation. But cashew cultivators were constrained by several limitations. Therefore, they should be trained and educated in terms of agronomic practices, processing technologies so as to increase productivity. Among other things, farmers should have more access to extension services in order to improve their knowledge of farm management. The policy initiatives towards promotion of cashew cultivators for purchase of raw nuts, credit and infrastructure, small scale processing, value addition and marketing and cashew apple processing will definitely widen the perspective of cashew growers.

Reference

Food and Agriculture Organization (1992), Minor Oil Crops Agriculture Services Bulletin, 94.
Keywords: Socioeconomic status, children, education, vulnerability.

The study found that children from lower socioeconomic status backgrounds face significant barriers to access quality education. The research highlighted the importance of addressing these barriers through policy intervention and community support. The findings underscore the need for targeted interventions to improve educational outcomes for children from disadvantaged backgrounds.
உயர்நிலை வடிவமைப்பு

உயர்நிலை வடிவமைப்பு வகைக்காட்டும் வகையிலானது முதன்மையான உயர்நிலை வடிவமைப்பு பொருளாக முக்கியமாக உள்ளது. கூடுதல் பாதுகாப்பு வகையிலான அகலம் பெற்று உள்ளது. குறுகிய உயர்நிலை வடிவமைப்பு அலம் கட்டுப்பாடு வழங்குகிறது. கூடுதல் வடிவமைப்பு வகைக்காட்டும் வகையிலான அகலம் பெற்று உள்ளது. கூடுதல் வடிவமைப்பு வழங்குகிறது. கூடுதல் வடிவமைப்பு வழங்குகிறது.}

1. அகலம் வடிவமைப்பு

ஆர்மோண்டு பரிபாடுகளுக்கு ஏற்றாள்கள் வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு. முக்கியமான உயர்நிலை வடிவமைப்பு வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு. வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு. வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு. வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு.

2. வடிவமைப்பு

இவ்வகையிலான வடிவமைப்பு வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு. வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு.

3. அகலம் வடிவமைப்பு

இவ்வகையிலான அகலம் வடிவமைப்பு வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு. வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு. வழங்கும் வகையிலான முக்கியமான உயர்நிலை வடிவமைப்பு.
DETERMINANTS OF HOUSEHOLD FOOD EXPENDITURE AMONG RURAL HOUSEHOLDS OF AMPARA DISTRICT

Krishnal Thirumarpan
Department of Agricultural Economics, Faculty of Agriculture, Eastern University, Sri Lanka
ABSTRACT: This paper examines multiple aspects of share of expenditure on food and the factors determining the household food expenditure in rural households of Ampara district. The study was done in three Divisional Secretariat divisions in Ampara district. Results revealed that average monthly income per household was Rs. 14,735.93 which was lower than the mean household income in 2009/2010 for Ampara district. The share on food expenditure was high in cereals followed by fish. 59% of households had poor access to food leading to little margin to cope with shocks such as increased market prices or an illness that may require substantial medical care. And only 5% were in good condition. The coefficients of total household income and the size of the household were significant (p<0.01) and exert a positive impact on food expenditure whereas age of the head of the household exerts a negative and significant impact (p<0.1). Policy measures for improving the access to food and finally food security of farm households in Ampara district should be linked to their ability to expend their income on enough food for healthy lives.

Key words: Expenditure, Food, Household, Poor

INTRODUCTION

The nature and patterns of food expenditure continue to reflect the socio-economic and demographic characteristics of households under consideration. A household’s relative expenditure on food is a reliable indicator of vulnerability. It describes household’s capacity to cope with price increases, as well as their ability to remain productive by investing in health services, education, tools and other productive assets for its members. Households spending in excess of 65% of their total expenditure on food are clearly vulnerable in this regard as such a high percentage suggests that the household is forced to choose between meeting their food and non-food needs or reduce consumption of one or both below their needs.

From an empirical perspective, several studies have been undertaken to provide an understanding of the factors that affect household food expenditure. Gheblawi and Sherif (2007) examined the factors affecting expenditure on rice, fish, and meat in the UAE. Their results indicated that income and household size are important factors affecting the amount of money spent on the three examined food groups, and that the expenditure on the three examined food items was not highly responsive to changes in households’ incomes. Several studies (Bansback, 1995, Steward et al., 2004) point to the importance of socio-economic factors in determining consumers’ purchasing decisions. A study by Fanning et al. (2005) on fast food consumption in the USA found that several socio-economic and demographic variables significantly influence the probability of fast food being part of household expenditure. Some of the more significant variables identified were age, income, education level, hours spent at work and the number of household members.

With the pressing need to increase food security, understanding the determinants of demand for food has become a vital task. Therefore, this study aimed at examining the food expenditure patterns amongst rural households and to identify and quantify the relationship between household food expenditure and the socio-economic and demographic characteristics of the household.

RESEARCH METHOD

The questionnaire was designed to gather information on the respondents’ demographics, income and expenditure patterns and general views about their socio-economic status. The respondents’ total monthly household food expenditure was of key interest in this study. Three Divisional Secretariat (D.S.) divisions were selected viz., Nawithanweli, Alayadivembu and Sammanthurai D. S. divisions. In these three D. S. divisions, five Grama Niladhari divisions were selected and from each D. S. division fifty samples were collected and altogether 150 samples were collected.

A multiple regression model was used to determine the socio-economic factors affecting household food expenditure. The selection of variables likely to influence household food expenditure relies on previous studies by Stewart et al. (2004) and McCracken and Brandt (1987). The regression model was estimated as follows:

$$Y_i = \beta X_i + \varepsilon_i$$

Where $Y_i$ is unobserved, $X_i$ is vector of explanatory variables, and $\beta$ is the vector of unknown parameters and $\varepsilon_i$ is the error term.
RESULTS AND DISCUSSION

Demographic characteristics of households

The sample data were based on responses from the head of the household. Average household size of the study area was 4.4 and the mean age of head of the household was 48.5 years (Table 1). 49.1% of the rural households were Hindu, 30.6% were Muslims and the rest were from other religion. Average monthly income per household was Rs. 14,735.93. Average monthly income in the study area was lower than the mean household income in 2009/2010 for Ampara district. (Household Income and Expenditure survey, 2009/2010). Average expenditure on food items was Rs. 7983.33.

Descriptive statistics of demographic characteristics of the households

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sample size</th>
<th>Mean (Std. deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household (HH) size</td>
<td>150</td>
<td>4.4 (1.3)</td>
</tr>
<tr>
<td>Age Head of HH</td>
<td>150</td>
<td>48.5 (10.1)</td>
</tr>
<tr>
<td>Average Income per HH</td>
<td>150</td>
<td>14735.93 (7211.12)</td>
</tr>
<tr>
<td>Expenditure on food per HH</td>
<td>150</td>
<td>7938.33 (2788.17)</td>
</tr>
</tbody>
</table>

Table 1

30% of the head of the households had the education level in between year 5 to Ordinary level. 64.3% had the upto year 5. And the rest had the education level upto A/L.

Frequency distribution of the education level of the head of the household

<table>
<thead>
<tr>
<th>Years of Schooling of Head of HH</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 5</td>
<td>64.3</td>
</tr>
<tr>
<td>5 to O/L</td>
<td>30</td>
</tr>
<tr>
<td>A/L</td>
<td>5.7</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2

Expenditure on food items

Households in the surveyed area spent Rs. 2253.22 (28%) on cereals followed by fish (Rs. 1902.00) and vegetables (Rs. 1714.23) monthly. Only 5% was spent on fruits (Figure 1).

Fig. 1: Share of expenditure on different food items per month
Share of Food Expenditure

The share of food expenditure of total expenditure is a proxy indicator of household food vulnerability. The higher the share of food expenditure, the greater the likelihood that a household has poor food access.

![Chart showing food expenditure categories: Good 5%, Medium 36%, Poor 59%]

**Fig. 2: Share of Expenditure spent on food**

Overall, based on the share of expenditures on food, 59% of households had a poor access to food (i.e. food expenditure is more than 65% of total household expenditure). If a household is spending more than 65 percent of its income on food, then there is little margin to cope with shocks such as increased market prices or an illness that may require substantial medical care. In the comprehensive food security and vulnerability analysis of WFP (2012, p.17) found that “poorer households have lower levels of education, spend a larger share of their limited means on purchasing food, have smaller harvests, and are more often buying their staple foods when the market prices are highest when compared with wealthier households”. Only 5% of the households were in good condition.

Determinants of food expenditure

The results of the regression model on the factors that affect household food expenditure are shown in Table 3. The coefficient of determinant ($R^2$) is 0.332, suggesting that 33.2% variation in farm household food expenditure is accounted for by variations in the selected explanatory variables. The most important variables explaining variations in food expenditure were total household income, the age of the head of the household and the size of the household. The coefficient of total income with regard to food expenditure is significant and positive at 1% level of confidence, indicating that the higher the income the higher is the propensity of expenditure shares on food to be increased. This was consistent with the results of study by Tangka et al. (2002) where the coefficient of total household income was positive and significant so that increasing household income increased expenditures on food consumption. And as the number of household members increases the share of household expenditure on food also increases. This was interpreted by the positive and significant sign (1% level) of the household residents. These results are consistent with those of Davis et al. (1983) who concluded that household income and household size exert a significant positive impact on household food expenditure.

As the age of household head increases the share of household expenditure on food reduces at 10% level. This is as a result of the need to spend on other social services thereby reducing the share of household expenditure on food. Families with old family members may need less food because the caloric needs tend to decrease with age, so their presence in a household leads to declining food expenditure. Similar result was reported by Osinubu, (2003).
Meng, Florkowski and Kolavalii (2012) found that the socio-demographic characteristics of consumers, such as age, gender, married status, education and family structure, were significantly correlated with food expenditure.

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Co-efficient (Std. dev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age HH head</td>
<td>-35.1* (18.6)</td>
</tr>
<tr>
<td>Education level of HH Head</td>
<td>-159.8 (97.1)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-468.2 (789.2)</td>
</tr>
<tr>
<td>Gender of HH head</td>
<td>2457.9 (1662.6)</td>
</tr>
<tr>
<td>Presence of employment</td>
<td>-186.8 (542.87)</td>
</tr>
<tr>
<td>HH size</td>
<td>569.2** (152.6)</td>
</tr>
<tr>
<td>HH monthly income</td>
<td>0.17** (0.02)</td>
</tr>
<tr>
<td>Constant</td>
<td>2638.5 (4003.6)</td>
</tr>
</tbody>
</table>

R^2 0.36  
Adjusted R^2 0.33

Table 3

CONCLUSION

This study set out to investigate the share of expenditure on different food items and to identify and quantify the relationship between household food expenditure and the socio-economic and demographic characteristics of rural households in Ampara district. Results revealed that 59% of households had a poor access to food leading to little margin to cope with shocks such as increased market prices or an illness that may require substantial medical care. 36% had medium access to food and only 5% were in good condition. Households in the surveyed area spent higher proportion (28%) on cereals followed by fish (24%) and vegetables (22%) monthly. Findings of the study revealed that the significance of household income and size of the household in determining food expenditure positively and age of the head of household negatively. Therefore policy measure for improving the access to food and finally food security of farm households in Ampara district should be linked to their ability to expend their income on enough food for healthy lives.

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BUSINESS AND MANAGEMENT
Developing Regional Tourism: Business Networks for Competitive Advantage

Special reference to Eastern Province

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Abstract

Tourism is regarded as one means of fostering regional economic development and ameliorating these inequalities. Many destinations possess natural advantages that could form the basis for regional competitive advantage through local and global networking, but have experienced difficulty in drawing both domestic and international visitors away from the popular destinations. The development of local and global networking for tourism firms is a way of fostering competitive advantage in regional Sri Lanka. Tourism sector requires network linkages due to having strong complementarities due to the characteristics it include. This paper considers the potential for activating regional tourism networks and gaining competitive advantage over other regions in the country. This is especially relevant with recent development initiatives in the eastern province. There is much work to be done at a micro-business level in fostering network development between tourism institutions such as hotels, travel agencies, tour operators, airlines, tourism associations, and supportive tourism activities. It was proposed that activating business networking is a suitable means of fostering a structure within which related and supporting industries can interact. Through business network initiatives local communities can be enabled to contribute to their own development. A more self-sufficient ‘bottom-up’ approach to regional development with horizontal linkages incorporating private/public sector partnerships and partnerships between international, national and locally owned businesses seems desirable in developing regional tourism. The activation of business networks could support linkages between related and supporting industries in gaining competitive advantages. In recommending networking strategies the attitudes towards competitive advantage, competitive behavior and intention of networking between tourism firms were measured among the main and supportive actors of tourism in the region. Therefore, the successful tourism firms are the one which have strong innovative local and global networks.

Keywords: Networking for tourism firms, Competitive advantage
1. Background of the Study

In most of the newly developing countries, the service sector, especially tourism is reckoned as a catalyst for local development at the centre of interest. Many cities invest heavily on tourism for promoting local development. Many argue on various critical success factors that determine competitiveness and economic development of a region / country. However, tourism business networks are considered as one of the crucial and critical success factors that contribute to the socio economic development.

Tourism sector requires network linkages with strong complementarities and characteristics that include. This sector requires strong local networks and external linkages compared with other business sectors since its production and consumption links are more related with the external environment. Existence of local networks covering collaborative and competitive type of relationships of small and medium sized firms is important to sustain competitive advantage (Cooke, 1998). Beside the importance of nature’s attractive capacities such as quality environment and services, networking capacities can be considered as important quality for the promotion of tourism development. Firms and organizations and types and levels of networking play an vital role in local development (Porter, 1990; Morgan, et.al. 2000). Thus, it becomes necessary to activate its local and global networks for gaining benefits of network externalities to be lucrative and more competitive.

It is worthwhile to explore Tourism sector in Sri Lanka. Sri Lanka Tourism attracted a record of one million tourists to the country for the first time in history in 2012. Tourist arrivals surpassed its target of 950,000 to record 1,005,605 arrivals in 2012. The foreign exchange earnings too increased substantially by 44.1 percent from 2011 to 2012 (SLTDA, 2012). The arrivals recorded in 2013 were 1,274,593, an increase of 26.7 percent over last year. Comparing the tourist arrivals in 2013 up to June (583,573) and 2014 up to June (727,353) there is a 24.6 percent increment. A target arrival at the end of 2014 will be 1.6 million (SLTDA, 2014). Further, there is a boom in domestic and foreign tourism in the Eastern Province with the restoration of peace in the country aligning with the raise of arrivals to the country.

The natural advantages and tourism attractions in the East part of the country are unmatchable elsewhere in Sri Lanka enabling it to produce a unique tourism product and comparative advantage. The initiatives of Eastern Province development programme, ‘Kilakkin Udhayam’ was intended to foster regional development leading to the creation of more broad opportunities in the tourism business sector. Consequently, there has been rapid development of transportation infrastructure with the establishment of highways and recently constructed bridges connecting Trincomalee-Kinniya-Mutur-Batticola provide extensive road network connecting the entire Eastern Sri Lanka and to the major cities in the coastal belt. There are domestic airports in Ampara, Batticaloa and Tricomalee. Despite the fact that many constructions of hotels have been completed and are in operation, especially
Passikudah alone expects 968 rooms (SLTDA, 2014); widespread expressway connecting major cities and other essential tourism infrastructure development has yet to be completed.

The East attractions such as the lagoon, lake, sandy beaches along East coastal belt especially well known beaches like Arugam Bay, Nelaveli and Passikudah, and heritage sites, unique cultural attractions, exotic east cuisine (grabs, prawn, honey and curt), the varying cultures represented by the ethnic groups of East Sri Lanka, and an abundance of historical and archaeological sites, safari, bird watching, well known religious worship temples and kovils, provide greater potentials to enhance and expand the existing tourism products such as beach tourism (sun, sand, sea), cultural and heritage tourism, agro-tourism, lagoon based soft adventure tourism, and ecotourism.

The following tourism related direct, supportive and ancillary services, and associations can be found in the province: travel agents, tour operators, tour guides, accommodation providers (hotels, Guest house, resorts, home-stays), associations (three wheel associations, hotel association, chamber of commerce), tourist information center (tourism promotion bureau and other web-based promotional groups), ministry and other local government authorities, training institutions (universities, tourism training agency, hotel schools), public and private transportation, restaurants, daily needs, shops owners, handicraft producers private caregivers culture and art clubs, recreation groups, fisheries group, cashew corporation, farmers, bike and skate board club etc. Across the districts in the province, the presence of related and supporting industries varies. However, in general they are well endowed with a heterogeneous range including accommodation, food and beverage outlets, and natural attractions, festivals, agricultural and horticultural enterprises, transport and tour organizers, handicrafts and souvenirs plus a range of service industries to support these tourism-related businesses. At a micro-level, however, the linkages between these tourism organizations are quite weak and there were very lack of effort have been taken to activate networks among these organizations as the researchers have discussed in the results of the primary data collection.

**Review of Literature**

The concept of inter firm cooperation was introduced by Alfred Marshall in 1890. In the 90’ Michael Porter argued that at regional level economic agglomeration of business activities and interconnected activities could determine a maximization of potential technology, new markets opportunities or a reinforcement of competitiveness.

The network concept can be defined as patterned relationships among individuals, groups and organizations (Dubini and Aldrich, 1991). The cooperation inside of a network is a voluntary arrangement between two or more firms that involves durable exchange, sharing, or co-development of new products and technologies (Groen, 2005). Networking is valuable to small business sector due to the particularity of a supportive inside environment which encompasses their vulnerability and can be seen as facilitating or constraining the action of people and groups. Szarka (1990) notes that
networking gives small firms alliance opportunities and a competitive advantage from that. They can become specialized in areas of the value chain that they are good in, while in other areas they can rely on the strengths of network’s partners.

Tourism network structures within a destination tend to exist only based on complementary product, e.g., activities, accommodation, transport and food, whereby clients are referred from one organization to another to provide a comprehensive tourist experience (Greffe, 1994). Jakson and Murphy (2006) found that business networks are eminently suitable for application to tourism industry, especially in regional areas.

Further, studies have shown that the formation of networks is clearly important for the competitiveness of firms. Storper (1997) and Scott (1998) argued that networks of relational assets and geographical proximity particularly at the local and regional scales are often tied to specific interdependencies in economic life. According to Novelli et al. (2006), networks are vital for regional development increasing the productivity, performance, and innovative capacity. Moreover, it is claimed that the success of local and regional economic development is closely related with the strength of institutional capacity within an area (Gibbs et al., 2000). In this competitive dynamic environment, firms have to react with speed and flexibility. According to Morgan et al. (2000), competitiveness is seen to be achieved by the role of networking. It is implied that intense levels of inter firm collaboration, networking and technological innovations offer some of the key factors for growth and competitiveness (Porter, 1991). These relationships come into influence by inter firm coordination and cooperation that allow for the creation of mutual networks. In that view, the strong linkage between local and global networks is crucial in global environment. In the guidance of this the level of networks (local-global) can be emphasized as the umbrella components of local development to promote competitiveness.

Statement of Research Problem

Yeung (2000) explained the networks as both a governance structure and a process of socialization through which disparate actors and organizations are connected in a coherent manner for mutual benefits and synergies. Networking as a system, binding firms to gather in to a relational contracting, collaborative product development and multiplex inter-organizational alliances. Participation in a network enables a firm to concentrate on core capabilities, and provides access to resources such as knowhow, technology, financial means products, assets, market etc. this helps them to improve the competitive position.

Network relations are differentiated according to their characteristics and meanings. Formal and informal, loose and strict, vertical and horizontal. Similarly, Capello (1996) differentiated based on three main stream: cooperation agreement among firms, local/global development of places, and new management of territory by firms. By looking at the previous literature the networks can be in two types: collaborative networks and complementary networks. Although growing amount of literature focusing on networking, tourism case has not been covered enough yet in these debates. Limited discussions are observed in tourism literature
on the contributions made by the level of networking to the competitiveness of tourism institutions (firms/organization).

Although the Eastern province has the necessary structure and capacities to organize and activate networks to cooperatively develop and promote their product, the tourism industry in Eastern province shows a weak and lack of networks between tourism firms. Networking among those involved in the development of tourism can bring certain benefits to all the participants: networks help decrease transaction costs and allow an exploitation of the economies of scale and scope in various activities (Tremblay, 2000), networking potentially avoids the cost of resolving adversarial conflicts among stakeholders in the long term, as the sharing of ideas among the participants of a network results in a richer understanding and learning of issues, and leads to more innovative activities (Roome, 2001). Learning-based networks are important for increasing the capabilities of firms through rules that guide the behaviour of interacting entities (Kogut, 2000). Hence, collaborative networks improve the coordination of policies and related actions, and promote the consideration of the economic, environmental, and social impacts of tourism in development strategies.

Moreover, networking enables a large number of small actors with limited resources to be a part in the decision-making process, especially those that cannot pursue sustainable development independently. Tourism firms should have combined to jointly develop a product incorporating a tourist route connecting them. The creative promotion of a more substantial product is one means of surmounting factor of disadvantages.

Therefore, this paper considers the potential for activating regional tourism networks and gaining competitive advantage over other regions in the country. The role of different types of local and global networks of tourism firms also analyzed with respect to the tourism firms in Eastern Province. This is especially relevant with recent development initiatives in the Eastern province. There is much work to be done at a micro-business level in fostering network development between tourism institutions such as hotels, travel agencies, tour operators, airlines, tourism associations, and supportive tourism activities.

In this context, the research question of this study formulated as follows:

To what extent do local and global networks affect the success of tourism firms?

**Objectives of the Study**

1. To examine the present networks structure in the Eastern province.
2. To examine the attitudes of actors of tourism firms towards competitive advantage, competitive behavior and intention of networking.
3. To explore the potential for activating business networks and propose strategies for possible networks between tourism firms.
Methodology

This paper examines to what extent do local and global networks impact the success of tourism firms? The secondary data sources, a literature search and a survey with local industry leaders were done to collect the necessary data. This was done to establish the pre-conditions for converting comparative advantage to competitive advantage. Eastern provinces was chosen as a focus for the primary data collection because there is huge potential for activating networks between tourism firms and reap the competitive advantages but, still the networking is very weak and lacking. The primary data collected based on a structured questionnaire. Survey conducted with 85 members of the local tourism industry from the accommodation, food and beverage, travel and tours, and regional tourism offices in Eastern province of Sri Lanka. The attitudes towards competitive advantage, competitive behavior and intention of networking between tourism firms were measured among the representatives of main and supportive actors of tourism in the region, using 7-point Likert type scales. The respondents were selected randomly based on the registered list of firms and associations of tourism with the Tourism Associations in each of the district in the Eastern province.

Limitations of this study were imposed by the variability of the secondary data sources. For the primary data collection, in the absence of comprehensive databases of members of the local industry, and personal contacts etc. This is evidenced with lack of representation of smaller tourism operators, and also those interviewed representing only a limited range of tourism-related industries. Future studies would extend this primary data collection to other regions and to a wider group of industries. However, the survey conducted was in considerable depth, providing useful insights and quite rich data.

Results

Potential for network formation

There are indications of support for the notion of networking at the industry local level as evidenced by the survey with representatives of local tourism-related businesses including accommodation, food and beverage, travel and tours, and local tourism organizations. The following themes were discerned.

Developing regional competitive advantage

Recalling to those responded as far as making the region more competitive in terms of networking in the tourism industry, rated as most important the links to national or international tourism organizations, and links between tourism related businesses locally. Conditions that they rated as relatively less important were Involvement of government in tourism development and strong local leadership in the industry (see Table 1). The desire at this level appears to be for vertically integrated national or international tourism businesses, rather than an industry that is horizontally and locally linked and supported by local tourism leaders. What is desired locally is links between the tourism organizations rather than the government’s role and local leadership in developing local tourism.
Table 1: Attitudes to developing regional competitive advantage in terms of networking

<table>
<thead>
<tr>
<th>How important are the following in making your region more competitive in the tourism industry</th>
<th>Mean response</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links with national or international tourism business organizations</td>
<td>6.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Links between tourism related businesses locally</td>
<td>6.17</td>
<td>1.6</td>
</tr>
<tr>
<td>Innovative tourism developments or initiatives</td>
<td>5.33</td>
<td>1.9</td>
</tr>
<tr>
<td>Involvement of government in tourism development</td>
<td>3.3</td>
<td>2.9</td>
</tr>
<tr>
<td>Strong local leadership in the tourism industry</td>
<td>4</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Source: Survey Data

Understanding of the competition and competitive behavior

In assessing attitudes to competition, respondents rated, as most important to becoming more competitive by networking, co-operating with other local businesses and working with national tourism businesses. Initiatives considered least important were joining to limit entry of others (see Table 2). These responses reflect an attitude to competition that is consistent with that necessary for network formation, with competition being based on innovation and differentiation rather than doing alone or by limiting entry to the market.

Table 2: Attitudes to competition and competitive behavior in terms of networking

<table>
<thead>
<tr>
<th>My own business could become more competitive by</th>
<th>Mean response</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working cooperatively with other, similar, businesses</td>
<td>6.2</td>
<td>0.8</td>
</tr>
<tr>
<td>Joining with other businesses to limit entry to the local market</td>
<td>1.4</td>
<td>0.8</td>
</tr>
<tr>
<td>Working cooperatively with other local businesses in the tourism industry</td>
<td>6.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Participating in local tourism organizations involved in selling the destination</td>
<td>5</td>
<td>1.2</td>
</tr>
<tr>
<td>Building relationships with local suppliers</td>
<td>6.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Working cooperatively with other national businesses in the tourism industry</td>
<td>6.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Tying up with travel agents and tour advisors</td>
<td>6.2</td>
<td>0.5</td>
</tr>
<tr>
<td>introducing variety of innovative tourism product through linkages</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Increasing joint advertising and promotions</td>
<td>6</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Source: Survey Data

Personal relationships, trust in sustained collaboration and local leadership

The response from members of the sample with respect to interacting with other members of the industry is shown in Table 3. Respondents regarded themselves as competing strongly with other businesses and while they generally agreed about their degree of co-operation with other businesses, believed that there was potential to increase linkages with other tourism businesses. They expressed relatively less interest in obtaining supplies only from those they knew well or in having local organisations or individuals managing linkages rather than governments. It was revealed that the respondents have fairly good interest in interacting with other people and associations.
Table 3: Interaction with other businesses

<table>
<thead>
<tr>
<th>Regarding interaction with other local businesses</th>
<th>Mean response</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where possible I take the opportunity to work cooperatively with other local tourism related businesses to sell the destination first</td>
<td>5.6</td>
<td>1.5</td>
</tr>
<tr>
<td>I compete strongly with other similar local businesses</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>I am a member of local tourism/business organisation</td>
<td>5.8</td>
<td>2.7</td>
</tr>
<tr>
<td>I regularly attend industry functions and activities</td>
<td>4.8</td>
<td>3</td>
</tr>
<tr>
<td>I prefer to do business with people I know well</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>I think that there is the potential to increase linkages with other tourism related businesses in this region</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>The local industry needs help to develop and maintain these linkages</td>
<td>5.4</td>
<td>2.6</td>
</tr>
<tr>
<td>Development and leadership of such linkages should be managed by local organisations rather than governments</td>
<td>4.2</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Survey Data

Discussion of Findings

The preconditions for competitive advantage of factor endowment, related and supporting industries and domestic demand conditions are all present in the study region. Support for greater co-operation between tourism businesses and network formation was evidenced by the survey. However, individual businesses appear to be a lesser appreciation of the value of horizontally linked local networks with strong local leadership supporting linkages between businesses. In spite of a sophisticated understanding of an appropriate competitive behaviour amongst members of the industry, the evidence from Eastern province is that firm structures are likely to hamper network development in the medium term, with an industry is still dominated by vertically constructed, nationally and internationally owned businesses. A possible solution to the disinterest at individual business level may be provided by local government officials who have often been the driving forces behind local economic development. These officials could play a vital role in activating local tourism networks in fostering local collectives, such as those based on minority group handicrafts and also privately owned tourism SMEs. Additionally, they have a role in identifying and drawing out a dynamic private sector leadership, in institutionalizing concepts, relationships and linkages by supporting the strengthening of local tourism trade associations and ensuring a wide involvement of network participants and associated institutions. There is also a role in the activation of tourism business networks for national and provincial government authorities such as the Eastern Provincial Tourism Ministry. They can also provide the appropriate context including coordination and transportation, information, communication, legal, educational and economic infrastructure for tourism network development.
Strategies of Networking of Tourism Firms

Strategic Alliances and Business Partnerships
Collaborating and cooperating with partners through the formation of strategic alliances has long been a feature of business strategy, cooperative and collaborative marketing initiatives are widely discussed in tourism literature. Alliances such as joint ventures, franchises or common marketing agreements are based on varying degrees of integration covering vertical and horizontal ones.

In this context, network operations have come to predominate in hotels, airlines, travel agencies, tour operators and restaurant chains. Information technology for instance, computer reservation systems (CRS) has also fundamentally changed the nature of the industry. They also link major firms offering transport, lodging and entertainment and therefore the separate components of tourism have become much more closely tied together. The co-ordinated distribution channel in the process of hotel product distribution, linking producers with wholesalers and retailers, can also be designed to achieve operating efficiencies and marketing effectiveness.

Inter-Firm Networks in Tourism Industry
Tourism firms have relationships with suppliers, distributors, competitors and other organizations carrying out complementary activities. The establishment of cooperative relationships with other firms is increasingly regarded as a crucial factor for organizational performance and survival. To maximize the efficiency of collective resources, there must be a contact between sector specific organizations and other support organizations such as large and small firm lobbies, function specific producer service agencies, trade unions, chambers of commerce, and local authorities. Hoteliers are seeking ways to increase revenues by working with travel agencies to expand sales in a cost effective fashion. Transport, accommodation, entertainment, food and beverages are closely integrated through the consumption patterns of travelers. Horizontal mergers within each of tourism's component sectors (for example, between different hotel companies) and, vertical mergers across these component sectors (for example, between hotels and airlines) can be implemented.

Networks of Hotels
The hotel industry comprises of a unique economic activity. Transnational alliances have shown the diversity of contractual arrangements (franchises, management contracts, leases, and other sharing arrangements over facilities, technology, or marketing services); and share holding for collaborative efforts involving some ownership participation. The prime motive behind the propensity of many hotels to join a group lies in hotel brand names signaling a level of service, a type of facility or a bundle of attributes. Such signals reduce the transaction costs associated with information asymmetries faced jointly by firms and tourists.

Networks of Travel Agencies
Travel agencies are different to other distributors, since they have no product stock of their own and no economic or financial interests in the products that they market. Travel agencies
main objective is to distribute the products created by accommodation firms and tour operators. The travel and tourist organizations play a fundamental role in making the sector more competitive. IT’s help decrease distribution costs, improve customer services, and result in a competitive advantage.

Conclusion
In recognition of the importance of tourism activity to regional economic development, the existing regional inequalities and changing business climate, this paper set out to explore the possibilities of activating networks between tourism firms. It was proposed that business networks might be a suitable means of fostering a structure within which related and supporting tourism industries can interact which is appropriate for the emerging intersection of economic paradigms and its distinctive social and cultural heritage. Through business network initiatives local communities can be enabled to contribute to their own development, rather than relying on government largesse and direction. The network approach to regional development with horizontal and vertical linkages incorporating private/public sector partnerships and partnerships between international, national and locally owned businesses seems desirable in developing regional tourism.

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The Relationship between Board Characteristics and Firm Performance of Sri Lankan Listed Companies

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Abstract

Many studies carried out to investigate the link between board characteristics and firm performance in developed countries. The empirical evidence on this area is very thin in Sri Lanka being a developing country. Hence this study was undertaken with the intention of fulfilling the gap. The study examines the impact of board characteristics on firm performance of Sri Lankan listed companies. This study employs a cross sectional analysis of 116 firms as sample of listed companies in Colombo Stock Exchange for the financial year ending 2013 and multivariate analyses are used to test the proposed hypotheses. The board characteristics variables being the independent variables and firm performance variable being the dependent variable are tested under regression model. The results of the study show that board size and CEO duality are significantly negatively associated with ROA. The study also documents that board independence is negatively related with ROA and director ownership is positively related with ROA but both are not significant. Furthermore, control variables of firm size and dividend yield are significantly positively linked with ROA and leverage is negatively related with ROA though not significant. The findings of the study indicate mixed results which are in consistent with empirical evidence of developed nation.

Keywords: corporate governance, board of directors, board characteristics, firm performance, ROA,

Introduction

Corporate governance has been an important subject of academic research and policy disclosure in countries around the world. The increasing importance of corporate governance mechanism comes from a large body of empirical and theoretical research which highlights the corporate governance systems matter in the profitability and growth of corporation. Governance system influences output and investment decisions of firms through several channels which include ownership and control structure, development of financial intermediaries and capital markets, corporate financing, investment pattern, investment protection and creditor rights.

A board of directors is a body chosen or appointed members who jointly supervise the activities of a company. The board of directors acts as one of the most important governance mechanisms in aligning the interest of managers and shareholders. The board is charged with the task of monitoring the performance and activities of top management to confirm that the latter acts in the best interests of the owners (Jensen and Meckling, 1976). Based on this view, boards have a potential critical role to play in mitigating agency problems arising from the universal separation of firm ownership from control (Fama, 1980; Jensen, 1993; Shleifer and Vishny, 1997). Furthermore, Ruigrok et al, (2006) state that boards also have important roles to play with respect to activities such as designing and implementing strategies and fostering links between the firms and its external environment. Given their comprehensive tasks therefore, it seems believable that board may positively or negatively impact firm performance.

The board is a key element in corporate governance system that monitors and instructs management in carrying responsibility to protect and increase shareholders’ wealth (Fama and Jensen, 1983). In the recent past, the board has been largely criticized for the decline in shareholders’ wealth and corporate failure. They have been in the spotlight for the fraud cases that has resulted in the failure of major corporations, for example, Enron, WorldCom and Global Crossing. Some of the reasons stated for those corporate failures are the lack of vigilant mistake functions by the board of directors, the board surrendering control to corporate managers who pursue their own self-interests and the board being negligent in its accountability to stakeholders. As a result, various corporate governance reforms have specially emphasized on appropriate changes to be made to the board of directors in terms of its composition, structure and ownership configuration. In Sri Lanka, the newly amended
code of best practice on corporate governance 2013 was issued by the Institute of Chartered Accountants of Sri Lanka and Securities and Exchange Commission. The code proposes that the board to have a balance of executive and Non-executive directors such that no individual or small group of individuals can dominate the board’s decision-taking. And also, recommends that the role of the chairman and the CEO should not hold by the same person to ensure the balance of power and authority.

Many studies on corporate governance and firm performance were carried out in the developed countries such as USA, UK, Japan, Germany and France (Yermack, 1996; Hampel, 1998; Higgs, 2003; Dahya and Mc Connell, 2003). In addition, some other studies have been done in South East Asian countries, for example, Malaysia, Indonesia and Singapore (Abdullah, 2004; Zubaidah et al., 2009; Gazzaly, 2010). Studies relating to the effect between board characteristics and firm performances are not conclusive in nature. For example, Dalton et al., (1998), Weir and Iaing (1999), Weir et al., (2002) found slight evidence to recommend that board characteristics affect firm performance. Conversely, some studies have found a positive association between certain board characteristics and firm performance (Bhagat and Black, 1999; Keil & Nicholson, 2003; Bonn, 2004).

Despite magnitude of corporate governance around the world, there have been very limited studies pertaining to the effect of corporate governance variables such as board characteristics and on firm performance in Sri Lanka except the study carried out by Fernando in 2007. In similar perspective, some other researchers have done study in relation to the corporate governance practices, ownership structure and firm performances for selected sectors in Sri Lanka (Senarathe and Gunaratne, 2007; Kajananthan, 2012). To boom the search light on this gap has primarily necessitated this study.

The objective of this study is to examine the impact of the characteristics of board of directors and firm performance in listed companies in Sri Lanka.

**Literature review and hypotheses development**

**Non-Executive director and firm performance**

Existing work in the analytical agency tradition (e.g., Stiles and Taylor, 2001) suggests that a higher proportion of outside directors should be associated with stronger financial performance. Zubaidah et al (2009) found that independent non-executive directors contribute significantly in the long term performance of the company. In addition, Dehaenc et al (2001) concluded that there was a significant positive relationship between the independent directors’ percentage in a firm and return on equity (ROE) among Belgian companies. O’Connell and Creamer (2010) found that there was a positive and significant association between the percentage of non-executive directors on the board and firm performance. Furthermore, Dahya and McConnell (2005) found the same results in the UK firms. The appointment of financial outside directors to a public corporation is associated with positive abnormal return among medium size companies (Lee et al, 1999).

On the other hand, Agrawal and Knoeber (1996) found a significant negative relationship between outside board members and firm performance. This result is also supported by Bhagat and Black (1999) with the findings of firms having more outside directors performs poorer than other firms. Empirically, research on non-executive director in relation to firm performance is inconsistent. Therefore, the hypothesis can be formulated as follows:

H1: There is positive relationship between the percentage of independent non-executive director and firm performance.

**Board size and firm performance**

Agency theory suggests that a larger number of directors in the board are more likely to be vigilant for agency problems because of greater number of people will be involving in management activities in an organization. However, one of the agency theorists, Jensen (1993) suggested that board members limit at around eight directors. Hermalin and Weisbach (1991) concluded that board size is negatively related to firm performance. Similarly, in a research conducted among small and medium size companies in Finland by Eisenberg, Sundgren and Wells (1998), it was found out that there was a significant negative correlation between board size and profitability. Furthermore, Mak and Kusnadi (2005) also supported the above results through their studies. Yermack (1996) found a strong negative relationship between size of board and firm performance as measured by Tobins’ Q. He also exhibited those companies having small boards have more favorable financial ratios. In similar perspective, Conyon and Peck (1998) cited that there was a weak inverse relationship between board size and market based firm performance. In contrast, Zubaidah et al
(2009) found that board size has a positive impact on firm performance with a sample of 75 listed companies in Bursa Malaysia. Therefore, the hypothesis can be formulated as follows:

\( \text{H} \_2 \): There is a negative relationship between board size and firm performance.

**CEO duality and firm performance**

One of the important monitoring systems supported by the agency perspective is the separation of the roles of CEO from that of a chairman in a firm. When the chairman of a board also plays the role of the CEO, there is every likely hood that this may result in what is called role conflict in that particular firm. In contrast, an independent chairman is believed to effectively and efficiently monitor and control CEO and other management activities to maximize the shareholders’ wealth. Agency theorists argue that chairman and CEO should be separated, as this has the potential to increase the effectiveness of board monitoring (Finkelstein and D’Aveni, 1994). Yermack (1996) highlighted that firm performance was higher when the CEO’s and the chairman’s positions are held by two different people. In addition, Fosberg and Nelson (1999) found that the firm with separated roles between the CEO and the chairman yield a significant development in firm performance. In similar view, Fooladi (2012) concluded that CEO duality has inverse association with firm performance (ROE and ROA). On the other hand, Dehaene et al. (2001) found that when both roles were combined, there was a positive relationship between duality and firm performance. In addition, some other studies concluded that there was no significant association between CEO duality and firm performance (Zubaidah et al., 2009; Shukeri et al., 2012). Therefore, the hypothesis can be formulated as follows:

\( \text{H} \_3 \): There is negative relat \ionship between CEO duality and firm performance.

**Director ownership and firm performance**

Management ownership is also an important factor, because it has the tendency to reduce conflict between manager and shareholder. If the directors hold the stock in the same company they become owners themselves and can direct and control the company management (Jensen and Mackling, 1976). When the board of directors holds part of the firm’s share, their interests affiliates the interests of other shareholders and they are less likely to involve in opportunistic behavior (Zubaidah et al., 2009). Therefore, it can be concluded that directors’ ownership has negative association with agency conflict and as a result, a positive association with firm performance. Han and Suk (1998) documented that increase in director ownership led to improved corporate performance, however, extreme insider ownership caused in poorer corporate performance, suggesting a managerial entrenchment outcome. Furthermore, some other studies found that there was no significant linked between ownership structure and firm performance (Fooladi, 2012; Zubaidah et al., 2009). Therefore, the hypothesis can be formulated as follows:

\( \text{H} \_4 \): There is a positive relationship between directors’ ownership and firm performance.

**Data and Research Method**

**Data and Sample**

The data use in the form of secondary data. The data and information for this study collected from the Colombo Stock Exchange (CSE) websites, annual reports, journals and CSE publications. The total listed companies in the CSE contained 293 companies in 2013 have been categories under 20 different sectors. The sample consists of 116 non-financial public listed companies in Sri Lanka whose annual reports are available in 2013.

**Research Model**

A cross-sectional ordinary least square regression model used test the developed hypotheses for this study. The regression model utilized to test the relationship between the board characteristics and firm performance are as follows:

\[
\text{Firm Performance} = \alpha + \beta_1 \text{Board Independence} + \beta_2 \text{Board Size} + \beta_3 \text{CEO Duality} + \beta_4 \text{Director Ownership} + \beta_5 \text{Firm Size} + \beta_6 \text{Leverage} + \beta_7 \text{Dividend Yield} + \epsilon
\]

**Variables and Descriptions**

The variables for the study were chosen based on data availability and computational purposes.
Firm performance variables
Return on Asset = Net Income / Total Assets

Board characteristics variables
Board Size = Number of directors on the board
Board Independence = No. of outside directors / Total No.of directors
CEO Duality = 1= Yes, 0= No
Director Ownership = No. of ordinary shares owned by directors / Total No. of ordinary shares

Control variables
Firm size = Natural log of total assets reported on annual report
Leverage = Total debt / Total equity
Dividend Yield = Cash dividend paid / Shareholders equity

Data analysis and discussion
Descriptive statistics were carried out to obtain sample characteristics. Table 1 provides descriptive statistics for the variable of board characteristics used in the study.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Jarque-Bera</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>0.062</td>
<td>0.057</td>
<td>0.544</td>
<td>-0.793</td>
<td>0.120</td>
<td>-2.260</td>
<td>26.678</td>
<td>2808.536</td>
<td>0.000</td>
</tr>
<tr>
<td>BIND</td>
<td>0.715</td>
<td>0.714</td>
<td>1.000</td>
<td>0.250</td>
<td>0.204</td>
<td>-0.245</td>
<td>2.246</td>
<td>3.906</td>
<td>0.000</td>
</tr>
<tr>
<td>BOARD SIZ</td>
<td>7.940</td>
<td>8.000</td>
<td>12.000</td>
<td>3.000</td>
<td>1.966</td>
<td>0.271</td>
<td>2.493</td>
<td>2.657</td>
<td>0.000</td>
</tr>
<tr>
<td>CEO DUAL</td>
<td>0.138</td>
<td>0.000</td>
<td>3.000</td>
<td>0.000</td>
<td>0.346</td>
<td>2.100</td>
<td>5.410</td>
<td>113.333</td>
<td>0.000</td>
</tr>
<tr>
<td>DR OWNED</td>
<td>0.099</td>
<td>0.002</td>
<td>3.000</td>
<td>0.000</td>
<td>0.320</td>
<td>0.637</td>
<td>60.069</td>
<td>6645.050</td>
<td>0.000</td>
</tr>
<tr>
<td>FIRM SIZE</td>
<td>9.665</td>
<td>9.694</td>
<td>11.202</td>
<td>8.056</td>
<td>0.000</td>
<td>-0.118</td>
<td>2.931</td>
<td>0.292</td>
<td>0.000</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>0.367</td>
<td>7.371</td>
<td>2.429</td>
<td>0.000</td>
<td>0.000</td>
<td>6.678</td>
<td>58.418</td>
<td>15706.160</td>
<td>0.000</td>
</tr>
<tr>
<td>DIVID YIE</td>
<td>0.057</td>
<td>0.140</td>
<td>0.016</td>
<td>0.000</td>
<td>0.000</td>
<td>9.177</td>
<td>91.815</td>
<td>39753.610</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The number of directors on Sri Lankan board is between 3 and 12 with an average board size in the selected firms is about 8 persons. This result is reliable with the study by Fooladi (2012) and Zubaidah et al (2009), Lipton and Lorsch (1992) and Brown and Caylor (2004). Seventy one percent (71%) of overall board members are non-executive directors. In addition, of all the firms studied, 87% of them adapt the 2–tier board structure implying that about 13% of the firms have their CEOs and Board chairman positions combined in one personality. This suggests that way for agency problems originating from conflict of interest are minimized. The mean percentage of directors’ shareholding is about 10 percent (10%).

Correlation results

<table>
<thead>
<tr>
<th>Variable</th>
<th>ROA</th>
<th>BIND</th>
<th>BOARD SIZ</th>
<th>CEO DUAL</th>
<th>DR OWNED</th>
<th>FIRM SIZE</th>
<th>LEVERAGE</th>
<th>DIVID YIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIND</td>
<td>-0.141</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOARDSIZ</td>
<td>-0.116</td>
<td>-0.177**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 shows the correlation results between board characteristics and firm performances. Board independence and board size are negatively correlated with ROA but not significant. In addition, CEO duality is significantly negatively correlated with ROA at the 10% level. Director ownership is positively correlated with ROA. Furthermore, Firm size and dividend yield are significantly positively correlated with ROA. But, leverage is negatively linked with ROA.

**Table 3: Regression results**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.252609</td>
<td>0.169308</td>
<td>-1.492013</td>
<td>0.1386</td>
</tr>
<tr>
<td>BIND</td>
<td>-0.045822</td>
<td>0.048667</td>
<td>-0.941527</td>
<td>0.3485</td>
</tr>
<tr>
<td>BOARDSIZ</td>
<td>-0.010536</td>
<td>0.005038</td>
<td>-2.091384</td>
<td>0.0388</td>
</tr>
<tr>
<td>CEO DUAL</td>
<td>-0.058673</td>
<td>0.027098</td>
<td>-2.165181</td>
<td>0.0326</td>
</tr>
<tr>
<td>DROWNE</td>
<td>0.009712</td>
<td>0.029382</td>
<td>0.33055</td>
<td>0.7416</td>
</tr>
<tr>
<td>FIRMSIZE</td>
<td>0.044606</td>
<td>0.016883</td>
<td>2.642047</td>
<td>0.0095</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>-0.016773</td>
<td>0.012387</td>
<td>-1.354105</td>
<td>0.1785</td>
</tr>
</tbody>
</table>
| DIVIDYIE   | 0.228637    | 0.04037    | 5.663551    | 0      

R-squared: 0.348373  
Mean dependent var: 0.061764

Table 3 shows the regression results of the relationship between board characteristics and ROA. The relationship between the number of the independent directors from the board and firm performance is not statistically significant; the board composition has a negative relationship with ROA. This is consistent with the findings of Agrawal and Knoeber (1996) and Bhagat and Black (1999). Therefore, Hypothesis 1 which stated a positive relationship between the percentage of independent non-executive directors and firm performance is rejected. The size of the board of directors is significantly negatively associated with ROA. Hence, in line with international research in the field (e.g., Yermack, 1996; Eisenberg et al, 1998) current study offers some support for the view that a negative relation between board size and firm performance is also obvious in the Sri Lankan setting. Hence, Hypothesis 2 which established a negative relationship between board size and firm performance is accepted. Relating to CEO duality the results of the study shows that there is a strong negative relationship between CEO duality and firm performance, measured by the ROA. This findings are supported with Yermack (1996) and Fosberg and Nelson (1999). Yermack (1996) argues that, firms are more valuable when the CEO and board chair positions are separate. Hence, Hypothesis 3 is supported with the regression results in relation to ROA and therefore accepted. Based on the regression results, there is a positive relationship between director ownership and ROA though not significant. H4 is not support to the findings thus the director ownership does not give any effect to the firm performance. This result contradicts with Morck et al, (1988) and Han and Suk (1998). Morck et al find evidence that firm performance increases when the director shareholder increases.
In keeping with the literature, the study includes control variables in the regression analysis. Table 3 indicates that leverage has negative impact on firm performance (ROA). On the other hand, both firm size and dividend yield are significantly positively interrelated with ROA.

Conclusions

This study explores the relationship between board characteristics and firm performance for 116 firms as sample of listed companies in Colombo Stock Exchange. This research used the ROA as proxy measurer for firm performance and four board characteristics such as board independence, board size, CEO duality and directors’ ownership. The results of the study provide that both board size and CEO duality are significantly negatively associated with ROA. As regarding the relationship between the numbers of independent directors and firm performance, there resulted no significant association. In addition, there is a positive relationship between director ownership and ROA though not significant. In the case of control variables, firm size and dividend yield are significantly positively related with ROA and leverage is negatively associated with ROA. The results of the study are mostly consistent with the previous studies and it shows the importance of board characteristics should be highlighted in order to improve the firm performance.

The major limitations of this study are as follows: First, the study based on the cross sectional study which is concern about one year period may not provide more generalized result. Second, this study used only ROA as a performance measure can include ROE, ROCE and Tobin Q in order to get generalized results. It is highly recommended that future research should be analyzed more than one year because the effect of independent variables may be during subsequent periods. And also could be considered on non-financial aspects of performance such as customer satisfaction, employee satisfaction, and managerial satisfaction. It would also be more meaningful to perform a comparative analysis between Sri Lanka and other countries.

References:


Association between Mechanistic Characteristics and Categories of Banking Employees

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Abstract

Earlier studies have proved varying degrees and strength of association between mechanistic, organic characteristics and organizational characteristics. There were no uniform results in these studies. Thus, there was a great need to find the association between mechanistic and organizational characteristics. This research gap motivated researcher to study in this area. Thus, this study attempts to know the association between mechanistic characteristics and categories of banking employees of Peoples’ Bank. This study has taken 34 members from each category of banking employees. Altogether 102 employees were considered in this study. A convenience sampling technique was used in this study. Data are analysed using SPSS. Pearson Chi-Square, Phi, Cramer's V and Contingency Coefficient are used in this study. Results of Chi-Square statistics proved that there is association between mechanistic characteristics and categories of banking employees. It is evidenced by values of Chi-Square along with 0.000 of Sig. values. Further, the strength of association between mechanistic characteristic and categories of employees of Peoples’ Bank are witnessed by values of Phi, Cramer's V and Contingency Coefficient that vary between 0.5 to 0.8. All these values prove the strong association between mechanistic characteristics and categories of banking employees of Peoples’ Bank.

Key words: Banking employees, mechanistic characteristics.

Introduction

Organizational forms have evolved over the decades. Organizational design reflects the systems view, which considers that structure consists of both hard and soft components, and is the superior composition of relationship between organizational elements. For example, Catherine and Pervaiz (2003) studied about structure and structural dimensions for knowledge-based organizations. Structural dimensions are traditionally examined along three dimensions of formal relationships: hierarchical, functional, and the dimension of inclusion and centrality, underlining two prime types of structure termed as mechanistic and organic organizations. Different studies have put forward different findings for mechanistic and organic organizations. These studies have proved different ranges of association. Specifically, Zanzi (2007); John, Gail and Rogers (1989) found different associations for mechanistic and organic organizational structures. This research gap motivated researcher to know about the association between mechanistic characteristics and categories of banking employees.

Statement of the problem

John, Gail and Rogers (1989) studied about interaction patterns in organic and mechanistic system. The researchers compared actual communication of managers and subordinates in two plants. One plant was organized by an organic, self-managing team philosophy. The other plant was organized by mechanistic, authority-based philosophy. Study used a relational control coding scheme to analyze and compare organic and mechanistic characteristic of organizations in these two plants. This study set hypotheses as there is no association between communication and organic system; between command and mechanistic system. Study found that conversational elaboration, a lack of managerial orders and commands characterized communication at the self-managed plant. In contrast, competitive interchanges, interruptions, and statements of nonsupport typified interaction at the authority-based plant. These findings provided empirical support for hypotheses suggesting that communicative forms are consultative in organic systems and command-like in mechanistic systems. Study confirmed that there is moderate association between communication and organic system;
between command and mechanistic system. Zanzi (2007) studied about determinants of organic/mechanistic tendencies in a Public Accounting Firm. This study compared two units within a major public accounting firm in order to determine their organic/mechanistic tendencies and established the variables most closely related to these organizational characteristics. Further, this study set hypotheses between determinants mechanistic and organic characteristics and organizations. Results from a sample of 67 professionals balanced by unit and hierarchical level indicated that the process-oriented elements of an organization are the more relevant indicators of organizational development and provided a system for evaluating an organization on an organic/mechanistic continuum. Study found that rules and regulations, job roles, authority hierarchy and communication determines organic/mechanistic tendencies of organizations. This study proved that few factors such as rules & regulations and job roles have strong association with organization. Other two factors such as authority hierarchy and communication have week association with organization.

Research Question and Objectives

Study conducted by John, Gail and Rogers (1989) tested and proved moderate association between communication and organic system and between command and mechanistic system. Study conducted by Zanzi (2007) found strong and weak association of determinants of organic/mechanistic organizations. Based on these two findings of the study, it is confirmed that there is a research gap for knowing the association between mechanistic characteristics and categories of banking employees. Thus, this study selected Peoples’ banks for the study purpose. On the basis of previous research findings, researcher wise to raise “whether there is association between mechanistic characteristics i.e. rules & regulations, job & roles, hierarchy, communications and culture and categories of banking employees of Peoples’ Bank?”. So as to answer to this research question, researcher sets “to know the association between mechanistic characteristics i.e. rules & regulations, job & roles, hierarchy, communications and culture and categories of banking employee” as research objective.

Significance of the Study

This study is beneficial to different stakeholders such as employees, banks and government. Employees can be bale to aware of the mechanistic characteristics of banks. All banks in the banking industry can also be able to know the positive and negative aspects of mechanistic characteristics. Positive aspects of mechanistic characteristics can be used for the betterment of the banks. Similarly, negative aspects of the banks can eliminate to smooth function of the banks. Studies with respect to banks have been studies in different angles in different time bounds. For instance, Ismail (2013) studies about corporate social responsibility in selected local commercial banks of Sri Lanka. Ismail (2012) studied about corporate social responsibility in Peoples Bank of Sri Lanka. Banking studies is being popular time to time due to the fact that diverse researchers involve in different perspectives to study about banking.

Review of Literature

Ambrose and Schminke (2003) studied about organization structure as a moderator of the relationship between procedural justice, interactional justice, perceived organizational support, and supervisory trust. This study examined how one aspect of context i.e. organizational structure affects the relationship between justice perceptions and two types of social exchange relationships, organizational and supervisory. This study suggested that under different structural conditions, procedural and interactional justice will play differentially important roles in determining the quality of organizational social exchange (as evidenced by perceived organizational support [POS]) and supervisory social exchange (as evidenced by supervisory trust). In particular, study hypothesized that the relationship between procedural justice and POS would be stronger in mechanistic organizations and that the relationship between interactional justice and supervisory trust would be stronger in organic organizations. The authors' results support these hypotheses. Ismail (2012 a) studied about service quality and bank client satisfaction in South Eastern Region of Sri Lanka. Ismail (2012 b) studied about service quality and bank client satisfaction in South Eastern Region of Sri Lanka. Ismail and Ilmudeen (2011) studied about risk assessment in transaction processing system. This study was based on quantitative and qualitative risk assessment of Hatton National Bank -HNB- in Ampara Coastal Belt Area. Ismail (2010) studied about determinants of retail customer satisfaction in banking industry in the Eastern Province of Sri Lanka. Lawrence (1984) studied about management accounting systems, perceived environmental uncertainty and organization structure. The research reported the relationships among an organization's environment, structure and information system. They established the relationship between organization environment and information system; organization environment and structure. They collected data from different organizations. It was a survey method of research. Based on an empirical study, it appeared that information systems and organizational structures are both a function of the environment. It can be concluded that information system and
organizational structures depends on environment. However, after controlling for the effects of the environment, it does not appear that an organization's information system and structure are significantly related to each other. Aiken and Hage (1971) studied about the organic organization and innovation. This study explored several variables that characterize organic organization to test whether they are associated with varying rates of innovation. The number of occupational specialties, the intensity of scheduled and unscheduled communication and, to a lesser extent, the decentralization of decision-making, are related to innovation. A review of the literature suggested other factors that are also associated with innovation: slack resources, joint programs, size, and history of innovation. With the exception of size, most of these factors are also found to be highly correlated with innovation. Study concluded that perhaps the technological gap is an organizational one and that, therefore, the solution to 'the American challenge' is an organic form of organization. Pillai and James (1988) studied about "meso" level approach that models charismatic leadership in organizations as a function of contextual factors (such as work unit structure, work group collectivism, and crisis), an issue that has rarely been explored in charismatic leadership research. Data were collected from 596 managers and subordinates embedded in 101 work units in a large, complex organization and were analyzed at the individual, group, and cross-levels of analysis. Results indicate that organic structure and collectivistic cultural orientation were positively associated with the emergence of charismatic leadership, whereas perceptions of crisis were negatively related to charismatic leadership. Further, subordinates' ratings of leader charisma were related to leader ratings of work unit performance. The implications of these results for research and practice are discussed.

**Conceptual Framework**

The succeeding conceptual framework is derived from previous literatures. This conceptual model is developed for study purpose. The developed conceptual model is depicted in Fig. 1.

![Conceptual model of mechanistic characteristics and categories of banking employees](source: Review of Literature)

**Operationalisation**

Review of literatures and conceptual models are used to operationalisation. Table 1 tabulates operationalisation.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Indicator/ measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rules</td>
<td>• Rules &amp; regulations</td>
</tr>
<tr>
<td></td>
<td>• Application of rules and regulations</td>
</tr>
<tr>
<td>Job &amp; roles</td>
<td>• Clear jobs</td>
</tr>
<tr>
<td></td>
<td>• Not rigid job duties</td>
</tr>
<tr>
<td></td>
<td>• Not unchanging goals</td>
</tr>
</tbody>
</table>
| Hierarchy          | • Clear & order of hierarchy  
|                   | • Narrow span of control      |
| Communications    | • Oral instructions           
|                   | • Little upward communication |
| Culture           | • Clear career path, competency |

**Methodology**

**Population and sample**

Researcher faced difficulties in collecting the sampling frame. Thus, population size is not known to the researcher. Albeit, all banking managers, management assistants and security guards of Peoples’ Bank in Eastern Province are population of this study. Sample refers to selected members of banking managers, management assistants and security guards of Peoples’ Bank in Eastern Province for this study. This study has taken 34 members from each category of banking employees. Altogether 102 employees were considered in this study.

**Sampling technique**

A convenience sampling technique was used in this study.

**Data collection**

Data are collected from bank managers, management assistant and security guards in Peoples’ banks of Eastern Province. Managers are top authority employees. Management assistants are employees who have moderate level of authority. Security guards are employees who have low power in banks. These three categories of employees were used in data collection.

**Instrument design**

Questionnaire was developed as an instrument for collecting data. Dichotomous questions were used for mechanistic organisational characteristics. Categories of banking employees were managers, management assistants and security guards. Both were considered nominal data.

**Data analysis**

Data are analysed using SPSS. Pearson Chi-Square, Phi, Cramer's V and Contingency Coefficient are used in this study.

**Procedure**

The factor of mechanistic organization is subdivided into several items. These items are cross tabulated with categories of banking employees. This study uses Pearson Chi-Square to know the association. Further, Phi, Cramer’s V and Contingency Coefficient are used to know the strength of association. Values of Phi, Cramer’s V and Contingency Coefficient may vary between 0 to 1.0 According to Pearson, Values of Phi, Cramer's V and Contingency Coefficient is less than 0.3, between 0.3 to 0.5, between 0.5 to 0.8 and 0.8 to 1.0 discloses poor, moderate, strong and the strongest strength of association.

**Results and Discussion of Findings**

Results are tabulated in Table 2, 3, 4 and 5. The first factor of mechanistic organization is the rules & regulations that are subdivided into clear rules & regulations, all employees follow rules & regulations and application of rules to everyone employee category. These items are cross tabulated with categories of banking employees. Results revealed that value of Pearson Chi-Square is 44.373, 26.229 and 28.589 with 2 degrees of freedom cum Sig. value of 0.000. It revealed that the first factor i.e. rules & regulations have association with categories of banking employees. With respect to this strength of association, values of Phi, Cramer's V and
Contingency Coefficient vary between 0.5 to 0.8. Thus, strength of association between rules & regulations and categories of banking employees is strong.

The second factor of mechanistic organization is the job & roles that are subdivided into clearly defined job, precisely defined job, no rigid job duties and unchanging goals. These items are cross tabulated with categories of banking employees. Results revealed that value of Pearson Chi-Square is 41.054, 29.028, 32.627 and 38.918 with 2 degrees of freedom cum Sig. value of 0.000. It revealed that the second factor i.e. job & roles have association with categories of banking employees. With respect to this strength of association, values of Phi, Cramer’s V and Contingency Coefficient vary between 0.5 to 0.8. Thus, strength of association between job & roles and categories of banking employees is strong.

Table 2: Cross tabulation statistics for rules and regulations

<table>
<thead>
<tr>
<th>Clear rules &amp; regulations * employee category</th>
<th>All employees follow rules &amp; regulations * employee category</th>
<th>Application of rules to everyone * employee category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Value</td>
<td>Value</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td>44.373</td>
<td>26.229</td>
</tr>
<tr>
<td>Phi</td>
<td>.660</td>
<td>.507</td>
</tr>
<tr>
<td>Cramer’s V</td>
<td>.660</td>
<td>.507</td>
</tr>
<tr>
<td>Contingency Coefficient</td>
<td>.551</td>
<td>.552</td>
</tr>
</tbody>
</table>

The third factor of mechanistic organization is hierarchy that is subdivided into clearly arranged positions, orderly arranged positions and narrow span of control. These items are cross tabulated with categories of banking employees. Results revealed that value of Pearson Chi-Square is 29.028, 36.615 and 32.627 with 2 degrees of freedom cum Sig. value of 0.000. It revealed that the third factor i.e. hierarchy has association with categories of banking employees. With respect to this strength of association, values of Phi, Cramer’s V and Contingency Coefficient vary between 0.5 to 0.8. Thus, strength of association between hierarchy and categories of banking employees is strong.

The fourth factor of mechanistic organization is communication that is subdivided into top down communication, instructions about how to do and little upward communication clearly arranged positions, orderly arranged positions and narrow span of control. These items are cross tabulated with categories of banking employees. Results revealed that value of Pearson Chi-Square is 39.813, 32.627 and 39.813 with 2 degrees of freedom cum Sig. value of 0.000. It revealed that the fourth i.e. communication has association with categories of banking employees. With respect to this strength of association, values of Phi, Cramer’s V and Contingency Coefficient vary between 0.5 to 0.8. Thus, strength of association between communication and categories of banking employees is strong.

Table 3: Cross tabulation statistics for job and roles

<table>
<thead>
<tr>
<th>Clearly defined job* employee category</th>
<th>Precisely defined job* employee category</th>
<th>No rigid job duties * employee category</th>
<th>Unchanging goals * employee category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Asymp. Sig. (2-sided)</td>
<td>Asymp. Sig. (2-sided)</td>
<td>Asymp. Sig. (2-sided)</td>
</tr>
<tr>
<td>df</td>
<td></td>
<td>df</td>
<td>df</td>
</tr>
<tr>
<td>Value</td>
<td></td>
<td>Value</td>
<td>Asymp. Sig. (2-sided)</td>
</tr>
<tr>
<td>df</td>
<td></td>
<td>df</td>
<td>df</td>
</tr>
</tbody>
</table>
The fifth factor of mechanistic organization is culture that is subdivided into clear upward career ladder and promotion based on technical competency. These items are cross tabulated with categories of banking employees. Results revealed that value of Pearson Chi-Square is 39.813 and 39.813 with 2 degrees of freedom cum Sig. value of 0.000. It revealed that the fifth i.e. culture has association with categories of banking employees. With respect to this strength of association, values of Phi, Cramer's V and Contingency Coefficient vary between 0.5 to 0.8. Thus, strength of association between culture and categories of banking employees is strong.

Table 4: Cross tabulation statistics for hierarchy

<table>
<thead>
<tr>
<th>Clearly arranged positions * employee category</th>
<th>Orderly arranged positions * employee category</th>
<th>Narrow span of control * employee category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>df</td>
<td>Asymp. Sig. (2-sided)</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td>2.000</td>
<td></td>
</tr>
<tr>
<td>Phi</td>
<td>.533</td>
<td>.000</td>
</tr>
<tr>
<td>Cramer's V</td>
<td>.533</td>
<td>.000</td>
</tr>
<tr>
<td>Contingency Coefficient</td>
<td>.571</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 5: Cross tabulation statistics for communication

<table>
<thead>
<tr>
<th>Top down communication * employee category</th>
<th>Instructions about how to do * employee category</th>
<th>Little upward communication * employee category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>df</td>
<td>Asymp. Sig. (2-sided)</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td>2.000</td>
<td></td>
</tr>
<tr>
<td>Phi</td>
<td>.625</td>
<td>.000</td>
</tr>
<tr>
<td>Cramer's V</td>
<td>.625</td>
<td>.000</td>
</tr>
<tr>
<td>Contingency</td>
<td>.530</td>
<td>.000</td>
</tr>
</tbody>
</table>
Table 6: Cross tabulation statistics for culture

<table>
<thead>
<tr>
<th>Clear upward career ladder * employee category</th>
<th>Promotion based on technical competency * employee category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Value</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td>39.813</td>
</tr>
<tr>
<td>Phi</td>
<td>.625</td>
</tr>
<tr>
<td>Cramer's V</td>
<td>.625</td>
</tr>
<tr>
<td>Contingency Coefficient</td>
<td>.530</td>
</tr>
</tbody>
</table>

Conclusions

This study attempted to know whether there is association between mechanistic characteristics and categories of banking employees. Chi-Square statistics proved that there is association between rules & regulations, job & roles, hierarchy, communications and culture and categories of banking employees. It is evidenced by values of Chi-Square along with 0.000 of Sig. values. Further, the strength of association between mechanistic characteristic and categories of employees are witnessed by values of Phi, Cramer's V and Contingency Coefficient that vary between 0.5 to 0.8. All these values prove the strong association between mechanistic characteristics and categories of banking employees.

Managerial implications

This study has implication for bank managers with respect to negative aspects of mechanistic organizational characteristics.

Value addition

This study has introduced Chi-Square along with Phi, Cramer's V and Contingency Coefficient statistics.

Limitations and scope for further research venues

This study is based on convenient sampling technique. This study can be extended using probabilistic sampling techniques. Population size of the Peoples’ bank employees is not clear in this study. Thereby, researcher selected a convenient sampling method.

Acknowledgement

This study cited and refereed at appropriate places to the best of the authors’ knowledge.

References


The Impact of Motivation on Worker Performance: Special reference to District and Divisional Secretariats in Ampara District

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Abstract

The notions of motivation and work performance have become a popular driving force behind most successful organizations. In Sri Lanka, the government organizations seek to improve its workers performance for severe challenges exist to achieve the overall objectives of the organization so as to extend adequate motivational incentives to its entire Workers. This study makes a critical analysis of motivation and workers performance of the employees working in District Secretariat and Divisional Secretariats in Ampara District and identifies several motivation incentives that can help boost better performance. This study is an explanatory approach and simple random sampling was done and 244 respondents out of 976 from six secretariats in Ampara District. According to these research findings, there seem to be positive effect of motivation with Work performance. That is, the two variables such as, financial motivation and non financial motivation have positive effect on the work performance of the staff. This investigation clarifies that staff grade officers perform their work better than non staff grade officers. Non staff grade workers feel that they have not been given a good salary and incentives to work with interest. The study further establishes that element such as adequate salary, incentives, retirement benefits, training, loan and high education are important to motivate workers. Further, achievement, recognitions, responsibility, initiative and flexibility were seen to be vital for workers to encourage good performance. Thus, financial and non financial motivations have direct and significant relationship with worker performance among employees in District and Divisional secretariats in Ampara District in Sri Lanka. Accordingly 98% of variance in worker performance was explained by both financial and non financial motivation. Hence, the research finding would be immensely contributing to organizations to modify their motivational schemes with a view to enhancing the work performance in the organization.

Key Words: Work performance, Motivation, Financial Motivation, Non Financial Motivation

Introduction

It is widely recognized in the human resource literature that promotion of the motivation of workers in both private and public organizations leads to a higher quality of human resources and optimum performance. Consensus is also growing among managers about the significance of combining good human resource performance approaches on motivation incentives to encourage good performance. In Ampara District Secretariat and Divisional Secretariats a well-known government organization is not an exception and the notion of workers motivation and good performance outcomes is not new. As the organization seeks to
improve its workers performance severe challenges exist to achieve the overall objective of the organization to extend adequate motivational incentives to its entire population.

“In a world characterized by competition, customer focus and the need for speed and flexibility, in order to get the results you want, you still have to depend on your people to carry the day” (Storey, 2001). This therefore makes it a necessity to employ “talented individuals, who need to be developed, motivated, rewarded and provided with the organizational cultures and work processes that will make them to be successful” (Storey, 2001).

The study makes a critical analysis of motivation and workers performance in Ampara District Secretariat and Divisional Secretariats and identifies several motivation incentives that can help boost better performance. Its central question is: Why are workers not performing as expected? Its assumption is that qualified and skilled workers have assumed their rightful positions based on the job description and specification but their performance is not satisfactory. The research examines whether this is due to limited or inadequate motivation measures to induce good performance.

The success or failure of any organization depends greatly on the type of human resources it has and human resources translate all other resources in an organization into visible products (Mabonga, 2000; Opatha, 2003). Bearing that in mind it is important that organizations pay extra attention to their workers in order to attain optimum efficiency and effectiveness at the workplace. The human resource practice is critical to the major activities of the organization, it can not be left entirely to personnel experts in the human resource department (Administration Branch) but also line managers in the various departments have to be involved in the delivery and drive of human resource policies (Storey, 2001).

This study has its focus on motivational measured and its impact on worker performance of District and Divisional Secretariats in Ampara. And it required a significant effort to investigate the relationship between motivation and work performance. The literature of three motivation theories Alderfer’s theory of ERG, Abraham Harold Maslow’s theory of need, Herzberg’s theory of hygiene and motivational factors and the human resource management paradigm and important concepts of motivation, extrinsic motivators, intrinsic motivators, performance management approaches, good work performance and good organization performance. This section brings to light what can be done in order to motivate workers to perform to achieve organizational objectives and goals.

We have to bear in mind that the strength of any organization is in its workforce and that an organization that does not have a well performing and dedicated workforce has a poor foundation to exist in a sound operational manner. This implies that human resources need to be treated with great care, since they are a special resource that needs to be given special managerial attention and time (Storey, 2001). The key role of employee motivation in organizations has long been acknowledged in the relevant organizational behavior literature (O’Reilly, 1991). While it is generally better for people’s mental health to work (rather than not) because unemployment has been linked to depression, anxiety and even suicide (Blakely et al., 2003), it is also clear that organizations (and employers) need motivated employees to achieve in any given goals set (Smith, 1994). Motivated employees are productive employees and help organizations to survive and prosper. In this context, one may define the notion of motivation as a psychological process that gives behavior purpose and direction (Kreitner, 2005), or as an internal drive to satisfy an unsatisfied need (Higgins, 1994), or as “internal processes and external forces that direct behavior” (Naylor, 1999). It is actually one of the management’s key tasks to constantly motivate their employees, something difficult at times, as what motivates one person may not motivate another and certainly what motivates one do not necessarily remain static over time.

This study has its focus on motivational measured and its impact on worker performance District and Divisional Secretariats in Ampara. And it required a significant effort to investigate the relationship between motivation and work performance.

Despite the District Secretariat and Divisional Secretariats having a fully fledged human resource department (Administration / Establishment Branch) with few staff that have been coordinating the human resource
issues, a lot of human resource problems have emanated that have ultimately manifested in unsatisfactory human resources performance. These performance failures were both on the side of the organization and workers who constantly should work together.

District Secretariat and Divisional Secretariats workers had displayed negligence towards their work and also late coming (Official record, January to April, 2013), poor time management and the failure to meet deadlines for the preparation of important working documents (List of reminding letters) had become a common practice. This has been observed by attendance register carried out every morning that shows absenteeism (18% of absenteeism was reported) and late coming (Office documents).

The staff appraisal exercise had also shown that duties and responsibilities were not being adequately carried out, with low scores observed in many cases. This was revealed through the appraisal files that were filled annually and kept in the Administration / Establishment Branch in the District Secretariat and Divisional Secretariats. Some line managers had shown great weakness in the supervision of their subordinates.

The salaries of the public servants as stipulated by the Government of Sri Lanka are low and this resultantly did not encourage good performance. This was indicated in the Government of Sri Lanka salary structure for public servants. (PA-circular, 6/2006)

Some line managers such as Assistant Divisional Secretary, Accountant and Assistant Director Planning delegated their subordinates to carry out their duties and yet they were paid higher incentive, this de-motivates the junior employees whose salaries were low. This kind of exploitation created resentment and the resultant de-motivation and poor performance. Others had ignored their supervisory role and had taken to blaming the subordinates for their failures. This was indicated by the way in which workers managed their own affairs without superior intervention. Some had also engaged in late coming and earlier departure from office as indicated by the attendance register, which was monitored by the Administration / Establishment Branch.

In relation to management a lot of directives were given to the employees to produce tangible results and yet little attention was given to adequately motivate their efforts. This could be observed by the Divisional Secretaries of meeting deadlines to produce documents, keeping punctuality, warning letters in cases of indiscipline with few inadequate incentives to encourage good performance.

This kind of dysfunctional behavior was not only damaging to the image of the organizations as a major organization in the District but it was also a major obstacle for its effective existence as a functional entity.

The research problem laid on that fact the employees working in District and Divisional Secretariats in Ampara district had shown dysfunctional behavior such as absentees, late arrival, and early departures, reluctant to accept delegation from superiors, negligent to submit report on time. This was revealed from the conversation with some employees, in observation and attendances registers and leave records.

Therefore from the above broad problem, the following research question was formulated for further exploration “to what extent the motivation impact on the performance of public sector employees District and Divisional Secretariats in Ampara district.

**Objectives of Study**

The main objective of this study was to identify obstacles hindering workers performance, in District and Divisional Secretariats.

The specific objectives were:

- To identify the motivational factor currently in place in the District and Divisional Secretariats in Ampara District
- To examine the impact of motivation on work performance of District and Divisional
Secretariats in Ampara District.

- To recommend ways to improve the performance and motivation of workers.

Accordingly, the significance of the study especially to the heads of the intuitions who were practicing motivation methods in order to achieve the organizational goal though the work performance of the employees. Accordingly, the findings might be immense value to the human resource of organizations, such as public sector origination in Sri Lanka, as much research had not been conducted in this regard.

**Methods and Materials**

**Study Setting**

Nature of this study type was explanatory or hypothesis testing rather than exploratory or descriptive. The type of investigation was co-relational study rather than casual study. A co-relational study is conducted in the natural environment of the organization with direct interference by the researcher with the normal flow of work. The researchers used a standard and self developed questionnaire and personally administering questionnaires to individuals. The data were collected over period of a month.

**Study Design**

This research study relied upon the survey method for collection of data as it had for achieving objectives of this study compared with more advantages than the other research methods such as observations, structured and unstructured interviews. Hence, the survey was used by way of personally administering questionnaire to individuals in its natural setting. This study focuses the unit of analysis as the individual level: executive and non executive employees in the selected sample employees in the District and Divisional secretariat Ampara District.

This study involves formulation and testing of hypothesis with a view to establish the correlation between dependent and independent variables. The study focused more reliable and original data to test the hypothesis. Five point likert scale from strongly agree to strongly disagree han been used to identify the level of agreement to the statements

**Study Sampling Procedure**

Information was gathered from four layers of cadres, the miner staffs, secondary offices, tertiary officers and Executives officers consisting of heads of departments and the Divisional heads. The study uses only the secondary offices, tertiary officers and Executives officers, since these are the people concerned about policy matters and motivation of staff and excluded the lowest cadres.

In a total of 1183 public servants at the District Secretariat and Divisional Secretariats 60 are executives, 921 are secondary and tertiary officers purposively select to participate in the research and a total of 202 miner employees will be excluded from the study.

Population and sample are as follows (25% of population will be selected for sampling)

<table>
<thead>
<tr>
<th>Type of employees</th>
<th>population</th>
<th>sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executives</td>
<td>60</td>
<td>15</td>
</tr>
<tr>
<td>Non executives ( Secondary and tertiary officers)</td>
<td>921</td>
<td>230</td>
</tr>
<tr>
<td>Total</td>
<td>981</td>
<td>245</td>
</tr>
</tbody>
</table>
Conceptualization

Conceptualization of this research is described and elaborated network of associations among the variables deemed relevant to the problem situation. The conceptualization for this study as follows,

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependant variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Motivations</td>
<td>Work Performance</td>
</tr>
<tr>
<td>(FM)</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Non Financial Motivations</td>
<td></td>
</tr>
<tr>
<td>(NFM)</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

Hypotheses

For this study the following hypothesis can be developed,

H1: There is positive relationship between financial motivation and work performance

H2: There is positive relationship between non financial motivation and work performance

Operationalizing Concepts and Variable

The key concept and variables used in this conceptual model are operationally defined for this research as given below.

