

THREATS OF MANGROVE FLORA AND THE MANAGEMENT ACTIONS; A CASE STUDY IN KALUWANCHIKUDY AREA

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ABSTRACT

Mangroves are the valuable resource estimated the extent of 8,000 hectares in Sri Lanka, of these, about 1421 hectares occur in Batticaloa District including Kaluwanchikudy area. The dominant mangroves present in this area are *Excoecaria agallocha*, *Sonneratia caseolaris*, *Acrostichum aureum*, *Pandanus tectorius*, *Cerbera odollam*, *Thespesia populnea* and *Ceriops tagal*. At present, the mangrove stands in Kaluwanchikudy area are threatened by anthropogenic activities including mangrove deforestation. The study was carried out at Kaluwanchikudy area to assess the impact of mangrove destruction with a view to propose management activities for the mangroves in this area. This study included the collection of primary and secondary data, the primary data has been collected through questionnaire survey with the stakeholder parties of the mangroves in the area including fishermen and other persons. The secondary data with respect to land use patterns and the extent of mangroves has been collected from maps, internet based surveys and Forest Department. MS Excel, SPSS and GIS software were used for the study. Based on the study, management actions for the mangroves in Kaluwanchikudy area are proposed, these include declaration of mangrove protected zones, restoration of mangrove denuded areas, launching mangrove re-plantation programs, and holding public awareness programs to stakeholder parties in the area including fishermen community and school children on the importance of mangroves.

Keywords: Mangroves, Deforestation, Survey, Restoration, Anthropogenic

INTRODUCTION

Mangroves are various large and extensive types of trees up to medium height and shrubs that grow in saline coastal sediment habitats in the tropics and subtropics. (NECCEDP, 2010).

The mangrove ecosystem is composed of two main parts, the terrestrial component and aquatic components. The aquatic part is also composed of marine and freshwater components, which cover along the bank tropical and subtropical rivers and coastline in the South, South-east and many other parts of the world (Kaleel, 2013).

According to this, the amount of mangroves in Sri Lanka rated about 8,000 hectares. The world has 64 types of true mangroves but, this unique ecosystem is home to over 20 true mangroves and the mangrove associates species of Sri Lanka. They remained about 8,000 hectares ground now. In these lands, we can see about 1,421 hectares in Batticaloa district including Kaluwanchikudy (CC & CRMD, 2014).

Less population area in the Eastern and the Northern west part of Sri Lanka has the highest amount of mangroves. They grew only a few hectares in the total lands of Sri Lanka. It has very less when compare with Thailand, Malaysia and Indonesia.

STUDY AREA

The study was based on Kaluwanchikudy, the partial area of Batticaloa, situated in South East part of Batticaloa District. This is located in the North latitude 7° 31' 3" and the East longitude 81° 47' 13". It consists of 45 Grama Niladhari Divisions and its population is 59,450 and consists of 15,466 families. It has an extent of 52.5 km².

OBJECTIVES

1. To identify the mangrove flora in Kaluwanchikudy area
2. To find the reasons of mangrove destruction in the study area
3. To formulate the solution for protecting Mangroves in the study area

METHODOLOGY

Primary Data

Required data and information related to Mangrove flora has been collected from the primary and secondary data sources. Sampling method has been used to collect primary data. Fifty samples have been collected by Questionnaire survey. These 50 samples were distributed to different stakeholders as follows; 20 government officials, 20 fisher man and 10 farmers. The lagoon area of mangroves was obtained by field observation and was identified the changes of a few years with stored data.

Secondary Data

Secondary data has been collected from Forest Department report, Coastal Resource Management Department report, Census report of Sri Lanka, images, and published research reports.

Data Analysis

Rainfall Data for the period of 10 years obtained from Meteorological Department was analyzed to examine the diminishing of Mangroves by flood. MS Excel, SPSS and GIS software were used for the study.

RESULTS AND RECOMMENDATIONS

The extent of mangroves in Sri Lanka is small compared to those Asian countries. Not only the area of mangroves in Sri Lanka is small, but also the mangrove extend, as a percentage of available land is lowest in the region. That means there is plenty of non-mangrove land available for agriculture and development projects (Kaleel, 2013).

Identified Mangroves Flora

- a. *Cerbera odollam*
- b. *Excoecaria agallocha*
- c. *Acrostichum aureum*
- d. *Sonneratia caseolaris*
- e. *Pandanus tectorius*
- f. *Thespesia populnea*

The lagoon area remains some different kinds of species including mangroves. According to questionnaire, nowadays, around 70% density of *Sonneratia caseolaris*, *Excoecaria agallocha* was highest in all these sites when compared with other species like, *Cerbera odollam*, *Acrostichum aureum*, *Pandanus tectorius* and *Thespesia populnea*. *Excoecaria agallocha* has poisonous latex exudates, which produce skin rash in humans when it touched. This poisonous plant is not popular for firewood, since the smoke is harmful to humans. Their leaves were not preferred by animals or

livestock. This may be the reason for high density of *Excoecaria agallocha* in the study areas.

