Master Thesis

The possibility for developing a sustainable strategy to solve the conflict between local people and Elephants in Hambantota District, Sri Lanka.

By
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The master thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

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Abstract

The emphasis on fostering state-community synergy for improving human well-being and sustainable development has been recognized in development circles and especially in Third World countries. This recognition is apparent to solve social as well as developmental problems. In the past thirty years, conflict has been a major challenge for the development process of Sri Lanka. Not only for the North and East, the conflict affected the entire country in several ways. Sustainable Development is the most important requirement to any country today. The authority should have a sustainable strategy when they are implementing the development projects to ensure both economical and environmental sustainability.

The Hambantota District is located within the southern province of Sri Lanka. The sudden rise of the development activities under the President Rajapaksha`s government has being making a tremendous difference in the district. Six years ago the Hambantota District was a one of the major rural districts of the SriLanka. During the last few years the Human Elephant conflict has gone up abundantly in the Hambantota District. Therefore, this study seeks to explain the possibility for developing a sustainable strategy to solve the conflict between local people and Elephants in Hambantota District. Not only that, further from this study the researcher tries to explain the human elephant conflict in Hambantota District and whether, there are any relationships between the HEC and development projects in the Hambantota District.

A qualitative research methodology, based on semi-structured in-depth interviews and focus group discussions provides the research framework of the study. I intend used following methods for data collection methods, Interviews, Observation, Focus group discussion, Snow ball sampling, Analyzing text and document.
The environmental disorder if not sudden environment change can make a prominent disparity to the nature. The findings show that, there is lack of synergy between the process of development Hambantota district and consideration of the wild elephants in the area and which sidelined the energies of the society needed to complement state efforts to provide amicable solutions to the human-elephant conflict in Hambantota District.

Acknowledgement

Declaration by candidate

I hereby declare that the thesis:

The possibility for developing a sustainable strategy to solve the conflict between local people and Elephants in Hambantota District, Sri Lanka.

has not been submitted to any other universities than the University of Agder for any type of academic degree.

Ajith Wasantha Liyanage   1st of June 2012

Table of Contents

List of Figures

List of Tables

List of Appendices

Abbreviations and Acronyms

DR   Department of Railway

DWC   Department of Wildlife Conversation

EIA   Environmental Impact Assessment

ETH   Elephant Transit Home

HEC   Human Elephant Conflict

INGO   International Non Governmental Organizations

NGO   Non Government Organization

NPPD   National Physical Planning Department

PS   Pradesheeya Saba (Second highest Local Authority in the District)

RDA   Road Development Authority

RWAF   Ruhunu Wellassa Area Foundation

UDA   Urban Development Authority

GS   Grama Sevaka

Definitions

Ali Wedi – This is kind of giant crackers providing by the department of wild life conversation to the villagers to explode during the elephant attacks to drive them away.

Chena Cultivation - Chena (Slash and Burn) cultivation is one of the most old type of cultivation practice among most of the tropical countries. The Chena cultivation, involving cutting down of virgin forest and burning and clearing of land that leads to a formation of barren Chena lands, is still taking place and increases from year to year in Sri Lanka. (ERA :2009)

Elephant – Elephas Maximus/ Elephant is a mammals (Animals that drink their mother`s milk) Elephants are the biggest animals that walk on land. One fully grown elephant can weigh as much as 85 adult humans. Elephants are also very tall. They can be as high as 3.5 meters. An elephant has the largest brain of all the animals that live on land. They can even hear sounds that humans cannot hear. Elephants live a long time, sometimes as long as 70 years.

ETH (Elephant Transit Home) – this was set up for orphaned elephant looking after until they fit to release to the jungles.

Goad/Ankus – A long stick, with a hook on one end. The elephant keeper uses the stick to guide the elephant.

GS - Grama Niladhari/ Grama Sevaka, Official Sri Lankan Government representative for each village Division

Hakka Patas – Locally made dynamite to kill wild animals like Wild boar, Elephants etc. This is something like a ball (similar to base ball size) which is conglomerate with rotten flesh of fish or chicken and gun powder. It has a very good smell to abstract wild animals and when they chew the ball their jaws blasting and dead. This is illegal. "A small pressure mine concealed in fruits or

vegetables, which shatters the jaw on being bitten down upon." (Fernando P, Jayewardene etc: 2011:96)

Mahout - The person who look after and can control the elephant

Pinnawala Elephant Orphanage – The 1st elephant orphanage was set up in 1975 by the purpose of providing the shelter for elephants who's becoming orphans due to HEC. Today there are 88 elephants and 48 mahouts to look after them.

Samurdhi – A projects conduct by the Samurdhi authority of Srilanka to uplift the life conditions of the poor community of the Sri Lanka.

Single Elephant – An elephant who threw away from the group. When a single male elephant is roaming in the jungle/village, peoples know that it's a really aggressive.

Tusks – The long front teeth of an animal. African elephants and some male Asian elephants have two tusks.

World Vision Lanka – World vision is a Christian relief, Development and advocacy organization dedicated to working with children, families and communities to overcome poverty and injustice.

Yala and Maha - There are two cultivation seasons namely; Maha and Yala - which are synonymous with two monsoons. The Maha Season falls during "North-east monsoon" from September to March in the following year. The Yala season is effective during the period from May to the end of August.

Chapter 01: Introduction

1.1. Background

The history and pre-history of Sri Lanka has goes back millions of years. During its history the relationships with the elephants were remarkable. Sri Lanka has a written history starting from 600 BC. The entire History has been mentioned in the book called "Mahawansa" (The great Chronicle - provides a continuous historical record of over two millennia and can be considered as the world's longest unbroken historic record – The mahawamsa: 2007). There are several passages illustrating human and elephant relationships of the past within this historical timeframe. Jayawardena (2006:) for example writes that "A 12th Century inscription on a stone seat at Polonnaruwa records that King Nissanka Malla sat upon it while watching elephant fights. These fights were staged for the entertainment of nobles".

There is historical, archeological and anthropological evidence to prove that we have been domesticating elephants throughout history. Often these relationships were very close and often even symbiotic. Even today any Sri Lankan can easily observe that domesticated elephants do not stray too far from people. This may be in jungle camps, temples, zoos, circuses, religious pageants, processions and houses. (In Sri Lanka there is habit especially among the richest people in society, to look after elephants (sometimes as a pet) in their gardens as it is seen as a symbol of opulence and luck for their family and great honor for elders).

Most Sri Lankan Kings had armies of elephants. They were very helpful in defeating adversaries during the war. They were however predominantly used for peaceful purposes such as constructions activities, transportation, in religious activities, state and royal occasions, jungle clearing, plowing in agriculture, construction of large reservoirs, trade with other countries etc. Historically the elephant has been revered and worshipped as a God, used as a warrior, ambassador, beast of burden, and has held a central place in Asian civilizations. (Fernando P, Kumar M.A, Williams A.C, Wikramanayake, Aziz T and Singh M : 2008)
Among the folklore there are stories which explain the human elephant relationship in the country. Buddhism has a very close relationship with animals and among them the priority goes

to elephants. According to Buddhism the Lord Buddha had lived previous lives as an elephant. This could be a significant factor for the human elephant relationship in Sri Lankan history.

Further the human elephant relationship in Sri Lanka can be recognizing as a culture. As a separate subject, the language of human-elephant communication is available as a study in Sri Lanka. There is an elephant language, sign language, training system, domestication techniques, people to control (Mahout – The person who can control the elephant/the person who look after the elephant), elephant medical system etc. Actually it is really hard to find instances of Human Elephant Conflict (HECs) in the history but today the entire situation has changed and is arising as common issues across the country.

The issue is especially acute in a few districts in contemporary Sri Lanka. Among those districts the issue is more critical in Anuradhapura, Hambantota, Monaragala and Batticaloa. Humans and elephants have lived harmoniously for thousands of years and it is therefore important to conduct research to understand the reasons for current human-elephant conflict.

1.2. Brief Contextual Overview

The part of the chapter explains the history of the issue and how it became more serious today. The human-elephant conflict (HEC) is a term that defines a growing problem in the Asia today. Sri Lanka is one of the country most suffering from significant HECs during the last couple of years in Asia. Therefore addressing the issue in different ways could be more effective for with the countries huge development processes. After the 30 years of war the government is now expected to accelerate the development of the country. In the existing development process of the country the HEC is seen as hindering that process. Therefore studying this issue is important. This focus is especially true for the study within Hambantota District which is now seeing massive development projects being undertaken. This development is placing stresses on both human and elephant populations in the area and which both are significant stakeholders in the process. Hambantota District is projected to become a major economic hub in the southern Sri Lanka despite the growing HEC existing in the region.

Today elephants are considered as valuable creatures in the world yet they are already are an endangered species. "Throughout history, the elephant has played an important role in human economies, religion, and culture. The immense size, strength, and stature of this largest living

land animal have intrigued people of many cultures for hundreds of years" (Bagheera : 2010; 01). Gradually the Elephant population has begun decreasing due to human activities. "It is reported that at the beginning of the 19th century there were 19,500 wild elephants in Sri Lanka. A hundred years later indiscriminate capture, hunting for 'pleasure' and the destruction of elephants as agricultural pests catastrophically reduced the figure to just 2,000" (Elephants and elephants conservation in Sri Lanka : n.d). Therefore, humans have a big responsibility to protect this animal. Elephants need a large amount of habitat because they eat much more than other animals. Humans have become their direct competitors for living space. "Humans do not regard elephants as good neighbors. When humans and elephants live close together, elephants raid crops, and rogue elephants (aggressive male elephants during the breeding season) rampage through villages. Local people shoot elephants because they fear them and regard them as pests" (Bagheera : 2010).

According to the most updated government census there are more than 6000 wild Elephants in Sri Lanka. But the tragedy is that almost 200 Elephants are killed each and every year in Sri Lanka. "Sri Lankan elephants are a subspecies of the Asian elephant and can only be found here" (Jayasinghe U: 2011) Therefore the taking greater steps at conserving this asset is important. The Sri Lanka population is around 20 million and according to the census which was conducted last year elephant's population of Sri Lanka is between 5500 and 6000. (But according to other specialist on the subject it should be more than that like 8000).

The man elephant ratio is 5000:1 as well as about 5 square km of land is needed to support an elephant in its forest habitat. (Biodiversity and Elephant conservation trust: 2011). The man elephant ratio is increasing gradually while the size of land area to feeding for elephants is also decreasing. "Reducing habitats and the resultant Human Elephant conflicts, which records the deaths of both the humans and elephants, is the greatest threat to Sri Lanka`s wild elephants population" (Biodiversity and Elephant conservation trust: 2011)

1.3. Research Objectives

The main objective of the study is to investigate the relationship between Hambantota mega development projects and existing HEC in the district. The proposed area for the development projects were once jungle and before the project was started an area that was inhabited by

elephants and other wildlife. Back then there was no significant HEC and is clearly worse today. Elephant attacks on the community and agricultural lands are gradually increasing and humans tend to kill the animals purposely and skillfully increasing.

The following Research Questions (RQ) will address the research problem:

RQ 1: To what extent does the elephant represent a serious problem to local communities in Hambantota?

RQ 2: How has the urbanization of the Hambantota district influenced the human elephant conflict?

RQ3: How can elephants are utilized as an important resource for Hambantota development projects?

RQ 4: What strategies have been tried to solve the elephant problem, and to what degree have these strategies been successful?

RQ 5: What could be the role of wild life conservation organizations?

1.4. Methodology in brief

The data collection was carried out during the period of December 2011 up to the March 2012 within the Hambantota District in Sri Lanka. Especially the data collected from the entire Hambantota district by randomly checking the places where the HEC is being exists. The qualitative method was mainly used for data collection and the thesis included with two major case studies.   The thesis have been used for data collection mainly methods such as Qualitative Interviews, Observations, Focus group discussion, Analyzing text and document etc.

1.5. Data collection Methods

I intend used following methods for data collection methods

- Interviews
- Observation
- Focus group discussion
- Snow ball sampling
- Analyzing text and document

1.6. Thesis Outline

Chapter 01

From the first chapter I pointed out the introduction about the thesis as well as background of the thesis. Further I have mentioned about the thesis questions and objective the research very briefly. Besides this chapter included brief contextual overview and small summery of the methodology. Further, at the end of the chapter I have mentioned the ways of data collection for this thesis. In addition to that the chapter explains about the challenges I faced when conducting the research.

Chapter 02

The second chapter explains some general statistics about the SriLanka and further it does explain about the Hambantota district in details. Further it will explain the statistics about the Hambantota District such as Geologic factors of the district, social and economic profile in detail.

Chapter 03

This chapter will be explaining literature review and theoretical framework of the research. It does include historical evaluation of the Human Elephant conflict of the Hamabntota districts.

Chapter 04

Fourth chapter will be explaining about the methodology uses in this research. Further it will explain research strategy, designing, sampling and data collections strategy (Interviews, Focus Groups discussion, informal conversation and observation) as well. In addition to that the chapter does include the data analysis and challenges faced during the study.

Chapter 05

This is will be explain about all the ongoing development projects in the Hambantota District very briefly using with maps and photographs. Besides it will presents into what extend the concept of Environmental impact assessment used while planning the projects.

Chapter 06

Chapter 6 will be explaining two major case studies in line to the HEC in the Hambantota District. Both case studies are really related to the issue.

Chapter 07

This is the most important chapter n this thesis. Within this chapter I will try to explain the issue in line with my research question by analyzing the findings from the field works. At the beginning of the chapter I will try to presents some information about the elephant barriers using in the district since future and up to date. Then, few details about the government policies have been declared about the subject. Further here I will be explain my analysis in different perspectives, such as Agriculture, Security, Respecting Elephant, Lack of Knowledge, Financial Assistance, Communication model when applying financial re-coverage, Relocation of Elephants and Insurance Scheme for the victims etc.

Chapter 08

Last but not least, this chapter goes with Conclusion and suggested recommendations.

Chapter 02: Contextual Overview

2.1. The Sri Lanka – Hambantota District

Sri Lanka is an Island which is located about 31 Kilometers off the south coast of India. It is situated in the Indian Ocean in a strategic location in relation to shipping lanes. Sri Lanka has very good harbors of varying importance dotting its coastline. Today its population is 20 million. There were several ancient names for Sri Lanka such as Taprobane, Serandib, Ceilåo, Ceylon, pearl of the Indian Ocean, etc. On February 4, 1948 the country won its independence as the Commonwealth of Ceylon. In 1978 it was changed to "Democratic Socialist Republic of Sri Lanka".

Sri lanka has a very long history going back to the pre-historic age. In 123,000 BC the oldest human remains were found in Sri lanka at Pathirajawela in the deep south very close to the Ambalantota (In Hambantota District) (ScenicSrilanka.com:n.d.). Archaeologists have found remains of animals such as lions, rhinoceros and hippopotamus from excavations in the Rathnapura area. According to the carbon dating some of those remains are from as long ago as 80,000 BC. This evidence shows that Sri Lanka has long had high levels of biodiversity.

Today Sri Lanka is a multi-religious and multi-ethnic nation. The Sinhala community forms the majority who are Buddhists. Other citizens are Tamil, Muslim and Burger. When we compare with other countries in the region the specialty of Sri Lanka is the variation of climate. The entire country has about 65,000 square miles and within this small surface area the climate has drastic variations. A cool climate exists in the central highlands while at the same time hot climate can be found along the coasts and in the south. The "Island has a pleasant tropical climate and average temperature of the low lands ranges between 25-30 degrees Celsius." (Mahawamsa: 2007)

After over two thousand years of rule by local kingdoms, Sri Lanka became a colony of (in sequence) Portugal, Netherlands and finally Britain. During the age of kingdoms Sri Lanka was known for exporting cinnamon, cardamom, gems, ivory, and elephants etc. According to the ancient evidence and archeologist they have been found plenty of evidence to prove them. And also according to the evidence were found the Asian elephant had a big demand from European countries rather than African elephants. Because, when compare with the African elephants

South Asian elephants can easily tame. Most of the time Merchants were arrived from Middle East, Persia, Burma, Thailand, Malaysia, Indonesia and other parts of the South for buying the Sri Lankan elephants.

2.1.1. Hambantota District - History, Socio Economic Context, Geography

Hambantota district is considered by many to be one of the most important districts in the country due to its geographical situation and historical value. Further, Hambantota ranks as the third poorest district in the country and the poorest coastal district in the country, recording 32 percent of its people as poor." (Research Paper: 2005:02). It has wilderness sanctuaries, sacred places, ancient tanks and a long coastline along the Indian Ocean. The land is fertile and today it is gradually becoming an economic hub of the country.

Hambantota District stretches along 130 km of the southeast coast of Sri Lanka from the southernmost tip of the Island to the river Kumbukkan Oya in the East. It is largely a rural District with a small number of interior towns, amongst which are Beliatta, Sooriyawewa, Middeniya, Walasmulla and Lunugamwehera. The principal coastal communities include Tangalle, close to the border with Matara District, Ambalantota and Hambantota in the central coastline, and Kirinda close to Yala National Park that straddles the borders with Ampara and Monaragala Districts.

