A Trend Analysis of Innovative Investment in Agricultural Sector

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Abstract

Agriculture is an important contributing sector and connective with rest of the sectors in Sri Lankan economy and one third of the working population engaging in this sector. However, many farm households have limited knowledge of modern production methods and struggle to get access resources such as commercial market, adopting new technology, varieties of seeds, fertilizers, harvesting methods, storages and marketing systems. These obstacles constrain their ability to compete the market and limit their family income. The innovative investment would create a better environment for the investor in this field. This study mainly focused the trend in innovative investment on agricultural Research and Development (R&D) such as the government's public investment in agriculture research and development (R&D), higher education and full time equivalent in agricultural output, as well as to understand how such investment has played a role to compete agricultural production. These data for the study were gathered from secondary sources. The study found that the innovative investment in R&D is decreasing over the period of time and also output of the labour force could not increase along with the increasing population. By learning from the past and looking into the future, the agricultural policy makers should create the sound and innovative investment in agricultural R&D to prevent food crisis and ensure the sustainable agricultural development in Sri Lanka.

Keywords: Agricultural, innovative investment, higher education, R&D

Introduction

Agriculture sector is the major contributing sector for most of developing countries' economy. But it is a seasonal, less productive and labour surplus sector. Therefore, every country should focus especially on innovation in Research and Development (R&D) in agricultural sector to increase the productivity. Manual (2002) defines R&D that creative innovative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of human culture and society, and the use of this stock of knowledge to invent new approach of the research and development application with additional technical improvement on the product and process in agricultural sector. The world economy faces lots of challenges in producing agricultural goods due to lack of access to innovation research and development. The developed countries can increase the agricultural production with more efficient investments in R&D and policy measures regarding agricultural R&D. The developed countries introduce new technology in agricultural staple and non-staple crop for skilled labours, new varieties of seeds, fertilizers, irrigation and more efficient laboratories, storage and marketing strategies in international world market. Globally, innovation R&D in agricultural plantation and non-plantation innovation from rich countries to poor countries

obviously increased the productivity and maintain the food security for many part of the developing world. But nowadays the agricultural development new trends in both the developed and developing world mean that poor countries may no longer be able to depend as they have in the past. Quantity of new agricultural technologies and knowledge from rich countries, mainly advances related to enhance the productivity of stable foods, although many developing countries are like an orphan in agricultural technology however some of the more advanced developing countries like Brazil, China and India have improved with the assistance of productive and self-sustaining local research sectors -Chadha (2013)

In case of Sri Lanka, there are three major national organizations providing funds and monitoring for research and development in agriculture; Sri Lanka Council for Agriculture Research Policy (SLCARP) is the only major government agricultural research organization. National Science Foundation (NSF), National Research Council (NRC) and higher education sectors which are allocating a huge amount of funds, which are also pumped from the international organization; SIDA, WHO, ISP, UNO, EC, IFS, NORAD, IDRC and ADB are running under the Sri Lanka Council for Agricultural Research Policy. This organization is playing a central role to improve R&D in Sri Lanka. Foreign assistances are provided in several ways such as long-term research development, institutional development, human resources development, individual research grants and various multilateral program. Particularly the R&D funds are allocating in proper sectors such as higher education, government, private business, private non-profit organizations, foreign organizations and other sources of R&D activities in Sri Lanka (Gunasena, 2004), but the national research institution's goal should be continued to face the future challenges like food security, water security, energy security, health and resilience of climate change. Mostly researchers focus on the research areas such as agriculture, human nutrition, livestock production, chemistry, physics, microbiology, food and harvest technology, renewable energy, and natural resources also the especially in vegetables, fruits, tea, coconut palm and rice (Stads, 2012).

Methodology

This study analyzed the performance of innovative investment in agricultural sector 1981 to 2009. The data were collected from secondary source Agriculture Science and Technology Indicators (ASTI). The study analyzed innovative investment in agricultural R&D, government investment, Full time equivalent (FTE), higher education, and agriculture output, during these period (1981-2009). The Quantitative data were used to analyze the trends in agricultural R&D investment. This paper would bring the overall picture of the agricultural R&D possibilities in Sri Lanka.

