

# HUMAN ELEPHANT CONFLICT: CASE OF AMPARA DISTRICT, WITH SPECIAL REFERENCE TO SAMMANTHURAI DIVISIONAL SECRETARIAT.

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**Abstract:** The association between man and elephant in Sri Lanka is ancient. Elephants being the largest terrestrial herbivores require relatively large areas and diversity of environments to forage. With an increase in human population density and changes in the land-use patterns, elephant habitat is being continuously reduced. Many species including Asian elephants face an increasingly conflictual relationship with humans when competing for space and resources. In Sri Lanka, approximately 50 human were killed by elephants and approximately 100 elephants were killed by human each year. The main objective of this study was to analyze the nature of human elephant conflict in coastal belt of Ampara district with special reference to Sammanthurai Divisional Secretariat Division (DSD) where a higher numbers of such incidences were taken place in recent years. The Primary data needed for this study was collected from Sammanthurai DSD which consist of 51 GND. The purposive samples were selected from GND where the highest number of incidents were reported. This study was conducted from April to September, 2016. Thirty households of farming community that were affected by elephants were interviewed. 15 were males and 15 were females. Farmers represented 90% of the total number interviewed. The households in the sample were affected by the elephants repeatedly frequency of the of attacks were recorded as 35 times per year between 2005 to sept 2016. Most of the time attacks by the elephants were taken place in the night. Highly affected crops by elephants were paddy, coconut, banana respectively. Considering the characteristics of farm families, the majority were low income people representing income categories of less than Rs/=50001-10000/month and less than Rs5000/= respectively. Majority of the people (85%) lives within 3 kilometers distance to the Wallathappitty jungle. However 12 human death, 5 elephant death, 16 human injurious were taken place in the human-elephant confrontations were taken place from 2005- September, 2016. All the farmers paid a payment for elephant protection to border guards. This is paid by money that Rs50/= per acre during the season. In Sammanthurai, Rs 1301250/= paid for elephant protection from 2005 to 2016 September. All the farmers paid payment for elephant protection to border guards. Only 3.5% of people were compensated for their losses out of total expenditure by government authorities.

**Keywords:** Conflict, Elephant, Human

## 1. Introduction

Asian Elephant has three sub species as *Elephas Maximus Maximus* (in Sri Lanka). The Sri Lankan elephant is endemic to the category of subspecies of *Elephas Maximus* (Deraniyagala, 1993).

A strong and healthy relationship, association is observed between human being and elephant in Sri Lanka since ancient time. No other animal has had such a close relationship with the people of Sri Lanka. Elephants were used for the religious purposes, special festivals such as Kandy Perahera and have been used for various types of work including moving hardwoods and hauling loads. However, the relationship between human and elephants has been deteriorated significantly over the past few decades. It would be difficult to imagine the island without the elephant. Despite its small size (65,610 km<sup>2</sup>), and high human population

(>20 million) Sri Lanka is home to at least an estimated 4,400 elephants, which represent roughly 10% of the global total of the Asian elephant in the wild (Kerf and Santiapillai, 2000).

Human Elephant Conflict (HEC) is the second most frequently reported disaster in Sri Lanka. This conflict as we see it today that the entry of elephants into human habitats, mainly to the small villages that are closer to forest territory where elephants live; causing destruction of their agriculture; and risk of death by elephants. Human-elephant conflict is increasingly becoming an issue in Sri Lanka.

The human-elephant conflict has existed since people started invading the habitats of elephants causing them to invade the villages and areas where people live, in search of adequate food and water. Elephants live in their own space even if there is a change in the population but as for humans, they clear forests and protected areas for wild life legally or illegally to get more lands to settle down ignoring the fact that it will result in the change of elephant and wild life habitats.

Many studies have been carried out on human elephant conflict in Sri Lanka. Charles and Santiapillai et al (2010) studied human elephant conflict in North Western province, North Central Province, Uva Province and Eastern Province and those studied about economic losses regarding cultivation damages, injuring and death of people and the pattern of elephant incursions. Gunarathna and Premarathne (2005) studied on assessing the effectiveness of electric fences introducing to control HEC in Sri Lanka.

In the Eastern region, human elephant conflict is high in districts of Ampara, Batticaloa. The study area in this study is located in the southern part of the Coastal belt of Ampara District. So much so, Sri Lanka as an agricultural country having paddy as the main crops supported by the farm such as coconut vegetable and other cereal crops are the main aspect of livelihood of the people.

In the case of Sammanthurai Divisional Secretariat(DSD) area in Ampara District where majority of the people depend upon agriculture for their livelihoods. But agriculture has been subjected to drought, heavy rainfall, pesticide and the threats of animals. It is on this problematic situation of clash between man and elephant that the researcher has come to focus on the impact of elephants on the progress of cultivators or farmers in Ampara District with special references to Sammanthurai(DSD), surrounded by the Ninatvur, and

Addalaichchenai villages, paddy fields on the East, Irakkamam village , paddy fields on the South , paddy fields, forest on the North and Wallathapitty ,Buddangala forest on West where new villages and settlements have come to be established due to the Educational Institute development, rehabilitation projects by the Government and Non Governmental Organizations.