The area of study for this research is in southern part of Sri Lanka in Hambantota district within and around a couple of Wild Parks. The Hambantota district lies southeast of Colombo. The District comprises of 12 divisional secretariats (DS) and has 592 Grama Niladari (GS) divisions, the smallest unit in the administrative structure in the country. The district covers an area of 2609 square kilometers and a shoreline of 130 km. There are two urban councils (Hambantota Urban Council and Tangalle urban Council) and 10 pradesheeya Saba(Divisional secretariat divisions) (PS) (Ambalantota, Angunakolapelessa, Beliatta, Tangalle, Weeraketiya, Lunugamwehera, Tissamaharamaya, Katuwana, Hambantota, Sooriyawewa) in Hambantota District. (Statistics: District Secretariat Hambantota)

Agriculture in the district is dominated by smallholder production systems and irrigated agriculture is the mainstay of agricultural activities (7th largest paddy production district of the country) and the coastal belt provides a large proportion of the country's marine and lagoon fish. Currently the area is becoming increasingly significant nationally because of the ongoing mega

projects. It has plenty of bare lands which can easily be cleared for construction. The elephant conflict in this area does not have a long history since a couple of years ago the area was quiet and calm with few if any significant development. Elephants had a plenty of space to graze and farmers had good opportunity to continue their cultivation without any destruction from the wild animals. The phenomenon however, began between 3 and 4 years ago, after the mega development project of the district began and today the situation has become rather controversial with several HECs reported daily.

Hambantota Overview according to the Urban Development Authority (UDA): (UDA: Sources)

Hambantota District (General Information)	
Population	206, 588 (Year 2001)
Extent of the area	113, 200 ha
Population Growth rate	1.4%
Population Density	1.87 Per ha
Housing Units	34, 663

(Table 01: General information of Hambantota District)

Local Authorities – Hambantota Urban Council, Tangalle Urban Councils, Hambantota Pradesheeya sabawa (PS), Lunugamwehera PS, Sooriyawewa P.S, Ambalantota P.S, Tissamaharama P.S, Beliatta p.s, Angunakolapelessa P.S, Weeraketiya P.S, Katuwana P.S and Tangalle P.S

Among the all local authorities the HEC existing within most of the local authorities apart from Ambalantota P.S, Tangalle, Beliatta, Angunakolapelessa, Weeraketiya and Katuwana

Hambantota District Key Demographic data is presented below to provide an overview of the Distrct.

Population	Rural – 503,410 (95.6%)	Population Male	263,197 (50.0%)
Population	Urban – 21,571 (4.1%)	Population Female	263,217 (50.0%)
Population	Other – 1,433 (0.3%)		
Population	Total – 526,414	Total Population	526,414

The ethnic composition of the District is comprised: Sinhala 97.1 per cent; Tamil 0.5 per cent; Moor/Malay 2.5 per cent.

The classification of population indicates a predominantly rural district with an agriculture and fisheries-related economy. The percentage of rural poor population is around 95% more than the national average and an important factor in considering economic development activities.

Literacy Rate			
	Total	**Male**	**Female**
Hambantota District	88.9%	90.0%	87.0%
National	91.1%	92.6%	89.7%

(Table 02: Literacy rate)

The District literacy rate is below the national average despite an increase of forty-four Government schools and over 4,464 teachers between 1972 and 2001.

Income   Minimum expense per person per month for basic needs

Hambantota District   Rs.2, 915.00

National   Rs.3, 025.00

As well as having a lower than national average gross value added rate, the overall earnings average in the district is marginally below the national poverty line. This demonstrates the need for specific actions to improve skills and output, as well as development investment.

Hambantota ranks as the fourth largest rice-producing district, with 54,129 acres under cultivation. The 2009 Yala (There are two major cultivation season in Sri Lanka call Yala and

Maha) season saw the second-highest yield at 4,591,000 bushels. These statistics confirm the District's success in, and commitment to, agriculture.

Hambantota is in the arid region, is susceptible to drought and is vulnerable to climate shifts. Available groundwater is limited and that which is available is frequently contaminated with a high salt content. Nevertheless, the region is more heavily reliant on agriculture than the national average and over 95 percent of the population is classified as "rural" 16 percent higher than the national average.

Although Hambantota is traditionally referred to as a "rural" region, implying a major reliance on agriculture, in reality, its employment profile is somewhat more complex. The 44 per cent of the working population engaged in agriculture is significantly higher than the national average of 32 percent. However the proportion employed by industry, at 27 per cent, is equal to the national average. Despite vigorous efforts to promote tourism, the service sector (which includes hotel and resort operations) represents a lower proportion of employment than the average for the country, a complex development failure that historically reflects both demand and supply shortcomings. Furthermore, the rate of employment in the private sector is 22 percent less than the national average.

Most of the roads in the Hambantota Districts are very common with the notice like "Elephant crossing" signs.

Figure 01: (Photograph by Researcher) – Some common signboard you may seen by the roads of Hamabntota District.

This means, there is no proper fence along the roads and most of people travelling during the night along this roads are vulnerable. Again as we see in the above picture this kind of sign boards are not properly managed by authorities and very commonly it is difficult to recognize such a sign boards at night. Therefore it is common that elephants and people meet each other face to face during the night and conflicts occur.

The Hambantota district rich with the wild life and 568 km^2 of protected wild life conservation abitat, 223km^2 of designated agricultural lands, 43 cultural heritage sites, 7 forest conservation areas and 215km^2 of inland water. (Hambantota 2018 the commonwealth game candidate city: 2011)Forest and Parks: Hambantota is rich in fauna and flora, with three major National Parks located in the District, Yala National Park (97,880 Hectares), Bundala National Park (6,216

Hectares) and Lunugamwehera National Park (23, 498 Hectares). Additionally, there are some bird and animal sanctuaries located within the district – Namely, Weerawila (4, 164 Hectares), Ridiyagama (4,273 Hectares), Pallemalala (13.7 Hectares) Kalametiya (2,525 Hectares), Nimalawa (1,065 Hectares) and Madunagala (995 Hectares). (Statistics: District Secretariat Hambantota)

The Hambantota district has a couple famous places among the visitors. There for during the seasons many people roaming here and there. The Udawalawa national park`s one margin running along with the main road and today some of the elephants used to come to by the fence and getting feeding by the peoples. This is quite dangerous as well as at the one end kind of encouraging the elephants come out from the wild parks. Today is being built an 11 kilometers electric fence parallel to the previous fence to avoid public to the elephants for feeding. (Silva D P: 2012:02)

Figure 02: (Photograph by Researcher) – newly build signboard in around the development project`s area of the Hamabntota District.

Figure 03: (Sources: http://www.ccrsl.org/) **– Herd of Elephants crossing the road - Hambantota**

Chapter 3: Literature Review and Theoretical Framework

In this chapter I will evaluate the literature written in relation to the HEC. I have referred books, papers, articles, news conference reports, government and non-governmental reports, internet articles, peer reviewed journals. In addition, the rest of the chapter discusses the issue in relation to other literatures. The last part of the chapter discusses possible approaches shown by others as sustainable solutions for the issue. Further the chapter will discuss what the possible approaches are to solve the HEC. The end of the chapter will discuss strategies utilized by the community and DWC to mitigate the HEC today. Thus the HEC exists within the development process and the chapter will discuss how the HEC influences sustainable development in the area. Many suffer due to the HEC, these include DWC officers, NGOs and government officers, communities and elephants. However, the dissatisfaction of the elephants due to the human activities cannot be quantified, measured or analyzed during the research. Sri Lanka is a prominent country in the Asian region within elephant conservation and HEC mitigation (Fernando P, etal,: 2011:93).

3.1. Humans versus Elephants

This study aims to carry out a qualitative research concerning the conflict between local people of Hambantota District and elephants. The justification for taking this study is that, the results will be helpful to future planning of development projects while taking into consideration the wildlife so that development and nature may better co-exist. Also **"i**t seems that the elephant-human conflict has already become a serious problem to some areas of Sri Lanka, since almost, every day we hear of deaths caused as a result of this conflict through mass media" (Kumara L.W.G.C: 2005). Therefore, this study is likely to increase awareness regarding this problem as well as possible actions to prevent it may later be developed by the government and other concerned agencies both national and international as a result of this study. In this study, the qualitative method of research has been considered as more appropriate as detailed in the design description section. Further, the study will try to find out whether there is any inter correlation between the urbanization and interational development project in Hambantota District and the human-elephant conflict. The current government has planned to develop the Hambantota District as an attractive tourist destination of the Deep South of Sri Lanka. In that regard the

study will try to find possibilities to utilize the elephants more specifically for this purpose. Furthermore, the study will explore the implementation of existing policies (Practicability of the policies and process of policy making) related to the issues and the strategies used to solve/control the issue by the local and national government bodies. In addition to that the research will try to find out the role of wild life department.

The planned mega projects of Hambantota District such as the International Harbor, Airport, Cricket Stadium, Oil Refinery, Administration Complex, Convention Center, Solar Power Generation Plant, Dry Zone Botanical Garden and Nature Park may indeed bring a degree of growth to the district. When considering the hierarchy of issues involved in developing these projects, the human-elephant conflict will not be the first priority of developers (SLNF: 2010). The conflict may likely be a growing potential threat if ongoing and future development programs fail to consider the elephant and human conflict of the Hambantota District. "However, friction between humans and elephants termed human-elephant conflict (HEC) occurring mainly over space and manifesting in seasonal raids in villages that lie in the elephants' range often result in retaliatory killings." (Fernando P. etc,:2008) With the sudden rise of the Hambantota district developments, elephants are pushed into human-populated areas to larger and larger degrees. This can be seen as "Wildlife authorities warned about a dramatic rise in the elephant-human conflict situation as over 70 elephants had stormed into an area near the Hambantota Development Project site" (Weerasinghe C: 2010).

Therefore geographically, socially and economically, the district is very important and policy makers have a big responsibility to work towards the betterment of both parties and find possible solutions for the circumstances otherwise the results can be dangerous since man slaughtering and attacking village attacks, paddy fields, and loss of agricultural lands can increase significantly. This is why this study seeks to carry out an investigation on this particular problem so as to increase awareness concerning the issue because limited focus has been put on it by other researchers.

"Reducing habitats and the human-elephant conflicts, which records the deaths of both the humans and elephants, is the greatest threat to Sri Lanka`s wild elephants population" (Biodiversity and Elephant conservation trust: 2011)

There were very close relationship between the human and elephants since ancient age. The Elephant's culture is different country to country according to the method of capturing, taming etc. (Fernando P, Jayewardene etc: 2011:93) Buddhist and Hindu considered elephants as a totem and accordingly killing and capturing them is a taboo. (Kurt F: 2005: 01)There were elephants all over the country except few coastal areas and Jaffna peninsula. During the Kings era the elephants were exported to some European countries and especially there was a big demand for Asian elephants during the Kingdom age (Biodiversity and Elephant conservation trust: 2011). Later, during the British age, the elephant populations were greatly reduced due to British elephant hunting elephants for both ivory and sport. The British declared the elephant as a pest and had given the maximum authority to kill them in order to protect crops (Biodiversity and Elephant conservation trust: 2011). During the colonial period (1505 to 1948) the country was commercially active due to British trading activities and this changed the elephant distribution and numbers (Fernando P, Jayewardene etc: 2011:93). At the same time they had chased a large number of elephants from the hill country to low lands. Observing elephants in the hill country today is very rare occasion. "Over the past 200 years, human land use has forced the elephants from the wet and fertile regions of the south west of the island to much drier regions" (Biodiversity and Elephant conservation trust: 2011).

In Hambantota district the situation is especially acute as the reductions of their living lands have forced some herds into isolated pockets in the bush. Their movement has been restricted to very small areas where food and water resources are gradually depleted. Due to this particular destruction for the elephant and lack of foods and water the potential to wander in to new cultivated lands of the farmers is now gradually increasing. There are a couple of wild parks and conservations within and around the Hambantota District today and in the Udawalawa National park (Density 1.02-1.16 elephants/km2) where around 804 – 1160 elephants live today.

Normally, a single elephant can eat 200 kg grass per day and also it can destroy the entire cultivation yard in just single night. "But the African elephants require a large area for feeding daily. They spend up to 90% of their time foraging and consume up to 300 kg of vegetation per day." (Karimi R R: 2011: 16) Therefore most of the farmers in the area do not like to keep the elephants as their neighbors. According to the high population growth rate the government has to

provide the necessary infrastructures facilities for the wellbeing of the community. Finding land for fulfilling the needs of a growing population is a very important part of this obligation. Therefore, the clearing of new land for settlement and development projects is a priority of the government. Within this concept the wild animals have to compensate and sacrifice their life for the wellbeing of human beings. Therefore from one angle the community does a big part to displace the wild elephant and on the other hand force elephants to attack villages and crops lands. "Since 1950, a minimum of 4200 elephants have perished in the wild as a direct result of the conflict between man and elephant in Sri Lanka" and not only that due to the HEC a total of 1464 elephants were killed, with 672 humans being killed by elephants. (Biodiversity and Elephant conservation trust: 2011).

According to more recent data "in the year 2007 alone, about 183elephants lost their lives, of which 80 died of gunshot injuries, 19 were electrocuted, 8 died by falling into wells, 7 were poisoned, 4 succumbed to landmines, 6 died in accidents, and 19 died from "other causes" and 40 from "unknown causes". (Santiapillai C, Wijeyamohan S,etc :2010:24)

According to Jayasundere`s analysis there are several causes of elephant deaths in Sri Lanka today (Jayasundere O.2009). The major cause of elephant death is gunshot while the next most common reason is unknown. The third reason is accidents, falling in to wells, landmines etc. Elephants' death due to accidents is also quite frequent in other parts of the country even though there are few similar incidents in Hambantota districts due to the absence of railways in the area. Elephant deaths due to land mines are not reported in Hambantota District today. According to the analysis of Jayasundere asserts that other cause of elephant deaths include poisoning, electrocution and natural reasons such as starvation or scarcity of foods, sickness and diarrhea. The majority of dead reported in Sri Lanka due to animal attacks like snake bite even though without much publicity. The second most frequent type of animal attack in Sri Lanka is by elephant (Santiapillai C, Wijeyamohan S,etc 2010:24). Further, there are some organized groups of poachers who kill the mother elephants in order to catch the baby elephant and sell the cubs to businessmen who keep the elephant claiming they had been born to captive domesticated-elephants (Hettiarchchi K: 2012). In addition, elephants are at risk in the north central province area, because during the drought seasons they try to climb down to the torrential water flows which come from major tanks in the area. With their huge thirst they carelessly climb down to

the water flow. These water spilling channels are very aggressive and sometimes the elephants float more than 25 miles to the villages or until DWC officers rescue them. The resolution of direct conflict between Humans and Elephants has become a serious local and political issue in recent years in several ways in South Africa, such as crops damages; threaten to human life, food stores and water sources etc. (Hoare R E,:1990:01) The methods of capturing elephants different in South Asia and Asia, they have been using the methods such as Hunt to capture, Driving in to natural traps, Pits, Ground noosed, Decoy and hand-noosing, Mela Shikar (Capturing wild elephants by the help of highly trained elephants), Keddha (Through a funnel elephants are driven into a narrow corridor) etc. (Kurt F:2005: 03)

In Cameroon the only strategy is to mitigate the HEC had been used by the DWC officer is eliminate the culprits, but there is no evidence that it reduces the magnitude of the damage. (Tchambe M N.1995:40)
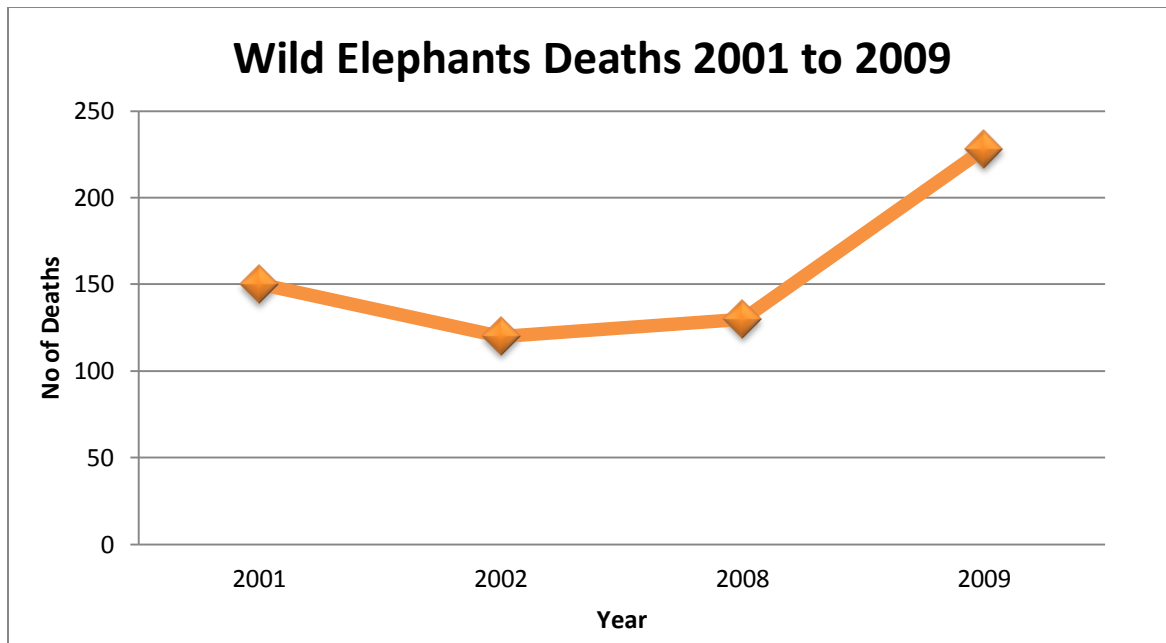
Figure 04: Sources: (Jayasundere O.2009)

The above chart shows the number of elephant deaths during the 2001 to 2009. According to the chart the number of elephant's deaths is being increasing year by year.