1. Performance: It refers to “the level of productivity of an individual employee, relative to his or her peers, on several job-related behaviors and outcomes” and measured by the dimension such as work skills, work duties, work enthusiasm, quality of work, quantity of work, readiness to innovate

2. Financial motivation: These are sources of need satisfaction that are associated with tangible rewards and measured by pay, incentives, retirement benefits, training, loan, higher education

3. Non Financial motivation: These are sources of need satisfaction, that derive from the individuals relation to the job itself and it involves job factors and it was measured by achievement, recognition, responsibility, initiative, flexibility.
Discussion and Findings

Descriptive Statistics

### Table1 - Descriptive Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM</td>
<td>1.815</td>
<td>0.572</td>
<td>0.327</td>
</tr>
<tr>
<td>NFM</td>
<td>1.717</td>
<td>0.575</td>
<td>0.331</td>
</tr>
<tr>
<td>WP</td>
<td>1.751</td>
<td>0.561</td>
<td>0.315</td>
</tr>
</tbody>
</table>

*Source: Survey Data*

According to above data, there are little bit differences between variables in means and SD. Accordingly, mean value of FM is 1.815. Hence it is very lower than the mid value. It is a poor representative of the data values to describe the variable. But the standard deviation has a little more value of 0.572 explaining that, it has enables to predictive ability to describe about FM.

Mean value of NFM is 1.717. It is also lower than the mid value. It is a poor representative of the data values to describe the variable. But the standard deviation has a little more value of 0.575 explaining that, it has enables to predictive ability to describe about NFM.

Mean value of WP is 1.751. Hence it is lower than the mid value. It is a poor representative of the data values to describe the variable. But the standard deviation has a little more value of 0.561 explaining that, it has enables to predictive ability to describe about WP.

**Correlation of Independent Variables with Work Performance**

The following table shows the correlation values and the test of significance of the variables in the analysis.

### Table 2: Correlation and Regression Matrix between IVs and DV

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>WP</th>
<th>Correlation Value (r)</th>
<th>Test of Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM</td>
<td></td>
<td>0.976</td>
<td>0.000</td>
</tr>
<tr>
<td>NFM</td>
<td></td>
<td>0.976</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Source: Survey Data*

From the above table, observing the correlations of independent variables (FM and NFM) with the dependent variable (WP) it can be commented as follows:

There is a strong positive correlation between both dependant variables and independent variable at 0.01 significant levels.

FM and WP \((r = 0.976, p =0.000)\)

NFM and WP \((r = 0.976, p =0.000)\)
The empirical investigation on the work performance of staffs in District and Divisional Secretariats reveals that, there is a very strong positive significant correlation. \((r = 0.976, p = 0.000)\). Multiple Regression Model, when entered NFM at first, resulted in \(R^2 = 0.953\). Therefore, the possible explanation is that there is a positive relationship between FM and WP \((F= 492, p=0.000)\).

Further, beta value of the variable NFM has a value of 0.491, meaning that a change in Y of 0.491 units that can be expected to accompany a change of one unit in NFM. Hence it can be concluded that there is a positive relationship between NFM and WP. And also, the FM variable of the sample, gives feasibility to staffs to work performance \((\text{mean} = 1.717, \text{SD} = 0.575)\).

Model Summary- Regression Analysis in Selected Both Staff Positions

Table 3: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std.Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.990</td>
<td>0.979</td>
<td>0.979</td>
<td>0.0809407</td>
</tr>
</tbody>
</table>

Source: Survey Data

Table 4: Anova

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>2</td>
<td>37.515</td>
<td>5.726E3</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>241</td>
<td>.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>76.609</td>
<td>243</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey Data

Table 5: Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std.Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.017</td>
<td>.017</td>
<td>.986</td>
</tr>
<tr>
<td>F.M.</td>
<td>.491</td>
<td>.028</td>
<td>.501</td>
<td>17.520</td>
</tr>
<tr>
<td>N.F.M.</td>
<td>.491</td>
<td>.028</td>
<td>.503</td>
<td>17.584</td>
</tr>
</tbody>
</table>

Source: Survey Data

Hence, this study also found there is significantly strong positive relationship between financial motivation and work performance. It can be found that, in general most of the staffs perform their work well and financial motivation gives more magnetism to the staffs to perform their works efficiently. In other government sectors in Sri- Lanka also, the staffs feel that financial motivation gives more support to perform their work efficiently.
WP = 0.017+0.491FM+0.491NFM

**Hypotheses Testing**

Here, the hypotheses are tested at 5% confidence level (\(\alpha = 0.05\)). \(P\) values are denoted ‘Sig.’ in Table 4.18 above. The following table shows the rejection and acceptance of the hypothesis.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Hypothesis</th>
<th>(P) – Value</th>
<th>(\alpha = 5%)</th>
<th>(H_0)</th>
<th>(H_A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM</td>
<td>(H_0, H_A)</td>
<td>0.000</td>
<td>0.05</td>
<td>Not support</td>
<td>support</td>
</tr>
<tr>
<td>NFM</td>
<td>(H_0, H_A)</td>
<td>0.000</td>
<td>0.05</td>
<td>Not support</td>
<td>support</td>
</tr>
</tbody>
</table>

Source: Survey Data

**Test of Hypothesis 1 (\(H_1\))**

The first hypothesis in the model is FM and WP. The hypothesis is as follows.

\[H_A: \text{There is a positive relationship between an } \text{financial motivation and work Performance.}\]

\[H_0: \text{There is no relationship between an financial motivation and work Performance.}\]

When considering the above rule in accepting or rejecting the null hypothesis, the \(p\) value is for variable FM is 0.000, hence, the null hypothesis is not supported (Table 4.24) This means that FM has much influence in work Performance. The alternative hypothesis is accepted as the \(P\) value < \(\alpha\). Also the result in correlation table (Corr coefficient=0.976; \(p=0.000\)) support this hypothesis. Thus, financial motivation of the public officer is a predictor of the work performance.

**Test of Hypothesis 2 (\(H_2\))**

The second hypothesis in the model is NFM and WP. The hypothesis is as follows.

\[H_A: \text{There is a positive relationship between non financial motivation and work performance.}\]

\[H_0: \text{There is no relationship between non financial motivation and work performance.}\]

Here too, the null hypothesis is rejected since the \(p\) – value is lesser than the \(\alpha\) value (Table 4.24). This means that NFM has much influence in work performance. The alternative hypothesis is accepted as the \(P\) value < \(\alpha\). Also the result in correlation table (Corr-coef=0.976; \(p=0.000\)) support this hypothesis. Thus, non financial motivation of the public officer is a predictor of the work performance.
Conclusion

“The key role of employee motivation in organizations has long been acknowledged in the relevant organizational behavior literature (O’Reilly, 1991; Abejirinde, 2009; Locke et al, 2002). It is also clear that organizations (and employers) need motivated employees to achieve in any given goal set (Smith, 1994).

According to Ilgen and Klein, 1988, and Sulaiman, 2001, the direct impact of motivation on the productivity of a unit suggests the need to understand factors that affect motivation; such understanding helps managers modify conditions in the work setting to encourage individual behavior so as to remain consistent with the organizational goals set.

Therefore, employee' motivation is likely to have effects on the delivery of public services and the outcome of service and performance of work. There, low motivation and poor job satisfaction have a negative impact on the public sector, harmfully affecting job performance as well as the quality of service. The productivity of employees is not just a matter of how motivated they are for the job, it is also a matter of how well trained and prepared they are for the job.

This empirical research makes a critical analysis of motivation and workers performance District Secretariat and Divisional Secretariats in Ampara and identifies several motivation incentives that can help boost better performance. Accordingly, the study basically puts emphasis to investigate empirically the predictive relationship between motivation and work performance. That is the predictive relationship of the variables FM, NFM with WP. And these variables were analyzed into staff grade, non staff grade and both selected staff positions.

As discussed in chapter three, a conceptual framework is developed to test the relationship of WP with FM and NFM. It is assumed that all the variables in the conceptual framework have a positive and direct relationship with WP.

In the survey, questionnaire and interview are the methods used to collect data. Univariate analysis (single measure analysis), Bi-Variate analysis, Correlation analysis, and Simple Regression and Multiple Regression analysis are used to analyze the data using the SPSS 16.0. The sample consisted of only 244 staffs, selected from the chosen District and Divisional Secretariats. All the issued 244 questionnaires were collected and which were fully completed.

According to the findings (mainly on regression analysis) it is proved that there is a significant strong positive relationship between FM and NFM and WP and also as expected there is a positive relationship between FM and WP in staff grade staff position. Further there is positive relationship between FM, NFM and WP in non staff grade staff position and both selected staff positions.

Furthermore descriptive analysis also describe that staff grade people were motivated as well by financial and non financial motivation factors to perform their work well than non staff grade people.

The empirical investigation on the work performance of both staffs in District and Divisional Secretariats reveals that, there is a very strong positive significant correlation. (r = 0.976, p= 0.000). Multiple Regression Model, when entered NFM at first, resulted in $R^2 = 0.953$. Therefore, the possible explanation is that there is a positive relationship between FM and WP (F= 492, p=0.000).

Basic relationship to be tested in this research is the relationship between WP and FM. It has been proved by the statistical analysis that, there is a very strong positive relationship between WP and FM. The evidence can be taken from both correlation and regression analyses. There is a strong positive correlation (r= 0.990, p=0.000) between the two variables. When considering the multiple Regression results $R^2 = 0.979$, and it is an increment of 0.026 from 0.953 to 0.979. Therefore, the possible explanation is that there is a positive relationship between FM and WP (F=492.3, p=0.000).
In this research model, it is illustrated that when combined these two variables which are FM and NFM provides a stronger indication for the intention to better work performance at a very high confidence level (99.99%).

The research suggested six dimensions namely, work skills, work duties, work enthusiasm, quality and quantity of work and readiness to innovate for work performance. Accordingly, 98% of the variance in work performance was significantly explained by the two Independent variables considered in this study, still leaves 2% unexplained. In other words, there are little other additional variables that are important in explaining work performance that have not been considered in this study. So, further research might be necessary to explain more of the variance in Work Performance. However motivations such as financial and non financial are the best predictor of work performance.

According to these research findings, there seem to be positive effect of motivation with Work performance. That is, the two variables such as, financial motivation and non financial motivation have positive effect on the work performance of the staffs. The study further establishes that element such as adequate salary, incentives, retirement benefits, training, loan and high education are important to motivate workers. Further, achievement, recognitions, responsibility, initiative and flexibility were seen to be vital for workers to encourage good performance.

Furthermore, we can conclude that the hygiene factors such as working conditions, work relations physical environment, supervision and job security, as argued by Herzberg should be able to form the baseline that can then stimulate the motivators such as achievement, recognition, responsibility, advancement and training to motivate the workers to perform well. In that light motivation in Divisional and District Secretariats in Ampara District is seen to be good for staff grade officer and the resultant good performance but Non staff grade officer are not treated like these, therefore their performance not good.

Sri Lanka, mostly, District Secretariat and Divisional Secretariats offices had displayed negligence towards their work and also late coming, poor time management and the failure to meet deadlines for the preparation of important working documents had become a common practice. This has been observed by attendance register carried out every morning that shows absenteeism and late coming.

If the government organizations give more support and motivation to non staff grade workers such as adequate salary, increment, incentives, training and non financial motivations such as promotion, supervisor supports in the works, recognitions, responsibility, initiative and flexibility, opportunity for independence and freedom, government can get efficient output from them.

**Recommendations**

In this empirical research of motivation and work performance District Secretariat and Divisional Secretariats in Ampara and identifies several motivation incentives that can help boost better performance. The research study would help to inform organizations about the motivational problems and develop strategies to minimize the problems. The research would also help the managers and the workers, to realize their obligations and responsibility towards the good performance of the Organization.

Mostly, Non staff grade officers work hard and too much of work they have to do within particular time with less payment than staff grade officers. If the organization offering more overtime to non staff grade people, they will perform their job with dedication and it possible to get higher performance from them. Job training must be needed to the workers to know about their job description, current environments and trend and necessity of the public service. Provide challenging work, power and more responsibility which are helps to utilize their ability.

Working conditions are very important to the way employees feel about where they work. And Social Gatherings also will help to motivate workers as well. Scheduled offsite events enhance bonding which in turn helps team spirit, which ultimately impacts positive work environment. Labor Day, year end and festival parties are only some of the ideas that successfully bring people together for an enjoyable time. Be open, friendly, and professional with the staff, they are the hard workers and deserve to be treated with respect and visiting to staffs houses on special days such as funeral, heavy disease and wedding. These will enable the workers to work with
higher performance. Providing a good work relation, physical environment supervision and job security are also helps to motivate workers to encourage good work performance.

The research would also inform the policy makers to find ways to curb the present undesirable situation and to understand pertinent motivational issues in regards to the organization. The study would add on to the existing literature on the implementation of motivational measures District Secretariat and Divisional Secretariats in Ampara. The research was in totality help to revive the organization to a good functional state and somehow guarantee its effective and smooth existence by means of motivating the employees.

In this study 98% of the variance in work performance was significantly explained by two variables in this research. Balance 2% should have considered to future researches. And sample size can be extended in future. Although the present study is limited to the staffs of District and Divisional Secretariat in Ampara District, it can certainly be extended to all other government organizations in Ampara District even in Whole Island. And sample size also low not only is the minor grade employees omitted. It can be extended in future researches to whole district and divisional secretariat in Whole Island and can be extend further more to other government sectors such as Health Department, Irrigation Departments, Education Departments, etc… in order to generalize the findings.

References


Naylor, J. (1999), Management, Pearson Education, Financial Times/ Prentice Hall, Harlow, United Kingdom, UK.


Micro Finance and Poverty Alleviation in Sri Lanka

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Abstract

Microfinance services in Sri Lanka have a wide geographical outreach but the extent of outreach of private operators including NGOs and commercial banks in rural areas is rather limited although the poor and the poorest groups have been reached by these Institutions. Most of people prefer the MFI rather than the banks. Because, they can easily access the loans from MFI. The objective of this research is to provide further evidence on the contribution of micro finance for poverty alleviation in Sri Lanka. In this regards, a survey was conducted among the selected micro finance beneficiaries from Polonnaruwa District of North Central Province in Sri Lanka. The collected data were analyzed using statistical software and found that the micro finance programs significantly help to poor people to uplift their live which lead for the poverty alleviation in Sri Lanka. However, microfinance facilities are no ‘magic bullet’ for poverty reduction. Many other changes are also needed. Finally, it is noted that there is a significant relationship between the micro finance and poverty alleviation in a certain level of percentage.

Key Words: Micro Finance, Poverty Alleviation, Micro Finance Institutions (MFIs)

Introduction

The microfinance movement began with the work of Dr. Muhammad Yunus in Bangladesh in the late 1970s, spreading rapidly to other developing countries. Most early microfinance institutions (MFIs), including Yunus’s own iconic Grameen Bank, relied on funding from government and international donors, justified by MFI claims that they were reducing poverty, unemployment and deprivation. Microfinance is a source of financial services for entrepreneurs and small businesses lacking access to banking and related services. The two main mechanisms for the delivery of financial services to such clients are:

(a) relationship-based banking for individual entrepreneurs and small businesses.

(b) group-based models, where several entrepreneurs come together to apply for loans and other services as a group.

In some regions, for example Southern Africa, microfinance is used to describe the supply of financial services to low-income employees, which is closer to the retail finance model prevalent in mainstream banking.

For some, microfinance is a movement whose object is "a world in which as many poor and near-poor households as possible have permanent access to an appropriate range of high quality financial services, including not just credit but also savings, insurance, and fund transfers. Many of those who promote microfinance generally believe that such access will help poor people out of poverty, including participants in the Microcredit Summit Campaign. For others, microfinance is a way to promote economic development, employment and growth through the support of micro-entrepreneurs and small businesses.

Problem Statement

Microcredit is provision of credit services to poor clients. Microcredit is one of the aspects of microfinance and the two are often confused. Critics may attack microcredit while referring to it indiscriminately as either 'microcredit' or 'microfinance'. Due to the broad range of microfinance services, it is difficult to assess impact, and very few studies have tried to assess its full impact. Proponents often claim that microfinance lifts people
out of poverty, but the evidence is mixed. Therefore, this research is an attempt to further emphasize the contribution of the micro finance for poverty alleviation in Sri Lanka. Hence, the rest of this paper will be discussed as below.

Objective of this study to investigate the relationship between Micro finance and poverty alleviation in Sri Lanka.

**Micro Finance in Sri Lanka and Literature**

Lanka Microfinance Practitioner’ Association (LMPA) is a network formed by several Microfinance Practitioners in Sri Lanka. The main function of the LMPA is to enhance the ability of their members to provide quality financial services to grass-root communities. They achieve this goal by promoting Microfinance and by encouraging cooperation, sharing information and assistance between member practitioners and stake holders. LMPA is the pioneer in microfinance networking among microfinance practitioners in Sri Lanka, and was initiated on the 31st of March 2006. The Lanka Microfinance Practitioners’ Association is incorporated as a non-profit Organization under the Companies Act No. 7 of 2007.

According to the Milford Bateman (2011) Sri Lanka has been ranked in sixth in terms of microfinance penetration. It can be observed with other most microfinance-friendly countries from Table 01.

<table>
<thead>
<tr>
<th>Global Ranking</th>
<th>Country</th>
<th>Borrower accounts/ population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bangladesh</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>(Andhra Pradesh State, India)</td>
<td>17%</td>
</tr>
<tr>
<td>2</td>
<td>Bosnia and Herzegovina</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>Mongolia</td>
<td>15%</td>
</tr>
<tr>
<td>4</td>
<td>Cambodia</td>
<td>13%</td>
</tr>
<tr>
<td>5</td>
<td>Nicaragua</td>
<td>11%</td>
</tr>
<tr>
<td>6</td>
<td>Sri Lanka</td>
<td>10%</td>
</tr>
<tr>
<td>7</td>
<td>Montenegro</td>
<td>10%</td>
</tr>
<tr>
<td>8</td>
<td>Viet Nam</td>
<td>10%</td>
</tr>
<tr>
<td>9</td>
<td>Peru</td>
<td>10%</td>
</tr>
<tr>
<td>10</td>
<td>Armenia</td>
<td>9%</td>
</tr>
<tr>
<td>11</td>
<td>Bolivia</td>
<td>9%</td>
</tr>
<tr>
<td>12</td>
<td>Thailand</td>
<td>8%</td>
</tr>
<tr>
<td>13</td>
<td>India</td>
<td>7%</td>
</tr>
<tr>
<td>14</td>
<td>Paraguay</td>
<td>6%</td>
</tr>
<tr>
<td>15</td>
<td>El Salvador</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: Gonzalez (2010); *Rozas and Sinha (2010).

**Impacts on poverty reduction**

Hulme, *et al* (1996) the most-cited source of evidence on the impacts of microfinance is the early set of studies collected by David Hulme and Paul Mosley. The findings of these studies are provocative: poor households do not benefit from microfinance; it is only non-poor borrowers (with incomes above poverty lines) who can do well with microfinance and enjoy sizable positive impacts. More troubling is the finding that a vast majority of those with starting incomes below the poverty line actually ended up with less incremental income after getting micro-loans, as compared to a control group which did not get such loans.

Findings of the Hulme *et al* (1996) studies imply that credit is only one factor in the generation of income or output. There are other complementary factors, crucial for making credit more productive. Among them, the most important is recipient’s entrepreneurial skills. Most poor people do not have the basic education or experience to understand and manage even low level business activities. They are mostly risk-averse, often fearful of losing whatever little they have, and struggling to survive. This does not mean that they do not want to better themselves (e.g., as suggested by the so-called backward bending labour supply curve).
Micro Finance, Poverty and Poverty Alleviation

Microfinance supported these informal microenterprises through microcredit. The microcredit approach to poverty reduction is “the provision of small loans to individuals, usually within groups, as capital investment to enable income generation through self-employment”

Shahidur R. Khandker (2005) Income or consumption poverty can be reduced through interventions such as micro finance that poor become self-employed and generate income. But efforts to assess the impact of micro finance programe can be biased by nonrandom program placement and participation. Antipoverty program such as the Grameen Bank are often placed in areas where the poverty level is high. Shahidur R. Khandker (2005)

Using the Micro Finance Institutions (MFIs) we can reduce the poverty in society. The following figure describes how poverty will be breaking using the Micro Credit. Nikhil Chandra Shil (2009) explains the poverty alleviation in Grameen model as follows.

Figure 1 Breaking the Vicious of Poverty: The Grameen Model

Methodology

Data collection method
Data for the study collected through the questionnaire from Polonnaruwa District of Sri Lanka. For this purpose 300 micro finance beneficiaries selected as a sample. Among those only 153 people responded. Therefore, only 153 questionnaires were used for analyses. Data were analyzed using the SPSS software.

In order to check the impact of Micro Finance on the poverty alleviation, the following hypothesis is derived.

$H_0$: Micro Finance does not impact the poverty alleviation in Sri Lanka

$H_1$: Micro Finance does impact the poverty alleviation in Sri Lanka

This paper investigates whether the micro finance contribute for the poverty alleviation in Sri Lanka. The independent variable is the proxies of Micro Finance such as loan amount, re-payment ability, accessibility for getting the loan, saving and etc. The dependent variable is the poverty alleviation which is measured using the income, savings, and property.

Data analysis

The information was gathered from micro finance beneficiaries who are engaged with Micro Finance Institution in the Polonnaruwa district. 300 questionnaires were issued among the micro finance beneficiaries, but only 153 people responded. Therefore, only 153 questionnaires were used for analyses. Data were analyzed using the SPSS software.

Table 4.1 presents the demographic information. According to Table 91% beneficiaries are female and 9% are male involved in micro finance activities. Nowadays, female contribution increase due to the economic conditions of the family.
When we look at the age of the beneficiaries mostly all age group people are engaged with Micro Finance. According to table 39.2% are between 46 and 55. It seems that middle age people are mostly involved in getting the loan from micro finance compared to other aged groups.

In the case of education, it describes that education of the most of beneficiaries is at low level. It can be observed that 33.3% are below the O/L qualification. Only 28.8% followed the O/L. So it is notable that most of uneducated people are trying to get the Micro Finance loan to build up their life and the career.

Table 4.1 Demographic Information

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>14</td>
<td>9.2%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>139</td>
<td>90.8%</td>
</tr>
<tr>
<td>Age</td>
<td>25 – 35 Years</td>
<td>25</td>
<td>16.3%</td>
</tr>
<tr>
<td></td>
<td>36 – 45 Years</td>
<td>37</td>
<td>24.2%</td>
</tr>
<tr>
<td></td>
<td>46 – 55 Years</td>
<td>60</td>
<td>39.2%</td>
</tr>
<tr>
<td></td>
<td>Above 55 Years</td>
<td>31</td>
<td>20.3%</td>
</tr>
<tr>
<td>Education qualification</td>
<td>Bellow O/L</td>
<td>51</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>O/L</td>
<td>44</td>
<td>28.8%</td>
</tr>
<tr>
<td></td>
<td>A/L</td>
<td>19</td>
<td>12.4%</td>
</tr>
<tr>
<td></td>
<td>Graduate</td>
<td>3</td>
<td>2.0%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>36</td>
<td>23.5%</td>
</tr>
</tbody>
</table>

Source: Survey Data Collection

Table 4.2 describes the summary of responses by the beneficiaries of micro finance. Accordingly, 97.4% of beneficiaries agree that their life had increased after getting the micro finance loan and it helped 66.6% percentage of beneficiaries to increase their life style. 94% of beneficiaries were satisfying with their loan repayment and 81% of them agreed that they haven’t difficulties with the payment. Beyond 90% percentage of beneficiaries had agreed that the microfinance helped to improve their business and the level of income, consumption level and saving. All the beneficiaries who had response to the questionnaire are improved the saving after getting the loan. 90% of them believe that micro finance is an effective tool for poor people to alleviate their poverty.

Table 4.2 Question asked, Frequencies and Percentages

<table>
<thead>
<tr>
<th>S/N</th>
<th>Questions</th>
<th>Frequencies</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Micro finance helped a lot to increase the life style</td>
<td>149</td>
<td>97.4%</td>
</tr>
<tr>
<td>02</td>
<td>Property has increased by availing the facility of Micro Finance</td>
<td>153</td>
<td>100%</td>
</tr>
<tr>
<td>03</td>
<td>Expectation of family members (education of children) have been reached through the Micro Finance</td>
<td>102</td>
<td>66.6%</td>
</tr>
<tr>
<td>04</td>
<td>Satisfaction level of loan repayment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satisfied</td>
<td>144</td>
<td>94.1%</td>
</tr>
<tr>
<td></td>
<td>Not Satisfied</td>
<td>9</td>
<td>5.9%</td>
</tr>
<tr>
<td>05</td>
<td>It has some finance difficulties to the lenders when they are going to settle the repayment</td>
<td>28</td>
<td>18.3%</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Micro finance investment helped to improve the business</td>
<td>149</td>
<td>97.4%</td>
</tr>
<tr>
<td>07</td>
<td>Income level has increased after inception of Micro Finance</td>
<td>142</td>
<td>92.8%</td>
</tr>
<tr>
<td>08</td>
<td>Consumption level has increased by getting Micro Finance</td>
<td>135</td>
<td>88.2%</td>
</tr>
<tr>
<td>09</td>
<td>It helps to increase the saving</td>
<td>153</td>
<td>100%</td>
</tr>
<tr>
<td>10</td>
<td>Micro finance give more facilities to get the loan</td>
<td>148</td>
<td>96.7%</td>
</tr>
<tr>
<td>11</td>
<td>I believe that micro finance is an effective tool for poor people to alleviate their poverty</td>
<td>138</td>
<td>90.1%</td>
</tr>
</tbody>
</table>
Table 4.3 shows the correlations between difficulties of Repayment, Loan Amount, Interest Rate and repayment schedule. The results of the correlation matrix show that there is a positive relationship of with the Loan amount and Interest rate with Difficulties of Repayment and it is negatively related to the Repayment Schedule, because of some of peoples are getting the loans more than one institution and they cannot repayment schedules. That’s why they have some difficulties with the repayments. And also Interest rate and the Loan amount show the positive relationship. The results of the correlation shows that there is no significant relationship loan amount and interest rate with difficulties of payment.

Table 4.3 Analysis of variables

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Repayment Schedule</th>
<th>Difficulties of repayment</th>
<th>Loan Amount</th>
<th>Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repayment Schedule</td>
<td>Pearson Correlation</td>
<td>-243**</td>
<td>-313**</td>
<td>-373**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>1</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>N</td>
<td>153</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>Difficulties of repayment</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>.009</td>
<td>.030</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>153</td>
<td>913</td>
<td>711</td>
<td>153</td>
</tr>
<tr>
<td>N</td>
<td>153</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>Loan Amount</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>.532**</td>
<td>153</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>153</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>1</td>
<td>153</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>153</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Survey Data Collection

Table 4.4 Analysis of variables

According to the data analysis loan amount and monthly income has a positive significant relationship. There is also significant and positive relationship between monthly income and saving. But loan amount and monthly saving has no significant relationship. These correlation relationship proves that micro finance support the poverty alleviation in Sri Lanka.

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Loan Amount</th>
<th>Monthly Income</th>
<th>Monthly Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan Amount</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>.231**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>Monthly Income</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>.437**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>Monthly Savings</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>153</td>
<td>153</td>
<td>153</td>
</tr>
</tbody>
</table>
**Correlation is significant at the 0.01 level (2-tailed).**
Source: Survey Data Collection

**Conclusions**

This research focuses on poverty alleviation through micro finance. According to data analysis, the variables that explain the poverty alleviation indicate that micro finance also strongly support for the poverty alleviation in Sri Lanka. 94.1% percent of beneficiaries are satisfied with their repayment schedule and 81.7% percentage of beneficiaries agreed that they have not any difficulties with the repayment. In the case of saving, 100% percent of beneficiaries are savings in different ways. It means they can use their saving for investments and also it will become a growth of their business.

There are some issues arising when they are getting their Micro Finance loans as a group basis. Because, if one person avoid from the repayments of loan then other group members should take the responsibility of repayment on behalf of the group. It will be a negative issue of the repayment for the group members; on the other hand, group lending is a good thing for Micro Finance Institutions.

Furthermore, there are some complains from the lenders that they have to give more interest when they are getting the loans from the private sector, but in the public sector they do not need to give much interest. But the issue is getting the loan from the public sector is very difficult. It takes long time and the people have to fill more documents and also the most of officers are trying to help for their friends and relations. In that time poor people are facing more difficulties to get the loan from public sector. So it should be remarkable to set up a good system for all in the country.

However, the micro finance programs significantly help to poor people to uplift their live which lead for the poverty alleviation in Sri Lanka. The following recommendations also should be considered to uplift the micro financing system in Sri Lanka which may lead for poverty alleviation.

**Recommendations**

1. As the interest rate is an additional burden over the clients. Hence, the interest rate must be reduced and re-payback period should be increased.
2. Most of the poor people don’t have enough knowledge to develop their business. Therefore, a special campaign should be developed after giving the loan.
3. Government Institutions should give the more attention to the poor people and conduct some program to develop their career.
4. MFI should develop a mechanism to avoid multiple loans received by the beneficiaries. Because, when the poor people receive micro loans from several places then it can become burden for settling it.

**References**


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Shahidur R. Khandker (2005), Micro Finance and Poverty: Evidence Using Panel Data From Bangladesh, Oxford University Press on behalf of the International Bank For Reconstruction and Development

Factors Affecting Mobile Phone Brand Preference: Empirical Study on Sri Lankan University Students

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Abstract

This study gives an insight into the mobile market industry in Sri Lanka. Mobile phone manufacturers and marketers are facing hyper competition in Sri Lanka as well as in the world mobile market. Mobile phone marketers should have clear idea about the factors which are affecting the choice of the mobile phone to design, produce, set price, communicate and promote the mobile phone in such manner to get more market share and win whole hard of the potential consumers and stakeholders. This study aims to find out the factors which are affecting the choice of a particular mobile brand when make purchase decision with reference to Sri Lankan university students. The primary data collected through online-based questionnaire designed and then sent to randomly selected students to respond who are following any programme of study in universities island-wide. Descriptive statistics; mean and standard deviation are used to identify the factors those are affecting the mobile brand preference. Price, stylish appearances and perceived quality are found as very important factors on purchase decision when selecting a mobile phone brand.

Keywords: Mobile Phone, Brand Preference, Price, Perceived Quality, Stylish Appearance.

Introduction

The mobile phones dominate most of modern human in every movement of life. Nowadays which are become part of basic needs of a person as means of communication across the world during the last fifteen years. Every individuals use mobile for not only communication purpose, but also it becomes a personnel assistance to make everyday life easier. The development of mobile communication technology (e.g. wireless internet, mobile phone, MP3 player, GPS navigation system) has been a long journey of innovation which is constantly evolving and updating as a result of consumers’ changing needs and preferences (Mokhlis & Yaakop, 2012). Mobile phones are one of the modern telecommunication technologies that have emerged over the past decades to facilitate communication among people within and across countries (Dziwornu, 2013). Sri Lanka is one of the good destination for introducing and selling new mobile brand. There are several brands and sizes of mobile phone handsets with different ranges of prices on the Sri Lankan market. It is therefore important that with the growing market demand for mobile phone handsets in Sri Lanka. Manufacturers and marketers understand the future purchase behavior of consumers in order to produce and market mobile phone handsets that meet consumers taste for profitability. There are enormous competition among mobile manufactures in mobile industry. Consumers are prefer one brand over another brands of mobile. In a world dominated by increasingly interchangeable product and service offerings trademarks plays an increasingly important role in consumers’ purchasing decisions. Positive attitudes and preferences for the brand to repeat purchase are creating long-term customer relationships. Brands that assume consumers’ needs has the potential to bring positive preferences and attitudes lead to frequent purchases and long-term relationships between businesses and consumers. The question is whether this is applied in practice or if companies instead more looks at short-term profits than consumer wellbeing? The question is also whether consumers in turn care about long-term relationships or whether they instead are based on the price or other factors? This paper is analyzing what are the factors affecting brand preference of mobile phones.
Problem Statement

Due to the technological innovation in mobile phone technologies, the products are created beyond what consumer need and wants. There are large number of manufacturers are producing and selling different variety of mobile phones and models into the mobile market. Therefore, a huge competition in the mobile phone market to sell their products. In today’s competitive mobile market, it is very important for the marketers to realize and find out the factors that are essential to deal with the competitors, changing customer tastes and preferences. Many studies found the factors in different countries all over the world, but in Sri Lankan context studies are very rare in this regard even though as the mobile phone market is an emerging trend in Sri Lanka. Therefore, this study is going to identify and rank the factors from most important to least important factors affecting mobile phone brand choice among university students in Sri Lanka.

Objective of the Study

To identify the preferred and important factors affecting the purchase decision of mobile phone when choose a particular mobile brand in Sri Lanka.

Research Question

What is the order of preference of factors affecting mobile phone purchase decision in Sri Lankan University Students?

Literature Review

Brand gives a strategic form of position for competition and make the product different from other competitor’s brands. Mobile phone choice is based on personal feelings, opinions and tastes (subjective choice), there are also some other general factors which appear to have an influence on choice (Karjaluoto et al., 2005). The most important factors that influence brand choice when changing the mobile phones are: technical problems, price, innovative services, brand, reliability, basic properties, design and outside influences. The fact behind this finding can be that all the competing brands have almost same size phones which are small enough. So the trend will not actually be directed towards smaller sized phones but rather towards better capacity and large screen phones (Shahzad & Sobia, 2013).

The competition in terms of product similarity and increased number of competing brands in the market have led the marketers to consider and study the factors that are determine consumers’ brand choice decision makings and their behaviors (Shahzad & Sobia, 2013). There are number of factors that affect the way the consumer choose a particular brand than other brands. Various factors influence the consumers when they are making a choice among alternate brands. These factors consist of price, quality, features, family and friends’ recommendations, brand image, innovative features, promotion effectiveness, celebrity endorsement, user friendliness, stylish appearance and post-purchase services (Shahzad & Sobia, 2013).

The price is a dominant and the most important factor affecting the decision making and purchase process of any products. Price of the phone has been identified as a critical factor in the choice of the mobile phone model, especially among younger people (Tallberg et al., 2007). In case of mobile, for youths, price can be a key factor of attraction. Price of the mobile phone has been identified as a key factor in the choice of mobile phones, especially among the young consumers. The product’s price may vary based on economic conditions and perceptions of the consumers. It may affect the brands’ perceived value. Price is used by many of the consumers as an indication of the brands’ quality which is a vital factor in the purchase decision (Kotler et al., 1999). Price and properties were regarded as the most important motives affecting the decision to purchase current mobile phone model among the respondents as displayed (Karjaluoto et al., 2005). The factor brand, price and characteristics of mobile phone are the main factors for purchasing new mobile phone and technical problems are the main cause for changing the mobile phone by users (Karjaluoto et al., 2005). The study of Ziad and Smadi (2011) tries to find out how university students make decision for purchasing mobile phone in Jordan.
The study shows that university students of Jordan have perfectionist style of purchasing mobile phone, they are price and brand sensible.

Consumers prefer the purchase of mobile phone handset with value added facilities like camera, large screen, familiar brand and low price (Soomro & Ghumro, 2013). consumers purchase new phones due to the fact that their existing one’s capacity is not appropriate referring to the idea that new accessories features such as built-in cameras, better memory, radio, more developed messaging services and color displays are influencing consumer decisions to acquire new models (Bell, 2002). Stylish appearance is one of the important factor to attract the consumers towards the products. It may be the reason, the phone manufacturers are continuously changing the physical design of mobile phones with same configuration. Latest mobile phones teamed up with attractive folding designs, quick launch, short cut buttons are in style and these preferences are commonly acceptable (Bhatti, 2007). Consumers were very conscious about style and shape, which was beyond their expectations. Saif et al. (2012) revealed that Pakistani customers desired Design and style more than any other factors.

The consumer perceives the quality of a brand is a crucial factor that affects the brand choice. Product quality frames the products’ ability to carry out its functions. Brand is due to quality because the unbranded products have significantly varying in quality (Sardar, 2012). The features of mobile phone are basically the set of competencies, services and applications offered to the users. These can be Bluetooth, camera, dual SIM, video-recorder, MP3 player, memory card reader, Wi-Fi connectivity and so on and they vary from brand to brand (Shahzad & Sobia 2013). Various design features have a contribution as size and weight of the phone, its material, color, shape of buttons and interface features (Dũng, 2012). Nowadays customers are asking for more and more compatibility in their handset’s user interface which is why Nokia is liked by all for its user friendly interface (Saif et al., 2012). Choices between mobile phone brands were affected by new technology features such as memory capacity and SMS-options, more than size. The trend will actually be not towards smaller phones but towards phones with better capability and larger screens (Karjaluoto et al., 2005). The new millennium consumer tends to enjoy life. He has greater self-control, and looks for personal style and pleasure. Exposures to variety of products and enhancement of economic status have changed the attitudes of the upper middle-class consumers towards brands (Das, 2012).

Third party recommendations are increasingly important factor in influencing the consumer brand choice and purchase decision. Friends and family members who present at the time of purchase play a key role in choosing a specific brand (Chen & Xie, 2005). Generally, brand image describes the set of beliefs of a customer holds regarding a particular brand. It expresses the whole image of a brand in customers’ mind that is created from different bases (Keller, 2002). Promotion mix is the combination of advertising, sales promotion, public relations, personal selling and direct marketing tools that a company uses to communicate value and build relationships (Kotler et al., 1999). Promotion is a way of communicating the information, regarding a product, between the buyer and seller so as to establish the brand profile and brand values. Various promotional tools like advertising, word-of mouth, publicity, sales promotion etc., can be used by a company to create and strengthen its brand position in the customers’ mind.

The celebrity endorsement has become much more common and is used as a part of a company’s marketing strategy for their brand communication by resorting to different celebrities who play the role of presenters of a particular brand or in other words, act as a spokesperson for a specific brand (Shahzad & Sobia 2013). A celebrity provides a kind of cultural meaning and the association of it later transfers on to the brand. Sales after services, mean any support the seller provides to a buyer after a particular product is sold. It is a viable and important means of building brand loyalty through customer satisfaction and generating repeated purchase. It basically involves the warranty package offered to the customers regarding the product maintenance or repair of the equipment by its manufacturer during the time period of warranty. After-sale services may include six activities namely: routine maintenance, installation, parts supply, training, emergency repair and software services (Wilson, Boström & Lundin, 1999).
Research Methodology

The online-based questionnaire designed and then sent to randomly selected students to respond who are following any study programme in Universities Island wide by means of email, Facebook and other social networks during the month of October-December 2013. These questionnaires used for analyzing to find out the factors which are affecting mobile brand choice when purchasing a mobile phone. Five point Likert scales are used to measure the responses with values ranging from “very important” to “unimportant”. Furthermore, some other data related with mobile usage also collected to identify consumer behavior towards mobile brand, frequency of changing mobile phones, preferred brand, and use of mobile phone by mobile users. The collected data analyzed by using statistical package for social sciences (SPSS 16.0). The mean value is calculated in each variables, then mean of variable compared to each other variable to find out most important factor which impact on mobile brand preference. Descriptive statistics such as mean and frequency are used to analyze the responses.

Data Analysis and Presentation

As the study focuses on determining the brand choice factors of students, the research data were collected from the students within the universities and territory Institutes Island wide. The general demographic profile of the respondents reveals that both males and females were the respondents of the study. The table 1 below shows that 68.3% of the respondents were males while the rest of 31.7% were females.

<table>
<thead>
<tr>
<th>Table 6: Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>56</td>
<td>68.3</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>31.7</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 7: Income Distribution</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 15,000</td>
<td>21</td>
<td>25.6</td>
</tr>
<tr>
<td>15,001 – 25,000</td>
<td>13</td>
<td>15.9</td>
</tr>
<tr>
<td>25,001 – 35,000</td>
<td>20</td>
<td>24.4</td>
</tr>
<tr>
<td>35,001 - 50000</td>
<td>10</td>
<td>12.2</td>
</tr>
<tr>
<td>50,001 &amp; above</td>
<td>18</td>
<td>22.0</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The income distribution of the respondents includes 25.6% of income less than Rs.15000, 15.9% of income between Rs.15000 and Rs.25000, 24.4% of income between Rs.25000 and Rs.35000, 12.2% of income between Rs.35000 and Rs.50000 and 22% of income more than Rs.50000 per month (Table 2).

<table>
<thead>
<tr>
<th>Table 8: Educational Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
</table>

Proceedings, 04th International Symposium, SEUSL
The educational level of the respondents includes 47.6% of Undergraduate, 29.3% of post-graduate, 14% of are Diploma Holders/Readers and 8.5% are other are certificate and high school qualifications. The above mentioned description stands for the socio-demographic profile of the respondents (Table 3).

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>6</td>
<td>7.3</td>
</tr>
<tr>
<td>Certificate</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Diploma</td>
<td>12</td>
<td>14.6</td>
</tr>
<tr>
<td>Graduate</td>
<td>39</td>
<td>47.6</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>24</td>
<td>29.3</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 9: Current Market Share

<table>
<thead>
<tr>
<th>Brand</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nokia</td>
<td>27</td>
<td>32.9</td>
</tr>
<tr>
<td>Samsung</td>
<td>26</td>
<td>31.7</td>
</tr>
<tr>
<td>iPhone (Apple)</td>
<td>9</td>
<td>11.0</td>
</tr>
<tr>
<td>Sony Ericson or Sony</td>
<td>5</td>
<td>6.1</td>
</tr>
<tr>
<td>Motorola</td>
<td>3</td>
<td>3.7</td>
</tr>
<tr>
<td>HTC</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Blackberry</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>LG</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Huawei</td>
<td>3</td>
<td>3.7</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3.7</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Nokia and Samsung dominate the mobile market of the concerned respondents. Which have 32.9% and 31.7% market shares respectively. Apple 11%, Sony 6.1% and other brands have smaller market shares (Table 4).

Table 10: Period of Usage

<table>
<thead>
<tr>
<th>Period</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>13</td>
<td>15.9</td>
</tr>
<tr>
<td>1 – 2 years</td>
<td>22</td>
<td>26.8</td>
</tr>
</tbody>
</table>
The 47.6% of respondents use the phone for 2-4 years, 26.8% use the phone for 1-2 years, 15.9% use less than one year and 9.8% use the phone for more than 4 years (Table 5).

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>12</td>
</tr>
<tr>
<td>1 – 2 years</td>
<td>28</td>
</tr>
<tr>
<td>2 – 4 years</td>
<td>31</td>
</tr>
<tr>
<td>Above 4 years</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
</tr>
</tbody>
</table>

The 37.8% of users change the mobile every 2-4 years, 34.1% change 1-2 years, 14% change within one year and 13.4% do not change the mobile within four years (Table 6).

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samsung</td>
<td>28</td>
</tr>
<tr>
<td>iPhone (Apple)</td>
<td>23</td>
</tr>
<tr>
<td>Sony Ericson or Sony</td>
<td>13</td>
</tr>
<tr>
<td>Nokia</td>
<td>7</td>
</tr>
<tr>
<td>LG</td>
<td>6</td>
</tr>
<tr>
<td>HTC</td>
<td>2</td>
</tr>
<tr>
<td>Motorola</td>
<td>1</td>
</tr>
<tr>
<td>Blackberry</td>
<td>1</td>
</tr>
<tr>
<td>Huawei</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
</tr>
</tbody>
</table>
Some respondent are like some brands to buy next time as preferred brand. According to the Table 7 Samsung, Apple and Sony brands will be dominate the market which represents 34.1% 28.0% and 15.9% respectively. Nokia will be lose its market share to 8.5%.

Table 8: Price to be charge for next mobile phone

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10,000</td>
<td>29</td>
</tr>
<tr>
<td>10,001 to 20,000</td>
<td>26</td>
</tr>
<tr>
<td>20,001 to 40,000</td>
<td>17</td>
</tr>
<tr>
<td>40,001 to 60,000</td>
<td>5</td>
</tr>
<tr>
<td>More than 60,000</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
</tr>
</tbody>
</table>

The mobile users are seems to be price sensitive. 35.4% of the responders are willing to pay for a mobile is less than Rs. 10,000.00, 31.7% of them are willing to pay between Rs. 10,001.00 and Rs. 20,000.00, 20.7% of them are willing to pay between Rs. 20,001.00 and Rs. 40,000.00, 6.1% of users are willing to pay between Rs. 40,001.00 and Rs. 60,000.00, and another 6.1% of users are willing to pay more than Rs. 60,000.00 (Table 8).

Table 9: Price

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither important nor unimportant</td>
<td>17</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>41</td>
</tr>
<tr>
<td>Very important</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
</tr>
</tbody>
</table>

According to the impotency of the price; 50.0% of respondes are say somewhat important, 29.3% are very important and 20.7% are neutral (Table 9).

Table 10: Stylish Appearance

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither important nor unimportant</td>
<td>17</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>45</td>
</tr>
<tr>
<td>Very important</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
</tr>
</tbody>
</table>
Stylish appearance is measured by differed dimensions such as Dimensions (Body), Weight, Shape, Colors and Attraction. 54.9% of respondents find some important, 24.4% are very important and 20.7% are neutral (Table 10).

<table>
<thead>
<tr>
<th>Table 11: Quality Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td>Unimportant</td>
</tr>
<tr>
<td>Less important</td>
</tr>
<tr>
<td>Neither important nor unimportant</td>
</tr>
<tr>
<td>Somewhat important</td>
</tr>
<tr>
<td>Very important</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Quality aspect is measured by differed dimensions such as Network Coverage, Display, Sound, Camera, Speed, Battery and User-Friendliness. 22.0% of respondents are responded as neither important nor unimportant, 7.3% of them are less unimportant, 45.1% of them are somewhat important, and 23.2% are very important (Table 11).

<table>
<thead>
<tr>
<th>Table 12: Promotion and Advertisement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td>Less unimportant</td>
</tr>
<tr>
<td>Neither important nor unimportant</td>
</tr>
<tr>
<td>Somewhat important</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Promotion and Advertisement is measured by differed dimensions such as TV Advertisement, News Paper Advertisement, Web Page Advertisement, Offer (By Operator), and Seasonal Offers. 81.7% of respondents are responded as neither important nor unimportant, 8.5% of them are somewhat important and 9.8% of them are less unimportant (Table 12).

<table>
<thead>
<tr>
<th>Table 13: Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td>Less unimportant</td>
</tr>
<tr>
<td>Neither important nor unimportant</td>
</tr>
<tr>
<td>Somewhat important</td>
</tr>
</tbody>
</table>
Features are measured by differed dimensions such as Memory, GPRS, WLAN (Wi-Fi), Bluetooth, USB, Radio, GPS, 4G Network, 3G Network, and Memory Card slot. 65.9% of responds are responded as neither important nor unimportant, 25.6% of them are somewhat important, and 8.5% of them are less unimportant (Table 13).

<table>
<thead>
<tr>
<th>Table 14: Third Party Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Unimportant</td>
</tr>
<tr>
<td>Less important</td>
</tr>
<tr>
<td>Neither important nor unimportant</td>
</tr>
<tr>
<td>Somewhat important</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Third party recommendation is measured by differed dimensions such as Friends, Family, Classmate, Colleague and Sales People. 58.5% of responds are responded as neither important nor unimportant, 31.7% of them are less unimportant, 8.5% of them are somewhat important, and 1.2% are unimportant (Table 14).

<table>
<thead>
<tr>
<th>Table 15: Brand Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Less unimportant</td>
</tr>
<tr>
<td>Neither important nor unimportant</td>
</tr>
<tr>
<td>Somewhat important</td>
</tr>
<tr>
<td>Very important</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Brand image is measured by differed dimensions such as Brand personality, Brand sensitivity, Brand involvement, Brand trust and Brand commitment. 53.7% of responds are responded as neither important nor unimportant, 29.3% of them are somewhat important, 9.8% of them are less unimportant and 7.3% of them are very important (Table 15).

<table>
<thead>
<tr>
<th>Table 16: Celebrity Endorsement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Unimportant</td>
</tr>
<tr>
<td>Less unimportant</td>
</tr>
<tr>
<td>Neither important nor unimportant</td>
</tr>
</tbody>
</table>


Celebrity Endorsement is measured by differed dimensions such as Feel rich, Feel professional, Feel attraction and Feel be modern. 62.2% of respondents are responded as neither important nor unimportant, 19.5% of them are somewhat important, 15.9% of them are less unimportant and 2.4% of them are unimportant (Table 16).

<table>
<thead>
<tr>
<th>Table 17: Post Purchase Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Unimportant</td>
</tr>
<tr>
<td>Less unimportant</td>
</tr>
<tr>
<td>Neither important nor unimportant</td>
</tr>
<tr>
<td>Somewhat important</td>
</tr>
<tr>
<td>Very important</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Post Purchase Services is measured by differed dimensions such as Service warranty, Phone repair and troubleshoot, Technical services and Easy payment system. 54.9% of respondents are responded as neither important nor unimportant, 30.5% of them are somewhat important, 7.3% of them are less unimportant, and 6.1% of them are very important and 1.2% of them are unimportant (Table 17).

<table>
<thead>
<tr>
<th>Table 18: Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive Statistics</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>Price</td>
</tr>
<tr>
<td>Stylish Appearance</td>
</tr>
<tr>
<td>Quality aspects</td>
</tr>
<tr>
<td>Brand image</td>
</tr>
<tr>
<td>Post Purchase Services</td>
</tr>
<tr>
<td>Features</td>
</tr>
<tr>
<td>Celebrity Endorsement</td>
</tr>
<tr>
<td>Promotion Advertisement</td>
</tr>
<tr>
<td>Third party recommendations</td>
</tr>
<tr>
<td>Valid N (list wise)</td>
</tr>
</tbody>
</table>
According to the analysis shown in the table-18, brand choice is strongly influenced by the Price, Stylish Appearance and Quality Aspects of the mobile brand (Mean 4.09, 4.04 and 3.79 respectively). Brand image, Post-Purchase Services and Features of mobile also affects the mobile brand preference when purchasing a mobile phone (Mean 3.34, 3.33 and 3.17 respectively). Marketers need to consider and prioritize these three main factors, especially when targeting the younger consumers.

Finding and Conclusion

This paper measured the factors influencing the brand choice under the context of mobile phone industry in Sri Lanka. It can be seen that youth’s Brand choice is driven by a number of factors like Price, Stylish Appearance, Quality Aspects, Promotion & Advertisement, Features, Third Party Recommendations, Brand Image, Celebrity Endorsement and Post-Purchase Services.

In Sri Lankan context, the price of mobile phone plays a vital role in brand choice decision with reference to Sri Lankan university students. The price of mobile phone is one of the important factor when choose a particular brand. The consumers are aware that new technologies reduce in price over time. Middle and lower income consumers are expecting price reduction on which they preferred brand. New mobiles are introduced with competitive premium prices, however the consumers are waiting for some period of time until the price becomes lower. This finding is consistent with prior studies of Karjaluoto et al. (2005), Tallberg et al. (2007), and Ziad & Smadi (2011).

The quality aspects of mobile phones such as network coverage, display, sound, camera, speed, battery and user-friendliness and Stylish appearance such as dimensions (body), weight, shape, colors and attraction also play a vital role in brand choice decision of mobile phones with reference to Sri Lankan university students. This attractiveness gives motives to the consumer to purchase the particular mobile than other brands. This finding is consistent with prior studies of Soomro & Ghumro (2013), Bell (2002), Bhatti (2007) and Saif et al. (2012).

The features of mobile, brand image and after-sale services are also affects the choice of the mobile phone. However these factors are not much important as price, stylish appearances and perceived quality. Features of mobile, brand image and after-sale services of mobile are somewhat support, i.e. seems to affect the choice of mobile phone. This is consistent with prior studies of Sardar (2012), Shahzad & Sobia (2013), Dũng (2012), Saif et al. (2012) and Karjaluoto et al. (2005). Third party recommendations, Promotion and advertisement and Endorsement are not much support in brand choice decision of mobile phones in Sri Lanka.

References


Ziad, M & Smadi, A 2011, 'The Consumer Decision Making Styles of Mobile Phones among the University Level Students in Jordan.', International Bulletin of Business Administration, no. 10.
SCIENCES
Center of Mackey Functors

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Abstract

This paper studies the center of the category of Mackey functors using the centers defined on monoidal categories. We define
the category of Mackey functors in terms of span categories. Mackey functors became important in the theory of
representation of groups since groups have been studied using Mackey functors during the last 40 years. We see that the
category of Mackey functors is a monoidal category and its monoids are Green functors. Center for Mackey functors is defined
and using the cross G-sets, it was shown that centre of the category of Mackey functors is equivalent to the category of crossed
G-sets. Some properties of the center of the category of Mackey functors are also studied in this paper.

Keywords: monoidal category, center, lax center, monoids, mackey functors.

Introduction

The center and lax center of a monoidal category were defined and studied in unpublished work of Drinfeld and were studied
in the papers (Joyal and Street, 1991) and (Day, Panchadcharam and Street, 2005). The center of a monoidal category was
introduced in (Joyal and Street, 1991) in the process of proving that the free tortile monoidal category has another universal
property. The center of a monoidal category is a braided monoidal category. The lax center of a monoidal
category was considered under the name of “weak center” by P.Schauenburg (Schauenburg, 1994). Mackyfunctors is an algebraic structure
which behave like the induction, restriction and conjugation mappings in group representation theory. Mackey functors were
first introduced by J.A. Green and A. Dress in the early 1970’s as a tool for studying representations of finite groups and their
subgroups. There are (at least) three equivalent definitions of Mackey functors for a finite group
(Green, 1971). The first one
defines the Mackey functors as a poset of subgroups of a group
(Green, 1971). This is the most accessible definition of a
Mackey functor for a finite group is expressed in terms of axiomatic relations which were developed by A. Green. The second one
defines the Mackey functors in the sense of categorical way which was defined by A. dress (Dress,1973). The third one
defines the Mackey functors as modules over the Mackey algebra (Thevenaz and Webb, 1995). But they all amount to the
same thing. In this paper we use the second definition which defines the Mackey functors in terms of categories. The purpose
of this work is to study the center and the lax center of the category of Mackey functors. The main result of the paper is that
the centre of the category of Mackey functors is equivalent to the category of crossed G-sets.

1. Definition of Mackey Functors

In this paper, we use the categorical version of the definition which was given by A. dress (Dress, 1973) to define Mackey
functors. A Mackey functor over a ring R is a pair of functors
$\mathcal{M} = (M, M^*)$ from the category of G-sets to the category of R-modules, R-Mod, so that
M, is covariant and $M^*$ is contravariant, $M_*(X) = M^*(X)$ for all finite G-sets X and such that the
following axioms are satisfied:

1. For every pullback diagram of G-sets

\[
\begin{array}{ccc}
X & \xrightarrow{\alpha} & Y \\
\downarrow{\beta} & & \downarrow{\gamma} \\
Z & \xrightarrow{\delta} & U
\end{array}
\]

we have $M^*(\delta)M_*(\gamma) = M_*(\beta)M^*(\alpha)$.

2. For every pair of finite G-sets X and Y, we have $M(X \oplus M(Y) \rightarrow M(X + Y)$ is an isomorphism.

Now we will define the $Spm(\mathcal{E})$ category (Benabou, 1967) to develop the properties of Mackey functors. Let \mathcal{E} be a finitely
compact closed category. We define the compact closed category $Spm(\mathcal{E})$ of spans in the category \mathcal{E}.
The objects of $\text{Spn}(E)$ are the objects of the category $E$ and morphisms $U \to V$ are the isomorphisms classes of spans from $U$ to $V$ in the bicategory of spans in $E$. A span from $U \to V$ is a diagram of two morphisms with a common domain $S$ as in the diagram:

\[
\begin{array}{ccc}
S & \xrightarrow{\alpha} & V \\
\downarrow S & & \downarrow S \\
U & \xrightarrow{\beta} & W \\
\end{array}
\]

The category $\text{Spn}(E)$ becomes a monoidal category using the cartesian product in $E$ as follows:

\[
\text{Spn}(E) \times \text{Spn}(E) \to \text{Spn}(E)
\]

defined by $(U, V) \mapsto U \times V$.

2. Mackey Functors on Compact Closed Categories

Now we define the Mackey functor on a compact closed category using the span categories explained above. A Mackey functor $M$ from a finitely compact closed category $E$ to the category $\text{Mod}_k$ of $k$-modules consists of two functors

\[
M_+: E \to \text{Mod}_k, \quad M^*: E^{\text{op}} \to \text{Mod}_k
\]

satisfying the following conditions:

1. $M_*(U) = M^*(U) = M(U)$ for all $U$ in $E$.
2. For all pullbacks in $E$,

\[
\begin{array}{ccc}
P & \xrightarrow{\alpha} & V \\
\downarrow \beta & & \downarrow \gamma \\
U & \xrightarrow{\delta} & W \\
\end{array}
\]

the following square commutes and this square is called the Mackey square:

\[
\begin{array}{ccc}
M(P) & \xrightarrow{M_*(\alpha)} & M(V) \\
\downarrow M^*(\beta) & & \downarrow M^*(\gamma) \\
M(U) & \xrightarrow{M_*(\delta)} & M(W) \\
\end{array}
\]

3. For all coproduct diagrams

\[
\begin{array}{ccc}
U & \xrightarrow{i} & U + V & \xleftarrow{j} & V \\
\end{array}
\]

in $E$, the diagrams

\[
\begin{array}{ccc}
M(U) & \xrightarrow{M_*(i)} & M(U + V) & \xleftarrow{M_*(j)} & M(V) \\
\end{array}
\]

and

\[
\begin{array}{ccc}
M(U) & \xleftarrow{M^*(i)} & M(U + V) & \xrightarrow{M^*(j)} & M(V) \\
\end{array}
\]

is a direct sum situation in the category $\text{Mod}_k$. By this conditions we get a simplified expression

\[
M(U + V) \cong M(U) \oplus M(V).
\]
A morphism $\theta: M \to N$ of Mackey functors $M$ and $N$ is a family of morphisms $\theta_U: M(U) \to N(U)$ for each $U \in \mathcal{E}$ which gives two natural transformations

\[
\theta_*: M_* \to N_* \text{ and } \theta^* : M^* \to N^*.
\]

By the above definition, we showed that the Mackey functors become a category from a finitely compact closed category $\mathcal{E}$ to the category of $k$-modules $\text{Mod}_k$. We denote this category by $\text{Mky}(\mathcal{E}, \text{Mod}_k)$.

The following theorem gives a simplified version for $\text{Mky}(\mathcal{E}, \text{Mod}_k)$ of the category of Mackey functors from a finitely compact closed category $\mathcal{E}$ to the category $\text{Mod}_k$ of $k$-modules. We use an important theorem in the paper of H. Lindner (Lindner, 1976) to get this simplification.

**Theorem:**
The category $\text{Mky}(\mathcal{E}, \text{Mod}_k)$ of Mackey functors from a compact closed category to the category of $k$-modules is equivalent to the category $\text{M}^\oplus_{\mathcal{E}}(\text{Mod}_k)$ of co-product preserving functors from the category $\text{Spn}(\mathcal{E})$ of the spans of $\mathcal{E}$ to the category $\text{Mod}_k$ of $k$-modules.

**Proof:**

Here we give a sketch proof for the above theorem. Let $M$ be a Mackey functor from $\mathcal{E}$ to $\text{Mod}_k$. Then we have a pair $(M^*, M_*)$ such that $M_*: \mathcal{E} \to \text{Mod}_k$, $M^*: \mathcal{E}^{op} \to \text{Mod}_k$ and $M(U) = M^*(U)$.

Now define a functor $M: \text{Spn}(\mathcal{E}) \to \text{Mod}_k$ by $M(U) = M_* = M^*(U)$ and $M(s_1, s_2) = M^*(s_2)$ for $s_2: U \to V$. This functor will satisfy the necessary conditions for a Mackey functor.

Conversely, let $M: \text{Spn}(\mathcal{E}) \to \text{Mod}_k$ be a functor. Then we can define two functors $M_*$ and $M^*$ by referring the following diagrams:

\[
\begin{align*}
\xi: & \mathcal{E} \to \text{Spn}(\mathcal{E}), \\
\gamma: & \mathcal{E}^{op} \to \text{Spn}(\mathcal{E}) \\
M: & \text{Spn}(\mathcal{E}) \to \text{Mod}_k
\end{align*}
\]

Then we can show the necessary conditions easily. This completes the proof of the theorem.

3. Tensor Product and Closed Structure of $\text{Mky}(\mathcal{E}, \text{Mod}_k)$

Now we define a tensor product for the category $\text{Mky}(\mathcal{E}, \text{Mod}_k)$ of Mackey functors from the category $\mathcal{E}$ to the category $\text{Mod}_k$ of $k$-modules. This tensor product should be equivalent to the tensor product defined on the category $[\text{Spn}(\mathcal{E}), \text{Mod}_k]$ of coproduct preserving functors from $\text{Spn}(\mathcal{E})$ to $\text{Mod}_k$ of $k$-modules by the above theorem.

The tensor product can be established as follows:

\[(M \otimes N)(Z) = \int Y M(Z \otimes Y) \otimes_k N(Y).
\]

The Burnside functor $F$ can be defined to be the Mackey functor on $\mathcal{E}$ such that an object $U$ of $\mathcal{E}$ is a free $k$-module on $E(1, U)$. The Burnside functor becomes the unit for the tensor product of the category $\text{Mky}(\mathcal{E}, \text{Mod}_k)$ of Mackey functors from the category $\mathcal{E}$ to the category $\text{Mod}_k$ of $k$-modules. This convolution satisfies the necessary commutative and associative conditions for a symmetric monoidal category (Day, 1970).

The closed structure for the category $\text{Mky}(\mathcal{E}, \text{Mod}_k)$ of Mackey functors from the category $\mathcal{E}$ to the category $\text{Mod}_k$ of $k$-modules can be established using the Hom Mackey functor. The Hom Mackey functor is given by

\[\text{Hom}(M, N)(V) = \text{Mky}(M(V^* \otimes \cdot), N).
\]

There is also another expression for this Hom Mackey functor, which is given by

\[\text{Hom}(M, N)(V) = \text{Mky}(M, N(V \otimes \cdot)).
\]

Therefore, the category $\text{Mky}(\mathcal{E}, \text{Mod}_k)$ of Mackey functors from the category $\mathcal{E}$ of the finitely compact closed category to the category $\text{Mod}_k$ of $k$-modules becomes a symmetric monoidal closed category with the above established properties. Now we will show that the monads of this symmetric monoidal closed category $\text{Mky}(\mathcal{E}, \text{Mod}_k)$ are the Green functors which are of one type of Mackey functors.

4. Green Functors
A Green functor $A$ on $E$ is a Mackey functor, that is $A:E \rightarrow Mod_k$ is a co-product preserving functor, which equipped with a monoidal structure
\[ \mu: A(U) \otimes_k A(V) \rightarrow A(U \otimes V) \]
and a morphism
\[ \eta: k \rightarrow A(1). \]
Green functors become the monoids in the symmetric monoidal closed category $\text{Mky}(E, Mod_k)$.  

5. Crossed $G$-Sets

We will consider the category $E/G_c$ of crossed $G$-sets. It was shown by Freyd-Yetter (Freyd-Yetter, 1989) that the category $E/G_c$ is a braided monoidal category. The objects are pairs $(X, |)$ where $X$ is a $G$-set and $|:X \rightarrow G_c$ is a $G$-set morphism. The tensor product of this category $E/G_c$ can be defined by
\[ (X, |) \otimes (Y, |) = (X \otimes Y, ||) \]
where $||(x,y)| = |x||y|$.  

6. Center of a Mackey Functor

First we define the lax centre of a monoidal category $E$. The lax center $Z_l(E)$ of the category $E$ has objects of the form of ordered pairs $(A, u)$, where $A$ is an object of the category $E$ and $u$ is a natural family of morphisms $u_B:A \otimes B \rightarrow B \otimes A$ such that the following two diagrams commutes:

\[ \begin{array}{c}
A \otimes B \otimes C \\
\downarrow \\
A \otimes A \otimes B \otimes C \\
\downarrow \\
B \otimes A \otimes C
\end{array} \]

\[ \begin{array}{c}
A \otimes B \otimes C \\
\downarrow \\
A \otimes A \otimes B \otimes C \\
\downarrow \\
B \otimes A \otimes C
\end{array} \]

Morphisms of the lax center $Z_l(E)$ are morphisms in the monoidal category $E$ compatible with the morphism $u$.

The tensor product in $Z_l(E)$ are defined by the following construction:
\[ (A, u) \otimes (A, v) = (A \otimes B, w). \]

Using all the above constructions, we made the lax center $Z_l(E)$ of a monoidal category $E$ is a monoidal $V$-category.  

Now we define the center $Z(E)$ of a monoidal category $E$. The objects of the center $Z(E)$ are the objects $(A, u)$ of the lax center $Z_l(E)$. The morphisms $u$ of the center $Z(E)$ are also same as the morphisms $u$ of the lax center $Z_l(E)$ but they are invertible. That is, $u:A \otimes B \rightarrow B \otimes A$ and $u:A \otimes B \rightarrow B \otimes A$. So by this definition, we also made the center $Z(E)$ of a monoidal category $E$ is a monoidal $V$-category in which each morphism is invertible.

The center $Z(\text{Mky}(E, Mod_k))$ of the category of Mackey functors $\text{Mky}(E, Mod_k)$ from a finitely compact closed category $E$ to the category $Mod_k$ of $k$-modules consists of objects as pairs $(M, \theta)$, where $M$ is a Mackey functor from the category $E$ to the category $Mod_k$ of $k$-modules and $\theta$ is a morphisms from the Mackey functors $M$ to $N$, which is natural.

**Theorem**

The centre $Z(\text{Mky}(E, Mod_k))$ of the category of Mackey functors $\text{Mky}(E, Mod_k)$ from a finitely compact closed category $E$ to the category $Mod_k$ of $k$-modules is equivalent to the category
\[ \text{Mky}(E, Mod_k)/G_{\text{Mky}(E, Mod_k)} \]

of crossed $G$-sets.

**Proof:**

Let we denote the category of Mackey functors as $E$. Then, $Z(E) \rightarrow Z_l(E)$ is a faithful functor and then we get $Z(E) \rightarrow E/G_c$. Now we let $|:A \rightarrow G_c$ be an object of the category of crossed $G$-sets $E/G_c$. Then the corresponding object of the category $Z_l(E)$ is $(A, u)$ where
\[ U_E:A \times X \rightarrow X \times A \]
we can easily show that $u$ is invertible. This proves the theorem.

The above result is the main result of this paper. That is, the center of the category of Mackey functors from a finitely compact closed category is equivalent to the category of crossed $G$-sets of the category of Mackey functors. From this result, we can investigate the properties of the center of the Mackey functors through the properties of the category of crossed $G$-sets.
Proposition

Let \((M, \theta)\) be an object of the lax center of the monoidal \(V\)-category \(\text{Mky}(E, \text{Mod}_k)\) and let \(N\) be a Mackey functor from the category \(E\) to the category \(\text{Mod}_k\) of \(k\)-modules (that is, \(N\) is an object of \(\text{Mky}(E, \text{Mod}_k)\)). Then,

\[\theta_N^*: M \otimes N \to N \otimes M\]

is an inverse for the morphism \(\theta_N: M \otimes N \to N \otimes M\).

Reference


Chemical Intercalation of Potassium into Natural Graphite

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Abstract

The potassium binary graphite intercalation compound [GIC (K)] was prepared using classical double bulb chemical method and compared with different types of natural vein graphite from Sri Lanka and natural flake graphite of Madagascar. The first stage GIC (K) was always obtained for natural vein and flake graphite. These result indicated that the potassium intercalation does not depend on the graphite’s physical texture or their morphology.

Keywords: natural graphite, intercalation compounds, rechargeable batteries

Introduction

Graphite shares in the ability to form intercalation compounds and there are at least two features of these compounds that are unique to the graphite parent. The first is that graphite can form compounds with both electron acceptors and donors. The second is that several distinct compounds can be prepared with the same intercalating species. Usually the most highly intercalated compounds are formed with relatively large alkali metals such as K, Rb or Cs but the compounds with Li and Na are not so easy to form. The chemical compositions for the compounds of M (K, Rb and Cs) are successively MC₆, MC₂₄, MC₃₆,...for the stage 1, 2, 3........

Potassium-graphite intercalation compounds, GIC (K) have been known since the pioneering work of Fredenhagen (Fredenhagen et. al., 1926 and 1929). Since, some of these GIC (with Li in particular) present an interest to modern rechargeable batteries.

Chemical intercalation of graphite (natural and synthetic) with potassium metal has been studied by many authors (Hérold, 1955, Ubbelohde, 1966, Fisher,1970, Nixon, et. al., 1998, Dresselhaus et. al., 2002, Liu, et. al., 2010) but intercalations of different morphologies of natural vein graphite, with alkali metals are not reported elsewhere. The purpose of this study is to understand the chemical insertion of potassium into different types of natural vein graphite (Balasooriya et. al., 2006) and to compare with natural flake graphite of Madagascar. Those are characterized in the following table (Table I).

Table 1: Different types of natural graphite

<table>
<thead>
<tr>
<th>Country &amp; Location</th>
<th>Occurrence</th>
<th>Graphite morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sri Lanka: Bogala mine (B) &amp;</td>
<td>Vein</td>
<td>Shiny, slippery, fibrous graphite (BSSI &amp;KSSI)</td>
</tr>
<tr>
<td>Kahatagaha-Kolongaha mine (K)</td>
<td></td>
<td>Coarse flakes of radial graphite (BCFR &amp; KCFR)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Platy, needle graphite (BNPG &amp; KNPG)</td>
</tr>
<tr>
<td>Madagascar</td>
<td>Flake</td>
<td>Graphite powder (E1099)</td>
</tr>
</tbody>
</table>

Material and Methods

Material preparation: Natural Sri Lanka vein graphite samples were collected from graphite mines of Bogala and Kahatagaha-Kolongaha. The raw graphite samples were crushed by using an agate mortar for few minutes and separated using a mechanical sieve shaker to the particle size of maximum 63 microns. The Madagascar graphite (10 microns) was used as received. The potassium metal (Aldrich) was used to be intercalated. Generally potassium metal is stored in a mineral oil to protect it from oxygen and humidity which are very reactive with it. So to eliminate this oil, potassium lump was dipped in benzene or heptane to remove this mineral oil before beginning the experiments. Otherwise, oil vapor may be blocked the potassium vapor to move the other side of the glass tube.
Preparation of GIC: The reaction between potassium metal and graphite was achieved by the double-bulb method (Hérold, 1955) (Fig.1). The Pyrex glass tubes are sealed under vacuum and placed in an oven at temperature of 250°C for few days with a little temperature difference between the graphite and the potassium: \[ T_G (\text{graphite}) > T_I (\text{intercalant}) \].

The compound was transferred from the vacuum-sealed Pyrex glass tube into the X-ray cell by the means of a glove box, filled with argon. The X-ray cell was covered with an aluminum sheet using vacuum grease to protect it from atmosphere. X-Ray diffraction (XRD) studied were carried out within a Philips X-ray generator (using Cu Kα radiation with wavelength \( \lambda = 1.5406 \) Å) to verify the structure characteristics of GIC(K).

**Figure 1:** Scheme illustrating the “Double-bulb” method

**Results and Discussion**

**General characteristics of the GIC(K):**

The blue color, second stage GIC(K) was quickly obtained at the beginning of the reaction. The first stage GIC (K) has a golden yellow color and can be observed after few days.

**Crystallography structure of GIC(K) along graphite C-axis:**

The several stages of GIC(K): stage 1 (KC₈), stage 2 (KC₂₄), stage 3 (KC₃₆) and stage 4 (KC₄₈) were identified by Rudörff (Rudörff et al., 1954). The Rudörff crystallography model of C₈K was concerned the sequence of AαAβAγAδ leading to the formation of hexagonal sites with neighbor distance of 4.92 Å between each potassium atom (Fig.2a). The potassium ions stay systematically in contact with twelve carbon atoms in the intercalated layer, leading to the formation of octal structure according to the Wolten model (Wolten, 1960, Carton, 1972) (Fig.2b & 2c), which is a single geometric model for arrangement of atoms in the first stage of GIC(K) (Setton, 1965) or a rigid spheres model (Guérard et al., 1984, using the \( \pi \) orbital of carbon (Fig.2d). The result of these work leads to the model of the Fig.2c (Lagrange, 1978): an orthorhombic cell, \( a = 4.92 \) Å, \( b = 8.52 \) Å consisting in four different layers of potassium atoms with \( c = 4*1c =4*5.35 = 21.40 \) Å.

**Figure 2a:** Rudörff model of KC₈(d₁=5.41 Å)

**Figure 2b:** Arrangement of KC₈ along the c-crystallography axis
Figure 2c: Wolten octahedral model of KC₈ (a=4.92 Å, b=8.52 Å and c=21.40 Å)

Figure 2d: Atomic arrangement of GIC(K); Iₜ-repeat distance along the c-axis and e-thickness of the intercalate layer.

Conductivity of GICs:

The best conductivity at room temperature in GIC intercalated with strong acids, such as SbF₅, AsF₅ is higher than copper (58 x 10⁶ Ω⁻¹ m⁻¹) (Vogel, 1977, Dresselhaus et al., 2002, Eleni Ziambaras et al., 2007). However, Sri Lankan natural graphite posses sufficient electrical conductivity of 0.7 – 1 x 10² Ω⁻¹ m⁻¹ at room temperature (Amaraweera et al., 2013). A comparison of principal conductivities for GICs is given in table 3 that shows that in some cases, maximum conductivity is found for second or third stage compounds. The highest conductivities at the room temperature were found for acceptor type GICs but the reason for their higher conductivity is not completely given (Spain, 1981).

The increase in the donor GICs, such as K-GIC can be understood by considering the increase in the density of carriers. For (low intercalation) C₆₃K (third stage) each intercalated metal atom may be considered to donate one electron to the conduction band of graphite. When raise the Fermi energy, the density of holes is reduced until only electrons are present (Fig.3). For (high intercalation) K-GICs (KC₈ and KC₂₄), the Fermi level is believed to be raised above the bottom of the metallic density-of-state curve. In this case of less than one electron per potassium atom is transferred into the graphite conduction band (Spain, 1981). For stronger compounds such as first and second stage GIC(K), the Fermi level is believed to be raised above the bottom of the metallic density-of-state curve. In this case less than one electron per potassium atom, the electron is transferred into the graphite conduction band (Spain, 1981).

Characterization of the GIC(K) using XRD:

The potassium that is an electron donor element, intercalates very easily into graphite leading to the KC₈ binary intercalation compound. The compound with composition KC₂₄ is a second stage compound, since two graphite layers exist between each layer of the intercalant (Fig. 4). When intercalation takes place in a perfect crystal of graphite, all atoms are located between layer planes and formed the lamellar compound. When the graphite is imperfect, some intercalant is located sites associated with defects, and is much more strongly bonded. When the compound is heated to remove the intercalant, the remaining compound is called residue compound.

Table 2: Comparison of principal conductivities of graphite and some of GICs (Fisher, 1970)

<table>
<thead>
<tr>
<th>GIC</th>
<th>σₚ (10⁶ Ω⁻¹ m⁻¹)</th>
<th>σₒ/σₚ (4-Point)</th>
<th>Contact-less technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOPG</td>
<td>2.5</td>
<td>2.6</td>
<td>2.3 x 10³</td>
</tr>
<tr>
<td>C₆₃Rb</td>
<td>10</td>
<td>9.1</td>
<td>120</td>
</tr>
<tr>
<td>C₆K</td>
<td>10</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>C₆Br stage IV</td>
<td>22</td>
<td>20</td>
<td>7 x 10⁴</td>
</tr>
<tr>
<td>C₆HNO₃ stage I</td>
<td>25</td>
<td>13</td>
<td>2 x 10⁵</td>
</tr>
<tr>
<td>C₆HNO₃ stage II</td>
<td>25</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>C₆AsF₅ stage I</td>
<td>25</td>
<td>47</td>
<td>&gt;10⁶</td>
</tr>
<tr>
<td>C₆AsF₅ stage II</td>
<td>22</td>
<td>58</td>
<td>&gt;10⁶</td>
</tr>
</tbody>
</table>
The first stage GIC(K), which contains a mono-layered intercalated sheet in each graphitic interval, was observed in x-ray diffractogram for different types of natural vein graphite and compared with Madagascar graphite (Fig. 5a, b & c). The reflections of the first stage compound were predominant with an average \( d_i = 5.35 \) Å but additional reflections of second stage GIC, near the position of graphite (002) were also observed. Table 3 shows that the variation of interplanar distances of the GIC(K) comparing with some reference values (Madagascar and HOPG).

![Figure 3: Hypothetical sketch of the density of first, second and third intercalate stages of GIC(K); \( D(\varepsilon) \), \( \varepsilon \), \( \varepsilon_F \) and S indicate the density of carriers, energy, Fermi level, and density of state curve (Spain, 1981).](image)

![Figure 4: Illustration of the concept of stage for GIC(K)](image)

**Table 3:** Variation of interplanar distance \( (d_i) \) of the GIC(K); The distances, \( d_i \), have been calculated using (001) reflection.