This study also has its significance as recently various public opinions have been exposed about the inability of farmers in the Sammanthurai Divisional Secretariat area to cultivate paddy fields in the face of elephants trespass. In last year, 3 human death ,4 human injuries,1 elephant death occurred by human elephant conflict in the study area.So it has become major concern of the government and the policy makers to mitigate this problem for peaceful life of all the communities and sustainable development.

### **Profile of this Study Area**

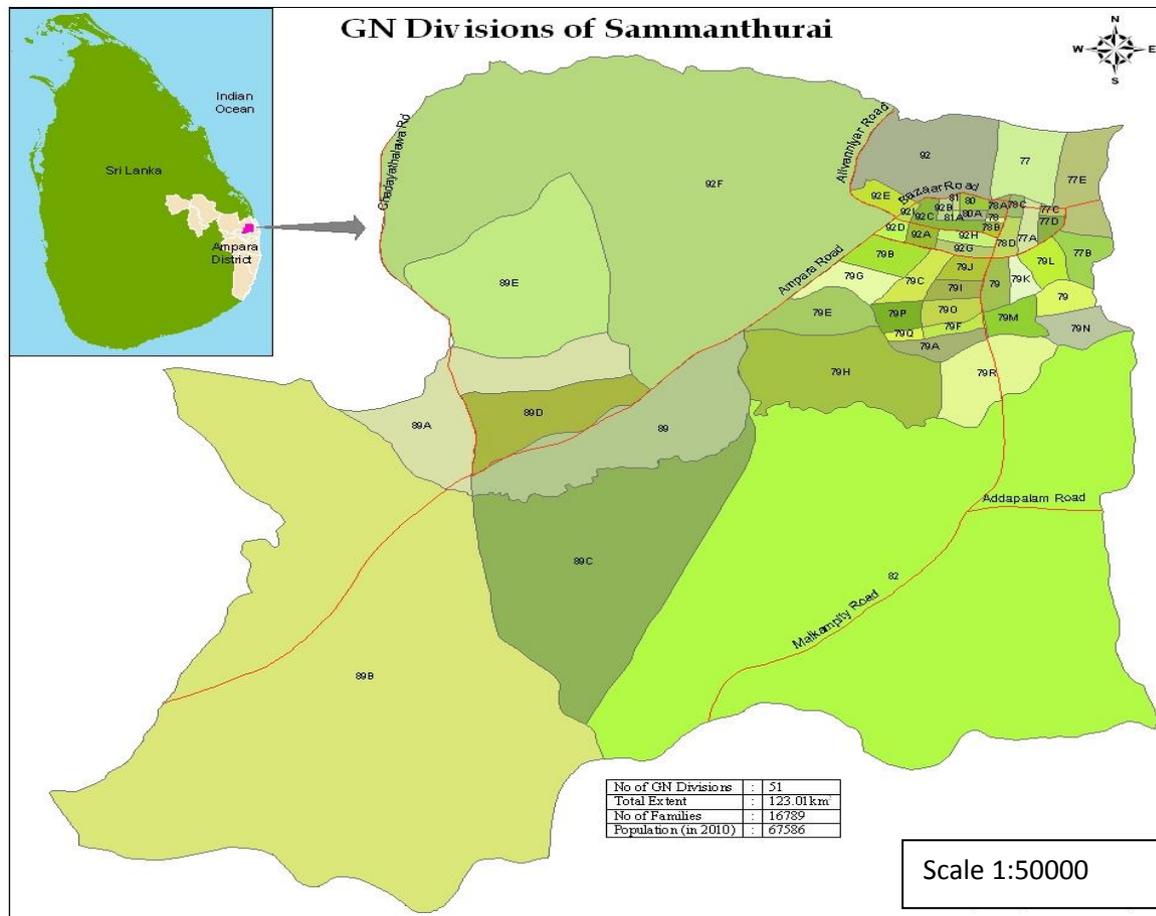
Sammnthurai (DSD)consisted with 51 GN divisions .This area is located in the dry zone of the country and receives 1735 mm of rainfall annually .The vegetation comprises moist monsoon forest, dry monsoon forest, riverine dry forest ,mangrove ,sparse forest. It is the study area where the multi ethnic communities such as Muslims,Tamils, Sinhalese andMuslims are living.The following table illustrates the profile of this area.

<b>NO</b>	<b>FEATURES</b>	<b>DATA</b>
1	Population	71279
2	Study area	123 sq km
3	Farm families	5763
4	Total family	18919
5	Area under paddy	21687.5(ac)
6	Samurthirecipients	8456

7	Other crop land areas (coconut, banana, vegetables )	24(ac)
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Source : Divisional Statistical information hand Book,Sammanthurai 2016

**Table 01: study area profile**



Source : Survey Department ,2016.

**Figure 1: Geographical Location of the Study Area**

## 2. Objectives

### 2.1 Main Objectives

The main objectives of this study is to analyse the nature of human elephant conflict in the coastal belt of Ampara District with special reference to Sammanthurai (DSD).

## **2.2 Specific Objectives**

- To assess the cost of Human Elephant Conflict in the study area.
- To study the risk and preventive techniques against Human Elephant Conflict in the study area.
- To identify how much the expenditure by the public to be used in this conflict.
- To recommend biological mitigation measures to reduce this increasing issue.