The below chart explains the main causes for the Elephants deaths in year 2008.

Causes of Elephants Deaths in 2008
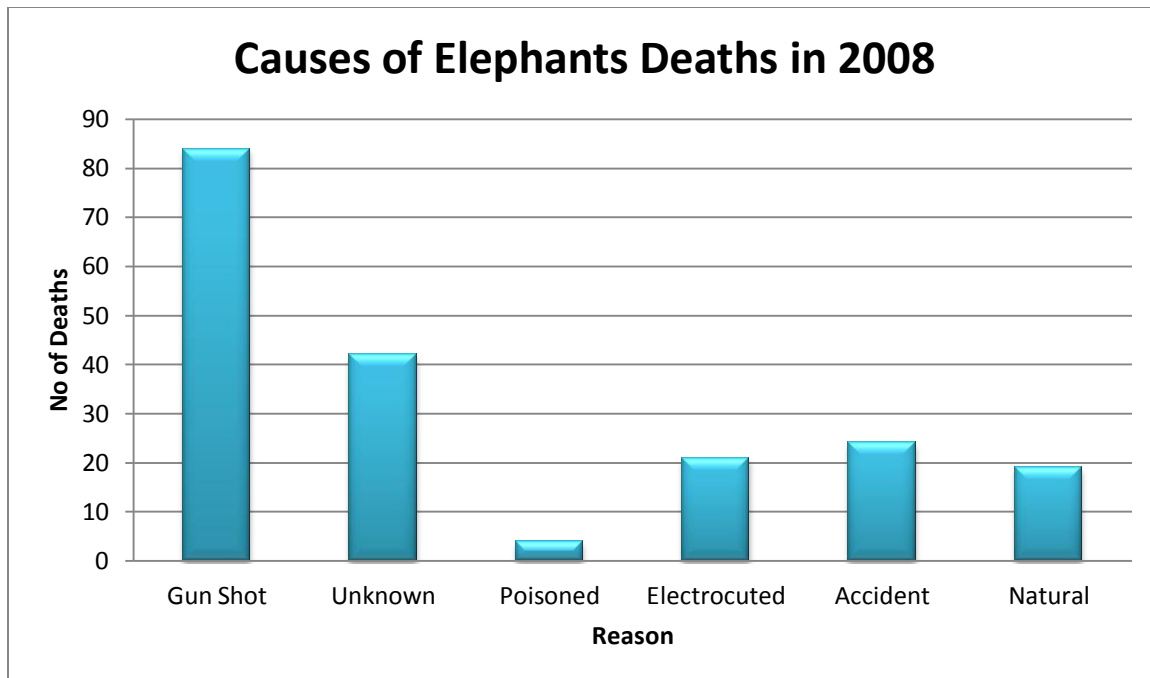
Figure 05: Sources: (Jayasundere O.2009)

Human Deaths Caused By Wild Eleplants
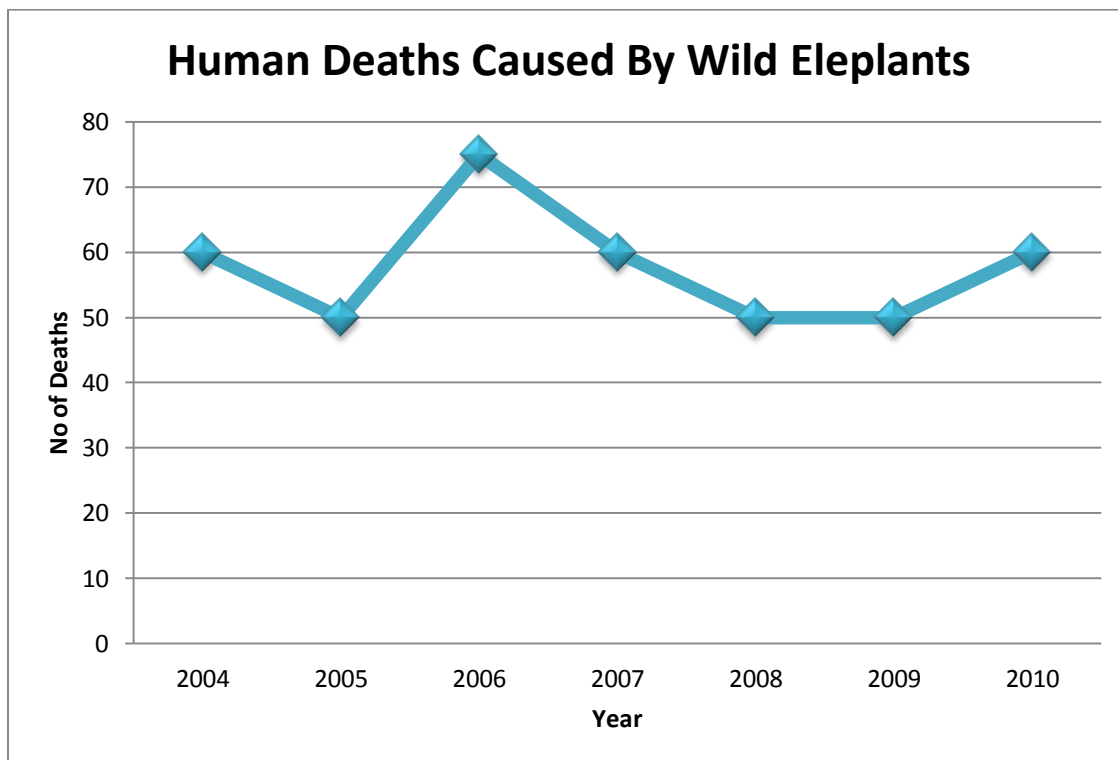
Figure 06: Sources: (Jayasundere O.2009)

The above chart explains the Human deaths due to elephant attacks during the years 2004 to 2010. The numbers of human deaths have been varied according to the years and according to the chart number of human deaths is being gradually increasing again since 2009.

According to research conducted by the International Research Institute for Climate and Society (IRI Technical Report :2010-2012) climate changing is also a major cause of death of wild elephants today. "Elephant deaths were significantly correlated with droughts in the early part of the year. Anomalously wet conditions in the latter part of the year were weakly correlated with enhanced elephant deaths" (IRI Technical Report 10 – 02: 2005). Further, they have argued that when extreme conditions occur, wildlife can become increasingly vulnerable to normally marginal effects such as climate variability and resource condition change. During the drought seasons the potential of elephants entering human living areas for water increases. In such occasions both humans and elephants confront come into confrontational situations. Thus, when the elephants roam here and there for water and foods they increase their own vulnerability. "The main limiting factors for elephants in Sri Lanka are the availability of fodder and surface water." (IRI Technical Report 10 – 02: 2005)

Causes of elephant deaths recorded annually 2005-2010 (DWC data).							
Year	2005	2006	2007	2008	2009	2010	Total
Shot	73	93	85	123	113	87	574
Unknown	14	16	40	30	49	30	179
Electrocuted	9	21	19	20	19	17	105
Train accidents	14	7	23	18	14	14	90
Natural (old age)	3	4	16	22	8	2	55
Poisoned	0	3	6	10	4	8	31
Hakka-patas	0	0	0	0	0	11	11
Other	10	19	0	1	21	58	109
Total	**123**	**163**	**189**	**224**	**228**	**227**	**1154**

Table 03:(Fernando P, Jayewardene etc: 2011:97)

The central government of Sri Lanka annually allocates millions of dollars from the budget to work on HEC without having produced any successfully sustainable solutions for the issue. In 2007 the central government allocated 20,000,000 SLR (182,000 US $) from the budget and in 2011 it was an almost doubled to 42,000,000 SLR (382,000 US $) (Fernando P, Jayewardene etc: 2011:97). Thus the amount of money allocated annually is increasing. Further during the years of 2007, 2008, 2009 and 2010 the DWC spent 14, 245,000 SLR (129,000 US $) for chasing the elephants 1107 − 1150. The average cost for the translocation of a single elephant is 270,000 SLR (2,500 US $). Nevertheless, there is a good chance that within short time the relocated elephant will come back to the same place where it lived before the translocation. As an example, in a test conducted with a huge collard jumbo which was relocated 93.4 kilometers away from its original habitat, researchers found that it had managed to come back to its original habitat within a couple of days of the relocation (Hettiarachchi K :2009).

The DWC has developed over 1800 kilometers of electric fences up to 2011. The average cost for building one kilometer of electric fence is 500,000 SLR (4500 US$) (Fernando P, Jayewardene etc: 2011:97). Further, the government recommends paying the families of elephant attack victims about 100,000 SLR (900 US$). The DWC has decided to expedite the process of compensation since the victims of HEC are dissatisfied with existing compensation systems. Normally the time for compensation to be provided after a death is at least 8 months and often over a year. According to the current program plans are underway to shorten this wait to within 3 months after a death (Wijayaratne S.M:2008). When calculating the damages caused by the elephant attacks to cultivation areas annually the cost would be in the SLR millions. In Rombo District in Tanzania the annul damage cost in 2008 of elephant damages to crops is Shilling 718 million (317,643 US $) (Liganga L: 2010). According to many agriculturists the major reasons for crop damages in Tanzania are elephants (Karimi R R: 2011: 01). Most countries have introduced compensation systems for crop damages caused by elephants (Karimi R R: 2011: 16). This strategy is very popular in India today. However, compensation systems do not work properly due to the delay of the process, inadequate compensations for losses and corruption etc. According to the Minister of Environment and Natural Resources, Mr.Champika Ranwaka, the ministry needs SLR 10 billion (900,000 US $) annually to work on the management of wild elephant in the country but it only receives 3 billion annually (Colombo Page: 2007).

Mr.Prithiviraj Fernando conducted studies on Sri Lankas HEC and found that there are a couple of major concepts which can be used to mitigate the HEC and crop raiding. They are: crop guarding, chasing elephants from the vicinity of crop fields and villages, elephant drives, capture translocation and electric fencing (Fernando P, Jayewardene etc: 2011:97). There are several strategies suggested by different people in regards to the HEC, such as establishing special task forces (Human Elephant Conflict Working Group – HECWG) to work on the issue, physical barriers (electric fences, non electrical fences, live fences, trenches), vigilance methods (buffer zones, watch towers, string fences, lights or fire), deterrent methods (unpalatable crops, making noise, smoking, nails and spikes), repulsion methods, elephant drives, capture (followed by translocation or taming), culling, compensation schemes, land use planning, manipulating female/male reproduction etc (Perera O B M A: 2009:47). In Tanzania farmers still use traditional elephant deterrent methods to drive them away. They have divided the traditional methods in to two categories, passive deterrent methods (electric or barbed wire fences, trenches, warning systems, and buffer zones) and active deterrent methods (people driving the elephants away with loud noises like gunshots or banging on pots, burning dung mixed with chili peppers, throwing stones, or night-guarding) (Karimi R R: 2011: 11). Further, the same strategies are used in South Africa to mitigate the issue but some strategies are different from those in Tanzania, they are passive methods (buffer zones, string fences, alarm systems, grease and hot pepper oil) and active methods (fires, pepper dung, noise makers) (Parker G E and Anstey S G : 2002:10).

The countries like Tanzania using different kinds of traditional strategies to mitigate the HEC, such as "using spotlight and fire to scare the elephants, spreading chili oil around crop fields and even on occasionally killing the offending animals." (Liganga L: 2010) But over time elephants easily get used to most strategies used by humans and learn to circumvent them in order to again reach crops. "Elephants are intelligent and quickly adapt to active and passive deterrent techniques." Despite of that they can communicate using the chemicals signals during with their reproductive seasons. (Karimi R R: 2011: 11)

The political involvement in the issue is utmost most politicians used to visit if something happened to the community due to elephant attacks. Politicians used to visit HEC areas with the

Department of Wild Life Conservation officers during election times promising communities to solve such problems in countries like Tanzania (Hoare R: 2009:04). Most Sri Lankan politicians have involved themselves in solving the HEC today. It is an especially common occurrence for politicians to visit when there is a big incident related to the HEC. The government of Sri Lanka has taken a number of steps to solve the HEC while also improving elephant conservation. The ministry of Agrarian services and wildlife of Sri Lanka has been taken several steps to mitigate the HEC such as Elephant Relocation, Taming, Building Electric fences, Compensation systems etc. An example from the News Portal of Sri Lanka in 2009 demonstrates this political involvement: "Minister of Environment and Natural Resources Mr.Patali Champika Ranawaka said at Parliament yesterday that he has launched the Gajamithuro (Elephant`s friends) program, by the purpose of protecting the elephant population of the country". Further Hambantota also has a branch situated within its borders. Mr. Ranawaka showed plans to establish a 2nd elephant orphanage at Girithale as well as establishing 25 elephant rehabilitation centers in a country-wide effort (Official Government News Portal of Sri Lanka: 2009).

Sri Lanka has begun a census to find out healthiest wild elephants use for Buddhist and Hindu temples, for tourism (domestic transportation and heavy works) and industrial laborer. (Burke J: 2011: 01)

3.2. Approaches to Mitigating the HEC

The department of Wild Life Conversation has identified certain conservation measures to mitigate HEC such as (Biodiversity and Elephant conservation trust: 2011):

a) The establishment of elephant corridors

b) Increasing the extent of protected areas

c) Translocation of troublesome elephants

d) Driving elephants to new locations

e) Erection of electric fencing

f) Ex-situ conservation

g) The integration of elephant conservation with economic development

h) Formulating and adopting National Policy for Elephant Management and Conservation

According to the research related to the HEC in Sri Lanka, most people have been recommended to limit the elephants to the conservations areas. "A main approach to elephant conservation in Sri Lanka, as in much of the rest of Asia, has been to attempt to restrict elephants to conservation areas." (IRI Technical Report 10 – 02: 2005) Further they have explained "Indeed, artificially maintaining high elephant densities in conservation areas, by translocation, has caused major disturbances to those reserves" (IRI Technical Report: 2005).

Lotter (2004-2006) has explained in his report "The ethics of managing elephants" that there are four major factors for limiting the number of elephant in particular territories:

First, to simulate nature – Make the conservation areas the most comfortable area for the elephant and minimize human activities and encroachment in surrounding areas.

Second, translocation – Capturing aggressive elephants from the herds and relocate them in another conservation areas.

Third, contraception – "New research on elephants suggests that contraception might provide a long-term solution for limiting elephant numbers in game reserves" (Lotter H.P.P, (2004-2006:07)

Fourth, culling – Killing weak and some old elephants after recognizing how many elephant can accommodate in a particular conservation area. According to the culture of Sri Lanka, the majority of Buddhist people do not find this to be an acceptable practice. Therefore, they should have good strategy for culling, if it can be done by the most trained persons as humanely as possible it would be better tolerated.

According to the Bandara R, Tisdell C (2002: 339) some possible strategies for HEC are(1) Providing extra protection around the existing national parks and protected areas, (2) translocation excess and troublesome elephants, (3) domestication of the elephants and (4) establishing elephant orphanages and recreation centers to promote eco-tourism. Further local people in Simao area in China, have been used several methods to mitigate the Human-Elephant conflict, such as Sounds (loudspeaker broadcasting especial noise), light and fires, (lighting lamps), Trenches and manmade salt ponds. (Zhang L, Wang N: 2002:356) According to the local people elephants are interesting to eat salt and after established the artificial salt pond in the jungle they believe that elephant do not raid the villages frequently.

Today 70% of the total elephant populations live outside the wild parks and conservation areas (Santiapillai C, Wijeyamohan S,etc :2010:21). Therefore the sight of elephants in the midday by

roads, houses and public places in Hambantota district is a common sight. There are many studies related to the issue identifying the reasons for this sudden rise in elephants in the area, the reasons behind the human elephant attacks, and the reasons why elephants are so aggressive today compared to earlier.

According to the report "An assessment of the Human elephant conflict in Sri Lanka" there are some major reasons for elephant crop raiding. These include the "density of elephants in the vicinity of the villages, area of crop cover, density of certain preferred browse species, availability of shade, incidence of wood cutting, water availability, rainfall, cattle grazing, abundance of weed and occurrence of forest fire" (Santiapillai C, Wijeyamohan S,etc :2010:23). In addition, elephants are very attracted to crop lands situated near their territories. If someone starts to cultivate next to the conservation area or Wild Park it often leads to the temptation of elephants to depredate the crops as well as increase their vulnerability too.

According to the study of De Silva P (n.d) about human-elephant conflict of Sri Lanka, she has suggested mitigation strategies for human-elephant conflict.

- Long term strategies- 1 to 12 months (Remove the elephants threat to the human life from the area, drive away the crop raiding and villages attacking elephants from the area, Provide basic equipments for protect from the elephant to villagers eg: Firecrackers, alarms, etc)

- Mid-term strategies – 1 to 3 Years (remove small herds of Elephants who`s raiding crops, expedite the process of compensation and increase the amount according to the damages, Increase the mutual relationship between DWC officers and Community, Organize programs to aware the public about HEC)

- Short term strategies – 3 Years and above (Translocation the extra herd of elephants to another sanctuary, limit the deforestation/people`s encroachment to jungles, Increase the community development activities and introduce new job opportunities in the area, Progress evaluation of the HEC mitigation activities implementing the area, Establish permanent borders for the conservation areas)

Elephants are very energetic and eager to raid the paddy fields from a very young age, and are attracted to young crops just as well as those that are near ready for cultivation. Elephants like to eat rice plants and bananas, coconut, manioc and corn (Santiapillai C, Wijeyamohan S,etc :2010:24). Thus the elephant attraction to the home gardens is due to the diversity of crops

within a small area. Most of the time elephants use holes in the fence to enter cultivation areas. If there are no such holes they often walk around the fence until an alternative weak spot is found. There are intelligent elephants that can break the fence tactfully. There are some irresponsible people who cut the wire of fences and sell them illegally for a profit (Weerasinghe C: 2010). According to the Southern province Assistant Wild Life director Mr. Muthubanda, elephants can easily enter to the cultivation area through an opening of electric fence where thieves had removed the wires of the 28 kilometer electrified fence between the area of Hambantota and Sooriyawewa. Today the problem of cutting wires is extensive issue in these areas (Weerasinghe C: 2010).