Result and Discussion

Let's look at the government's public investment in agricultural R&D, higher education and employment of researchers in agricultural institutions, to understand how such investment has played the innovative investment in agricultural R&D. Using the ASTI (1981-2009) data. Sri Lanka's invests in agricultural R&D experiences some time volatility trend in this sector.
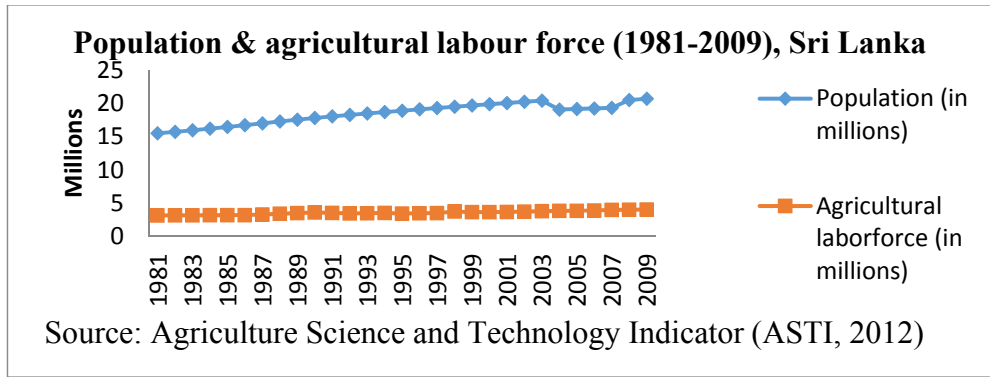
Figure1 : Population & agricultural labour Force (1981-2009), Sri Lanka

The above combinations of two indicators show that the proportion population is increasing very sharply from 1981to 2003, the absolute term 15 million to 20 million then suddenly in 2005 till 2005 constant then increasing in comparison to agriculture labour force. In terms of the agricultural sector labour force we found that it has to increase crop production so as to provide food for the geometrically increasing population. Sri Lanka is agricultural country most of people depend on paddy cultivation. Even though compared with other sectors the proportion of the agricultural share is declining over time. (Varies CBSL reports)
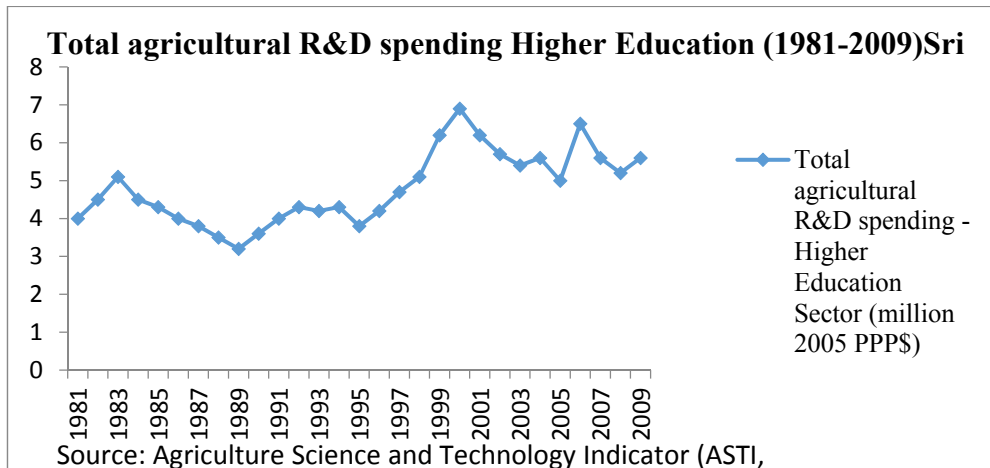

Figure 2:.Total Agri. R&D spending Higher Education (1981-2009) Sri Lanka

There are large variation in educational degree levels which provide BCs, MSc, and PhD scientist researchers. The above figure shows that trend is slightly increasing and reached peak in 1983, and is sharply decreasing till 1989. After that spending is gradually increasing peak in 2000 which is higher the reason rapidly increase an arrival of young newly under graduate–BSc qualified scientist. Felling back in 2003 slightly rising in peak 2007 due to scientist received MSc and PhD training through SLCARP's collaboration with ICAR during the 2000-2010. After that the training program and opportunity have ceased due to lack of funding. Many of the doctorates left seeking new job opportunity, still brain drain challenge in Sri Lanka. Many excellent and experience Sri Lanka scientist are compete their PhD training in