## **3. Methodology**

The primary and secondary data were used for the study. The primary data was collected mainly through survey using questionnaire from April to September 2016 and through field observations. The secondary data was collected from the study area from Government departments and other sources (Divisional Secretariat office, Wild Life Department, Forest Department, Agrarian Paddy Service Center, Insurance corporation for farmers, Irrigation Department, Farmers Organizations, Survey department, published research articles, books, related media, website).

Thirty households were selected for study. The selection of households has been based on the HEC data obtained from Wildlife Department of the Ampara. Of the 30 adults who were interviewed, includes 15 males and 15 females. Majority (90%) interviewed were farmers. The purposive sampling techniques were used for data collections and MINITAB, SPSS package were used for frequency analysis of collected data. Observation method was used for identifying damages (property, crops, life).

## **4. Results and Discussion**

### **4.1. Characteristics of the sample**

The study area including 51 Grama Niladhari Division consisted of agro based economy. Majority of the household heads (60%) engaged in agricultural activities while (16.67%) represent economically inactive and in self employment (Table 2).It shows that majority of employees represent informal private sector. Considering agricultural activities, the nature of the cultivation is presented in Table 3. The majority (91% )of majority among farmers were engaged in paddy cultivation while the second and the third priority goes to coconut, Chena cultivation and other crops.

<b>Employment of Head of the household</b>	<b>Frequency</b>	<b>%</b>
Government (Permanent)	-	-
Private (Permanent)	-	-
Private (Temporary)	01	3.33
Self Employment	05	16.67
Agricultural activities	18	60
Economically inactive	6	20

Source : Divisional Statistical information hand Book, Sammanthurai 2016

**Table 2: Employment status of household head from (2005-2016 September)**

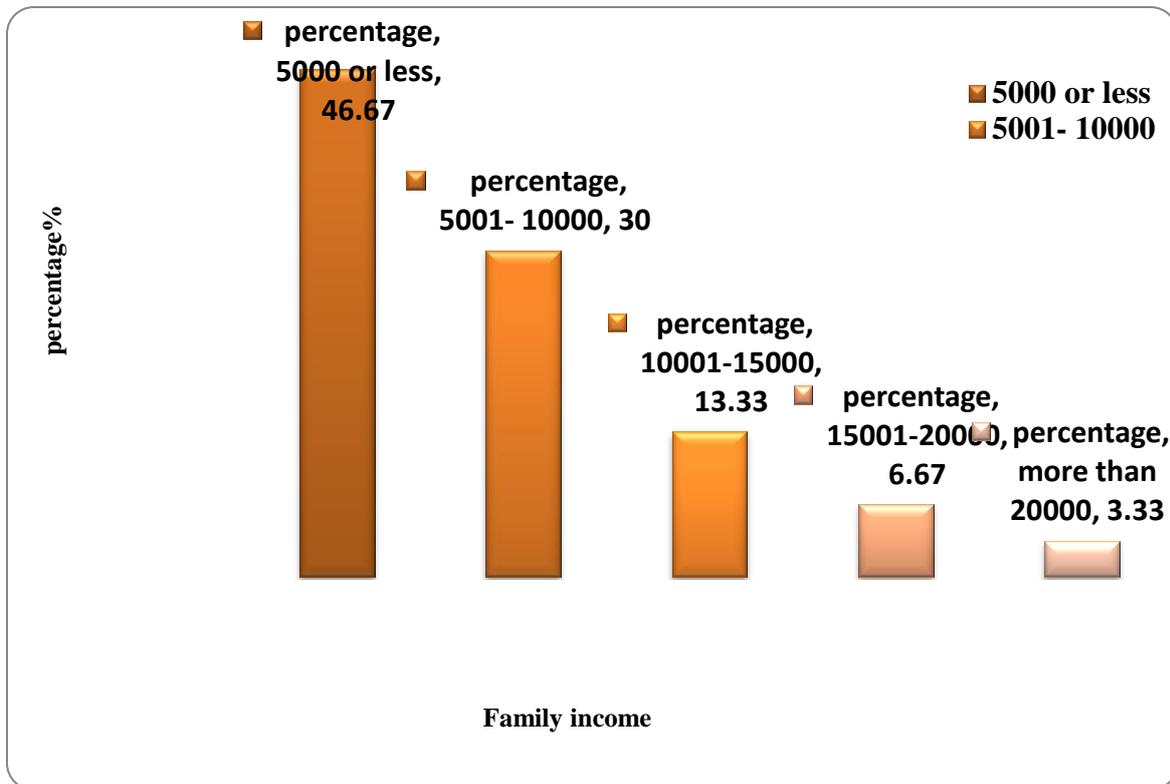
<b>Type of crops</b>	<b>Extent (ac)</b>	<b>Percentage %</b>
Paddy cultivation	2675	91
Coconut cultivation	480	3.5
High land crops	95	0.5
Chena cultivation	345	3
Banana cultivation	250	2

Source : Divisional Statistical information hand Book, Sammanthurai 2016

**Table 3: Nature of Agricultural activities (2005 –September 2016)**

The majority of household heads represent middle age of 50-60, while mean is recorded as 50 years old. Considering education, no schooling was 13% while the majority represents pre secondary education. Seventy four percentage of households have an income earner while

26% have two. Considering housing, majority of the houses were permanently built and 89% of houses were owned houses. Eighty seven percentage of houses were built using cement and 75% of houses were roofed by roofing tiles. Ninety fourpercentage of lands were owned by the people.