Most of the time elephant raids happen at night while elephants remain relatively inactive during the day. As a percentage 73% of raids took place at night, while second priority was reported at dawn and very few casus at dusk (Santiapillai C, Wijeyamohan S,etc :2010:24).

There are several organizations in Hambantota District working specifically with the HEC. Most of the organizations' objectives are to mitigate the issue between humans and elephants as well as find sustainable solutions for the issue. But most of the people living in the Tissamaharamaya and Lunugamwehera areas do not feel satisfied with their services. Villagers complain that "these people only establishing the organizations nothing doing other than that, their service limit only to the name of the organizations etc" (Hennayaka S.V:2012:19). Besides, people of some villages are not interested in the services of the wild life officers and some of the inhabitants complain that these people cannot solve this problem unless powerful politicians focus on the issue. In most of the countries where the HEC exists the DWC has the responsibility of making the decisions in regard to the HEC. Further DWC in countries like Tanzania has to play a major role in issue and they have the responsibility in any case related to the HEC (Hoare R: 2009:03). Studies in Africa have reported that 85 % of attacks took place on farms that were not guarded and that organized patrolling can contribute effectively in reducing crop damage substantially (Kulkarni J, Mehta P and Hiremath U: 2008: vi).The countries like Cameroon has been using local strategies for reducing elephant impacts such as, Drive elephants out of the farms, Collective prayers and magical practices, beating drums or emptying barrels, Sheep dung burning, Sticks and stones throw at elephants etc. (Tchambe M N :1995 : 38) But most of them are ineffective strategies today. Further According to the Tchambe`s (1995.39) study in

Cameroon community aspects on mitigating the HEC are, shooting elephants (8%), Scaring animals by gunshot (4%), moving the elephants and fencing them in to somewhere (36%) and 26% do not know what to do exactly to mitigate the issue.

Further most of the studies have been mentioned that the requirement of strong fence to mitigate the HEC issue at their conclusions. Five types of barriers were built on the southern and eastern boundaries of Ari Nyiro Ranch in western Laikipia in Kenya as an experimental fence to find the best type of fence, Stone wall, Six-strand fence (three live wires and three earth wires), Three-strand fence (consist with 3 wires), Twelve-strand fence (six live wires and six earth wires), Two-strand fence (one live wire and two earth wires) (Sakwa J, Thouless C R:1994: 104) "Management of human-elephant conflict has been researched and documented throughout Africa and Asia." A review of methods discussed in the literature follows. Traditional Methods (Crop guarding, Noise, Fire, Air-borne missiles, Decoy foods, Cleared field barriers, Simple Barriers, Traps spikes or homemade firearms) Disturbance Methods (Lights thunder flashes and flares, Firing Methods, Trip wire alarms, Driving with air craft's vehicles or people), Killing elephants, Translocation, Repellent methods, Physical Barriers (Trenches and moats, Stone walls, Standard un-electrified fence, Electric fence), Compensation schemes, Wildlife utilization schemes, Land use planning. (Nelson A, Bidwell P and Zubiri S: 2003: 4-20)

3.3. Theoretical Framework

The data were analyzed according to the following analytical assumptions guided by an theoretical framework. The research mainly focuses on the approach of human-elephant conflict in development as well as the sustainable solutions for the human-elephant conflict. The figure 8.1 will explain how the theories applied in this study.

Further the diagram explains the link between all the major influencing factors in the HEC such as human influence and activities related to the issue, in what way their activities effect the issue, in what way elephants react to the issue, what are the best strategies for mitigating the HEC, and whether it is possible to achieve a sustainable solutions to resolve the issue.

Human encroachment in to the conservation areas is making plenty of trouble for inhabitant elephants. When humans destroy the grazing areas and living spaces of elephants they might get aggressive and in this situation elephants frequently raid crop fields and break down houses to

get at stored crops (World Wild life fund: 2008). Further, land acquisition for development projects in areas with elephant populations also provokes HEC. Clearing of forest for settlement is one of the major reasons for the HEC today (Abdeen J S M: 2008). Therefore, wild elephants have to fight for their territory to protect them from encroaching humans. As a result of that when confronted with the aggressive humans and elephants may take drastic, even deadly measures. Further, unrelenting crop raids by the elephants can also greatly impair community and regional and the development in the country.

The conflict between elephants and humans causes great damage in several ways such as loss of human lives, loss of elephants (today elephants are consider one of most endangered species in the world), financially cost, social and cultural losses, delays of development activities.

Figure 07: Theoretical Framework

Human encroachment to conservation areas

Development Activities

Population growth

Extra lands for cultivation

Invasive elephant activivties

Crops raiding
Killing humans

Human-elephant conflict (HEC)

HEC mitigation stratergies

Policy
Elephant`s corridors
Conservation
Relocation
Fencing etc.

Sustainable solution for HEC
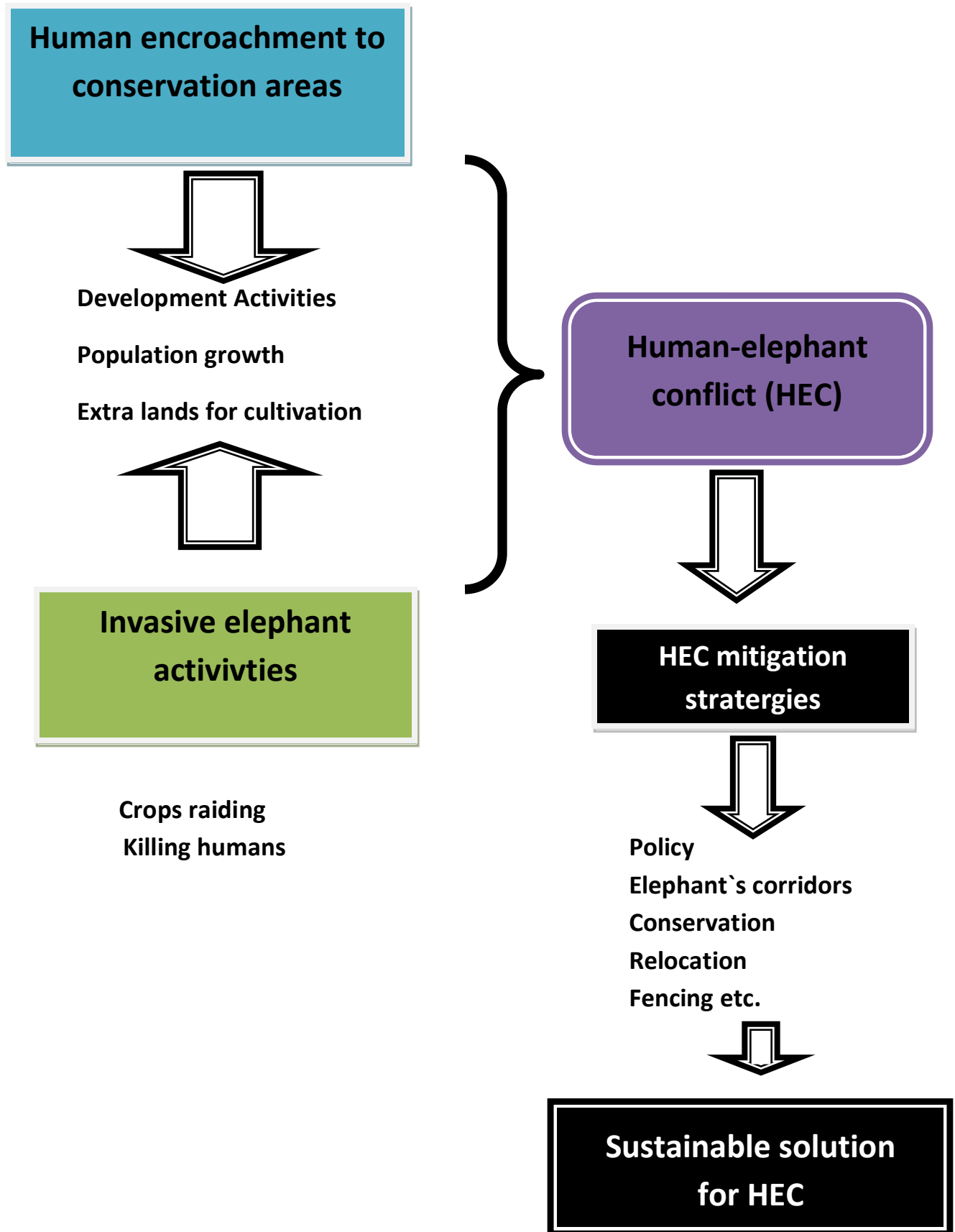
Therefore it is important to identify the main courses of the issue and apply the most sustainable solutions for them. But some people argue that "Good land-use planning that takes both people and elephant needs into account are the only long-term solution" (World Wild life fund: 2008).

Chapter 4: Methodology

The main objective of this research is to find out whether there are any sustainable solutions for the human-elephant conflict in Hambantota district while also exploring whether there is any relationship between human-elephant conflict and ongoing mega development projects. Further this study will try to explain the role of the department of wild life conservation in the context of the government standpoint towards this issue

This chapter will present the methodology used to collect data during the field work. Mostly qualitative methods will be used in this research. "Qualitative research aims to understand the richness and complexity of social experience by attending closely to the actions, interactions, and social contexts of everyday life. It involves systematically 'watching people in their own territory' or speaking with them in depth about their thoughts and feelings" (Holstein J.A. and J.F.Gubrium: 2011). The method is especially suitable for the particular conflict in question and will enable substantial understanding of the social world through an examination of the interpretation of that world by its participants (Bryman 2008: 366). I mainly focused on human-elephant conflict and development approach with the theoretical framework. Therefore the use of qualitative research method will be most suitable approach in this study. Further Bryman has explained the importance of qualitative methods when analyzing descriptive detail and especially reporting on human behaviors (Bryman, 2004: 281). However, according to Bryman, the major argument against including qualitative research being too objective and decisions being so close to the researcher and hence difficult to replicate and generalize the findings (Bryman 2008:391). Therefore, the researcher will try to use some probability methods to avoid such challenges. I was travel to the affected areas many times to gather interviews and do the observations of the inhabitants. That was helpful me to working with the community and finding some contemporary and relevant information. Further, according to the Ospina S (2004:02) "flexibility to follow unexpected ideas during research and explore processes effectively, sensitivity to contextual factors, ability to study symbolic dimensions and social meaning, increased opportunities" (Ospina S.: 2004:02), the research findings can be stronger.

4.1. Research Design

The research design is really important when answer the identified issue from the research. According to Bryman "a research design relates to the criteria that are employed when evaluating social research" (Bryman, 2004). The design has been chosen for this study by considering various factors, such as, in depth investigation on finding out whether there are any sustainable solutions to human-elephant conflicts in Hambantota district. Are there any relationships between the ongoing Hambantota mega development projects and human-elephant conflict? What could be the department of wild life conservation`s role in solving the problem? There are three major groups of interviewees in this study including people involved in the Hambantota mega development process, community members of Hambantota who are suffering from the issue, as well as the government authority. The theses discuss about two major case studies to enhance the theoretical background. From these case studies the thesis endeavors to emphasize how both humans and elephant suffer from the conflict. Especially the community has a big influence on their day-to-day activities as well as livelihood from the issue. The case studies try to explain both situations clearly.

4.2. Research area and significance of the study

I have selected the Hambantota District, the most southern district in Sri Lanka, for the study. Human-elephant conflicts have also existed in other districts for a long time. However the HEC is quite new for the Hambantota District. Therefore it is important to find out more behind the issue as well as to find out whether there are any sustainable solutions for the issue. In fact, the Hambantota district is ideal for the study due to the fact that it was one of many "sleeping districts" for a long time and the sudden rise of the district has had an impact on the human-animal relations in several ways. Further, the district has very significant sanctuaries even though the HEC issue is so prevalent. On the other hand with the sudden rise of the consideration about the nature, wild life is an important factor, especially when conducting the Environmental Impact Assessment (EIA). "Wildlife authorities warned about a dramatic rise in the elephant-human conflict situation as over 70 elephants had stormed into an area near the Hambantota Development Project site"(Weerasinghe c: 2010). The process of development is seen as a necessity for the district to overcome local issues related to poverty. However it does not mean carrying out development activities without considering the nature or wild life. If it is an

appropriate and sustainable development both should be considered simultaneously. Therefore this type of study is significant for the district.

4.3. Sampling Technique

The simple random sample from the category of probability sample as well as convenience sample and snowball sample from the category of non-probability sample were used in this research. According to Bryman, "with random sampling, each unit of the population has an equal probability of inclusion in the sample" (Bryman: 2008). Therefore by the use of probability sampling it is easy to generalize findings derived from a sample to the population (Bryman: 2008). By using the convenience sampling the researcher receives all the questionnaires back to maintain a good response rate (Bryman: 2008) most of the time even though the convenience sampling strategy is less ideal for generalizing findings. Further, the snowball sampling also brings good confidence to the research during the field work. Because, especially while doing the field work in the village it is quite easy to move to the next step in this sampling strategy. As an example, after the interview with respondents they may guide us to that you should go to that house, if not that area, they have much experiences with the issue, they may have much to tell you etc. According to Bryman the "researcher makes initial contact with a small group of people who are relevant to the research topic and then uses these to establish contacts with others." (Bryman:2008) When choosing informants I used a combination of convenience and snowball-sampling, with focus on collecting data from respondents with a variety of characteristics such as gender, relationship with the HEC, age and years living in the area. I found that informants who had lived in the area for 15 years or more could share large amounts of information related to the thesis, and were also those who had the most relevant and valid proposals for improvements.

Data has been collected from Hambantota district, especially from the areas where the issue is most prevalent. Qualitative structured interviews have been conducted among local stakeholders, village officer (G.S.), governmental authorities and representatives from the Department of Wildlife Conservation (DWC) as well as some of the officers of Development projects in the Hambantota District. According to Bryman, the purposive sampling is recommended when the research is mostly based on qualitative interviews (Bryman: 2008) Therefore, I have selected respondents randomly by considering the sample size. Such as, 20 households (including victims and farmers) in each village, 5 officers from Department of wild life office, 5 officers from

Development projects and 5 officers from local authority were included in the research. I have selected respondents strategically by considering the HEC influence on their livelihoods as well as suitability towards the research questions. According to Bryman the sample size depends on the number of considerations and there is no one definitive answer (Bryman: 2008). Sometime during my field work duration I have heard some incidents related to the HEC within my targeted area, in that type of situation I visited those places and collected the information. One good example is my first case study mentioned in the thesis.

Some of the organizations in the rural areas who are working for rural area people have done an excellent job making it possible to talk to them in focus group discussions as well as conducting the individual interviews too. As I thought to limit my respondents up to 35 at the beginning and during the field work I had to twist the respondents and sample naturally became larger according to the respondents feedback. Eventually the number of respondents went up to the 40 and above.

4.4. Data Collection

The collection of data took place over a period of about four months. Since I am also living in Hambantota district where the research is being conducted I had the convenient opportunity to observe the surrounding area often. The collection of data did not happen according to the post agreed time table or plan. Data was collected opportunistically, whenever there was time available. Further, the relationship of the organization where I am employed has partner organizations all over the Hambantota District which have been helpful in aiding my acquisition of data that I was expecting to gather. As well as during my office time I have confronted many from the local community, Business community, NGOs, government officers and development planning officers who are living in the several areas of the district. On that occasion I had the opportunity to have informal discussions with them about the HEC as well as what their intentions are about the issue even though these conversations were not immediately transcribed. Mostly I have used methods including interviews, observation, focus group discussion, snow ball sampling, analysis of text and document for data collections. Sometime I conducted some of the interviews as household interviews and sometime as individual interviews.

4.5. Interviews

In this study I have used both structured interviews and unstructured interviews. Both types of interviews were conducted with the all targeted respondents. Especially semi-structured interviews and unstructured open ended interviews have been used often. The semi-structured interviews were conducted with the help of an interview guide especially developed to get the information from the department of wildlife conservation office staff as well as the Community and Hambantota Development project staffs. While conducting the interviews in an informal way the interview guide ensured all the questions had been addressed by the interviews. Most of the time, I gave the opportunity to talk freely to my respondents. The HEC was a burning issue for some of the respondents and most of the time I was trying to hear their grievances while doing my interviews. I conducted the few household interviews by using the questionnaires. The questions are open and according to the Bryman when there is an open question respondents can answer free and without any hesitations (Bryman: 2008). The length of the interviews depended on the occasions and I spent ample time with the respondents to get the maximum benefit of the interviews. During the interviews some villagers were starting to tell the stories and most of them taking quite a long time, some of them are most specific to my research and some of them not at all relevant to the research. Bryman also mentions that sometimes open ended interviews can be time consuming and most of the time respondents could be talking solely to express their personal experiences as well as history of the issues etc. (Bryman: 2008). On the other hand this is quite a good process to get the maximum understanding about the issue not only that their personal inceptions also can be elucidated during that type of conversation. Besides, this type of interview guides me to explore my ideas and my intention on the research to new concepts and exploring new strategies etc. Further I was quite lucky, because all the interviews conducted by myself were in Sinhala, my mother tongue due to the other ethnic groups do to living within my research areas. Further, understanding of their real intention, what they wanted to express, was easy for me to understand. This was especially the case when they spoke with their vernacular, often using specific local forms of slang, colloquial words, inherent words, rustic words and sub cultural words etc. therefore it was easy for me to get the maximum understanding from the discussions.