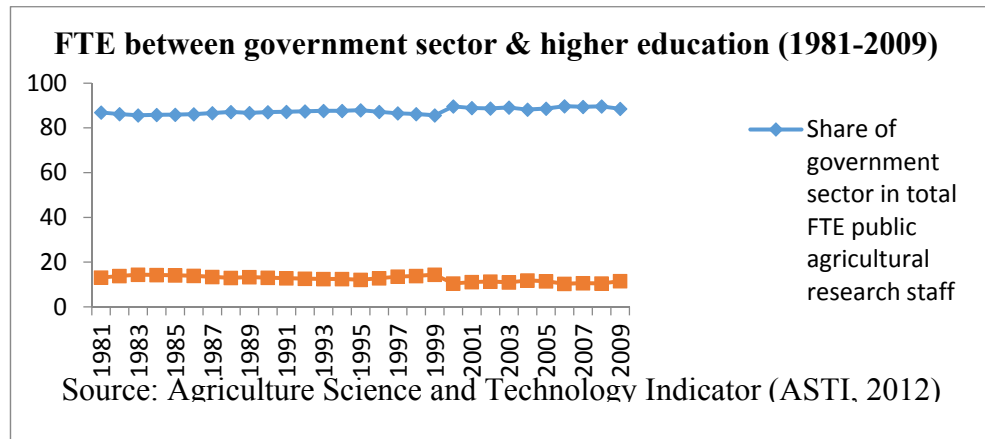foreign countries Europe, Australia and USA seek higher paying jobs outside of Sri Lanka(ASTI- 2012).

Figure 3:.FTE between government sector & higher education (1981-2009), Sri Lanka

The Full Time Equivalence (FTE) which is measuring the number of R&D staff. These staff works either laboratory staff, member of the designs and testing establishment also the part – time activities of university teachers or postgraduate students. How much the researchers devoted their time for the R&D counting. For example; researcher normally spends thirty person times on R&D and other rest of the time that person can spend time for the teaching, university administration and student counseling. Suppose the researcher is working only six month on R&D, this result in a FTE of 0.5. Requiting some the FTE of R&D staffs is hiring on the basis of the temporary staff by government at the end the university teaching year for further R&D innovation.

The above figure shows that the absolute terms of the two indicators are increasing smoothly in this period. But there are suddenly different turning points between share of government sector in total FTE public agricultural research staff and share of higher education sector in total FTE public agricultural research staff. The share of government sector in total FTE public agricultural research staff is slightly arising in 2000 the remaining same it may or may not be new scientists, who were not hired into official research position due to restriction on recruitment instituted by the national government. On the other hand the share of higher education sector in total FTE public agricultural research staff is gradually declining from 2000 to 2009, mainly the reason of new scientists are not given official research positions due to recruitment restriction and lack of salary level of the scheme and many scientist of training opportunities and other benefits commensurate with their colleagues and senior staff who did hold full research status. The trained teachers are less opportunity and other facilities almost very less in this period (ASTI, 2012)
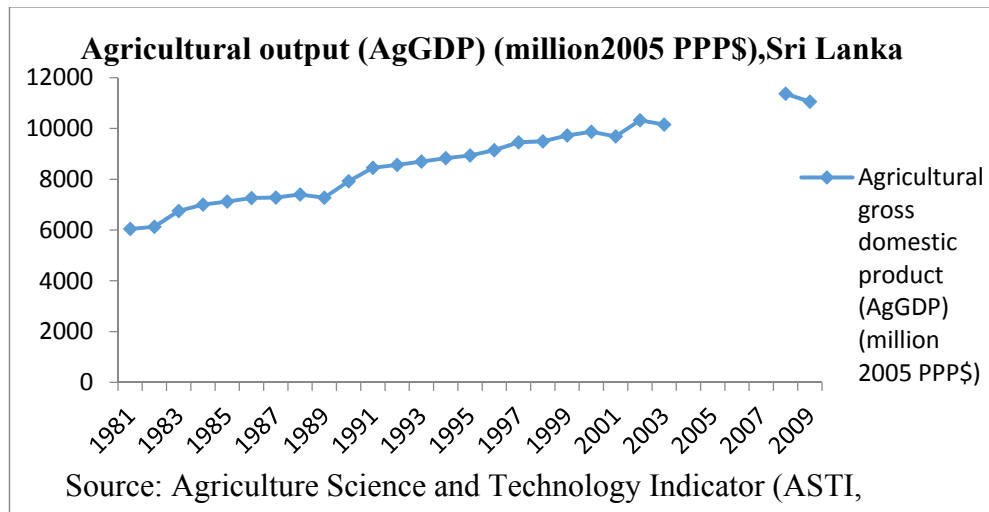
Agricultural output (AgGDP) (million2005 PPP$),Sri Lanka