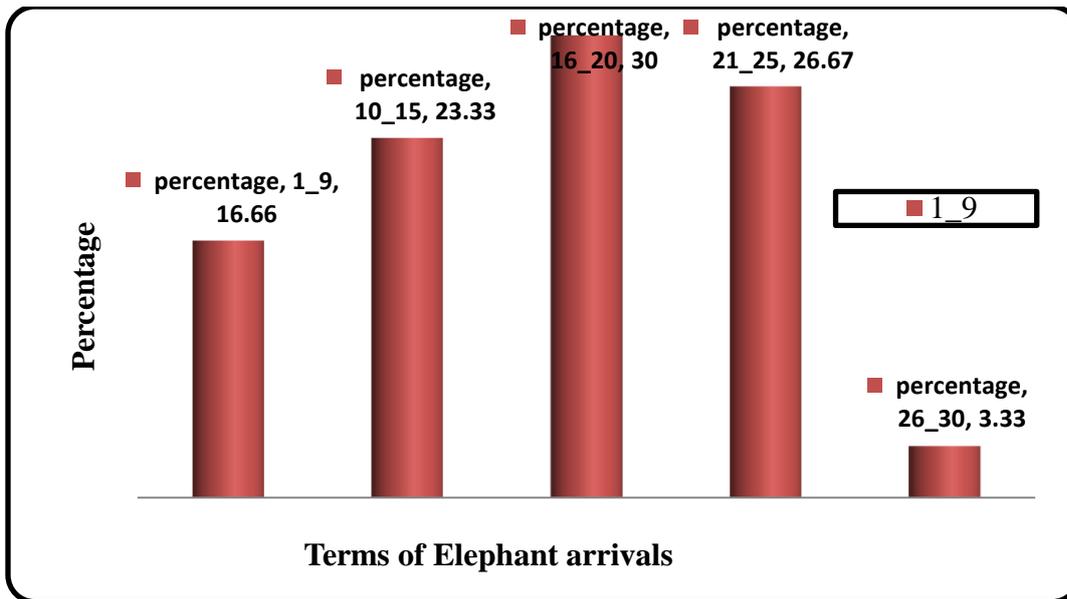


**Figure 2: Family income of household head.**

In view of family income, majority of households have less than Rs 10000/=income (66.67%) while only 3.33% have income more than Rs 20000/=. The mean income of a household was reported as Rs 7820/=.

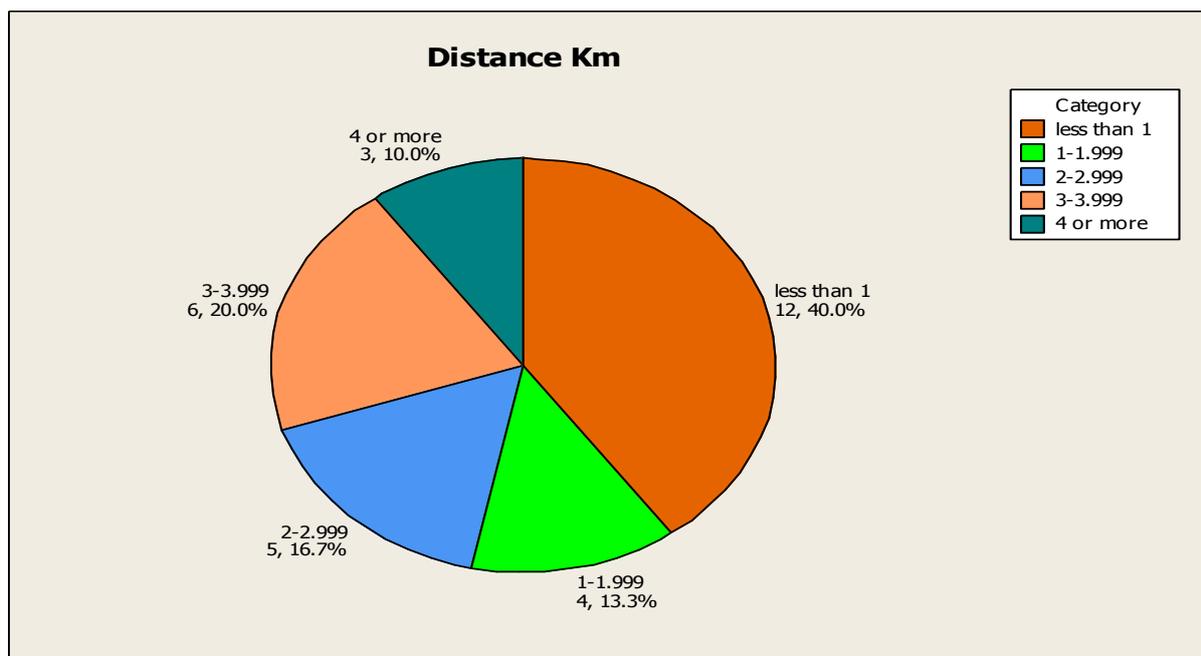
#### **4.2The Nature of the Human Elephant Conflict in the study area**

Regarding the frequency of arrival by elephants, majority reported that they have experienced 16-20 times is high in last year 2015. Twenty seven percentage of the households were arrived by elephant 21-25 times last year. Four percentage of the sample arrived by the elephant 26-30. Mean terms of elephant arrivals in the study area was 35 times per year.