4.6. Focus Groups

"The purpose of focus group discussions is to gain knowledge about a particular topic or need by interviewing a group of people directly affected by the issue" (ETR Associates: 2012).

I had five focus group discussions during my field work. Most of the time there were between 10 to 15 respondents in each focus groups discussion. I prepared for the discussion in advance by preparing an interview guide to ensure whether I have asked all the necessary questions during the discussions. I tried during the discussion to continue the discussion without having any disturbances from the backgrounds. Actually the responses from the focus group discussion varied from each other most of the time and therefore it was a difficult for me to generalize with one focus group`s responses to other community in the analysis. I had to be attentive during the focus group discussion to listen and guide the discussion according to the interview guide. Therefore I had to work as a moderator, guiding the discussion without participating directly in it as well as refraining from making comments or suggestions that could bias the conversations (Frank D :n.d). In fact, the focus group interview brings more authenticity to the interview than individual interviews, because there is the opportunity that people who normally would want to keep silent are talking.

According to the Bryman "the focused interview was that people who were known to have had a certain experience could be interviewed in a relatively unstructured way about that experience" (Bryman: 2008). Therefore the issue that I am talking from the study is most relevant to most of the respondents, and conducting the focus groups interviewed is ideal for the research. I conducted all five focus group discussions with the help of two Nongovernmental organizations (World Vision Lanka –Lunugamwehera area development project and Ruhunu Wellassa Area Federation) and one government organization (Divi Neguma project – Under the Ministry of Economic Development Sri Lanka) in the area. Most of the time the particular organization helped me to carry out the best discussion by providing logistic support to me even though I could not use a comfortable client observation room with one way mirrors and audio video facilities. According to Frank D, there are some benefits to focus group discussions such as their being relatively quick, inexpensive, excellent for obtaining background information, [the] client can participate in the discussions if appropriate and easy to accommodate contingencies by changing scenarios in mid stream if necessary etc. (Frank D :n.d).

From the focus group discussions I was trying to get the information about the HEC issue from the communities who had experienced it both directly and indirectly in the district. In addition to that I got the opportunity to observe the participants' behavior when they explained different situations within the groups. Besides when I encouraged to talk about the issue and when they noticed that I recorded while listening they gain the confidence to express themselves even more openly. During the focus group interview the only noticeable issue was that of gender balance. Some of the women came with their children and they were often in a hurry to go before finishing the discussions. That was the only issue I felt during the focus group interviews.

4.7. Participant's Observation

"Participant observation has been used in a variety of disciplines as a tool for collecting data about people, processes, and cultures in qualitative research."(Kawulich B B: 2005) According to Bryman participation observation is a good tool to recognize and observe the behaviors and activities while engage the community in particular works, organizations or group etc. (Bryman: 2008) Besides when working with the community this kind of observation process is highly effective to get the maximum understanding about the factors such as, checking for nonverbal expressions of feeling, determining who interacts with whom, grasping how participants communicate with each other, and checking for how much time is spent on various activities (Kawulich B B: 2005). During the field work I have had the opportunity to partake in some activities as a member of the group. During that period I was able understand their behaviors, attitudes, experiences in regards to the issue manifested as interaction between members etc. Some of the organizations I worked with in the area allowed me to partake in particular activities. I had the opportunity to visit to an electric fence building project with the community of the area and observe its construction and functioning. Both workers and community had a conversation about the eructing fence with the DWC officers on the good and bad side of the fence. I have also gained much information about the HEC from participating and observing the mass demonstration against local authorities/government organized by the community who has suffered from the HEC in Hambantota District. It took place over a half day and more than 300 people were gathered and showed their disappointment in local authorities and criticized their behaviors on the particular issue. Bryman has explained that peoples behaviors could be changed because of researcher presence (Bryman: 2008) although while there, I got the opportunity to

observe this demonstration as an inhabitant, further since I am also from Hambantota it did not prove to be a difficult task.

4.8. Document Analysis

The document analysis is a main part of this research because by the analyzing of document in related to the issue can find the theoretical information as well as information otherwise could not be revealed from the field work. "Document analysis is the detailed examination of documents produced across a wide range of social practices, taking a variety of forms from the written word to the visual image" (Wharton C: 2006).

By the analyzing documents such as monthly news bulletins, regional newspapers related to the Hambantota development projects I acquired good information about the projects. Further, after analyzing some of the documents developed by NGOs and government offices relevant in the area I could recognize statistical information about the issue to a significant extent. Most of the documents I refer to about the Hambantota projects were developed for meetings and presented to visitors and for the general public. They have been developed by the URBAN DEVELOPMENT AUTHORITY (UDA) of Hambantota District. After going through such documents at the beginning of the research I could access a new perspective of the research topic, because those documents provide data about the projects from the perspective of other relevant parties. Stakeholder analysis and Environmental Impact Assessment were some of the relevant documents analyzed. They have been mentioned in the documents that they have planned to consider the environmental factors when planning the projects Therefore, some of the documents developed by the particular projects maybe in favor to their objectives. When analyzing such documents it is necessary to be careful. According to some regulations of local authorities I faced some limitations as to which documents related to the projects I would be allowed to use.

4.9. Quantitative Methods for data collection

Data collection is a most important part of any type of study and also incorrect data can be a big impact of final output. Quantitative data collection involves the use of numbers and statistical analysis to asses and evaluates the information. There are several methods to collect the data in quantitative methods such as, interviews, meetings, observations, questionnaires and review of

the internal documents etc. (Bryman: 2008) within this study I used the self-completion questionnaires for the data collections. However I used very basic calculations to analyze the data collected from the self-completion questionnaires.

4.10. Self-competition Questionnaires

In self-completion questionnaires, respondents answer questions by completing the questionnaire themselves. "Most Respondents will see a self-completion questionnaire as the least intrusive and most anonymous way of being surveyed" (Vavoula A: 2010).I have completed 10 self completion questionnaires including 6 men and 4 women.

This is the cheapest and quickest method for a researcher to collect the data as well as most convenient method for respondents while allowing the researcher to maintain the proper response rate (Bryman : 2008). Basically, the self-completion questionnaires have been developed on the basis of research questions. I did the final fine tuning of the questionnaires after having tested a couple of pilot interviews. There were some issues of the questionnaires such as understanding some theoretical questions, filling the statistical questions etc and eventually I simplified them in that regard. I have provided 4 or 5 possible answers to select the most suitable one in the self-completion questionnaire. This is quite an easy format for the respondents without requiring too much time for reflection, because they have alternative answer to choose. "If the questionnaire is well constructed, the analysis could also be time efficient" (Munn. P. and Drever E :1990:01).

4.11. Informal conversations with inhabitants/Village people

During my field work I also had plenty of opportunities to talk to villagers apart from the unstructured interviews. Since I am living in the same district and working in the district where my research taking place I had a lot of chances to visit all over the district and talk with people. Sometime I utilized my official and day-to-day activities such as parties, get-togethers, ceremonies, picnics etc. to talk with the people and get to know their intentions about the issues in informal discussions. There are some benefits of this kind of informal conversations, because villagers have good confidence in expressing their personal intentions as well as the

communities' ideas in the area rather than in the context of formal interviews or focus group discussions.

4.12. Challenges

4.12.1. Confidentiality and right to privacy

During the field visit I was not able to reach people who had been involved in the killing of elephants, because they do not want to share the experiences openly. Further, there is thus a knowledge gap related to explaining why the killing of an elephant occurred despite the fact that villagers see the protection of elephants as part of their Buddhist belief.

During my field work I heard of couple of incidents where people had killed elephants by shooting with illegal locally made weapons. Therefore most of the people did not want to share that type of information with me. Besides, most of the villagers normally think that when a new man arrives in the village this man can be from the Criminal Investigation department or other such security forces. Therefore it is really important to build good trust with the respondents to reveal the both negative and positive factors of the issue. Before I commenced the interviews I was careful to ask their authorization to perform the interview.

4.12.2. Politicization

Today, Hambantota district is one of the prominent districts in a political perspective. The sudden rise of the district has been a controversy in the country. Therefore, I had to face some difficulties to reveal the information about some incidents. Because respondents did not want to share everything they knew with me due to political influences. Thus I had to always ensure with my respondents of the study would not negatively be affected under any circumstances as a result of the research. The study is likely to be affected by politicians, who may like to use the study for personal political interests. According to the SLNF (2010) "many of the interventions implemented by the government to resolve HEC were often contrary to the recommendations of the national policy."

4.12.3. Accessibility/Transport

Further the researching areas were sometimes situated far away from the city, travelling to the villages and walking house to house for filling questionnaire would be more tough due to the dangers of wild elephants roaming the areas even during the day. Besides poor transport, bad weather, people are not available in the house during the day. Most of the families are working in the paddy fields and would be strained in terms of work schedules to come home for an interview.

Another limitation is that most of the people in these areas have escaped from their houses due to the aggressive elephant attacks and therefore, getting them for interviews and focus groups may be a challenge as they might see the journey as risky and dangerous.

Sometimes I met the villagers who were very interested in the HEC and they want me to go to meet the families and peoples who were victims of the HEC as well as some time they want to show me the gardens and farm lands which were damaged by elephants. In those circumstances I did not refuse and most of the time I joined them even though the specific incidents were not relevant to my study. This type of incident makes me spend ample time in the field and sometimes I had to postpone or cancel other appointments which I was supposed to do later the same day.

4.12.4. Mentality of the respondents

At the beginning of the study I studied the research areas. I had a general knowledge about my study area, especially about factors such as livelihood, culture, family backgrounds, education, attitudes of the people and political interference etc.

Another challenge was that some of the respondents asked for money to answer the questions, this may have affected the research findings. This type of rewarding and tipping could affect the quality and integrity of data and subsequently compromise research findings. No money was given in exchange for data in this research.

This type of data collection is always happening in the district by several government and NGOs in the area. Most of them are conducted for the purpose of providing grants, micro credits,

donations, housing schemes, Samurdhi etc to the community. Some of the rural communities think that this is also some kind of donation program even though I had initially explained the purpose of the thesis. Many respondents try to gain some financial benefits. Some believed that after having collected the data I would come back and provide the grants or some household equipment for free. Otherwise they believed that I would report this information to the local government. Therefore, many respondents were willing to provide inaccurate information in order to qualify for what they thought might lead to their becoming eligible for some sort of funding. This was what many of the respondents perceived, despite my initial declaration that my intentions were otherwise.

Despite these circumstances affecting me in several ways such as people visiting and collecting their information and giving hope to them that subsidies might be provided in future programs. Villagers were often quite disappointed and thus disliked to providing information with me. Some people became aggressive, and some criticized the government, while others seemed almost hostile towards NGOs.

4.12.5. Lack of the accurate data about the development projects/accesses the data

The process of Hambantota development is being implementing rapidly. Communities in the area know that several mega development projects are being implemented in several places in the district. But for the community in the district, often their awareness about the development projects was minimal. The Urban Development authority has control of all the development projects even though they are not aware of the public very well. One villager shared his view with me:

"*We are really proud to see this unbelievable development process in Hambantota district. But authorities plan and implement them, and we only find out after start the project, so the relationship between project and community is very low*"

During the field work I was also unable to access accurate quality data concerning the existing mega development projects of the Hambantota District. This affected my research to some extent and I had to work hard to find reliable information about them.

4.12.6. Reliability and Validity

I tried hard to maintain the reliability and validity of the data that I collected. With the experience of living in the same area I ensured to some degree the reliability of data that I collected. Often I had to consult the village leader (Grama Sevaka) to double check information provided by the villagers. Some information such as numbers, statistics provided by the inhabitants were not correct most of the time. I could easily figure out those inaccurate data after check with the village leaders.

4.12.7. Time for the field work

This is the one of major issue I was faced during the field work. Some time it is hard to be in the field for more than a day at a time continuously due to my full time job. Since I am working in the organization where my research takes place I had several benefits as well as several disadvantages. Apart from less free time I had a problem involving most of the respondents were people I had known from a work context. Therefore most of the time they thought that I was doing this study as a part of my career if not for the organization itself. As I said before I was trying hard to explain the study before each and every interview. I also used to go to the field especially on mercantile and government holidays. During these holidays most of the government offices in the area also closed. So I had to make special attempt to meet them during office time itself.

4.13. Ethical Evaluation

"Ethical issues arise at a variety of stages in social research; ethical issues cannot be ignored as they relate directly to the integrity of a piece of research and of the disciplines that are involved" (Bryman 2008:113). According to Bryman it is necessary to identify ethical factors we would face when doing the research at the beginning of the research. (Bryman 2008:75)

Most often I tried to explain about myself at the beginning of the interviews or any activities related to the research, because the issue is a very common and prominent one in the area, therefore there are lot of activities going o the area in related to the HEC today, due to that the begin with the good self introduction could be a good initiative for the field work. On the other

hand there are some possibilities that the respondents' community believes that I somehow represent the government or any other NGOs existing in the area.

This can guide towards productive conversation with the respondents. Especially when interviewing people who have lost family members due to the conflict. There might have been some sensitive situations because of these tragedies. In my research, I have tried to follow the ethical values such as confidentiality and asking for their permission before allowing any respondent to take part in the study. Despite some people talking aggressively and others being very emotional in the interview the people all respondents provided good data based on their experience in the HEC.

Chapter 5: Development projects and its dissemination of the District

5.1. Introduction

According to the National Physical Planning Department (NPPD) policy and plan Hambantota is one of the Metro regions identified for future development.
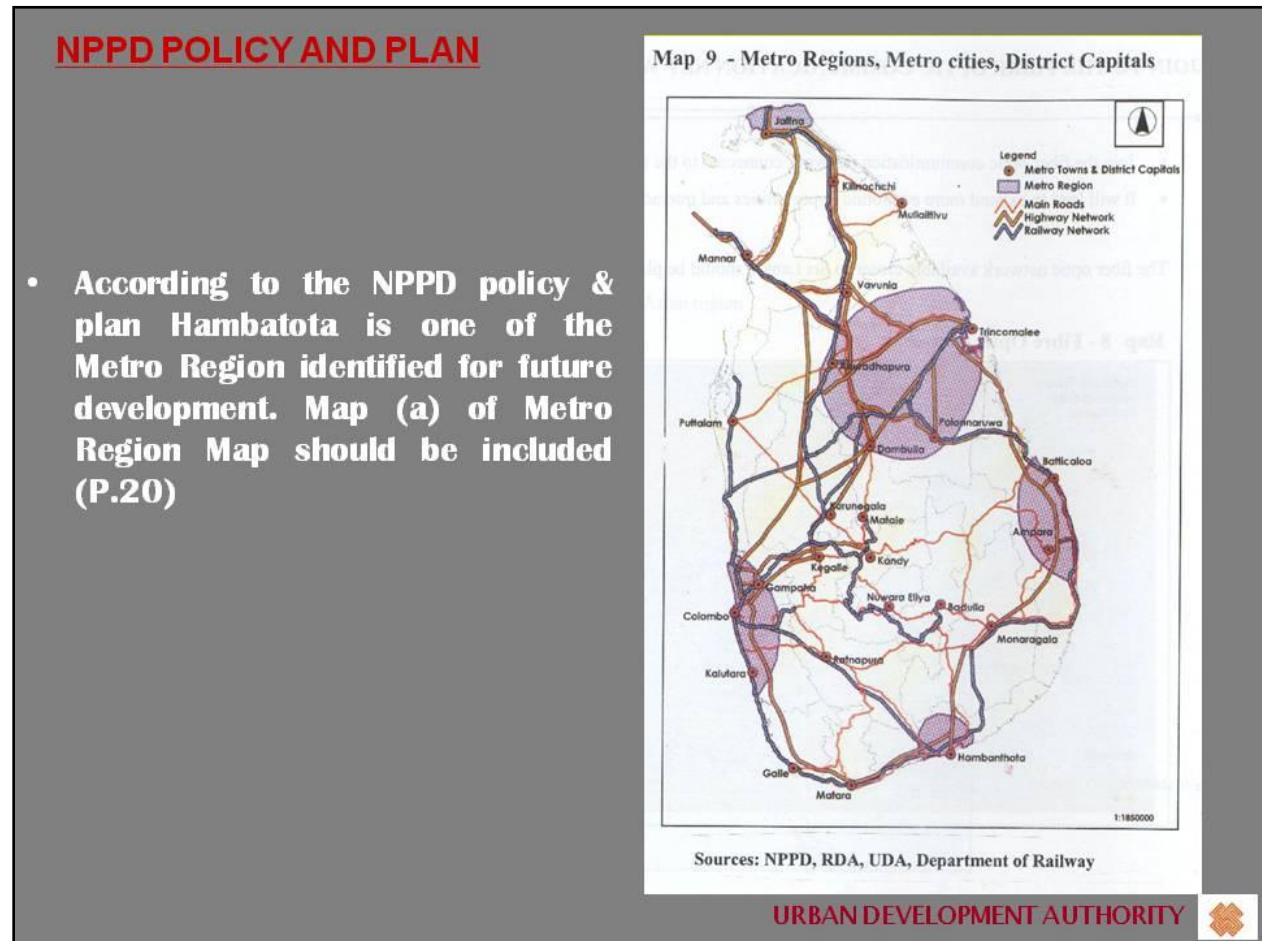
Figure 09: Metro Regions, Metro Cities, District Capitols in Sri Lanka.