Figure 4: Agricultural output (AgGDP) (million2005 PPP$), Sri Lanka

The above figure demonstrates that agricultural gross domestic product (AgGDP) is gradually increasing over time. Data is not available for the period (2004-2007). But agricultural gross domestic production reached peak in 2008 then start to slightly decline. Because the agricultural research and development has been a major role to agricultural innovation and productivity increasing in this period and the green revolution might be significantly contributed to increase agricultural production in this period.

Therefore, the overall innovative agricultural R&D contribution, government expenditure is the most dominant investment in research and development. There are many challenges to lead especially research and development in Sir Lanka. That are allocating fund and research staff in different ways so that the getting the output less efficiency and skilled resource persons. Government imposed restriction on recruitment of staff in all categories like a scientific and technical and many researchers secured employment to get better salary and better facility for the R&D technology innovation in foreign research institution. One of the majors problems is, the scientists are seeking for better salaried jobs and are living abroad mainly in Australia, New Zealand, Canada and United States. They are not returning to their home land to create a better research environment. It would be humble for the brain drained people to work in their own country, though very few scientists and intellectuals are contributing their services to R&D in Sri Lanka.

Furthermore, population rate is increasing very rapidly but agricultural labour force is gradually increasing in this scenario agricultural is only one sector link with other sectors mainly to provide food, which tells us the agriculture should produce more food production demand will come from rest of the sectors. So the government should provide better platform to encourage the farmers and individual investor involving research and development.

Conclusion

This research focused the innovative investment in agricultural R&D and found very low output to faces the future challenges and meets food production along rapidly increasing population in Sri Lanka. Substantially the government should pay more attention for R&D in science and innovative applicable technology to make contribution to Sri Lankan economic development and take the forward steps to encourage the agricultural sector. Therefore, new paradigm of agricultural research and development should promote the agribusiness through formulate and implement a plan to progressively invest more and more in this research field. Generally the public sector cannot spend and contribute alone to research and development and innovation activities, because government has to expend a large amount of funds to build the social welfare and infrastructure activities in the country. Hence government should create sound policies to involve the private sector enterprise to investment in R&D to develop the agricultural production with collaboration between public and private partnerships and learning the best practice form the south Asian regions well as for sharing their experiences.

References

Agricultural Science Technology Indicators (ASTI) (2012), Publisher's name (Available at: http://www.asti.cgiar.org/data/?snapshotgeo1=LKA).

Central Bank Report of Sri Lanka (CBRSL) (varies annual reports 2010, 2011, 2012 & 2013), Colombo, section of Agricultural sector.

Chadha, G K, (2013), ' Is Third World agricultural R&D slipping into a technology' Current science, vol. 105, No. 7.10. pp. 908-913.

Gunasena, M. P. H, (2004), Enhancing agriculture research in Sri Lanka, Colombo, Sri Lanka Council for Agricultural Research Policy (CARP),

Manual, F., (2002).Proposed standard practice for surveys on research and experimental development, France, Organisation for Economic Co-operation and Development (OECD).

Stads, J. G and Herath, P. M, G, (2005), Sri Lanka_ Institutional Development, Washington, International Food Policy research Institute (IFPRI), ASTI.

Stads, J. G and Michael, R, (2012),Public Agricultural R&D in South Asia, Washington, IFPRI Agricultural Science Technology Indicators.