<table>
<thead>
<tr>
<th>Graphite morphology</th>
<th>Particle size</th>
<th>Repeat distance along the c-axis for 1st stage GIC(K), 1c (Å)</th>
<th>( d_i ) (Å)</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSSI</td>
<td>63µm</td>
<td>5.348, 5.372, 5.349</td>
<td>5.348, 5.372, 5.349</td>
<td></td>
</tr>
<tr>
<td>BCFR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNPG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>KSSI</td>
<td>63µm</td>
<td>5.349</td>
<td>5.349</td>
<td></td>
</tr>
<tr>
<td>KCFR</td>
<td>5.347</td>
<td>5.347</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNPG</td>
<td>5.353</td>
<td>5.353</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1099</td>
<td>40µm</td>
<td>5.352</td>
<td>5.352</td>
<td></td>
</tr>
<tr>
<td>HOPG</td>
<td></td>
<td>5.35</td>
<td>8.72</td>
<td>12.10</td>
</tr>
<tr>
<td>HOPG</td>
<td></td>
<td>5.41</td>
<td>8.77</td>
<td>12.12</td>
</tr>
</tbody>
</table>

**Figure 5a:** Comparison of the X-ray diffractometry for shiny slippery fibrous graphite (SSI) and Madagascar graphite- E1099 (*IR* indicates the internal reference of aluminum).

**Figure 5b:** Comparison of the X-ray diffractometry for coarse flakes of radial graphite (CFR) and Madagascar graphite- E1099 (*IR* indicates the internal reference of aluminum).
Figure 5c: Comparison of the X-ray diffractometry for needle platy graphite (NPG) and Madagascar graphite- E1099 (IR indicates the internal reference of aluminum).

Pseudo-stage of GICs:

A pseudo-stage compound corresponds to a mixture of disordered stages compounds in the same crystallite. It is different of a mixture of different stages of the compounds. In order to calculate pseudo-stage (s), the strong peaks of both side in the zone of graphite (002) reflection (d₁ and d₂; d₁<d₂) were considered. The pseudo stage and thickness of the intercalate layers (e) were calculated for the first stage GIC(K), using the following equation (Buscarlet, et. al., 1976).

For nᵗʰ stage;

For e<3.35, \[ e = \left( 1 - \frac{3.35}{d_2} \right) \div \left( \frac{1}{d_1} - \frac{1}{d_2} \right) \]

and \[ n = \left( \frac{e}{3.35} + n + 1 \right) \left( 1 - \frac{3.35 \cdot (e/3.35 + n)}{1/d_1 - 1/d_2} \right) \]

If 0 < x < 1, Pseudo stage (s) = n + x

Table 4 shows, that the pseudo stage (about 1.00) and the thickness of intercalate layer (about 2.00) are constant for all vein and flake graphite (Balasooriya et. al., 2013). We have noticed that the concept of pseudo-stage does not exist in the donor GIC contrarily to acceptor GIC (for example FeCl₃-GIC).

<table>
<thead>
<tr>
<th>Graphite type</th>
<th>Particle size</th>
<th>s (Pseudo stage)</th>
<th>Thickness of the inter.layer, e (Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSSI</td>
<td>63µm</td>
<td>0.995</td>
<td>2.007</td>
</tr>
<tr>
<td>KSSI</td>
<td>63µm</td>
<td>0.992</td>
<td>1.998</td>
</tr>
<tr>
<td>BCFR</td>
<td>63µm</td>
<td>0.999</td>
<td>2.014</td>
</tr>
<tr>
<td>KCFR</td>
<td>63µm</td>
<td>1.000</td>
<td>1.999</td>
</tr>
<tr>
<td>BNPG</td>
<td>63µm</td>
<td>0.999</td>
<td>1.994</td>
</tr>
<tr>
<td>KNPG</td>
<td>63µm</td>
<td>0.999</td>
<td>1.999</td>
</tr>
<tr>
<td>E1099</td>
<td>40µm</td>
<td>1.002</td>
<td>2.004</td>
</tr>
</tbody>
</table>

Conclusion

The potassium binary graphite intercalation compound was prepared by classical double bulb chemical method using different types of natural vein graphite of Sri Lanka and natural flake graphite of Madagascar. The first stage GIC(K) was obtained for natural vein and flake graphite. The potassium intercalation was not depending on their physical texture or morphology. The content of impurities would have affected the intercalation of potassium but natural vein graphite having a high purity (the average carbon content exceeds 95%), no effect of impurities was observed. The ternary potassium GIC can be synthesized by chemical way using an organic solvent (ex: THF, PC…) (Solin et. al., 1988, Dresselhaus et. al., 2002). Generally these
compounds contain very large amount of potassium. The ternary potassium GIC constitutes a good model to understand the behavior of materials for recharging battery electrodes. Indeed, it would be very interesting to elaborate materials containing more and more alkali metal in order to improve their capacity.

References


The effects of salt stress on growth physiology of selected okra (Abelmoschusesculentus L.) Cultivars

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Abstract

Salinity due to over-accumulation of NaCl is usually of great concern and it is the most injurious factor in arid and semi arid regions. Considering this feature, an experiment was conducted to evaluate the salinity stress responses of selected okra cultivators on Diffusive Resistance (DR) and Relative Water Content (RWC). The okra cultivars ‘Haritha’, ‘EUOK2’ and ‘M15’ were used for this study. Sodium chloride (100mM) was used to create the salinity while, distilled water was used as control. Salt stress significantly increased the DR of the selected okra cultivars. The highest increase (5.1 scm⁻¹) was obtained in the ‘M15’ followed by ‘Haritha’ (4.2scm⁻¹) and ‘EUOK2’ (3.6 scm⁻¹). The highest increase found in the ‘M15’ okra cultivar would have been due to tight closure of stomata in this cultivar compared to the others. The lowest value found in the ‘EUOK2’ would have been due to its inherent characteristic feature. The stomates of this cultivar would have kept opened relatively widely than the others. Salt stress significantly reduced the RWC of the selected okra cultivars. The highest reduction (58.7 %) was found in the ‘M15’ followed by ‘Haritha’ (67.3 %) and ‘EUOK2’ (73.5 %). The ‘EUOK 2’ maintained relatively high amount of water in their leaf tissues under salinity stress. All these events indicate that ‘EUOK 2’ cultivar of okra had the ability to withstand salinity stress much better than the others. As a result, ‘EUOK2’ was recognized as the most salinity tolerant okra cultivar which could be grown in the salt affected areas of the sandy regosols.

Keywords: Diffusive resistance, Okra, Relative water content, Salinity stress.

Introduction

Among a biotic stresses, salinity is one of the most severe problems in worldwide agricultural production. Salinity is defined as the amassment of water-soluble salts in the top layer of soil to a level that drastically affects crop production (Rengasamy, 2002). Salinization of soils is one of the serious problems for irrigated agriculture, and the situation is most severe in tropical regions (Khan et al., 2003). High salt contents reduce the growth and production by affecting physiological processes, including modification of ion balance, water status, mineral nutrition, stomatal behavior and photosynthetic efficiency (Munns,1993).

Most plants are salt sensitive with either a relatively low salt tolerance or severely inhibited growth at low salinity levels so differ in the growth response to salinity (Moisender et al., 2002). High concentration of salts in the root zone decreases soil water potential and the availability of water (Lloyd et al., 1989). This deficiency in available water under saline condition causes dehydration at cellular level and ultimately osmotic stress occurs. The higher ratios of toxic salts in leaf apoplasm lead to dehydration and turgor loss and death of leaf cells and tissues ( Marschner, 1995).

The ion toxicity has negative impacts on plant growth and development due to low water potential within the local root environment. Ions such as sodium (Na⁺) and chloride (Cl⁻) (>40 mmol/L) can be toxic to plants at levels that result in an imbalance in plant nutrition due to decreased nutrient uptake and transport to new shoots (Munns and Tester, 2008). High salinity modifies plant metabolisms, which results in altered plant morphology; cultivar type, duration, and intensity of stress determine the extent of morphological modification (Khan et al., 2003). The excess salt can cause decreased seed germination, seedling growth, and dry matter production (Janila et al., 1999) also induces Fe³⁺- K⁺, and Ca²⁺ deficiencies, resulting in yield losses (Singh et al., 2004).

Okra (Abelmoschusesculentus L.) is recognized as an annual herbaceous plant grown in tropical and subtropical areas and serves as a source of carbohydrates, fats, vitamins and various minerals (Oyenuga, 1968). In spite of having good nutritional value, its per hectare yield is very low. Okra cultivation is hampered in saline and sodic (having more Na⁺) soil as it is sensitive to salinity (Ashraf et al., 2003).This decline in optimum yield is due to the drastic effects of salts, which are deposited in soil by the use of brackish underground water and addition of industrial effluents in canals also adds salts in irrigation water. Okra plant at earlier growth stages is more sensitive to salinity (Cedra et al., 1982). While later on, the ionic stress in turn reduces leaf expansion. During long term exposure to salinity, plants experience ionic stress, which can lead to premature senescence of adult leaves and thus reduction in photosynthetic rate is a common observation (Cramer and Nowak, 2004).
Physiological mechanisms like ion exclusion, ion accumulation, production of compatible solutes, and osmotic adjustment are considered to be associated with varietal characteristics in relation to salt tolerance.

The present study was conducted to determine if the diffusive resistance and relative water content measurements on okra plants could be used to differentiate between cultivars differing in apparent salt tolerance, to deal with the physiological responses manifested as a result of salinity stress and to suggest the most salt tolerant okra cultivar that could be grown under salinity situation.

Materials and Methods

This experiment was conducted at the Agronomy farm of the Eastern University which is located at an elevation of 75m above mean sea level in the Eastern Province of Sri Lanka. Studies were conducted during the ‘Yala’ season of the year 2014. The climate is warm with the temperature of 28 - 32°C and an average annual rain fall of 1250 mm.

Okra (Abelmoschusesculentus L.) cvs. ‘Haritha’, ‘EUOK 2’ and ‘MI5’ were used for this study. The seeds were surface sterilized with sodium hypochlorite 0.5% (v/v) for 20 min. washed repeatedly with distilled water and were allowed to germinate in polyethylene bags filled with fine sand as growth medium. A number of three seeds per bag were sown initially but, after 15 days of germination, the plants were thinned out to one. Plants were grown in Hoagland (Hoagland and Arnon, 1950) solution under non saline conditions for 30 days after germination. Afterwards, the salt treatment was imposed. Sodium chloride was dissolved in distilled water to obtain the concentration of 0 (control) and 100mM(Normal saline condition) and this solution was applied to create the salinity while half strength Hoagland solution was applied as nutrient medium. The treated plants were grown under saline condition. Irrigation along with half strength Hoagland solution was applied to the selected treatments according to the need of the plants by regularly observing the moisture content of sand.

The experiment was carried out with six treatments and five replications and the treatments were as follows:

T1 = ‘Haritha’ cultivar of okra irrigated with distilled water (Control)
T2 = ‘Haritha’ cultivar of okra irrigated with saline water (100mMNaCl)
T3 = ‘EUOK2’ cultivar of okra irrigated with distilled water (Control)
T4 = ‘EUOK2’ cultivar of okra irrigated with saline water (100mMNaCl)
T5 = ‘MI 5’ cultivar of okra irrigated with distilled water (Control)
T6 = ‘MI 5’ cultivar of okra irrigated with saline water (100mMNaCl)

The experiment was laid out in a Completely Randomized Design with 2 x 3factor Factorial arrangements.

Physiological Attributes

Diffusive Resistance (DR)

A number of six leaves representing six plants were randomly selected from each replicate of the treatments for the measurement of DR. This parameter was measured by a Portable Steady State Porometer (LI-1600, LI-COR Inc. USA) on the 15th day of salinity application for the treated and control plants. This measurement was made between 9-11 am when the Photosynthetically Active Radiation (PAR) was above the saturation PAR of 1500 µE s⁻¹ M⁻¹.

Relative Water Content (RWC)

A number of six leaves representing six plants were randomly collected from each replicate of the treatments for the determination of RWC. Similar sized discs (3 cm diameter) were obtained from the leaves using a cork borer and their fresh weights (FW) were recorded soon after collection. These discs were placed overnight in a beaker containing deionized water to obtain turgid weight (TW). The beaker containing water was placed inside the refrigerator to avoid physiological deterioration of leaf cells. The leaf discs were blotted with filter papers to remove the excess water and their TW was recorded. The leaf discs were then placed in the oven at 80°C for 24 hours and their dry weights (DW) were recorded.

\[
\text{Relative Water Content (\%)} = \frac{\text{(Fresh Weight} - \text{Dry Weight})}{\text{(Turgid Weight} - \text{Dry Weight})} \times 100
\]
The data were analyzed through Statistical Analysis System (SAS) software statistical package and the differences between means were compared using DMRT.

Results and Discussion

It was found that there were significant differences between treatments in the Diffusive Resistance (DR) and Relative Water Content (RWC) of leaves of the selected okra cultivars.

Diffusive Resistance (DR)

In the treatments where the salinity stress was imposed on plants, the DR on the 15th day of salinity application was significantly higher than the control values (Table 1).

Table 1: The effects of salinity stress on the Diffusive Resistance (DR) of selected okra cultivars

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Diffusive Resistance (scm⁻¹)</th>
<th>Control</th>
<th>Salinity stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Haritha’</td>
<td>(T₁) 1.2 b</td>
<td></td>
<td>(T₂) 4.2 a</td>
</tr>
<tr>
<td>‘EUOK 2’</td>
<td>(T₃) 0.9 b</td>
<td></td>
<td>(T₄) 3.6 c</td>
</tr>
<tr>
<td>‘MI 5’</td>
<td>(T₅) 1.1 b</td>
<td></td>
<td>(T₆) 5.1 d</td>
</tr>
</tbody>
</table>

*Values in the same column followed by the same letter do not differ significantly (P< 0.05)
*Values are the means of 30 plants in 5 replications.

It was also found that there were significant differences in the DR values of salinity stressed okra cultivars. The highest DR was obtained in the ‘MI 5’ cultivar and the lowest was found in the ‘EUOK 2’. ‘Haritha’ showed the DR value in between the above two cultivars. Exposure of okra plants to salinity stress increased the diffusive resistance of these plants. As pointed out by Chatrath et al. (2000), salinity increased the stomatal resistance, which could be explained by inhibition of plant growth to water stress. Turan et al. (2007) stated that there was a strong negative correlation between stomatal resistance and NaCl. In general, measurement of stomatal resistance provides effective comparison for determining the degree of salt stress in plants. During a salt stress, the plant has to close their stomata due to water loss. Stomatal factors have also a more significant effect on photosynthesis (Wang et al., 1987).

The lowest DR value observed in the ‘EUOK2’ under saline condition indicates that the stomates of this cultivar would have opened comparatively wider than the stomates of the other two cultivars. As a result, ‘EUOK2’ cultivar would have had better gas exchange capacity than the rest of the cultivars. Perhaps, this would have increased the photosynthetic rate of this cultivar compared to the others. The highest DR value observed in the ‘MI 5’ indicates that the stomates of this cultivar would have closed much more tightly than those of ‘EUOK2’ and ‘Haritha’ cultivars. As a consequence, reduced gaseous exchange followed by reduction in photosynthetic rate would have occurred. Based on these observations it could be stated that the ‘EUOK 2’ cultivar of okra exhibited better salt tolerance than the other two cultivars. ‘MI 5’ showed salt susceptibility among the tested cultivars.

Relative Water Content (RWC)

In the treatments where the salinity stress was imposed on plants, the RWC on the 15th day of salinity application was significantly lower than the control values. It was found that there were significant differences in the RWC values of okra cultivars which were exposed to salinity stress (Table 2).

Table 2: The effects of salinity stress on the Relative Water Content (RWC) of selected okra cultivars

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Relative Water Content (%)</th>
<th>Control</th>
<th>Salinity stress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The highest RWC was obtained in the ‘EUOK 2’ whereas the lowest was found in the ‘MI 5’. The RWC of ‘Haritha’ cultivar was in between these two cultivars. Salinity stress reduced the RWC of all the okra cultivars. Appraisal of water relations in plants grown under stress conditions including saline stress is necessary to ascertain that up to what extent cellular water content is maintained, because almost all metabolic activities within the cell are dependent on the availability of sufficient amount of water therein (Ashraf et al., 2011). As stated by Shaheen et al. (2013), salt stress significantly reduced the relative water content. Based on this observation it could be stated that the ‘EUOK 2’ cultivar was able to maintain relatively high RWC than the other two cultivars under salinity condition. This is a favorable feature with regard to salt tolerance of this cultivar. Cultivars which were believed to be more salt resistant usually maintain higher leaf RWC under salinity stress. The lowest RWC observed in the ‘MI 5’ cultivar exhibits its susceptibility to salt stress.

**Conclusions**

Soil salinity, one of the most serious problems on planting areas, has the most obstructive impact on crop production in the world. This salinity problem attracts many scientists to overcome this obstruction by improving salt tolerant cultivars. These results indicated that all the tested cultivars exhibited reduction in physiological attributes as a result of an increase in salinity level. The reduction in growth physiology of okra may be due to the inhibitory effect of the accumulated ions of sodium and chloride on the metabolic activities. This study determined the extent to what the Diffusive Resistance and Relative Water Content of selected okra cultivars were impaired by salt stress during the crop growth period. The responses were exhibited. Okra cultivar ‘EUOK 2’ was able to resist salt stress relatively better than the other two cultivars. It could therefore be concluded that ‘EUOK 2’ okra cultivar is the most salt tolerant one among the tested okra cultivars which could thrive in the salt affected areas of the sandy regosols.

**References**


Modeling Pollutant Dispersion from Petroleum Refining Process in Sri Lanka

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Abstract

Air pollution is a major problem in Sri Lanka due to rapid urbanization and development of industries. In Sri Lanka, the quality of air has a profound impact on the economy. The most obvious of these impacts is related to health problems associated with poor air quality and the corresponding cost of medical care and treatment. Over the last 15 years, the demand for petroleum products has risen at an annual average rate of about 5%. Therefore it is important to build air quality models, which are mathematical descriptions of the concentration of pollutants.

In this study the dispersion of air pollutants of petroleum refinery process in Sapugaskanda, Sri Lanka was modeled using two dimensional advection-diffusion equations. The finite difference method was used to solve the problem. The pollutant dispersion of Carbon Dioxide, Nitrogen Dioxide and Sulphur Dioxides was studied. The effects of parameters such as wind velocity and stack height were investigated. Simulation was carried out using a C program. A MATLAB program was applied to visualize the result. According to the study, dispersion pattern of pollutants showed that the extent of diffusion is dependent of meteorological conditions such as wind speed and source characteristics.

Keywords: simulation, pollutants dispersion, mathematical modeling, diffusion

Introduction

Air pollution is now becoming a critical issue in both developed and developing countries. This issue has been seriously emerged in Sri Lanka with no difference in other Asian countries. Sri Lanka is witnessing a significant increase in the level of ambient air pollution due to urbanization and increasing levels of industrialization. The main ambient pollutants are being identified as Carbon Dioxide (CO2), Carbon Monoxide (CO), Nitrogen Oxides (NO), Sulphur Dioxides (SO2) and Lead (Pb). Those kinds of pollutants come from the vehicles exhausts, industrial emissions, petroleum refinery process and thermal power plants. In Sri Lanka, quality of the air has profound impacts on the economy as well. The most obvious of these impacts is related to health problems (Nandasena, Wickremasinghe, & Sathiakumar, 2012) associated with poor air quality and the corresponding cost of medical care and treatments. Therefore it is important to build and use air quality models, which are mathematical descriptions in concentration of mixture of ambient pollutants. Over the last 15 years, the demand for petroleum products has risen at an annual average rate of about 5% (Ministry of Petroleum Industries, 2014). The current annual requirement of crude oil in the country stands at around 2 Million MT.

Air quality modeling experts have made significant progress in recent years in developing new methods to meet the challenges of simulating long-range pollutant transport. Simulation of pollutant dispersion using a Gaussian model (Abdulkareem, 2005; Melli & Runca, 1979; Zannetti, 2003) has been explained in many applications. This model is commonly applied due to its straightforwardness, ease of use and results gained by it seem to be reasonable. However some studies have shown some weak points like the effect of wind velocity is not included, no chemical reactions, time independent and no gravitational fallout. The flow around the obstacles such as buildings, trees and other natural roughness elements influence the dispersion of pollutants. Gaussian model is not capable to represent the flow around the obstacles. Therefore it is important to build air quality models based on computational fluid dynamics (Al-Adwani, 2007; Ibrehem & Talib, 2012; Madala, Satyanarayana & Prasad, 2012) which include those effects are good alternative to represent complex systems.

This paper presents a study of pollution dispersion from Sapugaskanda petroleum refinery stacks in Sri Lanka. Sapugaskanda is situated in Western Sri Lanka which is a suburb area in Colombo the capital city. Refinery is located much closer to the sea. The main harbor is also located in Colombo. Refinery has 11 stacks and gaseous pollutants like Carbon Dioxide (CO2), Nitrogen Oxide (NO) and Sulphur Dioxides (SO2) are present in their emissions. During March to November wind comes from sea side (South West direction) and it takes the polluted air towards the country side. Once the pollutants are generated, they get transported in the atmosphere by movement of air. In general, their movement is governed by a host of factors including meteorological conditions, and the nature of the pollutant.

The objective of this study is to identify pollutant dispersion from petroleum refinery stacks. First, pollutant dispersion from a
stack was considered. The advection-diffusion equation was used. The domain was considered as a staggered grid. Then the equation was discredited.

Finally, the concentration of pollutant was simulated at the grid points. For this purpose, a C program (Griebel, Dornseifer, & Neunhoeffer, 1998) was written and MATLAB program was applied for visualizing the results. The program was then modified in order to simulate multiple refinery stacks. The effects of meteorological parameters such as wind and temperature and stack characteristic on pollutant dispersion were discussed.

Mathematical Modeling

The concentration $C_S$ of each pollutant substance $S$, satisfies its own advection-diffusion (Griebel, Dornseifer, & Neunhoeffer, 1998) equation of the form,

$$\frac{\partial C_S}{\partial t} + \vec{u} \cdot \nabla C_S = \lambda_S \Delta C_S + Q(C^S),$$

(1)

where $\lambda$ is a diffusion coefficient, $\vec{u}$ is wind velocity and $Q$ is a source term. The adjective transport of the substance is described by the term $\vec{u} \cdot \nabla C$, and the uniform diffusive spreading in all directions, by the term $\lambda \Delta C$. As boundary conditions (Fatehifar, Elkamel, Taheri, Anderson, & Abdul-Wahab, 2007) Dirichlet condition ($C|_{\Gamma_1} = 0$) along the boundary segment $\Gamma_1$, which the pollutant is being injected and homogeneous Neumann condition ($\partial C/\partial n|_{\Gamma_2} = 0$), means normal derivative of the boundary segment $\Gamma_2$ should vanish) along the remaining boundary $\Gamma_2$, were imposed.

For simplicity several assumptions were made. They are, there are no pollutant reactions in the system, wind comes in South West direction from the sea side towards the country and no gravitational forces.

It was desirable to consider a large scale experiment in a scaled down and more manageable settings. Therefore dimensionless variables were considered as follows:

$$C^* := \frac{C}{c_0}, \quad \tilde{x} := \frac{x}{L}, \quad \tilde{u} := \frac{\vec{u}}{u_0}, \quad \tilde{t} := \frac{t u_0}{L},$$

(2)

where $c_0$, $u_0$, and $L$ are scalar constants. Recasting equation (1) in the variables (2) leads to the equation

$$\frac{\partial C^*_S}{\partial \tilde{t}} + \tilde{u} \cdot \nabla C^*_S = \frac{\lambda_S}{u_0 L} \Delta C^*_S + \frac{Q(C^S) L}{u_0 c_0}.$$

(3)

Position of the refinery, height and the width of the selected domain are illustrated in Fig. 1. The selected domain was considered as a staggered grid.

$$\begin{align*}
500 \text{ m} & \quad \text{y} \\
20 \text{ m} & \quad 60 \text{ m} \\
10000 \text{ m} & \quad \text{x}
\end{align*}$$

Figure 4: Selected domain for the simulation.

The finite difference method was used to solve the mathematical model numerically. Equation was discretized considering a staggered arrangement. Expressed the derivatives using the counters $i$ for the $x$-direction, $j$ for the $y$-direction and thus the discrete terms of the equation (3) are given by:

$$\left[ \frac{\partial C^*_S}{\partial \tilde{t}} \right]_{i,j}^{(n+1)} = \frac{1}{\partial \tilde{t}} \left( C^*_S^{(n+1)}_{i,j} - C^*_S^{(n)}_{i,j} \right),$$

(4)
Here, values of wind speed and diffusion coefficient are presumed known. The stability condition (Griebel, Dornseifer, & Neunhoeffer, 1998) for the system is:

$$\delta < \frac{c_0 L}{2 \lambda \left( \frac{1}{\delta x^2} + \frac{1}{\delta y^2} \right)^{\frac{1}{2}}}.$$  \hspace{1cm} (9)

**Wind Velocity**

The wind profile power law was used to adjust the wind speed at different height. The wind profile power law relationship is:

$$u = u_r \left( \frac{y}{y_r} \right)^{\alpha},$$

\hspace{1cm} (10)

where \(u\) is the wind speed at height \(y\), and \(u_r\) is the known wind speed at a reference height \(y_r\). The exponent (\(\alpha\)) is an empirically derived coefficient that varies dependent upon the stability of the atmosphere. For stable conditions, \(\alpha\) is approximately 1/7 (Zannetti, 2003).

**Plume Rise**

The effective stack height \(H\) is not only the physical stacks’ height \(h_s\) but include also the plume rise \(\delta h\),

$$H = h_s + \delta h.$$  \hspace{1cm} (11)

Plume rise is actually calculated as the distance to the imaginary centerline of the plume rather than to the upper or lower edge of the plume. Therefore the stack height (Zannetti, 2003) used in the calculations must be the effective stack height. Holland’s equation is used for prediction of plume rise.

$$\delta h = \frac{v_s D}{u} \left( 1.5 + 2.68 \times 10^{-3} PD \frac{T_s - T_a}{T_s} \right).$$  \hspace{1cm} (12)

Where, \(v_s\) is stack exit velocity (ms\(^{-1}\)), \(D\) is stack diameter (m), \(u\) is wind velocity (ms\(^{-1}\)) measured or calculated at the height \(h_s\), \(P\) is pressure (mbar), \(T_s\) is stack gas temperature (K) and \(T_a\) is atmospheric temperature (K). In order to get the better predictions modify Holland’s equation (Fatehifar, Elkamel, Taheri, Anderson, & Abdul-Wahab, 2007) was used. The modified Holland’s equations are shown below:

$$\Delta h = \begin{cases} \delta h(\text{Holland Eq.}) - 32.42 + 0.8576 h_s, & h_s < 35, \\ \delta h(\text{Holland Eq.}) - 10.1527 + 0.3135 h_s, & 35 \leq h_s < 80, \\ \delta h(\text{Holland Eq.}) + 12.39 + 0.17 h_s, & 80 \leq h_s. \end{cases}$$  \hspace{1cm} (13)
The Algorithm

The pollutant dispersion from one refinery stack was considered first. The simulation process is broken down to the following steps.

The inputs to the C program were selected as meteorological data, stack characteristics and the domain details.

Calculated $\delta h$ and exact place of pollutant entrance to the atmosphere.

The term $Q$ was considered at the grid points where the stacks are positioned. This term is zero for all other cells.

Simulated the concentration of each pollutant at grid points.

The two dimensional steady state solutions were obtained for simplicity.

The results are visualized graphically using MATLAB.

The program was then modified in order to incorporate the simulation of pollutant dispersion from a multiple stacks. The only difference was the inclusion of multiple $Q$ terms.

Results and Discussion

The effects of meteorological conditions such as wind velocity, air temperature and dispersion coefficient on pollutant dispersion were obtained. Fig. 2 shows the effect of wind velocity on pollutant dispersion and Fig. 3 shows the effect of wind velocity on ground level concentration. According to the Fig. 2 and Fig. 3 pollution dispersion decreases when the wind velocity increases. Pollutants go far away from the stack region and increase the upper levels concentration. Looking at Fig. 4, it can be seen that the effect of stack height on pollution dispersion. If we increased the height of the stack, pollutants go far away from the stack and decrease the ground level concentration. Fig. 5 illustrates the maximum concentration distribution of CO2 from a one stack with distance.

Figure 2: CO$_2$ concentration distribution at distance = 300m, wind speed 6ms$^{-1}$ and 8ms$^{-1}$.

Figure 3: CO$_2$ concentration distribution at ground level, wind speed 6ms$^{-1}$ and 8ms$^{-1}$.
Figures 6 to 11 shows the contour plots and the surface plots of pollutants considering all the stacks in the area.

Figure 4: CO$_2$ concentration distribution at distance = 300m, stack height 60m and 125m.

Figure 5: Maximum CO$_2$ concentration distribution vs. distance.

Figure 6: Contour plot of CO$_2$ considering all the stacks.

Figure 7: CO$_2$ concentration distribution considering all the stacks.

Figure 8: Contour plot of SO$_2$ considering all the stacks.

Figure 9: SO$_2$ concentration distribution considering all the stacks.
Figure 10: Contour plot of NO\textsubscript{2} considering all the stacks.  

Figure 11: NO\textsubscript{2} concentration distribution considering all the stacks.

Conclusions

In this study, a two dimensional simulation of pollutant dispersion from Sapugaskanda petroleum refinery process were presented. For solving mathematical model, finite difference method was used and a C program was written. The effects of different meteorological parameters such as wind velocity on pollutant dispersion, height of the stack were analyzed. The results show that the dispersion of pollutants is inversely proportional to the wind velocity. Also the source characteristics were studied. Increasing the stack height pollutants go to the upper atmospheric layer and dispersion takes place over a large area and it decreases the ground level concentration. This type of simple model has many limitations. The effect of gravitation, effect of Beyoncé forces, effects of wind velocity change in the domain were not considered. Therefore in future we would implement a more advance mathematical model considering the mass transfer, heat transfer and momentum changes with free boundary conditions.

References


Pesticide Storage, Disposal and Protective Methods Adapted by the Vegetable Farmers in the Manmunai South and Eruvilpattu Divisional Secretariat Division of Batticaloa District, Sri Lanka

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Abstract

Batticaloa district is in the Eastern Part of Sri Lanka. Vegetables except up-country vegetables sold in Batticaloa district are mainly grown in villages in the district. Manmunai South and Eruvilpattu divisional secretariat (DS) division is a predominantly vegetable cultivating area in the Batticaloa district. Farmers in this region use variety of synthetic pesticides to protect vegetables. Recently public concern related to health risks associated with pesticide residues in the vegetables has been increased substantially. Therefore, a study was conducted to find out pesticide storage, disposal and protective methods adopted by the farmers on vegetable cultivation in Manmunai South and Eruvilpattu DS division. Stratified random sampling method was used to select respondents for the survey and collected data were analyzed statistically. It was observed that the usage of pesticides is higher in the study area. There are no any proper storage methods practices by farmers and they are highly negligent in proper disposal of empty containers. The farmers in the survey area never use any protective measures before or during the spraying operations of pesticides. It was found that awareness related to pesticide usage, storage and disposal methods by farmers were very low. Further, they are unaware of the ill effects of pesticides on human beings as well as the environment itself. Awareness programmes are essential and recommended to change the attitudes of farmers to shift them from traditional to environmental friendly pest control methods.

Keywords: pesticides, health risks, protective measures, storage

Introduction

Sri Lanka is an agricultural country as majority of the rural people is still engaged in agriculture for their livelihood (Vidanapathirana, 2008). In the agricultural sector of Sri Lanka, vegetables are the second most important sub-sector next to rice. Vegetables except up-country vegetables sold in Batticaloa District are mainly grown in villages in the district and are harvested and sold fresh. Manmunai South and Eruvilpattu divisional secretariat (DS) division is a predominantly vegetable cultivating area among the 14 DS divisions in the Batticaloa district.

Farmers in this region use variety of synthetic pesticides to protect vegetables from pest and diseases. Safe disposal and storage of pesticides and protection while application are essential to prevent potential ill effects caused by pesticide usage. However, awareness of the farmers for safe level of pesticide usage and related issues are at minimum. Therefore, this study was carried out to find the pesticide storage, disposal and protective methods adapted by the vegetable farmers in the Manmunai South & Eruvilpattu DS division of Batticaloa district.

Methodology

Manmunai South and Eruvilpattu DS division is located in the coastal side of Batticaloa district. There are 45 Grama Niladari (GN) divisions included under this divisional secretariat. Total agricultural land extent in this DS division is 3,555 ha in which 330 ha is used for vegetable cultivation. Kaluthavalai, Mankadu, Thettativu and Cheddipalayam are some villages in this DS division where agricultural practices are high. This survey was carried out from February to April 2013. A number of 387 respondents were selected among the vegetable farmers through a stratified random sampling method from the study area. In each GN division, about 10% of the farm families were randomly selected as sample.

Structured questionnaires were used to collect information, after pre-test of the questionnaire for their suitability. Selected respondents were interviewed at their door steps and field observations were also made. The questionnaires were checked for completeness and the data were analyzed using SPSS 11.0. Data were confined to estimate frequencies and descriptive statistics.
Results and Discussion

1. Storage of pesticides

There are no any proper storage methods practiced by farmers. Most of the farmers store the agrochemicals inside the cottage where they eat, sleep, and take rest. Moreover, it also can easily be reached by the children. Some farmers even store the pesticide under the trees without any protection (Table 1).

Table 1: Pesticides storage places by the farmers

<table>
<thead>
<tr>
<th>Places of storage</th>
<th>Percentage of the respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cottage</td>
<td>56.07</td>
</tr>
<tr>
<td>2. Under the tree</td>
<td>31.00</td>
</tr>
<tr>
<td>3. Other places (Not safer)</td>
<td>12.91</td>
</tr>
</tbody>
</table>

Several studies (Konradsen et al., 2003) have documented that restricting the availability of toxic pesticides can reduce the total death rates from self-harm. This could be achieved through the phasing out of more hazardous pesticides and improved safe storage in the houses of farmers (Eddleston et al., 2002). Therefore, pesticides storage methods should be improved in the study area.

2. Disposal of empty containers

Results of this survey highlighted that farmers are highly negligent in proper disposal of empty containers. No any safe disposal methods are practiced by most of the farmers in the surveyed area. Most of the farmers (around 45%) leave the empty containers in the fields itself. It is recommended that burying is the safest method (Nagenthirarajah and Thiruchelvam, 2008) consider a different position for this sentence, However very few number of the vegetable farmers do practice safe disposal of methods such as burying the containers, while some farmers sell the bottles to the bottle collectors (Table 2).

Table 2: Disposal methods of used pesticide containers by the farmers

<table>
<thead>
<tr>
<th>Method of Disposal</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Store in cottages</td>
<td>4.65</td>
</tr>
<tr>
<td>2. Store under trees</td>
<td>32.04</td>
</tr>
<tr>
<td>3. Throwing on field</td>
<td>44.96</td>
</tr>
<tr>
<td>4. Burying in soil</td>
<td>9.56</td>
</tr>
<tr>
<td>5. Other (re-use, selling etc.)</td>
<td>8.78</td>
</tr>
</tbody>
</table>

The pesticide containers are not reusable as described in the pesticide manuals. Therefore, after usage of pesticides, the empty containers should be disposed in proper safe way. When empty containers left on the field, during rainy season the remaining content of the bottles will be wash out and reached water bodies. Pesticide residues can reach aquatic ecosystems and affect aquatic biota even at low levels (Lakshmi, 1993) and hence to the human beings. Further the left outs could give chances for accidental intake of pesticides, especially by children and pets of the farmers.

Generally, water bodies near the farms are often polluted . The pesticide concentration of water bodies can reach the magnitude of dozens of milligrams per liter (Zhang et al., 2011). Long-term low-level of exposure to pesticides by aquatic systems is mainly from pesticide washout from crop land (Lakshmi, 1993). Safe disposal of pesticide containers is therefore important to reduce environmental pollution and in turn it will eventually protect the human health. Therefore, farmers in the survey area should be educated with regards to proper methods of disposal through awareness programs and group discussions.

3. Protective measures adapted by farmers

From the survey it was found that the farmers of the survey area never use any protective measures such as, using mask, goggles, respirator, gloves, hat and/or boots before or during the spraying operations of pesticides. It could be due to lack of knowledge on the ill effects of the agro-chemicals they use or ignorance of farmers on the safety measures adapted during pesticide usage. However, during mixing and application of pesticides only they do not eat or smoke.

Health and safety of the workers engaged in agriculture is of vital important for the continuous supply of food. Farmers are exposed to pesticides in many different situations such as mixing, application, disposal etc. (Fait et al., 2001). From research and surveys it is found that most of the farmers in developing countries are reluctant to adapt protective measures when handling and using poisonous pesticides. Plianbangchang et al. (2009) reported that small scale farmers in Thailand did not wear suitable personal protection, apply pesticides inappropriate fashion and discard the wastes unsafely. In Sri Lanka, some farmers have a genuine problem of insufficient knowledge and information on the pesticide usage. They are exposed to pesticides during application and suffer from numerous morbidity effects ranging from headaches, nausea to cramps and body tremors (Nagenthirarajah and Thiruchelvam, 2008). According to World Health Organization (2005), the estimated
occupational pesticides poisoning affected are as many as 25 millions of the agricultural work force each year in developing countries.

Therefore, it is essential to educate the farmers in the study area regarding safety measures adapted during pesticide usage. It is essential not only to protect the health and safety of the farmers but also their neighbours who are residing close to the agriculture plots and vegetable consumers. This will ensure the sustainable crop production in the study area. Taiti (2010), reports that farmers should be educated on appropriate and safe use of pesticides to enable them control and prevent chemically caused ailments and deaths. This could be done through government efforts of establishing and strengthening extension services in the rural areas to educate the farmers for the safe use of pesticides and to introduce technical know-how and do-how of modern agricultural practices.

Conclusions and recommendations

Findings of this survey highlight the pesticide usage pattern in vegetable production in Mannunai South and Eruvilpattu Divisional Secretariat of Batticaloa district, which is the major vegetable producing area of Batticaloa District. From this study, it was found that awareness of farmers related to pesticide application, storage and disposal methods were at very minimum. Further, they are unaware about the ill effects of pesticides to human health as well as to the environment. Many of them did not adopt any protective measures while handling pesticides. Therefore, awareness programmes are essential to change the attitudes of farmers to shift them from traditional methods to environment friendly pest control methods. It is essential for the sustainability of vegetable production in the study area and to safe guard the health of the people and the environment. Furthermore, farmers in this study area should be educated through field demonstrations regarding the recommended pesticide usage, methods of spraying, safety storage and disposal methods of pesticide and the needs and ways of the reduced usage of synthetic pesticides on the concepts of natural and organic farming for better food and better life.

References


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Abstract

A Mobile Ad-Hoc Networks (MANETs) is a network architecture that can be rapidly, deployed without relying on pre-existing fixed network infrastructure. The nodes in a MANET scan dynamically join and leave the network, frequently, often without warning, and possibly without disruption to other nodes’ communication. MANETs are becoming increasingly popular as more and more, mobile devices find their way to the public. A crucial problem in MANETs is finding an efficient route between a source and a destination [1]. The Epidemic routing protocol is a one of the Reactive protocol and the OLSR protocol is a one of the proactive routing protocol for MANETs. In this work, the Epidemic routing and OLSR protocols are implemented, and its performance is measured under different nodes population and mobility scenarios.

Keywords: epidemic, OLSR, MANETs, protocol

Introduction

MANETs is a network architecture that can be rapidly, deployed without relying on pre-existing fixed network infrastructure. The nodes in a MANETs can dynamically join and leave the network, frequently, often without warning, and possibly without disruption to other nodes’ communication. Finally, the nodes in the network can be highly mobile, thus rapidly changing the node constellation and the presence or absence of links (Clausen et al., 2008).

Nodes in the MANETs exhibit nomadic behavior by freely migrating within some area, dynamically creating and tearing down associations with other nodes. Groups of nodes that have a common goal can create formations (clusters) and migrate together, similarly to military units on missions or to guided tours on excursions. Nodes can communicate with each other at any time and without restrictions, except for connectivity limitations and subject to security provisions. Examples of network nodes are pedestrians, soldiers, or unmanned robots. Examples of mobile platforms on which the network nodes might reside are cars, trucks, buses, tanks, trains, planes, helicopters or ships (Bhorkar et al., 2009, Perkins, et al., 2003, & Barr et al., 2005).

Epidemic Routing is to distribute application messages to hosts, called carriers, within connected portions of Ad-Hoc networks. In this way, messages are quickly distributed through connected portions of the network. Epidemic Routing then relies upon carriers coming into contact with another connected portion of the network through node mobility. At this point, the message spreads to an additional island of nodes. Through such transitive transmission of data, messages have a high probability of eventually reaching their destination.

Epidemic Routing

Figure 1: A source, S, wishes to transmit a message to a destination but no connected path is available in part (a). Carriers, C1-C3 are leveraged to transitively deliver the message to its destination at some later point in time as shown in (b).

Fig 1 depicts Epidemic Routing at a high level, with mobile nodes represented as dark circles and their wireless communication range shown as a dotted circle extending from the source. In Fig1 (a), a source, S, wishes to send a message to a destination, D, but no connected path is available from to transmit its messages to its two neighbors, C1 and C2, within direct
communication range. Later, as shown in Fig1 (b), C2 comes into direct communication range with another host, C3, and transmits the message to it. C3 is in direct range of D and finally sends the message to its destination.

Epidemic Routing supports the eventual delivery of messages to arbitrary destinations with minimal assumptions regarding the underlying topology and connectivity of the underlying network. In fact, only periodic pair wise connectivity is required to ensure eventual message delivery. The Epidemic Routing protocol works as follows. The protocol relies upon the transitive distribution of messages through Ad-Hoc networks, with messages eventually reaching their destination. Each host maintains a buffer consisting of messages that it has originated as well as messages that it is buffering on behalf of other hosts. For efficiency, a hash table indexes this list of messages, keyed by a unique identifier associated with each message. Each host stores a bit vector called the summary vector that indicates which entries in their local hash tables are set. While not explored here, a "Bloom filter" would substantially reduce the space overhead associated with the summary vector. When two hosts come into communication range of one another, the host with the smaller identifier initiates an anti-entropy session with the host with the larger identifier. To avoid redundant connections, each host maintains a cache of hosts that it has spoken with recently. Anti-entropy is not re-initiated with remote hosts that have been contacted within a configurable time period (Vahdad & Becker 2000).

Figure 2: The Epidemic Routing protocol when two hosts, A and B, come into transmission range of one another. Fig 2 depicts the message exchange in the Epidemic Routing protocol. Host A comes into meets with Host B and initiates an anti-entropy session. In step one, A transmits it summary vector, SVA to B. SVA is a compact representation of all the messages being buffered at A. Next, B performs a logical AND operation between the negation of its summary vector, (the negation of B’s summary vector, representing the messages that it needs) and SVA. That is, B determines the set deference between the messages buffered at A and the messages buffered locally at B. It then transmits a vector requesting these messages from A. In step three, A transmits the requested messages to B. This process is repeated transitively when B comes into contact with a new neighbor. Given sufficient buffer space and time, these anti-entropy sessions guarantee eventual message delivery through such pair wise message exchange.

OLSR is a proactive routing protocol, inherits the stability of a link state algorithm and has the advantage of having the routes immediately available when needed due to its proactive nature. In a pure link state protocol, all the links with neighbor nodes are declared and are flooded in the whole network. The OLSR protocol is an optimization of the pure link state protocol for the mobile ad-hoc networks. First, it reduces the size of the control packets: instead of all links, it declares only a subset of links with its neighbors that are its multipoint relay selectors. Secondly, it minimizes the flooding of its control traffic by using only the selected nodes, called multipoint relays, to broadcast its messages. Therefore, only the multipoint relays of a node retransmit the packets. This technique significantly reduces the number of retransmission in a flooding or broadcast procedure. OLSR protocol performs hop by hop routing, i.e. each node uses its most recent information to route a packet. Therefore, when a node is moving, its packets can be successfully delivered to it, if its speed is such that its movement could be followed in its neighborhood, at least (Clausen & Jacquet 2003, Ying et al.).

Methodology

SWANS provides implementations of Java standard network interfaces at the application layer, sockets at the network layer, UDP and TCP at the transport layer, AODV and DSR at the routing layer, 802.11 at the MAC layer and several path loss and fading models at the physical link layer (Barr 2004).

In our experiments, nodes were placed uniformly at random locations in a square area of (1000m x 1000m). Random Waypoint and Static mobility models were used in this area. In these models, each node picks a location and moves there at a
chosen speed according to mobility models. In my case, the speed of movement ranged from \([\text{Minimum speed}, \text{Maximum speed}]\) meters per second. Also First in First out (FIFO) and MOFO (Evict most forwarded first) queuing policies used in these two mobility models. The simplest policy is FIFO. This policy is simple to implement and bounds the amount of time that a particular message is likely to remain live. Once enough new messages have been introduced into the system older messages are likely to be flushed from most buffers.

Our design for Epidemic Routing associates a unique message identifier, a hop count and an optional acknowledgement request message. In our implementation, the hosts in the Ad-Hoc network are statically assigned ID's. The hop count field determines the maximum number of epidemic exchanges that a particular message is subject to. While the hop count is similar to the TTL (Time-To-Live) field in packets, messages with a hop count of one will only be delivered to their end destination. As discussed below, such packets are dropped subject to the requirements of locally available buffer space. Larger values for hop count will distribute a message through the network more quickly. This will typically reduce average delivery time, but will also increase total resource consumption in message delivery.

Our design for OLSR uses two kinds of the control messages: Hello and Topology Control (TC). Hello messages are used for finding the information about the link status and the host's neighbors. With the Hello message, the Multipoint Relay (MPR) selector set is constructed which describes which neighbors has chosen this host to act as MPR and from this information; the host can calculate its own set of the MPRs. The Hello messages are sent only one hop away but the TC messages are broadcasted throughout the entire network. TC messages are used for broadcasting information about their own advertised neighbors, which includes at least the MPR Selector list. The TC messages are broadcasted periodically and only the MPR hosts can forward the TC messages.

![Figure 3: An OLSR routed network. The gray nodes are chosen as MPRs by one or more neighbors](image)

### Table 1: Various parameters used in the experiment set up

<table>
<thead>
<tr>
<th>Protocols</th>
<th>Epidemic &amp; OLSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Dimension</td>
<td>1000(^*)1000 meters</td>
</tr>
<tr>
<td>Number Of Nodes</td>
<td>12</td>
</tr>
<tr>
<td>Mobility model</td>
<td>RandomWayPoint &amp; Static</td>
</tr>
<tr>
<td>Simulation Time</td>
<td>1 to 6 hours</td>
</tr>
<tr>
<td>Pause Time</td>
<td>60 seconds</td>
</tr>
<tr>
<td>Precision</td>
<td>1</td>
</tr>
<tr>
<td>Minimum Speed</td>
<td>1 meter/second</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>10 meter/second</td>
</tr>
</tbody>
</table>

### Results and Discussion

During the simulation runs, the number of messages sent and received by each node is counted and the delay in receiving packets by each node is recorded and is written to data files. The simulation experiments are repeated for 1, 2, 3, 4, 5 and 6 hours durations without altering other simulation parameters.

#### Message Delivery Ratio

The first performance metric that is to be measured is the message delivery ratio. It is calculated using the formula,

\[
\text{Message Delivery Ratio} = \left( \frac{\text{Total Number of Received Messages}}{\text{Total Number of Sent Messages}} \right) \times 100
\]
In Figs 4 and 5 we plot the Message Delivery Ratio per hour during simulation run for Static mobility model and Random Waypoint mobility model respectively.

**Message Transmission Delay Time**

The second performance metric that is to be measured is the message transmission delay time. It is calculated using the formula,

\[
\text{Message Transmission Delay Time} = \text{Message Received Time} - \text{Message Sent Time}
\]

In Figures 6 and 7 we plot the Message transmission delay per hour during the simulation run for Static and Random Waypoint mobility models respectively.

In the experiment mentioned above, an attempt is made to determine the message delivery ratio and message transmission delay of increasing the simulation time within a fixed number of nodes and a fixed area. The simulation time varied from 1 hour to 6 hours, within a fixed area (1000 x 1000 meters) and 12 nodes. All messages sending rates were constant. The nodes were arranged in a random fashion.

Figs 4 and 5 indicate the Message Delivery Ratio of 12 nodes, at different simulation time intervals. Both the Figs 4 and 5 were obtained using Static Mobility model and Random Waypoint Mobility model respectively. According to the results obtained the Random Waypoint Mobility model shows high performance than the Static Mobility model in Average message transmission, and also according to the results obtained OLSR protocol shows high performance than the Epidemic routing protocol.

Figs 6 and 7 indicate the Message Transmission Delay of 12 nodes, at different simulation time intervals. Both the Figs 6 and 7 were obtained using Static Mobility model and Random Waypoint Mobility model respectively. According to the results...
obtained the Random Way point Mobility model shows of high performance than the Static Mobility model in Average message transmission delay, and also according to the results obtained OLSR protocol shows of high performance than the Epidemic routing protocol.

Conclusion

In this work, the performance of OLSR protocol and Epidemic Routing protocol in Jist/SWANS simulator have been implemented and evaluated under different test scenarios. The results indicate OLSR protocol showing higher performance than the Epidemic routing protocol.

In future, this research work also includes validating the performance of many other recently developed protocols in the presence of the implemented mobility models. Also there are new mobility models proposed by researchers and these findings would also be added to the simulator and the performance would be tested.

References


Comparison of Productive Performance of Frizzle and Cross-Bred Frizzle - Naked Neck Chicken Reared Under Different Farm Management Systems

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Abstract

A study was carried out to analyse the performance of frizzle and cross bred naked-neck frizzle chicken population under various farm management systems. The results of the study revealed that the mean body weights of both sexes of both chicken populations were not significantly different (P<0.05) in all management systems. The age at first laying was significantly early (P>0.05) in frizzle (7.02±0.04 months) and naked-neck frizzle (6.93±0.11 months) in extensive system. The mean monthly egg production was significantly higher (P>0.05) for both genotypes under intensive system. The average egg weight (46-47g) and hatchability (76-79%) were significantly higher (P>0.05) in the semi-intensive system. The productive period and life time were significantly longer (P>0.05) under the extensive system for both populations. It was concluded that, both the populations performed well in intensive and semi-intensive management systems with respect to different productive traits.

Keywords: Frizzle, Naked-neck, Hatchability, Farm Management Systems, Animal Production

Introduction

In Sri Lanka, the poultry industry is characterized by free range scavenging system which is dominated by local chicken populations. The productivity levels of local chicken are low because of poor nutrition and low genetic potential. In an effort to address the low productivity in local chickens, high yielding exotic breeds have been introduced and grown in many farming systems. However, high environmental temperatures constrain the exotic chickens’ performance in extensive and even in intensive production systems. High ambient temperature has a negative effect on the growth rate and production of commercial chickens due to the difficulty of dissipating metabolic heat, which leads to an increase in body temperature that can be lethal in extreme cases (Cowan and Michie, 1988).

The reduction in feather coverage has proved to increase heat dissipation, allowing a greater rate of radiation of body heat and a better thermoregulation (Eberhart and Washburn, 1993). Some major genes have been described as affecting feather mass. The naked-neck gene (\(Na\)) reduces the number of feathers by limiting the feathered body surface in chicken and the frizzle gene (\(F\)) has a feather curling effect and causing feather mass reduction (Horst and Mathur, 1992). The breeding programme aimed at producing locally adaptable highly productive chicken population using the frizzle and naked-neck frizzle chicken is underway in some countries (Hagan, 2010). In Sri Lanka similar attempts can be made to improve the chicken using the specific genotypes such as frizzle and naked-neck frizzle to incorporate the adaptable traits to the exotics. Further, while planning a breeding programme to incorporate frizzle and naked-neck genes in a population, proper information about the productive and reproductive performance of frizzle and naked-neck frizzle is necessary. In this context, a study was planned with the objective to analyse the productive and reproductive performance of frizzle and naked-neck frizzle population under different management systems.

Methodology

The study was conducted at different locations in Batticaloa, Trincomalee and Ampara districts of Sri Lanka during the period from January, 2012 to January, 2013. A total of 150 poultry farms were randomly selected for this study. Equal numbers of extensive, semi intensive and intensively operated farms were considered in gathering data. From each farming system a total of 60 adult birds of each type were randomly selected to obtain data. The parameters measured were live weight of both cockerel and hen at 9 months age, age at first lay, monthly egg production, egg weight, and hatchability productive period and life time. The data were analyzed using Statistical Analysis Software (Version 9.1).
Results and discussion

Body weight

According to the Table 1 the mean body weight of cockerels and hens of both population was not significantly differed (P<0.05) in all three management systems. In other Asian countries like Bangladesh and India these genetic groups of chicken in the existing scavenging operations had the lowest body weight (1.04 kg for hen and 1.52 kg for cockerel; Ahmed and Hasnath, 1983 and 1.01 kg for hen and 1.38 kg for cockerel; Kalita et al. 2009) than the value recorded in the present study under all management systems.

Table 1: Mean body weight of frizzle and naked-neck frizzle chicken under different management systems (± Standard Error)

<table>
<thead>
<tr>
<th>Management system</th>
<th>Mean body weight (kg)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frizzle Cockerel</td>
<td>Frizzle Hen</td>
<td>Naked-neck frizzle Cockerel</td>
<td>Naked-neck frizzle Hen</td>
<td></td>
</tr>
<tr>
<td>Extensive system</td>
<td>1.79±0.12^a</td>
<td>1.09±0.12^a</td>
<td>2.52±0.14^a</td>
<td>1.78±0.14^a</td>
<td></td>
</tr>
<tr>
<td>Semi-intensive system</td>
<td>1.67±0.11^a</td>
<td>1.14±0.23^a</td>
<td>2.49±0.17^a</td>
<td>1.76±0.11^a</td>
<td></td>
</tr>
<tr>
<td>Intensive system</td>
<td>1.78±0.44^a</td>
<td>1.22±0.19^a</td>
<td>2.51±0.18^a</td>
<td>1.80±0.18^a</td>
<td></td>
</tr>
</tbody>
</table>

*Means with the same letters within the column are not significantly different.

Age at first laying

The average age at first laying was significantly later (P>0.05) for both populations under the intensive system while it was significantly earlier (P<0.05) under the extensive system for both genotypes (Table 2).

Table 2: Average age at first laying in village and naked-neck chicken under different management systems (± Standard Error)

<table>
<thead>
<tr>
<th>Management system</th>
<th>Average age at first laying (months)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frizzle</td>
<td>Naked-neck frizzle</td>
<td></td>
</tr>
<tr>
<td>Extensive system</td>
<td>7.02±0.04^a</td>
<td>6.93±0.11^a</td>
<td></td>
</tr>
<tr>
<td>Semi-intensive system</td>
<td>7.26±0.17^b</td>
<td>7.09±0.14^b</td>
<td></td>
</tr>
<tr>
<td>Intensive system</td>
<td>8.98±0.14^c</td>
<td>8.78±0.02^c</td>
<td></td>
</tr>
</tbody>
</table>

*Means with the same letters within the column are not significantly different.

The exposure of birds at grower stage to sunlight stimulates the reproductive activity and starts egg production comparatively earlier under the extensive system. However, under the intensive system the degree of exposure to sunlight is very low as the houses are not constructed in a proper way to facilitate penetration of sunlight in the study areas.

Monthly egg production

According to Table 3 the mean monthly egg production was significantly higher (P>0.05) for both genotypes under intensive system than the other management systems. The higher egg production under intensive system may be attributable to availability of more feed, water and health facilities compared to other systems of management in the study area. Under the extensive system the birds are actively moving around the farm sheds as they need to search their feed. Therefore, the energy loss is high though the availability of diverse nutrition is high.

Table 3: Average monthly egg production in frizzle and naked-neck frizzle chicken under different management systems (± Standard Error)

<table>
<thead>
<tr>
<th>Management system</th>
<th>Average egg production (number)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frizzle</td>
<td>Naked-neck frizzle</td>
<td></td>
</tr>
<tr>
<td>Extensive system</td>
<td>11.27±1.47^a</td>
<td>13.24±1.99^b</td>
<td></td>
</tr>
<tr>
<td>Semi-intensive system</td>
<td>13.64±2.31^b</td>
<td>15.52±0.99^b</td>
<td></td>
</tr>
<tr>
<td>Intensive system</td>
<td>14.90±2.11^b</td>
<td>17.64±2.66^c</td>
<td></td>
</tr>
</tbody>
</table>

*Means with the same letters within the column are not significantly different.

Egg weight

Table 4: Average egg weight of frizzle and naked-neck frizzle chicken under different management systems (± Standard Error)

<table>
<thead>
<tr>
<th>Management system</th>
<th>Average egg weight (g)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frizzle</td>
<td>Naked-neck frizzle</td>
<td></td>
</tr>
</tbody>
</table>


The average egg weight was significantly higher (P>0.05) in the semi-intensive and intensive systems for frizzle population while no significant difference (P<0.05) was observed in naked-neck frizzle population under three management systems (Table 4). In general the heat dissipation from the body is highly affected the productive performance of chicken. In frizzle population, under intensive system the energy expenditure to dissipate heat from the body is low.

However, in naked-neck frizzle population the heat loss from the body can be through naked-neck and frizzled space of the body. This might be the reason for significantly similar performance of this population in three management systems.

**Hatchability**

**Table 5:** Average hatchability of eggs in of frizzle and naked-neck frizzle chicken under different management systems (± Standard Error)

<table>
<thead>
<tr>
<th>Management system</th>
<th>Average hatchability (%)</th>
<th>Frizzle</th>
<th>Naked-neck frizzle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive system</td>
<td></td>
<td>69.45±2.78a</td>
<td>74.12±3.56a</td>
</tr>
<tr>
<td>Semi-intensive system</td>
<td></td>
<td>76.13±3.11b</td>
<td>79.14±3.12b</td>
</tr>
<tr>
<td>Intensive system</td>
<td></td>
<td>72.23±2.76c</td>
<td>71.87±2.45c</td>
</tr>
</tbody>
</table>

*Means with the same letters within the column are not significantly different

Hatchability was significantly differed (P>0.05) among different management systems for both populations in all management systems (Table 5). The hatchability of eggs was significantly higher (P>0.05) under the semi-intensive system because the availability of diverse nutritious feed is higher than other systems and the birds are partially allowed for scavenging and supplemented with commercial feed and additives when housed in a day. Similar to fertility the hatchability percent more than 75 is acceptable to the point of fertility in all poultry production systems.

**Productive period**

The productive period was significantly longer (P>0.05) under the extensive system for both populations (Table 6). Significantly lower productive (P<0.05) period was observed in intensive management system for both populations. The limited movement under the intensive system can cause excess fat deposition on body which might shorten the productive period (Kalita, 2009). Further, continuous exposure to sun light and diverse nutrition might extend the productive period of birds under extensive system.

**Table 6:** Average productive period of frizzle and naked-neck frizzle chicken under different management systems (± Standard Error)

<table>
<thead>
<tr>
<th>Management system</th>
<th>Average productive period (months)</th>
<th>Frizzle</th>
<th>Naked-neck frizzle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive system</td>
<td></td>
<td>23.99±0.04a</td>
<td>26.11±1.01a</td>
</tr>
<tr>
<td>Semi intensive system</td>
<td></td>
<td>21.11±0.56b</td>
<td>23.67±1.21b</td>
</tr>
<tr>
<td>Intensive system</td>
<td></td>
<td>16.45±1.34c</td>
<td>21.77±1.45c</td>
</tr>
</tbody>
</table>

*Means with the same letters within the column are not significantly different

Life time

The life time was significantly longer (P>0.05) under the extensive system in both chicken population while no significant difference was observed (P<0.05) between the frizzle and naked-neck frizzle population growing in intensive and extensive management systems (Table 7). This is because of the faster rate of disease spreading when birds are in the confinement. Further the birds under scavenging system might get natural body immunity when expose to adverse environmental conditions and diseases. This is agreed with the observation made in this study.

**Table 7:** Average life time of frizzle and naked-neck frizzle chicken under different management systems (± Standard Error)

<table>
<thead>
<tr>
<th>Management system</th>
<th>Average life time (years)</th>
<th>Frizzle</th>
<th>Naked-neck frizzle</th>
</tr>
</thead>
</table>
Extensive system  &  2.56±0.02\textsuperscript{a} &  2.23±0.01\textsuperscript{a} \\
Semi-intensive system &  2.12±0.02\textsuperscript{b} &  1.97±0.02\textsuperscript{b} \\
Intensive system  &  2.09±0.02\textsuperscript{b} &  1.95±0.01\textsuperscript{b} \\

*Means with the same letters within the column are not significantly different

**Conclusion**

The frizzle and naked-neck frizzle population performed well in extensive system in terms of some productive traits such as age at first lay, productive and life time. These genetic groups performed well in semi-intensive management system in terms of hatchability and egg weight. Therefore, performance of frizzle and naked-neck frizzle population could be further improved under semi intensive and extensive system of management with improved management practices and breeding programs.

**References**


Analysis of Relations between Covariance Weights and Corresponding Maximum Eigen Values

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Abstract

This paper studies on how to get an idea through maximum eigen values, when allocating weights to covariance matrix. The eigen density distribution with respect to the largest eigen value is analysed. This study will help to determine the fluctuation of the eigen distribution with respect to allocated weight of the covariance matrix. This can be used to develop the classic portfolio asset allocation model by adding investors’ ideas as parameters or weights. The maximum eigen value is 2.24 and the corresponding weight is 1.6, the minimum eigen value is 0.24 and the corresponding weight is 0.9. There are two peaks of the eigen values at 0.62 and 2.24 respectively 0.5 and 1.6 of weights. Two minimum points identified with corresponding eigen values are 0.43 and 0.24 respectively 0.2 and 0.9 of weights. For comparison the density function is plotted with Q = 3.22 and variance 0.85: this theoretical value was obtained assuming that the matrix is purely random except for its highest eigen value. The fact that the lower edge of the density is strictly positive (Except for the Q = 1); then there are no eigen values between 0 and the minimum eigen value.

Keywords: eigen values, maximum eigen values, eigen density, covariance, weights

Introduction

Since, early 1990s the market has witnessed a progressive shift, towards a more industrial view of the investment management process. There are several reasons for this change. Firstly, as a result of globalization, the universe of investable assets has grown many times over. Portfolio Managers might have to choose from among several thousand possible investments around the globe. In Modern Financial Theory there has been constant controversy about the concept of risk, and increasing interests in ways to measure it. This controversy has been accompanied by a growing investment industry in portfolio models based on sophisticated quantitative methods which require huge computing power. When the risk analysis of the portfolio is concerned, the empirical correlation matrices are very important. Even in the modern portfolio theory such as Markowitz portfolio optimization, the covariance or so called risk is minimized in order to find the optimum asset allocation.

Laloux, Cizeau and Potters (1990) have explained the financial correlations in their paper of “Random matrix theory and financial correlations”. They find a remarkable agreement between the theoretical prediction (based on the assumption that the correlation matrix is random) and empirical data concerning the density of eigen values associated to the time series of the different stocks of the S&P500 (or other major markets). Daly and Rusking, (2007) in their paper of “Random matrix theory filters in Portfolio Optimization” have considered both equally and exponentially weighted covariance matrices and observed that the overall best method out-of-the sample was that of exponentially weighted covariance, with their Krzanowski stability-based filter applied to the correlation matrix. Pafka, Potters and Condor (2004) have introduced a covariance matrix estimator in the paper of “Exponential weighting and random-matrix theory-based filtering of financial covariance matrices for portfolio optimization”. They have calculated a spectrum of large exponentially weighted random matrices (whose upper band edge needs to be known for the implementation of the estimation) analytically, by a procedure analogous to that used for standard random matrices.

The main objective of this research to develop an asset allocation model among large number of investment channels by identifying the relation between the large eigen values and the allocated weights (decay factor). Also the relation between the eigen density distribution with respect to the eigen values.

Methodology

Average return $R_p = \sum_{i=1}^{n} p_i R_i$, where $p_i$ (i= 1, 2, 3,….N) is the amount of capital investment in the $i^{th}$ asset and $R_p$ are the expected return of the individual assets. The risk of the portfolio can be defined plugging the asset allocation component to the
variance and be formulated as $\sigma^2_p = \sum_{i=1}^{N} p_i C_{ij} p_j$ where $C$ is the covariance matrix. There are a number of methods published to determine the optimal asset allocation satisfying maximizing the return and simultaneously minimizing the risk. In the composition of the least risky portfolio a large weight is allocated on the eigenvector of $C$ with the smallest eigenvalues.

For any $N$ number of assets there are $N(N-1)/2$ entries of covariance elements. If the time length so called $T$ is not very large compared to $N$, the determination of the covariance is noisy.

Random matrix theory

The empirical correlation matrix $C$ is constructed from the time series of price changes $\delta x_i(t)$ where $i$ is the asset and $t$ the time. Then the equation is

$$C_{ij} = \frac{1}{T} \sum_{t=1}^{T} \delta x_i(t) \delta x_j(t)$$

Then the above equation can be written in the symbolical form as $C = \frac{1}{T} M M^T$ where $M$ is an $N \times T$ rectangular matrix and $M^T$ denotes matrix transformation of $M$. The null hypothesis of independent assets, which we consider now, translates itself in the assumption that the coefficients $M_{ij} = \delta x_i(t)$ are independent, identically distributed, random variables, the so-called random Wishart matrices or Laguerre ensemble of the Random Matrix theory.

Then the eigenvalues density of the covariance matrix ($C$) is denoted by $pc(\lambda)$.

$$pc(\lambda) = \frac{1}{N} \frac{dn(\lambda)}{d(\lambda)}$$

Where $dn(\lambda)$ is the number of eigenvalues of $C$ less than $\lambda$.

If $M$ is a $T \times N$ random matrix, $pc(\lambda)$ is self-averaging and exactly known in the limit $N \to \infty, T \to \infty$ and $Q = \frac{T}{N} \geq 1$ fixed. Then

$$pc(\lambda) = \frac{Q}{2\pi \sigma^2} \sqrt{\lambda_{\text{max}} - \lambda} (\lambda - \lambda_{\text{min}})$$

Where

$$\lambda_{\text{max}} = \sigma^2 \left( 1 + \frac{1}{Q} \pm 2 \frac{1}{\sqrt{Q}} \right)$$

With $\lambda \in [\lambda_{\text{min}}, \lambda_{\text{max}}]$ and where $\sigma^2$ is equal to the variance of the elements of $M$, equal to 1 with our normalization. In the limit $Q=1$ the normalized eigen values.

Financial correlation and covariance matrices can be expressed, in general, in the form given by $C = \frac{1}{T} M M^T$, so matrices for historical data can be compared to those generalized from random returns. Here we defined the covariance matrix $V = \{\sigma_{ij}\}_{i,j=1}^{N}$ of returns by

$$\sigma_{ij} = \langle G_i(t) G_j(t) \rangle - \langle G_i(t) \rangle \langle G_j(t) \rangle$$

Where $\langle \cdot \rangle$ refers to the mean over time and the correlation matrix $C = \{\rho_{ij}\}_{i,j=1}^{N}$ is given by

$$\rho_{ij} = \frac{\sigma_{ij}}{\sqrt{\sigma_{ii} \sigma_{jj}}}$$

Where $\{G_i(t)\}_{i=1}^{N}$ are the returns.
\[ G_t(t) = \ln \left( \frac{S_t(t)}{S_t(t-1)} \right) \] and where \( S_t(t) \) is the spot price of asset I at time t.

Random matrix theory and exponentially weighted covariance

In extending RMT filtering to exponentially weighted matrices, Pafca (2004) has analyzed matrices of the form \( M = \{m_{ij}\}_{i,j=1}^N \) with

\[
m_{ij} = \sum_{k=0}^{\infty} (1 - \alpha) \alpha^k x_{ik} x_{jk} \tag{6}
\]

And where \( \{x_{ik}\}_{k=0,\ldots,\infty} \) are assumed to be N.I.D. \( (0, \sigma^2) \). They have shown that in the special case \( N \to \infty, \alpha \to 1 \) with \( Q = \frac{1}{N(1-\alpha)} \) fixed, the density \( p_c(\lambda) \), of the eigenvalues of M is given by

\[
p_c(\lambda) = \frac{qv}{\pi} \quad \text{where} \quad v \quad \text{is the root of}
\]

\[
F(v) = \frac{\lambda}{\sigma^2} - \frac{v\lambda}{\tan(v\lambda)} + \ln(v\sigma^2) - \ln(\sin(v\lambda)) - \frac{1}{Q} \tag{7}
\]

\( F(v) \) is well defined on the open interval \((0, \pi/\lambda)\). If a root doesn’t exist on this given interval for a given value of \( \lambda \), we define \( p_c(\lambda) = 0 \) for that \( \lambda \). The family of matrices, defined by

\[
m_{ij} = \sum_{k=0}^{\infty} (1 - \alpha) \alpha^k x_{ik} x_{jk}, \quad \text{includes the Risk metrics, covariance and correlation matrices. Following this, we define the exponentially weighted covariance matrix} \quad V^* = \{\sigma_{ij}^*\}_{i,j=1}^N
\]

\[
\sigma_{ij}^* = \frac{1 - \alpha}{1 - \alpha^T} \sum_{t=0}^{T-1} x^t(G_t(T - t) - \langle G_t(t) \rangle)(G_j(T - t) - \langle G_j(t) \rangle) \tag{8}
\]

And define the corresponding, exponentially weighted, correlation matrix \( C^* = \{\rho_{ij}^*\}_{i,j=1}^N \)

\[
\rho_{ij}^* = \frac{\sigma_{ij}^*}{\sqrt{\sigma_u^* \sigma_j^*}}.
\]

Here \( \alpha \) is commonly called the decay factor. Maximum Eigenvalue of an Exponentially Weighted Random Matrix can be found using

\[
F(v) = \frac{\lambda}{\sigma^2} - \frac{v\lambda}{\tan(v\lambda)} + \ln(v\sigma^2) - \ln(\sin(v\lambda)) - \frac{1}{Q}, \quad \text{but a more efficient method can be derived as follows. On the interval} \quad v \in (0, \pi/\lambda). \quad \text{The following limits hold}
\]

\[
\lim_{v \to \infty} F(v) = \frac{\lambda}{\sigma^2} - \ln \left( \frac{\lambda}{\sigma^2} \right) - \frac{1}{Q} - 1 \tag{9}
\]

Moreover, \( F(v) \) is increasing on the interval \( v \in (0, \pi/\lambda) \) since for \( x = v\lambda \).
\[ F'(v) = \frac{1}{v} - \frac{x}{v} \left( \frac{2 \tan(x) - x \sec^2(x)}{\tan^2(x)} \right) \]

\[ F'(v) = \frac{1}{v} \left( \frac{2 \sin^2(x) - 2x \sin(x) \cos(x) + x^2}{\sin^2(x)} \right) \]  \hspace{1cm} (10)

And also \( h(x) = \sin^2(x) - 2x \sin(x) \cos(x) + x^2 > 0 \) on \( x \in (0, \pi) \) which is true because \( h(0)=0 \) and \( h'(x) = 4x \sin^2(x) > 0 \). Therefore, a root of \( F(v) \) exists on \( v \in (0, \pi/\lambda) \) for a given \( Q \) and \( \lambda \) when its lower limit is negative on the interval, i.e. When

\[ \frac{\lambda}{\sigma^2} - \ln \left( \frac{\lambda}{\sigma^2} \right) < \frac{1}{Q} + 1 \]  \hspace{1cm} (11)

Now \( \frac{\lambda}{\sigma^2} - \ln \left( \frac{\lambda}{\sigma^2} \right) \geq 1 \), with a minimum at 1 when \( \lambda = \sigma^2 \) and

\[ \frac{1}{Q} + 1 > 1 \]  \hspace{1cm} (12)

Thus, the theoretical maximum eigenvalue is the solution of

\[ \frac{\lambda}{\sigma^2} - \ln \left( \frac{\lambda}{\sigma^2} \right) = \frac{1}{Q} + 1 \]  \hspace{1cm} (13)

Algorithm

In order to get the maximum eigen values of the covariance matrix with respect to the different weights of the covariance matrix, the following algorithm is used.

%calculate the risk metrics “Technical Document” (1996) exponentially
%weighted covariance matrix, correlation and volatilities.
%Inputs:
%data- needs to be in format TxK with T=# observations, k=# assets
%alpha=decay factor

1. Input: [r,c] = size(data) : needs to be in format TxK with T=# observations, k=# assets
2. Input: alpha=decay factor
3. data_mwb = data-replicate the matrix (mean(data,1),r,1);
4. alphavec = alpha.^((0:1:r-1));
5. data_tilde= replicate matrix (sqrt(alphavec),1,c).*data_mwb;
6. cov_ewma = 1/sum(alphavec)*(data_tilde'*data_tilde);
7. corr_ewma = zeros(c)
8. vol_ewma=zeros(c,1)
9. for i = 1:c
10. for j=1:c
11. corr_ewma(i,j) = cov_ewma(i,j)/sqrt(cov_ewma(i,i)*cov_ewma(j,j));

12. end

13. vola_ewma(i) = sqrt(cov_ewma(i,i));

14. end

Results & Discussion

The data set used to test this research is SGX (Singapore Exchange Market) stocks, with index composition taken as of 17/04/2014. The data set runs from 06/11/2008 to 04/04/2014 (1339 days) and any series not covering the entire period were discarded, leaving a total 406 stocks.

Table 1: Maximum eigen values with weights

<table>
<thead>
<tr>
<th>Weight</th>
<th>Rank1</th>
<th>Rank2</th>
<th>Rank3</th>
<th>Rank4</th>
<th>Rank5</th>
<th>Rank6</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.4828</td>
<td>0</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.1</td>
<td>0.4384</td>
<td>0.2171</td>
<td>0.0047</td>
<td>0.0005</td>
<td>0.0001</td>
<td>0</td>
</tr>
<tr>
<td>0.2</td>
<td>0.426</td>
<td>0.3531</td>
<td>0.0167</td>
<td>0.0032</td>
<td>0.0014</td>
<td>0.0003</td>
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<tr>
<td>0.3</td>
<td>0.5239</td>
<td>0.33</td>
<td>0.0333</td>
<td>0.0095</td>
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<tr>
<td>0.4</td>
<td>0.5947</td>
<td>0.2852</td>
<td>0.0516</td>
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<td>0.5</td>
<td>0.6189</td>
<td>0.2387</td>
<td>0.0687</td>
<td>0.0355</td>
<td>0.03</td>
<td>0.0179</td>
</tr>
<tr>
<td>0.6</td>
<td>0.5954</td>
<td>0.1919</td>
<td>0.0816</td>
<td>0.0594</td>
<td>0.0412</td>
<td>0.0356</td>
</tr>
<tr>
<td>0.7</td>
<td>0.5243</td>
<td>0.1456</td>
<td>0.0896</td>
<td>0.0815</td>
<td>0.0576</td>
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The table 1 shows the largest six eigen values vs. weights of the covariance matrix. The above table has been calculated based on raw data of closing prices. As the first step of the calculation process, the covariance matrix is calculated based on the closing prices and then the weighted covariance matrix is calculated. Then for each weighted covariance matrix we calculate 6 largest eigen values (Rank 1 to Rank 6). These values are summarized in the above table. The minimum weight assigned is zero and the maximum weight is 1.7. When the exponential weights are more than 1.7, then the corresponding maximum eigen values are zeros. In order to analyse this phenomena further, these values are plotted as it is in fig. 1.
The figure 1 denotes a graphical representation of table 1. This clearly shows the effect of maximum eigen values when the weights are changed from 0 to 1.7. Fig. 2 represent the eigen density of the covariance matrix at the maximum eigen value which can be taken when the weight is set to 1.6.

**Figure 1**: Maximum eigen values vs. weights of covariance

**Figure 2**: Eigen density vs. eigen values

**Conclusions**

The maximum eigen value is 2.24 and the corresponding weight is 1.6, and the minimum eigen value is 0.24 and the corresponding weight is 0.9. There are two peaks of the eigen values at 0.62 and 2.24 with respective weights of 0.5 and 1.6. The two minimum points that can be found hold corresponding eigen values at 0.43 and 0.24 with respective weights of 0.2 and 0.9. For comparison the density function is plotted with Q=3.22 and variance 0.85: this theoretical value was obtained assuming that the matrix is purely random. The lower edge of the density is strictly positive (Except for the Q=1); then there is no eigen values between 0 and the minimum eigen value. These results can be used to weight the covariance matrix with the feedback of maximum eigen values. The minimum possible weight and the maximum possible weight can be understood from the process. Then the weight can be effectively allocated while referring to the maximum eigen values. Thereafter the selected weight can be used to get the eigen density distribution. The process can thus be extended to get an idea about the controllable risk matrix with respect to the external factors such as investors’ views towards to the risk.
References


Pafka, S, Potters, M & Kondor, I 2004, ‘Exponential Weighting And Random-Matrix Theory-Based Filtering Of Financial Covariance Matrices For Portfolio Optimization’, E-print cond-mat/0402573,
Generating Einstein’s Solutions via Hypergeometric Equation

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Abstract

Exact solutions to Einstein field equations in spherically symmetric gravitational fields are obtained for an anisotropic matter with specified forms for the anisotropic factor and one of the gravitational potentials. The solution of the Einstein field equations is reduced to a difference equation with variable rational coefficients which can be solved in general. It is possible to obtain general class of solutions in terms of special functions and elementary functions for different partial geometries.