According to the NPPD policy and plan there are 5 major areas to develop as a major city in Sri lanka. The Hambantota mega development projects have been very significant among the plans today. Their Vision is Gateway to Asia (Air Port and Sea Port) and Economically Prosperous, Ecologically Sustainable, Culturally Vibrant.

Figure 10: Greater Hambantota GN divisions

Considered factors for Zoning such as, (UDA:Hambantota)

- Potential /Constraints
- Compatibility with existing land use patterns
- Sensitive areas

  (Cultural/Historical/Archeological/Envirenmental/Religions/Architectural/View Points)
- Settlement Patterns of the area
- Population Density
- Future Development Trends
- Availability of infrastructures
- Development of surrounding areas
- Disasters prone areas/Future risk factors
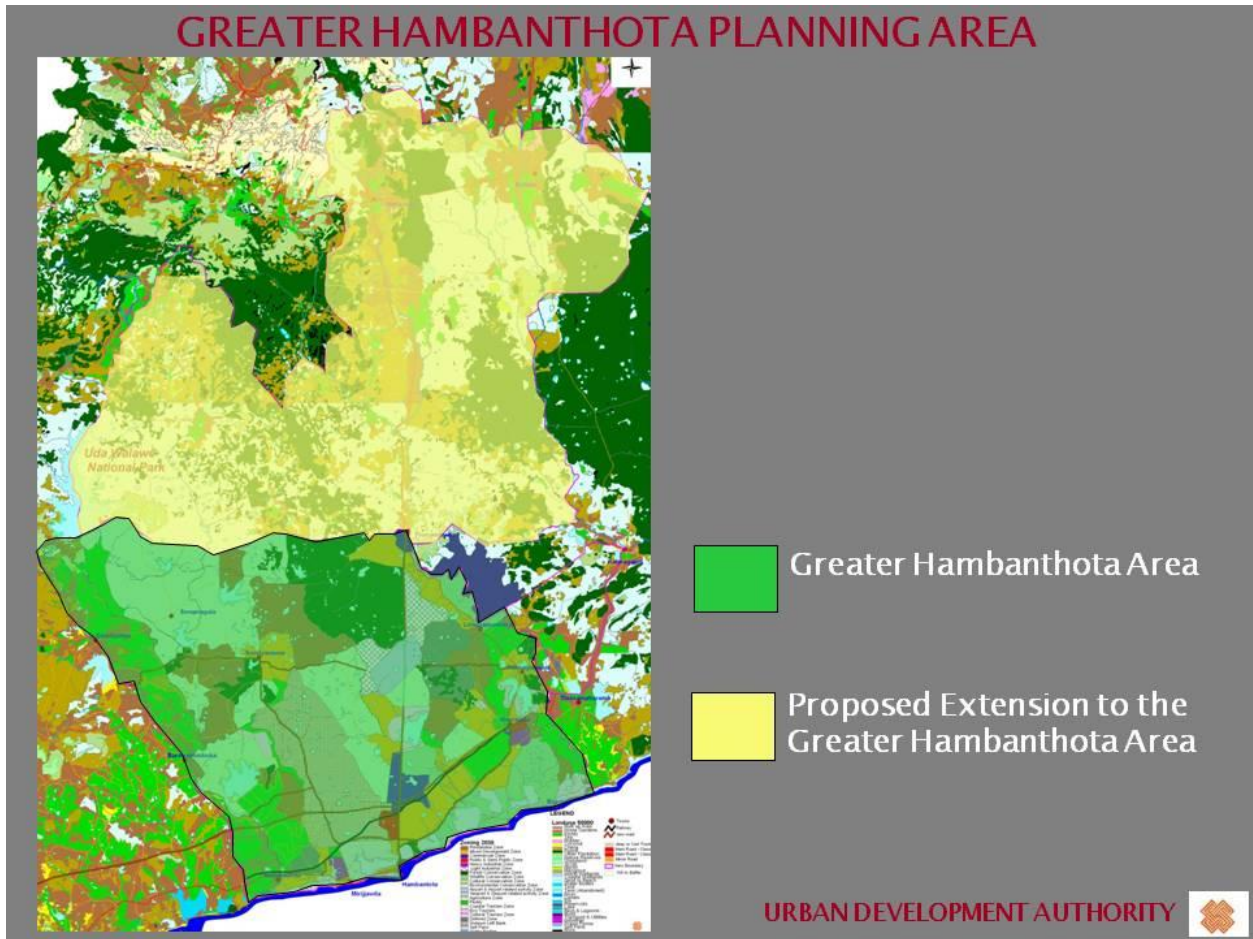
Figure 11: Greater Hambantota Planning area

From the overlook it is clear that the entire development projects will take place in primarily areas of wilderness. As the picture shows, most of the green (wilderness) areas will be obtained for the development projects and most of the mega projects will clear the area again as you see the position of the big projects take places from the picture below.

01. Administrative complex
02. Convention Center
03. Botanical Garden
04. Hambantota Sea port
05. International Cricket Stadium

06. Mattala Air Port
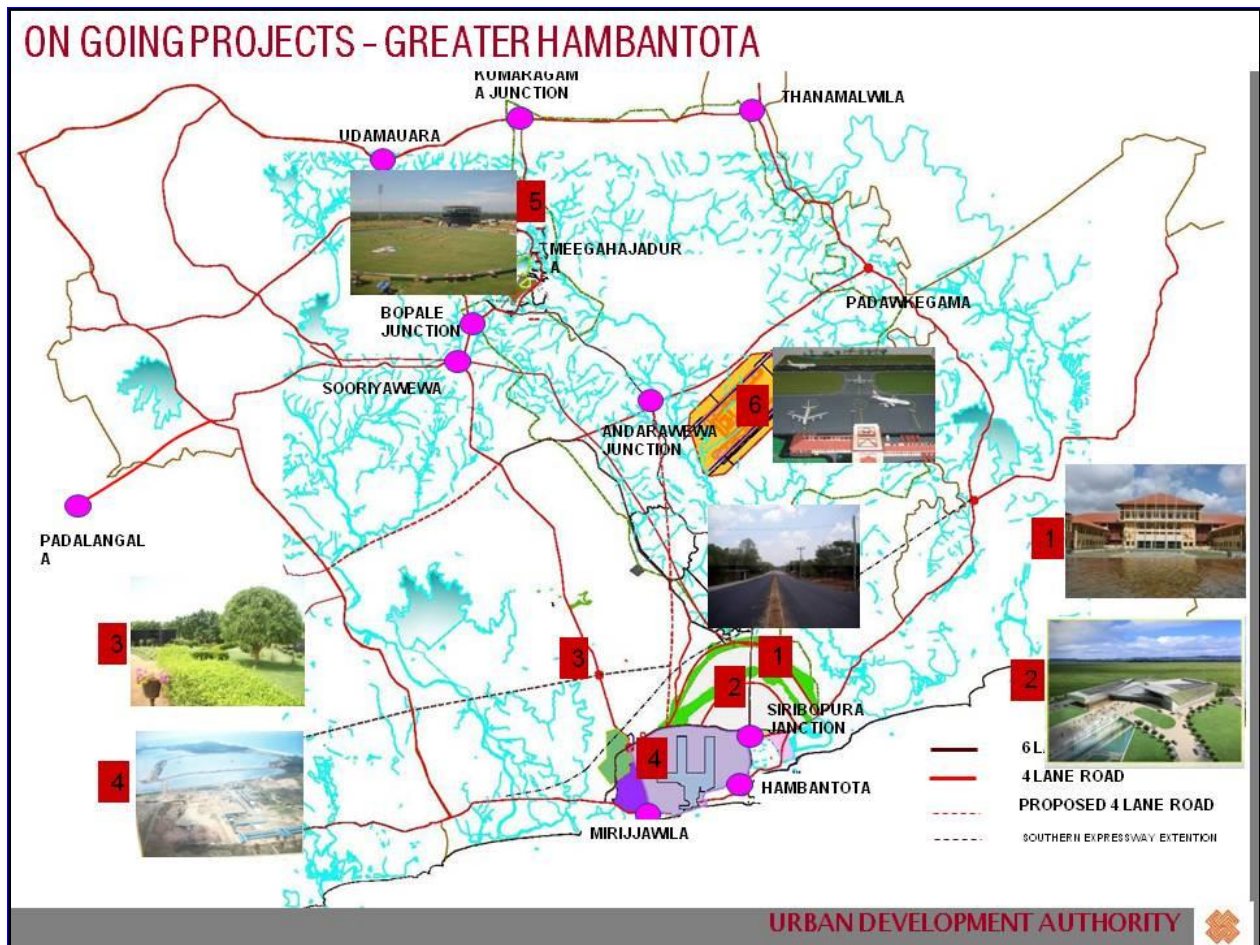
Figure 12: Ongoing projects – Greater Hambantota

There are around 400 wild elephants in this area even though the area out of protected area.   The Mattala area has been identified as a 'Managed Elephant Range' where elephants will continue to remain and its implementation will be a landmark for elephant management in Sri Lanka. (Fernando P, Jayewardene etc: 2011:93)
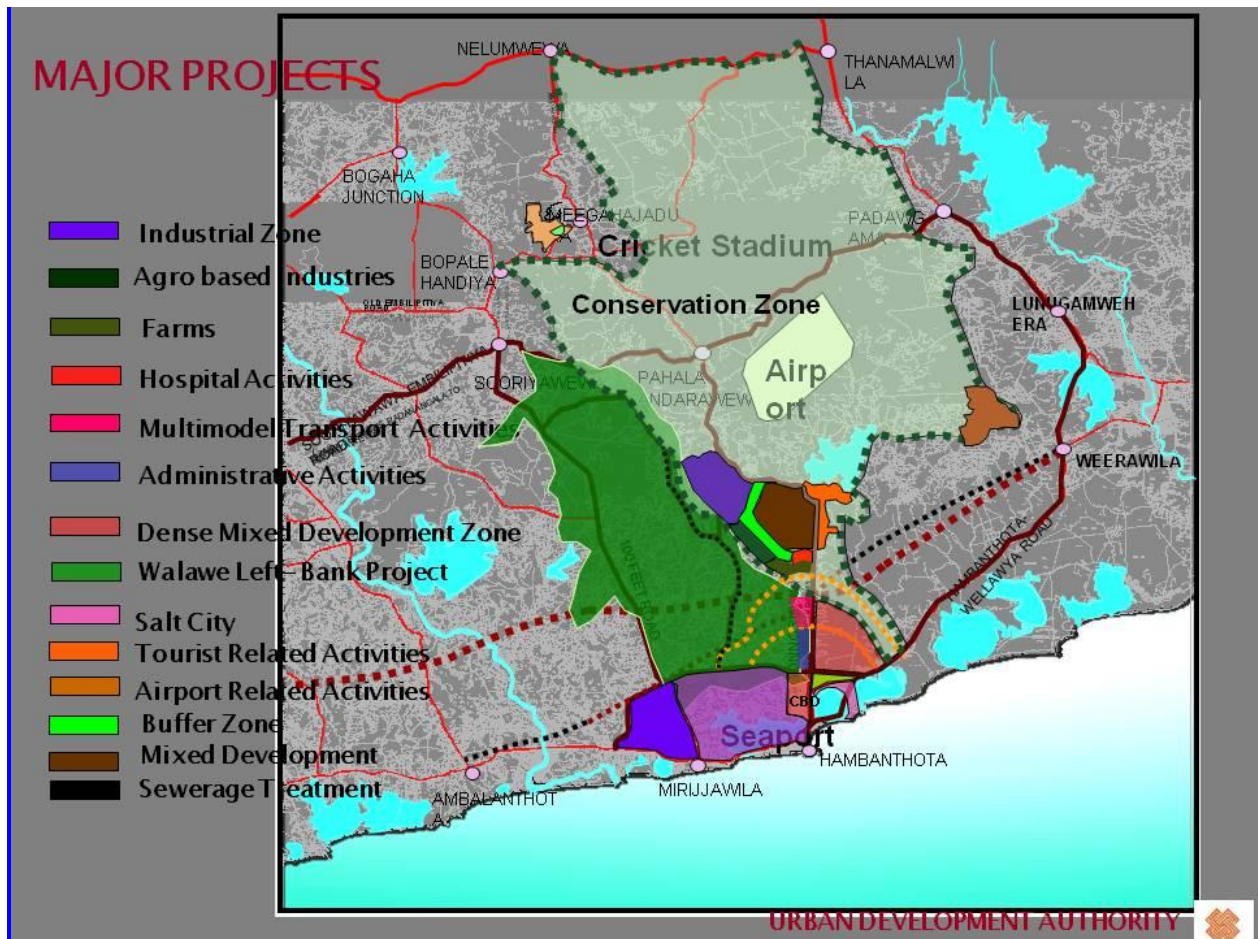
Figure 13: Major Projects Hambantota

Industrial areas have been divided in to several categories such as

01. Light Industries – Non Polluted and Non Hazardous

02. Medium Industries – Non Polluted and Hazardous

03. Heavy Industries – Polluted and Hazardous/Polluted and Non Hazardous/Non Polluted and Hazardous

According to the Urban Development Authority analysis the process of development project of Hambantota District will be confront the challengers such as,

01. Environmentally sensitive areas, forest reserves, Conservation Zones, Archeological reserves etc.

02. Human Elephant Conflict

03. Newly identified Elephant Corridors

04. Funds for implementation

05. Mechanism for Implementation

06. Lack of Coordination. Various agencies are working isolated. (Eg: RDA road network, Telecom tower etc.)

Introduction of risk factors due to the development such as,

01. Diminishing green cover

02. Decrease of water level

03. Encroachment of Archeological areas (Sensitive areas)

All the projects are not very far from each other and most of the projects are being developing away from human habitats. As an example the construction of the Solar power generation plant is being developing in middle of the forrest in the area. One site is funded by the Republic of Korea and other site funded by the Japanese government.

Figure 14: (Photograph by Researcher) – Projects Name Board one of the major projects in Hambantota

The one site area is 17, 287.38m^2 and with the other project the total area is doubled. The entire project will take place at the center of a wilderness area and the area was mostly inhabited by wild elephants before it was built. There are powerful electric fences around the projects and the entrance to the water area is totally blocked by the project.

Figure 15: (Photograph by Reearcher) – An Electric Fence

5.2. Government Policies

There is a national policy for the conservation and a management of wild elephants in Sri Lanka. The entire policy can access from the www.dwc.gov.lk. This was introduced in 2006 even though it does not functioning properly even today. Further, "Elephants in Sri Lanka are protected under the Fauna and Flora Protection Ordinance and recent amendments to it makes taking the life of an elephant illegal under any circumstances." (Fernando P, Jayewardene etc: 2011:93) In addition to that the government law is very keen on any kind of elephant abusing activity, if Catching or killing a wild elephant carries a fine of Rs. 150,000-500,000 (US$ 1400-4500) or imprisonment of 2-5 years or both. (Fernando P, Jayewardene etc: 2011:93)

The national policy for the conservation and a management of wild elephants in Sri Lanka is consist with 6 major policy statements (National elephant conservation policy: 2006), such as

1. To ensure the long-term survival of the elephant in the wild in Sri Lanka.

2. To mitigate the human-elephant conflict.

3. To derive socio-economic benefits from conserving the elephant.

4. To defray the costs imposed by the human-elephant conflict on communities affected by it.

5. To adopt regulatory mechanisms for the removal of elephant from the wild for management reasons.

6. To promote scientific research as the basis for elephant

According to the government rules and regulations there are possibility to domesticate the elephants. According to the survey done by the Biodiversity and Elephant conservation trust in 2003 there are 189 domesticated elephant under the 128 owners all over the country. (Jayawardene J: 2003). Presently the potential of keeping elephant as a pets or domestication is very rare. Nevertheless, the current government banned the capturing elephants from the jungle and introduced the new system; Elephant orphanage has a responsibility provide baby elephants according to the formal request. (Jayawardene J: 2003)

Chapter 06: Case Studies

6.1. Case Study 01: Story about Female nurse who was killed by an Elephant

There is a village called Weligaththa in the Hambantota district. It is situated in Tissamaharama DS area and 25 Km away from the Hambantota city. According to the local leader today there are 40 houses in the village. Most of the houses are wattle and daub houses and rests of the houses are built by the bricks and cement bricks. The village has been suffering from several difficulties and infrastructure is very poor. There is no electricity for everybody, no proper roads, no road lamps during the night, no transportation and no electricity fence around the village. Most of the people`s living in the village livelihood is agriculture. All the three sides of village covered by the Bundala National bird sanctuary. This is a very famous wet land in the district, According to the Ramsar Convention "Bundala National Park comprising 6240 hectares has been declared as a Ramsar wetland on 15th of June 1990. It is the 487th wetland in the list of wetland of international importance designated under the international convention on wetlands". The area is gradually becoming more crowded and the influence to the wetland due to human activities goes up day by day. One villager said "*Before the area was cleared by the people it was a dense Forest and a very popular feeding area of the elephants. In fact it was a motherland of the elephant*"

Due to sudden colonization in the area and the increasing human influences to the Forest area the elephant attacks to the villagers and cultivation land for surrounding areas have been increased.