**Figure 3: Terms of Elephant arrivals in 2015.**

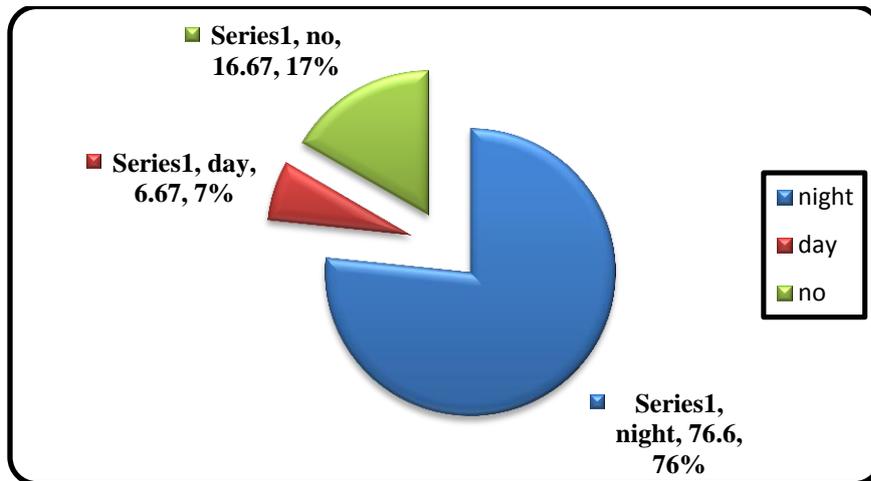
Distance between house and forest is another important factor to be considered regarding human elephant conflict. One of the key reasons for the arrival of elephants to the villages was that people are encroaching the territory of the elephant through cultivation or settlements.



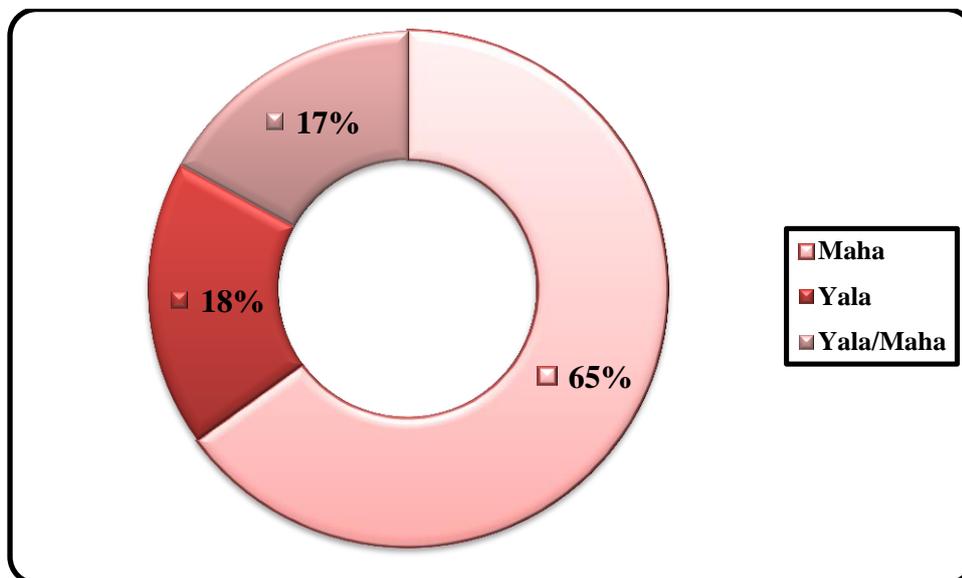
**Figure 4: Distance between house and forest.**

According to Figure 4, Forty percentage were living with the distance less than one kilometre to the forest while 13% of people live less than 2 kilometers distance from the forest. The majority reported that elephants came from Wallathapitty forest while 14% majority reported that elephants came from Pallakadu forest. Eleven percentage reported that they do not know from where elephant arrived. The routine of elephant arrival was further

examined according to the view points of people. Seventy seven percentage reported that elephants arrived at night while 7% says that they arrived at day time.