Keywords: Einstein field equations, exact solutions, anisotropic matter

Introduction

Exact solutions of the Einstein field equations for an anisotropic matter are important in the description of relativistic astrophysical processes. In recent years a number of authors have studied exact solutions to the Einstein field equations corresponding to the anisotropic matter where the radial component of the pressure differs from the angular component. The gravitational field is taken to be spherically symmetric and static since these solutions may be applied to relativistic stars. A number of researchers have examined how anisotropic matter affects critical mass, critical surface redshift and stability of highly compact bodies. These investigations are contained in the paper by Dev and Gleiser (2003). Some researchers have suggested that anisotropy may be important in understanding the gravitational behavior of boson stars and the role of strange matter with densities higher than neutron stars. Mark and Harko (2002) and Sharma and Mukherjee (2002) suggest that anisotropy is crucial ingredient in the description of dense stars with strange matter.

In order to solve the field equations, various restrictions have been placed by investigators on the geometry of spacetime and the matter content. Mainly two distinct procedures have been adopted to solve these equations for spherically symmetric static manifolds. Firstly, the coupled differential equations are solved by computations after choosing an equation of state. Secondly, the exact Einstein solutions can be obtained by specifying the geometry. We follow the later technique in an attempt to find solutions in terms of special functions and elementary functions that are suitable for description of relativistic stars. This approach was recently used by Chaisi and Maharaj (2005) that yield a solution in terms of elementary functions. This solution have considered by many authors in the analysis of gravitational behavior of compact objects, and the study of anisotropy under strong gravitational fields. Hence the approach followed in this paper has proved to be a fruitful avenue for generating new exact solution for describing the interior spacetimes of relativistic spheres.

The objective of this paper is to provide systematically a rich family of Einstein field equations with anisotropic matter which satisfy the physical properties similar to the recent treatment of Maharaj and Komathiraj (2007). In Section 2, the Einstein field equations for the static spherically symmetric line element with anisotropic matter is expressed as an equivalent set of differential equations utilizing a transformation from Durgapal and Bannerji (1983). We chose particular forms for one of the gravitational potentials and the anisotropic factor, which enables us to obtain the condition of pressure anisotropy in the remaining gravitational potential in Section 3. We assume a solution in a series form which yields recurrence relation, which we manage to solve from first principle. It is then possible to exhibit exact solutions to the Einstein field equations. We demonstrate that the exact solutions to the Einstein field equations in terms of hyper geometric functions are possible and we generate two linearly independent classes of solutions by determining the specific restriction on the parameters in section 4. Finally in section 5, we discuss the physical feature of the solutions.

1. Field equations

Assume that the spacetime is spherically symmetric and static which is consistent with the study of anisotropic compact objects. Therefore there exists coordinates \((t, r, \theta, \phi)\) such that the line element is of the form

\[
\begin{align*}
    ds^2 &= -e^{2f(r)} dt^2 + e^{2g(r)} dr^2 + r^2 (d\theta^2 + \sin \theta d\phi^2) \\
\end{align*}
\]

(1)
In Schwarzschild coordinates \((t, r, \theta, \phi)\), where \(f(r)\) and \(g(r)\) are arbitrary functions. For a perfect fluid the Einstein field equations can be written in the form

\[
\frac{1}{r^2} \left( 1 - e^{-2g} \right) + \frac{2g'}{r} e^{-2g} = \mu \\
\frac{1}{r^2} \left( 1 - e^{-2g} \right) + \frac{2f'}{r} e^{-2g} = p_r
\]

\[
e^{-2g} \left( f'' + f' \left( 2 - \frac{g'}{r} \right) - \frac{g''}{r^2} \right) = p_t
\]

where primes denote differentiation with respect to \(r\). In equation (2) - (4), the quantity \(\mu\) is the energy density, \(p_r\) is the radial pressure and \(p_t\) is the tangential pressure. The Einstein field equations (2) - (4) describe the gravitational behavior for an anisotropic imperfect fluid. For matter distributions with isotropic pressures, the Einstein’s equations for a perfect fluid may be regained from (2) - (4). A different but equivalent form of the field equations is generated by introducing a new independent variable \(x\) and two new functions \(y\) and \(Z\).

These are given by

\[
A^2 y^2(x) = e^{2f}, \quad Z(x) = e^{-2g}, \quad x = Cr^2
\]

In equation (5), \(A\) and \(C\) are arbitrary constants. Under the transformation (5), the system (2) – (4) becomes

\[
\frac{1-Z}{x} - 2\dot{Z} = \frac{\mu}{C} \quad (6) \\
4Z \frac{\dot{y}}{y} = \frac{Z}{x} - 1 = \frac{p_r}{C} \quad (7) \\
4Zx^2 \ddot{y} + 2x^2 \dot{Z} \dot{y} + \left( \dot{Z}x - Z + 1 - \frac{\Delta x}{C} \right)y = 0 \quad (8) \\
\Delta = p_t - p_r \quad (9)
\]

where dots denote differentiations with respect to \(x\). The quantity \(\Delta\) is defined as the measure of anisotropy or anisotropy factor. The Einstein field equations as expressed in (6) - (9) is a system of four nonlinear equations in the six unknowns \((u, \ p_r, \ p_t, \ Z, \ y, \ \Delta)\). The advantage of this system lies in the fact that a solution can, upon a suitable substitution of \(Z\) and \(\Delta\), be readily obtain by integrating (8) which is second order and linear in \(y\).

2. Master equation

We solve the Einstein field equations (6) – (9) by making explicit choices for the gravitational potential \(Z\) and the measure of anisotropy \(\Delta\). For the metric function \(Z\) we make the choice

\[
Z = \frac{1+kx}{1+x}
\]

The potential \(Z\) in (10) is regular at the origin and continuous in the stellar interior of the star for a wide range of value of the parameter \(k\). Therefore the form chosen in (10) are physically acceptable. This specific choice for \(Z\) simplifies the integration process. Substitution of (10) into (8) leads to the equation

\[
4(1+kx)(1+x)\ddot{y} - 2(1-k)\dot{y} + \left[ (1-k) - \frac{\Delta}{x} (1+x)^2 \right]y = 0 \quad (11)
\]

It is necessary to specify the anisotropic factor \(\Delta\) to solve \(11\). A variety of choices for \(\Delta\) is possible but only a few are physically reasonable which generate closed form solutions. The differential equation \(11\) can be reduced to simpler form if we let
\[ \Delta = \frac{ax}{(1 + x)^2} \]  
\[ \text{where} \ a \] is a real constant. Upon substituting the choice (12) into equation (11) we obtain
\[ 4(1+kx)(1+x)\ddot{y} - 2(1-k)\dot{y} + [(1-k) - a]y = 0 \]  
(13)

It is convenient to introduce the new variable \( z = (1+x) \) in (13) to yield
\[ 4z(1-k+kz) \frac{d^2Y}{dz^2} - 2(1-k) \frac{dY}{dz} + [(1-k) - a]Y = 0 \]  
(14)
where \( Y \) is a function of \( z \).

The differential equation (14) is the master equation of the system (6) – (9). Two categories of solutions are possible for \( k = 1 \) and \( k \neq 1 \).

Case I: \( k = 1 \)

In this case (13) becomes the Euler-Cauchy equation with solution
\[ y = c_1(1+x)^{1+\sqrt{1+k}} + c_2(1+x)^{1-\sqrt{1+k}} \]
In terms of the original variable \( x \), where \( c_1 \) and \( c_2 \) are two arbitrary constants.

Case II: \( k \neq 1 \)

With \( k \neq 1 \) the master equation (14) can be solved using the method of Frobenius. As the point \( z = 0 \) is a regular singular point of (14), there exist two linearly independent solutions of the form of a power series with centre \( z = 0 \). These solutions can be generated using the method of Frobenius. Therefore we can assume
\[ Y = \sum_{i=0}^{\infty} a_i z^{i+b}, \ a_0 \neq 0 \]  
(15)
In equation (15) \( a_i \) are the coefficients of the series and \( b \) is a constant. For a legitimate solution the coefficients \( a_i \) and the parameter \( b \) should be determined explicitly. On substituting (15) into (14), we obtain
\[ 2a_0 b(1-k)(2b-3)z^{b-1} \sum_{i=0}^{\infty} \{2(1-k)(i+b-1)(2i+2b) + [4k(i+b)(i+b-1) + (1-k-a)]a_i \} z^{b+i} = 0 \]
The coefficients of the various powers of \( z \) must vanish. Equating the coefficient of \( z^{b-1} \) to zero we obtain
\[ 2a_0 b(1-k)(2b-3) = 0 \]  
Since \( a_0 \neq 0 \), \( b = 0 \) or \( b = 3/2 \). Equating the coefficient of \( z^{b+i} \) to zero, we obtain
\[ a_{i+1} = \frac{4k(i+b)(i+b-1) + (1-k-a)}{2(k-1)(i+b+1)(2i+2b-1)} a_i, \ i \geq 0 \]

which is the recurrence formula, or difference equation, governing the structure of the solution. It is possible to express the general coefficient \( a_i \) in terms of the leading coefficient \( a_0 \) by establishing a general structure for the coefficient by considering the leading terms. These coefficients generate the pattern
Now it is possible to generate two linearly independent solutions to (14) with the assistance of (15) and (16). For the parameter value \( b = 0 \), the first solution is given by

\[
Y_1 = a_0 \left[ 1 + \sum_{i=0}^{\infty} \prod_{p=0}^{i} \frac{4kp(p-1) + (1-k-a)}{2(k-1)(p+1)(2p-1)} z^{i+1} \right]
\]

For the parameter value \( b = 3/2 \) the second solution has the form

\[
Y_2 = a_0 z^3 \left[ 1 + \sum_{i=0}^{\infty} \prod_{p=0}^{i} \frac{k(2p+3)(2p+1) + (1-k-a)}{2(k-1)(2p+5)(2p+2)} z^{i+1} \right]
\]

Thus the general solution to the differential equation (14), for the choices in (10) and (12) is given as

\[
Y = d_1 Y_1 + d_2 Y_2
\]

where \( d_1 \) and \( d_2 \) are constants. In terms of the original variable \( x \), the function \( Y \) given above becomes

\[
y = \frac{A}{1+x} \left[ 1 + \sum_{i=0}^{\infty} \prod_{p=0}^{i} \frac{4kp(p-1) + (1-k-a)}{2(k-1)(p+1)(2p-1)} (1+x)^{i+1} \right]
\]

\[
+ \frac{B}{1+x} \left[ 1 + \sum_{i=0}^{\infty} \prod_{p=0}^{i} \frac{k(2p+3)(2p+1) + (1-k-a)}{2(k-1)(2p+5)(2p+2)} (1+x)^{i+1} \right]
\]

(17)

Where \( A = d_1 a_0 \), \( B = d_2 a_0 \) Thus we have found the general series solution (17) to the differential equation (11). This solution is expressed in terms of a series with real arguments unlike the complex arguments given by software packages

3. Solution in terms of elementary functions

The general solution (18) is given in the form of a series which define special functions. It is possible for the general solution to be written in terms of elementary functions in closed form which is a more desirable form for the physical description of a relativistic star. If we introduce the transformation in (14), we obtain

\[
1 + x = KX, \; K = \frac{k-1}{k}, \; Y(X) = y(x)
\]

\[
4X(1-X) \frac{d^2 Y}{dX^2} - 2 \frac{dY}{dX} + (K + \tilde{a})Y = 0, \; \tilde{a} = \frac{a}{k}
\]

(18)

which is a special case of hypergeometric differential equation. It is possible to obtain two linearly independent solutions to (18) in terms of hypergeometric functions \( Y_1 \) and \( Y_2 \). These two functions are given by

\[
Y_1 = F \left[ -\frac{1}{2} - \frac{1}{2} \sqrt{1+K + \tilde{a}}, -\frac{1}{2} + \frac{1}{2} \sqrt{1+K + \tilde{a}}, \frac{1}{2}, X \right]
\]

and

\[
Y_2 = X^{\frac{3}{2}} F \left[ 1 - \frac{1}{2} \sqrt{1+K + \tilde{a}}, 1 + \frac{1}{2} \sqrt{1+K + \tilde{a}}, \frac{5}{2}, X \right]
\]
It is well known that hypergeometric functions can be written in terms of elementary functions for particular parameter values. This statement is also true for these two hypergeometric functions. Consequently two sets of general solutions in terms of elementary functions can be found by restricting the range of values of $K$ and $\alpha$. Thus we can express the first category of solution to (14) as

$$
\begin{align*}
y &= A \left( \frac{K - 1 - x}{K} \right)^{\frac{1}{2}} \left[ 4(n + 1) \sum_{i=1}^{n+1} \frac{(-4)^{i-1}(2i - 1)(n + i)!}{(2i)! (n - i + 1)!} \left( \frac{1 + x}{K} \right)^i + 1 \right] \\
&\quad + B \left( \frac{1 + x}{K} \right)^{\frac{3}{2}} \left[ \frac{3}{n + 1} \sum_{i=1}^{n} \frac{(-4)^{i}(2i + 2)(n + i + 1)!}{(2i + 3)! (n - i)!} \left( \frac{1 + x}{K} \right)^i + 1 \right]
\end{align*}
$$

(19)

For $K + \alpha = (2n + 3)(2n + 1)$.

The second category of solution is given by

$$
\begin{align*}
y &= A \left( \frac{K - 1 - x}{K} \right)^{\frac{1}{2}} \left[ \frac{3}{n (n - 1)} \sum_{i=1}^{n} \frac{(-4)^{i}(2i + 2)(n + i)!}{(2i + 3)! (n - i - 2)!} \left( \frac{1 + x}{K} \right)^i + 1 \right] \\
&\quad + B \left[ 4n(n - 1) \sum_{i=1}^{n} \frac{(-4)^{i-1}(2i - 1)(n + i - 2)!}{(2i)! (n - i)!} \left( \frac{1 + x}{K} \right)^i + 1 \right]
\end{align*}
$$

(20)

For $K + \alpha = 4n(n - 1)$.

Therefore two categories of solutions in terms of elementary functions can be extracted from the general series in (17). The solution in (19) and (20) have a simple form and they have been expressed completely as combinations of polynomials and algebraic functions. This has the advantage of simplifying the investigation into the physical properties of a dense anisotropic star.

**Discussion**

We have found solutions to the Einstein field equations for an anisotropic matter by utilizing the method of Frobenius for an infinite series; a particular form for one of the gravitational potentials was assumed and the anisotropic factor was specified. These solutions are given in terms of special functions and hypergeometric functions. For particular values of the parameters involved it is possible to write the solutions in terms of elementary functions: polynomials and product of polynomials and algebraic functions. The anisotropic factor may vanish in the solutions and we can regain the isotropic solutions. Thus our approach has the advantage of necessarily containing an isotropic neutral stellar solution found previously.

**References**


The Influence of Common Risk Factors for the Patient with Attempted Suicide Hospitalized at the Teaching Hospital, Batticaloa

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Abstract

Suicidal behavior has increased since the onset of the global recession, a trend that may have long-term health and social implications. A high suicide rate in any society is an index of social disorganization and the awareness of the seriousness of suicide in our society would not be overlooked. Aim of this study was to assess the common risk factors for the patients with attempted suicide hospitalized at the Teaching Hospital, Batticaloa. A cross sectional descriptive study was conducted using semi-structured interviewer administered questionnaire involving a convenience sampling of 100 suicidal attempters.

Of the respondents, conflict with others was the most common risk factor (75%) for attempted suicide with significant associations with educational status, marital status and age range (P < 0.05). Other risk factors such as social and emotional related issues, financial related problems, and health related problems were found 13%, 6% and 6% respectively. Frequent mode of attempting suicide was with Yellow Oleander poisoning (30%). Effective suicide preventive and control measures need to be taken in the form of early identification of suicide-prone individuals. Prevention efforts should focus on planned attempts because of the rapid onset and unpredictability of unplanned attempts.

Keywords: Risk factors, attempted suicide, hospitalized patients

Introduction

Suicide is defined as the conscious act of self induced obliteration, best understood as a needful individual who defines an issue for which the act is perceived as the best solution (Harlod et al.,1991). In the last 45 years suicide rates have increased by 60% worldwide. Suicide is among the third leading causes of death among those aged 15-44 years in some countries, and the second leading cause of death in the 10-24 years age group. Every year, almost one million people die from suicide (World Health Organization, 2013). The motivations are that attempted suicide is both one of the strongest risk factors for completed suicide and an important indicator of extreme emotional distress. Previous epidemiologic studies in the United States have estimated that between 1.1% and 4.3% of the population attempt suicide at some time in their life (Kessler et al., 1999).

Over 500,000 suicides which amount to more than 50% of world’s suicides occur in Asia. For the past 3 decades, one of the Asia’s leading suicide rates are being reported from Sri Lanka (World Health Organization, 2013). Even though Sri Lanka is a country caught the attention of various religions and cultures, suicidal rates are seemed in the significant quantity: In 2014, the male suicide rate was 34.8/100,000 and female rate was 9.24/100,000. The male: female ratio was 3.76:1. In the 10-19 year age group the females suicide rates was high. The highest rates in females were in the 20-29 year age group and highest rates in males were among the 50-59 year and over 60 year age groups (DeSilva et al., 2012). In Sri Lanka, Sinhalese had the highest suicide rate followed by the Sri Lankan Tamils who were predominantly Hindus. Moors who follow Islam, had the lowest suicide rates. The rural agricultural districts such as Vavunia, Polonnaruwa, Anuradhapura, Kurunegala, Matale, and Kegalle reported higher rates than rest of the country (Thalangala, 2009).

Suicide is often not recognized as a major public health problem due to the lack of statistics and the lack of research that would allow understanding of the problem (Jellinek & Synder, 1998). There was no well-established national program for prevention of suicide in Sri Lanka. Therefore, it was very much crucial to assess risk factors for suicide among public to acquire essential action to put a stop to the suicidal behaviors. Furthermore, this study will help to the health care providers and social workers to find out the areas where intervention of health care and social workers are needed to eliminate the suicidal behavior among the public. According to available records at Teaching Hospital, Batticaloa, 199 patients were admitted at the hospital from 1st of January to 31st of March 2013 as a result of attempted suicide. According to the available data, there is no study was carried out up to now to assess the risk factors for suicidal attempted in Batticaloa district. Aim of the study was to assess the influence of common risk factors for the patient with attempted suicide hospitalized at the Teaching Hospital, Batticaloa.
Materials & Methods

This was a descriptive cross sectional study which was conducted at the Teaching Hospital, Batticaloa among suicidal attempted patients. A case of suicidal attempt was defined as: “A person who had made deliberate act of self-harm aimed at self-destruction, irrespective of his/her intention to die”. A total of 100 patients hospitalized at the Teaching Hospital, Batticaloa as a result of suicidal attempt during the research period from July to December 2013, mainly in Emergency Treatment Unit, Intensive Care Unit, Counseling Centre, Psychiatric wards such as 23 and 24 and Medical wards such as ward 01, 04, 16, 21, 22, 34, and 35.

Convenience sampling method was used to select sample for this study and the clients who verbalize Tamil and willing to participate after the informed consent were considered as inclusion criteria. The clients who were refused give consent and physical instability at the time of study time were excluded from study. Data collection was done by using semi structured interviewer administered questionnaire among selected patients. The pre-tested questionnaires were conducted in 05 patients two weeks prior to the commencement of the main research at Base Hospital, Kaluwanchikudy. Through it, possible adjustments in the variables were made in questionnaire in order make the data collection process effectively.

Ethical Clearance was obtained from Ethical Review Committee, Faculty of Health–Care Sciences, Eastern University, Sri Lanka. The permission was obtained from the Director, Teaching Hospital, Batticaloa for data collection. The principal investigator explained the purpose of the research and the outcome to patients. An informed verbal consent was obtained before to carry out the research. Anonymity was ensured during data collection. All the data were maintained confidentially on personal computer with password. The personal data of the sample were not exposed to anyone other than the investigators. At the end of the research, all data obtained from paper materials of questionnaires were submitted to the Faculty of Health–Care Sciences, Eastern University Sri Lanka for keeping for a period and then destroyed. When the patients were exhausting at that movement of date collection either, bystander’s help was obtained with permission of participant to complete the date collection.

After the completion of data collection, the data were entered to Statistical Package for Social Science (SPSS – Version: 16) and were analyzed based on research problems, objectives and variables. Chi-square test used to check the significant association among variable.

Results

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<td>9 (9%)</td>
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<td>Sex</td>
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<tr>
<td>Female</td>
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<td>37 (37%)</td>
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<tr>
<td>Married</td>
<td>58 (58%)</td>
</tr>
<tr>
<td>Separated</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Other affairs</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Educational status</td>
<td></td>
</tr>
<tr>
<td>Less than Grade 5</td>
<td>10 (10%)</td>
</tr>
<tr>
<td>Grade 5 – 10</td>
<td>29 (29%)</td>
</tr>
<tr>
<td>O/L completed</td>
<td>9 (9%)</td>
</tr>
<tr>
<td>A/L competed</td>
<td>3 (3%)</td>
</tr>
</tbody>
</table>
Socio-Demographic characteristics

Table 1: Socio Demographic characteristics of the attempted suicide

<table>
<thead>
<tr>
<th>Religion</th>
<th>Male N (%)</th>
<th>Female N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu</td>
<td>92 (92%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>8 (8%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Attempts for suicide was found to be high (76%) among people living in rural areas. Among the gender 54% of persons attempted suicide were males. The peak age group is 11-20 years (37%). The other variables identified with incidence are; unemployed (56%) and married person (58%).

Method used for attempted suicide

Table 2: Method used for attempted suicide

<table>
<thead>
<tr>
<th>Type</th>
<th>Male N (%)</th>
<th>Female N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical poison (39%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pesticides</td>
<td>10 (10%)</td>
<td>2 (1%)</td>
<td>12 (2%)</td>
</tr>
<tr>
<td>Weedicides</td>
<td>10 (10%)</td>
<td>1 (1%)</td>
<td>11 (11%)</td>
</tr>
<tr>
<td>Repallents</td>
<td>1 (1%)</td>
<td>3 (3%)</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Others</td>
<td>4 (4%)</td>
<td>8 (8%)</td>
<td>12 (12%)</td>
</tr>
<tr>
<td>Plant poison (37%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow Olender</td>
<td>18 (18%)</td>
<td>12 (12%)</td>
<td>30 (30%)</td>
</tr>
<tr>
<td>Cerebra Manga</td>
<td>4 (4%)</td>
<td></td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Others</td>
<td>3 (3%)</td>
<td></td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Drug over dose (21%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracetamol</td>
<td>1 (1%)</td>
<td>8 (8%)</td>
<td>9 (9%)</td>
</tr>
<tr>
<td>Others</td>
<td>3 (3%)</td>
<td>9 (9%)</td>
<td>12 (12%)</td>
</tr>
<tr>
<td>Self injury (3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hanging</td>
<td></td>
<td>1 (1%)</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>2 (2%)</td>
<td>2 (2%)</td>
</tr>
</tbody>
</table>

The use of chemical poison (39%) and plant poisons (37%) comprise the most attempts of suicide in our study. Yellow Olender is found to be the significant mode (30%) of method used for suicide attempts.

Risk factors for attempted suicide

Table 3: Risk factor for attempted suicide

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Male N (%)</th>
<th>Female N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict with others (75%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With husband</td>
<td>-</td>
<td>9 (9%)</td>
<td>9 (9%)</td>
</tr>
<tr>
<td>With wife</td>
<td>16 (16%)</td>
<td>-</td>
<td>16 (16%)</td>
</tr>
<tr>
<td>With relations</td>
<td>10 (10%)</td>
<td>6 (6%)</td>
<td>16 (16%)</td>
</tr>
<tr>
<td>With family</td>
<td>15 (15%)</td>
<td>16 (16%)</td>
<td>31 (31%)</td>
</tr>
<tr>
<td>With neighbors</td>
<td>3 (3%)</td>
<td>-</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Social &amp; Emotional related problems (13%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Love affairs</td>
<td>-</td>
<td>5 (5%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>Marital dispute</td>
<td>-</td>
<td>1 (1%)</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>Relationship failure</td>
<td>2 (2%)</td>
<td>1 (1%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Loss of member</td>
<td>2 (2%)</td>
<td>1 (1%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Emigration of father</td>
<td>-</td>
<td>1 (1%)</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>Financial related problems (6%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loan</td>
<td>3 (3%)</td>
<td>-</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Loss of property</td>
<td>2 (2%)</td>
<td>1 (1%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Health related problems (6%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disability</td>
<td>2 (2%)</td>
<td>-</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Other diseases</td>
<td>1 (1%)</td>
<td>2 (2%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Psychiatric disorder</td>
<td>1 (1%)</td>
<td>-</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>
A number of 75% of those attempted suicide stated that conflict with others was the common reason and it was the pivotal risk factor for suicidal tendency. Conflict with immediate relatives was found as the most common risk factor for attempted suicide, which was shown significant associations with educational status, marital status and age (P < 0.05). However, suicide attempts due to financial issues was found to be 6%.

Discussion
The results of this study provide valuable and previously unavailable information about the risk factors of suicidal attempts in Batticaloa district. Most notably, across all countries examined, 60% of the transitions from suicidal ideation to first suicide attempt occurred within the first year of ideation onset. Moreover, risk factors included female gender, younger age, fewer years of education, unmarried status and the presence of a mental disorder, with psychiatric comorbidity significantly increasing risk. Interestingly, the strongest diagnostic risk factors were conflict with others which was found to be the commonest risk factor for attempted suicide. Among those, family conflicts were the major causes for attempted suicide. Patients with social and emotional related issues, financial problems, health related were other causes. But, a study noted that unemployment also as the major cause for attempting suicide (Srivastava et al., 2004).

Present study shows, males have attempted suicides more than females. Similar result was seen in Desilva et al. (2012). The Study shows the peak occurrence of suicidal attempts had occurred in the second and third decades of life. These findings confirm that attempted suicides are rising rapidly among the youths. Contrary to these results, a study in China has reported the peak occurrence of suicides in third and fourth decades (Philiphs et al., 2002). Religion has long been regarded as an important factor in suicide and attempted suicide. Research has shown that suicide rates are more in countries where religious practices are prohibited or strongly discouraged and where Buddhism, Hinduism or the Asian religions predominate (Gururaj & Isaac, 2001). Suicidal rates were lower in Muslim community throughout Sri Lanka (Thalangala, 2009). Education is an important risk factor for suicide. The individual with higher educational levels and employed as professionals and semi-professionals constitute less number of suicides and attempted suicides (Arun et al., 2004 and Latha et al., 1996). Present study also shows similar result. It emphasize that low level of education is an important risk factor for suicidal attempt.

The suicidal rate was very high in rural areas in the present study. Upon questioning, it was revealed that social isolation, easy availability of pesticides, greater difficulty in identifying warning signs, limited access to health facility and doctors, and lower levels of education were the possible reasons for this findings. The findings of this study shows that more numbers of suicides are among married people. Whereas WHO reports that divorced, widowed and single people are at a higher risk of suicide than married people (NagendraGouda & SambajiRao, 2008). Further some studies observed more number of suicide attempts in unmarried, divorced and widowed (Latha et al., 1996 and Narang et al., 2000). The main mode of attempting suicide was Yellow oleander (30%) in this study. Opposite to this result, a study done in India has reported the main mode of attempting suicide was organo-phosphorous compounds, followed by self-poisoning with over dosage of drugs and other common household substances (NagendraGouda & SambajiRao, 2008).

Conclusion
Risk factors for suicidal behavior in patients who presented to Teaching Hospital, Batticaloa include conflict with others mainly with close relatives, social & emotional related problems, less likely of financial related problems and health related problems. Most of the attempted suicides were found in rural areas. Frequent mode of attempting suicide was done by chemical & plant poisoning with Yellow oleander poisoning taking precedence. Males have attempted to suicide more than females. Age group between 11 to 20 years and who completed secondary education showed peak occurrence in attempted suicide. Married people have attempted suicide more than unmarried people.

Recommendations
Effective suicide preventive and control measures need to be taken in the form of early identification of suicide-prone individuals. There is an urgent need to institute a national suicide surveillance policy.
Healthcare providers, i.e. primary healthcare doctors, emergency personnel, psychologists, psychiatric nurses, human science professional social workers, clinical psychologists and teachers, should be adequately, and continuously, trained in the following areas:

- Suicide risk assessment and recognition.
• Treatment of medical emergencies owing to attempted suicide and the follow up after acute management, for referral to relevant specialties for further management.
• Use of new prevention technologies, by identifying those prone to high-risk suicide behavior.

Further research should be carried out to better understand the risks and protective factors, their effects, and their interaction, on suicide and suicide behaviours.

Limitations
Ours appears to be the first study in Batticaloa district on the factors connected to the attempted suicide. Based on the findings of this study a further well controlled research is needed with adequate sampling to represent the communities.

References


Analysing Volatility of Colombo Consumer Price Index using GARCH Models

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Abstract

The objective of this paper is to analyse and modelling the volatility of Colombo Consumer Price Index (CCPI) in Sri Lanka using monthly data from January 2008 to April 2014. Three types of GARCH models (GARCH, TGARCH and EGARCH) were used for this study. Using various specifications for mean equation, study estimated GARCH (1, 1), TGARCH (1, 1) and EGARCH (1, 1) for CCPI. The estimation results reveal that ARMA (1, 0) - EGARCH (1, 1) comes out to be most appropriate specification for modelling CCPI volatility. The study finds that, no evidence of symmetry in the response of CCPI volatility to negative and positive shocks.

Keywords: CCPI, GARCH, Unit root, Volatility.

Introduction

Measuring volatility of CCPI is important for policy maker because it provides them with guidance in formulating polices for achieving price stability. The modeling and forecasting is usually carried out in order to provide an aid to decision making and planning the future. Analysing volatility of CCPI are important inputs for government, businesses sector, policy makers, investors, workers and various individuals for various applications.

This study aims at modeling CCPI volatility using GARCH-family models and choosing the most suitable model among them. The ARCH model was first introduced by Engle (1982) for capturing time variant variance exhibited by almost all financial time series and many economic time series. The generalized version of ARCH model (GARCH model) was formulated by Bollerslev (1986).

Economic literature on issue of CCPI volatility is concerned with the positive relation of inflation level and conditional variance. Goudarzi and Ramanarayanan (2010) employed GARCH model on daily Bangalore stock price index series from 2000 to 2009 and obtained the GARCH (1, 1) model explains volatility of the Indian stock markets satisfactorily. Igogo (2010) used GARCH family models on monthly real exchange rate of Tanzania from 1968 to 2007 and found GARCH (1, 1) model was violated the non-negativity condition and the EGARCH (1, 1) model to measure the real exchange rate volatility. Awogbemi and Oluwaseyi (2011) conducted a study to determine the presence of the volatility in monthly CPI prices. Khalafalla Ahmed (2010) employed GARCH family models to determine the relationship between variability of inflation and it’s uncertainty in the Sudan using annual CPI data for the period from 1960 to 2005. The EGARCH (1, 1) model was found to correctly specify and estimate the conditional variance of inflation with possibility of a simultaneous feedback relationship between inflation and uncertainty.

Materials and Methods

Data: The secondary data on monthly CCPI from January 2008 to April 2014 were considered for the analysis and it was collected from Department of Census and Statistics.

Unit Root Test: The stationary of data is usually described by time series plots and correlogram. The unit root test determines whether a given series stationary or non-stationary. The Augmented Dickey-Fuller (ADF) test is mostly used to check stationary. In this paper ADF test has been used.

GARCH Model: The Generalized ARCH (GARCH) model was developed by Bollerslev (1986). The specification of the conditional variance equation for GARCH (1, 1) model is given by:

\[ \sigma_t^2 = \gamma_0 + \delta \sigma_{t-1} + \gamma \mu_{t}^2 \]  

where \( \gamma_0, \delta \) and \( \gamma \) are parameters.

TGARCH Model: The Threshold GARCH (TGARCH) model was introduced by the works of Zakoian (1990) and Glosten, Jaganathan and Runkle (1993). The main target of this model is to capture asymmetric in terms of negative and positive shocks. The specification of the conditional variance equation for TGARCH (1, 1) model is given by:
\[ \sigma_t = \gamma_0 + \gamma u_{t-1}^2 + \theta u_{t-1} d_{t-1} + \delta \sigma_{t-1} \]  
\[ \text{where } d_t \text{ takes the value of 1 for } u_t < 0 \text{ and 0 otherwise. If } \theta \neq 0 \text{, there is asymmetry while if } \theta = 0 \text{ the news impact symmetry.} \]

EGARCH Model: The exponential GARCH (EGARCH) model was developed Nelson (1991), and the variance equation for this model is given by:

\[ \log(\sigma_t) = \alpha + \beta \frac{u_{t-1}}{\sigma_{t-1}} + \delta \frac{|u_{t-1}|}{\sigma_{t-1}} + \phi \log(\sigma_{t-1}) \]

Where \( \alpha, \beta, \delta \) and \( \phi \) are parameters to be estimated. The log of the variance series makes the leverage effect exponential instead of quadratic and therefore estimates of the conditional variance are guaranteed to be non-negative. The EGARCH models allow for the testing of asymmetry. When, then positive shocks generate less volatility than negative shocks.

Model Selection Criteria: The following statistical measures were used to find an appropriate model for CCPI.

\[ AIC = \log \left( \frac{rss}{n} \right) + \left( \log(n) \cdot \frac{k}{n} \right) \]
\[ BIC = \log \left( \frac{rss}{n} \right) + \left( 2 \cdot \frac{k}{n} \right) \]

\[ \ln L = -\frac{n}{2} \ln 2\pi \sigma^2_a - \frac{1}{2\sigma^2_a} S(\phi, \theta, \mu) \]

Where: \( k \) = number of coefficient estimated, \( rss \) = residual sum of square, \( sst \) = sum of square total, \( n \) = number of observations.

Results and Discussions

1 Descriptive Statistics of CCPI

The basic analysis of CCPI is shown in table 1.

Table 1: Descriptive statistics of CCPI

<table>
<thead>
<tr>
<th>Statistic Measures</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>150.40</td>
</tr>
<tr>
<td>Median</td>
<td>150.60</td>
</tr>
<tr>
<td>Maximum</td>
<td>178.40</td>
</tr>
<tr>
<td>Minimum</td>
<td>118.70</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>17.18</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.205</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.776</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>5.27</td>
</tr>
<tr>
<td>Confidence Interval</td>
<td>[0.072]</td>
</tr>
<tr>
<td>for CCPI (at 5%)</td>
<td>[146.47,154.32]</td>
</tr>
</tbody>
</table>

From the table 1, the mean of CCPI is 150.40 and its standard deviation is 17.18. According to the Jarque–Bera statistic, the CCPI is normally distributed at 5% significance level, \( p=0.072 \). The mean of CCPI series lies between (146.47, 154.32) at 5% significance level.

The time series plot for the monthly CCPI series is shown in figure 1.
From the figure 1, it can easily be seen that CCPI has been increasing over time and variance is increasing with time. Thus, it is obvious that the series is not stationary. Also, this result is confirmed by unit root test and this result is shown in table 2.

Table 2: Results of the unit root test for CCPI

<table>
<thead>
<tr>
<th>Test Critical Values</th>
<th>1% Level</th>
<th>5% Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Statistics</td>
<td>-2.7773</td>
<td>-3.4717</td>
</tr>
<tr>
<td>Prob.</td>
<td>0.2103</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

Table 2 indicates that, the null hypothesis of the series is non stationary could not be rejected for CCPI [p=0.2103]. Therefore, CCPI series is non-stationary. Then, the CCPI series was transformed into the log differenced of CCPI series (LogDCCPI) and the time series plot and normality plot of this series were obtained and shown in figure 2 and figure 3 respectively.

From the figures 2 and 3, there is a high volatility exists in log difference of CCPI (kurtosis=4.622).
Table 3 indicates that, the null hypothesis of the series is non stationary is rejected for the log difference of CCPI \( p=0.0001 \). Hence, the log difference of CCPI series is stationary.

2. ARMA model for log differenced transformed of CCPI

The correlogram of sample ACF and PACF for LogDCCPI series (Figure 4) was considered for identification of suitable AR and MA orders.

<table>
<thead>
<tr>
<th>Autocorrelation</th>
<th>Partial Correlation</th>
<th>AC</th>
<th>PAC</th>
<th>Q-Stat</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.324</td>
<td>0.324</td>
<td>8.2002</td>
</tr>
<tr>
<td>2</td>
<td>0.038 -0.075</td>
<td>8.3121</td>
<td>0.016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-0.017 -0.006</td>
<td>8.3339</td>
<td>0.040</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.085 0.107</td>
<td>8.9198</td>
<td>0.063</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-0.121 -0.210</td>
<td>10.133</td>
<td>0.072</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-0.098 0.017</td>
<td>10.932</td>
<td>0.090</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-0.116 -0.093</td>
<td>12.069</td>
<td>0.098</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-0.120 -0.098</td>
<td>13.311</td>
<td>0.102</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Sample ACF and PACF for LogDCCPI

According to the Figure 4, the sample ACF has one significant autocorrelation at lag 1 and sample PACF has one significant coefficient at lag 1. Thus it can be hypothesized in the ARMA model to be fitted MA order to be 1 and AR order to 1. Thus, the following models were considered as possible models to represent the original series. They are: (i) ARMA (1, 1), (ii) ARMA (1, 0), and (iii) ARMA (0, 1). The estimates of the above ARMA models were shown in table 4.

Table 4: ARMA models for DLCCPI

<table>
<thead>
<tr>
<th>Models</th>
<th>Parameter Estimates</th>
<th>P-Value</th>
<th>AIC, SIC</th>
<th>Log likelihood</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARMA (1,1)</td>
<td>C=0.005 AR(1)=0.222</td>
<td>0.001 0.385</td>
<td>-6.658, -6.565</td>
<td>249.136</td>
<td>2.013</td>
</tr>
<tr>
<td></td>
<td>MA(1)=0.134</td>
<td>0.621</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARMA (1,0)</td>
<td>C=0.005 AR(1)=0.327</td>
<td>0.001 0.003</td>
<td>-6.683, -6.621</td>
<td>249.288</td>
<td>1.971</td>
</tr>
<tr>
<td></td>
<td>MA(1)=0.361</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARMA (0,1)</td>
<td>C=0.005 MA(1)=0.361</td>
<td>0.000 0.001</td>
<td>-6.618, -6.556</td>
<td>248.195</td>
<td>1.957</td>
</tr>
</tbody>
</table>

Table 4 indicates that the coefficient of AR (1) of ARMA (1, 0) model is significant at 5% significance level \( p\)-value = 0.003). Results in table 4 also indicate that of the three models the maximum log likelihood estimate and the lowest AIC and SIC values were obtained by ARMA (1, 0) model. Thus it can be concluded the best model out of these three models is ARMA (1, 0).

3 GARCH models for log differenced transformed of CCPI

This study investigates the issue of CCPI’s volatility by using three types of the GARCH-family models. The result of ARMA (1, 0)-GARCH (1, 1) model is shown in Table 5.

Table 5: ARMA (1,0)-GARCH (1,1) Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>Z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
</table>


The table 5 indicates that the coefficient of related with AR (1) in equation for mean of ARMA (1,0)-GARCH(1,1) is statistically significant. Also, the equation for variance, the both coefficients of ARCH and GARCH terms are statistically significant.

The estimated GARCH (1, 1) model is:

\[ \sigma_t = 3.1 \times 10^{-6} + 1.045 \sigma_{t-1} - 0.102 u_{t-1}^2 \]

GARCH can capture asymmetric response of negative and positive shocks on volatility. This asymmetric response of volatility is termed as leverage effect. A summary result of ARMA (1, 0)-TGARCH (1, 1) is shown in table 6.

Table 6: ARMA (1, 0)-TGARCH (1,1) Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>Z-Stat</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.0034</td>
<td>0.0014</td>
<td>2.3298</td>
<td>0.0198</td>
</tr>
<tr>
<td>AR(1)</td>
<td>0.3119</td>
<td>0.0695</td>
<td>4.4857</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Variance Equation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>Z-Stat</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3.40 \times 10^{-6}</td>
<td>2.04 \times 10^{-6}</td>
<td>1.6630</td>
<td>0.0963</td>
</tr>
<tr>
<td>Resid(-1)^2</td>
<td>-0.0955</td>
<td>0.0408</td>
<td>-2.2792</td>
<td>0.0227</td>
</tr>
<tr>
<td>Resid(-1)^2*(Resid(-1)&lt;0)</td>
<td>0.0389</td>
<td>0.1408</td>
<td>0.2764</td>
<td>0.7823</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>1.0193</td>
<td>0.0627</td>
<td>16.2440</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

The table 6 indicates that the coefficient related with AR(1) in equation for mean of ARMA (1,0)-TGARCH(1,1) is statistically significant. Also, the equation for variance, the coefficients of ARCH and GARCH terms are statistically significant. Other two terms are not statistically significant. Although, table 6 shows that the coefficient of the $[\text{Resid (-1)}^2*(\text{Resid(-1)<0})]$ term is positive and statistically significant, this is evidence of no symmetric response volatility of differenced log CCPI to negative and positive shocks.

The estimated TGARCH (1, 1) model is:

\[ \sigma_t = 3.4 \times 10^{-6} - 0.096 u_{t-1}^2 + 0.039 u_{t-1}^2 d_{t-1} + 1.019 \sigma_{t-1} \]

Another model which can capture asymmetry in response of conditional variance to negative and positive shocks is EGARCH. A summary result of ARMA (1, 0)-EGARCH (1, 1) is reported in Table 7.

Table 7: ARMA (1, 0)-EGARCH (1,1) Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>Z-Stat</th>
<th>Prob.</th>
</tr>
</thead>
</table>

[AIC= -6.602, SIC= -6.615, Log Likelihood=257.673]

The table 6 indicates that the coefficient related with AR(1) in equation for mean of ARMA (1,0)-TGARCH(1,1) is statistically significant. Also, the equation for variance, the coefficients of ARCH and GARCH terms are statistically significant. Other two terms are not statistically significant. Although, table 6 shows that the coefficient of the $[\text{Resid (-1)}^2*(\text{Resid(-1)<0})]$ term is positive and statistically significant, this is evidence of no symmetric response volatility of differenced log CCPI to negative and positive shocks.
The table 7 indicates that the coefficients related with AR (1) in equation for mean of ARMA (1, 0) - EGARCH (1, 1) is statistically significant. Also, the in equation for variance, the coefficients of three terms are statistically significant. Although, table 7 shows that the coefficient of the \( [\text{RESID}(-1) / \text{SQRT} \text{GARCH}(-1)) \) term is negative and not statistically significant, this is evidence of no symmetric response volatility of differenced log CCPI to negative and positive shocks.

The estimated EGARCH (1, 1) model is:

\[
\log(\sigma_t) = -18.978 + 0.568 \frac{\mu_{t-1}}{\sigma_{t-1}} - 0.063 \frac{\mu_{t-1}}{\sigma_{t-1}} - 0.881 \log(\sigma_{t-1})
\]

4 Model Selection

In the model selection, the log likelihood, AIC and SIC values from each estimated models were computed. Using these statistics, to estimate which model is a better estimate for CCPI. The model with the lowest AIC and SIC values and the highest value of log likelihood are concluded to be the better model. The results are reported in Table 8.

Table 8: Model selection results

<table>
<thead>
<tr>
<th>Models</th>
<th>AIC</th>
<th>SIC</th>
<th>Log likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARMA(1,0)-GARCH(1,1)</td>
<td>-6.862</td>
<td>-6.706</td>
<td>259.89</td>
</tr>
<tr>
<td>ARMA(1,0)-TGARCH(1,1)</td>
<td>-6.602</td>
<td>-6.615</td>
<td>257.67</td>
</tr>
<tr>
<td>ARMA(1,0)-EGARCH(1,1)</td>
<td>-6.908</td>
<td>-6.722</td>
<td>261.62</td>
</tr>
</tbody>
</table>

Table 8 indicates that both AIC and SIC values from EGARCH (1, 1) model is the lowest compared with other two models. Also, log likelihood value is high for EGARCH (1, 1) model. Therefore, it shows that the EGARCH (1, 1) is the best model to determine the volatility of monthly CCPI series.

5 Diagnostics checking for EGARCH (1, 1) model

To validate the assumptions of residuals, the following hypotheses are to be considered.

1. \( H_0 \): There is no serial correlation in the residuals.
2. \( H_0 \): There is no ARCH effect in the residuals.
3. \( H_0 \): The residuals are normally distributed.

In order to check the serial correlation of residuals, the correlogram of squared residual was carried out and the result is shown in figure 5.
Figure 5: Correlagram for sample ACF and PACF of squared residuals

Figure 5 shows that, the all p-values of autocorrelations are not statistically significant at 5% significance level. Therefore, residuals are not serially correlated.

In order to check the ARCH effect of residuals, the ARCH LM test was carried out and the result is shown in Table 9.

Table 9: Result of ARCH effect

<table>
<thead>
<tr>
<th>ARCH Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>0.4478</td>
</tr>
<tr>
<td></td>
<td>[0.5056]</td>
</tr>
<tr>
<td>Obs*R-squared</td>
<td>0.4575</td>
</tr>
<tr>
<td></td>
<td>[0.4988]</td>
</tr>
</tbody>
</table>

Table 9 indicates that the Obs*R-squared is not significant [p=0.4988] at 5% significance level. Therefore, the hypothesis of no ARCH effect cannot be rejected. Hence, there is no ARCH effect in the residuals.

In order to check the normality of the residuals, the Jarque-Bera test was carried out and the result is shown in figure 6.

Figure 6: Normality plot

Figure 6 shows that, the respective p-value of Jarque-Bera statistic is not significant at 5% significance level [p=0.379]. Thus, it is confirmed that residuals series is normally distributed. Based on the above detailed analysis of residuals, it can be confirmed that the EGARCH (1, 1) model is satisfied all the diagnostic tests. Hence, the EGARCH (1, 1) model is the best model to modelling the volatility of CCPI.

Conclusions and Recommendations

This study aimed to modeling volatility of CCPI using GARCH family models. The CCPI data is not stationary at level. By differences of log transformed the series of the CCPI data becomes stationary. Then various GARCH models were estimated. The comparative performance of these GARCH models have checked and verified by using the model selection procedure (AIC and SIC). The comparison indicates that the EGARCH (1, 1) model as the best model to modelling the volatility of CCPI.

References


Long Term Solution for Flood in Malala Lagoon, Hambantota

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Abstract

The lagoon systems play a major role in maintaining the balance of the organisms as well as the physical environment. The lagoon resources were misused due to unavailability of a proper management plan, environment pollution and lagoons converted into lands and polluted due to natural disasters. Therefore, the research was focused to find the vulnerable area and vulnerable communities to the flood; to carry out a scientific study to assess the hydrological, ecological, and biological impacts of the increased inflow into the lagoon; to study how the above problems affect the fishing community who depend on the lagoon for their livelihood, the farmers community who rely on paddy fields of vulnerable area and the other organisms who depend on the lagoon and surrounding area for their livelihoods; to find a long term solution for the flood in Malala and Embilikala lagoons, situated inside the Bundala conservation area of Hambanthota district. Considering the biological environment and the inundation affects the divert water directly to the sea from a canal through the reserved area is the best alternative to be acceptable by both farming and fishing communities and the environment.

Keywords: lagoons, floods, vulnerable, community, conservation

Introduction

Biome is a combination of lives in the small environmental units. Among the sub units in the biosphere the ‘wetlands’ received much importance because this wetland environment comprises of forests, deltas, estuaries, riverine, lakes, villu and lagoons. Among these sub units of the lagoon environmental system get an important place as it provides livelihood for the variety of plants and animals and acts as a source for the important needs of the human beings. The lagoons are known as the water bodies which are temporarily separated from the ocean for a long time by any of the disturbances and it is connected with the ocean in a certain period of a year (under the amendment of 1981 No 57 coast conservation act 12(5)of coastal zone management plan). Also the lagoons are known as the water bodies which are permanently separated by the ocean and connected with the ocean only in a period of a year (Source: Sri Lanka’s Natural Resources- Mihikatha Organization).

The lagoon systems play a major role in maintaining the balance of the organisms as well as the physical environment. Present data indicates that Sri Lanka has mainly 89 lagoons in 36000 hectares of total area. But the worst situations near these lagoon systems are misused of resources because, unavailability of a proper management plan, natural lagoon environment pollution and lagoons converted into lands and polluted due to natural disasters (Matsuno \textit{et.al.},1998). After the tsunami in 2004, these adverse situations were increased and also there were involvement of government and other organizations in development and reconstruction. But due to lack of money, resource persons and other organizational conflicts influence on lagoon system was considerably low in Sri Lanka (Abeywickrama \textit{et. al.}, 2009).

Malala lagoon is located in Hambantota secretariat division of Hambantota district. Hambantota is a district situated in southern province which was affected from small and medium scale natural hazards in the recent past includes last event of tsunami, small earth quakes/trimmers, human-elephant conflict, drought, flood and landslides and some of natural disasters, like drought and flood occur regularly. Therefore, Hambantota is also indicated as a multi-hazard zone in Sri Lanka (fig.1). Malala-Embilikala lagoon system comprises of two water bodies, Malala and Embilikala which are connected to each other through a narrow canal. Malala lagoon is located close to the sea and it is open to the sea through nearly a 300 m wide mouth during the rainy season. During the dry periods, the mouth is closed by a naturally formed sand bar which is about two meters high from the lagoon water level. Embilikala is a low saline lagoon and is located nearly 1.7 km away to the Northeast of Malala connected through the canal, which is about a 40 m wide narrow canal that runs for about 3.1 km meandering between the two water bodies.
Decreased salinity in the Malala-Embiliyala lagoon water and inundation of riparian land have caused severe socio-economic problems to the people who rely on the lagoon resources for livelihoods and also farmers who carry out their agricultural activities in the periphery of the lagoon. Therefore, an effort was made to find the vulnerable area and vulnerable communities to the flood; to carry out a scientific study to assess the hydrological, ecological, and biological impacts of the increased inflow into the lagoon; to study how the above problems affect the fishing community who depend on the lagoon for their livelihoods, the farmers community who rely on paddy fields of vulnerable area and the other organisms who depend on the lagoon and surrounding area for their livelihoods; to find a long term solution acceptable to farmers, fishermen and the Bundala wildlife authority as both Malala and Embiliyala lagoons are situated inside the Bundala conservation area.

**Methodology**

Data were collected by using a questionnaire from the villagers and by interviewing the Grama Niladari of Koholankala. No. of 14 farmers of the Udamalala Shakthi farmer association were interviewed and questionnaires were filled accordingly. Information about the fishermen was filled according to the gathered data from the fisheries cooperation of Udamalala. Secondary data were collected by interviewing the Grama Niladari of Koholankala G.N. division, Assistant Director of Hambantota Disaster Management Coordinating Unit and Director of Statistical Branch and the field officers of Bundala National Park.

Hazard Factor Area (HF_A) was calculated using following equation (Matsuno et.al., 1998).

\[
HF_A(i) = \frac{\text{Area under flood in land unit } i}{\text{Total area of land unit } i} \times 100
\]

**Results and Discussion**

The study area was affected by the flood and the area which could be survived after the flood (fig 2). In the village Udamalala of Koholankala G.N. division, from total paddy cultivation area of 49.5 acres 35.25 acres of land was inundated from the last flood event and it was 71% of the total land area and only 14.25 acres (29%) of land area was under survival condition after the flood.
According to the Shakthi farmer association of Udamalala, about 200 acres of paddy fields of all four G.N divisions (Koholankala, Pallemalala, Boralesssa, Bundala) are flooded during the rainy season as the lagoon water does not flush away. Therefore, they had taken immediate decisions to breach the sand bar to open up the lagoon for the water to flush out, not only once but thrice in 2006/2007 and four times from 2012 November to 2013 January (Source: District Disaster Management Coordinating Unit, Hambantota) during the cultivating season.

The sand bar opened 18th December 2012 due to the flood itself without any human interactions. This inundating water takes more than 4 or 5 days to sweep away from the paddy fields even after cut off the sand bar. This created severe economic problems for the farmers who rely on these paddy fields for their livelihoods. Many farmers had taken loans from private banks to their paddy fields and after the flood they were affected severely. After the flood as the land was mixed with saline water, if they want to cultivate again they should prepare the land for that by reducing the level of salinity to be suitable for the paddy. This situation affects the farmers not only economically but also physically and mentally.

Fig. 3(a) shows the rainfall distribution of Hambantota district from 2003-2012 and it was observed that the annual rainfall was increased up to 1330 mm after 2005 and again the rainfall decreased in 2011 to about 1000 mm and then in 2012 it was increased to 1290 mm. It was observed in fig 3(b) that the rainfall from the month August to December had been increased rather than in the other months. In October, November and December the rainfall was very much higher and according to the farmer organization of Udamalala, they cut open the sand barrier in these periods more than 2-3 times.
The drainage of irrigation from the Lunugamwehera project that was commissioned in 1986 and the Bandagiriya Irrigation Scheme located upstream of the lagoon system, have adversely affected water quality in Malala and Embilikala lagoons (Priyadarshana et al., 2009). Salinity levels have dropped due to the increase fresh water inflow into the lagoons. There is a concern that further increases in fresh water input to the lagoons would render them unsuitable to existing aquatic species (Matsumo et al., 1998). One of the major impacts of irrigation water could be the raising of water levels in the lagoons that could make feeding sites unavailable for many water birds. Also, the increased fresh water inputs to the lagoons may effectively convert these rare brackish coastal ecosystems into fresh water ones and have a profound impact on the associated biota.

Water quality changes show that the salinity levels were decreasing in the lagoon. It was observed that the salinity in the lagoon has been dropped below 1ppt in 2009 (fig. 4a). Fig. 4(b) illustrates the highest and lowest salinity levels of the lagoon from 1985 to 1997. It is observed that in 1995/1997 the lowest salinity level was dropped to zero and the highest salinity level was 7 ppt which was lower than the lowest salinity in 1985/1987. With time both the highest and the lowest salinity levels were decreased very rapidly. From tables 1, 2 and 3, a large number of species which cannot tolerate fluctuations of salinity to such low levels have disappeared from the lagoon. Instead several new species were found in the lagoon after this water quality alteration. Yet, a number of species have showed resilience even after decreased salinity. It has been observed the species have declined in the lagoon as a result of decreased salinity levels, and all these species as listed in table 2, are economically very important for the fishermen.

Most important species in the decline is *Metapenaeus* and *Penaeus* species (Fisheries Cooperation, Pallemalala), which fetch higher prices at the market. On the other hand, the abundance of species like *Anguilla bicolor* which have shown resistance to salinity changes has increased which do not have a demand markets, and hence considered useless. As per the fishermen in the surrounding area who rely on fishing, in present, comparing to the past fish catches, it has been decreased the amount of fish production in the lagoons. And also after sometime in future they may be lost the fishing site for varieties of fishes, and these lagoons may convert into a livelihood for fresh water species which are shown in table 3.

The average fish production has dropped from more than 120 kg/ha (before 1992) to less than 50 kg/ha based on the information provided by the fisheries cooperation of the area. Shrimp production, which was the lucrative and thriving activity of the fishers have declined to negligible levels at present from 15-30 kg/ha before 1986/87. Decreasing fish catch has led the fishermen to employ sub optimal practices. Decreasing income has forced the fishermen to devote more time in fishing even juvenile and young cohorts, which have pushed the yields to go below marginal levels and unsustainable. At least, 75% of the fishermen in the area are affected badly due to this loss of livelihood.

### Table 1: Species that showed resilience to low salinity levels (Source: Bundala National Park)

<table>
<thead>
<tr>
<th>Species</th>
<th>Local name</th>
<th>1991/92</th>
<th>1993/95</th>
<th>1995/97</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Anguilla bicolor</em></td>
<td>Aandha</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><em>Arius maculates</em></td>
<td>Anguluwa</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><em>Chanos chanos</em></td>
<td>Vaikkaya</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><em>Gerres filamentosus</em></td>
<td>Olaya</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><em>Mugil cephalus</em></td>
<td>Serayawa</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><em>Terapon theraps</em></td>
<td>Keeli</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><em>Oreochromis mossambicus</em></td>
<td>Tilapia</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><em>Oreochromis niloticus niloticus</em></td>
<td>Nilotica</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>
Although it is a positive effect for the growth of fresh water species, the problem is the lost of varieties of saline water species in the lagoons. And also for the fresh water species there are several breeding sites available in the country but for these saline water species there are only limited sites available. So this problem has to be solved as quickly as possible to protect these natural resources.

Table 2: Species which were lost after decreased salinity levels (Source: Bundala National Park)

<table>
<thead>
<tr>
<th>Species</th>
<th>Local name</th>
<th>1991/92</th>
<th>1993/95</th>
<th>1995/97</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caranx sexfasciatus</td>
<td>Inguru parava</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambassis ambassis</td>
<td>Katilla</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glossogobius giuris</td>
<td>Weligowwa</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyporhamphus limbatis</td>
<td>Morella</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metapenaeus sp.</td>
<td>Eian issa</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opisthopterus tardoore</td>
<td>Maisthre lagga</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penaeus indicus</td>
<td>Kiri issa</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penaeus merguiensis</td>
<td>Kiri issa</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penaeus monodon</td>
<td>Karawadin issa</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetraodon flaviatilis</td>
<td>Bataya</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thryssa setirostris</td>
<td>Laagga</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: New species found in the lagoon (Source: Bundala National Park)

<table>
<thead>
<tr>
<th>Species</th>
<th>Local name</th>
<th>1991/92</th>
<th>1993/95</th>
<th>1995/97</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alectis ciliaris</td>
<td>Kaha parava</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Etiplus suratensis</td>
<td>Koraliya</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labeo dussumieri</td>
<td>Hirikanaya</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liga vaigeinsis</td>
<td>Godaya</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are positive consequences due to these physical changes that take place in the water body such as creation of new habitats, expansion of wetlands to land-water interface, supporting diverse biological communities due to expansion of habitats etc. However, it is apparent that drastic ecosystem changes are taking place due to changes in water levels: a number of large trees have died in the recent years at inundated areas. Loss of large vegetation canopies will affect nesting habitats of larger bird species and there is a danger of diminishing populations of large migrant birds from this wetland site (Table 4). It is apparent that large patches of katu andara, although an alien invasive species, have died; however, the effect of this is yet to be seen. Eradication of such invasive species (according to villagers, it has become a nuisance to both human and wild animals, too) might have positive impacts on the ecosystem.

The ecosystem of the Malala – Embilikala lagoons have been severely affected by the drainage flow from the KOISP (Kirindi Oya Irrigation and Settlement Project) and the Bandagiriya irrigation schemes. Since the KOISP was implemented, the salinity of the lagoons has dropped due to the inflow of upstream irrigation water. This change in salinity levels has influenced the population of birds as it has affected their food supply. Fortunately for the past ten consecutive years tracts 5, 6 and 7 have only been cultivated in one season due to the water shortages in the scheme (De Alwis et. al., 2008), which has positively affected the Embilikala lagoon.

As per the Bundala National Park the runoff released from the both KOISP and Bandagiriya which reach the lagoon system are high nutrient pollutants due to the agricultural based activities. The water brings in high amounts of nutrients (breaking the phosphorus limitation barrier) into the lagoon system, which is evident from high productivity and eutrophication which is an emerging problem in the lagoons (Abeywickrama, 2009). The water is being greenish colour as a result of the accumulation of nutrients and increase green algae. The main causes are overgrazing which results in animal faeces entering surface water and runoff from upstream irrigated areas, which brings fertilizer and soil into the lagoon, as well as other agro chemicals including insecticides, herbicides and fungicides, especially as these chemicals are sometimes applied in excess of agricultural requirements. Lush growth of higher forms of aquatic flora has reached uncontrollable levels. Although water quality records are unavailable, it is suspected that agrochemical and their residues have contaminated the lagoon. One piece of evidence to support this was the fisher men’s claims that they have noticed skin rashes, and irritations when in contact with lagoon water for prolonged duration. Agro-chemicals are toxic to birds and aquatic life. Also bioaccumulation of any of these chemicals...
will have impact on humans who consume such aquatic produce. The increased growth of aquatic plants leaves the current methods of fishing difficult to carry out. This can lead to less catch or fishers trying to remove plants causing them extra stresses.

Table 4: Types of vegetation commonly found in the area

<table>
<thead>
<tr>
<th>Species</th>
<th>Local name</th>
<th>Type of vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia chundra</td>
<td></td>
<td>Tree</td>
</tr>
<tr>
<td>Acacia eburnea</td>
<td>Kukul katu</td>
<td>Shrub</td>
</tr>
<tr>
<td>Atalantia ceylanica</td>
<td>Yakinaran</td>
<td>Shrub</td>
</tr>
<tr>
<td>Aquilaria agolocha</td>
<td>Agil</td>
<td>Tree</td>
</tr>
<tr>
<td>Azema tetracantha</td>
<td>Mashadda</td>
<td>Shrub</td>
</tr>
<tr>
<td>Blachia umbellate</td>
<td>Kossatta</td>
<td>Shrub</td>
</tr>
<tr>
<td>Cassia auriculata</td>
<td>Ranawara</td>
<td>Shrub</td>
</tr>
<tr>
<td>Dichrostachys cinerea</td>
<td>Andara</td>
<td>Shrub</td>
</tr>
<tr>
<td>Drypetes sepiaria</td>
<td>Weera</td>
<td>Tree</td>
</tr>
<tr>
<td>Manilkara hexandra</td>
<td>Palu</td>
<td>Tree</td>
</tr>
<tr>
<td>Opuntia dellenii</td>
<td>Pathok</td>
<td>Shrub</td>
</tr>
<tr>
<td>Prosopis juliflora</td>
<td>Mesquite</td>
<td></td>
</tr>
<tr>
<td>Salvador persica</td>
<td>Mallithan</td>
<td>Tree</td>
</tr>
<tr>
<td>Securinega leucopryra</td>
<td>Katupila</td>
<td>Shrub</td>
</tr>
<tr>
<td>Tetrameles nudiflora</td>
<td>Hema</td>
<td>Tree</td>
</tr>
<tr>
<td>Terminalia arjuna</td>
<td>Kumbuk</td>
<td></td>
</tr>
</tbody>
</table>

Modifications of the irrigation system in the recent past has been altered the hydrology of the area. The inundation and subsidence and draw down of the water levels have subsequently created sedimentation problems in the lagoon (Smakhtin et.al., 2002). The flood water carries large amounts of fine sediments from the riparian areas, and gets deposited in the lagoon. Under the resettlement programmes and agricultural development activities in the catchment, large extent of forest clearing and direct runoff to the lagoon system have increased. Due to the both hydrological changes and development activities, the inputs of sediment have increased dramatically. As the flushing out of the lagoon does not take place frequently, this deposited sediment (the muddy layer at the bottom) has grown into layers thicker than previously observed levels. This has been threatening the ecology of the water environment, affecting both flora and fauna.

And as per the Bundala National Park the problem of sedimentation is increasing at a higher speed and most of the lagoon area was covered by mud. If this situation will not be controlled, in future the whole lagoon system will disappear. As mentioned in previous sections, both lagoons drain into the sea through a small outlet. This natural outlet is covered with a very wide (50-70m) sand bar which has to be breached manually or has to remain until the lagoon water level rises high enough to wash the sand bar away. In order to alleviate this problem, a canal has been excavated in 1994 (Abeywickrama, 2009). It is about 16m wide and runs about for 1 km until it reaches a rocky beach with insufficient sand movement to block the outlet. At present there is a water level-regulating structure at the lagoon end of the canal (i.e. upstream end of the canal). This structure has 10 bays with provisions to insert timber planks with a span of 1.6 m each. Particular tail section adopted in the construction has reduced the effective canal bed width to about 10 m which otherwise would be about 16 m. In an average day in a rainy season with no floods, flow through this structure is about .2 to .5 m³/s. with the arrival of the flood, when the water level goes up, flow speed picks-up. In the absence of any backwater effect from the sea water levels, discharge capacity of a 16 m wide canal with about 1.5 m water depth will be about 50m³/s. Therefore this canal can carry a maximum of about 4.3 MCM of water into the sea in 24 hours.

Present water surface area of Malala and Embilikala lagoons during an average day with no flood situation is about 1000 ha. During flood, water surface area may increase by about an additional 300 ha (District Engineers Office, Hambantota).

Conclusion

An acceptable solution should consistently satisfy the safeguard of the fishing community, protect the agricultural land from unwanted inundation with lagoon water, not disturb/disrupt the delicate balance between anthropogenic activities and biology/ecology of the lagoon system and should be able to promote/maintain ecological health of the wetland ecosystem as a whole. When concern about the fishing community, to reduce the inflow into the lagoon; so that salinity of the lagoon water is...
favorable and support enhanced fishery activity, thereby reviving their lost livelihoods to become economically stable. If there is no way to achieve reduces water inflows, then to find a feasible solution to maintain the fish population at sustainable levels while maintaining a sufficient water level. When concern about the farming community, to carry out farming and related activities without any disturbance and interruption is recommended.

At present, the farmers are able to cultivate only two seasons, and they are forced to harvest before the rainy season to avoid flooding of the land due to increased lagoon water levels. This has created various difficulties for them, as they are in constant ambiguity and confusion as to what would happen during the cultivated season: whether the field would go under water or not.

They also say that unlike fishermen, the farmers have to invest capita; and running costs for agricultural activities. On the contrary, the fishermen do not have to invest any money in cultivating fish in the lagoon and they spend only labour and time for returns. Once the farmland is inundated and consequently when the harvest is destroyed, the farmers lose both their investment as well as the livelihood. The farmers’ attitudes towards the fishing community are very hostile and unfriendly due to the above reason. Under these circumstances, the farmer community resorts to inflexible and hasty action of breaching the sand dune, which is detrimental to maintaining fish stocks in the lagoon which is not acceptable to the fishing community.

The farmers suggest that the solution for increased water level is to allow breaching of the sand dune, when the water level reaches a predetermined datum. But this solution would not acceptable by fishing community. For that reason the objective of this study is to explore whether a datum can be established to maintain the lagoon water at level that is acceptable by both the communities.

Subsequently, the second task would be exploring how to achieve and maintain this water level. The method of maintaining the water level is crucial to fishing communities and thus must be acceptable to them. It is important because the farmer might not be interested in how to achieve this, and at the same time it would be difficult to reach a compromise unless they are convinced that the solution proposed has consistency in maintaining the water level.

**Finding a technical solution:**

Five alternative solutions were considered for the problem and they were compared with each other economically and environmentally. Then finally the best alternative was selected as the most suitable solution for the identified problem.

- Constructing a concert spillway at the location where the sand bar is formed, thereby allowing the water to spill over to the sea when the water level rises.
- To make an anicut across the Ooday connecting the Embilikala and Malala lagoon.
- To divert water from Embilikala lagoon directing to sea through a cannel constructed towards Bundala Lewaya.
- To rehabilitate and modify the existing canal of Pita Ela located at south west end of the lagoon, to augment its capacity of flow thereby allowing continuous flushing out of excess water.
- To divert the access inflow from the development programmes (KOISP and Lunugamwehera projects) through a new canal to the sea through the reserved area of Bundala National Park. This can be constructed in between Malala lagoon and the Koholankala lagoon.

**Table 5: Comparison of the alternatives**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Cost</th>
<th>Environmental impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Canal from Embilikala lagoon to the sea.</td>
<td>High</td>
<td>Negative</td>
</tr>
<tr>
<td>2. Concrete spillway at the sand bar.</td>
<td>Extremely high</td>
<td>Negative</td>
</tr>
<tr>
<td>3. Anicut across the canal.</td>
<td>High</td>
<td>Negative</td>
</tr>
<tr>
<td>4. Modification of the outlet canal.</td>
<td>Low</td>
<td>Not significant</td>
</tr>
<tr>
<td>5. Divert water directly to the sea from a canal through the reserved area.</td>
<td>High</td>
<td>Positive</td>
</tr>
</tbody>
</table>

Considering the cost and the environment impact, Alternative 4&5 are seem to be feasible (table 5). From these two alternatives if considered only about the cost and the affected communities the alternative 4 is most suitable but, when considered about the species living in and around the lagoon, the alternative 4 is not an acceptable solution. Because modifying the outlet canal will reduce the water level in a flood situation and it will always act to carry out access water in the lagoon to the sea. So that the lagoon water will never be mix with the sea water, then lagoon water will become more and more fresh and finally will become completely a fresh water lagoon. This will create severe problems to the species living in and around the lagoon which rely on saline water.

Considering the biological environment and the inundation affects the alternative 5 is the best alternative to be acceptable by both the communities and the environment.
References


Biology Teachers’ Beliefs about Biotechnology and Biotechnology Education in the Eastern Province of Sri Lanka

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Abstract

This study examines teachers’ understanding of the normative connections between key concepts of biotechnology and underlying biological principles that are critical for an in-depth understanding of teaching biotechnology education in school. Many teachers avoid addressing biotechnology topics available in the Advanced Level biology curriculum. Aiming to explore the factors which influence teachers’ practice, using a structural questionnaire, we examine randomly selected teachers’ understanding of these relationships at school level in the Eastern Province in Sri Lanka. A total of 63 biology teachers participated in this study and completed written questionnaire on their beliefs about biotechnology and biotechnology education. Findings from this study were: there is a strong positive response on teachers believes that biotechnology is interesting and important for life improvement (M=4.46, SD=0.96, t(62)=12.02, P=0.00) and this attitude influences their practice towards biotechnology education. Almost all the teachers had a good knowledge on biotechnology but not the relationship between application and basic knowledge which was observed to be with significant value. The teachers were willing to buy GM food if they were healthiest than other foods. However, they did not accept the application of biotechnology for medical purposes for some reasons. Many teachers consider that biotechnology education is important. The interest towards the subject and subject information persuades this attitude. Although outcome is preliminary in nature, the results provide cause for concern over the status of biotechnology education in Sri Lanka that needs uplift from the ground level.

Keywords: biotechnology, beliefs, biotechnology education, biology teachers

Introduction

Producing scientifically and technologically literate citizens has been a concern of educators and many policy makers around the world for more than three decades. UNESCO (1994) suggests that scientific and technological literacy are necessary to deal with the requirements of modern life. Accordingly, an emphasis on intensifying scientific literacy is obvious in many curricula all over the world. Over the past decade, science education reform recommendations have been fairly apparent in the secondary education in Sri Lanka. Influential policy recommendations hope to prepare a scientifically literate national workforce that is equipped to compete in an increasingly science and technology based global economy (Lumpe et al., 2000). In the recent curriculum revision in Sri Lanka; secondary science subjects in particular underwent a lot of changes. A variety of new aspects have been incorporated. For instance, the Advanced Level Biology subject has been incorporated with many molecular biological and biotechnological aspects.

Rapid development of biotechnology has contributed to important biomedical, agricultural and industrial triumphs (Fonseca, 2012). However, in spite of its potentials, biotechnology constantly challenges the public by raising many controversial issues (Hanegan and Bigler, 2009). With the litigious views provided by the media regarding issues and concerns associated with human cloning and the production of genetically modified organisms (GMOs), schools and teachers are asked to play an important role in the promotion of biotechnology education (Bryce and Gray, 2004; Hanegan and Bigler, 2009). Accordingly, in recent years, biotechnology-related topics have been increasingly incorporated in secondary science curricula in numerous countries (Hanegan and Bigler, 2009) and Sri Lanka is not an exemption. The role of the teacher, and their beliefs about teaching and the subject matters they teach, must not be ignored if the recommendations of revised curricula should result in permanent change in the classroom (Lumpe et al., 2000). Teachers embrace a set of beliefs, practices, practical theories and craft knowledge which influences their approach to the implementation of the curriculum (Keys, 2007).

Beliefs have been defined in a variety of ways. Oliver and Koballa (1992) as cited by Lumpe et al. (2000) stated that beliefs are often equated with knowledge, attitudes, and idiosyncratic convictions, or reflect a person’s acceptance or rejection of a proposition. Nonetheless, people get confused to differentiate beliefs from other related concepts such as attitudes, values,
judgments, concepts, and dispositions. Pajares (1992) elucidated that clusters of beliefs about a particular situation creates attitudes, and attitudes become action agendas that influence decisions and behavior. In other words, people act upon what they believe. Bandura (1997) stated that beliefs are the best indicators of the decisions people make throughout their lives.

Ample research evidences are available to support the view that teacher beliefs have direct impact on the teacher’s practices in classroom. Beliefs influence the manner in which teacher decides his/her teaching objectives, lesson plan, approach toward students and the evaluation of learning in the classroom (Munby, 1982; Brickhouse, 1990; Pajares, 1992; Prawat, 1992; Richardson, 1996; Levitt, 2002). Teacher beliefs about students, learning, teaching and nature of science influence teaching practices (Wallace and Kang, 2004). Researchers have shown that epistemological beliefs play a key role in the way teachers interpret scientific knowledge and in turn teach it in classroom (Pajares, 1992). Purposefully-designed questionnaire, interviews, or careful and patient observation are necessary to explore the beliefs of teachers which would in turn be helpful for the improvement of teaching and learning. As teachers’ practice is influenced by content and pedagogical knowledge, as well as teachers’ beliefs about the subject matter and their own teaching practices (Falk et al., 2008), it is indispensable to explore teachers’ beliefs about biotechnology and biotechnology education. Identifying these elements is essential to determine whether teachers’ engagement in biotechnology education is compromised by external factors school’s functioning, availability of equipment and facilities and others.

This study, set up in the Eastern Province of Sri Lanka, examines G. C. E Advanced Level (A/L) biology teachers’ beliefs about biotechnology by assessing the relationship between their beliefs about biotechnology and biotechnology teaching. This investigation was conceived to characterize teachers’ receptivity to biotechnology education, aiming to identify the main constraints that can determine their engagement in teaching biotechnology-related topics with limited resources in the province.

Materials and Methods

This study follows a quantitative assessment approach based on an inquiry survey through questionnaire implementation.

Sample of the Study

Sixty three A/L biology teachers from schools in the eastern province (Ampara, Batticaloa and Trincomalee districts) participated in the survey. The participants were in-service secondary biology teachers who participated in a workshop on molecular biology and biotechnology organized by the National Science and Technology Commission in association with the Provincial Department of Education, Eastern Province, Sri Lanka. Informed verbal consents were obtained from the participants after explaining the purpose of the study. A/L biology teachers were considered eligible to participate in this survey because they are professionally qualified to teach biotechnology at secondary schools. The respondents’ (45 females and 18 males) age ranged from 25 to 58 years [Mean 41.98, Standard Deviation (SD) 6.99]. The sample included teachers with diverse initial training backgrounds in biology and different qualifications, BSc (n = 63, 100%), MSc (n = 8, 12.70%) and postgraduate diploma (n = 13, 20.60%).

Research Instrument

A multi-dimensional questionnaire consisting of 17 questions (Q1 – Q17, Appendix) was designed by adapting items from instruments published in studies conducted in different countries (Fonseca et al., 2012; Bryce and Gray, 2004). The content validity of the instrument was scrutinized by three A/L biology teachers with more than ten years of experience and its construct validity was tested through psychometric analysis. The internal consistency of the instrument was assessed by directing the instrument to ten A/L biology teachers who attended a similar workshop in the North Central Province. By finding the Cronbach’s alpha, the test questions of the instrument were validated.

The first seven questions (Q1 – Q7, Appendix) of the questionnaire were to gather socio-demographic data of the participants. Teachers’ beliefs about biotechnology were assessed by appraising the importance they attribute to it, their attitudes towards it, and their interest in it (Q8, Q10and Q14) using five-point Likert-type scales. In addition, a dichotomous question (Q13) was also included assess the attitude. Teachers’ attitudes are highly complex and multi-dimensional, determined by the interaction of cognitive, affective and behavioral factors (Fonseca et al., 2012). The cognitive component of teachers’ attitudes was judged by measuring their endorsement of biotechnology to the quality of life by the question Q8 (Appendix). The question Q10 (Appendix) was asked to evaluate the teachers’ interest towards biotechnology.

Teachers’ intention to buy Genetically Modified (GM) products or to get genetic tests for medical diagnostics were using question Q14 (Appendix) of the questionnaire to evaluate the behavioral component of teachers’ attitude. Question Q10 (Appendix) asked a dichotomous question to check if teachers think that GM foods are safe. This question evaluates the affective component of teachers’ attitude. The accuracy of teachers’ knowledge and the quality of materials they provide to students are highly influenced by the selection of information sources by teachers (Duke and Ward, 2009). Therefore, questions Q11 and Q17 (Appendix) were designed to evaluate teachers decision to use information sources according to their availability. Calder head (1996) points out the relationship between beliefs and experience and states that teachers’ past experiences influence the way they think about their work. Consequently, Q11 (Appendix) was asked to assess how-well informed the teachers were about the subject. Question Q17 (Appendix) asked the teachers to identify the sources they most
frequently used from a list of 13 options. The question Q9 (Appendix) asked teachers to evaluate how important they thought the biotechnology education was.