In this rural village there was a girl. She was a student of Hambantota Nursing Training school. She had to attend the oath giving ceremony at the last day of her training. After the training she was supposed to report to the duty at the Hambantota General Hospital. One of her friend also stayed with her in her house by the thought of attending the ceremony. The Following day early morning she was left in the home with her friend. Her Father was joining with them to accompany them to the public bus halt which is situated 7 miles away by his foot cycle. This is the only transportation method used by most of the villagers in the area. When they departed from the house, one neighbor shouted that "*There was single Elephant by the road, be careful*"

Then father replied "*No problem, elephants are common sight in our village*". When they went to the main road they had to pass through a narrow mud road either side covered with the bushes and trees. The time was 5.45 am and suddenly a big jumbo appeared on a road ahead and the father did not have enough time to turn the foot cycle especially due to the two other people on the bike (his daughter and daughter`s friend) When he was trying to stop the bicycle, it came to them and bicycle fallen down. Then when they were trying to run the elephant thumping and came closer to them quickly and attacked to the daughter first, it crushed her head. Then trampled the father's leg and when trying to kill the father one person who lives nearby saw the incident and was shouting at the elephant to change its attention towards him. In between this incident the other girl was running and gets entangled by barbed wire fence by the road. Eventually she was run into the house nearby with lot of injuries. Then few people were joining and shouted, the elephant was back to the forest and both father and daughter were accompanied to the Hambantota general hospital. The daughter who was a nursing student died on the spot and father's leg was broken from couple of places. The daughter`s head was deformed seriously and all the body cover with the blood.

After the couple of hours of the incident the people of the entire village were gathered to the main road and started to demonstrate against the local authority and wild life conservation office in the area. They burnt the tiers on the road and displaying the posters with several demands and criticizing the local authority. They blocked the roads and demanded from the local authority to make the electricity fence around the village. Finally, the district secretary visited the place and talked to the aggressive people. Villagers professed that, they would not withdraw until the government agreed to make the fence during the next couple of days. After the long conversation with both District secretary and villagers, they came to compromise to start making the fence within next few days. Then the villagers withdrew from the demonstrations and the road was cleared and allowed vehicles to pass. In the following day the wild life officers prepared a plan to drive away the aggressive elephant to the sanctuary area and build the fence with the help of army officers. They started the campaign and the group of army officers and wild life officers behind the elephant; they were making noises, fusing firecrackers and were trying to drive away the elephant. But suddenly the elephant turned back and started to follow army officers. Eventually it hunted down the officer and trampled the officer`s leg. Before it tramped the

officer's head the other army officers shoot it and finally it was killed. That's the end of this aggressive elephant. One villager said

"*After the shot by the army officer it was run to the same place where the girl killed by it before and dead*" But still the elephant`s death is mystery whether it was killed purposely or if it was because of trying to kill the army officers. There was big rush of the people to see the dead body of the elephant but not to attend the funeral of the girl. One young person of the village said with me "*there was a big rush to see the elephant dead body, people passed by the girl's funeral house to see the dead elephant without attending the funeral*"

Actually that's quite good picture to understand the attitude and interest on the elephant of the village.

6.2. Case Study 02: Story about a killed Mother Elephant by the peoples

There is a village called Weeravila in the Hambantota District. Most of the people living in the village used practice agriculture as their main livelihood. This area`s forest cover is considerably high when compared with the other parts of the district and wet areas such as wetlands and water courses are also abundant. The village is very close to the Hambantota international air port construction site and this area is quite busy with the development activities related to the Airport. Aplenty of heavy vehicles moving here and there and the village area is being busy not like the couple of years before. The vicinity is covered by the paddy field and the area has been posh with agricultural activities. Due to the village`s location, agricultural activities and located close the Bundala bird sanctuary and Yala National sanctuary, the roaming of elephant through the area is very high. Therefore the villagers have been facing plenty of difficulties due to the elephant`s influx. Further the village`s one side margin to the Weeravila air force army camp. During the last couple of months, the camp has enlarged its territory with an intention of providing the better service in line with the International air port import, export, customs, and immigration and emigration activities. The army camp has a separate electric fence around the camp and this fence has been a barrier to the wild elephant to enter to the water area during the drought seasons. Therefore, again villagers have to suffer from the HECs and today their life, their village development, their economy and their social persistence have been affected.

One villager said "*we could not come out from the house after the 6 pm due to the elephants barnstorm*"

When compared with the other parts of the districts the HEC is much exalted in this village today. The incidents of Human Elephant confront exist and the impact is a common situation today. Using the locally made fence around the hoses is commonly seen in this village. Some of the people who have money have been making quite good electric fence from their own money and some of the people who are poor have been making very basic fence around their houses using the primary equipments. They are using empty cans, plastic bottles, glass bottles and iron bars for this fence. First encircle the house by the iron wire and then hang some waste things on it. During the night it's easy to recognize when the elephant is trying to creep their garden, because when the elephant touch the fence it makes noise.

In year 2008, there been happened a very famous incident in this village. That is some of the aggressive group who were highly victimized of the HEC were trying to kill a pregnant elephant by shooting. According to the villagers still they couldn't recognize the real offenders. Therefore I tried to focus on their story mostly.

One day in the morning one of the villagers saw a female elephant gasp. The news was spread in the villages and within couple of minutes; hundreds of people were gathered to the place to see the half dead female elephant. Some of the veteran villagers could recognize that it was pregnant to. The news was sent to the nearest wild life office quickly. Until the officers visited the place, villagers built a temporary hut to make the shade for the dying elephant. They had started to pour water on it to protect its humidity and from the sun shine. Some other people started to feed it, they brought fruits from their houses such as pineapple, Banana, King Coconut, etc.

Figure 16: Dead Mother Elephant (Photographs, the Sunday Times News Paper 15th January 2012)

The elephant was quite familiar to the villagers, because that particular elephant was a member of the villager`s elephants cultivation destruction team. During the attacking they had some intention to kill the elephant but this time their intention was totally different. They also suffered with the elephant and were trying to hardly recover it. Especially most of the women were suffering really because it was pregnant. They were hurt with the people who were shooting and prayed to God to protect the elephant and punish the offenders. The Sunday Times National news paper reported the incident as a "It was a double tragedy – the bullets not only killed the cow-elephant but also the unborn baby she was carrying at Demaliya, close to the northern boundary of the Lunugamvehera National Park last Wednesday." (Hettiarchchi K: 2012)

Eventually wild life officers arrived at the place and started to investigate, while the veterinary surgeons were doing some treatments to the elephant. According to the DWC`s Veterinary surgeon who has done the post-mortem, The cow elephant was about 25 years old and the fetus about 21 months old. (Hettiarchchi K: 2012)

One villager said, "*Yes some time we had a vengeance with elephants, because they have destroyed our harvests, houses and some time kills the people too. Even thought still we didn't*

have any kind of desire to kill the elephant at least maimed them. We know that killing elephant is illegal and especially as a Buddhist it's a big sin to kill any kind of animals."

All the attempts of the wild life officers, veterinary surgeons and villagers of recover the elephant were unsuccessful and finally it was dead. This is a good example about the Human elephant relationship in Sri Lanka.

Chapter 7: Findings and Analysis

7.1. Introduction

This chapter will explain the finding and analysis of the collected data. Findings are presented according to the main objective of the research and further it will focus the main theoretical framework. The first part will answer the research questions. The first part will focus on how the HEC seriously affects communities of Hambantota District, the possibilities of utilizing elephants for development processes, the strategies that have been successfully used to solve the HEC, the role of DWC's in this issue, the sudden urbanization of Hambantota district and its influence on the HEC. Further, this chapter will discuss several categories linked to the HEC such as security, agriculture, respecting to elephants, lack of knowledge, financial assistance, elephant relocation, compensations and tourism etc.

7.2. Findings and Analysis

Today, it is a common occurrence that elephants attack people, destroy farmlands or at least destroy houses. Also, not uncommon is the illegal poaching that occurs in Hambantota District. From this research, I try to identify the reasons for the increasing number of HEC incidents in Hambantota district. More specifically, to understand the role current development projects in Hambantota district play in the HEC. During the 1980s the government introduced "Govi Janapada", which means 'cleared jungle'. This entailed deforesting the banks on either side of Sri Lanka`s longest river and relocating people from other parts of the country to these riverbanks. The project caused massive amounts of deforestation. Most of the forests were originally wild elephant habitats. "During the 1980s the aggregated forest density in Sri Lanka is 84% and after the 12 years it was reduced up to the 12% due to the over population and development activities" (Gunathilaka T: 2012:17) The project placed considerable strain on elephant populations which were pressed out of these lands and into areas populated by other elephants. These elephants suffered as a result of these human development projects. According to government sources the number of elephants that died as a result of the development was between 150 and 200. 90% of these elephants dead were reported to have been killed by gunshot (Gunathilaka T: 2012:17).

Most of the farmers in the Hambantota District are still use traditional methods to protect their crops from elephants. Most of them work while others are not highly effective. According to the community who has been living in HEC prone areas more than 20 years, they use basic traditional methods to protect themselves and their crops from elephants. Most farmers cultivated products of low economic value and they work hard to protect the crops despite this low economic return. There are some crops which easily grow in the area such as rice, banana, corn, coconut, vegetables (pumpkin, tomato, snake guard, ash plantains, green pee) Fruits (wood apple, water melon, papaya, mango). On the other hand the most important vulnerability is most of the crops they have cultivated are very appealing to elephants and easy to access as farmlands do not require the elephants to navigate through thick jungle. According to farmers they have to work very hard at the beginning of cultivations and will have to wait for a long time for results. During this processing time they have to protect the crops from bad weather, drought, vermin, thieves, floods, pest, and epidemic. This is no easy task while also having to fend off wild elephants. Therefore, since they do not have much high-tech equipment to deal with elephants they use traditional and less expensive strategies. "Therefore, while many methods can be utilized to effectively safe guard crops from elephants the cost per-unit of safeguarding can be comparatively high, preventing their employment on a wide scale." (Fernando P, etc: 2008)

Most of the traditional techniques they use are very cheap functioning well while others are less effective. There is no full proof elephant deterrent that most farmers have access to. Some of the traditional methods are, shouting, drum-beating, noise-making, use of fire crackers, lights and torches, construction of elephant barriers such as rubble walls, ditches and canals, timber fence, alarming fence (fence around houses and crops with hanging empty tins attached intruding elephants will cause much noise on these fences which alerts home owners), cactus fence.

Some respondents argued that the best way to maintain the relationship between elephants and humans is to move the elephants from the villages to the national parks. This has been done on some occasions where the elephant has been found to be very aggressive. Wildlife officers however argued that such action does not take place unless a proper Environmental Impact Assessment finds it beneficial to remove the elephant from its natural habitat.

7.3. HEC impact on the Community

After analyzed my research data I could identified how the HEC influence on community. The HEC has been affected on community in several ways, including socially, economically and culturally. The ratio of the HEC economically effectiveness on community is high than other factors. The following paragraph is explaining about how the HEC affect on community in the Hambantota District.

Wild elephants survive in habitats which have become progressively smaller due to encroachment by a fast growing human population, development projects and urbanization in the district. To protect humans and their crops from elephants, the vulnerable community`s last refuges must be fenced.   The small fruit stalls are common scene along the major roads in Hambantota District and most of the time they sell fruits for pilgrims travelling to Kataragama, the most religious place in Sri Lanka's Southern Province. In general more than a hundred people sell fruits along these roads everyday and earn enough money to provide for their family.

Figure 17: (Photograph by Researcher) Temporary food stalls by the roads of Hambantota

Today most of these fruit stands confront a big issue of nocturnal intrusive and belligerent elephants. Dealing with this the shop owners have to transport their fruits every day between their home and work by the road. After interviewing many of these shop owners they often explained that this precaution was tiresome and expensive.

These shopkeepers are very concerned with the functionality of the electric fence along the roads as quality fencing would to improve their businesses. According to the community in the area there are no signs that fence building in the area is something that may occur soon. Yet most argue that each and every development project is protecting from elephants belligerence by making an electric fence or similar. As in the photo below most electric fence supporting pillars were made with timber and it is common to see that after a couple of months they were easily destroyed. Sometimes elephants are very crafty often using big trees to break the fences. According to villagers first the elephants break a big dry tree which they use to topple a section of the electric fence over which they simply walk across. Elephants also come to the edge of some fences because they have learned that passing pilgrims will usually give them food while also sometimes taking photographs. This situation provides elephants with the incentive to break these fences. Thinking that food is abundant on the other side of the fence will entice hungry elephants to break these fences down.

Figure 18: (Photograph by Researcher) Deteriorated pillar

Strong and well maintained electric fences are indeed useful to protect human areas from elephants. Fences to contain or exclude elephants (elephant barriers) can be divided into two main groups. Both groups have pros and cons for both people and elephants.

7.4. Strategies that have been used to solve the HEC

This part is being explaining about the strategies have been tried to solve the elephant problem, and to what degree have these strategies been successful etc.
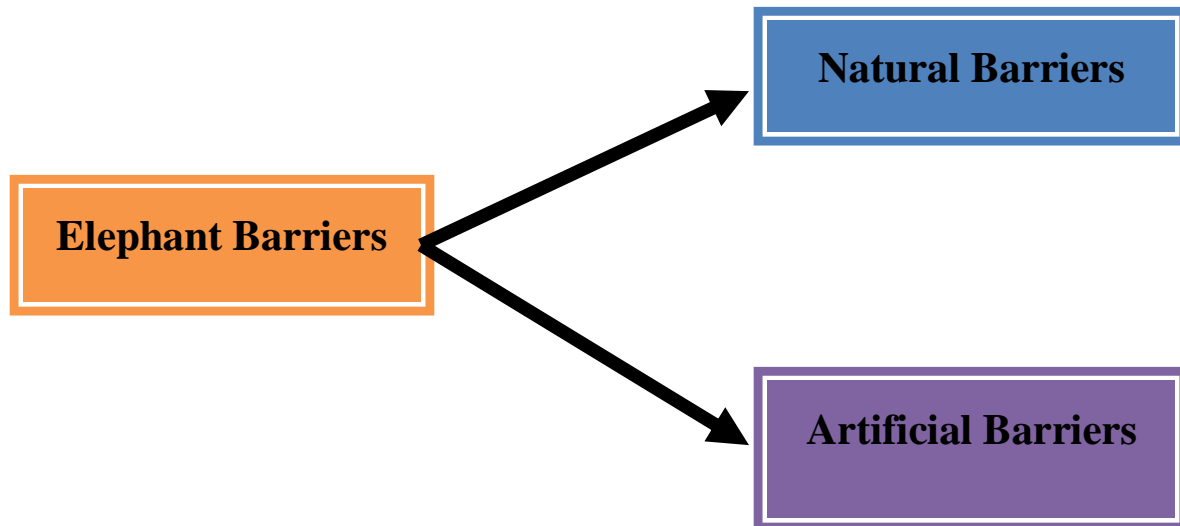
Natural Barriers

1. Rivers

2. Sea

3. Cactus plants (Biological fences)

4. Repellent plants

5. Dogs

Artificial Barriers

1. Barbed Wire fence

2. Wire Fences (Netting style)

3. Stone/Bricks wall

4. Ditches

5. Electric Fence

6. Temporary fence (Rope, Fishing nets, Asbestos sheets, Empty can, bottles etc.)

When asked about the best defense mechanism for scaring away elephants, all the affected communities were unanimous; strong and high voltage electrical fences. Because they have few electric fences as the current trend, with only one that actually functions as it should, it might be several years before any substantial electrical fence network might be in place. Even in the focus group discussions subjects made unanimous sentiment addressing the following question, "What do you think could be the best alternative solution for the issue?" their answer were "*If the government or any organization could build a electric fence using electricity with strong pillars*" Further they added that all elephant roaming in the area should be moved to conservation areas before erecting any fences. In addition, their view on the solar power electricity fence was not as positive. According to the respondents the solar power electricity fence does not last long. During the rainy season it does not work and the life time and durability of batteries is very poor. Further they asserted that "*authorities build solar power fences as temporary solutions for the issue to get favor with politicians which amounts to nothing more than a temporary plaster on a substantial problem.*" Also rather effective is the use of firecrackers, torches, flashlights and shouting; though some have experienced that elephants have become desensitized to these strategies and some are no longer frightened by them whatsoever. Some villagers also experience difficulties obtaining firecrackers and thus become an easy target for elephants.

Most of the inhabitants (living close to conservations areas or wild parks) interviewed have used any kind of material to fence in their house and/or crop lands in the absence of a common fence around the village. They understand that they live in vulnerable areas and are aware of the potential for unexpected elephant attacks. Many use illegal and unsafe electrical fences around their houses for which they have to pay expensive electricity bills monthly. Sometimes other animals like deer, buffalo, and dog incur injury due to these unsafe fences which are often riddled with shoddy electrical work. Most of the habitants who had used the electric fences around their homes have to pay over SLR 750 monthly. When compared with their income this

is huge and unbearable for them. But finally they have mentioned that "*Their only strategy is to hide inside their house and hope the elephants will pass by without extensive damage to their house or crops.*"

There are two major strategies to use by the community to protect from the elephants in the area.