**Figure 5: Time of Elephants arrivals.**



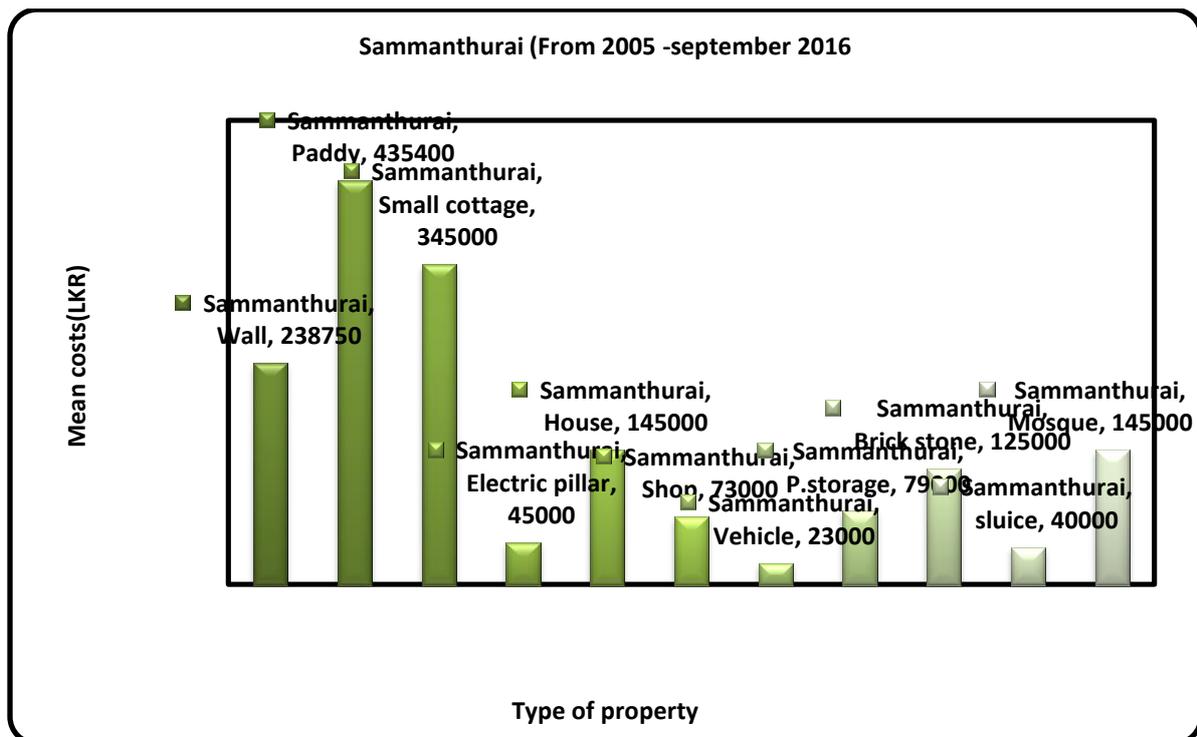
**Figure 6: Elephant arrivals by agricultural season**

Considering paddy cultivation majority reported that the elephant arrivals were high in Maha than Yala as given in Figure 6. Another important consideration was that , the times of the arrivals by elephants have been increasing last few years between 2005 to September 2016, the number of arrivals is rapidly increased.

### 4.3 The cost of Human Elephant Conflict

The cost of human elephant conflict is multi dimensional. Cost of human –wildlife conflicts is of three type: direct, indirect, opportunity costs(Thirgood ,woodoroffe and Rabinowitz,2005).Direct cost is imposed by crop,property and life damages and investment on capital and raw materials for conflict mitigation physical and mental costs due to dealing with risk and uncertainty always. Farmer’s lost time for protecting crops and property and compromised family security account for indirect costs. The foregone income from any or several of above reasons is considered as the opportunity cost of the conflict.

### 4.3.1 Property damage



**Figure 7 : Types of property damage in study area(from 2005 to September 2016)**

Paddy grain was the most commonly affected property (26%) by wild elephants followed by small cottage (20%) and wall of the house(14.1%) between from 2005 to September 2016.Mean property damage in Sammanthurai was around Rs 154014/=.

### 4.3.2 Crops damage

Paddy crop was the most commonly affected crop (53%) by wild elephants followed by coconut (13%) and vegetable garden(13%) between from 2005 to September 2016. Mean crops damage is around Rs 385887/=.