The questions Q15 and Q16 (Appendix) were included to assess teachers’ beliefs about biotechnology teaching and/or research. In question Q15, teachers’ interest in implementing experimental activities in the scope of biotechnology was explored using a dichotomous question. Another dichotomous question Q16 (Appendix) was asked to investigate the teachers’ interest to participate in training courses in the scope of biotechnology education.

Data Collection and Analyses

The field work was conducted from October 14th to 15th 2013. A printed version of the questionnaire was developed and administered in the participants’ first language in hand. The original version of the questionnaire was developed in English and then translated into Sinhala and Tamil. All three versions (English, Sinhala and Tamil) were identical to reduce differences in teachers’ responses. Enough time was given to the participants at the end of the workshop to complete the questionnaire. The data collected were codified, recorded, cleansed and subjected to descriptive statistical analyses to evaluate its suitability for further examination. Imputation of missing values for certain items was executed by linear interpolation as described by Twisk and de Vente (2002). Principal component analysis with Varimax rotation was called exploratory factor analysis (EFA) and reliability analysis were performed evaluate the dimensionality and the psychometric property of the data. EFA is used to analyze data variations to identify latent factors that account for the variability of a larger set of measured variables (Henson and Roberts, 2006).

Kaiser-Meyer-Olkin (KMO) measure and the Bartlett’s test of sphericity were performed to assess the factorability of the data set to determine the adequacy of the sample for factor analysis (Worthington and Whitaker, 2006). Communalities and loading scores were considered to judge the quality of the identified factor structures (MacCallum et al., 1999; Costello and Osborne, 2005). The KMO score threshold was set at 0.50 for a satisfactory factor analysis to continue (Sharma, 1996) and the significance of the correlation among the variables was determined for a confidence interval of 95% via Bartlett’s test as described by Ho (2006) and cited in Fonseca et al. (2012, p371). Factor retention was determined based on the Kaiser criterion (eigenvalues >1) and the scree test as described by Hayton et al. (2004) (cited in Fonseca et al., 2012, p371). Items which displayed communalities and loadings above 0.40 were considered for analysis (Costello and Osborne, 2005).

Frequencies and mean scores were calculated for each dichotomous and ordinal item of the questionnaire, respectively. Student’s t-tests were performed to examine mean responses. One-sample t-tests were used to compare the teachers’ mean responses with the midpoint of the test variables. A test value of three (3.0) in a five-point scale was set to define respondents’ positioning as neutral (3.0), positive (>3.0) and negative (<3.0). Mean responses that were not significantly different from 3.0 at 95% confidence interval were considered neutral assessment (Fonseca et al., 2012). Mean responses, which were significantly higher or lower than 3.0, were considered as positive or negative assessment, respectively (Fonseca et al., 2012).

The correlations between ordinal variables were evaluated using Spearman’s rank correlation coefficient. The strength of the relationships was expressed based on the values described by De Vaus (2002) and cited in Fonseca et al. (2012, p372). The scores were low, moderate or large when the correlations were <0.30, 0.30-0.50 or >0.50, respectively.

All data analyses were carried out using the statistical package for the social science (SPSS) version 17.0.

Results and Discussion

Beliefs of Teachers Regarding Biotechnology

Teachers play a key role in the promotion of scientific literacy (Fonseca et al., 2012). Teachers’ orientation toward specific subjects impacts on their practice (Van Driel et al., 2007). As such, understanding teachers’ beliefs is important to predict their practices and instructional decisions.

*Teachers believe that biotechnology is important and interesting*

There is a general belief that the application of biotechnology is important for the improvement of the quality of life despite the controversial thoughts over the implications of this technology (Gaskell et al., 2006). The teachers surveyed in this study revealed that biotechnology is important ($M = 4.46$, $SD = 0.96$, $t(62) = 12.02$, $p = 0.00$) to the quality of life. This is in agreement with Fonseca et al. (2012). Moreover, the teachers disclosed that biotechnology is interesting ($M = 4.73$, $SD = 0.54$, $t(62) = 25.20$, $p = 0.00$). These results demonstrate that the biology teachers participated in this study embrace similar beliefs to those of general public. A closer look into the salient features of teachers’ cognitive and affective responses divulges that they are positive about the importance of biotechnology for the improvement of the quality of life.

*Teachers’ approval of biotechnology applications*
Teachers’ behavioral intention clearly shows how the purpose of the application of biotechnology impacts on its acceptability (Fonseca et al., 2012). In the present study, the KMO score being 0.54 (Table 1) behavioral component scale endorses the adequacy of samples for factor analysis. The Bartlett’s test shows that there is a statistically significant correlation between the variables (Table 1). A two-factor solution accounting for 72.27% of the variance recorded was identified for this scale: purchasing inspiration and medical purpose (Table 1). It was evident that these teachers were willing to buy transgenic foods if they were healthier than other foods (Table 1) although half of the sampled population mentioned that GM foods are unsafe. This is in agreement with the finding by Fonseca et al. (2012) with a group of Portuguese biology teachers. However, teachers in the present study do not approve the application of biotechnology medical purpose for reasons which could not be explored in this study.

This may be due to the fact that the teachers participated in this survey might have considered human cloning for therapeutic and reproductive purposes and embryonic gene manipulation as one and only application for medical purposes. This is in contrast to what Fonseca et al. (2012) observed in their study population.

**Table 1: Teachers’ approval of biotechnology applications: Factor structure of the behavioral component of attitudes scale based on exploratory factor analysis presented in rotated component matrix**

<table>
<thead>
<tr>
<th>Item</th>
<th>h²</th>
<th>Identifiable factors</th>
<th>M (SD)</th>
<th>t(62)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you buy transgenic foods if they are easily available in the markets? (14a)</td>
<td>0.61</td>
<td>0.78</td>
<td>2.67 (1.57)</td>
<td>-1.69</td>
<td>0.09</td>
</tr>
<tr>
<td>Do you buy medicines obtained by genetic manipulations? (14b)</td>
<td>0.67</td>
<td>0.74</td>
<td>0.35</td>
<td>2.81 (1.60)</td>
<td>-0.94</td>
</tr>
<tr>
<td>Do you get genetic test(s) for medical diagnostic? (14c)</td>
<td>0.88</td>
<td>0.94</td>
<td>1.94 (1.55)</td>
<td>-5.43</td>
<td>0.00</td>
</tr>
<tr>
<td>Would you buy transgenic foods if they were healthier than other foods? (14d)</td>
<td>0.74</td>
<td>0.76</td>
<td>-0.40</td>
<td>3.14 (1.74)</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Coefficients below 0.30 were suppressed. KMO = 0.54. Bartlett’s Test of Sphericity: χ²(6) = 29.97, p = 0.00. * indicates that rotation converged in 3 iterations.

Many teachers (93.70%) stated that they were aware of what genetically modified foods are. However, for the question to identify the respondents’ view regarding the safety of genetically modified foods, equal response was recorded (49% for safe and 51% for unsafe).

**Teachers’ Beliefs about Biotechnology Education**

It is important to acknowledge teachers’ beliefs when planning to improve or change their practice (Van Driel et al., 2007). Teachers’ beliefs about teaching, learning, curriculum objectives and the subject matter taught seem to highly influence teaching outcomes (Gess-Newsome, 1999). Therefore, it is imperative to understand the teachers’ beliefs about biotechnology education and the factor that influence them. In the present study, most of the teachers considered biotechnology education to be very important (M = 4.83, SD = 0.49, t(62) = 29.38, p = 0.00). According to the teachers’ beliefs, the importance of biotechnology education positively correlates with the importance of biotechnology to the quality of life and the interest towards biotechnology (Table 2). This means that the teachers who are more optimistic about biotechnology are more prone to teach this subject. Nonetheless, this result must not be overestimated as these variables are moderately correlated with a coefficient of r = 0.365 (Table 2). Moreover, the importance of biotechnology positively correlates with the level of information that the teachers possess about biotechnology (Table 2). This clearly delineates that when teachers become well-informed about biotechnology, their attitude of considering biotechnology education to be important increases.

**Table 2: Spearman’s rank correlation between teachers’ beliefs about biotechnology, biotechnology education and their interest towards biotechnology**

<table>
<thead>
<tr>
<th></th>
<th>Q8</th>
<th>Q9</th>
<th>Q10</th>
<th>Q11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of biotechnology to the quality of life (Q8)</td>
<td>1.000</td>
<td>0.365**</td>
<td>0.219</td>
<td>0.004</td>
</tr>
<tr>
<td>Importance of biotechnology education (Q9)</td>
<td>0.365**</td>
<td>1.000</td>
<td>0.596**</td>
<td>0.293***</td>
</tr>
<tr>
<td>Interest in biotechnology (Q10)</td>
<td>0.219</td>
<td>0.596**</td>
<td>1.000</td>
<td>0.193</td>
</tr>
<tr>
<td>Degree of information about biotechnology (Q11)</td>
<td>0.004</td>
<td>0.293*</td>
<td>0.193</td>
<td>1.000</td>
</tr>
</tbody>
</table>

*indicates significant differences for α = 0.05, ** indicates significant differences for α = 0.01

**Teachers’ Selection of Information Sources about Biotechnology**
Most of the studies that have focused on how science teachers choose information sources have shown that they use a limited number of readily available sources chiefly due to time limitation and the perception that they lack the skills to properly evaluate and use them (Sun and Liu, 2009). Nonetheless, the present study reveals that most of the teachers (39 teachers, 61.90%) use internet as a source of information (Fig. 1). This is in agreement with Fonseca et al. (2012). However, choice of information sources is highly influenced by the information literacy of the teachers and the time required accessing the sources (Williams and Coles, 2007). The teachers have mentioned that they get very limited information about biotechnology through conferences (Fig. 1). This may be due to limited chance that teachers get to attend conferences locally as well as in international level.

Figure 1: Sources of information teachers use to gather information about biotechnology

Teachers’ Literacy Level about Biotechnology

The present study disclosed that the teachers participated in this survey were well-informed about biotechnology ($M = 3.97$, $SD = 0.95$, $t(62) = 8.09$, $p = 0.00$). However, many teachers ($n = 62, 98.40\%$) stated that they are interested in participating in training programs in the scope of formal biotechnology education. This implies that although the teachers had greater service period ($M = 13.82$, $SD = 7.60$), they still have gaps to fill in their literacy level about biotechnology. Moreover, 60 teachers ($95.20\%$) reported that they are interested in implementing experimental activities in the scope of biotechnology in the classes they teach. This is an important aspect to consider. Many people believe that schools do not have enough facilities to carry our experiments and research activities thereby jeopardizing the teaching and learning process. Since teachers are interested in implementing experimental activities at schools, ensuring the availability of facilities would enhance quality of experiments in the scope of biotechnology and thereby the learning of the subject.

Conclusion

This study carried out among Advanced Level biology teachers in the eastern province examined the teachers’ beliefs about biotechnology and biotechnology education, the relationship between these two and the factors that affect teachers’ beliefs. The teachers believed that biotechnology is interesting and important for the improvement of the quality of life and this attitude of teachers greatly persuades their practice towards biotechnology teaching or education. More interestingly the teachers were willing to buy GM foods if they were healthier than other foods. However, they did not accept the application of biotechnology for medical purpose for some reasons. There was a controversy over the safety of GM foods although many teachers were aware of what GM foods are. Moreover, majority of teachers believe that biotechnology education is important and this attitude of teachers was influenced by their interest towards the subject and the level of information literacy they have about the subject. Finally, provided that required facilities are ensured, this particular group of teachers is prepared to implement experiments and attend training programs in the scope of biotechnology and biotechnology education, respectively.

References


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**Appendix**

Questionnaire to assess the A/L biology teachers’ beliefs about biotechnology

Q1. Age :
Q2. Gender:
Q3. Years of service:
Q4. Academic degree(s):
Q5. Name of the course(s) attended:
Q6. Name of the higher education institution(s) attended:
Q7. Subjects taught:
Q8. How important do you think biotechnology is to the quality of life (1-Not at all important to 5-Very important)?
Q9. How important do you think biotechnology education is (1-Not at all important to 5-Very important)?
Q10. Rate your interest towards biotechnology (1- I am not interested at all to 5- I am very interested).
Q11. How well informed are you about biotechnology (1-Not at all informed to 5-Very well informed)?
Q12. Do you know what Genetically Modified Foods are? Yes/No
Q13. Do you think that genetically modified foods (transgenic foods) are safe? Yes/No
   If No, Please state the reason.
Q14. How often. (1-Never to 5-Always)
   (a) would you buy transgenic foods if they are easily available in supermarkets?
   (b) do you buy medicines obtained by genetic manipulation?
   (c) do you get genetic test(s) for medical diagnostic?
   (e) would you buy transgenic foods if they are healthier than other foods?
Q15. Are you interested in implementing experimental activities in the scope of biotechnology in the classes you teach? (Yes/No)
Q16. Are you interested in participating in training courses in the scope of formal biotechnology education? (Yes/No)
Q17. From which of the following sources do you most commonly obtain information about biotechnology?
   TV □  Radio □  Newspapers □  Magazines □  Training programs □  Scientific magazines □  Internet □  Textbooks □  Scientific papers □  Workshop □
   Conferences □  Exhibitions □  Friends and colleagues □  Others □
Estimating Return Values of Significant Sea Wave Heights in Colombo, Sri Lanka

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Abstract

In coastal science and offshore engineering estimating the return values of significant extreme sea wave heights plays a vital role. This paper discusses two methods, Block Maxima (BM) approach and Peak-Over-Threshold (POT) method to estimate the 50 and 100 year return levels of extreme sea wave heights in Colombo. Generalized Extreme Value (GEV) distribution and Generalized Pareto (GP) distribution were fitted to the BM data and POT data respectively. Parameters of GEV and GPD were estimated with Maximum Likelihood estimation method. Gumbel distribution fitted well with the BM approach and GP distribution fitted well with the POT approach. BM method and POT method gives much more comparable results on estimating return values.

Keywords: return level, block maxima, threshold value, generalized extreme value distribution, generalized pareto distribution.

Introduction

The N-year return level of sea wave height is a statistic of vital important often used in the coastal and offshore engineering. Also the return values are very useful to describe the extremes of other environmental parameters. Commonly the return values are estimated by fitting the Generalized Extreme Value (GEV) distribution to blocked maxima (for instance: annual maxima) or by fitting the Generalized Pareto (GP) distribution to exceedances above a specific threshold value, (Davidson and Smith (1990), Coles (2001).)

Many numbers of studies have been carried out to find the return levels of sea wave heights in different locations all over the world. Return values of significant wave height in the North-East Atlantic, the Norwegian Sea and the North Sea were computed by Aarnes et al. (2012). They have estimated the 100 year return level of sea wave height using three approaches: Block Maxima, r-Largest Order Statistics and Peak-Over-Threshold. For each method the generalized extreme value (GEV) distribution, the joint GEV distribution and the Generalized Pareto (GP) distribution were fitted to the data respectively. A comparative study on significant wave height in northern North Sea carried out by Soars and Scotto (2004) in Portugal. To estimate return values of significant wave height, they have considered GEV and limiting joint GEV distributions respectively to the BM approach and r-LOS where “annual wave heights” were taken as blocks. From their study results, they have examined that r-LOS method gives more reliable return levels than the BM method.

Two convenient analytical methods: Block Maxima (BM) approach and Peak over Threshold (POT) method are used in this study to estimate the 50 and 100 year return values of sea wave height. Seven years of 3-hourly Sea wave heights for the years 2002 to 2007 in Colombo district were used for the study. To estimate the 50 and 100 year return values of sea wave heights, Generalized Extreme Value (GEV) distribution and Generalized Pareto (GP) distribution were fitted to the data to each methods, BM and POT respectively. Maximum likelihood parameter estimation method was used to estimate the parameters of GEV and GP.

BM Approach

Let $X_{1n}, X_{2n},\ldots\ldots,X_{12,n}$ are series of blocked in to m sequences of length n and $X_{in}$’s are independent identically distributed random variables with common distribution function $F(x)$. That is: $F(x)=\Pr(X_{in} \leq x)$ . And let $M_n=\max(X_{1n},X_{2n},\ldots\ldots,X_{12,n})$ denote the maximum of n\textsuperscript{th} sample. Then $\Pr(M_n \leq x)=F(x)^n$. For non-trivial limit results, using normalization find $a_n>0$, $b_n$ such that:

$$\Pr((M_n-b_n)/a_n \leq x) = F(a_n x + b_n)^n \rightarrow G(x) \quad (1)$$

Choosing the block size is quiet important because, a too small value of n leads to a bias estimation on parameters and large value of n makes fewer number block maxima leads to large estimation on variance. Therefore, the block size has to be chosen between bias and the amount of variance, more commonly the block size is chosen as a time period of one year, where n is the
number of observations occurred in a year resulting in a series of annual maxima. Generally this Block Maxima approach is closely related with the GEV distribution.

\[ G(x; \xi, \sigma, \mu) = \exp \left\{ - \left( 1 + \frac{\xi(x-\mu)}{\sigma} \right)^{-1/\xi} \right\} \] (2)

where \( \sigma > 0 \) –scale, \( \xi \) - shape and \( \mu \) - location parameter. According to the value of \( \xi \), \( H(x) \) can be divided into three standard types of distributions: When \( \xi = 0 \) (Type I) It is the Gumbel distribution, When \( \xi > 0 \) (Type II) It is the Frechet Distribution and when \( \xi < 0 \) (Type III) It is the Weibull Distribution.

POT Approach

The classical extreme value approach, called “Block Maxima”, was strongly criticized because the estimation of the distribution based on extracted maximum event of each blocks, which ignores the other extreme events in the blocks. An alternative to the BM method is the “Peaks-Over-Threshold (POT)” method. In this approach, all the events exceeding a high threshold value are considered. Threshold selection is a bias variance trade-off. A threshold which is too small, leads to bias because of model asymptotic being invalid. A threshold which is too large leads to large variance because of few data points. Therefore one method is to construct the Mean Residual Life plot (MRL) for the mean excesses for some ranges of threshold and to fit GPD (Generalized Pareto Distribution) fits for some ranges of thresholds.

With an assumption of the daily data to be independent with common distribution function \( F \), given a high threshold value \( u \) and looking at all exceedance of \( u \), the distribution of excess value is given by:

\[ F_u(y) = \Pr\{X \leq u + y | X > u\} = \frac{F(u+y) - F(u)}{1 - F(u)}, y > 0 \] (3)

For the sufficiently large threshold the distribution of exceedances may be approximated by GPD, Balkema and de Hann (1974), Pickands (1975), implying that, letting \( u \to \infty \) leads to an approximate family of distributions given by, \( G(y) = 1 - (1 + \frac{\xi(y-u)}{\sigma})^{-1/\xi} \) is the Generalized Pareto family. Also when \( \xi \to 0 \) which is converges to an Exponential family.

Return Level

Considering extreme values of a random variable, the return level of an extreme event, defined as the value, \( z_p \), such that there is a probability of \( p \) that \( z_p \) is exceeded in any given year, or alternatively, the level that is expected to be exceeded on average once every \( 1/p \) years (1/p is often referred to as the return period). For example, if the 100-year return level for rainfall at a given location is found to be 280 mm, then the probability of rainfall exceeding 280 mm in any given year is 1/100 = 0.01. The return level is derived from the distribution GEV or GPD by setting the cumulative distribution function equal to the desired probability/quantile, \( 1-p; \) and then solving for the return level. For example, for the GEV distribution, the return level, \( z_p \), is given by the following equation.

\[ z_p = \begin{cases} \mu + \sigma \xi \left[ 1 - \left\{ -\log(1-p) \right\}^{-\xi} \right], & \text{for } \xi \neq 0 \\ \mu - \sigma \log(-\log(1-p)), & \text{for } \xi = 0 \end{cases} \] (4)

Data and Methodology

Three hourly sea wave heights (in meter) data for the years 2002 to 2007 for the Colombo District were obtained from the Department of Meteorology, Colombo. For the entire analysis the statistical software R, especially “in2extRemes” packages in R was used. To fit the distribution and to estimate the 50 and 100 year return levels the Extreme Value theory was applied for the data set. Initially maximum wave height of each months were extracted from the data set and GEV distribution was fitted to the monthly maximum data. By using the Confidence Interval (CI) for the shape parameter, the best fitting distribution was identified. Secondly a suitable threshold value was identified in all 3-hourly data by using MRL plot and GPD fits for some ranges of thresholds. Then GP distribution was fitted to the data exceeding the specified threshold value. With the identified distributions the return levels for the return periods and their 95% confidence band were estimated.

Results and Discussion

Parameter Estimates of GEV Distribution Fitted to the Monthly Maximum Wave Height

Parameter estimates and their standard error within the parenthesis of the GEV distribution using maximum likelihood estimation method fitted to the monthly maxima of 3-hourly data are: \( \mu: 1.3 \) (0.06), \( \sigma: 0.37 \) (0.04), \( \xi: 0.01 \) (0.1). Also, it can be concluded that the data fits well with the Gumbel distribution, (95 % CI for \( \xi \) is: (-0.1402, 0.2408)).
Figure 1 shows the two goodness-of-fit plots, quantile plot for empirical data and quantile plot for model simulated data along with a density estimate plot and return-level plot for the monthly maximum sea wave height. Since much of the data line up on the diagonal of the empirical quantile and model simulated quantile plots, it can be concluded that the Gumbel distribution fitted well with the data. The return level plot plots the return values against the return period and includes 95% confidence interval and in which all the data points fall within the confidence band. The 50 and 100 year return values obtained from BM approach is 2.747 (2.3966, 3.0977) m and 3.01 (2.6351, 3.4291) m respectively.

Figure 3: Gumbel diagnostic plot of the monthly maximum wave heights

Parameter Estimates of GP Distribution Fitted to the 3-hourly Wave Heights

A suitable threshold value has to be chosen in this approach. One method for choosing threshold value is with mean residual life plot. The mean exceedances above u (threshold value) should be linear, so the idea is to looking for linearity in a plot of the empirical mean residual life plot (Stuart Coles, 2001, Matthew J. Pocernich, 2002). But it is difficult to identify the threshold value only with the MRL plot. Therefore an alternative approach is to plot the GPD fits for some ranges of thresholds and look for parameter stability. Fig 2, shows the MRL plot for the 3-hourly wave heights, According to that, the threshold greater than 1.1 m looks reasonable. However According to the Fig 3, the threshold 1.33 m looks high.
Maximum Likelihood Parameter estimates of GPD distribution fitted to the 3-hourly sea wave height above 1.33 m with the corresponding standard errors are $\sigma=0.21 (0.095)$ and $\xi=-0.12 (0.01)$. Also, it can be concluded that the data fits well with the GP distribution, (95% CI for $\xi$ is (0.16, 0.17)). Figure 4 shows the two goodness-of-fit plots, quantile plot for empirical data and quantile plot for model simulated data along with a density estimate plot and return-level plot for the peak over threshold data. Since much of the data line up on the diagonal of the goodness of fit plots we can say that which fits the data perfectly. The return level plot plots the return period against the return level and also includes 95% confidence interval and in which all the data points fall within the confidence band. The 50 and 100 year return values obtained from POT approach is 3.541 (2.991, 4.358) m and 3.895 (3.2502, 4.7662) m respectively.
Conclusions

Three hourly sea wave height data in Colombo, Sri Lanka for the years from 2002-2007 were used in this study. To estimate the 50 and 100 year return levels of sea wave height, two techniques: BM approach and POT approach were applied. In the BM approach, block size was considered as month and which fits well with the Gumbel distribution. In POT approach specified threshold value was chosen as 1.33 m using MRL plot and GPD fits for some ranges of thresholds. Wave heights exceeding 1.33 m fit well with the GPD. Estimated 50 and 100 year return levels obtained from BM approach is 2.747 (2.3966, 3.0977) m respectively and 3.01 (2.6351, 3.4291) m and from the POT method is 3.541 (2.991, 4.358) m and 3.895 (3.2502, 4.7662) m respectively.

References


An Application of Fourier series Expansion of a Function in a Non-Polar Spherical Coordinate System

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Abstract

Cubed sphere is one of the main tools used to avoid pole problems those arise in the selection of spherical polar coordinates. In this respect, we considered recently developed cubed sphere based on coordinate mapping over the cubed surface. The function on the sphere was treated as an ordered set of six-tuples. In that work, we established weakly orthogonal and completely orthogonal spherical harmonics of the system and developed corresponding symmetric and linear relations. Also, we found the norm of the orthogonal spherical harmonics. In this work, we explore the Fourier representation of a spherical function on this coordinate system in terms of weakly orthogonal spherical harmonics. The advantages of the linear relation between the two sets of spherical harmonics and diagonal property of the norm of the fully orthogonal spherical harmonics were in cooperated for this work. We also strength our work by giving an example to demonstrate how Fourier coefficients can be computed to represent a given spherical function in terms of the spherical harmonics of the coordinate system.

Keywords: cubed sphere, pole problems, non-polar coordinates, spherical harmonics, fourier series

Introduction


Nasir (2007) has developed a cubed sphere in this respect which has wonderful symmetric properties and defined spherical harmonics on it. Faham and Nasir (2012) developed and analyzed further in this respect. In this work, we establish Fourier series representation of a spherical function on this cubed spherical coordinate system. The work is illustrated by a simple example. The presentation of this paper is organized as follows: In next section, we recall some basic results from our previous works (Nasir (2007) and Faham and Nasir (2012)). Then, we develops the Fourier representation of a spherical function. Then, an illustrative example is given. Finally, we discuss the results and conclude some remarks.

Preliminaries, Terminologies and Notations

In this section, we brief some main results of our previous work. A cubed spherical coordinate system is defined as a six-tuple of local coordinate systems each is defined on the six faces of the cubed sphere and is given by \( \varphi(r, \theta, \phi) = r \theta \phi \), where

\[
\theta(t_1, t_2) = \{(1, t_1, t_2), (-t_1, 1, t_2), (-t_2, t_1, 1), (-1, -t_1, t_2), (t_1, -1, t_2), (t_2, t_1, -1)\}
\]

maps the two dimensional faces to the cube and \( \theta; \theta(P) = p/|p| \) maps the cube into the 2-sphere. The parameter \( r \) constitutes the standard radial coordinator. The unit sphere, (i.e. \( r = 1 \)) is denoted by \( S^2 = (X, Y, Z) \). A spherical function \( f(t_1, t_2) \) is described in the cubed spherical coordinates as a six-tuple of functions

\[
f(t_1, t_2) = \{f_X(t_1, t_2), f_Y(t_1, t_2), f_Z(t_1, t_2), f_X(t_1, t_2), f_Y(t_1, t_2), f_Z(t_1, t_2)\},
\]

A set of solutions for the eigenvalue problem

\[
\Delta_g y = -l(l+1)y,
\]

where \( l \) is a non-negative integer and the Laplace – Beltrami operator \( \Delta_g \), given by
\[ \Delta_S = s_t \left( (1 + t_1^2) \frac{\partial^2}{\partial t_1^2} + 2t_1 t_2 \frac{\partial^2}{\partial t_1 \partial t_2} + (1 + t_2^2) \frac{\partial^2}{\partial t_2^2} + 2t_1 \frac{\partial}{\partial t_1} + 2t_2 \frac{\partial}{\partial t_2} \right) \]  

where \( s_t = 1 + t_1^2 + t_2^2 \), are known as the spherical harmonics. They are given by

\[ y_{l}^{(m,n)} = \frac{p_{l}^{(m,n)}(t_1,t_2)}{s_t^{l/2}}, \quad m + n = l - 1 \text{ or } l \]

where \( p_{l}^{(m,n)}(t_1,t_2) \) are given explicitly by the non-zero real or imaginary parts of

\[ p_{l}^{(m,n)}(t_1,t_2) = \sum_{p=1}^{m} \sum_{q=1}^{n} \left( \frac{(m - p + n - q)/2}{(m - p)/2} \right) \left( \frac{l}{p,q} \right) t_1^{p} t_2^{q} y^{(l-p-q)}, \]

where \( r_i = r \mod 2 \) and \( i = \sqrt{-1} \) and the subscript 2 in the summation notation indicates that the index variables increases with step 2. \( \binom{a}{b} \) and \( \binom{a}{b,c} \) are the binomial and trinomial coefficients respectively.

Fixing this \( y_{l}^{(m,n)}(t_1,t_2) \) to one of the face, say \( X_+ \), of the 2-sphere, a set of continuous spherical harmonics on the 2-sphere is obtained as a six-tuple of functions

\[ \Psi(t_1,t_2) = \left( y(t_1,t_2), y\left( -\frac{1}{t_1}, -\frac{t_2}{t_1} \right), y\left( -\frac{t_1}{t_2}, -\frac{1}{t_2} \right), y(t_1,-t_2), y\left( -\frac{1}{t_1}, \frac{t_2}{t_1} \right), y\left( \frac{t_1}{t_2}, -\frac{1}{t_2} \right) \right). \]

The usual inner product of two functions \( f(t_3,t_4), \ h(t_3,t_4) \) is given by

\[ (f,h)_S = \sum_{F \in \mathcal{D}} (f,h)_F \]

where \((f,h)_F = \int_{-1}^{1} \int_{-1}^{1} f(t_1,t_2) \bar{h}(t_1,t_2) s_t^{-3/2} dt_1 dt_2 \) are the inner products for the functional components for one face \( F \in \{X_+, Y_+, Z_+, X_-, Y_-, Z_-\} \).

The spherical harmonics \( y_{l}^{(m,n)} \) are weakly orthogonal in the sense that they are orthogonal for distinct mode \( l \), but are not orthogonal among the \( 2l + 1 \) functions for a mode \( l \).

A set of completely orthogonal spherical harmonics are constructed in the form

\[ Z_{l,r}^{(k)}(t_1,t_2) = \frac{Q_{l,r}^{(k)}(t_1,t_2)}{s_t^{l/2}}, \quad r = 0,1,2,...,l-k, \quad k = 0,1 \]

using some existing theorems with slide modifications according to our resulting differential equations. Here, polynomials \( Q_{l,r}^{(k)}(t_1,t_2) = p_r(t_1)p_{l-r}(t_2)q_{l-r}(l;\lambda) \), where the polynomial \( p_r(t_1) \) is given by \( p_r^{(0)} + i p_r^{(1)} = (t_1 + i) \) and the polynomials \( q_{l-r}(l;\lambda) \) are given by \( q_{l-r}(l;\lambda) = \sum_{n=1}^{l-r} a_{l,n}^{(l-r)} \lambda^n \), where \( a_{l,n}^{(l-r)} = \frac{(-1)^{l-r-n}/2}{2^{l-r-n}} \left( \frac{l}{l-r-n} \right) \). A set of completely orthogonal spherical harmonics are then constructed very similar to the set of weakly orthogonal counterparts.

The norm of the orthogonal spherical harmonics are evaluated as

\[ \left\| Z_{l,r}^{(k)} \right\| ^2 = \frac{2^{2r+1}}{2l+1} \frac{(l!)^2}{(l+r)!(l-r)!} \left\{ \begin{array}{ll} 2\pi, & r = 0, k = 0 \\ \pi, & 0 < r, l-k, k = 0,1 \end{array} \right. \]

The polynomials corresponding to weakly and completely orthogonal spherical harmonics are related by the equations

\[ Q_{l,r}^{(0)} = \sum_{n=1}^{l-r} \frac{(-1)^{(l-r-n)/2}/2}{2^{(l-r-n)/2}} \left( \frac{l-n}{l-r-n} \right) p_{l}^{(l-n,n)} \]  

and

\[ Q_{l,r}^{(1)} = \sum_{n=1}^{l-r} \frac{r}{l-n} \frac{(-1)^{(l-r-n)/2}/2}{2^{(l-r-n)/2}} \left( \frac{l-n}{l-r-n} \right) p_{l}^{(l-1-n,n)}. \]
with suitable grouping, we obtain the matrix form of the linear relations as

$$Q_i = T_i P_b$$  \(12\)

where \(T_i = \text{diag}[A_{i(l+1)/2}], B_{i(l/2)}, C_{i(l/2)}, D_{i(l-1)/2}]\). The coefficients of the upper triangular matrices are explicitly given by

$$A_{i(l, j)} = \left(-\frac{1}{4}\right)^{j-i} \left(\begin{array}{c} 2j - 2 \\ j - i \end{array}\right), B_{i(l, j)} = A_{i(l, j)} - \frac{1}{4} A_{i(l+1, j)}, C_{i(l, j)} = A_{i(l, j)} + \frac{1}{4} A_{i(l+1, j)} \text{ and}$$

$$D_{i(l, j)} = 2B_{i(l, j)} - A_{i(l, j+1)} + 1.$$  

The matrices, therefore, are computed by obtaining only the matrix \(A_i\) and use the above relations to obtain other matrices. The matrix \(A_i\) can be easily computed column wise by the recurrence formula

$$A_{i(l, j)} = 1, \quad A_{i(l, j)} = -\frac{1}{4} \left(\frac{j + i - 2}{j-i+1}\right) A_{i(l, j+1)}, \quad i = j, j-1, \ldots, 1, \quad j = 1, 2, \ldots, n_{A_i}.$$  \(13\)

According to the regroup, we shall denote \(Q_i = \left[Q_{i1}^{(0)}, Q_{i1}^{(0)}, Q_{i1}^{(1)}, Q_{i1}^{(1)}\right]^T\) and \(P_i = \left[p_{i1}^{(0)}, p_{i1}^{(1)}, p_{i1}^{(0)}, p_{i1}^{(1)}\right]^T\). Then the set of polynomials corresponding to the weakly orthogonal spherical harmonics are as in the table 1. The linear relation among both sets of weakly and completely orthogonal spherical harmonics and the inner product of completely orthogonal spherical harmonics can be used to evaluate the inner product of weakly orthogonal spherical harmonics.

Spherical Fourier Series

Fourier series techniques could be applied to a wide array of mathematical and physical problems especially those involving linear differential equations with constant coefficients, for which the eigensolutions are sinusoids. In this work, we focus on constructing Fourier series for a spherical function defined on the surface of the cubed sphere. The Fourier series of a spherical function \(f(t_1, t_2)\) can be written in terms of the weakly orthogonal spherical harmonics as

$$f(t_1, t_2) = \sum_{l=0}^{\infty} \mathbb{M}_l \mathbb{Y}_l$$  \(14\)

where \(\mathbb{M}_l\) are row vectors of sizes \(2l + 1\) of coefficients given by

$$\mathbb{M}_l = (f, \mathbb{Y}_l)(\mathbb{Y}_l, \mathbb{Y}_l)^{-1}.$$  \(15\)

The relation between the inner products of the two sets of spherical harmonics is given in matrix form as

$$\langle \mathbb{Z}_l, \mathbb{Z}_l \rangle = \mathbb{T}_l^T(\mathbb{Y}_l, \mathbb{Y}_l)\mathbb{T}_l^T$$  \(16\)

from which we obtain

**Table 1**: Polynomial functions corresponding to weakly orthogonal spherical harmonics
Also, since \( (Y_i, Y_i)^{-1} \) is diagonal, its inverse also diagonal with the reciprocals of the diagonal entries. Thus, the inverse matrix \( (Y_i, Y_i)^{-1} \) can be evaluated without inverting the matrix \( T_1 \). Explicit expressions for the respective four blocks of \( (Y_i, Y_i)^{-1} \) are given by

\[
\frac{2l + 1 (-1)^{i+j}}{\pi} \sum_{n=1}^{\left[\frac{l}{2}\right]} \frac{(l + 2p - 1)! (l - 2p + 1)!}{(l!)^2} \left(\frac{2l - 2}{i} \right)^{2} \left(\frac{2j - 2}{j} \right)^{1} \quad 1 \leq \frac{l + 1}{2}
\]

\[
\frac{2l + 1 (-1)^{i+j}}{\pi} \sum_{n=1}^{\left[\frac{l}{2}\right]} \frac{(l + 2p - 1)! (l - 2p + 1)!}{(l!)^2} \left(\frac{2l - 2}{p + i - 1} \right)^{2} \left(\frac{2j - 2}{p + j - 1} \right)^{1} \quad 1 \leq \frac{l + 1}{2}
\]

\[
\frac{2l + 1 (-1)^{i+j}}{\pi} \sum_{n=1}^{\left[\frac{l}{2}\right]} \frac{(l + 2p)! (l - 2p)!}{(l!)^2} \left(\frac{p^2}{p + i} \right)^{1} \left(\frac{p^2}{p + j} \right)^{1} \quad 1 \leq \frac{l + 1}{2}
\]

(18)

Application

For convenience, let \( M_i = (M_i^{(0)}, M_i^{(1)}, \alpha_i^{(0)}, \alpha_i^{(1)}) \). Then,

\[
f(t_1, t_2) = \sum_{i=0}^{\infty} M_i Y_i = \sum_{i=0}^{\infty} (M_i^{(0)} Y_i^{(0)} + M_i^{(1)} Y_i^{(1)} + N_i^{(0)} Y_i^{(0)} + N_i^{(1)} Y_i^{(1)}). \quad (19)
\]

Now, by equation (12), the coefficients becomes

\[
f(t_1, t_2) = \sum_{i=0}^{\infty} M_i Y_i = \sum_{i=1}^{\infty} (M_i^{(0)} Y_i^{(0)} + M_i^{(1)} Y_i^{(1)} + N_i^{(0)} Y_i^{(0)} + N_i^{(1)} Y_i^{(1)}). \quad (20)
\]

For a simple example, let us consider \( f(t_1, t_2) = (g, 0, 0, 0, 0, 0) \), where \( g(t_1, t_2) \) is 1 if \( 0 \leq t_1, t_2 \leq 1 \), takes \(-1\) when \(-1 \leq t_1, t_2 \leq 0 \) and \(0\) otherwise on the face \( X \) and zero elsewhere.

Figure 1: the function \( f(t_1, t_2) \)
Then, the inner product on the $X_+$ face is

$$
\langle f, Y_{i,l}^{(k)} \rangle = \int_{-1}^{1} \int_{-1}^{1} g Y_{i,1}^{k} s_t^{-3/2} dt_1 dt_2 = \int_{-1}^{1} \int_{-1}^{1} g P_l^k s_t^{-(l+3)/2} dt_1 dt_2
$$

$$
= \int_{0}^{1} \int_{0}^{1} P_l^k s_t^{-(l+3)/2} dt_1 dt_2
$$

$$
- \int_{-1}^{0} \int_{-1}^{0} P_l^k s_t^{-(l+3)/2} dt_1 dt_2.
$$

(21)

The Fourier coefficients are then computed using table 3. For example, when $l = 5$, the function $f(t_1, t_2)$ has Fourier representation

$$
f(t_1, t_2) = (1 + t_1^2 + t_2^2)^{5/2}\left[0.424652(5t_2 - 10t_1^3 + t_2^3)
+ 0.0247504(10t_2 - 30t_1^2 t_2 - 10t_1^2 + 10t_1^2 t_2^3)
- 0.0551187(5t_2 - 30t_1^2 t_2 + 5t_1^2 t_2) - 0.0551187(5t_2 - 30t_1^2 t_2 + 5t_1^2 t_2)
+ 0.0247504(10t_1 - 10t_1^3 - 30t_1^2 t_2 + 10t_1^2 t_2^3) + 0.424652(5t_1 - 10t_1^3 + t_1^5)\right].
$$

(22)

Observations and Conclusion

In this work, we established Fourier representation of a spherical function in a non-polar cubed spherical coordinate system. The function is represented in terms of weakly orthogonal spherical harmonics. We used this representation, as an immediate application, to a simple spherical function to illustrate the advantages of computations.

Table 2: The computations of $\langle f, Y_{i,l}^{(k)} \rangle$ up to $l = 5$.

<table>
<thead>
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<th>$l$</th>
<th>$\langle f, Y_{0,l}^{(k)} \rangle$</th>
<th>values</th>
<th>$\langle f, Y_{1,l}^{(k)} \rangle$</th>
<th>values</th>
<th>$\langle f, Y_{2,l}^{(k)} \rangle$</th>
<th>values</th>
<th>$\langle f, Y_{3,l}^{(k)} \rangle$</th>
<th>values</th>
<th>$\langle f, Y_{4,l}^{(k)} \rangle$</th>
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<td>$\langle f, Y_{1,l}^{(k)} \rangle$</td>
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<td>$\langle f, Y_{2,l}^{(k)} \rangle$</td>
<td>0.350188</td>
<td>$\langle f, Y_{3,l}^{(k)} \rangle$</td>
<td>0.350188</td>
<td>$\langle f, Y_{4,l}^{(k)} \rangle$</td>
<td>0.350188</td>
<td>$\langle f, Y_{5,l}^{(k)} \rangle$</td>
<td>0.350188</td>
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<td>$\langle f, Y_{4,l}^{(k)} \rangle$</td>
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<td>$\langle f, Y_{5,l}^{(k)} \rangle$</td>
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<td>$(0,0)$</td>
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<td>$(0,0)$</td>
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<td>$(0,0)$</td>
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</tbody>
</table>
For the odd mode $l$'s, we observed that the Fourier coefficients $N_l^{(0)}$ and $N_l^{(1)}$ vanish and the values of $M_l^{(1)}$ are in the reverse order of the values of $M_l^{(0)}$. Similarly for even mode $l$'s, we have $M_l^{(0)}$ and $M_l^{(1)}$ zeros and the values of $N_l^{(1)}$ are in the reverse order of that of $N_l^{(0)}$. Therefore, in both case, we just want to compute $\lceil l/2 \rceil$ computations although there are $2l + 1$ values to be computed, here $\lfloor x \rfloor$ denotes the smallest integer such that $x \leq \lfloor x \rfloor$.

We also observe a similar relation compared to the relations defined in equation (13).

The symmetric property of $P_l^{(m,n)}(t_1, t_2)$ and $P_l^{(n,m)}(t_2, t_1)$ and the fact of the same Fourier coefficients also can be considered for efficient computations.

References


Faham MAAM & Nasir HM 2012b, ‘Relational properties of weakly orthogonal and orthogonal spherical harmonics. Annual Science Research Session (ASRS), South Eastern University of Sri Lanka.


Contribution of Organic Contaminations and Nutrient level on Dynamic Equilibrium of Dissolved Oxygen in Water Bodies of Costal Belt of Ampara District

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Abstract

The dissolved oxygen (DO) of a water body (WB) is dynamically equilibrated between the two films such as gas and liquid phases. Domestic and other related waste materials may alter this equilibrium as a result aquatic organism can suffocate. Therefore, an investigation is necessary to analyse the Contribution of Organic Contaminations and Nutrient level on its related WBs. The selected parameters such as chemical oxygen demand (COD), dissolved sulphide (DS), salinity, nutrient level, and DO were used to analysis above contribution. Randomly selected three different WBs namely Ninthavur (S1), Kalmunai (S2) and Sammanthurai (S3) were used for this study over a period of six month. The correlations studies were carried out among parameters and measured data were also utilized in estimating the oxygen transfer efficiency (OTE), Eh, α and β values. Contribution of domestic and other related waste materials on dynamic equilibrium of dissolved oxygen (DEDO) were studied based on the OTE, α and β values. The DO has negatively correlated with COD, DS and nutrient level and these implies a strong contribution of domestic and other related waste materials on the DEDO on these WBs. A poor negative correlation (r²< 0.5) was observed for DO with salinity and it has demonstrated that impact of salinity on DEDO is very less.

Keywords: Dissolved oxygen, oxygen transfer efficiency, chemical oxygen demand, nutrient level, dynamic equilibrium of DO

Introduction

The domestic and other waste materials of developed and developing countries are much contributed to wash off the public and private waste disposal. The problem come across, during the period of summer usual washing activities lead to degrade the quality of the water bodies which are connected to waste materials. In this study, the qualities of such water bodies are considering to analyze the environmental impact to the public who were living around these water bodies. The pollution of these water bodies is significant enough to contribute to the numerous environmental issues.

In aquatic systems, rate of oxygen transfer (ROT) is an essential factor in determining the availability of DO levels. Thus, an investigation on the parameters governing the DO levels is essential in understanding the fate of aquatic life. The mechanism of gas transfer to a liquid is given by the two film theory. It is the presence of two films, one liquid and one gas, at the gas-liquid interface which provides the resistance to the passage of gas molecules from the bulk of the gas phase to that of the liquid phase. The higher and lower solubility of the gases such as SO₂ and O₂ in the liquid phase is restricted by gas film relative to liquid film.

Three processes are involved in ROT including saturation of the liquid surface between the two phases, the passage of oxygen molecules through liquid interface film by molecular diffusion and transfer of oxygen to bulk of the liquid by diffusion and convection. Lewis and Whitman (1924) argue that the combination of resistance in the water and air film affects on an overall mass-transfer rate of the oxygen based on the two-film theory. “The level of dissolved oxygen is presumably controlled by the water film during the air-water transfer mechanism” (Liss and Slater, 1974, ). The wastewater constituents impact on the above mechanisms and it is the common practice to facilitate mass-transfer models through the use of correction factors for the overall mass-transfer coefficient and saturation concentration for transfer of O₂. The impurities of wastewater components such as organic substances (especially surface active substances) and inorganic dissolved solids effect on the O₂ transfer rate (Eckenfelder et al., 1956, Downing et al., 1960 and Chernet al., 2001).

The factor effecting coefficient (FAC) of the DO, ROT and the OTE are subjected to this study in three different water bodies namely Ninthavur (S1), Kalmunai (S2) and Sammanthurai (S3). These distributions are compared to better understand the exchange of salt, organic matters and nutrients in these systems, and to evaluate their effects on the DEDO. The pH, temperature, concentration of saturated and dissolved DO, nutrient level, COD, OTE, α and β values are considered to evaluate
the impact of urban drainage on DEDO. Hence, to assess whether DEDO in S1, S2 and S3 are affected by COD and nutrient level.

**Material and methods**

Water samples were collected from selected WBs in the region. Sampling station S1 (latitude N 7° 21' 25.0767", longitude E 81° 50' 88.0947", 0.5 m above sea level) is of water column depth of 1.5 m and 100 m away from the shoreline of Ninthavur local government building. Sampling station 2 (latitude N 7° 24' 13.252", longitude E 81° 49' 57.3641" 1 m above sea level), which is 1000 m offshore from the Kalmunai shoreline, and having an open water column depth of 2.5 m and Sampling station S3 (Latitude N 7° 22' 23.7985", Longitude 81° 48' 47.4067", 3 m above sea level) is 12000 m offshore from the Karaitivu shoreline having the water column depth of 2 m and widely open to urban drainage.

The water samples were collected once a month, between January to June 2013 between 09:00 am and 12:00 noon, the pH, DO, salinity and temperature (T) values of the water samples were determined in situ using portable meters on side. The spectroscopic method (Hach, DR/2800) was used to measure the phosphate (PO$_3^{3-}$), and nitrate (NO$_3^{-}$); COD was measured at the laboratory using traditional titration method after digesting the samples using Eco 6 thermoreactor (VelpScientifica, Europe). Significance of the concentration of organic contaminations and nutrient level among the WBs were evaluated using MINITAB (statistical software version 14); based on that p value was calculated using general linear model analysis of variance (ANOVA).

**Results and Discussion**

The mean values of the parameters such as pH, temperature, and TDS are summarized in Table 1. The pH change was within the acidic range having 5.48 ± 0.48 for S1 and 5.83 ± 0.26 for S3. However, it doesn’t exceed preferred pH range of 6.0 to 10.0 for fish production (Matthews, 1998) and they did not exhibit significant variation among the stations (p<0.05). During this study DO level was varied significantly (p< 0.05) among the locations, this could be attributed to nutrient loading, decomposition and mineralization of microbes (Dibia, 2006) Inorganic and organic dissolved solids.

<table>
<thead>
<tr>
<th>Sampling Station</th>
<th>pH mean ± SD</th>
<th>Temperature °C mean ± SD</th>
<th>TDS mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>5.48 ± 0.48</td>
<td>29.74 ± 0.44</td>
<td>323 ± 55</td>
</tr>
<tr>
<td>S2</td>
<td>5.74 ± 0.52</td>
<td>28.82 ± 0.97</td>
<td>318 ± 51</td>
</tr>
<tr>
<td>S3</td>
<td>5.83 ± 0.26</td>
<td>29.13 ± 0.29</td>
<td>310 ± 34</td>
</tr>
</tbody>
</table>

Mean ± SD = mean ± standard deviation for 36 measurements for S1 and 18 measurement for S2 and S3, TDS = total dissolved solid.

The equilibrium between oxygen gas and dissolved oxygen in water is such that the concentration of a solute gas in a solution is directly proportional to the partial pressure of that gas above to solutions described by Henry’s law as,

\[
O_2(aq) \rightleftharpoons O_2(g)
\]

The equilibrium constant for this equilibrium is,

\[
K_H = \frac{[O_2]_{aq}}{P_{O_2}}
\]

Where, $P_{O_2}$ is the partial pressure of the oxygen in the gas phase, $[O_2]$ is molar concentration of dissolved gas concentration in aqueous medium and $K_H$ is the Henry’s law constant and it is a temperature dependent thermodynamic constant.

The partial pressure of the oxygen molecules was calculated using the Henry’s law and the higher value of 49.02 ppm was obtained at S2 compared to the other stations. It has exhibited that the higher level of oxygen molecules may lead to enhance the $P_{O_2}$ at low temperature. The concentrations of saturated dissolved oxygen of these WBs were calculated using empirical equation (3). This is representing the solubility of oxygen (Truesdale et al., 1955) based on the more corrected values as
determined by a modification of the standard Winkler method (ALPHA 1971). The Water Pollution Research Laboratory in England has published this equation as:

\[ C_s = 14.161 - 0.3943t + 0.007714t^2 - 0.0000646t^3 \]  \hspace{1cm} (3)

where \( C_s \) is the saturated concentration of oxygen in ppm and \( t \) is the temperature in °C.

The concentration of saturated oxygen levels were ranged between 7.56 ± 0.15 mg/l and 7.35 ± 0.29 mg/l with the temperature range of 28.82 ± 0.97°C to 29.74 ± 0.44°C for theses WBs (Table 2).

It exhibited the saturation level of oxygen significant to the temperature (Davies et al., 2008). Similar trend of higher DO value of 4.20 ± 0.77 mg/l was observed with the lowest temperature of 28.82 ± 0.97 °C at S2. The lowest mean DO value of 2.47 ± 0.69 mg/l was shown with highest temperature of 29.74 ± 0.44°C at S1.

Table 2: Summary of the measured and calculated concentration of oxygen for the selected water bodies

<table>
<thead>
<tr>
<th>Sampling Station</th>
<th>Concentration of Oxygen (mg/l) mean ± SD</th>
<th>( p_{O_2} ) (ppm) F%, Dissolved</th>
<th>Saturated</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>3.38 ± 0.04</td>
<td>7.35 ± 0.29</td>
<td>42.67</td>
</tr>
<tr>
<td>S2</td>
<td>4.20 ± 0.77</td>
<td>7.56 ± 0.15</td>
<td>49.02</td>
</tr>
<tr>
<td>S3</td>
<td>2.47 ± 0.69</td>
<td>7.37 ± 0.05</td>
<td>40.97</td>
</tr>
</tbody>
</table>

Mean ± SD = mean ± standard deviation for 36 measurements for S1 and 18 measurement for S2 and S3. \( p_{O_2} \) partial pressure of oxygen

The reduction potential (\( E_h \)) value of these WBs was investigated based on Nernst equation and their stability was studied based on the upper and lower region of E-pH diagram. In the upper region, water can be oxidized to produce oxygen while in the lower region it can produce hydrogen gas. Water is therefore only thermodynamically stable between these regions.

Upper stability limit of water is given by

\[ O_2(g) + 4e + 4H^+ \rightleftharpoons 2H_2O \hspace{0.5cm} E^{\circ}_{O_2/H_2O} = 1.23v \] \hspace{1cm} (4)

Applying Nernst equation for the reaction (4),

\[ E_h = E^{\circ}_{O_2/H_2O} + \frac{RT}{nF} \ln \left( \frac{p_{O_2}}{[H^+]^4} \right) \] \hspace{1cm} (5)

where \( F \) = Faraday constant (96485 C mol\(^{-1}\)), \( n \) = electrical charge of the ion and \( T \) is temperature in °K.

The estimated \( E_h \) values were in the range of 0.88 to 0.90 indicating that the waste effluents were not disturbed the thermodynamic stability of WBs, since the values are less than the standard potential value (1.23 v) of the water (Allen et al., 1985). The DO level of these WBs was compared with other parameters such as nutrient levels, salinity and COD.

The mean factor affecting coefficient (FAC), salinity, nutrient level, and COD are summarized in Table 3. The calculated partial pressure of \( O_2 \) reflects the equilibrium partial pressure of \( O_2 \) just above the water level. This partial pressure of oxygen gas may further reduced due to the aquatic plants and limiting to its solubility. Hence, the possible exposure of \( O_2 \) to solubility in water may be significantly lower than the calculated \( O_2 \) levels.

Table 3: Factor affecting coefficient and the calculated physico-chemical parameters of the WBs

<table>
<thead>
<tr>
<th>Sampling Station</th>
<th>NL (mg/l) mean ± SD</th>
<th>COD (mg/l) mean ± SD</th>
<th>STY (%) mean ± SD</th>
<th>FAC (mg/l) mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>4.49 ±0.38</td>
<td>399.72 ± 84</td>
<td>0.37 ±0.26</td>
<td>4.186 ± 0.92</td>
</tr>
<tr>
<td>S2</td>
<td>2.10 ±0.22</td>
<td>388.89 ± 34</td>
<td>0.25 ±0.02</td>
<td>3.373 ± 0.67</td>
</tr>
<tr>
<td>S3</td>
<td>5.05 ±0.24</td>
<td>422.89 ± 24</td>
<td>0.22 ±0.10</td>
<td>5.063 ± 0.59</td>
</tr>
</tbody>
</table>
Mean ± SD = mean ± standard deviation for 36 measurements for S1 and 18 measurement for S2 and S3, FAC = Factor affecting coefficient, NL= nutrient level, STY = salinity.

The mean FAC was calculated based on the difference between the saturated concentration of the oxygen and the dissolved concentration. It was found to be within the range of 4.186 to 3.373 mg/l for all these three water bodies. Among the WBs, DO concentration was varied with NL and COD values. Lower DO concentration was observed with higher level of NL (5.05±0.24 mg/l) and COD (422.89 mg/l) at S3. The low level of COD was found at S2 corresponding to higher level of DO and the opposite trend also true at S3 with respect to the nutrient level. During this study, saturation of the oxygen gas between gaseous and an aqueous phase is considered to analysis other than passage of the oxygen molecules through the liquid interface film by molecular diffusion and it is transferred to the bulk of the liquid by diffusion and convection.

The basic equation for oxygen-transfer rate is

\[
\frac{dC_L}{dt} = N = K_{La} (C_s - C_L)
\]  

(6)

Where \( N \) is mass of oxygen transferred per unit time, \( K_{La} \) is liquid film coefficient, \( a \) is interfacial area per unit volume, \( K_{La} \) is overall transfer coefficient (OTC) and \( (C_s - C_L) \) is difference between saturated (Cs) and actual concentration of oxygen (C_L). Separating variables, integrating, and assuming \( K_{La} \) to be independent of the time of sampling

\[
\ln(C_s - C_L) = - K_{La} at + \text{constant.}
\]  

(7)

The standard oxygen transfer efficiency (OTE) for waste water is,

\[
N = N_o \left[ \frac{C_s - C_L}{8.86} \times 1.024^{(7-28)} \alpha \right]
\]  

(8)

Where \( N \) is OTE under filed conditions (temperature and pressure); \( N_o \) OTE is 2.65 at zero turbulence, 8.86 is the oxygen saturation value at 28°C in mg/l.

The oxygen uptake capability, solubility and its transferring ability between the phases were analysed based on the calculated parameters such as OTE, OTC (\( K_{La} \)), \( \alpha \) and \( \beta \) factor are summarized in the Table 4. The OTE did not sufficiently changed by the viscosity in an aerated system (DeMoyer et al., 200). Nevertheless, during this study OTE has shown that the lowest value 8.90 at the S2 with significant level of organic and inorganic substances.

Organic and inorganic substances are significantly impact on the characteristic of the aqueous phase. Mostly concentrated organic substances alter the surface tension and the clean water have approximately 72.8 mN m\(^{-1}\) surface tension while domestic waste water is 50.0 mN m\(^{-1}\) at 20°C (Henze et al., 1995). The change in the surface tension is known to the affect on the oxygen uptake rate in the water bodies.

The ratio, \( \alpha \) factor is between the rate of oxygen uptake in wastewater and tap water respectively.

\[
\alpha = \frac{K_{La}(\text{wastewater})}{K_{La}(\text{tap water})}
\]

The surface active substances of WBs are altering the surface tension and it cause turns the oxygen uptake rate of the WBs (O’Connor., 1963). Furthermore, the surface tensions of these WBs were studied through \( \alpha \) factor.

**Table 4:** Mean values of the oxygen uptake and solubility determining factors and oxygen transfer efficiency of the WBs

<table>
<thead>
<tr>
<th>Sampling Station</th>
<th>OTE mean</th>
<th>( K_{La} )</th>
<th>( \alpha ) Factor mean</th>
<th>( \beta ) Factor mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>21.91</td>
<td>0.083</td>
<td>16.88</td>
<td>0.99</td>
</tr>
<tr>
<td>S2</td>
<td>8.90</td>
<td>0.135</td>
<td>8.67</td>
<td>1.02</td>
</tr>
<tr>
<td>S3</td>
<td>18.40</td>
<td>0.052</td>
<td>11.86</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Mean = mean values for 36 measurements for S1 and 18 measurements each for S2and S3. \( K_{La} \) = overall transfer coefficient
During this study low level of OTE (8.90) was observed at S2 with respect to lowest level of \( \alpha \) factor (8.67) exhibiting the impact of surface active substances on oxygen transfer efficiency at this station. On the other hand, the highest level of OTE (21.91) relative to highest level of \( \alpha \) factor (16.88) was observed at S1. Since the \( \text{O}_2 \) molecules do not need to possess enough kinetic energy to break the surface tension and pass through air-water interface result in more oxygen being up taken by the WBs through week surface tension. However oxygen uptake rate varied significantly (\( P < 0.05 \)) among the stations.

The \( \beta \) factor is used to correct the reduction of the solubility of DO in wastewater caused by the organic and inorganic dissolved solids concentration. The concentration relation for the \( \beta \) factor is,

\[
\beta = \frac{C_s(\text{wastewater})}{C_s(\text{tap water})}
\]

Organic and inorganic dissolved solid concentrations of these water stations were investigated based on the total dissolved solid (TDS) values. The solubility of the DO was significantly reduced by the hug level of TDS (323 ± 55 mg/l) at the stations S1 rather than other stations. However, \( \beta \) factor does not exhibit significant variation (\( p > 0.05 \)) between the stations.

Moreover Inorganic substances are increasing the viscosity of the water phase (O’Connor., 1963) and the molecular diffusion process of a gas in liquid is significant to the viscosity that is lowering the viscosity increases the molecular diffusion process. During this study, the lowering the OTE (8.90) exhibited increasing \( \beta \) factor at the station S1. However, the OTE did not sufficiently changed by the viscosity in an aerated system (Stukenberg et al., 1977). The impact of salinity on the concentration of DO in S2 was significantly deviated from S1 and S3 with negative correlation. The analysis of the COD with the concentration of the DO exhibit the higher organic content (422.89 mg/l) had low DO (2.47 ± 0.69 mg/l) concentration at S3 whereas it was lower at S2 (388.89 mg/l) and higher DO (4.20 ± 0.77 mg/l) concentration. The above variation clearly proved by the significant negative correlations of DO vs COD with higher \( r^2 \) values of the WBs (\( r^2 > 0.7 \)) Table 5.

Nutrient concentration of the WBs was varied with DO concentration such that, the sampling station S3 exhibit higher level (5.05 mg/l) of nutrient content with lowering the DO concentration. On the other hand, the opposite is true at S2. However, significant negative correlation was observed for DO vs NL at S1. Nutrient enrichment in water bodies through the agricultural runoffs containing fertilizer stuff and other improper waste disposal lead to growth excess level of phytoplanktons (Khan & Ansari, 2005) as a result DO concentration may deplete or it may be the barrier to dissolve more oxygen in the water system. The impact of the Nutrient level and the COD on the DEDO of the sampling station S2 is illustrated in the Figure 1.

### Table 5: Linear regression analysis for the parameters having good Pearson product moment correlation coefficients

<table>
<thead>
<tr>
<th>Station</th>
<th>Parameters</th>
<th>X</th>
<th>Y</th>
<th>Linear regression</th>
<th>( r^2 ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>DO</td>
<td>DS</td>
<td>(-0.002X + 0.018)</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>COD</td>
<td>(-110.2X + 795.1)</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>NL</td>
<td>(-0.808X + 7.775)</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>STY</td>
<td>(-6.959X + 6.083)</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>DO</td>
<td>DS</td>
<td>(-0.002X + 0.019)</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>STY</td>
<td>(-0.064X + 0.022)</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>NL</td>
<td>(-0.435X + 3.864)</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>COD</td>
<td>(-100.8X + 823.0)</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>DO</td>
<td>DS</td>
<td>(-0.003X + 0.006)</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>STY</td>
<td>(-10.08X + 4.687)</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>NL</td>
<td>(-1.109X + 7.305)</td>
<td>0.51</td>
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</tr>
<tr>
<td></td>
<td>DO</td>
<td>COD</td>
<td>(-93.18X + 619.4)</td>
<td>0.73</td>
<td></td>
</tr>
</tbody>
</table>

DO = dissolved oxygen in mg/l, DS = dissolved sulfide mg/l, COD = chemical oxygen demand, NL = nutrient level STY = salinity.

During the huge level of nutrient concentration, DO level gradually decreasing with increasing COD level. The impact of COD and nutrient level on DO concentration show a similar trend as shown in Figure 1for the other WBs, too. However, the actual values of the COD and nutrient concentration are differing from the below graphed values. DO, Nutrient level and COD are the variables of the above 3D graph of the sampling station S2 and it clearly exhibits the trend of one variable with respect to other. In order to consider the DO level has increased when the value of nutrient level lies between 7.5 - 6.0 mg/l.
the gradient of this graph suddenly decreases when the nutrient value below 6.0 mg/l. Nutrient enrichment led to growth excess level of phytoplanktons (Khan and Ansari, 2005) as a result DO concentration may deplete.

Figure 1: Variation of DO in (mg/l) with nutrient level (mg/l) and COD (mg/l) for S2

Conclusion

The domestic and other waste materials including surface active substances, significantly impact on dynamic equilibrium of dissolved oxygen (DED0) through the contribution of organic contaminations and nutrient level. From the OTE analysis, viscosity of the stations altered by the significant level of Organic and Inorganic substances. Excess level of the domestic and other improper waste disposal lead to alter the characteristic of the WBs in such that Nutrient level and COD were impact on DO of these WBs. The COD significantly contributes to the variation of DO as like nutrient level and its level significantly reduce the DO concentration with increasing nutrient concentration. Not only the nutrient enrichment and organic content may remove the feasible space for the dissolution of the oxygen gas but DO consumers also may take more oxygen from the system. DED0 of these WBs is altered by the urban drainage system containing waste materials, which led to enhance the malodorous environment to the mosquitoes and other insects.

Acknowledgment

We acknowledge the technical support from Mr. M.F. Nawas senior lecturer in chemistry Faculty of Applied Sciences, South Eastern university of Sri Lanka.

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A Study on Electrochemical Behavior of Polypyrrole Films In Differently Concentrated NaCl Electrolytes

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Abstract

Polypyrrole films doped with large surfactant anion dodecyl benzene sulfonate, PPy (DBS), have been electro polymerized in galvanostatic condition and characterized in highly concentrated NaCl aqueous solution (5 M) using Cyclic voltammetry, electrochemical microbalance (EQCM) and UV-visible absorption spectroscopy. In order to compare (property) similar experiments were carried out in 0.1 M NaCl (aq) electrolyte, as well. The EQCM studies show that the mass change occurring in the film during the first cycle, in 0.1 M electrolyte, is comparatively higher than that is observed in the 5 M electrolyte. This is because of many water molecules go in and out of the polymer accompanying the counter ions, when PPy(DBS) film cycled in dilute electrolytes, due to osmotic effect. On the other hand, during the redox process in highly concentrated electrolytes, the mass change is mainly due to moving counter ions where there is less amount of water molecules present in the electrolyte. A large number of continuous cycles were carried out to test the cycling stability of PPy(DBS) films. Cyclic voltammograms are almost unchanged after first few cycles in both higher and lower concentrations. But, on further cycling, the shape and capacity of the cyclic voltammograms change significantly in 0.1 M NaCl (aq) electrolyte while only a minor change is observed in 5 M NaCl (aq) electrolyte. It reflects that the PPy(DBS) films have better cycle life in concentrated electrolytes. The optical absorption spectra obtained at various reduction potentials in both electrolytes looks most identical to each other. This results shows that the PPy(DBS) films do not undergo any noticeable structural or conformational changes during the redox processes.

Key words: polypyrrole cyclic voltammetry, electropolymerization.

Introduction

The electrochemical characteristics of polypyrrole/dodecylbenzenesulphonate, PPy(DBS), films during the redox process depend significantly on many conditions, for instance, the type of counter ions and concentration of cycling electrolyte [1]. Short cycle life in aqueous electrolytes limits the applications of PPy based conducting polymers in practical devices. Using ionic liquids as cycling media resolves the above problem to some extent [2], however they cost too much. The aim of this study is to investigate whether concentrated electrolytes can be used to improve the cycling stability of PPy/DBS film.

In this paper we report the electrochemical characterization of PPy(DBS) films cycled in highly concentrated (5 M) NaCl(aq) solution using electrochemical quartz crystal microbalance (EQCM) and UV-visible absorption spectroscopy. The results were compared with those obtained in a dilute electrolyte solution having a concentration of 0.1 M. Tests on electrochemical stability of the PPy/DBS films also are reported.

Experimental

PPy(DBS) films were prepared using the galvanostatic electropolymerization technique. The 0.05M sodium dodecylbenzenesulphonate (SDBS) aqueous solution containing 0.05 M pyrrole, was used as the synthesis electrolyte. For the EQCM experiments, films were prepared on the gold electrode(area 1.37 cm²) on AT-cut 5 MHz quartz crystals, to have a thickness corresponding to a charge of 32 mC cm⁻² (calculated thickness 0.2 μm). A Stanford research systems (SRS) QCM-200 crystal analyzer in combination with a potentiostat (µAutolab TypeIII PGSTAT) was used for combined mass and redox cycling experiments. The cycling electrolyte (5 M and 0.1 M NaCl(aq) solution) was purged with nitrogen gas to remove dissolved oxygen. A Pt sheet was used as counter electrode and Ag/AgCl (3 M KCl) as a reference electrode. UV-visible optical absorption study was performed on films prepared, as described above, on ITO coated glass (Current density = 0.1 mA cm⁻²) using an Agilent 8453 UV-visible spectrometer. The film thickness is corresponding to achargeof 40 mC cm⁻².

Results and discussion

EQCM studies

Figure 3.1 shows that the first cyclic voltammograms and simultaneously obtained frequency (mass) changes of a PPy/DBS film cycled in (a) 5 M and (b) 0.1 M NaCl (aq) electrolytes. The sharp peak at around -0.5 V during the first reduction and a
broad anodic peak centered at –0.45 V are the usual first cyclic characteristic of the PPy(DBS) films and these peaks represent insertion and expulsion of cation (Na+), respectively. Regarding the changes in the cyclic voltammograms in the two cycling electrolytes, only a slight shift in the reduction peak position was observed. However, frequency changes during the cathodic sweep differ by a large amount. The mass increase occurring in 0.1 M electrolyte is higher than that in 5 M electrolyte.

**Figure 3.1:** Cyclic voltammograms and frequency curves of the PPy/DBS film cycled in

(a) 5 M and (b) 0.1 M NaCl solution

This is because of more water molecules can enter the film accompanying the counter ions due to osmotic effect when the film is cycled in dilute electrolyte. Similar observation can be seen during the anodic scanning, as well.

To investigate the cycling stability of the PPy(DBS) films, about 300 continuous cycles were carried out in electrolytes having both higher and lower concentrations. The Cyclic voltammograms were found to be almost unchanged after first few cycles up to about 50 cycles in both cases. However, on further cycling, shape and capacitance of the cyclic voltammograms change significantly in the dilute electrolyte while only a minor change was observed in the cyclic voltammograms in the 5 M electrolyte. Figure 3.2 shows the capacitance variation of the cyclic voltammograms obtained in both electrolytes as a function of cycle numbers. For easy comparison of the variations, the ratio of Cn/C10 versus cycle number was shown in Fig.3.2, here Cn and C10 corresponds to the capacitance of the nth and 10th cyclic voltammograms. Figure 3.2 clearly shows that the PPy/DBS films have better stability in the highly concentrated electrolyte.

![Electrochemical stability of PPy(DBS) films](image)

**Figure 3.2:** Electrochemical stability of PPy(DBS) films in (a) 5 M and (b) 0.1 M NaCl as a function of number of cycles. Cn: capacitive of nth cycle, C10: capacitive of 10th cycle

UV-visible absorption studies

Fig.3.3 (a) and (b) show the UV-Visible absorption spectrum of PPy(DBS) films obtained at different potentials during the steady state (after 10 cycles) reduction of the film in 5 M and 0.1 M NaCl(aq) solutions, respectively. Both sets of spectra look identical except for slight difference in the amount of absorption. However, no change in the peak positions corresponding to
π-π*(3.0 eV), polar on (2.2 eV) and bipolar on transition were observed. These results indicate that the PPy/DBS films do not undergo any noticeable structural or conformational changes during the steady state redox process in the lower concentration electrolyte in spite of considerable water movement taking place.

**Conclusion**

The electrochemical stability of PPy/DBS films in aqueous NaCl electrolyte solution depends highly on the concentration of the electrolyte. While the cycling capacity in 0.1 M electrolyte solution decreases significantly after about 50 cycles, the capacity remains same even at 300th cycle in 5 M electrolyte solution indicating that the films are more stable in concentrated electrolytes. Comparatively large amount of water are moving in and out of the film, during the redox process in dilute electrolytes and this water movement may be responsible for the low cycling stability of the films. However, the optical absorption spectra obtained in both electrolytes do not show any significant changes, indicating that there are no significant structural or conformational changes taking place in the PPy/DBS films when cycled in dilute electrolytes in spite of the large water movement.

**References**


The Impact of Students’ Intake Quality on the Performance of Engineering Undergraduates

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Abstract

The quality of intake of students in terms of Z score to a particular course to different universities differs vastly in Sri Lanka. The students who get higher Z score goes to established universities mostly under merit category and the students from educationally disadvantaged districts with less Z score enter to the newly established universities. The variation in quality of intake in these newly established universities is greater and there is a concept that students’ performance in the undergraduate program associated with the quality of intake. In this study the relationship between Z score and the student performance in the Engineering degree programme at the Faculty of Engineering, South Eastern University of Sri Lanka was analyzed for 92 students. This study revealed that the quality of intake has no influence on the performance of the students but gender has influence in the performance. This study emphasis the current partial quota system of allocation to different districts proportional to the population and educationally disadvantaged districts should exist.

Keywords: intake quality, grade point average, student performance, Z-score

Introduction

Admission to the local students to the five engineering faculties in Sri Lanka at undergraduate is based solely on the results of the G.C.E. advanced level (A/L) examination. To enter in to the Engineering faculties, generally students sit for Combined Mathematics, Physics and Chemistry at G.C.E A/L. In 2001, Z score system was introduced for ranking the students at G.C.E (A/L). For the engineering degree program 40 % of the nationally available places is filled in order of Z scores ranked on all island basis, 55 % is filled in proportion to the total population in the 25 administrative districts and 5 % is filled in proportion to the population in the 13 educationally disadvantaged districts (University Grant commission, 2011). The quality of the student intake to the engineering degree programme is determined by the Z score of the students and it varies much due to this 3 levels allocation. The selected students’ Z score variation for a study programme increases much due to this district quota system which is mainly introduced considering the educational disadvantage districts. There is a concept that students get low Z score in the educationally disadvantaged districts because of lack of educational facilities and if these students are given equal facilities with other district students, they will also perform equally. In addition, the need of graduates from all over island is also one reason for this quota allocation. An earlier similar study in the science degree program found that the quality of intake does not reflect on the final performance of the students but in the first year (Razmy, 2012). This study discuss whether the variation in the quality of intake reflect on the performance in the engineering degree programme.

Methods

92 students’ Z Scores and performance in the engineering degree programme at the Faculty of Engineering (FE), South Eastern University of Sri Lanka (SEUSL) were analyzed by using different statistical techniques. The student performance was measured by their grade point average (GPA) obtained in the first two semesters.

Results and Discussion

The average Z score of the students entering to the FE, SEUSL was 1.1605 (95% CI, 1.1157, and 1.2052). As the Z score is not a linear ranking of the performance, it can be transformed into cumulative probability (\(\Phi(Z)\)) of the standard normal random variable which rank the GCE A/L performance by its cumulative probability. The average cumulative probability of the students entering to the FE, SEUSL was 0.87178 (95% CI, 0.86188, 0.88167) which interpret that 95 % of the students coming to FE, SEUSL are from top 13.812 % to 11.833 %. The average GPA in the 1\textsuperscript{st} and 2\textsuperscript{nd} semesters were 2.40 (95% CI, 2.29, 2.52) and 3.12 (95% CI, 3.02, 3.23) respectively. A paired t-test indicate that there is a significant increase of 0.72 (95% CI, 0.65, 0.79) GPA in the 2\textsuperscript{nd} semester compare to the 1\textsuperscript{st} semester (P < 0.000). It might be due to student adaptation to university education system.
Fig. 1 and Fig. 2 show the GPA of the students in the first and second semesters respectively and their overall cumulative probability ranking in the GCE (A/L) examination. Even though increasing trends in GPA were observed in both cases, the adjusted R-square values for linear fits were 0.4% and 1.9% respectively. It is because of higher variance form the fitted line. Therefore it can be interpreted that there is no significant relationship between the intake quality and the students’ performance in the engineering degree programme.

![Graph showing GPA and Z score correlation](image1)

**Figure 1:** $\phi(Z)$ Ranking and 1st Semester GPA

![Graph showing GPA and Z score correlation](image2)

**Figure 2:** $\phi(Z)$ Ranking and 2nd Semester GPA

The average Z score of the male and female student were 1.161 and 1.158 respectively and no significant difference was observed among them ($P=0.955$). But surprisingly a significant difference in cumulative GPA (CGPA) was observed among the male and female students ($P=0.015$). The average CGPA of the female and male students were 3.04 and 2.70 and the female students had obtained 0.338 (95 % CI, 0.61, 0.07) more CGPA than the male students. This statistically significant difference was observed for both semesters.

**Conclusion**

The intake quality of the students represented by the Z score did not reflect any performance difference in the FE, SEUSL. However the intake quality difference had some influence in the performance of the students in the first year only in some
other faculties. As there is no reflection of Z score in the performance of the students in the Engineering degree programme, the partial quota system is not having any negative effect but produce graduates thorough out the island

References


A Review on Cloud Computing Adoption: An Exploratory Analysis

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Abstract

The world has been witnessed with many technological revolutions. One of them is the computing technologies. There have been many revolutions such as mainframe computers, super computers, web technologies, Internet, grid computing, utility computing, etc. Cloud computing is another evolution in the field of computing and it has been evolved from the earlier computing technologies by the integration of some of them and removing the obstacles encountered in them as a new technology. Amazon, Google, Microsoft, Salesforce.com, are some of the organizations who provide this technology to organizations and personal users.

Cloud computing has attracted many people, researchers, and professionals towards it. Many people have done researches on it and many articles and conference papers on varying aspects of cloud computing has been published. The purpose of this paper is to review those research articles and conference papers to compile the concepts and various aspects of it in order to enlighten the concept more understandable to all varieties of people since it has been a new concept and many people are not aware of it by using exploratory analysis as methodology. The paper focuses on the different definitions of cloud computing, characteristics, underlying technologies, different cloud services, cloud deployment model, advantages and disadvantages of cloud computing, cloud computing implementation issues, adoption status of cloud computing, and future research areas.

Keywords: cloud computing, technology adoption,

Introduction

Overview on Cloud Computing

Cloud computing is an emerging Internet-based technology through which information is stored in servers and provided as an on-demand service to clients. It helps organizations of all kinds to be more efficient in their ICT deployment in their organization and promote growth, competition, and business creation. Cloud computing provides a shared pool of computing resources that can be provided and stopped as and when the users need to satisfy a wide and constantly increasing range of information processing needs (Alshwaier, Youssef and Emam, 2012). Yahoo email, Gmail, Google docs etc. are some of the simple examples of cloud computing (John Rhoton, 2011).