According to the sample, 69% told, the density of mangrove species like, *Cerbera odollam*, *Pandanus tectorius* and *Thespesia populnea* and saplings were low in Onthachimadam, Kurumanvely and Periyakallar area. Two main reasons were noted. Firstly, impacts of tsunami and flood had destroyed mangrove cover. Secondly, pre-tsunami clearances of certain portion of mangroves by people as mangroves were thought as sites for mosquito breeding and hiding place for thieves.

Further, they use these areas to dump the garbage and grazing the livestock such as cow, goat. The major problem is inadequate protection and the administrative failure. Most of the stumps were not allowed to regenerate due to repeated cutting (during rainy days) and burning (during dry periods) for security reasons, this in turn prevents natural regeneration of mangroves. It appears that some people took advantage of the security situation for uncontrolled cutting and felling of the mangroves. Moreover, encroachment took place by means of cutting mangroves, fencing. These activities seriously threaten biodiversity of mangroves (Kaleel, 2013).

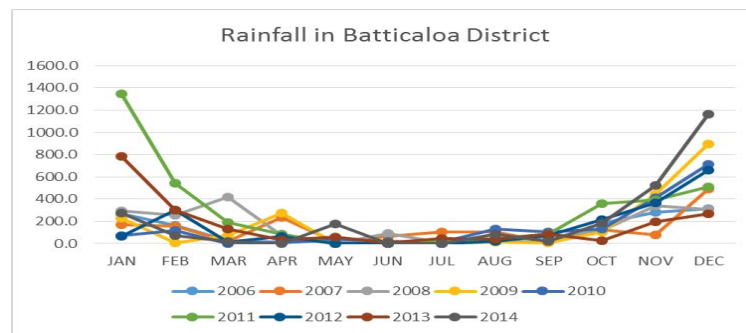


Chart 1. Rainfall in Batticaloa 2006 - 2014

The high rainfall caused to the flooding. The Rainfall trends (Chart 1) clearly show the differences of annual changes, and monthly changes. According to this, we experienced the huge rainfall in January 2011, 2013, December 2009, 2014 because of the climate change. During this period, we had experienced high flooding that caused to the mangrove destruction.

Mangroves forest diminished by 434 ha in Batticaloa, the main cause of this is the human activities, development as well as the natural disaster especially flooding.

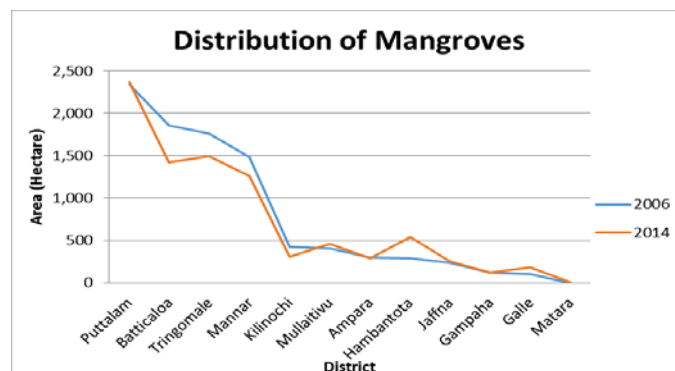


Chart 2. Distribution of Mangroves

The study has been identified, mangrove is important for the bio eco-system and the study suggests some solution to protect mangroves for the reason of smooth functioning of ecosystem at this area. It is required to take following measures; mangrove restoration, prevention of habitat destruction through legislation, creating awareness programs (School, University & Society level), mangrove re-plantation, create the rehabilitation for destroyed mangroves, declare as a protected zone, maintain with public support especially fisherman, increase the fish production and do the competition to the students (Art, Essay).

CONCLUSION

Mangroves are of particular significance in the context of coastal forests. Mangroves in Sri Lanka are the wealth of our nation. It provides many resources for us in many ways. When we increase the growth of mangroves, we can also improve the tourism (Kaleel, 2013).

Although this area has the largest mangrove tracts in the district and this region is seen as a centre for mangrove diversity, this is also the area in which the rate of loss of mangroves in recent areas. Less than half of the original extent of mangroves remains in area today. As a result, mangroves are most threatened ecosystems in the area. The following major issues are subjected to threads caused to Mangroves in Kaluwanchikudy area.

In addition, the fishing is the main purpose of the fisherman, they are constantly sustaining the mangrove resources. Recently, anthropogenic activities and the natural disaster interferes the mangrove environment of Sri Lanka. Mangroves have poor capacity to regenerate again in the cleared area over the last two decades. The overall tree density was low in Onthachimadam, Mahiloor and Kurumanvely when compared with other sites due to pre and post tsunami and flood impacts. The substratum for the establishment of mangroves was yet to be developed in a reasonable stage. Therefore, measurers must be taken to protect the mangrove forest in our country by the government of Sri Lanka, NGOs and environmental well-wishers.

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