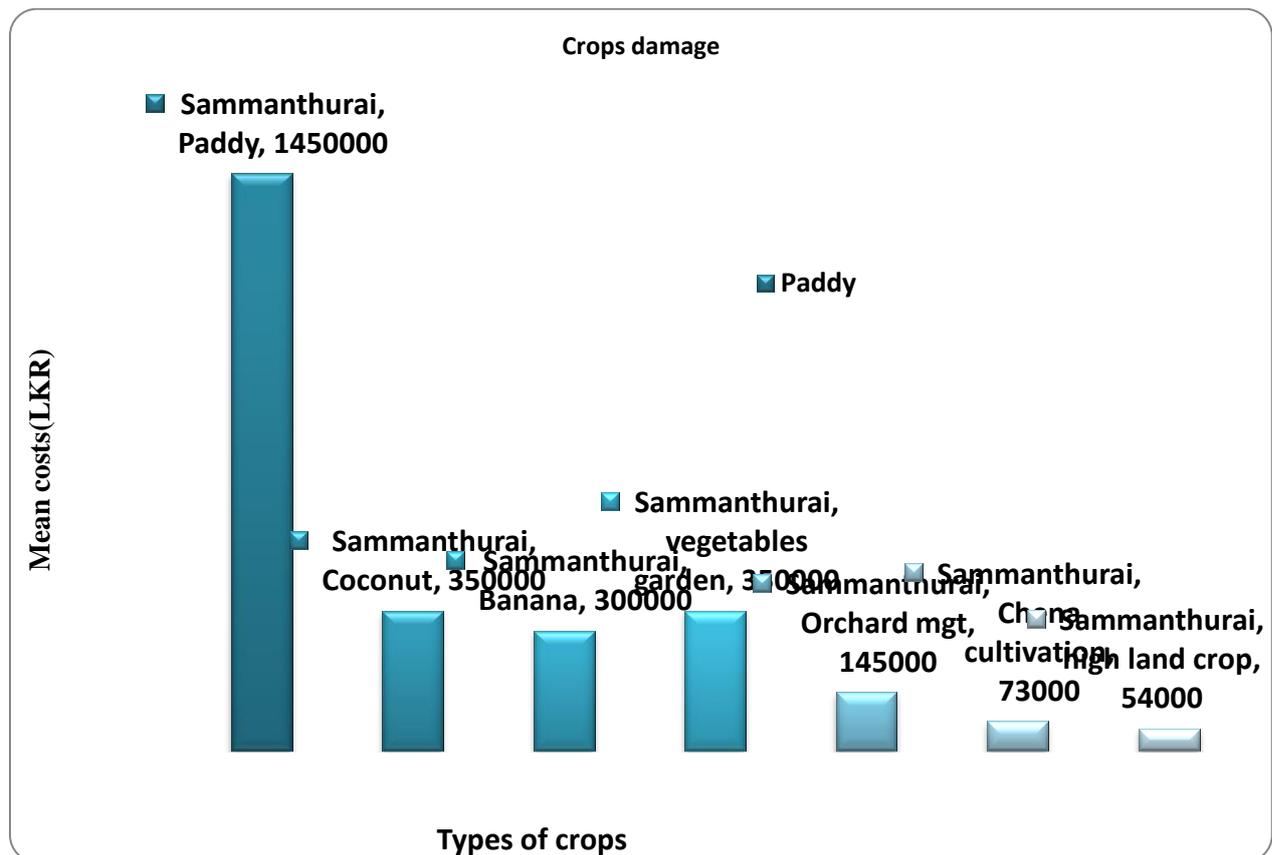


Figure 8: Type of crops damage (from 2005 to 2016 September)

### 4.3.3 Life damage

It was recorded 12 humans life loss from 2005 to September 2016 in the study area while there were 5 death of elephants, 16 incidences of injuring humans were recorded in the study area.

According to findings no compensation has been made for crop damage in Sammanthurai area. If farmer got insurance for their crops, at that time only compensation was paid to the farmers by government. Most of the Farmers do not apply for insurance in this area. Following the state circulars, life lost to the family was compensated with Rs 100,000/= by local government. Most of the people were not aware to apply for this compensation.

In 2013, 2014 years damage caused by wild elephant were comparatively higher than 2005, 2006. This cost of elephant arrivals for the cultivation and settlements, causes to be marked as elephant in the red list of endangered species in Sri Lanka.

## 4.4 Human- Elephant Conflict mitigation costs

### 4.4.1 HEC mitigation methods cost

Elephants raids usually take place from dusk to dawn. HEC mitigation tools or elephant deterrent techniques practiced in the area were watch guarding crops from field huts in the night, lighting lamps in the fields, use of battery –operated and electric torches or flashlights, burning firecrackers and erecting fences. Usually women don't take part in watch guarding. It is mostly done by the male household heads.

Community watch guarding was still practiced. Cost of the practice can be indirectly measured by the number of working hours farmers lose next day for sleeplessness in the previous night. In an average, a farmer sleeps 0.7 hours next day. Based on the present labor wage rates, which is Rs1000/day, daily opportunity cost of watch guarding by the farmers in Sammathurai is Rs 5,600/=. The need of watch guarding is different in the two agricultural seasons. It was 35 days for Yala and 45 days for Maha. Farmers do diverse crops as water availability abundant in Maha season. The varieties of paddy they cultivate in Maha takes a long time to mature when compared with that of in Yala. That demands more days of watch guarding against elephant raids.