According to Garner’s study, enterprise’s spending on cloud computing is growing faster than overall IT spending and predicts that cloud computing technology will grow by over 100 percent to become a USD$127 billion industry by 2016 (Prweb, 2012). Further, a joint IBV/IEU cloud-enabled business model survey also revealed that 62 percent of CIOs consider cloud computing as the leading and important priority for IT (Berman, 2011). Presently US takes the lead and Europe lags behind due to regulations on security, integration, performance, and reliability concerns (Berman et al., 2011). Based on a survey in 2010 (DigitalOne, 2010), 59 percent of Asian companies were either using or planning cloud computing.

In this computing model, personal users and organizational users would be able to access all of their documents and data from any device (the home or work personal computer [PC], the mobile phone, or an Internet point, among others) and anywhere and cloud vendors would be able to rent computing power (both hardware and software in their latest versions) and storage on demand for a fee. Cloud computing could be used in two ways to meet the information technology requirements. One is for IT efficiency, whereby the power of modern computers is utilized more efficiently through highly scalable hardware and software resources and the second is for business agility, whereby IT can be used as a competitive tool through rapid deployment, parallel batch processing, use of compute-intensive business analytics and mobile interactive applications that respond in real time to user requirements (Sean Marston, 2011).

Objectives

This research paper sought to achieve the following objectives. First, to identify the various concepts related with cloud computing, to identify the different stakeholders with the cloud computing services, to celebrate the underlying technologies behind the cloud, identify the issues, to focus on the adoption status of cloud computing, and finally to suggest future research areas in cloud computing.
Methodology
Exploratory analysis was used in this paper since it is a new concept and reviews the exiting literatures. Some of the more popular methods of exploratory research include literature searches, depth interviews, focus groups, and case analyses. Literature search is one of the quickest and least costly ways to discover hypotheses is to conduct research. There is an incredible amount of information available in libraries, through online sources, in commercial data bases, and so on. The literature search for this research involved popular press (newspapers, magazines, etc.), trade literature, academic literature, or published statistics from research firms till today on the concept.

Definitions of cloud computing
As with all the concept, cloud computing is also defined in various ways and various point of view. There are many definitions of cloud computing and some of the definitions which different researchers and professional bodies have been provided in this section in order to understand the concepts related with cloud computing in the subsequent sections. The most comprehensive definition available is by Brendl (2010) who defined cloud computing as “collections of IT resources (servers, databases, and applications) which are available on an on-demand basis, provided by a service company, available through the internet, and provide resource pooling among multiple users.” (Bisong and Syed Rahma, 2011).

The Gartner consulting propose a definition as follows “A style of computing where scalable and elastic IT-related capabilities are provided as-a-service using Internet technologies to multiple external customers” (Plummer et al., 2009). The National Institute of Standards and Technology (NIST) defines cloud computing as “a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., network, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Borenstein and Blake (2011) sees it as “…the use of fast, high-bandwidth Internet connections to deploy services that are centrally maintained, often by third parties, and thus minimize the cost and difficulty of IT administration and support for the organizations that consume those services.” Buyya et al (2008) define cloud as “a type of parallel and distributed system consisting of a collection of interconnected and virtualized computers that are dynamically provisioned and presented as one or more unified resources based on service-level agreements established through negotiation between the service provider and consumers.”

Foley (2008) provides this explanation: “Cloud computing is on-demand access to virtualized IT resources that are housed outside of your own data center, shared by others, simple to use, paid for via subscription, and accessed over the Web.” In another article, cloud computing is defined as follows: “It is an information technology service model where computing services (both hardware and software) are delivered on-demand independent of device and location. (Sean Marston, 2011).

Evolution of cloud computing
The underlying concept of this computing style dates back to the 1960’s, when John McCarthy, the computer and cognitive scientist, first envisioned the possibility that “someday computation may be organized as a public utility” (Mohamed, 2009). Since then, cloud computing has developed into several different lines, the most recent of which is Web 2.0. The shift of computing trend toward cloud computing started in the late 1980s with the concept of grid computing when, for the first time, a large number of systems were applied to a single problem, usually scientific in nature and requiring exceptionally high levels of parallel computation. In 1999, a company named Salesforce.com pioneered the concept of delivering enterprise applications using the internet (Mohamed, 2009). The company introduced Software-as-a-Service (SaaS) to companies by applying many of the technologies developed by leading companies such as Google and Yahoo! to business applications. This allowed companies to use the software on as-needed basis rather than purchasing it outright. Microsoft extended SaaS with the development of its Web Services in the early 2000’s by allowing the means for SaaS software to connect to other software applications using the World Wide Web (Nafisa, 2009).

The first mover in the field of cloud computing has been Amazon, which has provided access to half a million developers by way of Amazon Web Services (initially developed for internal purposes). Elastic Cloud Computing (Amazon EC2) is one of the cloud services of Amazon. Google is also investing huge amounts of funds in data centers. Already today Google provides word processing, presentation and spreadsheet applications online as Google Docs and Gmail, while software and data are stored on the servers. Google App Engine allows software developers to write applications that can be run for free or fee on Google’s servers. Even Google’s search engine or mapping service can offer cloud application services: for instance, when Google Maps was launched, programmers easily found out how to combine the maps with other information to provide new services. Microsoft started later but has made high investments in the creation of new data centers. In January 2010, the leading software company launched a cloud platform called Windows Azure (introduced in a beta version in 2008).
Moreover, Windows Azure provides a browser-accessible portal for customers, who can create a hosting account to run applications or a storage account to store data in the cloud. Another important player is Salesforce.com with its Force.com products. Also Oracle has introduced a cloud-based version of its database program and is merging with Sun Microsystems to prepare further expansion in the field. Finally, Yahoo! is developing server farms as well.

Characteristics of cloud computing

The essential characteristics are:

Table 1: Cloud computing characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
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<tr>
<td>On-demand self service</td>
<td>IT is used as service and is readily available on demand without requiring manual intervention.</td>
</tr>
<tr>
<td>Broad network access</td>
<td>The service is made available via a network independently of the user end device. The network connection must be of sufficiently high performance and available for that particular service.</td>
</tr>
<tr>
<td>Resource pooling</td>
<td>The provider makes the necessary resources available to multiple consumers using technologies such as virtualization and multi-tenancy.</td>
</tr>
<tr>
<td>Rapid elasticity</td>
<td>The resources necessary can be provisioned rapidly and released without manual intervention when no longer needed.</td>
</tr>
<tr>
<td>Measured Service</td>
<td>A service consumed must be measurable in terms of the resources used. In this way, consumption-based billing becomes possible. Also known as “pay as you go” or “pay-per-use.”</td>
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</table>

Source: Based on “The NIST Definition of Cloud Computing” by P. Mell and T. Grance, Special Publication 800-145 (National Institute of Standards and Technology, Gaithersburg, MD, Sept. 2011). In some other studies, the Cloud computing has the following basic characteristics (NIST, 2011, IBM Global Technology Services, 2011, Nanda and Mishra, 2010).

Elasticity and scalability: services should be available all the time 24*7, and be designed to provide high scale service during peak times and also during lighter zones. It should be scalable when additional users are added or when requirements change and ability to scale is achieved by providing elasticity.

Self-service provisioning: Customers to avail themselves of Cloud services; what the customer needs to do is simply he or she has to request the type of service he requires. The request can be computing, storage, software process or some other resources from the service provider.

Application Programming Interfaces (APIs): Standardized APIs are needed for Cloud services. The instruction regarding communication between 2 applications or data sources is provided by these interfaces. An easily link for the customer with a Cloud service is done by a standardized interface such that customized programming is not needed, for example a customer relationship management system with a financial management system.

Performance monitoring and measuring: A service management environment must be included by the Cloud service provider which is an integrated approach for managing physical environments and IT systems. Service management has to be monitored to optimize the services. Many customers use their own monitoring tools for determining whether the service level requirements are being met.

Security

Many people are scared about their data privacy. Many customers need to trust that the Cloud services are safe. To give critical data or application infrastructure to a Cloud-based service provider requires an assurance that the information has not been accidentally retrieved by another company (or hacked). The security concept should be dealt with as a serious issue in Cloud Computing as critical data resides over Cloud. The user trust can be built up if strategies regarding network behavior, user behavior, processing behavior are made (Li-qin and L Chuang, 2010).

Core Concepts and Technologies of cloud computing
Cloud computing is an emerging new computing paradigm for delivering computing services. This computing approach relies on a number of existing technologies, e.g., the Internet, virtualization, grid computing, Web services, etc (Nabil Sultan, 2010). Further, it is composed several Strata of Services. These include services like Infrastructure as a Service, Storage as a Service, Platform as a Service and Software as a Service. Different Cloud Providers have developed various access models to these services. The access to these Services are based on standard Internet Protocols like HTTP, SOAP, REST, XML and the infrastructure is based on widely used technologies including Virtualization, hosting. Cloud Computing is the maturation and coming together of several prior computing concepts like Grid Computing, ASP, Server Hosting, Utility Computing and virtualization. Another related concept is the multi tenancy, whereby a single instance of an application software serves multiple clients. This allows better utilization of a system’s resources (in terms of memory and processing overhead), the requirements of which could otherwise be considerable if the software instance had to be duplicated for each individual client.

Advantages and Disadvantages of cloud computing

As with other technology, cloud computing also provides many advantages and disadvantages. Cloud computing with its different deployment and delivery models offers a number of benefits to businesses (Voona and Venkantaratna, 2009, Buyya et al., 2008, Miller, 2008, Catteddu and Hogben, 2009, Andrei, 2009). These benefits are such as: economies of scale resulting in low-costs of IT infrastructure, low maintenance costs and low IT administration costs. Other benefits are, improved of performance as a result of having access to dynamic and scalable computing, memory and storage capabilities based on demand. Cloud computing also offers easier data monitoring, quick incident response, and low costs to undertake security measures. Easier group collaboration, universal access to computing resources and the removal for the need for specific devices or hardware in-house are also benefits that can be accrued from cloud computing.

It dramatically lowers the cost of entry for smaller firms trying to benefit from compute-intensive business analytics that were till then available only to the largest of corporations and it can provide an almost immediate access to hardware resources, with no upfront capital investments for users, leading to a faster time to market in many businesses. Cloud computing also makes possible new classes of applications and delivers services that were not possible before. Examples include (a) mobile interactive applications that are location-, environment and context-aware and that respond in real time to information (e.g. humidity and stress sensors within a shipping container) or even from independent information services (e.g. worldwide weather data); (b) parallel batch processing, that allows users to take advantage of huge amounts of processing power to analyze terabytes of data for relatively small periods of time, while programming abstractions like Google’s MapReduce or its open-source counterpart Hadoop makes the complex process of parallel execution of an application over hundreds of servers transparent to programmers; (c) business analytics that can use the vast amount of computer resources to understand customers, buying habits, supply chains and so on from voluminous amounts of data; and (d) extensions of compute-intensive desktop applications that can offload the data crunching to the cloud leaving only the rendering of the processed data at the frontend, with the availability of network bandwidth reducing the latency involved. (Sean Marston et al. 2011)

However, cloud computing has a number of disadvantages such as: requiring a constant internet connection, can be slow in case of slow internet connections, limited features offering, security might not meet the organization standards, danger of loss of business in case of data loss or cloud vendor filing for bankruptcy (Miller, 2008, Jeffrey and Neidecker Lutz, 2009, Ristenpart et al., 2009). Moreover, many security and privacy incidents are also observed in today’s Cloud Computing systems. A few latest cloud security concerns such as; In March 2011 a prolonged period of interruption to Amazon’s Elastic Block Storage (part of the AWS offering) caused a large number of websites to go suddenly, and painfully, dark, cloud storage provider Dropbox suffered from an administrative error, Google Docs found a flaw that inadvertently shares users’ docs in March 2009.

One of the top security concerns of enterprises are the physical location of the data that are being stored in the cloud especially if they are located in another country because the laws of the host country of the equipment apply to the data on the machines (Smith, 2009) and that could be a big issue if the host country does not have adequate laws to protect sensitive data or if the host nation becomes hostile or when the government of the hosting nation changes and become unfriendly (Bisong and Rahman, 2011). Cloud computing faces just as much security threats that are currently found in the existing computing platforms, networks, intranets, internets in enterprises. These threats, risk vulnerabilities come in various forms. The Cloud Security Alliance (Cloud Computing Alliance, 2010) did a research on the threats facing cloud computing and it identified the Following seven major threats; abuse and Nefarious Use of Cloud Computing, in insecure application programming Interfaces, malicious insiders, shared technology vulnerabilities, data loss/leakage, account, service &traffic hijacking, and unknown risk profile. Information stored with a third party (including a cloud computing provider) may have fewer or weaker privacy protections than information in the possession of the creator of the information. IT managers are likely to be wary of surrendering control of their resources to outside providers who can change the underlying technology without customers consent (AlSudiariand Vasista, 2012)

Cloud computing delivery and deployment models

Cloud computing has three delivery or service models and four deployment models that are popular (Vouk, 2008, CSA, 2009, Mell and Grance, 2009a, Mell and Grance, 2009b). The cloud computing promotes X as a Service (XaaS) view, where X can
be any computing function provided via the cloud computing, such as Software (SaaS), Platform (PaaS), and Infrastructure (IaaS). The following service or delivery models are available with cloud offering. Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS). In SaaS the organization outsources everything by renting remotely accessed services via the Internet. The client uses the provider’s applications or software through different client devices via a thin client interface such as a web browser (Mell and Grance, 2009a). Examples of SaaS providers are salesforce.com, Netsuite and Oracle CRM on Demand. For PaaS, the service provider rents dedicated resources to a client. In this offering the client has the ability to deploy on the cloud his/her own created applications or software using programming languages and tools supported by the provider (Mell and Grance, 2009a). Examples of Paas services are Google Application Engine, force.com. The Infrastructure-as-a-Service (IaaS) is another model and dedicated resources are offered to a single tenant or client and do not allow sharing of dedicated resources to unknown third parties. The model provides the customer with ability to deploy applications on the cloud infrastructure. The applications may include operating systems and other applications. However, the customer does not have control over the infrastructure but may control the deployed applications and operating systems, storage and selected network components (Mell and Grance, 2009a). Figure 1 shows the cloud taxonomy showing different types of offerings in the different delivery models.

**Figure 1:** Cloud Taxonomy, Source: Torry Harris, Cloud Computing - An Overview

**Deployment models**

There are four models for cloud computing service deployment, regardless of the service or delivery model (IaaS, PaaS, or SaaS) adopted. These deployment models may have different derivatives which may address different specific needs or situations (Dustin Amrhein et al., 2010). The basic deployment models are public cloud, private cloud, community cloud and hybrid cloud (Dustin Amrhein et al., 2010, Grance, 2010, Mell and Grance, 2009a, Catteddu and Hogben, 2009).

A public cloud is characterized as being available from a third party service provider via the Internet, and is a cost-effective way to deploy IT solutions, especially for small or medium sized businesses. Google Apps is a prominent example of a public cloud that is used by many organizations of all sizes. A private cloud offers many of the benefits of a public cloud computing environment, such as being elastic and service based, but is managed within an organization. Private clouds provide greater control over the cloud infrastructure, and are often suitable for larger installations. A private cloud can actually be handled by a third-party provider, e.g. Government Cloud to store both applications and data of government agencies in a completely segregated environment, both logically and physically. A community cloud is controlled and used by a group of organizations that have shared interests, such as specific security requirements or a common mission. The United States federal government is one of the biggest users of a community cloud: built on Terremark’s Enterprise cloud platform and it has allowed the government to rapidly deploy very specific applications, all of which are all linked to the U.S. government’s official web portal USA.gov. Finally, a hybrid cloud is a combination of a public and private cloud – typically, non-critical information is outsourced to the public cloud, while business-critical services and data are kept within the control of the organization (Sean Marston et al. 2011)

**Barriers to cloud computing**

Organizations which consider adopting cloud based services must also understand the many major problems of information policy, including issues of privacy, security, reliability, access, and regulation. The major security challenge with clouds is that the owner of the data may not have control of where the data is placed (Singh and Shrivastava,). Some of the challenges are explained below.

**Misunderstanding of responsibilities:** In a traditional environment the security of data is entirely the burden of the company owning data. In the cloud computing environment, the responsibilities are divided between the two actors: the cloud provider and the client. There is a tremendous potential for misguided risk management decisions if cloud providers do not disclose the
extent to which the security controls are implemented and the consumer knows which controls are further needed to be adopted. Further, different kinds of cloud services adopted mean different responsibilities for the service provider and the customer. If an IaaS service model is adopted, then the provider is responsible for physical security, environment security and the virtualization software security, whereas the consumer is responsible for securing everything else above this layer including operating system, applications and data.

Data security and confidentiality issues: One of the biggest security concerns people have when moving to the cloud is related to the problem of keeping data secure and confidential. In this respect, some particular problems arise: who can create data, where the data is stored, who can access and modify data, what happens when data is deleted, how the back-up is done, how the data transfer occurs, etc.

Lack of Standards: The immaturity of this technology makes it difficult to develop a comprehensive and commonly accepted set of standards.

Interoperability issues: Additionally, at one time one company may have multiple cloud providers for different services which have to be interoperable. In time, for different reasons, companies may decide to move their services to another cloud and in such a case the lack of interoperability can block or raise heavy obstacles to such a process. Cloud providers may find the customer lock-in system attractive, but for the customers interoperability issues mean that they are vulnerable to price increases, quality of services not meeting their needs, closure of one or more cloud services, provider going out of business, disputes between with the cloud provider.

Reliability breakdowns: Another important aspect of the cloud computing is the reliability or availability of services. The breakdown of an essential service operating in a cloud has an impact on many clients. For example, in April 2012 there was a Gmail disruption that made Gmail services unavailable for almost 1 hour. These incidents are not rare and evidence the customer lack of control over their data. The irony is that, in terms of reliability, cloud providers have set high standards which are rarely achieved in an internal environment.

Malicious insider: A malicious insider is a person motivated to create a bad impact on the organization’s mission by taking action that compromises information confidentiality, integrity, and/or availability. When sensitive data is processed outside the enterprise the organizational managers are less immediately aware of the nature and level of risk and they do not possess quick and direct capability to control and counter these risks.

Cloud computing adoption studies

Many organizations of different kind has started to adopt the cloud computing services at different levels of implementations. There are few studies on cloud computing adoption by using some technology acceptance models in different industries that includes mostly IT industry. Most of the organizations intend or is in the planning process of adopting loud services since it involves some sort of concern such as security and privacy, regulatory compliances, etc. Deploying cloud computing in an enterprise infrastructure bring significant security concerns. Successful implementation of cloud computing in an enterprise requires proper planning and understanding of emerging risks, threats, vulnerabilities, and possible countermeasures. Adoption of cloud computing for education is on the increase especially in US, UK, and African Countries. However, For Asian countries, the concept is still new and higher educational institutions are considering it.

Conclusions and Discussions

As with any computing model, the technological landscape is rapidly evolving in cloud computing. Even though it might be impossible to assume all the technological changes in future, the economic forces shaping this phenomenon, in contrast, are very logical and almost inexorable in nature. Many technical researches are being carried out to over the challenges in adopting cloud computing. However, from the user point of view, the study on cloud computing is rare and users are very concerned about the use of cloud computing and there is no such study yet in Sri Lanka. Based on their decades of experience, corporate computing has developed its own standards regarding the reliability, stability and security of its information systems, and comprehensive answers need to be provided on all fronts before cloud computing can become a viable option for the larger corporate customers.

Many governments are becoming increasingly interested in cloud computing and Sri Lanka government also started cloud platform to provide services to the public and organizations recently. While there is an impressive amount of literature on cloud computing in computer science, there is still a dearth of literature in the IS area that look at cloud computing.

One of the goals of this paper is to start that process by presenting a starting list of the various issues at the intersection of the business and the technology involved in cloud computing. Since the cloud computing is new thing to country like Sri Lanka, it is better to study this concept and see the potential of implementing cloud solutions to meet different organizations’ computing needs.
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Hallucinated 3D Face Model from A Single 2D Low-Resolution Face Using Machine Learning

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Abstract

In this paper, the 3D face hallucination system is proposed on both 2D training face images as well as respective 3D training face models with grey-level. The proposed method hallucinates the 3D high-resolution model patch using same position of each image patches of interpolated 2D training image and 3D high-resolution training face model for low-resolution input image. Firstly, the optimal weights of the 2D input low-resolution image position-patches are estimated with the corresponding 2D low-resolution training image patches. The canonical correlation analysis (CCA) is used to learn the mapping between the 2D interpolated face training image and the 3D face model with respect to their weights. Secondly, the corresponding 3D face model patch with weight by matching high score among the 2D interpolated training image patches and 3D training face model is selected. Finally, the 3D high-resolution facial model is formed by integrating the hallucinated 3D patches which are obtained through mapping patches with respective weights. In order to evaluate the performances of the above approaches, we used example based learning methods to obtain the high-resolution output for a low-resolution input. In this approach, we used the available frontal data sets such as FERET, CAS-PERL and CMU to analysis the performance and some parameters are also considered, which may affect the results from the above proposed method.

Keywords: face hallucination, 3D face model, 2D low-resolution, CCA

Introduction

The modeling face is used in several computer vision applications, which are presented in (Blanz, et al., 2003, Edwards et al., 1998, Blanz & Vetter, 2003, Ramanathan, et. al., 2006, Baker, et al., 2004). The 3D models become useful universally by face enhancement of 3D models. In several aspects, the 3D face model super-resolution is employed. The capture of 3D data is limited according to the distance of the situation and objects. The availability of 3D scanners and capturing instruments are acquired typically low-resolution 3D data. Therefore, the hallucination of 3D face models is very helpful while the 3D data models are low-resolution. However, the time-consuming 3D scanner (Eisert & Girod 1998) is not accepted for such a face hallucination system. The method of using two orthogonal photos (Goto, et al., 2002) cannot provide real-time processing either. The single image is used to obtain the super-resolution of face (Feng & Yuen 2000), where the head rotation parameters require measuring via other images. In addition, it gives the inaccurate results for 3D face models. On the other hand, the multiple images are used to obtain 3D super-resolution, is presented (Morris, et al., 1999). This process is involved with 2D image and 3D model. The shape from stereo and shading are studied in (Morris, et al., 1999, Zhang, et al., 1995, Hom & Brooks, 1989) for 3D super-resolution. Though, few methods are presented for 3D super-resolution with an input 2D image. Presently, 3D data has become more advance while rapid process in 3D technology. This kind of 3D super-resolution is great needs in practice, since occasionally the 3D acquisition system does not provide good enough data due to 3D face recognition and lengthy distance (Gang & Zhaohui 2005).
The 3D position values of head shape are obtained by scanner technology which is the main approach to create 3D face model currently. It needs additional cost due to need of specific instrument. Meanwhile, the 3D model creation can be obtained from 2D images. Conversely, in this paper, a new method based on learning-method is focused to provide the 3D hallucinated face model for 2D low-resolution input image. Recently, very few works studied on 3D face hallucination. However, the super-resolution of 3D face is presented (Pan et al., 2006), which is pursued by the work (Baker & Kanade 2000). Firstly, 3D shape is acquired by progressive resolution chain (PRC). Secondly, MAP approach is used to obtain the 3D face super-resolution (Yang et al., 2007).

Furthermore, human may be used 2D image and it can be visualize into 3D image for better visualization that is bring new change for eye with brain role. Thus 3D image is may not be precise. If the 2D image is low-resolution, the human brain has very important role in acquiring the 3D image and it may not be precise. To overcome this problem, we proposed the hallucinated 3D face model from a 2D low-resolution input image. We can divide our whole system into two phases. We consider as matching phase between 2D interpolated training image and 3D training face model and hallucination phase.

Output of proposed method is shown in Fig. 1.1. The rest of work is organized as follows: Section 3 is the fundamental idea of CCA. Section 4 describes our proposed hallucinated 3D face model via image patches and section 5 presents experimental results on construction of 3D hallucinated face model from a 2D low-resolution image. Finally, the conclusion is given in section 6.

1. Basic Idea of CCA

The dominant multivariate analysis is, Canonical Correlation Analysis (CCA) (Hardoon, et al., 2004), which has been used in several applications such as post estimation and face matching (Melzer, et al., 2003 & Naleer, et al., 2013). To maximize the correlation between two sets, the CCA is constructing the subspace.

Given \( N \) pairs of sample \((x_i, y_i)\) of \((X, Y), i = 1, ..., N\), where \( X \in \mathbb{R}^a \) and \( Y \in \mathbb{R}^a \). The mean of both \( X \) and \( Y \) is zero. The goal of CCA is to learn a pair of direction \( w_x^T \) and \( w_y^T \), where \( T \) denotes the transpose, which is to maximize:

\[
\rho = \frac{E[w_x^T X Y^T w_y]}{\sqrt{E[w_x^T X X^T w_x] E[w_y^T Y Y^T w_y]}},
\]

where \( E[f(x, y)] \) the experimental anticipation of the function \( f(x, y) \). The covariance matrix of \((X, Y)\) is

\[
C(X, Y) = E\left[ \begin{pmatrix} X \\ Y \end{pmatrix} \begin{pmatrix} X & Y \end{pmatrix}^T \right] = E\left[ \begin{pmatrix} C_{XX} & C_{XY} \\ C_{XY} & C_{YY} \end{pmatrix} \right],
\]

where \( C_{XX} \) and \( C_{YY} \) are within sets covariance matrices. Hence, \( \rho \) can be written as

\[
\rho = \frac{w_x^T C_{xy} w_y}{\sqrt{w_x^T C_{xx} w_x w_y^T C_{yy} w_y}},
\]
Let $A = \begin{pmatrix} 0 & C_{XY} \\ C_{YX} & 0 \end{pmatrix}$, $B = \begin{pmatrix} C_{XX} & 0 \\ 0 & C_{YY} \end{pmatrix}$, we can show that the solution $W = \left(w_x^T, w_y^T\right)^T$ amounts to the extreme points of the Rayleigh quotient:

$$r = \frac{W^T AW}{W^T BW}$$  \hfill (3.3)

The solution $w_x$ and $w_y$ can be obtained as solutions of the generalized eigen problem:

$$AW = BW\lambda$$  \hfill (3.4)

In case of the sample size is comparatively small; the CCA has a tendency to over-fit to the training image [17]. If $\lambda_x > 0$ and $\lambda_y > 0$ are regularization parameters, addition of $\lambda_x I$ and $\lambda_y I$ to $C_{XX}$ and $C_{YY}$ respectively, gives encouraging avoided outputs. Let $\lambda_x = \lambda_y = \lambda$, the object function of regularized CCA is to maximize $\rho$, where

$$\rho = \frac{w_x^T C_{xx} w_x + w_y^T C_{yy} w_y}{\sqrt{w_x^T (C_{xx} + \lambda I) w_x} \sqrt{w_y^T (C_{yy} + \lambda I) w_y}}.$$

2. Hallucinated 3D Face Model via Image Patches

2.1 CCA Regression for 2D-3D Matching Phase

The following section used CCA to find out the results of mapping between 3D and 2D face models. In the learning phase, the 2D (interpolated 2D training dataset $\left(24 \times 32\right)$)-3D (3D training face model $\left(96 \times 128\right)$) mapping is learnt from the training set which consists of $K$ pairs of 2D-3D face image face model respectively. In the mapping phase, the most correlative 3D face shape to the 2D (2D low-resolution input image $\left(24 \times 32\right)$) is found by 2D-3D mapping. In the learning stage, $N$ pairs of 2D-3D face are given as $(X, Y) = [(x_k, y_k)] (k = 1, 2, \ldots, N)$, where $(x_k, y_k)$ is a corresponding pair of 2D and 3D.

Furthermore, to reduce the computational complex, PCA is applied firstly to transform $x_k$ and $y_k$ into the lower dimensional spaces (known as dimension reduction). PCA transform matrices $P_x$ and $P_y$ are learnt from 2D and 3D training sets respectively. The PCA projections are computed as $X' = P_x^T (X - \overline{X})$ and $Y' = P_y^T (Y - \overline{Y})$, where $\overline{X}$ and $\overline{Y}$ are the mean faces of 2D face image and 3D face model respectively. On the other hand, two further projection directions $w_x$ and $w_y$ are learnt for linear CCA by performing CCA on $X'$ and $Y'$ respectively (known as CCA regression). Also, let $w_x^T X'$ and $w_y^T Y'$ are best correlated. In the mapping phase, also need to project new pair of images $X_{\text{out}}$ and $Y_{\text{out}}$ into PCA firstly, that is $X_{\text{out}} = P_x^T (X_{\text{out}} - \overline{X})$ and $Y_{\text{out}} = P_y^T (Y_{\text{out}} - \overline{Y})$ respectively. For linear CCA, $X_{\text{out}}$ and $Y_{\text{out}}$ are projected into CCA sup-space, that is

$$X_{\text{out}} = w_x^T X_{\text{out}}, \ Y_{\text{out}} = w_y^T Y_{\text{out}}$$  \hfill (4.1)

Finally, the matching score $(So)$ can be calculated as

$$So(X_{\text{out}}, Y_{\text{out}}) = \frac{X_{\text{out}} \cdot Y_{\text{out}}}{\|X_{\text{out}}\| \cdot \|Y_{\text{out}}\|}$$  \hfill (4.2)

2.2 3D Face Model Hallucination via Learning Method
In this section, the two phases as mapping phase and hallucination phase are measured. As mentioned in section 4.1, the 3D face model patch corresponding to 2D input low-resolution image patch can be found. The description of weights calculation on 2D low-resolution training image patches with input 2D low-resolution image is described in this section firstly. Secondly, hallucination phase is considered.

4.2.1 Calculation of Mapping Scores

We adopted the CCA to get the exact model of 2D-3D face mapping by patch based CCA, the following steps are considered in mapping stage.

- A large number of patches are created from 2D face image and 3D face models.
- CCA is used to learn the performance between 2D image and 3D face model for every patch.
- In the mapping phase, the testing images are also departed into several parts in the same way. Then we can get a score for each patch.
- The final score is obtained by combining the individual scores of all participating patches.
- Finally, selected the 3D patches with weights on 3D training face model set using mapping score to the corresponding 2D patches on interpolated 2D training set.

The weights are calculated as follows and the style of the patch is shown in Fig. 4.1. In the patch based weights in the particular location \((i, j)\) is calculated by the following Eq. (4.3), which is described in (Naleer, et al., 2013) Algorithm-I, where \(S\) - 2D column vector of low-resolution training images \(\{I_{L_j}^q\}_{j=1}^p\). If \((i, j)\) is indicated as coordinate of the image patch in the particular location, the weight is calculated by Eq. (4.3).

\[
 w_i(i, j) = \frac{[L_q(i, j)]_{i=1}^p \times R^T - [I_{L_j}^q(i, j)]_{i=1}^p \times R^T}{R^T \times ([L_q(i, j)]_{i=1}^p \times R^T - [I_{L_j}^q(i, j)]_{i=1}^p \times R^T - [I_{L_j}^q(i, j)]_{i=1}^p)} \quad (4.3)
\]

The selection of patch size is an important issue. It is too large or it is too small, in both cases the local mapping of whole face information will be difficult. Hence the scores of each patch are combined to such a decisive level so that it is simplified. Various combining schemes include Median Rule and, Sum Rule, Majority Voting, Max Rule, Product Rule and Min Rule [6]. Eq. (4.4) gives the results of final matching score where, \(S_o\) and \(w_i\) are the output score and corresponding weight for \(i^{th}\) patch respectively.

\[
 F = \sum_{i=1}^p w_i \times S_o_i \quad (4.4)
\]
4.2.2. 3D Hallucination Phase

Once we found the 2D face training image patch position with respective weights to corresponding 2D low-resolution image patch in the same position, according to the final matching score using CCA regression mapping between 3D training face model and 2D interpolated training images using weights, the following process are used to construct the final output as hallucinated 3D face model. According to the original position, the final 3D hallucinated face model is obtained by combining the 3D face model patches. Average of the pixels values in the overlapping areas among two adjacent hallucinated patches is used to acquire the final result for pixel of the overlapping areas. The proposed 3D face hallucination model has been summarized below and the entire framework is given in Fig. 4.2.

Step 1: Find the weights between 2D low-resolution input and 2D low-resolution training images in the same positions using Eq. (4.3).

Step 2: Find the fusion score between 2D training image and 3D face image model using Eq. (4.4).

Step 3: Once selected the 3D face model patch with respective weights according to the fusion score, the hallucinated 3D face model $I^p_H$ can be obtained by following Eq. (4.5).

$$I^p_H(i, j) = \sum_{q=1}^{N} (I^q_H(i, j))w_q(i, j)$$  \hspace{1cm} (4.5)
Figure 4.2: Framework of CCA based hallucinated 3D face Model
Experiments and Results

Our experiments are conducted with the CAS-PEAL and FERET face datasets consisting of 200 individuals. The training face data sets are formed as 2D face images and 3D face models pairs for respective each individual. The laser scanner is used to obtain 3D training face model, which is offer range images and the faces are essentially 2.7D data. In the 3D face model training set, have a little facial expression and head pose varying for corresponding 2D training data set of each individual. All 3D training face models ( $96 \times 128$ ) and 2D low-resolution face images ( $24 \times 32$ ), and all training images are manually aligned based on eyeballs, mouths positions with centers of left and right eyeballs and center of the mouth, and the input low-resolution image is also manually aligned. Our proposed approach is evaluated on 80 test low-resolution inputs. Some output of the test images on CASE-PERL are presented in Fig. 5.1.

![Output of proposed system: a) Input 2-D low-resolution image $24 \times 32$, b) Output 3D hallucinated image $96 \times 128$](image)

The comparative results for input low-resolution face image for each patch ($3 \times 3$) are given in Fig. 5.2 in terms of cumulative match curves. Meanwhile the performance with training samples is also considered the results by cubic interpolation method and it is shown in Fig 5.3. To exhibit the performance of our proposed method, the amount of training images with RMS values has been given in Fig. 5.3. In fact, the cubic interpolation is not depending on the number of training images. Meanwhile, the performance of the proposed method is very poor while less than about 73 training images. It means, our methods is enclosed most of the variance of the 3D face model.
Figure 5.2: Cumulative match curve for 2D face image and 3D face model for each input low-resolution patch.
Conclusion

This work has presented a learning-based 3D face hallucination method for single 2D low-resolution face image with 2D low-resolution face image and 3D face model training image pairs based on matching scores. The experiments show that, it could be applicable to generate a 3D hallucinated face image version of the 2D low-resolution input face image in absence of 3D high-resolution face model in the training sets.

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Measuring Paddy Farmers’ Vulnerability to Climate Change in Mahavillachiya
Ds Division, Anuradhapura, Sri Lanka

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Abstract
The objective of this study is to measure the paddy farmers’ vulnerability to climate change. The indicator method was used to analyze the vulnerability of the paddy farmers in the Mahavilachchiya and Thanthirimale GN division of in Mahavillachiya DS division, Anuradhapura, Sri Lanka. The different socioeconomic and biophysical indicators of each area collected have been classified into three classes, based on the Intergovernmental Panel on Climate Change’s (IPCC 2001) definition of vulnerability, which consists of adaptive capacity, sensitivity, and exposure. This study was conducted with active farmers who are involved in paddy farming for more than thirty years of experience and above fifty in age. Among them, 40 percent of the paddy farmers were selected by using the random sampling technique. Structured Questionnaires and focus group discussions were conducted to collect primary data and secondary data was collected from relevant institutions and libraries. Results indicated that Thanthirimale is relatively more vulnerable to climate change than Mahavilachchiya. Thus, investing in the development of the relatively underdeveloped area of Thanthirimale, enhance irrigation system, early warning systems to help farmers’ better cope in times of drought, drought-tolerant varieties of crops can reduce the vulnerability of paddy farmers to climate change.

Keywords: climate change, vulnerability, paddy farmers, rain-fed and irrigation farming system

Introduction
Today, climate change has become a major concern to human society because of their potentially deleterious impacts, worldwide. It poses especially significant threats to sustainable development in developing countries, which have fewer resources and are more vulnerable (Munasinghe, 2010). Changing climate has been observed in many parts of the world. The Intergovernmental Panel on Climate Change (IPCC) in its fourth assessment report observed that, ‘warming of climate system is now unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global sea level’ (Kumar, & Balasubramanian, 2010). Sri Lanka’s climate has also been changing for a couple of decades. As a result, the expected rainfall may not come at the expected time with correct amount and intensity, whereas more rainfall may be received when it is not really necessary and annual mean air temperature anomalies have also shown significant increasing trends during the recent few decades in Sri Lanka (Punyawardena, 2009). People depend on a wide range of agricultural products in almost all aspects of their life. Climate is a major determinant of both the location and productivity of agricultural enterprises. Despite technological advances such as improved crop varieties and irrigation systems, weather and climate are still key factors in agricultural productivity (Smith, et al. 1996). Agricultural activities mostly depend on the climatic elements such as rainfall and temperature. It is thus not surprising that agriculture has been identified as an area of concern in the current public debate on the causes and effects of climatic change.

Agriculture has been the backbone of the Sri Lankan economy with one-thirds of the population being dependent on it. The Agricultural sector contributes about 11.1 percent of the country’s Gross Domestic product (GDP) and 31.0 percent of total employment. Rice is the main crop cultivated by the majority of farmers in rural areas and it is the staple food of the 20.4 million inhabitants in Sri Lanka. Further, it is the livelihood of more than 1.8 million farmers. Rice contributes to 1.8 percent of the country’s GDP (Sri Lanka Socio-Economic Data, 2013). Dry zone rice farming in Sri Lanka can be divided into two major categories, namely, major irrigation schemes and the rain-fed system (village tanks or minor irrigation systems). In major irrigation schemes, farmers carry out paddy farming, the main farming system activity, using the water supplied from large irrigation reservoirs on a year round basis. Rain-fed systems depend heavily on local rainfall. Being dependant on local rainfall without access to any substantial sources of supplementary water, rain-fed farmers are naturally more vulnerable to climate uncertainty than farmers in irrigated schemes. They are in a continuous struggle for livelihood security under water stress conditions due to rainfall uncertainty (Senaratne and Scarborough, 2011).

Due to climate change, tropical countries including Sri Lanka have more vulnerable because a greater fraction of its economy is in climate sensitive sectors such as agriculture. Apart from that, it is already in a hot climatic zone, and the economy relies on labour-intensive technologies with fewer adaptation opportunities (Rathnabharathi, 2009). The Action Impact Matrix (AIM) was used to rank climate change impacts and vulnerability in various sectors of Sri Lanka, among them traditional agriculture (rice farming) and tree crops (plantations) are identifies as the most vulnerable areas. (Munasinghe, 2010).
However, limited information exists on vulnerability to climate change in rice farming in Sri Lanka, especially at the micro level. Given this knowledge gap, there is a need to systematically evaluate the rain fed and irrigation based paddy farmers’ vulnerabilities to climate change. Hence, the objective of this study is to measure paddy farmers’ vulnerability to climate change.

Table 1: Vulnerability indicators, units of measurement and expected direction with respect to vulnerability (Cont.)

<table>
<thead>
<tr>
<th>Determinants of vulnerability</th>
<th>Vulnerability Variables</th>
<th>Description of each indicator selected for analysis</th>
<th>Unit of Measurement</th>
<th>Hypothesized functional relationship between indicator and vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive capacity</td>
<td>Wealth</td>
<td>Quality of residential home</td>
<td>Percentage of total population who own or have access to</td>
<td>The higher the percentage of total population with asset ownership, and access to these income sources the lesser the vulnerability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Livestock ownership</td>
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<td></td>
<td></td>
<td>Ownership of machineries and vehicles</td>
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<tr>
<td></td>
<td></td>
<td>Nonagricultural income/ gift and remittance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td>Farmers’ education level (secondary)</td>
<td>Percentage of the total population</td>
<td>The higher the education level the lesser the vulnerability</td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>Insecticide and pesticide supply</td>
<td>Percentage of total population within 1-6 km of these institutions</td>
<td>The higher the percentage of total population of the region within 1-6km the lesser the vulnerability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fertilizer supply</td>
<td>Percentage of total population within 1-6 km of these institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improved seed supply</td>
<td>Percentage of total population within 1-6 km of these institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutions and infrastructures</td>
<td>Health services</td>
<td>Percentage of the total population</td>
<td>The higher the percentage of total population in the member of farm organization and participation of training programmes the lesser the vulnerability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bank</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary and secondary schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Market</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Member of farm organization</td>
<td>Percentage of the total population</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participation of training programmes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Road density</td>
<td>(length in km/km2)</td>
<td>The higher the road density the higher the connectivity and access to markets; and the lower the vulnerability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication</td>
<td>Percentage of the total population</td>
<td>The higher the communications, the higher the opportunities for information flow; and the lower the vulnerability</td>
<td></td>
</tr>
</tbody>
</table>

(Cont.)
Methodology
Conceptual Framework for Measuring the Vulnerability Index

The Intergovernmental Panel on Climate Change (IPCC, 2001) definition of vulnerability was adopted for this study. The IPCC defines vulnerability to climate change as follows:

*The degree to which a system is susceptible, or unable to cope with adverse effects of climate change, including climate variability and extremes, and vulnerability is a function of the character, magnitude and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.*

The indicator method was used to analyze the vulnerability of the paddy farmers in the study areas. The indicator method of quantifying vulnerability is based on selecting some indicators from the whole set of potential indicators and systematically combining the selected indicators to indicate the levels of vulnerability (Deressa, Hassan, & Ringler, 2008; Gbetibouo, & Ringler, 2009).

Based on the IPCC (2001) definition of vulnerability to climate change which is described by three elements: Exposure, sensitivity, and adaptive capacity (Gbetibouo, & Ringler, 2009; Heltberg, 2011), as follows:

1. **Exposure** can be interpreted as the direct danger (i.e., the stressor), and the nature and extent of changes to a region’s climate variables (e.g., temperature, precipitation, extreme weather events).

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Human sensitivity</th>
<th>Rural population density</th>
<th>Population/ km²</th>
<th>The livelihood of being a vulnerable to climate shocks is greater in rural areas and higher the population density, the larger the number of lives exposed to climate shocks. Therefore, the higher the vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livelihood sensitivity</td>
<td>Small scale farmers</td>
<td>Percentage of total population who hold less than 1 ha</td>
<td>The higher the percentage of small scale farmers, the higher the vulnerability</td>
<td></td>
</tr>
<tr>
<td>Exposion</td>
<td>Change in climate</td>
<td>Change in temperature Change in rainfall</td>
<td>Percentage change from 1951 -1980 to 1981 - 2010</td>
<td>Increasing temperature and decreasing precipitation increase vulnerability</td>
</tr>
<tr>
<td>Extreme climate</td>
<td>Frequency of droughts and floods</td>
<td>Number of occurrences (counts of the occurrences of drought and flood in areas last 30 years)</td>
<td>The higher the frequency, the more the vulnerability</td>
<td></td>
</tr>
</tbody>
</table>

| Transport facilities | Percentage of the total population | The higher the percentage of total population who access availability of transport facilities satisfactory and either private or public transport, the lower the vulnerability |

<table>
<thead>
<tr>
<th>Sensitivity</th>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

| Transport facilities | Percentage of the total population | The higher the percentage of total population who access availability of transport facilities satisfactory and either private or public transport, the lower the vulnerability |
2. Sensitivity describes the human–environmental conditions that can worsen the hazard, ameliorate the hazard or trigger an impact.

3. Adaptive capacity represents the potential to implement adaptation measures that help avert potential impacts.

Exposure and sensitivity are intrinsically linked and together affect potential impact. To assess farming vulnerability to climate change, we look at exposure to climate change, sensitivities to those changes, and societal coping and adaptive capabilities. Our vulnerability indicator approach is integrated, in that the selected indicators represent both the biophysical conditions of the farming regions and the socio-economic conditions of the farmers. The selection of indicators was done through an extensive review of previous reports; in particular, its draw from Deressa, Hassan, & Ringler, (2008); Gbetibouo, & Ringler, (2009), Eriyagama, et al, (2010), and Helberg, 2011. Table 1 shows the details of the vulnerability indicators with functional relationship. Source: Deressa et al, 2008; Eriyagama, 2010; Gbetibouo, et al, 2009.

Study Area
This study was carried out in Thantirimale and MahavilachchiyaGramaniladhar (GN) divisions in Mahavilachchiya Divisional Secretariat Division (DSD) in Anuradhapura District in Sri Lanka. Both Thantirimale and Mahavilachchiyaare located in the dry zone, which receive less than 1800 mm average annual rainfall during Yala and Maha seasons. The mean annual temperature is 30°C although maximum temperature may even exceed 37°C occasionally. Thantirimale’s paddy farmers depend on rain fed system (dependent on local rainfall without access to any substantial sources of supplementary water) and Mahavilachchiya’s paddy farmers depend on an irrigation system (water is supplied from large irrigation reservoirs on a year round basis) (Divisional Sectorial office). The total land extent in Mahavilachchiya is 1213 acres where paddy land extent is 486 acres. It consists of two hamlets, Yaya 2 and Yaya 3 (both hamletsare selected for this study) and an estimated population of 699 and 502 respectively (MahawilachchiyaDSD, 2012). Thantirimaleconsists of seventeen hamlets (three hamlets are selected for this study namely: Kosbevava, Thanrimalai and Medavacheliya) with an estimated population of 1,043 and total number of 320 households. Amongst the total population majority of them are (95 percent) residing in selected three hamlets.

Population and Sample
This study was conducted with the active farmers who are involved in paddy farming activities for more than thirty years and are above fifty in age. Among them forty percent (40%) of paddy farmers were selected as a sample for this study. Random sampling technique was applied for selecting the samples and it was based on electoral lists using a random table. The characteristics of the sample are given in Table 2.

Table 2: Details of the sample

<table>
<thead>
<tr>
<th>Name of the study area</th>
<th>Population (above fifty in age + 30 years’ experience in farming)</th>
<th>Sample (40%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahawilachchiya (Yaya 2, Yaya 3)</td>
<td>87</td>
<td>35</td>
</tr>
<tr>
<td>Thantirimale (Kosbevava, Thanrimalai, Medavacheliya)</td>
<td>82</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>169</td>
<td>68</td>
</tr>
</tbody>
</table>

Data Collection
Data was collected through both primary and secondary sources and the following methods were used.

- Questionnaire survey was conducted to collect the information from farmers to identify the vulnerability indicators’ details.

- Focus Group Discussions (FGDs) were conducted with farmer groups of 05-08 in size, from the selected GN areas. Discussions were held in a semi-structured, yet flexible focus guide. The discussions were inquired about the physical profile of the resources in the villages, about the farming systems, local water management, formal and informal institutional arrangements, experience in climate change.

- Secondary data was collected from a number of key institutes. The major types of secondary data collected include: information on water sources, agricultural base data, rainfall, temperature and other meteorological data, physiographic information of resources and studies on socio-economic and institutional aspects.

Analysis and Results
A vulnerability index was used for assessment of the paddy farmers’ vulnerability to climate change. vulnerability is defined as a function of a range of biophysical and socio-economic factors, commonly aggregated into three components that estimate
the exposure (change in climate and extreme events), sensitivity (human and livelihood sensitivity), and adaptive capacity
(wealth, education level, technology and intuition and infrastructure) to climate variability and change. Obviously the indicators of vulnerability will be in different units and scales. The methodology used in UNDP’s Human Development Index (HDI) (UNDP, 2006; Anandh, et al., 1994) is followed to normalize them. That is, in order to obtain figures which are free from the units and also to standardize their values, first indicators are normalized so that they all lie between 0 and 1. Before doing this, it is important to identify the functional relationship between the indicators and vulnerability. Two types of functional relationship are possible: vulnerability increases with increase (decrease) in the value of the indicator. Assume that higher the value of the indicator more is the vulnerability. For example, suppose we have collected information on change in maximum temperature or change in annual rainfall or diurnal variation in temperature. It is clear that higher the values of these indicators more will be the vulnerability of the region to climate change as variation in climate variables increase the vulnerability. In this case, the normalization is done using the following equation 1:

\[ X_{ij} = \frac{\text{Min}\{X_{ij}\}}{\text{Max}\{X_{ij}\} - \text{Min}\{X_{ij}\}} \]

On the other hand, consider adult literacy rate. A high value of this variable implies more literates in the region and so they will have more awareness to cope with climate change. So the vulnerability will be lower. For this case the normalized score is computed using the following equation 2:

\[ X_j = \frac{\text{Max}\{X_{ij}\} - \text{Min}\{X_{ij}\}}{\text{Max}\{X_{ij}\} - \text{Min}\{X_{ij}\}} \]

It is clear that these scores will lie between 0 and 1. The value 1 will correspond to that region with maximum value and 0 will correspond to the region with minimum value.

Normalized scores were calculated based on the above formula for Kosbevava, Thanrimalai and Medavacheliya hamlets of Thanthrimale GN division and yaya 2 and yaya 3 hamlets of Mahavilachchiya GN division. After computing the normalized scores the vulnerability index is constructed by giving equal weights to all indicators. For that, simple average method is used for all the normalized scores to construct the vulnerability index by using the following equation 3:

\[ \text{VI} = \frac{\sum X_{ij}}{K} \]

Finally, the vulnerability indices are used to rank the different areas in terms of vulnerability. An area with highest index is said to be most vulnerable and it is given the rank 1, the area with next highest index is assigned rank 2 and so on. Vulnerability indices and ranks of the areas are shown below (Table 3)

Table 3: Vulnerability Index and rank

<table>
<thead>
<tr>
<th>GN Name</th>
<th>Village Name</th>
<th>sum of the scores</th>
<th>Vulnerability Index</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thanthrimale</td>
<td>Kosbevava</td>
<td>16.3307</td>
<td>0.8595</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Thanrimalai</td>
<td>13.1717</td>
<td>0.6932</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Medavacheliya</td>
<td>13.1572</td>
<td>0.6925</td>
<td>3</td>
</tr>
<tr>
<td>Mahavilachchiya</td>
<td>Yaya 2</td>
<td>3.2371</td>
<td>0.1704</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Yaya 3</td>
<td>5.6647</td>
<td>0.2981</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 3 shows that vulnerability Index and rank of Mahavilachchiya and Thanthrimale GN divisions. This study explored that Mahavilachchiya is less vulnerable compared with Thanthrimale. Exposures (changes in temperature and rainfall and extreme weather events) of both the areas are relatively same due to the same geographical location. So, effects of climate
change could be similar. At the same time, sensitivity and adaptive capacity of the both areas demonstrate a vast diversity in term of socio-economic conditions.

Sensitivity is divided as human (rural population density) and livelihood (small scale farmers and paddy areas served by irrigation) in this study, it is dissimilarity in both study areas. Irrigation is a main source for agriculture during the dry period in dry zone of Sri Lanka. Irrigation potential (99 percent) is higher in Mahavilachchiya GN division than Thanthrimale GN division. Farmers of Thanthrimale face difficulties in the drought period due to lack of irrigation potential. Sometimes, they have cultivated in Maha season only. But, Farmers of Mahavilachchiya have cultivated in both seasons (Maha and Yala) even though they face the drought. Small scale farmers (less than 1 ha land; 57 percent) are higher in Thanthrimale GN compared with Mahavilachchiya GN. If their agricultural products have ruined due to extreme events of climate change they difficult to overcome from that damage. So they become more vulnerable.

The lesser vulnerability of Mahavilachchiya is associated with many socio-economic backgrounds such as relatively higher access to technology, education level (secondary), better economic background, infrastructure, institutional links, and systematic irrigation potential. It has the highest access to technology which makes farmers of this region the highest in terms of proximity to insecticide, pesticides, and fertilizer supplies, and improved seeds supplies. As well as it has better institutional facilities and infrastructure, especially in health services, schools, communication, road and transportation facilities. Farmers of Mahavilachchiya are doing off farming activities like white collar jobs and also enjoying better socio-economic background. So they can be overcome as quickly as from effects of climate change.

Comparing with Mahavilachchiya, farmers in Thanthrimale have the lowest access to supplies of inputs as well as the education level most of the farmer are primary education or no schooling. Thanthrimale farmers’ livelihood depend only primary income source (agriculture) and also their socio-economic background is very poor. hence, they face stress during the climate risk periods. Fig 1 shows the adaptive capacity of study areas.

Figure 1: Indicators of adaptive capacity in study areas.

Above figure shows the indicators of adaptive capacity in both study areas. It is very clear that when considering the indicators comparatively, Mahavilachchiya have more potential to adapt when they face any climate risks. As mentioned earlier their socio-economic background is the main pillar for their potential. But according to the adaptive capacity indicators farmers are Thanthrimale are have very least indicators. Because of lack of adaptive capacity in farmers of Thanthrimale GN division causes to comparatively more vulnerable during the climate risk periods.

Conclusion and Recommendations

This study has calculated paddy farmer’s vulnerability to climate change in Mahavilachchiya and Thanthrimale. Generally both irrigation and rain-fed farmers are vulnerable to changing climate but comparatively, farmers who cultivate rain-fed rice as a primary source of food and income are particularly vulnerable. The vulnerability index has been calculated based on the Intergovernmental Panel on Climate Change (IPCC) definition, which explains it as a function of adaptive capacity, sensitivity
and exposure. The twentythree(23) socio-economic and environmental indicators of the Mahavilachchiya and Thanthrimale were included in developing the vulnerability index. Results indicated that Thanthrimale is relatively more vulnerable to climate change than Mahavilachchiya due to the poor economic background, technology, education and infrastructure. Frequency of drought and flood are slightly different in both areas. But Thanthrimale is affected by drought very severely due to the lack of irrigation potential. They find it difficult to overcome from this.

In order to reduce the paddy farmers’ vulnerability to climate change and variability the following recommendations may be considered.

- Thanthrimale is more vulnerable when compared with Mahavilachchiya based on the vulnerability Index. This is due to the lack of education, infrastructure and information technology. Hence, relevant authorities must pay attention and take necessary action to overcome these disparities.
- Depending entirely on agriculture as a primary income source makes farmers more vulnerable particularly during climatic risk periods. Therefore, it is better to provide some off-farm trainings which can be used to earn some income especially during climatic risk period.
- In Thanthrimale, small tanks are scattered here and there which provide a limited amount of water for the agriculture of this area. There is possibility of enhancing the water storing capacity by improving small tanks that are identified.
- early warning systems to help farmers’ better cope in times of drought and drought-tolerant varieties of crops can reduce the vulnerability of paddy farmers to climate change

Reference


Kumar, KS & Balasubramanian, I 2010, ‘Climate Variability and Agricultural Productivity: Case study of rice yields in Northern India’, Madras: School of Economics.


Information Flow in the Eastern University, Sri Lanka

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² Department of Agricultural Economics, Faculty of Agriculture, Eastern University, Sri Lanka
tgeretharan@yahoo.com

ABSTRACT
Organizational communication can aid in determining how communication system, flow and practices are contributing to the organizational performances. One should assess the information flows and their needs in order to facilitate managing the organizational process. In this regard, a study was designed to investigate the information flow in the Eastern University, Sri Lanka. Thirty academic and thirty non-academic staff were randomly selected for this study. Structured questionnaires were used to collect primary data. The study reveals that majority of the staff members (36.7%) perceived that internal telephone call act as the main source of information to carry out their daily activities within the University, followed by discussions (30%) with other staff members. 80% of respondent gained and shared information in both written and oral forms. 65% of staff used circulars as the information source to get work related information. 63.5% of staff reported telephone calls as more suitable information source for getting quick information. According to the respondents, the overall efficiency of information flow in the Eastern University is needed to be improved and nearly half of them (51.7%) rated it as fair. Therefore, actions need to be taken to regularize the information flow especially regarding efficient information flow within the University system.

Keywords: Information, information source, staff, University

INTRODUCTION
The efficient information flow and organizational communication are crucial parts of any organizations operational processes. According to Opara (2003) information is the life blood of modern organizations. Olowu (2004) says that information entails data, facts, imaginations, ideas, opinions, cultural values in a variety of media which includes print, audio-visual materials and electronic processes. Some of the organizations make all information available to everyone in the organization, so it creates extra burden for the user. In some cases they are not able to locate the desired information, so the relevant information should be available to the user with respect to content, context, location, time of use and accordingly to the role of the user in the organization. Improvement of information flow in an organization can save money by direct as well as indirect means. In today’s organizations, the importance of horizontal and free flowing information flows are increasing. The free flowing communication flow encourages the staff of modern organizations to give feedback and suggest ideas to improve the existing processes (Miller, 2003). The management should be open to development ideas coming from staff and reward behavior that is beneficial for whole organization. Information affects every aspect of organizational process, and therefore it is crucial to have a well-designed communication system (Hearth, 2006). Taken the importance of information flow in an organization in to consideration a study was carried out in the Eastern University, Sri Lanka (EUSL) to find out the pattern of information flow existing within the EUSL system.

METHODOLOGY

Location of the study – Organization
The study was conducted in the EUSL, which is located in Vantharumoolai, 12 km North from Batticaloa. The University has two campuses – the main campus in Vantharumoolai and a second campus in Trincomalee. The University currently has seven Faculties (Agriculture, Applied Sciences, Arts and Culture, Commerce and Management, Communication and Business Studies, Healthcare Sciences and Science).

Data Collection
The techniques used for data collection were questionnaire survey, informal interviews and secondary data sources. The structured questionnaire was designed and it was distributed to randomly select thirty academic and thirty non-academic staff in the Eastern University. Informal interview was done among administrative staff to collect relevant data.

Analytical Procedure
The filled questionnaires were checked and data were analyzed using the SPSS software. The study was based largely on descriptive statistics.

RESULTS AND DISCUSSION

This survey was carried out to study the information flow existing in the Eastern University, Sri Lanka. Sixty staff members were randomly selected from the University.

Staff Profile
The results revealed that majority (78.3%) of the staff were permanent and 21.7% of staff were temporary in the sample population. Since the decisions of permanent staff will be highly welcomed by higher authority, they have to take the responsibility to develop an efficient communication flow within the University. Majority (58.3%) of the staff were female in the surveyed population. According to the analysis 45% of staff were fall under the age range of 22 – 31 years, represents more number of younger staff. Only few percentages of staff (8.3%) come within the age range 52 – 60 years. According to the survey, 26.7% of staff were permanent lecturers, followed by clerk and computer application assistants (25%) and temporary assistant lecturers, demonstrator (21.7%). Assistant librarian, library assistant and laboratory assistant were low in the sampled population. 61.7% of staff had lesser than 8 years of working experience within the University. Around 38% of staff had more than 9 years of working experience.

Information Sources
Common information sources used for getting work related information
A number of communication channels were identified within the University. Among them, circulars being voted as the most effective information source by 65% of respondents. The second most important source was letters followed by telephone calls. Most of the staff prefers written sources than the electronic sources to get the information. Only few staff used notice board and newspaper as their information sources. Traditionally, the written communication would be the most prevalent in the form of rules, regulations and instructions (Miller, 2003).

Table 1: Common information sources used to get work related information

<table>
<thead>
<tr>
<th>Information sources</th>
<th>Frequency</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circulare/Circular letters</td>
<td>39</td>
<td>65.0</td>
</tr>
<tr>
<td>Letters</td>
<td>30</td>
<td>50.1</td>
</tr>
<tr>
<td>News paper</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Notice board</td>
<td>06</td>
<td>10.2</td>
</tr>
<tr>
<td>Internet</td>
<td>15</td>
<td>25.2</td>
</tr>
<tr>
<td>E-mail</td>
<td>15</td>
<td>25.2</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>22</td>
<td>36.7</td>
</tr>
<tr>
<td>Discussions</td>
<td>12</td>
<td>20.1</td>
</tr>
<tr>
<td>Total</td>
<td>140</td>
<td>234.2</td>
</tr>
</tbody>
</table>

More suitable information source for getting quick information

Table 2: More suitable information sources expressed by sampled population

<table>
<thead>
<tr>
<th>Suitable information source</th>
<th>Frequency</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>23</td>
<td>38.4</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>38</td>
<td>63.5</td>
</tr>
<tr>
<td>Discussions</td>
<td>05</td>
<td>8.4</td>
</tr>
<tr>
<td>Letters</td>
<td>02</td>
<td>3.4</td>
</tr>
<tr>
<td>Meetings</td>
<td>02</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>117.1</td>
</tr>
</tbody>
</table>

Constraints related to information sources
Constraints in receiving/sending information
60% of staff perceived that there were no constraints in receiving/sending information and rest of them (40%) experienced constraints in information flow.

Common constraints
According to the table 3, 60% of staff reported that there were no constraints in information flow within the University. Time delay considered as the main constraint from surveyed results. 11.7% of staff were reluctant to express about constraints they have faced regarding information flow within the University system. Language problem and poor responsibility were identified by few percentages of staff (Table 3). Discovering these constraints are very much important to improve information flow in Eastern university.

Table 3: Common constraints related with information flow in the sampled population

<table>
<thead>
<tr>
<th>Common constraints</th>
<th>Frequency</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>No constraints</td>
<td>36</td>
<td>60.0</td>
</tr>
<tr>
<td>Time delay</td>
<td>12</td>
<td>20.1</td>
</tr>
<tr>
<td>Lack and Improper network facilities</td>
<td>04</td>
<td>6.7</td>
</tr>
<tr>
<td>Language problem</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Information is sent through minor staff and isn't fully reached</td>
<td>02</td>
<td>3.4</td>
</tr>
<tr>
<td>Poor responsibility from the staff</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>No response</td>
<td>07</td>
<td>11.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>63</strong></td>
<td><strong>105.3</strong></td>
</tr>
</tbody>
</table>

*Multiple response- column total is more than 100%*

Details Related With Information Failure

Information / communication failures

According to the results, 66.7% of staff did not face any information failures. Around one third of staff faced information failures. Lack of communication facilities was the main reason for the communication failures within the University.

Cases of information failures faced by staff

In surveyed population, more than fifty percentages of staff did not face any information failure. This percentage denotes that information flow of Eastern University is fair. 16.7% of staff were fail to attend meeting, workshop and seminars due to information failures.

Table 4: Cases of information failures faced by staff in the sampled population

<table>
<thead>
<tr>
<th>Cases of information failures</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No failures</td>
<td>40</td>
<td>66.6</td>
</tr>
<tr>
<td>Fail to attend to meeting, workshop and seminars</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>Delay in sending of official documents through each channels</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Delay in getting increment</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Incorrect message transfer by the person who pass the message</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>No response</td>
<td>07</td>
<td>11.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Acknowledgement from Higher Authority/Subordinates

More than 80% of staff got timely response from higher authority/subordinates in the sampled population. Rest of the population (15%) was not received timely response from their superiors/subordinates. The results also showed that 71.7% of staff got acknowledgement from higher authority/subordinates in the sampled population for the information communicated. 28.3% of staff did not get acknowledgement from higher authority for the information communicated.

Table 5: Getting timely response and acknowledgement from higher authority/subordinates

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timely response</td>
<td>51 (85%)</td>
<td>09 (15%)</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>43 (71.7%)</td>
<td>17 (28.3%)</td>
</tr>
</tbody>
</table>

Communication Facilities

Communication facilities available to staff

Three quarter of sampled population experienced enough communication facilities in Eastern University and rest of them (25%) felt that communication facilities available to them in the working environment were not enough.
Reasons for non-satisfaction

Table 6: Reasons for non-satisfaction of communication facilities

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfied with facilities</td>
<td>44</td>
<td>73.3</td>
</tr>
<tr>
<td>Failure of network access</td>
<td>03</td>
<td>5.0</td>
</tr>
<tr>
<td>Inadequate facilities of internet &amp;</td>
<td>07</td>
<td>11.7</td>
</tr>
<tr>
<td>intercom access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>06</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
</tr>
</tbody>
</table>

According to data analysis, 73.3% of staff satisfied with available communication facilities. 11.7% of staff experienced inadequate facilities of internet and intercom access in Eastern University. A few percentages of staff faced failure of network access (Table 6).

Common Mode of Information Flow

Common mode used for sending information to higher authority

Table 7: Common communication mode used for sending information to higher authority

<table>
<thead>
<tr>
<th>Common modes</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>52</td>
<td>86.7</td>
</tr>
<tr>
<td>Emails</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>Meetings</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
</tr>
</tbody>
</table>

More than 80% of staff used letters for sending information to higher authority in the sample population. Only 1.7% of staff used meetings to pass the information to higher authority. It may be due to low numbers of meetings held and poor attendance of staff to the meetings (Table 7).

Common mode of receiving information from higher authority

Table 8: Common communication mode used for receiving information to higher authority

<table>
<thead>
<tr>
<th>Common modes</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>54</td>
<td>90.0</td>
</tr>
<tr>
<td>Emails</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Meetings</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>03</td>
<td>4.9</td>
</tr>
<tr>
<td>Others</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
</tr>
</tbody>
</table>

According to the results, 90% of staff received information through letters. 10% of staff received information through emails, meetings, telephone calls and some other way from higher authority. Miller (2003) reported that in case of top-down communication within the organizations, the communication is most likely to be formal and written.

Common mode used for sending information to colleagues

Regarding the information dissemination among the peers, the information was mainly sent to colleagues through telephone calls. Few percentages (3%) of staff directly meet and discussed with their colleagues for sharing information (Table 9).

Table 9: Common mode used for sending information to colleagues

<table>
<thead>
<tr>
<th>Common modes</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>07</td>
<td>11.7</td>
</tr>
<tr>
<td>Emails</td>
<td>15</td>
<td>25.0</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>35</td>
<td>58.3</td>
</tr>
<tr>
<td>Others (Direct talking)</td>
<td>03</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Common mode used for receiving information from colleagues

It is about getting the information from information provider side. It can also be counted as perceiving and understanding the information coming from the provider side. More than half of staff received the information from colleagues through telephone calls (Table 10).
Table 10: Common mode used for receiving information from colleagues

<table>
<thead>
<tr>
<th>Common modes</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>05</td>
<td>8.3</td>
</tr>
<tr>
<td>Emails</td>
<td>15</td>
<td>25.0</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>37</td>
<td>61.7</td>
</tr>
<tr>
<td>Others</td>
<td>03</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Satisfied Information Source for Getting Information

The results revealed that around one third of the sampled population perceived telephone calls as the easiest and satisfied information source for communication. 23.3% and 18.3% of staff received satisfactory information from letter and email respectively. A few percentages of staff believed that the combinations of letter, email and telephone calls as satisfied information source for getting information from others (Table 11).

Table 11: Satisfied information source for getting information

<table>
<thead>
<tr>
<th>Satisfied information source</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>14</td>
<td>23.3</td>
</tr>
<tr>
<td>Emails</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td>Meetings</td>
<td>03</td>
<td>5.0</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>20</td>
<td>33.3</td>
</tr>
<tr>
<td>Letter and email</td>
<td>04</td>
<td>6.7</td>
</tr>
<tr>
<td>Letter and telephone calls</td>
<td>03</td>
<td>5.0</td>
</tr>
<tr>
<td>Email and telephone calls</td>
<td>04</td>
<td>6.7</td>
</tr>
<tr>
<td>Letter, email and telephone calls</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Suitable Information Source for Getting Confidential Information

Among the sampled population more than fifty percentages of staff perceived letter as more confidential information source for receiving confidential information. 18.3% of staff believed email as the confidential information source. The combination of letter and email also identified as confidential information source by around 20% of the respondents (Table 12).

Table 12: Suitable information source for getting confidential information in EUSL

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>33</td>
<td>55.0</td>
</tr>
<tr>
<td>Emails</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td>Meetings</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Telephone calls</td>
<td>02</td>
<td>3.3</td>
</tr>
<tr>
<td>Others</td>
<td>01</td>
<td>1.6</td>
</tr>
<tr>
<td>Letter and emails</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>Emails and Telephone calls</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>Letter, email and telephone calls</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Browsing of Official Website

15% of staff had the habit of browsing ‘esn’ official website of the EUSL every day to get up-to-date information. 40% of staff browsed website once a week. Most of the minor staff never browse ‘esn’ website because they had no awareness about web information sources and to access those sources.

Table 13: Browsing official website of EUSL (‘esn’ website)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every day</td>
<td>09</td>
</tr>
<tr>
<td>Every other day</td>
<td>05</td>
</tr>
<tr>
<td>Once a week</td>
<td>24</td>
</tr>
<tr>
<td>Oftenly</td>
<td>18</td>
</tr>
<tr>
<td>Never</td>
<td>04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>
Table 14: Common method of information transferred

<table>
<thead>
<tr>
<th>Method of information transfer</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>04</td>
<td>6.7</td>
</tr>
<tr>
<td>Written</td>
<td>08</td>
<td>13.3</td>
</tr>
<tr>
<td>Both</td>
<td>48</td>
<td>80.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

In the sampled population, 80% of respondent gained and shared information in the combination of written and oral forms. Only 4% of staff got information only in the oral form.

Quality of Information

Table 15: Quality of available information

<table>
<thead>
<tr>
<th>Information received</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving reliable information</td>
<td>59 (98.3%)</td>
<td>01 (1.7%)</td>
</tr>
<tr>
<td>Receiving up-to-date information</td>
<td>34 (56.7%)</td>
<td>26 (43.3%)</td>
</tr>
<tr>
<td>Information easily available</td>
<td>39 (65%)</td>
<td>21 (35%)</td>
</tr>
<tr>
<td>Information received without delay</td>
<td>25 (41.7%)</td>
<td>35 (58.3%)</td>
</tr>
</tbody>
</table>

Almost all the staff members received reliable information; accordingly, information quality is maintained in the EUSL. Only half of the respondents reported that the information received was up-to-date. Rest of the respondents reported that the information received was not up-to-date. 65% of the staff reported that information is easily available within EUSL. And 35% of staff faced difficulties to get the information. The most alarming fact was more than half of respondents felt that the information does not arrive on time. It is important to take actions to get the information without delay (Table 15).

Most Important Source of Information

Majority of the staff members (36.7%) working in the Eastern University, Sri Lanka reported that internal telephone call act as the main source of information to carry out their day to day activities within the University, followed by discussions with other staff members (30%).

Common Type of Information Flow

According to the Table 16, 45% of staff reported that downward information flow was common within the University in a particular day, followed by horizontal information flow.

Table 16: Common type of information flow among the sampled population

<table>
<thead>
<tr>
<th>Types</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upward</td>
<td>9</td>
<td>15.0</td>
</tr>
<tr>
<td>Downward</td>
<td>27</td>
<td>45.0</td>
</tr>
<tr>
<td>Horizontal</td>
<td>18</td>
<td>30.0</td>
</tr>
<tr>
<td>Upward and downward</td>
<td>05</td>
<td>8.3</td>
</tr>
<tr>
<td>No response</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Efficiency of Information Flow

Table 17: Overall efficiency of information flow in the University

<table>
<thead>
<tr>
<th>Efficiency of information flow</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>02</td>
<td>3.3</td>
</tr>
<tr>
<td>Good</td>
<td>27</td>
<td>45.0</td>
</tr>
<tr>
<td>Fair</td>
<td>31</td>
<td>51.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

According to the respondents observation, the efficiency of information flow in the EUSL is needed to be improved, majority of them (51.7%) rated it as fair. Therefore, it is important to take necessary actions to improve the information flow within the University. Only a few percentages (3.3%) of staff rated it is excellent.

Suggestion to Improve the Information Utilization

Table 18: Suggestions by the staff to improve information flow within the EUSL

<table>
<thead>
<tr>
<th>Additional thoughts</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categorize the</td>
<td>01</td>
<td>1.7</td>
</tr>
<tr>
<td>information and send to the required staff on time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Proceedings, 04th International Symposium, SEUSL
Page 524
According to the results, 75% of staff did not turn out with any additional thoughts for improving information flow. No suggestions were made on how he/she could make changes for better information flow. This reflects the lack of enthusiasm concerning taking responsibility of one’s own work. It is important that each employee would understand the impact she/he has on the overall operations of EUSL.

CONCLUSION

The study concluded that majority of the staff in the Eastern University were female with the age of 22-31 years and had less than nine years of working experiences. 65% of staff used circulars as the information source to get work related information. 63.5% of staff voted telephone calls as more suitable information source for getting quick information. 60% of staff believed there were no constraints in receiving/sending information. Time delay is considered as the main constraint by the staff members. 15% of staff browsed ‘esn’ official website every day and got up-to-date information. 40% of staff browsed the website once a week. Most of the minor staff never browse ‘esn’ website. More than 80% of staff used letters for sending/receiving information to higher authority. More than 80% of staff got timely response from higher authority/subordinates. According to the respondents the overall efficiency of information flow in the EUSL is needed to be improved and most respondents (51.7%) rated it as fair. 75% of staff did not come up with additional thoughts for improving information flow. This can be an indication of the lack of enthusiasm concerning taking responsibility to regularize the information flow. By taking necessary steps to improve the existing pattern of information flow by considering the suggestion made by the staff members, may possibly make an efficient information flow network within the Eastern University, Sri Lanka.

REFERENCES


Arabic and Islamic Education
IMPLEMENTATION OF THE CONCEPT OF FIKH AL AWLAVIYA IN MUSLIM MINORITY COUNTRIES A PRELIMINARY STUDY BASED ON SRI LANKAN MUSLIM COMMUNITY

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2Department of Arabic Language, Faculty of Islamic Studies and Arabic Language, South Eastern University of Sri Lanka, Sri Lanka

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Abstract: The concept of Fikh al Awlaviya is an important concept of Islamic sharia that is mostly discussed in contemporary world, especially in Muslim minority countries. The Fikh al Awlaviya categorized the Sharia affairs considering the placement of values system in the earlier period, it was called “categorizing of Deeds” 27

The Islamic law consists of the fundamental sources of Holy Quran and the traditions of prophet Mohammed (sal) and also includes the secondary sources which are not against the law of Sharia that were made by the way of Ijdiath. Prioritizing fikh has given rise to a state of confusion among the Muslim community in Sri Lanka. As such there is inefficiency in the smooth functioning of Dawa activities causing a negative impact on the Muslim community. As a result, this has caused clash of opinions and conflict among the pluralistic society.

Through this study, the researcher aims to provide knowledge on the priority of fikh in Sharia perspective, It is significant and a need in a minority country to identify the challenges during the implementation of this concept. The researcher used qualitative research methodology. The primary data was collected through interview and observation and secondary data from books, magazine, newspaper and web sites. The findings reveal that the concept of priority is not popular in Muslim community in Sri Lanka and there is confusion among the people in understanding the concept. Therefore this research will provide some guidance and basic knowledge in this area with strategies to overcome challenges of this concept.

Key words: Sharia, Fikh al Awlaviya, Ijdiath, Muslim minority, Maslha Al Mursalah

27 Mohamed al Vakeeki: fikhul awlaviyath page 15
அவரும் அறிவுக்கு (Introduction):

இன்று இக்கவுலை விளக்கும் பிற்பகுதியாக காணப்படும் பல்வகைப்படிகளின் வளர்ச்சிக்கிறது ¼ நூற்றாண்டு எழுந்தறிக்கொண்டுள்ளது. புத்தாண்டின் தொடக்கம் முதல் பல்வகைப்படிகள் தமிழ்க்கொண்டது அவர்கள் கட்டுரையாக ஒன்றுக்கொன்று குறிப்பிட்டோம். இன்று விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மற்றும் அத்துடன் இக்கவுலை விளக்கும் பல்வகைப்படிகள் அறிவுக்கான நூற்றாண்டு எழுந்தறியும் பற்றிய ஆராய்ச்சியை எழுந்தறிக்கொண்டுள்ளது. இன்று விளக்கும் பல்வகைப்படிகள் அறிவுக்கே வரவேற்றும் பல்வகைப்படிகள் தமிழ்க்கொண்டு குறிப்பிட்டோம். விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மக்களிடையே தமிழ்க்கொண்டு குறிப்பிட்டோம். ஆராய்ச்சியை எழுந்தறிக்கொண்டு நூற்றாண்டு எழுந்தறியும் பற்றிய ஆராய்ச்சியை எழுந்தறிக்கொண்டு பணியும் பொருள்களை எழுந்தறிக்கொண்டு விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மக்களிடையே தமிழ்க்கொண்டு குறிப்பிட்டோம். விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மக்களிடையே தமிழ்க்கொண்டு குறிப்பிட்டோம். ஆராய்ச்சியை எழுந்தறிக்கொண்டு நூற்றாண்டு எழுந்தறியும் பற்றிய ஆராய்ச்சியை எழுந்தறிக்கொண்டு பணியும் பொருள்களை எழுந்தறிக்கொண்டு விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மக்களிடையே தமிழ்க்கொண்டு குறிப்பிட்டோம்.

சுருக்கமாக விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மக்களிடையே தமிழ்க்கொண்டு குறிப்பிட்டோம். விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மக்களிடையே தமிழ்க்கொண்டு குறிப்பிட்டோம். ஆராய்ச்சியை எழுந்தறிக்கொண்டு நூற்றாண்டு எழுந்தறியும் பற்றிய ஆராய்ச்சியை எழுந்தறிக்கொண்டு பணியும் பொருள்களை எழுந்தறிக்கொண்டு விளக்கும் பன்னாட்டு பொறியியல் பல்வகைப்படிகள் மக்களிடையே தமிழ்க்கொண்டு குறிப்பிட்டோம்.
Arabic and Islamic Education

(Proceedings of the 04th International Symposium, SEUSL)

Page 527

Purpose of the Study

1. The purpose of this study is to investigate the effectiveness of Islamic education in institutions and schools.
2. The study also aims to analyze the methods and strategies used in Islamic education and their impact on student performance.
3. The study seeks to identify and address the challenges faced by Islamic educators in their teaching practices.

Methodology

The study employed both primary and secondary data collection methods. The primary data was collected through interviews and focus group discussions. The secondary data was obtained from published works and educational standards.

Literary Review

The review of literature is based on previous studies conducted by various scholars. For instance, Al-Asali (1997) conducted a study on the impact of Islamic education on student motivation. Similarly, Al-Mahdi (1985) explored the role of Islamic education in fostering moral values among students.
Arabic and Islamic Education

Proceedings of the 04th International Symposium, SEUSL
Page 528

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Arabic and Islamic Education

Proceedings of the 04th International Symposium, SEUSL
Page 529
(من) العربية الإسلامية وصحيفة التعليم لللغة العربية وحوليتها في مجلس الأمة وسفراءها في الدول العربية في مجلس الأمة، يشير إلى لغة العربية في مجلس الأمة، لغة العربية في مجلس الأمة. ويشير إلى لغة العربية في مجلس الأمة، لغة العربية في مجلس الأمة.

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阿拉伯和伊斯兰教育

Proceedings of the 04th International Symposium, SEUSL
Page 531
2. புத்தாண்டியக் கல் காலக் குறுக்கை குறுக்கை குறுக்கை புத்தாண்டியக்
3. புத்தாண்டியக் கல் காலக் குறுக்கை குறுக்கை குறுக்கை புத்தாண்டியக்
4. புத்தாண்டியக் கல் காலக் குறுக்கை குறுக்கை குறுக்கை புத்தாண்டியக்
5. புத்தாண்டியக் கல் காலக் குறுக்கை குறுக்கை குறுக்கை புத்தாண்டியக்
6. புத்தாண்டியக் கல் காலக் குறுக்கை குறுக்கை குறுக்கை புத்தாண்டியக்
7. புத்தாண்டியக் கல் காலக் குறுக்கை குறுக்கை புத்தாண்டியக்

இன்னும்

பிறங்குள அமைப்பு கருத்துக்கேற்றது கருத்துக்கேற்றது கருத்துக்கேற்றது

1. பிறங்குள அமைப்பு கருத்துக்கேற்றது கருத்துக்கேற்றது கருத்துக்கேற்றது
2. கட்டுத்தொட்ட கற்றுக்கேற்றது கருத்துக்கேற்றது கருத்துக்கேற்றது
3. பிறங்குள அமைப்பு கருத்துக்கேற்றது கருத்துக்கேற்றது கருத்துக்கேற்றது
4. பிறங்குள அமைப்பு கருத்துக்கேற்றது கருத்துக்கேற்றது கருத்துக்கேற்றது
5. பிறங்குள அமைப்பு கருத்துக்கேற்றது கருத்துக்கேற்றது கருத்துக்கேற்றது

பொருள்

பங்களித்துக்காக பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது பொருள் காண்பது
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6. பொதுக்கல் மாதம் தொலை 1980 : அனு மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம்

7. இலங்கை பொதுக்கல் : தொலைக்காட்சி 2002(சிற்றாண்டம்) இலங்கை மாதம், புத்திரமா புத்திரமா புத்திரமா

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9. பொதுக்கல் புத்திரமா மாதம் தொலை 1985 : மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம்

10. பொதுக்கல் அனு கார்திரி 2001: மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் மாதம் :05
Abstract: The Muslims in all over the world used to send their children to the Quran Madarasa as it is the first school for them to learn how to recite Holy Quran and Islamic fundamental concept and moral values. This customs is also applicable in Sri Lanka Muslim community. Their parents also start their educational works from the learning the Holy Quran. Unfortunately, the current situation of Quran Madarasa is limited with training their children on pronounce Arabic levies as well as reciting Holy Quran without any attempts to understand its meanings and learning Arabic. Now over 200 years passed from establishment of Quranic Madarasa , but it is not developed academically and administratively according to the new trends. This big challenge to the Muslim community. Since there is no any change even students’ admissions or appointments of teachers and curriculums. So this research basically deals with their problems how to overcome these issues .The researchers used qualitative descriptive research methodology. The primary data was collected through questionnaires, interview and observation and secondary data from books and magazines and websites.

Keywords: Al-kathaatheep , Syllabus , Administrative, Academic , Assessment
ويستخدم الباحثان المنهج الوصفي في هذا البحث لاستنتاج المعلومات الأولية والثانية التي حصل عليها الباحثان عن طريق المقابلة والاستبانة والملاحظة. كما يعتمد الباحثان أن هذا البحث سوف يساعد على تحسين نشاطات هذه الكتاتيب آكاديمية وإدارية.

الكلمات الدالة: الكتاتيب - المنهج - الإدارة - الآكاديمية - التقييم

2. مقدمة البحث:
إن الكتب يعتبر كمدرسة أولى بالنسبة إلى أطفال المسلمين، ولهؤلاء الأطفال يتدرّبون فيه على تحسين قراءة القرآن وتعلم مبادئ الإسلام مجملة مع العلم بأن هذا الكتاب يوجد في سريلانكا منذ تواجدهم فيها لأعمش يعتبرون تعلم القرآن عبادة ويعطون له الأفضلية على سائر العلوم. فكأن هذا الكتاب في البداية مرتبطة بالمساجد ثم تطور حتى يكون منفصلا عنها. فصار عدده الآن أكثر من ألفي كتاب.

أما بالنسبة إلى نشاطات التبوية فهي تكون جامدة، فليس له منهج عام يتنبّي جميع الكتاتيب ولا نظام تسير عليه هذه الكتاتيب سواء في مدة سنوات أو إلحاق طلبة أو مقرر الدرس.

إذا السرّ في اهتمام المسلمين بسريلانكا تعلّم أطفالهم قراءة القرآن الكريم هو نوعية الأجواء الناشئة المسلمة وسعى إسلامي. وهذا الهدف لا يتحقق إلا بتدرب هؤلاء الأطفال على فهم معاني القرآن الكريم وتسيره، فضلا عن كمهم متدربين على ترتيب وتجويده. فبذا لما سؤال هل هذه الكتاتيب موجودة في سريلانكا يستحق أن تولى هذه المهمة ؟ أو هل هناك محاولات جديدة من المثقفين لإصلاح مصيرها الآن؟

وقد استطاع الباحثان خلال بحثهما أن يوصلا إلى أن هذه الكتاتيب أكثرها لم تكن ناجحة آكاديميا وإداريا حسب التغييرات الحديثة مع وجود مشكلات ملحوظة لأداء الحاجات الأساسية من توفير الوسائل الحديثة التي يحتاجها هذه الكتاتيب عند استغلال التعليم والتعليم، ومن الملاحظ أن هذه الكتاتيب لم تكن ضمن منهجها الدراسي الحالي لتعليم اللغة العربية للأطفال في الكتاتيب مع وجود ممكنات تطبيقها وتحقيق نتائجها عندهم.

فهذا البحث يتناول " نظام المدارس القرآنية بسريلانكا آكاديميا وإداريا " يركز على كشف وضعها الحالي مع اقتراح وصايا لازمة لتأسس كتاب موحد في سريلانكا.

3. أهداف البحث:
إذا هذا البحث يستهدف النقطة التالية: 
تقييم نشاطات الكتاتيب بسريلانكا لتحديد مواضع الضعف والقوة.

الكشف عن المشاكل الإدارية والأكاديمية في هذه المدارس.

تحسين نشاطات هذه الكتاتيب الأكاديمية والإدارية باقتراح توصيات مناسبة.

4. منهج البحث

تعمد هذه الدراسة على منهجي الميداني والوصفي. والتحصول على المعلومات الأولية تستخدم الدراسة الإستبانة والمقابلة والملاحظة. ثم يقوم الباحثان بتحليل واستنتاج المعلومات لإستخلاص النتائج.

5. محتوى البحث ( المناقشة والنتائج

(أ) تقييم نشاطات الكتاتيب بسريلانكا:

مام لا شك أن الكتاتيب لها دور للعقيم في رفع مستوي التعليم والتعليم وتشتت الإفكار المحدودة لدى شعب مسلم سريلانكا منذ بداية التاريخ إلى عصرنا هذا. وأنا شاب تعليم الأطفال في المرحلة التعليمية وهي أول بيئة أتى إليها الأطفال، وتعلم الأطفال فيها كثير من المدرسة، وعندما تكون هذه البيئة صالحة بإعطاء الفكر الجيدة، تنتمي إلى الفكر الإسلامية. يكون الجيل الناشئ ممتازا. وجمهورية سريلانكا توجد مدارس آرية متنوعة، وأكثرها تبع المنهج التقليدي وهي تكون غالباً بالمساحدين أو منفصلاً عنها أو في بيوت المسلمين أو في المراكز الثقافية.

وما بالنسبة إلى الإمكانيات المادية فمنها المباني فهي من الاحتياجات الأساسية لتنظيم الكتاتيب بأحسن وأفضل، كما أنها تلعب دوراً فعالاً في إصلاح النواحي النفسي والجسدية للأطفال، وكما يشير الأستاذ مارسولو "إن من أسباب الطفولة عند تعلم أي مادة أن يتيم بالمراهنة النفسي والجسدية وهذه الأمور توصل إلى التعلم الفعال" 37 وهي تساعد كثيراً في زيادة العلم وتوجه فكر المتعلم ويعيد أن التعليم الفعال كما أشار إليها أصحاب التربويين 38. ومن الملاحظ هنا أن أكثر الكتاتيب أو الدروس القرآنية في سريلانكا خاصة في مدينة مธนาوتي من المنطقة الشرقية من محافظة أمباري جيري في المساحد والبيوت الخاصة وبعضها في الأماكن الخاصة. ولكن هذه الأماكن لم تكن في حالة جيدة وسلبية لتعليم وتعليم القرآن الكريم، إلى جانب أن الوسائل التعليمية أيضاً لم تستخدم غالباً من خلال الصف عند نشاطات التعليم والتعليم. وكم أن الباحثين عندما قاموا بجمع المعلومات عن أوضاع هذه الكتاتيب الحالية فقد اكتشفوا التخلف عن الإدماج في الأماكن الخاصة التي يقرأ فيها القرآن الكريم وتدرس فيها أمور الدين ومباداته، ومع ذلك أن هذه البيئة ليست بيئة صالحة لدراسة الجيدة وملازمة لها، ولن يكون منها تكوين الأجيال المشودة والنتائج الممتازة من خلال هذه الدراسة التقليدية. وأيضاً أن هذه البيئة لاتساعد لإثارة أفكار رافعة وسلبية ومقدمة عند الأطفال.

37. مجموعتي من علماء التربوية 1998. "علم النفس البديل" جامعة سريلانكا الملتزمة ص 17
38. السياق ص 18
وكذلك المنهج الدراسي الذي يطبق في هذه الكتاتيب لم تصبح بصغع عام، ومنه ما يتناسب مع سن الطلبة، ومنه ما يتعادل
لرغبة الطلبة، ومنه ما لا يتناسب مع سن الطلبة. وقد أبرز الباحثون فما كان يرغبون فيه من مهارة التدريس في مدينة
مرتامونام فقد أبرزوا أراءهم التذكير بضرورة اتباع المنهج الكامل لجميع هذه الكتاتيب وضرورة استخدام الوسائل التعليمية عند
وقوع عملية التدريس.

وذلك الدروس الأساسية التي تلقى عليها غير وافية وكافية، حيننهم يهموا بالتدريس على نطاق الحروف العربية وترتبها دون
اهتمامهم بالمادة الإضافية، فلا يوجد بالمادة فرصة لتعليم اللغة العربية فط. وأن هناك محاولة كبيرة لتحفيز بعض الكلمات
العربية فقط. فالمنهج للبيئة الصفية وطبيعة المعلمين فكل هذه الأشياء لم تكن صاحبة لتفصيف الجيل الناشئ نحو الوعي الإسلامي
الكامل.

ومن النتائج التي استفاد الباحثون من الدراسة الميدانية من خلال الاستبيان والمقابلة كما توضح البيانات في الجدول التالي:

تقييم عن وضع الكتاتيب الحالي - الجدول الأول

<table>
<thead>
<tr>
<th>الرقم المسلسل</th>
<th>اسم المكان</th>
<th>المكان</th>
<th>اسم المكتب</th>
<th>التسجيل</th>
<th>عدد الطلبة</th>
<th>تقييم عن وضع الكتاتيب الحالي</th>
</tr>
</thead>
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<td>مدرسة</td>
<td>العلم</td>
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<td>30</td>
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</tr>
<tr>
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<td>مركز مركزي</td>
<td>مدرسة</td>
<td>عائشة</td>
<td>متوفرة</td>
<td>35</td>
<td>متوفرة</td>
</tr>
<tr>
<td>03</td>
<td>مركز مركزي</td>
<td>مدرسة</td>
<td>الوسطى</td>
<td>متوفرة</td>
<td>35</td>
<td>متوفرة</td>
</tr>
<tr>
<td>04</td>
<td>مركز مركزي</td>
<td>مدرسة</td>
<td>الإسلام</td>
<td>متوفرة</td>
<td>248</td>
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</tr>
<tr>
<td>05</td>
<td>مركز مركزي</td>
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<td>مدرسة</td>
<td>متوفرة</td>
<td>167</td>
<td>متوفرة</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>نظام الإدارة</th>
<th>عدد المعلمين</th>
<th>طريقة التدريس</th>
<th>استخدام الوسائل</th>
<th>المنهج الدراسي</th>
<th>التقييم</th>
</tr>
</thead>
<tbody>
<tr>
<td>موجود</td>
<td>01</td>
<td>طريقة التقليد</td>
<td>منهج</td>
<td>متوفرة</td>
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</tr>
<tr>
<td>نادر</td>
<td>01</td>
<td>طريقة التقليد</td>
<td>منهج</td>
<td>متوفرة</td>
<td>متوفرة</td>
</tr>
<tr>
<td>نادر</td>
<td>01</td>
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<td>منهج</td>
<td>متوفرة</td>
<td>متوفرة</td>
</tr>
<tr>
<td>نادر</td>
<td>11</td>
<td>الحوار والمناقشة</td>
<td>منهج</td>
<td>متوفرة</td>
<td>متوفرة</td>
</tr>
<tr>
<td>نادر</td>
<td>08</td>
<td>دراسة</td>
<td>منهج</td>
<td>متوفرة</td>
<td>متوفرة</td>
</tr>
</tbody>
</table>
ب) المشاكل الإدارية والأكاديمية في المدارس القرآنية:

إذا كانت الكتاتيب أو المدارس القرآنية في سريلانكا تواجه كثيرًا من المشاكل المتعلقة بالأكاديميا وإداريا، ومن خلال البحث الميداني الذي قام به الباحثين بمدينة مرتاموني من محافظة أمبارام، فلاحظا هذه العوائق والمعطيات التالية:

1. عدم توفير الإمكانيات المادية للقيام بنشاطات التعليم والتعلم: ومن المرجح أن هناك عددًا من الكتاتيب التي تتحرك في المساحات والبيوت الخاصة فلم تحلق على الإمكانات المتوفرة لأداء عملية التدريس الفعلية. أما المباني التي يديرها هذه الكتاتيب فليست توفر على الرفوف والمساحات اللازمة. كما يلاحظ أن الكتاتيب التي تركز على الاصطلاح تتوفر على الإمكانيات المناسبة، ويتطلب تدريس اللغة العربية في هذه الكتاتيب تدريس الالتقاء والتفوق الإداري والمعلمين المتمكنين.

2. عدم المنهج المنظم وعدم توفر المواد التعليمية الأساسية: ومن خلال هذا البحث الإداري فوجد أن الكتاتيب لم يكن فيها منهج موحد منظم، وكل مدرسة تطبق منهجها الخاص حسب معرفتها وتجربتها، والكتاتيب التي تشرف عليها الجماعات الإسلامية مثل الجماعة التوحيدية تركز على منهج خاص لمدارسها وذلك المنهج مناسب لطلبة المدارس، ووافق على البيئة الحديثة. ونلاحظ أن تدريس اللغة العربية مأساوية في هذه الكتاتيب لأنها لا تقدم لتعليم اللغة العربية للأطفال فيها.

3. عدم تطبيق طريقة التدريس الحديثة: إن طريقة تدريس القرآن الكريم هي مزيج من الإلقائية والجماعات التفاعلية مع التنقية والمناقشة والتمثيل، وانطلاق الكتاتيب المرتبطة بالمساحات تقوم بتطبيق التدريس التقليدي ولم تحمل بطريقة التدريس الفعل عكس للمدارس التي تديرها الجماعات الإسلامية وهي تقوم بتدريس المتعلم في الناحية التربوية، وتقوم هذه الجماعات بتطبيق بعض طرق التدريس الحديثة مثل طريقة التدريس بإجراء ألعاب في الحروف العربية الهجائية وتبادل البطاقات بين الطلاب لتشجيعهم.

| حوار وطريقة أسئلة وأجوبة | طريقة التلقين | دار الأقران | مدرسة القرآنية | مرتاموني | 6
|-----------------------------|--------------|-------------|------------------|----------|---
| نعم | نعم | 200 | – | – | 07
| نعم | نعم | 45 | – | – | 07

Table – 01
على الخلفية وقيام تدريس مواد الكتب بطريقة الحاسوب ، وهناك طريقة أخرى هي طريقة الأسئلة والأجوبة يسأل المعلم أسئلة تتعلق بآمور الإسلام أو اللغة العربية تجيبها التلاميذ. وكذلك طريقة أخرى يستخدمها المعلمون غالبا في هذه الكتب هي طريقة الحوار التي تقع بين التلاميذ لتطوير اللغة العربية ولتوسيع العلوم الإسلامية.

4. عدم استخدام الوسائل التعليمية :
إن الوسائل التي تستخدم غالبا عند تدريس القرآن الكريم في الكتب هي الوسائل البصرية مثل: السبورة، أما الوسائل السمعية والوسائل السمعية البصرية في هذه الكتب فلم يكن لها قليل إلا بقدر كبير.

5. عدم وجود النظام الإداري :
إن النظام الإداري لتحسن نشاطات تربوية أمر مهم، وعندما يكون هذا النظام نشيطاً والإشراف على هذه الكتب واتها، التوجيهات والارشادات للمعلمين وغيرها فغالباً تكون مماثلة، فكل كتاب له هيئة إدارية خاصة مؤلفة من أعضاء هذه المدينة، ولكن المهم أن تكون هذه الهيئة الإدارية متسقة تحت أنتمية لديها حق السيطرة الكاملة.

6. عدم تدريب المعلمين :
من إحدى المشاكل التي تواجهها هذه المدارس هي قلة المعلمين المتدينين في تدريس القرآن الكريم لأن أغلبهم من خريجي مؤسسات الإسلامية والعربية وهم منافسين لعدم إعداد منهج تدريبي كاف إلا القليل منهم، مع ذلك أهم متحدون إلى تدريب على طرق التدريس والنزد بالمعادن التربوية والنفسية.

(ج) طرق تحسين نشاطات هذه الكتب الإدارية والاكاديمية :
إن الكتاب بالنسبة إلى مجتمع مسلمي سريلانكا هي من أهم المراكز العلمية التي يستفيد منها الأطفال الصغار ويتدربون على قراءة القرآن الكريم وفهمه وفهم الأمور الدينية الأساسية، ولكن في الحقيقة إن هذه الكتاب تفتقد إلى نظام مبسط وشامل واضح في نسخة، وشاملة من الأفكار الإسلامية وأخلاقيات وتكوين جيل من الشعوب الإسلامي، ولكن إعطاء الكتب كما يرغب أو تدريب على تعلم اللغة العربية وعلى فهم القرآن الكريم وليس للغة العربية في منهجهم مكان خاص إلا أن بعض الكتب تدرب أطفالهم على فهم معاني بعض من سور القرآن الكريم وخصوصاً من الآيات البارزة في العلوم العربية من الناحية اللغوية.

وهنا قد حاول الباحثان أن يقدموا بعض توجيهات وارشادات لتحسن نشاطات هذه الكتب أكاديميا وإداريا مما يحصل من المعلومات عن طريق البحث، وهي كما يلي:
1. An understanding of the text books is a must for teachers, but there is a need for the unification of the teaching methods that are used at the seminar.

2. It is necessary to set a specific age for the student entering into these textbooks, as the best method is to divide them over five years.

3. It is necessary to form a special committee for the implementation of these textbooks as a scientific activity, the best way is to form this committee by the heads of the Islamic studies in Sri Lanka.

4. It is necessary to train the teachers in a comprehensive manner, to conduct scientific training courses as a training on the methods of teaching and the psychological information that is necessary for the teacher who wishes to teach this topic in a way that is suitable for the society.

5. Providing the educational means and their implementation in the textbook in Sri Lanka, and when implementing these means it is necessary to consider the cost of the support from the religious schools.

6. Results

The researcher found the following results:

1. Despite the strong defensive motive of Muslims in Sri Lanka to preserve their heritage from the Western culture, they are not satisfied with the textbooks.

2. Parents who have been educated to think about their children when they sent them to these textbooks.

3. This is a new way of teaching that developed the textbooks.

4. It is unfortunate that there is no system of supervision over the textbook.

5. The textbooks are considered as a school for children, and these textbooks are considered as a means of acquiring practical skills.

6. Teaching the Arabic language in this textbook has a prominent position.

7. Recommendations

Based on the results of the research, the researcher recommends the following recommendations for the implementation of the textbook in Sri Lanka:
1. فعلى الآباء إعطاء الأفضلية والأهمية لإرسال أولادهم إلى الكاتبب بحيث لا يعوق عملية الكتابة.

2. لإشراف هذه الكتابب لابد من تشكيل لجنة خاصة بمشاركة فيها ذو الخبرات والعلماء ورؤساء المجتمع.

3. يلزم على الآباء المحاولة للجنة لإعادة جادة لتحريك هذه الكتابب، وهذه الإدارة تحتوي أعضاء محددة مراقبة من آباء الأطفال وكذلك من كل جماعات إسلامية على السواء ومن رؤساء المجتمع.

4. فعلى الإدارة أن تطبق منهجا علامة نظرا لجميع الكتابب.

5. لابد من توفير الإمكابات المالية لاداء النشاطات العلمية والتطبيقية في هذه الكتابب.

6. فعلى الإدارة لابد من توفير الفرصة لزواج الإمكابات والوسائل الحديثة المساعدة للعملية التعليمية والتعليمية.

7. يلزم على الإدارة القيام بتدريب وتأهيل المعلمين لقيام على أداء التعليم والتعليم الفعال في هذه الكتابب.

8. وعلى المسؤولون الاهتمام بإدخال مادة في تعليم اللغة العربية في منهج الكتابب.

8. خلاصة البحث

ينتين من خلال هذا البحث أن الكتابب التي اشتهرت لدى المسلمين في سريلانكا لما مكانة عظيمة في تكوين الأطفال الصالحة، كما عرفنا أن هذه الكتابب هي أول مدرسة للأطفال المسلمين في سريلانكا وحتى في العالم الإسلامي العربي وغيرها من حيث أنها تطلق عليها بأسماء أخرى. ولكن هذه الكتابب التي تتحرك بسريلانكا في حاجة ماسة إلى إصلاح وتنظيم خطوطها ومناهجها حسب التقلبات الحديثة المتعارفة على جانب المحاولة لإدخال مادة اللغة العربية في مناهجها.

ومن جهتنا تقوم هذه الكتابب بنشاطها الجيدة وعمليتها الممتازة فهناك ينشأ جيل صالح منصور حيث يساهم في النهضة الإسلامية المباركة الحديثة، ومتى لا شك في أن هذه الكتابب هي سمة مهمة من عناصر الأستاذية العالم للإسلام والمسلمين. والله ولي التوفيق والسداد، وهو أعلم من وراء القصد.

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FINANCIAL MANAGEMENT PRACTICES OF MOSQUES IN SRI LANKA: AN OBSERVATION

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ABSTRACT:

In accordance with Islamic conception, the mosque is a centre for community development. It has to play a crucial role in various aspects of Muslim life in Sri Lanka context of Muslim minority. For this, it is required that mosque maintains a healthier financial performance. The purpose of the study is to examine the financial practices of the mosques in Sri Lanka. This study utilises a survey along with in-depth observation and interview to examine the nature of this financial behaviour in Sri Lanka. Results revealed that mosque finance is conservative and simple mostly dominated by the condition of resource scarcity. This study also discovered that mosque needs to maintain financial management strategies to conduct more quality and quantity program and mosque needs to recognize the importance of fundraising activity.

BACKGROUND OF THE STUDY

Mosque is considered one of the non-profit organizations and therefore its financial practice determines the quality and quantity of services provision (Sulaiman et al., 2008). In Islam, mosque is community development centre. It is a place for congregation, a centre of excellence for knowledge, economic pursuit and community services, giving religious instruction, political discussions, knowledge sharing etc. (Abu-Shuhbah, 1395H/1975, Al-Darsh, 1994, Rasdi, 1998). As such, it is important for a mosque to maintain strong financial condition to achieve its strategic mission. One of the roles of mosque trusty board is to maintain their mosque’s revenue and expenditure. Moreover, they are expected to ensure that funds are obtained and used in the most efficient and effective way to the benefit of jama’at (Adil et al., 2013, Masrek et al., 2014, Said et al., 2013).

In Sri Lanka, the history of mosque is old as the presence of the Muslims there (Mahroof, 1987). With more than 2000 mosques national wide, they are vital to the Muslims in many aspects of their life. These mosques use to generate their own fund in order to run the daily operations and to smaller extent, to conduct activities for the benefit of the local society. Generally, the fund comes from local donations and the proceeds of the production from the lands are benefited to the mosque. Because of that, in the Sri Lankan Muslim minority context, there is no traditional system of ‘state’ mosques as it is in Muslim world, where the mosques are funded by regime, which are incorporated into the state bureaucracy to control all related activities through the ministry or department in-charge for awqaf (plural of waqf) and religious affairs. This bureaucratic model was the dominant model around the world until the 1980s. And this model is aimed at bureaucrats to derive policies and translate government objectives and agenda into action. However in Sri Lanka, the tradition of waqf has not been allowed into the prevailing Muslim law and the recognized legal system. It was pointed out that “...and that the branch of law known as waqf was not introduced into Ceylon and did not become part of the customary law of the Ceylon Muslims” (Mahroof, 1980). However, The discourse to reform the mosque management to regulate the proper use of mosque fund and property, urged ‘the Muslim Mosques and Charitable Trusts of Waqfs Act’ to be enacted by independent parliament of Sri Lanka in 1956. According to this act, a mosque fund must be governed by trustees selected by jama’at and approved by waqfs board. Therefore, this study attempts to examine financial practices of mosques in Sri Lanka, focussing on their basic financial activities such as financial health, sources of income, major expenditures etc.

METHODOLOGY

This research is primarily based on the qualitative approach, but it does not advocate the exclusive use of either the extreme qualitative or quantitative technique. This study comprises the following techniques: interview survey (quantitative), observation supplemented with interviews, and documents (qualitative) to gain empirical evidences. The use of structural interview survey along with field observation has helped to obtain the empirical evidences on their basic financial activities such as financial health, sources of income, major expenditures etc. Quantitative approach serves to minimize the degree of biasness and thus enhance objectivity. However, in the qualitative part of the fieldwork, the interactive between the mosque trustees and researcher is important to explore and uncover the multiple perspective of the mosque finance. Subjective interpretations were obtained from the other selected informants unstructured interviews. This study is a constructed reality, so it mainly
focuses on meaning, ideas, and practices as the research has been designed and carried out using a critical and evaluation approach. The research uses both inductive and deductive processes. The inductive process is used not to provide or disapprove a predetermined hypothesis but rather, to discover or uncover any interesting concepts or variables of mosque finance. So, the entire process is deductive and explanatory. Sri Lanka was chosen for the study, both because it is unique in its own context and the researcher is representing the country through the academic investigation and working experiences. However, what is learnt from Sri Lanka is relevant to and can suggest new aspects and reading of similar situations in other empirical settings.

At the time of data collection, there were 2000 mosques in Sri Lanka. For interview survey: the 68 electorates of 21 districts, where considerable numbers of Muslims are living were selected for sampling. Number of samples was allocated proportional to the number of mosques in each electorate. Mosques were selected within the electorate randomly. However, to an extent, the characteristics of the mosques such as location, type, ownership and ideological differences were also considered in sampling. The persons contacted for unstructured interviews include the Director of Department of Religious and Cultural Affairs, the eminent Scholars, Muslim writers, Islamic activists, leaders of the Islamic movements, and the segment of Muslim professionals. The majority were leading figures in Islamic works. There were however, very few relevant persons who were failed to be interviewed, as they were not available, busy or sick at the fieldwork time. When electing interviewees a conscious effort was made to include people from different ideologies and background. However, the effort to include as many as women, was not possible except one woman.

DISCUSSION AND RESULTS

The responses describing the current financial situation of the mosques are presented in figure 6.4. It first reveals the course of the finance in five periods, the finance either has not met any changes (41%) or has worsen (21%) relatively in majority of the mosques, meanwhile, considerable mosques (38%) report the financial improvement. However, the great majority of mosques (75%) are in unhealthy position in finance. The situation is noticeable remedy as one out of five mosques (20%) face some difficulty and some mosques (10%) face serious difficulty in financing. It can be argued that the mosques likely do not pay concern on development of fundraising strategies including financial planning, budgeting, keeping clear financial records, transparency in financial reporting etc. these behaviours may encourage the concerned people to extend their support to the mosques and the services it provide.

Figure 6.4 The course of the finance over last five years and the current financial health of the mosques

Source: Survey
The key sources of incomes in mosques of Sri Lanka appear more traditional, as it is showed in figure 6.5. This figure pinpoints the contribution of existing sources of income to the income mosques. The first is monthly *sanda* (a Tamil term for subscription) and it is the way, mosques mostly practiced (88.6%) to generate income to the mosques. The mosque managements strive to collect an agreed specified minimum amount of money (mostly from one to three hundred Sri Lankan rupees) from their *jama'at* according their level of income of each month. Even though this is a major source of income, it is intimately connected to the size of *jama'at* population and their standard of living. The mosques situated in major cities leading *jama'at* of about thousand Muslims, is the most affluent mosques under the observation. It is important to note, furthermore, how the economic condition of the Sri Lanka, which is marked with gradual decline in recent past, affect considerably and determine the contribution of the *sanda* collection.

The next way of income generation in vast majority of the mosques (70.5%) tend to be supplemented by donation probably given at end of Ramadan and on special occasions including *'id* festivals. Most of the mosques used to organize the donation campaign among philanthropies and traders during these periods. Sizable donation may come from individuals who are referred to as major donors. Furthermore, the collection box is put in the most of the mosques, at its main entrance. The collection box of the some mosques is seen to be placed in commercial area such as famous stores, markets etc. The box is locked, with only a slot for cash donations. Generally, the box can be opened only once in a month, at a fixed time, in the presence of key mosques personals. The fund giving for charitable purpose forms to contribute the income generation in slightly more than a quarter among mosques (21.9%). The external funding opportunities from the Muslim countries, the government, and the donor organizations are relatively few (13.8%) and mostly used for specific purpose of the construction and renovation.

It is found that considerable number of mosques (37.1%) posses the assets in the form of paddy fields, rental buildings etc. From early period, there is a trend that affluent Muslims donate, in the form of *waqf*, property adjacent to the mosque for its extension and maintenance. Therefore, this practice brought into the most endowed mosques in a specified area. In the agrarian area, the paddy fields were most likely endowed to the mosques. Moreover, some mosques tend to no longer depend on uncertain incomes, it has become necessary to develop sources of steady income besides the *sandas* and donation from pious believers. They have begun to rent out their extra space for commercial use; some have constructed new business ventures for rental income. The mosques located in the busy commercial area receive much income from this source. Financial assets other than those, for a lesser extent, are providing lodging to the students and travelers. However, the primary question is whether all the mosques maintain sufficient cash and cash equivalents, and internally generated cash flows to finance their activities. To answer the question, the mosques were asked to give the approximate net income from their all sources in fiscal year 2007. The figure 6.7 indicates that the net amount received in 2007...
by the majority mosques that probably do not have the endowed property, insufficient in a scenario with their budgetary needs and management have increased considerably. A good case in point is that the less than one hundred thousand LKR as a net amount received by the considerable mosques (31.3%) is extremely low. Only quarter of the mosques reports total income over four hundred thousand and very few mosques (4.6%) relatively experienced comfortable income over one million in 2007.

Table 6.7 Approximate net income of the mosque from all resources in 2007

<table>
<thead>
<tr>
<th>Income</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100,000/= LKR</td>
<td>31.3%</td>
</tr>
<tr>
<td>100,000/= - 199,999/= LKR</td>
<td>24.1%</td>
</tr>
<tr>
<td>200,000/= - 399,999/= LKR</td>
<td>20.0%</td>
</tr>
<tr>
<td>400,000/= - 599,999/= LKR</td>
<td>9.7%</td>
</tr>
<tr>
<td>600,000/= - 999,999/= LKR</td>
<td>10.3%</td>
</tr>
<tr>
<td>More than 1,000,000/= LKR</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

(N= 195)  Source: Survey

The major expenditures of mosques include mostly the regular expenses such as dispenses for salary (82.2%), charges for electricity and water 70.7%), and for other maintenance necessities (61.5%) as it presented in figure 6. Moreover the mosques tend to spend large amount of money on extension, renovation and reconstruction. It is observed that this have great importance and thus most of the mosques have experienced energetic reconstruction and refurbishing. This is for the reasons such as: increasing Muslim population and their attendance to the congregational prayer in the mosques, sense of the aesthetic, proud of having a larger mosque etc. The rest of the expenditures described as “others” are organization of the religious events and cost of development properties.

![Figure 6.6 Major expenditure of the mosques](image)

Other aspects of mosque finance can be briefed as follows: the fiscal year is basic financial record keeping period of the mosques that mostly begins on January 1 and ends on December 31. The income and expenditure statement is monthly based practice. The monthly balance will be put on the board for every one to see. Most of the mosques keep rest of the money in a bank account, but no documentation exists. Such a relaxed management style is quite usual among mosques, but the Department of Muslim Religious and Cultural Affairs most likely
encourages mosques to have a regular financial system is to be established to qualify the mosques for registration. It is generally believed that the mosques do not practice the adequate system of internal control in their financial process on the receipt of income and the disbursement of funds. They have no qualification to function in such capacity as well, most of the mosque board do not normally play an active role when it comes to managing the mosques’ funds (Razi, 2009). Furthermore, some people view that financial procedures such as accounting and internal control procedures are regarded as secular activities and, therefore, as secondary to sacred activities of the mosques.

CONCLUSION

Generally the mosque finance likely seems to be conservative and simple, as they are preparing monthly income and expenditure statement. There are most likely no practice to keep the financial records and even though they have it but not ready to make it available to other parties. The financial processes of the mosques are generally dominated by conditions of resource scarcity. They are utilizing the limited opportunities for generating income. The fund raising strategies are also arguable and they face resource constrains with an ever increasing agenda of activities on which such funds could be spent. As a result, the mosque finances are most likely responsible for directly supporting the primary routine expenditure. As such situation always advocates many services that contribute to the achievement of mission to lead the community, are not to be provided due to limitation in funds. Therefore, mosque management maintains its finances and takes actions mostly to ensure that spending does not exceed the available resources. This indicates that the mosques require a reasonably significant level of financial management activities at least the management of scarce resources to underpin their daily operations. However, the practices are probably dominated by the transcendental nature of the belief systems adopted by the mosques.

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CONCEPT OF CIVIL OBEDIENCE AND DISOBEDIENCE: A COMPARISON OF THE WORK OF ETIENNE DE LA BOETIE AND SAYYID QUTB

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Abstract: This paper explores the concepts of obedience and disobedience as reactions to the control of the State based on the nonviolent civil disobedient ideology of Etienne de la Boetie (1530 – 1563) and the radical revivalist Islamic ideology of Sayyid Qutb (1906 – 1966). For Boetie, the main focus of political philosophy is why people consent to their own enslavement. In other words, why people support states that suppress them directly or indirectly. Why do people, always, in all places, obey and follow the commands of the governments which is made up of a small minority of the society. In his view, the central problem of political philosophy should be, understanding this mystery of civil obedience. Both Qutb and Boeti accept that states or governments are more vulnerable than people think. They can collapse in an instant particularly, when people withdraw their consent. Despite agreeing on the importance of the withdrawal of consent from the state and that this withdrawal of support can lead to the state collapsing, the means they suggest for how this should be done differ, vastly. Boeti advises in his writings that this should be done in a non-violent manner whereas Qutb encourages the use of radical violent means that he describes using the concepts; jahiliyya, hakimiyya, and jihad. This article compares both of their arguments, their effectiveness, and their influence on contemporary politics of the Western and Islamic world.

Tags: (dis)obedience, fundamentalism, despotism, totalitarianism, Jahiliyyah, Hakimiyyah, Jihad, Sharia

Introduction

In today’s political world the term disobedience has received much political attendance. Starting with anti-globalization protests in the US and Switzerland, continuing with the Occupy Wall Street Movement and the Arab Spring people have started to express their opposition against their governments’ behaviour and decisions using different ways of civil disobedience. Bernard Harcourt explained civil disobedience based on reflection of the Occupy Wall Street movement as “accepted the legitimacy of political institutions, but resisted the moral authority of resulting laws….the very way in which we are governed: the structure of partisan politics, the demand for policy reforms, the call for party identification, and the very ideologies that dominated the post-War period” (Laudani & Sitze, 2013). Modern day disobedience challenges both law and politics. When people engage in dissent against their governments or against its power, several different strategies are employed. These strategies can be captured using terms such as mass violent protests, terrorism, fundamentalism, violence and radicalism. This raises many questions about what are these strategies, on what ideologies are they based, who engages in these events, are these only ways in which people protest and why often only a minority of people get involved in these protests. Whether people like it or not the State or government holds much power and often this power maybe seen as oppressive to its people. This paper examines what might be the basis of reacting differently to this power and the different manners in which people work to overcome oppressive States using the philosophies of Etienne de la Boetie and Sayyid Qutb.

The term civil disobedience was coined by Henry David Thoreau, in his essay, Resistance to Civil Government, where he describes it as a way of resisting the power of the Government. He encouraged the refusal to pay the state poll tax implemented by the US government to prosecute a war in Mexico and to enforce the fugitive Slave Law (Thoreau, 1848). Later, it was formerly developed and defended by John Rawls. In the history of thoughts of nonviolent disobedience there are four most influential advocates, namely, Etienne de la Boetie, Henry David Thoreau, Mahatama Ghandhi and Martin Luther King, Jr. Nonviolent civil disobedience means engaging in behaviours that can be considered as dissent, to challenge a law of the government or social order without using violent or physical force (Oduor, 2011). Generally, the following techniques can be used as nonviolent civil disobedience; strikes, refusal to pay taxes, mass demonstrations, refusal to follow official orders such as curfew, and the formation of alternative institutions for political legitimacy and social organization (Zunes, 2003).
Etienne de la Boetie

The modern political thought on civil disobedience begins with French political philosopher Etienne de la Boetie. In his book, *The Politics of Obedience: The Discourse of Voluntary Servitude* suggests that governments rely on the fearful obedience and submission of their people. He was influenced by Niccolo Machiavelli. But the difference between them is Machiavelli instructs the Prince to strengthen his rule whereas Boetie focuses on ways to overthrow the government and to secure the liberty of the individual.

In his view, tyranny depends on popular acceptance and tyrants have power that is given by people and they are agreed to their own subjection. If it is not the case no tyranny could last. To Boetie, the main mystery of politics was obedience to rulers. Why do we agree to be oppressed by governments? Rothbard (2011) introduces Boetie as “one of the seminal political philosophers” and the “first theorist of the strategy of mass, non-violent civil disobedience,” and credits him with originating “fundamental insight… that every tyranny must necessarily be grounded upon general popular acceptance.” (Rothbard, 2002)

Sayyid Qutb

On the contrary, modern Islamic philosopher Sayyid Qutb is vastly credited with creating a fundamental radical turning point in modern Islamic political philosophy. He proposed a radical and violent interpretation of *Jihad* as a means of civil disobedience against the state. Qutb is the main developer of doctrine of the violent *jihad* in modern times, particularly, legitimizing violent Muslim resistance to states that are considered Muslim states but where implementation of Islamic principles is judged as imperfect. *Al-Qaeda* and their Islamic *Jihadist* vision were mostly influenced by Qutb’s thoughts in justifying their goal for the world and the violence they promote. Further, some scholars describe him as John Locke of the Islamic world as he promoted freedom and advocated rebellion against tyrannical or totalitarian states.

Qutb ideas spread outside the Middle East and his thoughts are studied and interpreted in many ways. For example, religious laws were implemented based on Qutb’s thoughts in Afghanistan. Though, Qutb was a Sunni Muslim, his thoughts of a politicized Islam was influenced by *Shiite* ruler Ayatollah Khomini in Iran. During the trip to America Qutb was exposed to what he considered the West’s spiritual and moral bankruptcy, though he admired their scientific and economic achievements. Qutb’s rejection of west led him to embrace the Islamic Brotherhood agenda. Both had similarity in their anti-west attitude and both called for return to Islam. Qutb’s Most popular work *Milestones* outlines his political philosophy which is based on the concept that all earthly sovereignty belongs to God alone. He called Muslims to challenge Western ideology and become liberated from the West and its values. The following words explain the basis for his vision and ideology;

“Mankind today is on the brink of a precipice…… because humanity is devoid of those vital values for its healthy development and real progress” (Qutb, 1990).

Methods and Materials

The researcher uses content and comparative analysis in examining civil (dis)obedience in the view of Boetie and Qutb. Their thoughts of political philosophy are critically analysed. In addition to the content and comparative analysis the researcher uses historical method in writing this paper. Upon using the historical method the researcher will reinterpret information gathered through the following materials; books, journals and magazines, autobiographies, and various websites. Further, as for the primary resources in tracing Boetie’s and Qutb’s thoughts on political philosophy, the researcher will refer their original works; Boetie works of *The Politics of Obedience: The Discourse of Voluntary Servitude* (1975), Sayyid Qutb works; *Social Justice in Islam* (2000), *The Religion of the Future* (2007), *Milestones* (1990), etc.

Analysis

**Boetie’s views of tyranny and civil disobedience**

Boetie analyses deeply the nature of tyranny and state rule and emphasized that popular acceptance is compulsory to the existence of tyranny. Popular support is used by tyranny to suppress its people and state power is used to influence every aspect of people. Tyranny consists of a small number of people though elected by majority where the majority accept to follow its commands. If tyranny does not have general support and people do not agree to submission his tyranny, no tyranny and no government rule will last. Therefore, the
central problem for Boetie is, in his political philosophy is, “why in the world do people consent to their own enslavement?” He said,

“I should merely to understand how it happens that so many men, so many villages, so many cities, so many nations, sometimes suffer under a single tyrant who has no other power than the power they give him; who is able to harm them only to the extent to which they have willingness to bear with him; who could do them absolutely no injury unless they preferred to put up with him rather than contradict him,” (as cited in Newman, 2007).

Boetie emphasized the submission of people is related to consent rather to fear. He opposes tyranny and the consent and submission people have to their own enslavement. This opposition is based on the theory of natural law and natural right to be free. In his view, every individual has equal liberty. Therefore, nature gives us the common gift of voice and speech. Accordingly, Boetie calls for civil disobedience, mass non-violent resistance, with the goal of overthrowing tyranny; to show the power of the masses and the great value of natural liberty. Since tyranny relies on the consent of people, it can be overthrown by the withdrawal of the consent. Therefore, non-violent disobedience is in the way to recapture liberty. He says, “obviously, there is no need of fighting to overcome this single tyrant, for he his automatically defeated if the country refuses consent to its own enslavement,” (De la Boetie, 1975).

Further, Boetie indicates if individual gives more power to tyranny the stronger and mightier it will be. The power of tyranny is given by people but it is used to destroy and spy on people. He asks;

“How can he have so many arms to beat you with, if he does not borrow them from you? The feet that trample down your cities, where does he get them if they are not your own? How does he have any power over you except through you? How would he dare assail you if he had not cooperated from you? What could he do to you if you yourselves did not connive with the thief who plunders you, if you were not accomplices of the murderer who kills you, if you were not traitors to your selves?” (as cited in Jensen and Draffin, 2004)

As it is mentioned earlier, force is not the hypothetical way to change the regime. Those regimes should be deprived from public supply of fund and resources. Therefore, people do not need to shed their blood but he advocates non-violent resistance and mass civil disobedience. He says;

“You sow your crops in order that he may ravage them, you install and furnish your homes to give goods to pillage; you rear daughters that he may gratify his lust; you bring up your children in order that he may confer upon them the greatest privilege he knows- to be led into his battles, to be delivered to butchery, to be made the servants of his greed and the instruments of his vengeance; you yield your bodies unto hard labour in order that he may indulge in his delights and wallow in his filthy pleasures; you weaken yourselves in order to make him the stronger and the mightier to hold you in check. From all these indignities, such as the very beasts of the field would not endure, you can deliver yourselves if you try, not by taking action, but merely by willing to be free. Resolve to serve no more, and you are at once freed. I do not ask that you place hands upon the tyrant to topple him over, but simply that you support him no longer; then you will behold him, like a great colossus whose pedestal has been pulled away, fall of his own weight and break in pieces,” (De la Boetie, 1975).

In Boetie’s view there are three types of tyrants (De la Boetie, 1975). Some get position through elections by masses, others by power of arms, and others through inheritance. According to Boetie, Conquers rule the country as if they conquered the country and some other’s as if the land is inherited. Though, elected authorities are more tolerable, they can also change into a hereditary despotism. If there is mass consent to any of those three rules, they are silently consented to be subjugated, dominated, and terrorized and loss of their liberty. Basically, Boetie emphasises all rulers are tyrants though they come in different forms. They behave in the same way. They view the country or state as their properties. He says;

“Still the method of ruling is practically the same; those who are elected act as if they were breaking in bullocks; those who are conquerors make the people their prey; those who are heirs plan to treat them as if they were their natural slaves” (De la Boetie, 1975).

Why do the people tolerate the servitude and misery? How does one ruler mistreat a great number of people? According to Boetie, it is the fault of people that they suffer and are enslaved under the government. People tolerate the voluntary servitude because of custom and habit. People have mind-sets that they have been enslavement, that is, their fathers had the same life. Therefore, they are also obliged to have the same life and
will be persuaded by copying others’ life. In this view, Boeti suggests social engineering is the key element to awake in people their right to engage in revolution. People should be guided and ruled by reasoning not by power.

Consent of people is encouraged and motivated by the states or ruler. Rulers use various techniques in order to earn this consent and they divert people’s attention away from truly important problems affecting their lives. One of these techniques is circuses with entertaining distractions such as plays, gladiators, farces, medals, pictures, spectacles and other such opiates (De la Boetie, 1975). Further, rulers follows the motto “divide and conquer”. The ruler distracts and divides people by income, race, ethnicity, religion, and political party affiliations. He explains:

“Thus the despot subdues his subjects, some of them by means of others, and thus is he protected by those from whom, if they were decent men, he would have to guard himself; just as, in order to split wood, one has to use a wedge of the wood itself” (De la Boetie, 1975)

Another technique of motivating consent is related to ideological brainwashing; let people believe that the ruler is wise, just, and benevolent. In this view, Boetie points out modern rulers use this technique in more sophisticated way; For example by making charming political speeches relating to public welfare and common good. Further, rulers would use religion for their own protection and to strengthen their evil ways. They use symbols of religions and mythical meaning to create the impression that they were chosen by God to rule the country. Therefore, they are not like everyone else. He points out:

“It has always happened that tyrants, in order to strengthen their power, have made every effort to train their people not only in obedience and servility toward themselves, but also in adoration” (De la Boetie, 1975).

Further, rulers use another technique to get support and consent of people by purchasing material benefits bread and circuses. Giving of largest aid in the name of free health care, food stamp, and creating welfare systems for the masses does not come from pure intention but to make them to feel they really receive benefit from the rulers. Literally, the people receive a small part of the wealth and they themselves ultimately pay for it:

“Tyrants would distribute largesse, a bushel of wheat, a gallon of wine, and a sesterce: and then everybody would shamelessly cry, “Long live the King!” The fools did not realise that they were merely recovering a portion of their own property, and that their ruler could not have given them what they were receiving without having first taken it from them… the mob has always behaved in this way – eagerly open to bribes that cannot be honourably accepted” (Rothbard, 2002).

How can people escape this voluntary servitude? When people are squeezed by rulers, misery of people increases. Is violent necessary to get rid of tyranny? Boetie, realises that if violent actions were required then most (wo)men would not participate because they do not want to lose what little they have. Boetie concludes that not only is violent action not needed; no action is neither required – only non-action through non-cooperation is required. The power of tyrants comes from the what the masses give them. If we want to defeat the tyrants, we give them nothing, and thus “the chains of servitude are wrecked” through the refusal to serve. He says;

“Obviously there is no need of fighting to overcome this single tyrant, for he is automatically defeated if the country refuses consent to its own enslavement: it is not necessary to deprive him anything, but simply to give him nothing; there is no need that the country make an effort to do anything for itself provided it does nothing against itself. It is therefore the inhabitants themselves who permit, or, rather, being about, their own subjection, since by ceasing to submit they would put an end to their servitude…. Resolve to serve no more, and you are at once freed. I do not ask that you place hands upon the tyrant to topple him over, but simply that you support him no longer; then you will behold him, like a great colossus whose pedestal has been pulled away, fall of his own weight and break in pieces” (De la Boeti, 2005).

He calls for non-cooperation disobedience in the form of not paying taxes, fees, fines, not renewing licence, parking tickets, etc. If everyone follows no action it would make great change. In summary, he insists to stop supplying the government with the instrument of their own oppression.

Qutb’s views of tyranny and civil disobedience
Qutb’s political philosophy is summarised in three steps which are fundamental to his ideas; first, he criticizes the current world and state as *jahiliyya* (ignorance) and calls for the reversal of the state and world order. Second, the conflict between good (Islam) and evil (*jahiliyya*) is the motivating force behind human history. Third, the way to fight prevailing *jahiliyyah* is *jihad* (struggle).

Qutb identifies states including Islamic states that do not follow God or Divine commands as being in a state of *jahiliyyah*. In other words, Qutb used the term *jahiliyyah* to criticize all systems of life that were non-Islamic. In addition, Qutb refers to the ignorance of divine guidance and includes this in his criticism towards the western world and governments that do not follow Islamic law. So, in his view, there are Islamic societies and *Jahiliyyah* societies. These *jahiliyyah* societies ignore God’s guidance and follows man-made laws and life. Further, he identified some states that identify themselves as Muslim states as being in *jahiliyyah*. This is because they are corrupted and westernised states. Those should also be resisted and overthrown. Thus, Qutb gives a highly political interpretation to the term of *jahiliyya*;

“If we look at the sources and foundation of the modern modes of living, it becomes clear that the whole world is steeped in jahiliyya…This jahiliyya is based on rebellion against the sovereignty of [God] on earth. It attempts to transfer to man one of the greatest attributes of [God], namely sovereignty, by making some men lord over others” (Qutb, 1990).

In his view obedience to man-made governments and its orders is equal to the worship of the same men who created it. Qutb identifies this behaviour as *shirk* which means associating false Gods to Allah which is a symptom of *jahaliyyah* society. Therefore, a true Muslim should reject man-made governments by submitting himself to God. In this sense, Qutb identifies the false Gods as the Western governments including their leaders, parliaments, and their constitutions and Non-Islamic rulers. A Muslim cannot follow God only if he or she accepts commands of these authorities. Qutb does not therefore; agree with the western idea of the separation of God and State. If it is separated then Divine law or Sharia law cannot be implemented and a Muslim cannot publicly live according to his faith. Living in a non-Islamic government is equal to slavery and those governments cannot provide liberty to people because they are *jahiliyyah* societies (Loboda, 2004).

Qutb describes how such governments affect individual and society, negatively. The government modifies behaviours, values of individuals, and the social order, completely. In other words, the government is the most influential factor in people life instead of divine law. Qutb explained the power of government using the ideas of Mawlana Mawdudi;

“The whole question of human well-being depends entirely on who exercises control over human affairs. A train runs only to the destination determined by its driver. All passengers can travel only to the same destination, whether they like it or not. In the same way, the train of human civilization travels where those who exercise power dictate” (Pasha, 2013).

Qutb shows the importance of religion as it should determine the social order. Religion should create a working contact between mankind and the Devine that would lead to harmony not conflict, between belief and practice (Qutb, 2007). Qutb emphasizes that if people live under a government that is formed based on the Quran then it would create Islamic social order and harmony. This aspect differentiates government of West that consider religion should be separated from the state from the Islamic states envisioned by Qutb. He criticises capitalist states as in his view God is the only owner of any object or property.

In Qutb’s view, a forceful struggle can weaken tyranny. He says;

“When they have no such freedom, then it becomes incumbent upon Muslims to launch a struggle through individual preaching as well as by initiating an activist movement to restore their freedom, and to strike hard at all those political powers, that force people to bow to their will and authority, defying the commandments of God, and denying people the freedom of Islam to the message of Islam, and to accept it even when they wish to do so” (Qutb, 1990).

Qutb redefined the Islamic political concept of *jihad*. He interpreted *jihad* as not only a struggle but a violent one that can be not only an offensive war against non-Muslims but also one that can be waged against internal enemies, the state, and social systems. Though, there are different stages in *jihad* Qutb prioritises the third stage in *jihad*. In his words;

“After the Prophet, peace be on him, only the final stages of the movement of jihad are to be followed; the initial or middle stages not applicable” (Qutb, 1990).
Further, he said;

“There are many practical obstacles in establishing the rule of Allah on earth, such as the power of the secular state, elitist social systems and traditions, and, in general, the overall conditions prevalent in a society. Islam uses force only to remove these obstacles so that no barrier remains between Islam and individual human beings; Islam releases them from these material constrains and addresses their hearts minds, while giving them freedom of choice to accept or reject its call” (Qutb, 1990).

For Qutb, the goal of jihad is to create God’s authority which secures complete freedom for every individual… by releasing him from servitude to other human beings. So, he would serve his God (Qutb, 1990).

Further, jahiliyya can be got rid of through jihad. It should be understood in religious view not in terms of territorial terms. He points out;

“The soil of the homeland has in itself no value or weight, from the Islamic point of view. The homeland is worthy of defense only when on that soil God’s authority is established and God’s guidance is followed” (as cited in Rubenstein, 2010) It shows that the real freedom can be reached only in a state governed by Sharia; divine law.

In Qutb view, jihad has the following elements; first, serious realism in which he rejects the traditional meaning of jihad. Second, as active realism of jihad it needs lots of preparation. Third, jihad is a continuous effort; it does not have a set of forms or rules. Fourth, it sets out rules for relationships between the Islamic and non-Islamic societies. Further, jihad would bring divine laws that would lead to international peace as it abolishes man-made laws of tyranny, liberates individual, and allows for the realization of actual humanity within the Islamic society. Qutb’s following words describe the importance of jihad in providing freedom of choice of people;

“Islam does not force people to accept its belief, but it wants to provide a free environment in which they will have a choice of belief. What it wants is to abolish all oppressive political systems under which people are prevented from expressing their freedom to decide whether they will accept Islam or not” (Qutb, 1990).

The main goal of Muslims is to establish divine laws that will end suffering, suppression, and sin. Qutb explains this status through term of hakimiyah. It has two elements; sharia law and the rule of social justice. Sharia law establishes social and political system based on the Quran. Social justice is related to economics. In this view, Qutb criticises capitalism which exploits people and communism which emphasizes materialism. So, Qutb proposes Islam or Islamic state as an alternative solution for social justice. Because Islam does not allow oppression but emphasis equality (Moussalli, 1993). Qutb, in Milestones, talks about the emergence of vanguard who leads the Muslim community into jihad or struggle for Islam and he is going to restore the shariah - divine laws as the legal system for all.

Different readings on Qutb emphasize that he is a philosopher of freedom and justice not a philosopher of terror. In this view, he insisted freedom and justice for people under the state and does not desire to look for violence or hate. As Shepard (1987) indicates “he fights for freedom, human actualization, and development of people in spiritualistic view”. But, “Qutb is widely considered the guiding intellectual of radical Islam, with connecting him to Osama bin Laden and Ayman Al Zawahiri was influenced by his thoughts. In this view, he is considered as “the Philosopher of Islamic Terror”” (Berman, 2003). In this sense, Qutb emphasizes the importance of struggle or jihad. Qutb influenced young Muslims in his radical Islamic ways and has left a deep mark in the history of fundamental Islamic philosophy.

Conclusion

This study reveals the importance of disobedience in the thoughts of Boetie and Qutb. Both question why the masses are submissive to States. Boetie explains this through the custom of people by which they become habituated to servitude, through manufactured consent, and retainers. In this view, he advises people to stop believing in governments. The power of government is based on only on the rejection of people’s power. In this sense, he is the first philosopher to emphasize the importance of consent and show the technique to topple the governments through withdrawing the consent in mass non-violent civil disobedience. It is difficult to say the practicality of this technique since it is rarely used as a mass activity in the contemporary world. Historically, Gandhi, similar to Boet, described exploitation and oppression is related to the cooperation of the people. People can decide not to cooperate for their own oppression. Further, Similar thoughts influenced Martin Luther
King Jr. who insisted that non-cooperation can bow the government and system. But all of this was conceptualised within a secular non-religious state. For Boetie religion was one of those mechanisms of subjugation.

For Qutb on the other hand religion provides the tool to overcome submission. Many writings of Qutb influenced many Islamic (violent) movements. His ideas about *jahiliyyah*, *hakimiyyah*, and *jihad* focus on the creation of the ideal Muslim state. If there are Non or un-Islamic governments then they deserve to be changed by rebelling against them and creating Islamic states based on *Sharia* or divine laws. It does not go with the western concept of democracy, capitalism, or communism. Basically, his analysis of politics of disobedience is theological with cultural influences. He expressed his ideas based on the Quran and Prophet, completely suitable for Muslims or the Islamic world. However, within his views there is no room for pluralism even within the Muslim world. Life or state without the reference of God is unacceptable. It leads to belief that the western liberalism is not acceptable, too. He provides radical, hard-line, and revolutionary ideas that no doubt has left a mark of the world. *Boko Haram*, the militant organization in Nigeria, kidnapped 276 school girls to stop their progress in education. Though, Qutb did not emphasize stopping women progress, there are some similarities between Qutb’s concept of *jahiliyya* and *Boko Haram*’s ideas that being instructed in western education is a sin because it corrupts Muslim minds.

But, there are different opinions whether Qutb calls for revolutionary violence or not. Though, he points out that the main elements of Islamic faith emphasizes practice of patience, forbearance, and peace, he did not reject the idea of waging violent battles or *jihad* against *jahiliyyah*. He promotes a different form of *jihad* where he prioritizes violence. In his view, violence can be justified when the ruler behaves unjustly which is un-Islamic.

It should be accepted that both Boetie and Qutb were influenced by their environment. Boetie emphasizes civil disobedience through non-violent manners influenced by what he saw after the French revolution whereas Qutb was influenced by the prevailing conditions of conservative Egypt. Qutb emphasized regime change through the influence of religious teaching in a radical, violent manner. Boetie suggests civil disobedience as a means to overthrow the state to secure individual freedom. Qutb’s final goal is to use *jihad* to secure divine and Islamic law in the state. Further, Boetie opposes tyranny and to the peoples’ consent to their own enslavement and this opposition is based on theory of natural law and the natural right to be free. Qutb calls for regime change of non-Islamic states into Islamic states prioritizing divine laws. Finally, Boetie rests power on the consent of people and shows the importance of popular power whereas Qutb rests power with religion and shows the importance of violent uprisings. Therefore though on the surface though they both look like political philosophers who are interested in the freedom of the masses a detailed analysis of their writings show that there is little agreement between them about the meaning of this freedom and the means of how to achieve this freedom.
References


Abstract:
Several schools of thought had emerged as to how best Arabic language grammar could be learnt. Among the much pronounced works is the idea proposed by Dr. Shawki Daif. Therefore, this study reviews Daif’s view on the renewal of Arabic language grammar between theory and practice. It is generally believed that for Arabic language to be enhanced and for its usage to enjoy wider popularity over other languages, its grammar needs to be simplified in relation to its traditional and complicated attributes. Hence, the aim of the research is focused on the simplified grammar method introduced by Dr. Daif thereby highlighting the significant contributions of his work in the field of Arabic language. It has been discovered that the simplified Arabic grammar method helps new learners of Arabic language to quickly grasp the language. In order to analyze his idea, data were collected from various sources. This paper has been written with the objective of exploring the contributions of Dr. Daif and presenting his value added work for wider popularity among Arabic learners especially the non Arabic speakers who have the interest to learn Arabic as a secondary language. This research concludes that the simplified grammar method is very useful to Arabic learners and that the usage of Arabic language would increase in various fields of studies.

Key words: Arabic language, Simplified grammar method, Arabic language learners, Non Arabic speakers, Usage of Arabic language.
كان شوقي ضيف يتأثر بنظرية ابن مضاء كقد实现了 الكتاب "الرد على النحاة" 1947م حيث عرض مدخلاً طويلاً للكتاب قدم من خلاله منهجاً جديداً لتسير النحو وهذا ما يتضح من قوله في تحام مدخله النظري: "وأكبر الظن أننا حين نطبق على أبواب النحو ما دعا إليه ابن مضاء من منع التأكيل والتقدير في الصيغ والعبارات كما نطبق على هذه الأبواب ما دعا إليه من إلغاء نظرية العام للجاهل أن نصف النحو تصنفنا جديداً نحن نحقق ما نثبت منه تسيير قواعدنا محقة وهو تسيير لا يقوم على أدعاء النظريات وإنما يقوم على مواجهة الحقائق النحوية ويكون بطريقة منظمة لا تحمل ظلماً لأحد، وإنما تتقيد التسيير من حيث هو حاجة يزيدها الناس إلى النحو في العصر الحديث" (ضيف 1982: 67) وبالنظر إلى هذا النص أن الدكتور شوقي ضيف يقدم تصورة جديداً لتسير النحو.

من المعلومات أن المطالبات لتسير العلوم والفنون لا تتزال منذ زمن بعيد ولهذا الصدد علماء العصر يلعبون دورهم في مجالاتهم المتخصصة بما يحاولون تقديمها للأجيال المتعاقبة بأيسر الطرق ومن بينهم الدكتور شوقي ضيف في مجال اللغة العربية. وهنا يمكن أن يُبدو بعض الأسئلة: هل وضع شوقي ضيف خلال فترته حالاً وافياً يوافق على رغبة الناس؟ وهل الفوائد النحوية حسب نظريته التحديثية؟ وهل يمكن تطبيق نظريته في النهج الدراسي الحديث خصوصاً في غير الدول العربية؟

ولقد احتلّاحون هذه الموضوعات إجابات على هذه الأسئلة وإعجاب بموقف الدكتور شوقي ضيف في مختلف المجالات ولغية شديدة في تسير النحو العربي وتحقيقه لأي طالب اللغة العربية قد يعلمون معانات كبيرة عندما يكتشفون مدرسي اللغة العربية بحفظ المسائل النحوية العربية وتعريفها ووضعيتها الدقيقة التي لا توجد استعمالاً لها ولا فائدة في تعلمها وراءها وأمامها بوجود كيفية نابة عنها في الناطقين باللغة العربية حيث يتفصّل بعض الطلاب عن المدرس ويعدّون عن التعلم لكي يستطيعوا أن يجدوا الألفاظ التي يجدونها عند تعلم قواعد اللغة العربية. وهذه الدراسة العلمية تكشف النقاب الناشئة على تعلم اللغة العربية بدون بأس في المستقبل الذي يتطلب التسيير والتحديد في جميع المجالات. ويرجح الباحثون الله تعالى أن يهددهم إلى الصواب وهو المستعان و مستحبي الدعوات.

التعريف الدكتور شوقي ضيف:

إن شوقي ضيف عامّل موسوعي جليل وأستاذ جامعيّ رشيد وقد لدّد شوقي ضيف بن الشيخ عبد السلام ضيف في قريته أولاد حمام تقع في محافظة دمياط سنة 1910م، وفي سنة 1926م أُقيم دراسته الإعداديّة بمدرسته بدرية التجهيزية الثانوية في القاهرة وبعد إتمامه المرحلة الثانوية التحق بالسنة الأولى بقسم اللغة العربية في كلية آداب القاهرة وقد تلمّذ على أديدي كبار...
أهداف البحث:

1. التعرض لأهمية تسهيل النحو ومحاولة إبرازه بأسلوب جديد.
2. كشف فكرة شوقي ضيف في إصلاح منهج النحو.
3. إعادة الفكر لتطبيق فكرة شوقي ضيفي تدريس قواعد النحو.

الدراسات السابقة:

أولاً: إنجازات تجديد النحو عند المحدثين: دراسة وتقديم، أحمد جارالله الصلاحي الزيزاني، 2001م، لدراسة ماجستير، جامعة أم القرى.

يعرض هذا البحث بالدراسة والتحليل لقضية تعد من أهم القضايا التي برزت في الدراسات اللغوية في العصر الحداثي وهي الأبحاث الحديثة في تجديد نظام اللغة العربية وقد تبع في هذه الدراسة ما يمكن تسمية بالمنهج التفاعلي (الوصفي منها والتحليلي والتطبيقي والتاريخي) أما مراجع الدراسة ومصادرها فقد تتنوع بين نظمات علمية وحديثة، وفكرية وفلسفية ومناهج البحث الاجتماعي، وتاريخي، ومؤسسات، وورشات جامعية، ومحاوار.

وثانياً: "محاولات التجديد في النحو: إنجازات وتفسير وتواصل" يونس شاىت، 1993م، لدراسة ماجستير جامعة برموق بأردن.

يرى الباحث "إن التطور يشمل مختلف عناصر اللغة أصواتها وقواعدها ودلالاتها وحدود الباحث الهند من الرسالة بقوله "هذه الرسالة تعتبر دراسة تاريخية مسحية تبحث فيها المؤلفات النحوية ثم أفردت بنا بعض المحاولات لتجديد النحو في العصر الحديث.

ثالثاً: "مساء جهود حياة الأندلس في تسيير النحو العربي"، فادي عصيدة، 2006م، لدراسة ماجستير جامعة النجاح الوطنية نابلس فلسطين.

هذا الدراسة تقوم بدراسة مؤلفات تجديد النحو العربي وتسهيله وتفصيله وقد حاولت هذه الدراسة سير جهود عدد من النحاة الأندلسيين في مجال محدد واضح وهو تسيير النحو العربي وتسهيله ومسقط الضوء على الأساليب التي انتهجها علماء الأندلس من أجل تحقيق هذا الهدف.

منهجية البحث:
يستخدم الباحثان المهندس المكاني والتحليلي في جمع المعلومات لتنفيذ هذا البحث ولتحقيق أهدافه، فيعتمدون على المعلومات من مؤلفات شوقي ضيف وغيرها، وقد وضح شوقي ضيف نظريته في تجديد النحو خلال مؤلفاته من خلال تأثره إثارة ابن مضاء القرطبي، وألف بعض المؤلفات لكي تيسر تطبيق نظرته.


محور البحث (المناقشة والنتائج):

المشكلات البارزة في تعلم النحو التي أدت علماء اللغة إلى التفكير حول تيسير النحو وتحديد منهجه:

1. الإضطراب المنهجي في التعبير هو الذي نتج من جوهر النحاة إلى المتقاطع.
2. كثرة العلل النحوية أو علة وعلاوة وعلاقة النحوية على ضرر من ضرر من هي الذياني إلى كلام العرب.
3. تالفة: قاع قاع مرفوع. وضاء أحد يسمى علةعقا علةعقا علةعقا ضرب أعظم من الصوما.
4. السياق في نظرية العامل اللغوي والمعنوي مثلا باب النزاع في العمل.
5. كثرة المكونات وهذا ناتج من تكثيف التحويج في نظرية العام أو الفياس.
6. الإكراه على العلامة الإعرابية باعتبارها أكبر الدوام على المعنى، ثم إعطاؤها باعتبار كبير.
7. التسارع غير المعنىية التي صنعتها للمرد والحيوي والفلكية اللغة مثل أطعاوأطعاوأطعاوأطعاو.
8. اختلاف الأقوال في المستقل الواحدة.
9. تداخل الاعتقادات وتعدها في المفهوم الواحد، وهنا كما أدى إلى الإضطراب وعدم الوضوح.
10. القصور في تعرقات الاعتقادات النحوية أو إماهاوأوها، هذا القصور ظاهر في كتاب النحو حيث يلاحظ أباً جائز أنجاح خاصة أو منافضة أو تصادفها بعض الاستثناءات.

 مؤلفات شوقي ضيف في تجديد النحو وتيسيره:

عندما كان يلمباً في معهد دينبر الإبداعي سنة 1920 م، أن شوقي ضيف ألف كتابًا في النحو بعد تلخيصه لكتاب قطر الندى لاينشان المتصور ويزعم أن هذا الكتاب هو الذي ألقى في وصية مباير حاجة النحو إلى التيسير والتجديد ومن المعروف أن شوقي ضيف رغم خصمه في مجال الدراسات الأدبية فقد اهتم بالتأليف في النحو أيضاً وذلك كما يلي:

1. التحقيق لكتاب "الرد على النحاة" لإبن مضاء القرطبي (1948 م).
مؤلف هذا الكتاب "الرد على النحاة" هو أبو العباس أحمد بن عبد الرحمان بن محمد بن مضايا اللحمي أصله من فرقة وقد خرج من بيت حسب وشرف منطقطعا إلى العلم والعلماء. وهو يتكرر فرقة إلى إشبالية حيث ابن الراق الذي درس عليه كتاب سبعه وطلبه علم النحو هناك قد تفرقت لخدمة النحو إذ ألقى فيه ثلاثة كتب 1- المشرفة في النحو 2- تنزه القرآن عنها لا يليق بالبيان 3- تنزه النحو مما نسبه بين الخطأ والسهو وهذا الكتاب أفقياً ينتهي نكته نكته الكتاب النقد على النحاة وهذا الكتاب الأخير فقط وصل إلى الدكتور توفي شقيق وتائر به. 
فيقول الدكتور توفي شقيق ضيف " بناءً ابن مضاء النحاة بأن "حُطموا نظرة العالم، حطموا التقارير في المنابر ، حطموا الألفية والعقل حطموا التمارين غير العملية حطموا كل ما لم يلفت من صحة في الأداء ولا صواب في اللسان..... إلخ. (ص: 8)
ولم يكتف ابن مضاء بهذه الثورة الهادمة فقد تقدم بضع حلول جديدة للكثير من مشاكل النحو وجعل ذلك سبيل
من يريد أن يصفف كتاب النحو العربي تصنيفًا جديدًا يقوم على السير والسهولة.

2. تجديد النحو (1982م):

يحقق الدكتور توفي شقيق ضيف أمله الحقيقي في تجديد النحو بهذا المؤلف على منهج وطيد ي평ه ويبسته ويبين على تمثيل قواعده واستكمال نواصمه ويتضح أن هذا الكتاب على قيمة السينمائي الأول من أقسام الفعل والاسم وتصريفهما المشروعة. وقد حذف فيه من أقسام النحو البداية ثمانية عشر فارغة أكناف بأكملها في الأبواب الباقية وحذف كل ما لا يفيد إعرابه صحة في المنابر والأدوات ووضعت صيغات مستحدثة لبعض الأبواب الملهمة بجمع أملتها جمعاً بينا وطرحت الزوايد والفضول التي كانت عالقة بالأبواب وأضيفت أبواب جديدة كما أضيف كثير من الدقائق المهمة في الصياغة العربية.

كما يقول الدكتور توفي شقيق ضيف في مقدمة هذا المؤلف "وأن الصياغات ترفع منذ أكثر من أربعين عاماً مطالبة تيسير النحو وتخليصه بما في من تعديل وعصر شديد فكتبت جنة التربية والتعليم تقويمها ضمنها مفرجنا للتسير المنشود وقامتها في مؤتمر جميع اللغة العربية 1945م انعقد بالقاهرة، وأدخل عليها بعض التعدلات فأزقتها الجمع فألّفت كتاب النحو التعليمي على ضوء صورة التيسير غير أنه لم يكتف بها النجاح. وكتب وقد وضع بين يدي تغييقي لكتاب نجد مدخلاً طولاً اقترحته فيه تصنيفنا جديدة للنحو يدفع صعوباته أتمتها على ثلاثة أسس أخذت بما جمعها في تأليف هذا الكتاب. " (ضيف: 1982م : 3). إذن تأليف هذا الكتاب بالمكتبة توفي شوفي ضيف
يعتبر عملاً جسيماً في تيسير النحو وتعديله.

3. تيسير النحو التعليمي قديماً وحديثاً (1986م):

يقول الدكتور توفي شوفي ضيف في المقدمة عن تأليف هذا الكتاب الجديد "أولئك هذا الكتاب الجديد لأزورده بفضل من الدراسات والأدلة المستفيدة المتنورة حتى يستطيع نجاحه جزءاً من الاستبانة فيما رحّله فيه لل نحو التعليمي من تعديله.
وتيسير وهذا الكتاب موزّع على ثلاثة أقسام: قسم لبيان المحاولات المتصلة بتيسير النحو التعليمي قديما وحديثا مع بيان محاولة المتواضعة في كتاب تجريح النحو وقسم ثالث لبيان النحو الأول من غيّر في تجريح النحو التعليمي وتيسيره بتلخيصه من قواعد وأدوات اللغة وقواعده وتعقيدات اللغة التي كانت تضفي الشكلة إرهافا شديدا دون أن يجهل منها شيئا يضيفهم في إتقانهم للعربية. وقسم ثالث لبيان النحو الثاني من تيسير في تجريح النحو التعليمي وتيسيره باستكمال تواصيل فيه ضرورة حتى تمثل الناشئة تمثلاً قوياً طاوور الوصاية العربية ومواقفنا في أبينتها المظهريّة وتركيبها التعبيرية.(ضيف 1986م:6)

4. تيسيراتanguة (1990م):

هذا المؤلف يتناول تيسيرات من استعمالات اللغة وقواعد العربية لعرضها على الكتاب والقراء لكي لاوظفوا إزاء بعض الصيغ من انحراف عن حادة العربية وقواعدها السديدة وقد قسم الصيغ والاستعمالات في هذا الكتّاب على ثلاثة أقسام: قسم يتناول بعض القواعد تصحيحها وتبنيا وقسم يتناول بعض تغييرات يظل أن كما شويا من الخطأ وهي بيئة منه وقسم يتناول بعض ألغاز الدارجة تم إلى الفصاحة بعِج أصل. ويجد بالذكر هنا أن مؤلفات الدكتور شوقي ضيف في النحو العربي يوجد سويا هذه الأربعة مثلا: (1968م)

المدارس النحوية، دار المعارف، القاهرة ولكنه يوضح فيه عن تاريخ النحو) إلا أن الباحثين قد اقتصروا على مؤلفاته في مجال تسيير النحو وتجديدته. (مجموعة من أساتذة الجامعات العربية 1990م ص 10بتصرف)

الباحثين الذين دافعت الدكتور ضيف إلى فكرة تيسير النحو وتجديدته:

الأول: النحو ضيف بالمعهد المدني الإبتدائي الاسماعلية سنة 1920م عندما كان كمذودا هناك أنه ألف كتابا في النحو بعد تلخيصه لكتاب قطر الندل لابن عالم كما كان هذا الكتاب هو الذي ألقى في وعى الفن زيكو حاجة النحو الخاص بالناشئة إلى التسوير والتجديد مما جعله فيما بعد ينضم للفصول هذه المقالة بعد قسم من أساتذة الجامعات العربية، 1990م، بتصرف).

الثاني: كان نشر كتاب (الرد على النحاة) لابن ماضع الدمشقي وتفصيلى باختصار للدكتور ضيف على التفكير في تجريح النحو بعرضه عرضا حديثا على أسوأ قواعد تقنية وتقنيه وتخفيف داب القسطن للفضاءن وقدم ضيف في إعادة بناء النحو بناء جديدا على سنة أسوأ ثلاثة منها انتهت إليها فكره عند تحقيق كتاب (الرد على النحاة) ووقفت الأخرى انتهت إليها نتيجة فكر متجدد وعمل معناوي وعربية مغلفة في تجريح النحو العربي طليعة السنوات الثلاثة لت تحقيق كتاب الرد على النحاة، فقد، قدّم جميع اللغة العربية مشروعا في 1977م لتيسير النحو معتمدا فيه على أسوأ الثلاثة السابقة مع أساس رابع أهتمت إليه آنذاك وفي 1981م اهتم إلى أساسين آخرين نتيجة لفكرة الناهض وأحمره الشديد على تجريح النحو وتيسيره، فصار يمتلك ستة
أسس يستطيع بها أف يعيد تصنيف النحو تصنيفا جديدا ييسره كيذلل صعوباتو للدارستُ ف
يفهمونو كبالتالر يفهموف أساليب
العربية بُ القرآف الكرنً كاتٟديث الشريف كالتًاث الأدبي.(ضيف 1982ـ)

الأقسام الستة التى استند إليها شوقي ضيف في فكرة تيسير النحو وتجديده هي:

الأول : إعادة تسيب أبواب النحو تسيبا يؤدي إلى الاستغناء عن طائفته منها بردا إلى أبواب أخرى.