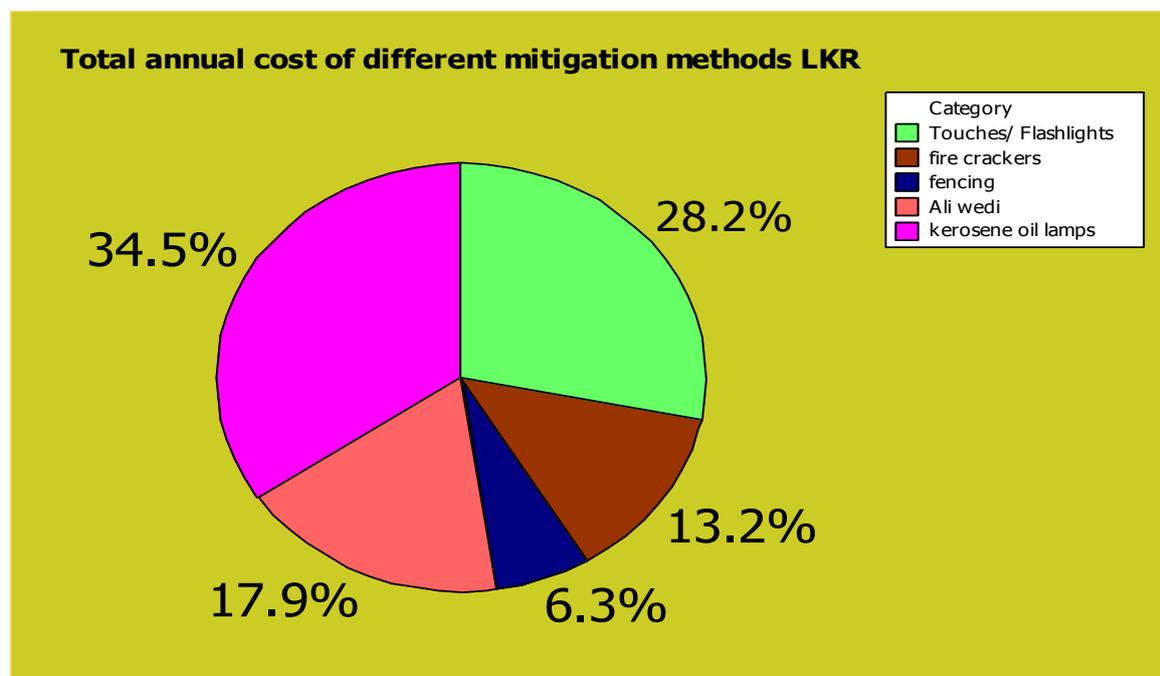


Figure 9: Total annual costs of different HEC mitigation methods in Sammanthurai (from 2005 to September 2016).

### 4.4.2 Payment for Elephant protection

The payment for persons who were protecting on the entrance of paddy fields during paddy cultivation season only, nearly 3 to 4 months, mostly paddy, as well as other crops and property were protected from elephant.

This payment was collected by Farmer organization of relevant paddy areas and distributed to relevant guards by the Agrarian Service Center. There are 15-25 guards are employed to protect paddy area and each guards gets a monthly salary of Rs25000/= and they were spending whole night and day at entrance point.

Unfortunately there is no guarantee for the lives of these guards. During the off season no guards were employed. Therefore the damages by the elephant cannot be stopped. And also no weapon were used to control themselves from elephant.

The farmers paid a fee of Rs 50/= / acre / season. In Sammanthurai, Rs 1301250 were collected for elephant protection from 2005 to 2016 September.

#### **4.4.3 Long –run welfare losses**

Does presence of wild elephants in neighbourhood adversely affect the children's education? About two thirds of the sample thought yes. 'It is a threat during the school run', 36 percentage explained while 13 percentage appreciated that elephant presence in home gardens disturbs children studying in the night.

Only two respondents identified household income loss to elephant crop raids has direct negative impacts on their children's education, in terms of possible lose level of investment following low income. One respondent reported that elephants could even damage school properties causing direct impact on education.

### **5. Conclusions and recommendations**

Human –elephant conflict in rural Sri Lanka is beyond a mere ecological predicament and is connected to socio-economic and local politics. Underprivileged, low income societies get low educational attainment and subsequently the youth start early marriages. Newly settled families encroach forest habitats for farming. Poor education doesn't return to better wages. Majority of the young crowd turn to farming. Farming is a huge challenge for changing weather patterns and is also severely affected by HEC as explained in results and discussion.

Farmers expenses on mitigating HEC compromises their expenditure on most important household needs like food, medicine, farming and education. According to the findings of this study there are human – elephant conflicts prevailing in Sammanthurai Divisional Secretariat area and farmers and their livelihood activities as well as elephants also had been annihilated. This critical and dreadful situation directly put the blocks and hindrance in achieving the sustainable developments. To overcome these problems and to attain the sustainable development, the measures of government should be implemented properly to solve the problems at the bottom level and the farmers also should actively involved in the programme of the kajamithuro organizations.

According to the above findings following recommendations are made as the final contribution of the study.

The study has identified that the highest damage made by elephants was related to the agricultural activities especially the Paddy cultivation. The main reason for this is that people were encroaching the residence of elephants for the purpose of cultivation. Therefore, a proper management in paddy cultivation integrating with land policies is an essential attempt which should be considered by the government authorities. Considering Chena, Vegetable, Orchard cultivation crops which elephants do not prefer such as chilies should be cultivated as a boarder of the cultivation area to avoid their coming.

Since Sri Lanka has been facing new economic approach based on tourism today, wild life based tourism could be expanded and this would help to protect elephants in the sense of economic advantages by the people. Awareness programme should be introduced by environment related government and non governmental authorities on cultural and economic values of elephants for the community and especially the younger generation through school syllabus. National dialogue on protecting Sri Lankan elephant should be promoted through media campaign because elephant is one of the national marks in Sri Lanka and mapping elephant corridors in the area is very much essential to prevent this issue. Proper compensation schemes and insurance schemes should be introduced to recover the loss of people with the support of government. Resettlement of the people out of the elephant corridors is yet another alternative to this. The government should provide weapon, training, life insurance for boarder guards, introduce the biological fence with palmyra, lime and also bees fence with bees that help to pollinate for crops.

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