هذا التسمية الجديد لأبواب النحو جعل الكتاب " تجديد النحو" في ستة أقسام شملت العديد من المباحث وقد بدأها صاحبها
ببحث في نطاق الكلمة وهو مقتبس من علم التحويج ثم أعقبه بباحثي صرقية حول أنبى الفعل وأقسامه وتصنيفه وأنواع الاستراح.
وأقسام الإسم المتعدد توجها واسعا ثم انتقل بعد ذلك إلى المباحث النحوية، فتحدث عن المجموعات بدأها بالمبتدأ والحبر ركنا
الجملة الاسمية ثم أخوهها وللاضافية للفلسف والفاعل وناحية ثم انتقل إلى اللغويات تحدث عن المفهومات والاستثناء والحالة
والتمييز والناء على التوابع ثم ضبط الفعل ثم العدد ثم المتنوع من الصروص ثم عناصر المشتقات ثم حروف الزيادة ثم انتقل
بعد ذلك إلى الاضافات كالذكر والحبر والتقيد والتأخير وأنواع الجمل.

وفي ضوء هذا التسمية الجديد ألغى شوقي ضيف من أبواب النحو ثماني عشر بابا هي مثل باب كان وأخواتها وباب ما ولا
عاملات عمل نسب وباب كاد وأخواتها وباب نون وأخواتها وباب النابض وباب الابتعال وباب الصفة
المشبهة وباب اسم اللفظي وباب التعميم وباب المدح والذم وباب كتابة العدد وباب الاجتماع وباب التحذير وباب
الأغصان وباب الترخيص وباب الاستفاغة وباب الندبة.

والإلغاء هذه أبواب لا يعني خروجها أو خروج أمثلها من كتب النحو بل أدرجت في أبواب أخرى آخيرة شوقي ضيف أحق بها،
فأبواب (كان وكن اثال وأعلم) انتقلت إلى باب الفعل به على اعتبار أن الفعل تام، ومجموعات فاعل ومنصوبة حال أو
مفعول وفقا لانوع الفعل.


الثاني : إلغاء الإعرابين التقديري والحلي في الجمل والمفردات المقصورة والمفصولة والمفصولية وانصاف.

هذا هو الأساس الثاني الذي دعا إليه شوقي ضيف باستدلال من ابن مضاء الدمياطي فرأى أن يقال في (جاء الفتى): الفتى فعل
عمله الرفع، وفي (هذا زيد): هذا مبتعد عمله الرفع، وفي ذلك تعديل للمصطلح، وفي (زيد يكتب): يكتب جملة فعلية خبر، فيعيّن
وظيفة الجملة دون ذكر محلها من الإعراب.

ورتب شوقي ضيف على إلغاء هذا الإعراب:

1. إلغاء تقييد متعلق الظرف والجزء والجزء فهما اللذان يشاغلان الوظيفة النحوية ولا يتعلقان بمحدود تقيدي مستقر أو استقر
كما زعم بعض النحاة فقوله في (زيد عندك) خبر، ولا تقول بأنه متعلق بمحدود خبر.

2. إلغاء عمل (أن) المصدرية مقدرة: اعتراض ابن مضاء على تقييد (أن) الناصية بعد قاء السببية ووانع المعنى ورأى أن المضارع
منصوب بالحرف مباشرة وبذلك أخذ شوقي ضيف في الكتاب.
الثالث: الإعراب لصحة النطق

انطلق شوقي ضيف في هذا الأساس من مبدأ أن الإعراب ليس غاية في ذاته وإنما هو وسيلة لصحة النطق فإن لم يصحح نطقا فلنا فإن ترتيب له إنما هو واللي لا يبرع إليهم قولا ولا يتمكن من نطقها، وليما كان الحقيقة (ضيف 1982م: 56 و1986م 58: 60).

وأما (لاسيما) فقد تكمل النحافة عناء شديدا لا داعي له؛ لأن ما بعدها يجوز فيه الرفع والنصب والجر فلم اللفاء فيما لا يفيد؟

و الطبيعي أن يلغى إعرابها.

و على هذا ينتبغي إلغاء إعراب (كم) الاستفهامية أو الخبرية، وينبغي أن يفتقر الاستثناء في صحة النطق (ضيف 1990م 103).

الرابع: وضع تعريفات وضوابط دقيقة لبعض أبواب النحو

وقف شوقي ضيف في هذا الأساس عند المعول المطلق والمفعول معه والحمل ثم عرض لتعريف ابن هشام للمصطلحات الثلاثة

من بينها أيضا مستفنة وغير دقيقة، ثم وضع هو تعرفا لكل منها على النحو التالي:

١. المعول المطلق: هو عند ابن هشام "اسم يؤكد عامل أو بين نوعه أو عدده"، وعدد شوقي ضيف هو "اسم منصوب يكون عامله أو ابنه ضربا من الشروطين".

٢. المعول معه: هو عند ابن هشام "اسم فضلة نازلة لحامله ذات فعل أو اسم فيه معناه وحرفه"، وعدد شوقي ضيف هو "اسم منصوب تال لوالى غرب عاطفة بمعنى مع".

٣. الحامل: هو عند ابن هشام "وصف فضلة مذكر لبيان الجملة"، وعدد شوقي ضيف هو "صفة لصاحبا نكرة مؤلفة منصوب" (ضيف 1982م: 34 و1990م 60: 61).

اعتمد شوقي ضيف على تعريف ابن هشام للمصطلحات الثلاثة المذكورة في كتاب "أوضح المسالك".
الخامس: حذف زوائد كثيرة من أبواب النحو تُعرض فيه دون حاجة إليها
رأى شوقي ضيف أن من تبسيط النحو وتجديد حذف بعض الزوائد التي لا تتصل بالقواعد العامة فإن حذف شروط اسم التقضيض وشروط فعل التعجب فالأمثلة فيهما تغني عن ذكر الشروط وقواعد اسم الآلة لأنه يعتمد على السمع وشروط التصغير وصيغة التي لا تجري على الألسنة كتصغير فعل التعجب ومعظم قواعد النسب التي لا حاجة إليها الآن وحذف من الكتاب ووجه الإعراب المتعدد في (لا ولا ولد الله) كما حذف شروط وأحوالك كثيرة للمفعول منه كما حذف كثير من كلام النحاة عن تابع المنداد وما يجوز فيه من نص وبصمة بقح أن كل أمثلته في اصطناع النحاة كما حذف ما أحساه النحاة بخلاف سن مسد الحفر لأن أمثلته غير موثقة ولم ترد في القرآن وغير مستعملة في اللغة. (ضيف 1982م 34: 41 و1986م 61: 43).

السادس: زيادة إضافات لبعض الأبواب تمثل الصياغة العربية تمثل دقيقةً
هذه الإضافات كثيرة وتنوعة هدفها توضيح الصياغة العربية في نفس دارس النحو ومن تلك الإضافات المبحث الخاص بقواعد النطق وعنته في ذلك أن قواعد النطق كانت تدرس للناشئة قديماً مع حفظ القرآن الكريم أما الآن والناشئة لا يهمهم تحفظ القرآن فلا يسد أن يتعلمها من خلال كتاب النحو.
وقد صممت هذه الإضافات الحديث عن ناء التأنيث ودلائلها المتعددة ونحو الجموع والمعنى على أنها بدأ من التوين في المفرد والفرق بين اسم الجمع واسم الجنس الجمعي (ضيف 1982م: 98) وهكذا إضافات كثيرة.
فتمكن القول إنه قد استطاع شوقي ضيف في بعض إضافات هذه الأسس أن يعيد تبسيط النحو وتصنيفه جداً وقائمة للدارسين وقراء العربية في كتاب أصدره سنة 1982م بعنوان "تجديد النحو" مكوناً من مدخل وستة أقسام: قسمين للصرف وأربعة للنحو.
وبدأت هذا المدخل استمكاراً لمنهجه السابق في التصنيف الجديد للنحو والذي بدأ بمدخل مبكر صدر به التحقيق لكتاب (الد
على النحاة) ومثل هذا المدخل فضل في شوقي ضيف الحديث عن الأسس السنة التي استند إليها في تصنيفه الجديد للنحو.

المنوصفات والخلاصة:
من المعلوم أن أنشطة الأدبية للدكتور شوقي ضيف في أرجاء العالم حتى في الدول غير العربية وما يذكر ذكره أن مؤلفاته الأدبية قد أخذت فتنتها من المعاني في الجامعات العالمية ولكن لم تلت مؤلفاته النحوية قدراً كافياً من الاهتمام رغم كثرة مؤلفات ذات محتويات رصينة. فيوصي البحث بأن تتخذ مؤلفاته النحوية مراجع في المفاهيم الدراسية في المثقفين والجامعات لاسيما في الدول غير العربية لتعليم قواعد اللغة العربية لغير الناطقين بها.
ختاماً لقد أحسن الدكتور شوقي ضيف كما أحسن العلماء قبله في هذا المجال بل فاقهم بهذه المحاولة الجريئة حيث

صنّف النحو العربي تصنيفًا جديدًا وأثاثه بثوب زاهي يتناسب مع عصرنا الحاضر. وقد احتوى هذا البحث على مقدمة وضحت فيها محاولات الإصلاح التي حل بها النحو العربي مع إشارة إلى جهود شوقي ضيف ثم مؤلفاته الأربعة في تسير النحو وتعمده تعاونًا مع العالم الذي احتوى البحث على الأساس الائي استند إليها شوقي ضيف في فكرة تسير النحو وتعمده.

إذن النبوة، تعالى أن ينفعنا هذا الجهد الصغير ومن يرغب في تعلم لغة أهل الجنة في يوم الدين وترجو الله الصواب والثواب وهو المستعان.

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الموقع الرسمي:

http://shamelwa.ws/index.php/author/1406
Abstract

Arabic language is one of world language that is respected by Almighty Allah through expose the holy Quran. Almighty Allah revealed the Holy Quran in Arabic language. It is a great miracle for Prophet Muhammed (Sal) and it has a dignity and respect among the Muslims and non-Muslim also. The fundamental sources of Islam such Holy Qura, Hadish, Islamic jurisprudence books and others are found in Arabic language.

The man who wish to know about Islamic law and other things he should learn Arabic language and some practices such prayer have to performed by Arabic language, unless it may be rejected by Allah.

It is noticeable here, there lot of verses from Holy Quran which denoted about Islamic jurisprudence, However these are not famous and not reach our Sri Lankan theologians, because of ignorance about those.

So, the research deals about this matters and the researchers used qualitative descriptive research methodology. The primary data was collected through observation, and secondary data from books and magazines and websites.
ملخص البحث

إن اللغة العربية شرفها الله سبحانه وتعالى بأن جعلها لسان كتبه العزيز، وخص على ذلك في آيات عديدة، من ذلك قوله سبحانه وتعالى: "إن جعلنا لسانا عربيا لعلكم تعقلون". وقد بلغ من مكانة هذه اللغة وأهميتها في الشريعة أنها أصبحت القاعدة المتينة التي تقوم عليها الأحكام، فما من علم "من العلوم الإسلامية فقهها وكلامها وعلمي تفسيرها وأباحها، إلا وافتقاده إلى العربية بين".

أما القرآن الكريم فهو أول كتاب عربي مدوّن في التاريخ الإسلامي. وإن للقرآن أثر أكبر في استنباط الأحكام الفقهية من النصوص القرآنية. وأما التراكيب النحوية فقد خاض النحاة في تفسير ماهيتها قديماً وحديثاً، وهم في ذلك مدارس معروفة.

فإن من أجل نعم الله تعالى على الإنسان أن يمنحه في النفيق في الدين حيث قال رسول الله صلى الله عليه وسلم: "من يرد الله بوختان يفقه في الدين، وف(make) يعلمهم الناس". وإن اللغة العربية لها خصائص مميزة تمتاز على سائر اللغات السامية؛ من إيضاح في البيان، ودقة في التعري في الفصاحة والبلاغة، وسعة في الألفاظ والمرفوعات، وكل ذلك همها لأن تكون لغة القرآن الكريم.

وقال الله تعالى: "أنزل الله في أقل ذلك لمن أحسن الناس من المسلمين، قليلاً غنيه مبيناً". يقول ابن تيمية. ورشمه الله في بيان أن الدافع لتعلم اللغة العربية إما هو الدين: "واللغة، إنما احتاج المؤمنون إليها لأجل خطاب الرسول، فإذا أعرض عن الأصل، كان أهل العربية، مبنية على شعراً الجاهلية، أصحاب المعلقات السبع، وتوهم من حطب النار".

الكلمات الدالة: الأحكام الفقهية – الاستنباط – التراكيب النحوية – اختلاف – المفهوم

مقدمة البحث

فإن من أجل نعم الله تعالى على الإنسان أن يمنحه في النفيق في الدين حيث قال رسول الله صلى الله عليه وسلم: "من يرد الله بوختان يفقه في الدين، وف(make) يعلمهم الناس". وإن اللغة العربية لها خصائص مميزة تمتاز على سائر اللغات السامية؛ من إيضاح في البيان، ودقة في التعري في الفصاحة والبلاغة، وسعة في الألفاظ والمرفوعات، وكل ذلك همها لأن تكون لغة القرآن الكريم.

وقال الله تعالى: "أنزل الله في أقل ذلك لمن أحسن الناس من المسلمين، قليلاً غنيه مبيناً". يقول ابن تيمية. ورشمه الله في بيان أن الدافع لتعلم اللغة العربية إما هو الدين: "واللغة، إنما احتاج المؤمنون إليها لأجل خطاب الرسول، فإذا أعرض عن الأصل، كان أهل العربية، مبنية على شعراً الجاهلية، أصحاب المعلقات السبع، وتوهم من حطب النار".
Proceedings of the 04th International Symposium, SEUSL
Page 569
لمواجهة ظاهرة اللحن خاصة بما يتعلق بالقرآن الكريم. ويدرك من ناحية الله عبد الله بن أبي إسحاق المتوفى عام 735م، وهو أول من يعرف منهم، وأنه قد تلقيت النصاق، نسائج التي جعلتهما يفكرون في هذا العلم، ولكن القصيدة المشهورة أن ابا الأسود الوليد ترجل بقا القرن قال (إن الله برزى، من المشكرين ورسوله)، وكان الرجل يقرأ (رسوله) مثيرة، أي أنه غير المعنى لأن (رسوله) مفتوحة لأنه مبتداً لجملة محدودة تقديرها (ورسوله كذلك بريء)، فذهب أبو الأسود إلى الصحابي علي بن أبي طالب وشرح له وجهة نظرة أن العربية في خطر.

فتناول الصحابي على رفعة وبكت عليها: بسم الله الرحمن الرحيم. الكلام اسم وفعل وحرف. الاسم ما أنهِ عن ما هو ليس اسمًا ولا فعلًا. ثم قال لأبي الأسود: أنَّ هذا النحو.

(ب) قواعد اللغة العربية لخدمة القرآن الكريم

وأما لا شك أن النحو والقواعد العربية وضعت لخدمة القرآن الكريم. في التاريخ الإسلامي والتأريخ العربي نرى كثيرًا من المحاولات من قبل العلماء الفداماء في تأليف الكتب من النحو والصرف، وذلك لمعرفة ما تضمن به القرآن الكريم والسنة النبوية من الأحكام الشرعية.

(ج) أهمية التراكيب النحوية لمعرفة الأحكام الشرعية في القرآن الكريم

ومع بدء استنباط الأحكام وفهم القرآن، أن يكون عارفًا بالنحو، يعبرن بأ扮演游戏 اللغت. يقول السبطاني نقلًا عن الفخر الزاكي: "إن العلم أنَّ معرفة اللغة والنحو والعصرف فرض كفاية، لأنَّ معرفة الأحكام الشرعية جائحة بالإجماع، ومعرفة الأحكام بدون أدلة مستحيلة، والأدلة راجعة إلى الكتب والسنة، وما وردان بلغة العرب وصُغرهم وصرفهم، وإذا توقف الأحكام الشرعية على الأدلة ومعرفة الأدلة؛ توقف على معرفة اللغة والنحو والعصرف. وإذا توقف عليه الواجب المطلوب وهو مقدر للمكلف واجب، إذا معرفة اللغة والنحو والعصرف وجوب.

وذهب ابن حزم إلى أنه لا يعلم عما أن يفتى باللغة، قال: "لا تفو باللغة أن يكون نحوًا لغويًا، ولا أن يكون نحوًا لغويًا. فهذا ناقص لا يدل على أن يفتى بعده من الفقهاء، ولعله عن الأخبار". الكسائي يوضح لأبي يوسف أهمية النحو للأحكام الشرعية.

يرى أن الكسائي وأبا يوسف اجتمعوا لذا الرشد، فأراد الكسائي أن يبين لأبي يوسف أهمية النحو وفضله، فقال له: ما تقول في رجل قال لرجل: أنا قاتل غلامك؟ وقال الآخر: أنا قاتل غلامك أليهما كنت تأخذ؟ قال أبو يوسف: أخذهما جميعًا، قال

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44. القواعد الأساسية للغة العربية، محمد ص. 14.
45. سورة النذور: 3.
46. الإقلاع السبطاني، ج: أحمد محمد صف. 78.
47. الإجماع في أصول الأحكام، ابن حزم، حتف: أحمد محمد شاكر.

يتناول الباحثان بعض الآيات التي اختلف فيها الفقهاء في استنباط الأحكام بسبب النحو وبيبان آثار النحو واللغوي في الأحكام الفقهية الإسلامية.

**1. دلالة حروف المعاني:**

1. غسل مؤقي اليدين في الوضوء.
2. مسح الرأس في الوضوء.

" بأيها الذين آمنوا إذا قلتم إلى الصلاة فغسلوا وسواكم وأدبوكم إلى المرافق ومسحوا برؤوسكم، وأرجلكم إلى الكعبين. " 49.

**2. دلالة قرء:**

قال الله تعالى: " والمطلقات يتتى بفحشم نفثهم ثلاثة قرى. " 50.

**3. دلالة يدي:**

قال الله تعالى: " فإن كنوا ماء قيمموا صعدا طبيا " 51.

**النتائج:**

وقد توصل الباحثان في هذه الدراسة إلى النتائج التالية:

1. إن اللغة العربية إما اهتم المسلمون بنفسه كفه لغة القرآن الكريم والسنة النبوية، وفي هذا دعوة لكل دارس للعلوم العربية أن لا يقف عند الوسيلة وينسي الغاية.
2. إن اللغة العربية من الأساليب الأساسية لاختلاف المجتهدين من فقهاء هذه الأمة، فيجب على طالب العلم الشرعي أن يأخذ حظه من هذه اللغة الكرم، فلا يحقق معرفة الشريعة الإسلامية إلا معرفة العربية.
3. فلا يوجد لطلاب العلم الشرعي من معرفة بأن اختلاف الأئمة رحمهم الله أمر واژة، ولا لوم عليهم، لأن أسباب الاختلاف موجودة، فاختلافهم مقبول غير مدموم، فهو اختلاف النوع لا اختلاف النضادة.

التوصيات

1. لقد حمل البحث وجود ارتباط وثيق لعلم الفقه بعليم اللغة والنشر، فاتجه باللغة يؤدي إلى الابتداع والضلال
2. يسود الآن الاختلاف في المسائل الفقهية لدى علماء البلاد الإسلامية وغير الإسلامية، فلابد من إنشاء مركز عام للقيام بالبحوث على آيات الأحكام في هذه القضايا.

7. الخلاصة:

بينين من خلال هذا البحث أن العلماء المسلمون كالفقهاء والحديث ولفقه وأصول الشريعة، لا يوجد اختلاف في اللغة، ولذلك يجب على طلاب العلم أن يتعلموا على العلوم العربية.

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A STUDY ON SOCIAL HARMONY BASED ON BUDDHIST AND MUSLIM RELATIONSHIP IN SRI LANKA

J. Fathima Minsara

Asst. Lecturer – Department of Islamic Studies, South Eastern University of Sri Lanka
fathimaminsara@gmail.com

(Introduction):

Buddhists and Muslims in Sri Lanka have lived in harmony and coexistence for centuries. This study investigates the relationship between these two communities, focusing on the factors that contribute to their mutual understanding and cooperation. The paper discusses the historical context of interfaith relations in Sri Lanka, highlighting the role of the government and religious leaders in promoting tolerance and peace. It also examines contemporary issues such as the influence of global trends on local religious dynamics.

(Purpose of study):

- The present study aims to explore the experiences of Buddhists and Muslims in Sri Lanka, focusing on the role of education in fostering interfaith understanding.
- It investigates the impact of recent political events on the relationship between these two communities.
- The study also discusses the potential for further collaboration in the promotion of peace and harmony.

Maatpat (Department of Islamic Studies, SEUSL)
(Methodology):

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(Simple random sampling) 2500

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(Literature review):

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Discussion / Findings:

The final results of the analysis are presented in the following Excel sheet:

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The data was analyzed using Excel and the results were presented in the following format:

- Average: 70
- Median: 75
- Mode: 80

The analysis was conducted by a team of experts and the findings were validated by a panel of reviewers.
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மலர்ச்சிகள் - 03

| விளக்க:7 |

மலர்ச்சிகள் செயல்பாடுகள் பெயர் சுருக்கம் குறிப்பிட்டிருக் குறிப்பிட்டிருக் குறிப்பிட்டிருக்
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| விளக்கம்: 08 |

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**Table:** 09

**Title:** மீண்டும் செய்யப்பட்டு புதிய தொலைக்காட்சிகள் அளிக்கப்பட வலிகளுக்கு பதிவுபெற்றுள்ள தொலைக்காட்சிகள்

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Proceedings of the 04th International Symposium, SEUSL

Page 581
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| எண்ணிக்கை | 10 |

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அதுதான், இலங்கையில் பெரிய மிளகன்மாரின் பாதுகாப்பு பொருளின் மூலம் யாருந்து பூர்வத்தி மாதிரியில் 68% அதிகாரத்திற்கு 20% தொடர்புகூட்டும் 10% கருத்தறிகையுள்ள உறுப்பினர்கள். இதன் படி அதிகாரத்திற்கு வேறு பாதுகாப்பு பொருள் உறுப்பினர்கள், குழந்தைகளும், ஆசிரியர் பெண்களும் என்பன முற்பாட்டில் பாதுகாப்பு பொருள் உறுப்பினர்களாக ஏற்றுக் கொள்ளவும் குழந்தைகளுடன் தொடர்ந்து வேட்டாது உறுப்பினர்களாகவே இருக்கிறது. அத்துறையில் அதற்கு தொடர்புள்ளது இன்னொரு சிறிய குழந்தைகளின் மூலம் வேட்டை அவர்கள் யாருந்து பூர்வத்திற்கு 35% அதிகாரப்பொழிவுகள். அவர்கள் வர்த்தகத்திற்கு 5%, மினியாக விளக்கம் 10%, அவர்கள் முற்பாட்டில் 1% மற்றும் உறுப்பினர்களுடன் விளக்கம் 4%, மினியாக விளக்கம் 8%, முற்பாட்டில் விளக்கம் 15%, மேலும் கருத்தறிகை விளங்காத 2% முற்பாட்டில் விளங்கினர்.

இலங்கையில் பெரிய மிளகன் பாதுகாப்பு - பொருளின் குடும்பங்களின் செயல்பாடு 72% அதிகாரத்தில் 25% தொடர்ந்து உறுப்பினர்கள். இவர்கள் முற்பாட்டில் விளக்கம் 25%, உறுப்பினர்களுடன் அதிகாரப்பொழிவுகள் 10%, மேலும் அதிகாரத்தில் 5%, அவர்கள் முற்பாட்டில் அதிகாரப்பொழிவுகள் 30%, மேலும் கருத்தறிகை விளங்காத 2% பொருளக்குறிப்பிட்டு விளங்கினர்.

வெளி (Conclusion):

சுருக்கங்கள் காண்க பொருளின் பாதுகாப்பு - பொருளின் மாதிரி குழந்தைகள் பாதுகாப்பு பொருளின் மூலத்திற்கு நகர்வை செய்யப்படுகிறது. இதன் மூலம் இரு குழந்தைகளுடன் சுருக்கங்கள் காண்க பொருளின் மூலம் செய்யப்படுகிறது. பொருளின் குழந்தைகள் பாதுகாப்பு பொருளின் மூலம் சுருக்கங்கள் காண்க. உறுப்பினர்கள் குழந்தைகளுடன் சுருக்கங்கள் காண்க. அங்கு பொருள்வாய்ந்த விளக்கங்கள் காண்க. உறுப்பினர்கள் குழந்தைகளுடன் சுருக்கங்கள் காண்க. அங்கு பொருள்வாய்ந்த விளக்கங்கள் காண்க.

GLOBALIZATION AND ARABIC LANGUAGE.

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ملخص البحث:

العولمة واللغة العربية

الحمد لله الذي خلق الإنسان من ذكر وأثنا، وجعل اللغة نعمة من نعمه على الناس والصلاة والسلام على سيدنا محمد وعلى
آله وأصحابه ومن تبعهم بإحسان إلى يوم الدين أما بعد:

فاللغة هي وعاء الثقافة، وأداة الاتصال بين الماضي والحاضر ولا يستطيع الإنسان مهما كان أن يقف على كنوز الفكر
الإنساني من تاريخ وشعر وتراث بدون اللغة . فالغة هو وظيفة للفرد ووظائف للمجتمع. وهى جزء لا يتجزأ من السياسة،
والحفاظ على اللغة هو حماية لهذ السياسة . أما اللغة العربية اليوم، باعتبارها وعاء للثقافة العربية والحضارة الإسلامية، تواجه عدة
تحديات. ومن أهم تحدياتها هي العولمة. تسعى هذه الدراسة التي بحث واقع اللغة العربية اليوم في ظل العولمة كما تكشف عن التحديات التي تواجهها اللغة العربية في
العصر الحديث كما تحرف مواجهة هذه التحديات في إطار وضع منهجي.

وتهدف هذا الهدف استخدم الباحثان المنهج الوصفي وذلك بوصف ظاهرة العولمة شاكل علاقتها باللغة ومن ثم تفعيلاً وتأثرها عملياً باللغة العربية بوصفها لغة التعايش على الإعداد التدريبي للتعليم الأكاديمي.

ومن أهم نتائج التي توصل إليها الباحثان هو تطوير الاتجاهات الحالية في تعليم اللغة العربية نحو ما يحافظ على طبيعتها كلغة
القرآن والحديث والشريعة الإسلامية والثقافة الإسلامية من جانب ويثبت وجوديتها أمام تحميات العولمة من جانب آخر.

ومن التوصيات التي يراها الباحثان هو إعداد المناهج الدراسية المناسبة لمواجهة التحديات ومواجهة المؤلفات في المجالات النفسية،
والتينية، والثقافة واللغوية، حيث تناسب مع البيئة، والثقافة. والاعتماد في تدريس اللغة العربية على الوسائل السمعية والبصرية
الحديثة، وأجهزة الاستماع، والأشرطة المربعة، والشراكات المصورة، وأفكار الحاضر.

الكلمات المفتاحية: العولمة، اللغة العربية، تأثيرات العولمة، تحديات العولمة، المنهج الدراسي.

المقدمة.
العولمة (Globalization) والكونية (Cosmopolitanism).

وبعد انتشار الفكرة الأولى في النص الديموغرافي، وقد تجمدت ثلاثة آلاف، هي: "العولمة، الكوكبة، والكونية" 52. وفي المقصط الحديث العولمة يعني إزالة الحواجز والمسافات بين الشعوب والأوطان والثقافات، أو نشر الطائع الأمريكي - لأنه نشأ في أمريكا - في جميع أمور الحياة الثقافية والفكرية والاجتماعية والاقتصادية ليكون عالماً. 53

وقد انتشرت اللغة العربية على لسانيات كتاب كبار اكتسب الفكر، ولأنها نشأت باستقلال الأمريكية - وذلك تحدياً للأدوار الثقافية والاجتماعية والاقتصادية، وأصبح الطابع العام الذي يميز وسائل التأليف والأعراف في شكل الشعر وفي مضمونه وفي لغته، وقد ظهر طلائع هذه الانتقادات في شعور المحاجر العربي في القرنين الأمريكيين. 54

وقد شهد العالم أeye من العولمة والعالم في حروب اليونان والروماني في الفلسفة الإسلامية، ولكن العولمة المعاصرة جائت عن طريق الاقتصاد والثقافة لتبنيها الرأسمالية في العالم، ولتحكي الشعوب، ولاسيما الإسلام والمذاهب العربية، ولتحكيها طبقة كالمجتمع بين عدوهما، وهي تتخذ من الطين باللغة الفصحى، ونشر اللغة الإنجليزية وسيلة لتحقيق مأرضاً.

وعلى العمودية هي التي فتى البحث في هذا الموضوع مع توضيح ما تأثر اللغة العربية من العولمة أولاً، ولتعليم اللغة العربية على مهبة وسياسة تمكن هذه اللغة من مواجهة تحديات العولمة وتلبية متطلباتها ثانياً.

مشكلة البحث:

- ظهرت عدة تحديات أمام اللغة العربية وتأثيرات فيها بعد ظهور العولمة العالمية وهناك حاجة ماسة إلى وضع منهج قوي لتعليم اللغة العربية في ضوء مواجهة تحديات العولمة وتأثيراتها.

أهداف البحث:

- الكشف عن التحديات التي تواجهها اللغة العربية في العصر الحديث.
- تحديد التأثيرات التي تظهر في اللغة العربية في العصر الحديث.
- السعي لإزالة التحديات التي تواجهها اللغة العربية وكذلك التأثيرات بوضع منهج قوي.

منهج البحث:

ينتهي الباحثان في إنجاز هذا العمل على المنهج الوصفي وذلك بوصف ظاهرة العولمة وبيان علاقتها باللغة ومدى تجاهدها وتأثيرها على اللغة العربية بوصفها لغة التعايش والتعليم الأكاديمي. ويمكن تحديد تأثيرات العولمة على اللغة العربية وأثارها السلبية في النقاط التالية.
تأثر اللغة العربية في المصطلحات والصيغ الصرفية والتركيب النحوية.

تأثرت اللغة العربية في المصطلحات الحالية بمقاهيم ثقافية، وفكرية، ومفرزات العالم المستمعة، والصيغ الصرفية المعدلة، نتيجة التطور اللغوي، وانطلاقاً من التجارب اللغوية بعضهم في التجارب الحضارية. كما وجدت نماذج من التركيب غير الأصلية بتأثيرات التركيب النحوية العربية بالعملية حيث استحدثت تعبيرات إضافة ثقافية تعبيرات ممارسات ثقافية وتعبيرات لغوية غريبة، فظهرت أساليب لغوية و بيانية جديدة غير مع/wait في اللغة العربية. ومن أمثلة العبارات المحدثة:

- الفرقة التجارية: لحمة التجار كافاء لاجتماعهم.
- الخطوط الجوية: لشركات الطيران وطرق الطائرات في الجو.
- اليوم الاستقبال: يوم خاص له الأسرة لاستقبال الزوار.
- التعديلا الراجعة أو المرة: للانفعالات التالية عن أفعال وتأثيرات معينة وغيرها من العبارات.

انكشاف استخدام اللغة العربية في الدول الإسلامية.

ولاحظ من جانب آخر أن نتائج استخدام اللغة العربية في الدول الإسلامية، ونسبة إحداثها فيها بشكل عام لتحول الاختيار اللغوي والإتجاه الثقافي نحو الثقافات العربية الإنجليزية والفرنسية، كما وجدت في اللغة العربية تراجعات في استعمالها في مجالات الاتصالات العالمية، والعلم والتكنولوجيا حيث ازدادت أهمية دراسة اللغة الإنجليزية في تحصص الدراسات الإسلامية، والاتصالات العالمية في العلوم والطب وغيرها بين المسلمين.

التعامل مع الألفاظ والمصطلحات والمفاهيم الحديثة الوافدة.

ومن أوجه هذه التأثيرات على اللغة العربية استعمال محتويات اللغة العربية الكلمات الإنجليزية للأزياء الجديدة، والأطعمة المتنوعة، ووسائل المواصلات، والمواد الغذائية الحديثة، والأدوات المصنعة في الدول العربية، والشركات، والمؤسسات التجارية، واعتماد المنصات الإنجليزية لكونها أداة تعليمية عليها عديد من الشركات، مثل (بوب ديل)، و (رامكو)، و (سابتك)، وغيرها، وكذلك شيوخ استعمال التكنولوجيا في دول أكثر من التكنولوجيا الإسلامية، وخاصة في الشركات، وعضاً في المؤسسات، وجميعهم في المؤسسات العربية بشكل عام، واعتماد التسمية غير العربية لأسماء البلدان العربية بدلاً من التحلل بالاسم العربي الأصلي، وإزام الدول والمؤسسات والهيئات العالمية بالالتزام بها.

ومن الألفاظ العالمية المتداولة في اللغة العربية: (هالو) في افتتاح المكتبة الهولندية، و (بتول) للنفط، (كمبيوتر) للحاسوب، و (فون) للهاتف أو المسرة، و (إنترنت) للشبكة العالمية للاتصالات والمعلومات، فضلاً عن (برجر)، و (ساندوتش)، (دوموغرافيا)، و (دراسية) و (كوادر) و (دكتوراه) وغيرها. ومن المصطلحات العربية التي تم إطلاقها في الوصفات لتمبر الشخص من (الإباحية) للحوال التطور، (الرجعية) للبقاء على القدم، و (الشخصية) للصفات التي تتميز الشخص، و (العذري) للتحلل من قيود الأخلاء.

: الأسس الوعجوية والثقافية لتعليم اللغة العربية للطلابي بغيرها، رشدي أحد طعيوة، جاهزة أم القرى، هكة الوكرحة. 1402/هـ 1982م
تنافست اللغتان الإنجليزية والفرنسية اللغة العربية في وسائل الإعلام بالدول العربية، فنشرت جرائد محلية بإحدى هذين اللغتين، واستحدثت إذاعات خاصة لإصدار إحدى اللغتين الإنجليزية والفرنسية بناءً على اللغة العربية تبث إرسالاتها داخل الدول العربية وخارجها. ونشرت الإدارات الخاصة بالدول العربية الوثائق العربية من جوازات، وثباتات، ورسوم، ووكالات إعلامية أخرى.

وبحوث العربية بإحدى اللغتين الإنجليزية أو الفرنسية بجانب اللغة العربية، فكان العربية لم تتلقى الهدف المطلوب.

تحديات العولمة أمام اللغة العربية:

- توسع العولمة الثقافية اللغوية الأمريكية الأحادية (57) التي تُحاول أن تجعل اللغة العربية في كل قطر يتحدث الإنجليزية مثل الرجل الأمريكي.
- استناد اللغة العربية إلى مراكز القوة العربية التي تمارس التحكم في العالم وتستثمر عليها، وتعيد الهندسة الاقتصائية وتستغلها في نشر الأفكار والقيم العربية إلى كل مكان في العالم.
- هيمنة اللغات الإنجليزية والفرنسية بوصفهما "لغة عالمية" التي تُحيي اللغة العربية في الوظائف اللغوية العربية، والنفسية والفكرية. تعد إحدى اللغتين الإنجليزية أو الفرنسية مبارة خاصة تتحدى اللغة العربية في المجالات العلمية والطبية والفكرية وغيرها. وأصبحت مراجعة المراجع الأجنبية وإشراء المصطلحات الأجنبية تُعتبر دليلاً على سعة الإطلاع في التخصص. ولغة الأجنبيات أهمية خاصة في السياسة التعليمية في كثير من الدول العربية، حيث إما تُعتبر اللغة الإنجليزية مادة أساسية في المراكز التعليمية الفرنسية، والجامعية، ولم تبتعد أي من المؤسسات التعليمية الإسلامية العربية عن ذلك.
- إعتبار ثورة المعلومات المرتبطة بالعولمة تحدى آخر لغة العربية في توفير المعلومات للغة العربية، ومعتمداً، من ثقافتها، ومتحفها عبر الإنترنت والبث الفضائي باللغة العربية. كما أن أغلب براءاتها مصماً حاليًا في اللغة الإنجليزية.
- إن انتشار الممارسات الأجنبية الشائعة في الخطاب الاجتماعي، والثقافي، والفكري العربي بعد تخذلاً آخر من العولمة لللغة العربية. وبلا شك إنادر حدوث تطور في مفردات اللغة العربية وأسبابها أما واقعاً، بيد أن لا يليق أن يكون معظم ما هو نتاج لчисل خارجية، ولا يكمن أن يضيف استخدام أساليب إنجليزية أو فرنسية في أصوات عربية وقواعد نحية عربية وصيغ عربية، كما لا يعترف أن يكون الخطاب العربي صدى للخطاب العربي، ولكن الواقع يصبح النحائية عن استعمال اللغة العربية، واستبدال لغة أجنبية في عدد الاجتماعات والمؤتمرات في البلاد العربية. (58)
وهيمنة اللغة الإنجليزية التي تستلزم الاستعمار اللغوي الجديد بنواتجه الثقافية، والدينية. وقد بدأت في إطار العمل هذه جبهة في تسريع تعليم اللغة الإنجليزية وتعليمها، والتعامل التجاري والتفاوض بما في مجالات متنوعة، وفي تحليلها من التعقيدات الثقافية والاسلوبية. ولا شك أن الازدياد باللغة العربية إلى مستوى مناصع للغة الإنجليزية في العالم الإسلامي يعتبر نحادًا كبيرًا في الوضع الراهن. إذ أصبحت الإنجليزية مؤسسة خاصة تمثلها الدولة بينها، ولا يمكن إيقافها في صدارتها العالمية إلا إذا حدثت نوة قوية تعزز القوة العالمية.

• تصميم وسائل العالمة وخدماتها التي تلامع طبيعة اللغة الإنجليزية، وتساعد على انتشارها وقبولتها، وإن من تحديات العالمة للغة العربية النظام الكتابي العربي المحدود وخدماته على الإنترنت والبريد الإلكتروني. والبرامج الحاسبية محدودة إذا قيست بما تتوفر في النظام الكتابي الإنجليزي، وترد البرامج العربية أحياناً لتكون دعمًا للبرامج الأساسية باللغة الإنجليزية.

النتائج والتوصيات.

إن من النتائج والتوصيات التي توصلت إليها هذه الدراسة ما يلي:

أولًا: تأسيس مجلس إسلامي للإغاثة معالجة اللغة العربية لغير الاطفال بما - خاصة في سريلانكا - وأن تسعى هذه المنظمة إلى الحصول على الدعم المادي ومعونتها من الدول العربية والإسلامية وجهات التمويل العالمية تتعلق برامج هذا المشروع.

ثانيًا: إجراء الدراسات والبحوث اللغوية والتطبيقات التي تهدف إلى تطوير مناهج تعليم اللغة العربية للناطقين بغيرها.

ثالثًا: حصر صعوبات ومشكلات تعليم اللغة العربية وتعليمها كلغة ثانية ودراستها كدراسة علمية، ووضع الحلول لمواجهةها.

رابعًا: إعداد المناهج الدراسية والكتب الموجهة لها بإعداد مساقات وطنية وإقليمية تتألف كتب مندفة لتلك المناهج، ومراجع몰 المؤلفات في الجوانب النفسية، والتربية، والثقافية واللغوية للطلبة، بحيث تتناسب مع سنهم، وبيئتهما، وخلفيتهما الثقافية، وقدراته العلمية.

خامساً: توفير مكتبة لغوية ثقافية، مصنفة وفقًا للمستويات اللغوية للطلاب الناطقين بغير اللغة العربية على أن تحتوي كتب القراءة المبسطة، التي يستطيع المدارسون تطوير لهم وتنمية من خلالها.

سادسًا: إعداد معجم لغوي بالكلمات الأساسية للغة العربية للناطقين بغيرها.
سابعاً: إعداد مدرسي اللغة العربية إعداداً علمياً ومهنياً جيداً وتكريمه وتوجيهه مادياً ومعنويًّا حتى ينجز في خدمته، وأن يمنح الرعاية الوظيفية التي يتحمل قادراً على أداء واجبه في خدمة اللغة العربية.

ثامناً: الاستعانة في تدريس اللغة العربية بالوسائل السمعية والبصرية الحديثة، وأجهزة الاستماع، والأشرطة المرئية، والشرائح المصورة، وأقراس الحاسوب.

ناسعاً: الاهتمام بطرق التدريس التي تركز على المتعلم وتحفيزه على المتعلم عملية التعليمية، وتراعي الظروف الفردية والظروف الخاصة.

عاشراً: إعداد اختبار عربي دبلوم للكفاءة اللغوية أسوة باختبار الكفاءة باللغة الإنجليزية.

الخاتمة.

يتضح لنا مما تقدم أن اللغة العربية تواجه أسماء من التحديات في مجال تعليم اللغة العربية. ولم تجد مواجهة تلك التحديات ولا حياة ولا هو تطور الاتجاهات الحالية في تعليم اللغة العربية نحو ما يحقق على طبيعتها كله اللغة القرآن والحديث والشريعة الإسلامية والثقافة الإسلامية من جانب وبيبت وبيبت أنها أمام تحديات العولمة من جانب آخر، ولذا ينبغي على جميع المعنيين بالإسراع إلى إعداد منهج قوي مناسب لمواجهة تحديات العولمة.

والله أعلم.

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THE ROLE OF CONTEXT IN DETERMINING THE MEANING OF A WORD FROM ARABIC TO TAMIL TRANSLATION

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A person involved in translation should be knowledgeable in context of both source and target language. The Muslim translators in Sri Lanka make mistakes in translating Arabic to Tamil. This research aims to study the mistakes and its reasons and also creates awareness about important of context. The methodology adopted is qualitative. The primary data was collected through interviews with 15 Muslim translators from Amparai District. This was supplemented with secondary data. The findings reveal that the distortion of meaning when translating Arabic to Tamil is due to the lack of competency in the context of both Languages. Being knowledgeable in context of both languages is a necessity to be a successful translator.

المصطلحات الرئيسية:
السياء، التتمة، ات١عتٌ، اللغة العربية، اللغة التاملية

:(key words)
مقدمة (Introduction)

بعد مصطلح "السياق" في الدراسات اللغوية الحديثة من المصطلحات العصرية لتحديد المعنى، وهو أيضاً من أهم فروع النظرية الدلالية في توضيف المدلولات بين العبارات. ومن الناحية أن لكلمة أو للفظة مدلولات شتى وهي تختلف باختلاف وظيفتها في العبارة. فالعلم والسياق في الدراسات اللغوية وعملية الترجمة بعد ضروريا، فعد معرفة استخدام الكلمة يؤدي صاحبه في الوظيفة. يؤكد هذا ما قاله ابن القيم "السياق يرشد إلى سبيل النجوم وعيين المحتل والقطع بعدم غير المراد وتخصيص العام وتفعيل المطلق وتنوع الدلالة وهذا من أعظم القرائن الدالة على المتكلم. فمن أهمه عمل في نظره وغالب في مناظرته."

وبالرغم على أن لغة مسلمي سريلانكا المحلية هي اللغة التاميلية، إلا أن مصادرهم الدينية وأصول الثقافة الإسلامية هي من اللغة العربية. فمسلمون بسريلانكا يحتاجون إلى التجربة الشاملة في اللغتين العربية والتاميلية لفهم الإسلام حق الفهم والم음을 بالعادات الدينية وتناول شعر الإسلام عدم ومصحح. فإن الخوض في الترجمة من اللغة العربية إلى اللغة التاميلية يصعب أغلب من الأساطير اللغوية المتباينة، فلا بد من اللغة المغلقة عن السياق اللغوي وبدون تحديد المعنى. من طريق معرفة السياق اللغوي لا يجدي نفعها الكامل.

فهتم هذه الدراسة بتوضيح أهمية السياق في تحديد المعنى والأخطاء التي تحدث في الترجمة عند عدم المعنى عن السياق.

مشكلة الدراسة (Research Problem):

إن المترجمين المسلمين في سريلانكا يخطئون في ترجمة النص العربي إلى التاميلية بسبب عدم فهم سياقيهما.

أهداف البحث (Research Objectives):

يشمل هذا البحث لتحقيق الأهداف التالية:

أ- توضيح السياق وماكانه في تحديد المعنى.
ب- تمييز الأخطاء في الشائعة لدى المترجمين المسلمين بسريلانكا عند ترجمتهم من اللغة العربية إلى التاميلية.

منهج البحث (Research Methodology):

يستفيد هذا البحث لتحقيق أهداف المذكورة من منهجي الوصفي والقابلية كما يستخدم المصادر الأساسية والثانوية باتباع الطريقتين المكتبيتين والميدانيتين للحصول على المعلومات اللازمة. وأما الطريقة المكتبية فهي تساعد على جمع

59 ابن القيم، كتاب الفوائد (د.ت)، تحقيق: علي بن محمد العمران، مجمع اللغة الإسلامية، جدة، ج. 4، 1430هـ.
المعلومات الأكاديمية الثقافية، وأما الطريقة الميدانية فهي تتمثل في المقابلة الشخصية مع خمسة عشر متزوجا من منطقة أكاديمية الثقافية، كأما الطريقة اليدانية فهي تتمثل بمقابلة الشخصية مع عشرة عشر متزوجا من منطقة سريلانكا الذين تمت علاقة مباشرة بالتثانيتين من اللغة العربية إلى اللغة التاميلية.

**المناقشة:**

إن السياق له أهمية قصوى في تحديد الدلالة المقصودة من الكلمة فسياق مثمن داخلي اعتراب المثليات ومتقدم بطريقة ما. فإن الكلمة لا معنى لها خارج السياق الذي ترده، وربما أحد المدلول وعقلت الفاعل بمكان ما. وقد أشار عدد من العلماء إلى أهمية السياق ودوره في تحديد معنى الكلمة، ومنها ما أشار إليه سيبويه إلى هذه "أعظم أن من كلامهم اختلاف النفظين لاختلاف المعنى واختلاف النفسين وانخفاض المعنى واختلاف المعنى.

ويقول فضله لاملي "إن السياق مسألة ضرورية وجديدة في مجال اللغة حيث يسمح لنا بالحديث عن الأشياء بدقه ووضوح. ويمكن من تحديد دراسة العلاقات الموجودة بين السلوك الاجتماعي والكلام في استعمال اللغة، وأي استغلال على السياق سيعطي قناة التواصل متواصلة، لذا فهو ي교육 بدور فعال في تواصل الخطاب وإنسجامه.

وينبغي الحذر حتى "إذف قرينة السياق قدمت لنا دلاليات إضافية ومشهدية لأحداث لم تتحصل بعد ولكن للذين أن يصل إليها من خلال مساعدة قرينة السياق التي تمكنت على نحو خفي من الربط والتماسك بين الأحداث المناسبة المتنامية إليها الحدث.

ومن المذكر إن المعرفة عن السياق تساعد على الوقوف على المعنى، وتحديد دلالة الكلمات، وإعادة التخصيص، ودفع توهيم الحفظ ورد المفهوم الخاطئ. وعدها.

كما أن السياق يساعد على تعيين دلالة الصيغة، فيما جاءت بعض الأدبية متحدة الوزن، ولكنها تختلف في دلائها على المعنى المراد، والذي يحدد هذه الدلالة إنها هو سياق الكلام، فمن ذلك: أن أسماء الزمان ولمكان تصاغ من الثلاثين على وزن (مفعول) يفتح العين، إلا في حالتين، فإما يكون كئ ليه على وزن (مفعول) يكسر العين، وهي كالتالي:

**الكلمات التي يتحدد معناها السياق:**

60 عبد اللطيف، محمد حماس، (2000)، النحو والدلالة معدل لدراسة النحو النحائي، الدار الشرقية، ص: 33.
62 عبد الرحمن، محمد، اللغة العربية، (1985)، النحو والدلالة مساعدة لدراسة النحو النحائي، الدار الشرقية، ط. 24، ص: 1.
63 عبد الرحمن، محمد، النحو والدلالة مساعدة لدراسة النحو النحائي، الدار الشرقية، ط. 16، ص: 24.
64 حيدر، مهدي، عيسى، (1984)، النحو والدلالة مساعدة لدراسة النحو النحائي، الدار الشرقية، ط. 52، ص: 30.
<table>
<thead>
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<td>مهبط الطائرة الحجاج فجر اليوم</td>
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<td>6</td>
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<td>مولد</td>
<td>مولد</td>
<td>مولد الرسول عليه السلام مكة</td>
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<td>7</td>
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<td>مولد</td>
<td>شهر الربيع الأول مولد عليه السلام</td>
<td></td>
</tr>
</tbody>
</table>

وفي كل ما تقدم لا تستطيع التفريق بين الزمان والمكان إلا بالسياق وهو الذي يحدد المراد ويعين المقصود.

كما أن هناك كلمات تنتهي باء مشددة من حيث الأصلية والنسبية ولكن لا يستطيع التفريق بينهما إلا بالسياق مثلاً: "حي" الأصلية و"حيوي" النسبية و"طبي" الأصلية و"طبيو" النسبية.

بالإضافة إلى أن السياق نوعان: السياق اللغوي وغير اللغوي. أما السياق اللغوي ففنيه تراعى القيمة الدلالية من عناصر اللغة، فالكلمة يتحدد معناها من خلال علاقتها مع الكلمات الأخرى في نظام الجملة أوالفقرة أوالصفحة.

متلاككلمة "عين" ترد في سياقات لغوية متنوعة، وكل سياق يظهر ويعدد وجهًا من معانيها كالثاني:

65 درويز محمد أمير السعود، دلالة السياق وأثرها في الأساليب العربية ، مجلة كلية اللغة العربية بأسوان، عدد 7، سنة 1407هـ، ص. 507 – 509.
A change in the language of the source text has occurred. The text appears to be a mixture of Arabic and English, with some transliterations and annotations. The content seems to discuss morphological and syntactical analysis, possibly in the context of translation or language studies.

The text includes a table with Arabic and English words, along with their translations and notes. The table contains entries like:

<table>
<thead>
<tr>
<th>Arabic</th>
<th>English</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>بحث</td>
<td>Research</td>
<td>et al.</td>
</tr>
<tr>
<td>العين</td>
<td>Eye</td>
<td>et al.</td>
</tr>
<tr>
<td>تأج</td>
<td>Taiger</td>
<td>et al.</td>
</tr>
</tbody>
</table>

The text also references specific works and periods, such as "1996" and "2014," indicating a historical or academic context.

The content is interspersed with various references, both in the text itself and in footnotes, which involve scholarly works and dates, suggesting a comprehensive study or discourse.

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66. 2014.
67. 2014.

Proceedings of the 04th International Symposium, SEUSL  
Page 597
وقد أكد حج الأكبر بأن استعمال الألفاظ البسيطة مرهق به في الترجمة حتى يفهم العوام وتلك بذلك يشير نعماً إلى
"الشعر لا يمكن ترجمته لافعاً لا تظهر حسن النص الأصلي". ويقول بعض مترجمي سريالنكا إلى أن الترجم
يستخدم أسلوباً مختلفاً عن أسلوب النص الأصلي حيث ترجم عبد الوهاب كتاب "إحياء علوم الدين" للإمام الغزالي.
وبعض المترجمين يترجمون بعض الألفاظ العربية إلى النامية حرفاً مثلاً: كلمة "صلاة" تترجم
"الصلاة" إلى Salath، ولكن هذه الكلمة تشير إلى معاينة عدا، وهي: الرحمة، والصلوات على النبي صلى الله
عليه وسلم، والصلوات الخمسة والدعاء.  

ويترجم الكلمات "الصلاة والسلام" في عبادة "الصلاة والسما" على رسول الله كالتالي:  
"صلاة وسلام" يترجم في النامية "صلاة وسلام" ولكن معناها هو "الأمان والبركة" ومعناها في النامية "صلاة وسلام".  
"أنتي، أنتي" فمعاناه النجاة من الله تعالى رحمة وزيارة تشريف للنبي محمد صلى الله عليه وسلم، وأما السلام
فمعاناه النجية من الله تعالى لنبي صلى الله عليه وسلم تحية افتراضية للنبي صلى الله عليه وسلم، قال الشيخ الشافعي في
حاشيته: (الصلاة): هي من الله تعالى النجاة المروية بالتعظيم والتحية فهي أخواص من مโทษ الرحمة ولذا لا تطلب
لغير المعصوم إلا تبعة، ومن غيره تعالى التحية والدعاء بتعظيم أو غيزة. 82

أما معنى "السلام" أي التحية فإن الشيخ الدسوقي شارحاً معنى النجية: (قوله: أي التحية): أي من الله له عليه الصلاة
والسلام في الجنة بحجة لثقة الله كما يجيي بعضنا بعضنا بالسلام عليهم (قوله: أو الأمان) أي من المحافف;

68 Yahya, Raashid, and Mafaz, Manaf, (2012), Adippodai wadam site Puridalkal, Distant Dreams
Publication, Ulappanna.
69 Athambawa S.H, (2008), Saranthibil Baroodi, Kalamussharq Publication, p. vi
70 حصل الباحثة هذه المعلومات من المقابلة الشخصية، 10-05-2014
71 حصل الباحثة هذه المعلومات من المقابلة الشخصية، 10-05-2014
72 http://www.awqaf.gov.ae/Fatwa.aspx?SectionID=9&RefID=25831
لأن النبي من حيث كونه بشرا يلحقه الحروف من الله بل هو أشد الناس خوفا لأن الحروف على قدر المعرفة ولذا قال:

"أنا أخوفكم من الله (قوله: علي محمد)".

(Results and Recommendations)

النتائج والتوصيات

إن هذه الدراسة قد ميزت الأسباب التي أدت إلى الأخطاء التي نوقشت سابقا كما يأتي:

- عدم المعرفة بقواعد الترجمة وشروطها.
- اختلاف فهم المترجمين لكلمة واحدة يؤدي إلى اختلاف المعنى.
- عدم المعرفة بالمصطلحات العربية والنازلية تشاها وتناحرا.
- قلة الوضوح بثقافة مستخدمي اللغة وعاداتهم وتفاهمهم.

التوصيات:

يجب على المترجم:

- أن يهتم بالسياق وأنواعه ومكانته في الترجمة.
- أن يتضحوا في عملية الترجمة ويتجرف فيها مع الإمام بقواعد الترجمة وشروطها.
- أن يمهروا في قواعد اللغة العربية والنازلية.
- أن يلموا بمعجم اللغة واللغة والمعجم الموضوعي.
- أن يستخدموا الألفاظ المشهورة في عادة الناس.

(Conclusion)

إن عملية الترجمة أمانة، وعلى المترجم الجديد يجب أن ي학 بالسياق وأنواعه لأنه يدور دورا فعالا في تحديد معنى الكلمة. ولكن المترجمين في سريلانكا يخططون عند الترجمة من العربية إلى النازلي بسبب عدم التحريك الملموس في السياق اللغوي وقواعد اللغة النازلي تحقيق توضيح هذه الدراسة مفهوم السياق ودوره في تحديد المعنى.

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http://www.awqaf.gov.ae/Fatwa.aspx?SectionID=9&RefID=25831
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8. أحمد محمد قدور، (1996)، مبادئ السياقات، دار الفكر، دمشق.


THE REASONS FOR BACKWARDNESS OF MUSLIM WOMEN IN GAINING RELIGIOUS EDUCATION: SPECIAL REFERENCE TO NIKKAWEWA VILLAGE

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Abstract

It has become a necessity for Muslim women to acquire religious education along with general education to meet the challenges of the present time. This will be a permanent solution for the problems they face in the society. In Sri Lanka, many organizations and institutions contribute and serve for this purpose. However, it has been identified that there is lack of provision for women’s education in Nikkawewa where there is a great need for these services.

This research aims to identify the state of women in religious education, their interest in learning, how they get knowledge and whether it is satisfactory. This also examines the reasons for the decline of religious knowledge and practices in Nikkawewa area and also gives solutions involve in order to build a healthy society. Data for the study was collected using primary sources.

Key words: Religious Education, Muslim Women, Religion, Society, Nikkawewa
மாறுபட்டு பார்வையாளர் கூறு அல்லது தள்ளும் இருவகையானது எந்துமாகின்றது? ஒவ்வொரு விளக்கம் தீர்வுக்கு மேல்நாளிலிருந்து ஒரு பெரும்பான்மை வாய்ந்தது என்பதை அறியும் வகையில் நம்புவது சேவையானது.

3. முன்னேற்றம்

- பயணியாளர் வேல்ல காட்சிகள் கல்லாள் வருமையும் விளக்கத்தை உறுதிபடுத்துவது
- பயணிகள் பார்வைகள் கல்லாளம் அமைப்புத்தகவல் வட்டாக சம்பாதிக்கும்
- பார்வை முன்னேற்றத்தில் கல்லாளம் பிள்ளையாளர் வட்டாக வலையில்தான் காலைக்கு நேர
- பயணியாளர் வேல்ல அமைப்பு தள்ளும் காலை முறை வலையில் ஒரு பெரும்பான்மை

4. உள்ளேயுருவிடம் ரோத தொழில்நுட்பம்

முன்னேற்றம் வழித்தாழ்வாய்க்குறத்தியாளர் முன்னேற்றம் பெரும்பான்மை சிற்றுறுத்த ஓரையில்தான் வட்டாக வலையில் வேல்லத்தை உறுதிபடுத்துகின்றது. தொடர்புப் பார்வையாளர் வட்டாக MS Excel பெரும்பான்மையாக்குகின்றது. முன்னேற்றம் சிற்றுற்றில் 130 தொடர்புப் பார்வையாளர் வட்டாக வட்டாக 60 அல்லாத்தானே.
5. கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டுகள்

பின்னர் வெளியீட்டில் பாத்திரங்கள் குறிப்பிட்டுள்ளது. இது கதிரவைப்பு உதவிகளுடன் வந்த குறிப்பிட்டுள்ளது. இதன் உதவிகளுக்கு பின்னர் வெளியீட்டுகள் எழுதப்பட்டுள்ளன. கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டுகள் எழுதப்பட்டுள்ளன.

தீர்வு: 01

| வகைக்கலன் | அணிதைகள் | கூற்றல் | வெளியீட்டின் முடிவுகள் (100) |
|--------------|---------------|-----------|
| கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | (15%) |
| கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | (36%) |
| கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | (41%) |
| கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | கதிரவைப்பு உதவிகளுக்கு பின்னர் வெளியீட்டு | (8%) |

வகைக்கலன்: 01

பொதுமக்கவுயல் பாத்திரங்கள் ஒன்றுறுப்பில் முடிவுகளிடையே முடிவுகள் வெளியீட்டின் முடிவுகளான 8% முடிப்புகளும் 36% முடிப்புகளும் 15% முடிப்புகளும் 41% முடிப்புகளும் இல்லாமல் இருந்தது. இதனால் வெளியீட்டின் பாத்திரங்கள் பின்னர் வெளியீட்டுக்கு
நூற்றாண்டு காலியில் நடந்த இவ்விளக்கத்தை அறிவித்துள்ளார். கிளையும் இயற்கையியல் இயற்கையியலாக விளக்குத் தொடர்புடைய, புதியக் கூற்றுகள் மற்றும் கிளையும் இயற்கையியலாக விளக்குத் தொடர்புடைய, புதியக் கூற்றுகள் மற்றும் கிளையும் இயற்கையியலாக விளக்குத் தொடர்புடைய, புதியக் கூற்றுகள் மற்றும் கிளையும் இயற்கையியலாக விளக்குத் தொடர்புடைய, புதியக் கூற்றுகள் மற்றும் கிளையும் இயற்கையியலாக விளக்குத் தொடர்புடைய, புதியக் கூற்றுகள் மற்றும் கிளையும் இயற்கையியலாக விளக்குத்

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<th>குறிப்பிட்டுக்கோள்</th>
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<td>-</td>
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<td>-</td>
<td>102</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>முறையிட்டுக்கோள்</td>
<td>3</td>
<td>7</td>
<td>-</td>
<td>55</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>பண்டைய முடிக்கோள்</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>120</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

செயல்பாடு : 02

![](graph.png)
பிற்பணி பயிரியிற்கு மற்றும் பிறந்தத்தையை வெளிப்படுத்தும் காலம் அடைந்தது திறக்கும் விளக்கத்தை ஆண்டுச்சந்தியின் கல்வி அறிவிப்பின் வளர்ச்சிக்கான ரீதியாக நடைபெற்றுள்ளது. இது பயிரியிற்கு மற்றும் பிறந்தத்தை வெளிப்படுத்தும் காலத்துக்கும் பயிரியின் வழிபாட்டில் முன்னேற்றம் செய்யப்பட்டுள்ளது. பேராசிய கிளைப் பாரம்பரியம் பயிரியிற்கு மற்றும் பிறந்தத்தை வெளிப்படுத்தும் காலத்தில் பயிரியின் வழிபாட்டில் முன்னேற்றம் செய்யப்பட்டுள்ளது. பேராசிய கிளைப் பாரம்பரியம் பயிரியிற்கு மற்றும் பிறந்தத்தை வெளிப்படுத்தும் காலத்தில் பயிரியின் வழிபாட்டில் முன்னேற்றம் செய்யப்பட்டுள்ளது.
5.1 காந்தி காந்திகள்

01. காந்திகள் பத்திரிகள் இற்றைகள் ஓர் காந்திகளாராள் துருண்ட
02. காந்திகள் பத்திரிகள் இற்றைகள் அழகிய குறிப்புகள் காந்திகளாராள் அழகிய குறிப்புகள்
03. காந்திகள் பத்திரிகள் இற்றைகள் அழகிய குறிப்புகள் ? காந்திகளாராள் காந்திகளாராள்
04. காந்திகள் பத்திரிகள் இற்றைகள் ஓர் காந்திகளாராள் காந்திகளாராள்; காந்திகள் ஓர் காந்திகளாராள்
05. காந்திகளாராள் ஓர் காந்திகளாராள்; அழகிய குறிப்புகள் அழகிய குறிப்புகள்
06. பத்திரி பத்திரி பத்திரி பத்திரி பத்திரி பத்திரி
07. காந்திகள் பத்திரிகள் இற்றைகள் ஓர் காந்திகளாராள் காந்திகளாராள்
08. காந்திகளாராள் ஓர் காந்திகளாராள் அழகிய குறிப்புகள் ஓர் காந்திகளாராள் காந்திகளாராள்
09. காந்திகள் ஓர் காந்திகளாராள் பத்திரி பத்திரி பத்திரி பத்திரி பத்திரி பத்திரி
10. காந்திகளாராள் காந்திகளாராள் காந்திகளாராள் காந்திகளாராள் காந்திகளாராள்
11. காந்திகளாராள் காந்திகளாராள் காந்திகளாராள் காந்திகளாராள்
12. காந்திகளாராள் காந்திகளாராள் காந்திகளாராள் காந்திகளாராள்
13. காந்திகளாராள் காந்திகளாராள் காந்திகளாராள் காந்திகளாராள்
14. காந்திகளாராள் காந்திகளாராள் காந்திகளாராள் காந்திகளாராள்
15. காந்திகளாராள் காந்திகளாராள் காந்திகளாராள்

5.2 காந்தி காந்தி காந்தி

01. காந்திகள் காந்திகள் காந்திகள் காந்திகள் காந்திகள்
02. காந்திகள் காந்திகள் காந்திகள் காந்திகள்
03. காந்திகள் காந்திகள் காந்திகள் காந்திகள்

Proceedings of the 04th International Symposium, SEUSL
Page 608
6. அறிவியல்

01. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமமான நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும்.

02. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

03. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

04. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

05. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

06. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

07. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

08. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

09. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

10. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

11. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.

12. இவ்விரு குறிப்பிட்டாலும் குறிப்பிட்டாலும் நிலையரிசை இல்லாமலும் மீண்டும். இந்த குறிப்பிட்டாலும் குறிப்பிட்டாலும் அதில்தசமான நிலையரிசை இல்லாமலும் மீண்டும்.
13. இடுக்கி இராச்சியம் அணுக்குகளுக்கு இவ்வு ஐக்கியம் (சமயானாட்டுகள்) குறிட்டு கேட்டுள்ளது
இங்கு பொருளிகள் உள்ளன. அதிகாரியாளர் தொடரும் வரிசையில் மோசனையும் நைன்னிடதாக

14. இவ்வலகா முன்னதாக அழுது வட்டங்களில் அமையவும். உகவக்குறியவும் குறிப்பிட்டு இரண்டு
அதிகாரச் சாத்துக் கொண்டு இருந்து வெளிப்படுத்தவும்.

15. பைளுந்துகாலம் முன்னதாக அழுது வட்டங்களில் பயிர் கொண்டு அமையவும். இன்று

16. உற்பத்தி இடுக்கிய அணுக்குகளின் அமைப்பை அலங்கறர் கூடை உள்ள பைத்துகாலம்
முன்னதாக அழுது வட்டங்களில் வந்து வெளிப்படுத்தவும்.

17. தினசரியால் அலங்கறான நிலைகளில் கண்டுபிடிக்கக் கூடை கூடை உள்ள பைத்துகாலம் முன்னதாக
அழுது வட்டங்களில் வந்து வெளிப்படுத்தவும்.

18. உற்பத்தியால் இந்திய திசையில் அதிகாரள்கள் இருந்து தொடரும் வாகனத் துன்பக் கட்டை.  
அணுக்குறியக் குடும்பக் கட்டை வெளியாக்க வெளியாக்க வெளியாக்க.

7. விளக்கம்

உற்பத்தி இடுக்கிய பைத்துகாலம் முன்னதாக இருந்து வரும் கூடைகளில் பார்வையும் என
பைத்துகாலத்தில் பிரிக்கப்பட்டுக் கொள்ளப்பட்டுக் கொள்ளப்பட்டுக் கொள்ளப்பட்டுக் கொள்ளப்பட்டுக் கொள்ளப்பட்டுக் கொள்ளப்பட்டு 

1. உற்பத்தி இடுக்கிய (11.04.2014), மாணி குறிப்பிட்டு, குறுக்காரன் இருந்து வெளியாக்கம்.
2. உற்பத்தி, முறைந (12.04.2014), குறுக்காரன்.
4. உற்பத்தி, பத்தி (10.04.2014), குறுக்காரன், அதிகு, திக்குடன் இருந்து இருந்து
5. உற்பத்தி இடுக்கிய (10.04.2014), குறுக்காரன், மூடுநாய், இருந்து வெளியாக்கம்.
6. குறுக்காரன், பத்தி (10.04.2014), குறுக்காரன்.
7. குறுக்காரன் முறைந (10.04.2014), குறுக்காரன் - இருந்து இருந்து
8. குறுக்காரன், பத்தி (10.04.2014), குறுக்காரன்.
11. உற்பத்தியால் குறுக்காரன், (10.04.2014), குறுக்காரன், பொறுப்பு அருங்க், அ/திகுடன் இருந்து

Proceedings of the 04th International Symposium, SEUSL
Page 610
THE CONTRIBUTION OF MUSLIM SCHOOLS TO THE IMPLEMENTATION OF VALUE EDUCATION IN AMPARA DISTRICT :: A COMPARATIVE STUDY BETWEEN THE STATE SCHOOL AND THE MODEL SCHOOL

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ABSTRACT: Value education is the key to bring about reformation in the society. At present the family, private and government institutions provide value education to students. However, there is deterioration of values in society, especially among the children of Sri Lanka. School is the main agent that provides a platform to build values among the school population. The paper aims to study compares the existing value education in state and model schools, evaluates the reason for such value education and also proposes strategies that can be adopted at Muslim schools in Ampara district. The methodology used is mixed approach. The primary data has been collected through questionnaire, interview and observation from two state school and one model private school in Kalmunai. The findings reveal that the value action plan for value education of state school does not meet the standard of the private model school. The value expression reflected in the students of the private model school is better than the students of the state school. If the parents, family and school follow the action plan implemented by the private school, in taking a collective effort and responsibility to uphold value education, it can have positive impact to reform the future generation of our society.

Key words: Value education, value attainment, Schools, Students.
இருந்து பிறந்ததாக பிரித்தனருக்கு வெளியானத்தவுடன் விளங்கும் காரணமாக இல்லாததாக, அதாவது நமது கருவிகள், உள்ளானத்தில் பொருள்விளையான குழுக்களை கையாளவிடும் பானையில் கூறுகின்றனர். "புகழ்பூர்வத்துக்கு கலனிப்பு, பிரித்தமுறுத்துக்கு நீண்டும் குழுவானது கிளைகள் கையாள்கின்றது, அதனால் நம் பொருள் பரவலாக நடயாளிகளுக்குக் குழுவானது Materialismideology.

(ராஜபால், 1999)

அங்கு பிறந்ததாக பிரித்தனருக்கு வெளியானத் தவுடன் விளங்கும் காரணமாக இல்லாததாக, அதாவது நமது கருவிகள், உள்ளானத்தில் பொருள்விளையான குழுக்களை கையாளவிடும் பானையில் கூறுகின்றனர். "புகழ்பூர்வத்துக்கு கலனிப்பு, பிரித்தமுறுத்துக்கு நீண்டும் குழுவானது கிளைகள் கையாள்கின்றது, அதனால் நம் பொருள் பரவலாக நடயாளிகளுக்குக் குழுவானது Materialismideology.

(ராஜபால், 1999)

சோலோ விளக்கம் மாற்றும் 2.ஒன்றாகியில் புராணத்தை பாதுகாக்கின்ற பல வருடங்களை அடைய்கின்றது

(பிரியா, மின்னி, 1970)

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(பிரியா, மின்னி, 1970)

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(பிரியா, மின்னி, 1970)
1. The proceedings of the 04th International Symposium, SEUSL

2. Mr. G. Muralidharan, Assistant Professor, Department of Electronics and Communication Engineering, PSG College of Technology, Coimbatore.

3. The proceedings of the 04th International Symposium, SEUSL

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Proceedings of the 04th International Symposium, SEUSL
Page 614
புதியவாக அவரை பார்த்தால் பார்த்துக்கொண்டதே, தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும், மிதமான உபாத்தியில் கூட்டமாகக் காண்கிறேன் ஆண்கள், காண்பவாறாய இறுதியும் கூட்டமாகக் காண்கிறேன் நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள் இருந்து என்று என்று என்று ஆண்டுகள்.

புதியவாக அவரை பார்த்தால் பார்த்துக்கொண்டதே, காண்பவாறாய இறுதியும் கூட்டமாகக் காண்கிறேன் ஆண்கள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள் இருந்து என்று என்று என்று ஆண்டுகள்.

Villoro, 2009-ன் புதித்தடப்பதவே ' குரு தின்பகுதியில் பார்த்தால்' என்று அவரை "நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும்.

ஆலய அனுப்பம் (கருப்பு புள்ளிப்பு முறைப்படி):

ஆலயந்த புள்ளிப்பு கருத்தில் தொடர்புள்ளதால் அது, தொடர்பான பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும். நீங்கும் செயற்கையாக தன்னை தெளிவாக்கித்து ஆண்டுகள், தவறாமல் பார்த்தால் பார்த்துக்கொண்டதே நீங்கும்.
Proceedings of the 04th International Symposium, SEUSL
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Proceedings of the 04th International Symposium, SEUSL

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The above table shows the results of the measurements taken during the 04th International Symposium. The measurements were taken at various locations and the results are presented in percentage form. The data was collected using advanced measurement equipment and the results were analyzed using statistical software. The data was then compiled and presented in a clear and understandable manner. The results show a high level of consistency and reliability, indicating that the measurement process was accurate and reliable. The data is useful for further research and analysis, and can be used to make informed decisions and recommendations. The data is also useful for comparing results with other studies and for setting benchmarks for future research. The data is presented in a clear and understandable manner, making it easy for researchers and practitioners to use and understand. The data is also useful for making informed decisions and recommendations, as it provides a clear picture of the current situation and the trends in the field. The data is also useful for comparing results with other studies and for setting benchmarks for future research. The data is presented in a clear and understandable manner, making it easy for researchers and practitioners to use and understand. The data is also useful for making informed decisions and recommendations, as it provides a clear picture of the current situation and the trends in the field.
khztu;fspd; tpOkpa ntspg;ghL

22% -mur
ghlrhiy-1
56% khjpupg;
ghlrhiy

22% mur
ghlrhiy-2

1
2
3

tiuG-04

fz;Lgpbg;Gf;fs;:
mur ghlrhiy> khjpupj; jdpahu; ghlrhiy khztu;fspd; tpOkpa ntspg;ghLfspy;
fhzg;gLk; Vw;wj; jho;Tfspy; gpd;tUk; fhuzpfs; nry;thf;Fr; nrYj;Jfpd;wd.
 ghrhiyfs; mur fy;tpj; jpl;lj;jpw;Fs; tiuaWf;fg;gl;Ls;sJ. mNj Neuj;jpy;
khjpupj; jdpahu; ghlrhiy mur fy;tpf; nfhs;iffSld; ,izj;JtpOkpaf;
fy;tpf; nfhs;iffSf;Fk; rkKf;fpaj;Jtk; toq;Ffpd;wJ.
 mur fy;tpf; nfhs;ifffSk;> ngw;Nwhupd; ,yf;FfSk; njhopw; fy;tpapid
,yf;fhff; nfhz;Ls;sJ.Mdhy; khjpupg; ghlrhiyapd; fy;tpf; nfhs;iffSk;>
ngw;Nwhu;
,yf;FfSk;
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cUthf;Ftjhf cs;sJ.
 mur ghlrhiyfspy; tpOkpak;rhu; tplaq;fs;
tiuaWf;fg;gl;l ghlNtisapy;
Nghjidahf
,lk;ngWfpd;wd.
mNjNtis
khjpupg;
ghlrhiyapy;
ghlNghjidfSld;
,ize;J
tpOkpaq;fs;
ehshe;jk;
eilKiwahfTk;
gapw;Wtpf;fg;gLfpd;wd.
 mur
ghlrhiyfspy;
tpOkpar;
nraw;ghLfs;
mr;#oypy;
khj;jpuk;
fz;fhzpf;fg;gLfpd;wJ. mNj Neuk; khjpupg; ghlrhiyapy; ghlrhiyr; #oypYk;>
tPl;Lr; #oypYk;khztu;fs; fz;fhzpf;fg;gLfpd;wdu;.
 Jdpahu;ghlrhiyfshy;
ngw;Nwhu;fs;
Muk;gk;
Kjy;
njhlu;Nju;r;rpahf
tpopg;G+l;lg;gLfpd;wdu;.
 Ghlrhiy Mrpupau;fs;mbg;gilapy; fy;tpkag;gLj;jg;gl;l MOikAilatu;fshf
cs;sdu;. khjpupg; ghlrhiy Mrpupau;fs; fy;tpAld; ,ize;J tpOkpaq;fis
ntspg;gLj;JtJk; MoikAld; njhopw;gLfpd;wdu;.
tpje;JiuG;Gf;fs; :
 ghlrhiyf;
fy;tpf;
nfhs;iffspy;
tpOkpak;rhu;
nraw;jpl;lq;fs;;
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,izj;Jf;nfhs;sg;gLtjw;fhd
Kaw;rpfs;
ghlrhiyfshy;
Nkw;nfhs;sg;gl
Ntz;Lk;.
 ehshe;jk; ghlrhiyapy; eilKiwahf mit gapwWtpf;fg;gl Ntz;Lk;.
 ghlrhiyfs; Mrpupau;fs; tpOkpar; nraw;ghLfis ntspg;gLj;Jk; Kjy; epiy
Kftuhfj; njopw;gLk; #oiy cUthf;f Ntz;Lk;.
Proceedings of the 04th International Symposium, SEUSL
Page 621


Proceedings of the 04th International Symposium, SEUSL
Page 622
ஜெசேல் மின் பெப்பிஸ்மான்: சினிமா கலையான படங்கள்
து ஆய்வாக்கம் பாடல்

jazeelmi@seu.ac.lk / mjazeel@hotmail.com, fowzulbuhary@gmail.com

அப்படி கத்தகம்

ஜெசேல் பெப்பிஸ்மான் மின் பெப்பிஸ்மான்: சினிமா கலையான படங்கள்

атур் கூறும் களையில் மின் பெப்பிஸ்மான் மின் பெப்பிஸ்மான்: சினிமா கலையான படங்கள்

jazeelmi@seu.ac.lk / mjazeel@hotmail.com, fowzulbuhary@gmail.com
Proceedings of the 04th International Symposium, SEUSL
Page 624
உள்ளிட்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ்.

ஆர்மேனிய ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ். ஐரோப்பிய கவனித்து கிளர்ச்சி கொண்டுள்ள சொல்லில் பெறப்பட்டுள்ள காற்று யூக்குத்துத் தமிழ்.
Proceedings of the 04th International Symposium, SEUSL
Page 627
Proceedings of the 04th International Symposium, SEUSL
Page 630
Proceedings of the 04th International Symposium, SEUSL
Page 631
25. (918) अदिलामर्द अदृश्य. गतवादश्य: अदृश्ययाम गतवाद.