Natural –

1. **Making Noise (shouting, drumming etc.)**

2. **Throwing things**

3. **Lightning fires**

4. **Alarm**

5. **Repellents**

Artificial (New strategies) –

1. Fire Crackers
2. Alarm
3. Night patrols
4. Electric Fences
5. Digging channels
6. Catching and send them back to the wild parks
7. Collared
8. Translocation
9. Culling
10. Taming
11. Birth Control

One of the main proactive strategies for coping with elephants is the erection of an electrical fence surrounding most of the villages en masse, which unfortunately can not include all the villages.

According to villagers the reason why some of the villages do not have the fence is poor administration by authorities, as one villager explained "*officer are coming and start to build the fence without having a single word with us, as a people who are living in the village we know that where the problem exists, where the elephants can come from, and the boundaries to cover with a fence*".

The electrical fences in some villages were only built after the elephants had killed several people. Further the victims have to influence local authorities to build the fence and must become politically active in order to have any chance at having help from authorities to make their villages safe from elephants. Still nearly all villagers expressed concern that the fence and the electrical capacity was not strong enough, and that it is no challenge for the elephants to break down. As one respondent told; "*The elephants are intelligent animals, they use sticks to destroy the electrical fences*".

The most common sentiment of the villagers can be found in the response one villager said: "*The elephants destroyed our house. It was made out of mud and one time the elephants came and pulled our roof down, because there was no electrical fence. They also destroyed our kitchen and ate the rice that was stored*" According to zoologists elephants have a well-developed instinct about where humans and their food is stored even from very far away. They can find rice stocks inside houses in the village easily. At night elephants enter villages by toppling fences and walls before using their trunks to consume hundreds of kilos of rice in couple of minutes. They can easily destroy the annual harvest of the farmers within just a single night.

The below picture explains the wandering patterns of a herd of elephants living in the Tissamaharamaya division (The picture was illustrated after having discussed with the villagers). It also explains the result of unplanned electrical fences and how the public and elephant suffer as a result. The particular electric fence has been affecting the community in many ways. Sometimes the herds of elephants are crossing the main roads and come to the paddy fields situated other side of the main roads. Further during the drought seasons elephants are coming to find the water and during their journey they are destroying everything what they confront. There for unplanned electric fences making lot of troubles to the local in many ways. The image pertains to a village called "Kudagammana 11" in the Tissamaharama Pradesheeya Saba (PS) area which suffers a substantial HEC problem. In addition, and the most prominent explanation

extracted in the field for the HEC in this case, was the fact that Kudagammana was established in mid 1980s in an area which used to belong to the elephants.
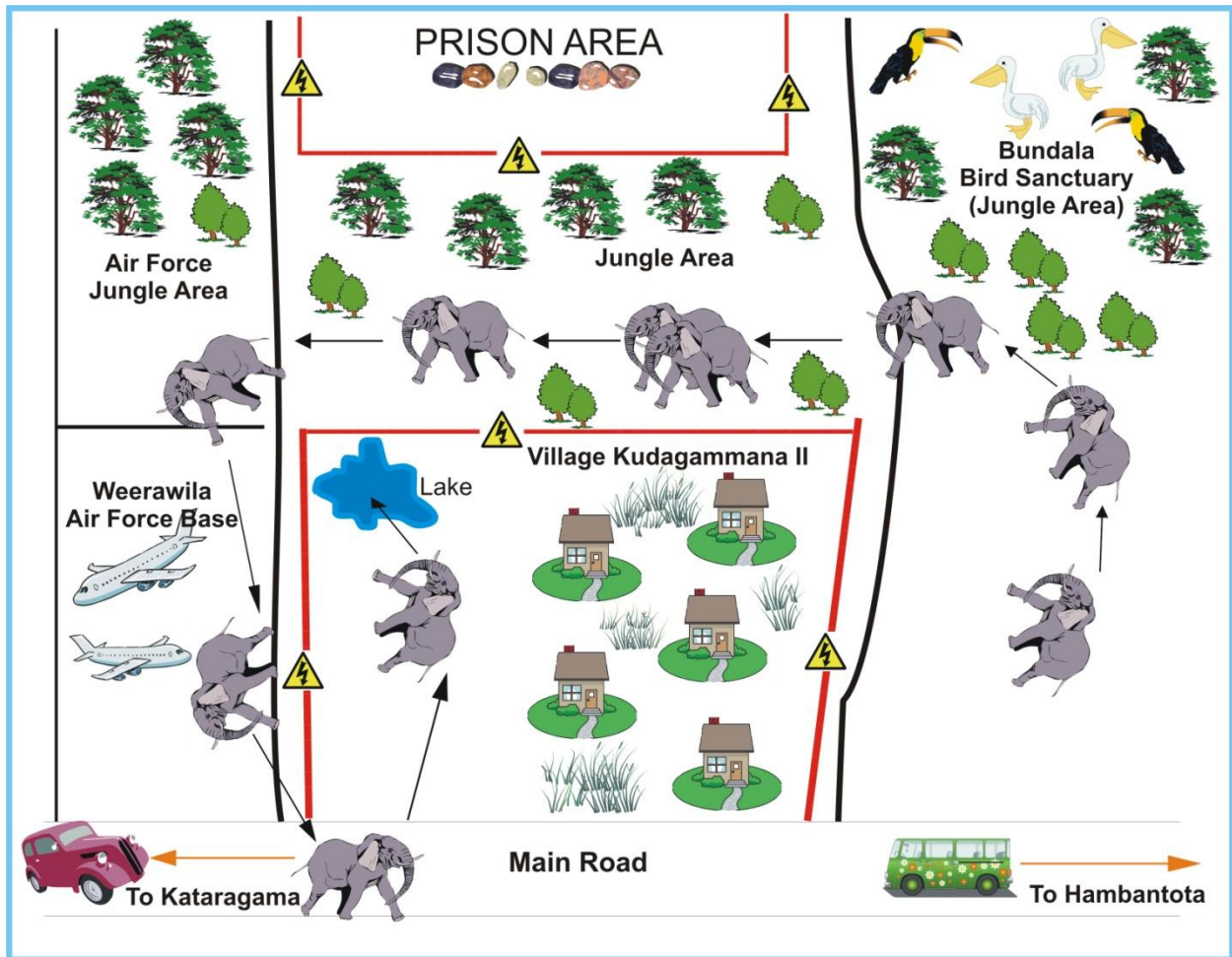
Figure 19: (Picture illustrated by researcher) wandering patterns of a herd of elephants in Kudagammana 11 area.

The majority were aware that elephants are highly habit seeking animals, stating; "*It is their land too. But they don't have a voice; we need to give them one*". Elephants had been killed by a couple of people and but the elephants had also destroyed the crops several times in this small village. The above map explains how electrical fencing does not cover the entire village perimeter so elephants may enter villages. Further a villager added that "*on their way to the tank inside the village the elephants pass our houses, so on their way they are destroying and eating what they can on either side of the roads, not only that if someone confronts them they attack, so*

we will have to live with the threat of elephants despite having an electric fence around the village."

Further some elephants come at dawn "*this is the time our kids are playing outside, sometimes when our kids are playing at the compound the elephants stop and look at the kids. One time I ran and grabbed the children and brought them in to the house and closed the doors, while my husband was at the paddy field.*"

The electricity in the fence is mainly supplied with solar power. The solar board itself is quite small in size, and is unstable during times of little sunlight, like the rainy season. There is also no adequate or clear division of responsibility in relation to maintenance of the fences. Thus damages may take a long time to be repaired, jeopardizing the safety of the inhabitants.

There are different electric fences in the area. They can be categorized according to who has build it, there are four major fence categories:

1. Erected by the Government/ Ministry of Agrarian Services and Wildlife
2. Erected by the NGOs
3. Erected by the Community in the area
4. Erected by the Security Forces

Figure 20: (Photograph by researcher) "Danger" signboard on electric fence

Most of the fences which were built by the government have been abandoned after they were built as local authorities lack the funds for maintenance and renovations. According to most wild life officers in the area money is only received for fence construction and not for anything else. Most of the time they build electric fences when there are large demonstrations against the government due to elephant attacks.

As an example the most recent incident exemplifies the government involvement with the issue. Recently, one female nursing student was killed by an elephant when she was on her way to Hambantota Nursing training collage with her father. Her father usually dropped her off at the bus stand early in the morning bicycle as her house is bit far from the main road. So she cycled through the dense forest inhabited by wild elephants. This episode demonstrates that authorities are able to act quickly to resolve HEC issues, despite the lack of action until tragedies occur.

This solution implemented by authorities was however not a long term solution as most people were well aware that it would not be long before elephants returned to the area. It is situations like these which show how important a more substantial electrical fence initiative is.

As you could see in the above picture most of the fences built by the government are not long lasting due to poor planning and lack of quality resources and technology. Most fences are made using timber pillars and the wires used for electricity are very thin and of low quality. Anybody can easily break them and sometimes a falling branch is all it takes to break the cables. Sometimes fences are erected without prior investigation of where the issues occur and where could be the most ideal place for them. Most of the time participation of the community in preparation the planning of these electric fences is very poor. Locals have very good practical knowledge about the issue despite this exclusion from planning. Community participation in the government planning process is compulsory, but due to some defects of the administration processes the participation process is sloppily adhered to.

There are a few electric fences built by NGOs in Hambantota District. Most of them are well functioning and some of them less so. After the analysis it is clear that most of the electric fences built by the NGOs were a result of community action. When the government process slows down or taking some time to work out NGOs often take the initiative and build them. There are some fences working with the electricity as well as other that run on solar power. The solar powered fences do not often work properly during the rainy season when elephant attacks on crops in the area are more frequent forcing farmers to guard their crops around the clock in the rainy season. After NGOs build fences they hand over maintenance responsibilities to the community in the area. Not long after the handover the NGOs do not check the fence's condition and most of the communities lack the funds to implement proper maintenance and thus the fence becomes useless and abandoned. Some of these fences were built according to the advice of some village leaders in the area who has some relationship with DWC officers and sometimes building fences is a bit partial to the advices people cultivation`s areas and did not concern the other area the issue still exists. Sometime this kind of issues causes rivalries between communities within villages vying for resources. A common grievance from the community as a whole is that people from different organization visit every day to collect information and photos about the issue and how they suffer from the issue before leaving, never to return with nothing

coming of it. Therefore most of the people in the district have little confidence in either government and non-government organizations in the district.

Out of desperation, some villagers construct unauthorized electrical fences around their own household, connecting to the main fence and thus lowering the protecting capacity for the whole village. Other respondents said that they pay for their own electrical fences, but expressed concern that it was becoming too expensive. As a result, some switch on the electric fences for some time during the night but this is risky since elephants may take advantage when the power is off to enter their homes and gardens. Most of these types of fence are built for their personal protection. These kinds of fences are very common and can easily be found many places in Hambantota district. These fences are not properly built and most are illegal. According to wild life officers there is a recommended capacity of this type of electric fence. But most people in the area fail to follow that rule by using the same electricity which they use for their homes (250 Volts - which can be deadly). Most often these types of illegal electric fences are common around houses, farms and gardens in the area. But some of the houses with big crops nearby use recommend electric fences. They have specially prepared electrical converter circuits to control the entire system and it has features such as visual warning systems. On the other hand, according to farmers using this electric system, they have to pay big electricity bills at the end of every month. Sometimes this is an unbearable economic burden for them and if their crop lands are ravaged by elephants they will still have to pay the electricity bill and deal with the cost of the cultivation damage. Therefore most of the farmers are quite dissatisfied with the compensation system of the local authorities. They are also concerned with the process of compensation because the process takes very long.

There are some electric fences which are erected by security forces in the area. Because of the political situation and some security purposes there are a considerable number of military bases in the districts. Due to the ongoing mega development projects in the district the requirement of security sectors is a high priority of the government. All military bases have their own electric and barbed wire fence. Often there are bricks walls too. These military fences are well maintained and are as good as immune to elephant intrusions.

The military bases are situated inside the forests in the area and they have cleared large areas of forest which was used by elephants to feed.

There are some repellent plants that veteran villagers use to drive away the elephants in most of the villages I have interviewed in. There are several beliefs among the villagers such as:

- Growing chilly plants repels elephants.
- Burning dried chilly and spreading the smoke when elephants attack can drive them away them from the area.
- Growing pepper plants around the garden or burning pepper and making them smoke can drive away elephants.
- Hanging tires as a chain can distract elephants from crops and homes.
- There are some people (Exorcists) who can do the charms (voodoo) and drive away elephants (Villagers believe that there are some effective results of this methods).

There are similar beliefs among older generations of villagers related to elephants. According to some educated people I have met during the field work mentioned that these types of practices do not make any difference in today's HEC as elephants are familiar with these tactics and have learned to tolerate or overcome them. Further there are some trees and plants which are avoided by elephants such as lime, orange, sesame, mango, pepper, neem (margosa), palmyra, laulu, teak, tobacco, durian, pomegranate, bitter guard, guava and kaduru (Santiapillai C, Wijeyamohan S,etc :2010:26).

Figure 21: (Temporary house built on a tree: Picture by researcher)

The above picture shows how people use temporary tree-houses to protect from elephants at night. Most people living around the conservation areas use this type of temporary houses. Some people sleep in their house and if they hear elephants in the area they quickly climb up into the tree-house with their families. Further these types of temporary tree-houses are very common in paddy fields or crop yards in the area.

Most people I have met during the field work have had very bad experiences with elephants. They have experienced difficulties sustaining agricultural production due to them. The villagers recounted that, *"the elephants usually come into their properties destroying all their coconut trees, cassavas or enter their house to access rice, water or salt."* Roaming elephants within villages discourages farmers from cultivation the same crop and become keen on transitioning to another kind of business. The majority of respondents reported that they grow crops to support their households, however the presences of elephants have forced them to quit all agricultural activity as it attracted elephants to enter their gardens, destroying crops, houses and water pumps. The issue of unsustainable agriculture due to the elephants was reflected in the interviews. Further even though it does not seem direct, the HEC has affected traditional cultivation system and has begun to collapse already in most of the research areas. The everyday life of farmers consists of much uncertainty and fear during nighttime that they will wake up broke tomorrow due to elephants robbing their crops.

As informed by one respondent, *an elephant needs approximately 4 square kilometers within a jungle forest per night to collect enough food*, which gives a picture of how much damage one elephant can impose on a village of approximately 16 square kilometers.

According to information from a village official, there have been attempts to improve the situation by relocating one of the more aggressive elephants. One was moved 400 kilometres north, but managed to find its back within 3-4 days. This was an initiative by the Department of Wildlife Conservation. The initiative shows that the department is aware of the situation. Still, during an interview with a representative of the organization it was clearly stated that elephants are not dangerous to human lives unless they are provoked directly.

Farmers' main objectives are to protect their crops and families from elephants. Therefore most of their nights are spent at cultivation sites to stand guard. This is a very risky practice and eventually some farmers are injured or killed by elephant attacks. When farmers are killed by elephants the families struggle to compensate for the lost income. Further, no working-age men are in their homes at night. They spend all their nights in the tree-houses. Because of the elephant presence, villagers do not go outside after 7-8 pm unless absolutely necessary or to guard their crops at night. On the other hand people who stay in the home spend the night with much fear and discomfort as they do not have toilets inside their homes. Often families must use crude

temporary resepticle to relieve themselves near to where they sleep. If someone gets sick at night they wait until morning before travelling to the hospital.

Villagers have a problem on receiving sufficient "Ali wedi" (Jumbo firecrackers). According to the villagers the process of providing the Ali wedi among the villagers has some issues. They blame the government; one villager said that "*for the sake of development projects of the government they are clearing the jungle which is making trouble for the elephants which are now coming out of the jungle as a result*". On the other hand cutting trees for the timber business is very lucrative. Before starting the project elephant attacks were rare occurrences and that an elephant even came was almost special. But after the projects have started the elephants are coming out from the jungle in greater numbers and frequencies often in herds of over 40 elephants.

In addition to that farmers in the area cultivating subsidiary crops such as banana, cashew, corn, coconut, sorghum, winged bean, cow pea, gram, manioc, tomato, chili, mango, millet, sweet potatoes, pumpkin, long beans, brinjals, green pea, ash pumpkins, bitter guard and sugar cane. Most of the Families I have met during the field work are villagers cultivating at least one crop from the above list in their garden or Chena (a different cultivation system use by the villagers, clearing jungles and cultivation). Chena is a one of major cultivation system in my research area. Chenas are also frequently looted by elephants but also by animals like wild pigs, monkey, porcupines and parrots.

After analyzing the collected data the HEC seems rather prevalent in the Tissamaharamaya, Lunugamweera and Sooriyawewa divisions. These divisions report at least one incident of human elephant confrontation per week most often this entails damage to crops. In that regard the DWC or local authorities should introduce plans to mitigate this trend in two categories:

- Long term strategies (Strong and well functioning compensation system, Long lasting electric fences, Evaluation about the elephants living in the territories and control the number of elephant according to the available lands, Finding potential lands and forest for elephants habitat, Aware the community about using them for income generate activities, Identify the Elephant corridors, check the food availability in the elephants

territories for the elephants, identify the permanent borders of conservation areas, establishes franchise offices of DWC`s at villagers etc.)

- Short term strategies (collect all the information of affected people, remove the aggressive elephants from the villages, repair the broken electric fences, Response the community`s complains quickly, build the signboards where elephants cross the roads, providing the adequate firecrackers to the community to use during the elephants crops raiding etc.)

Further, according to some respondents the main problem for the community is a big hole in the electrical fence on one side of the Lunugamwehera national park. After observation I could personally confirm that there indeed was such a hole where elephants could easily pass through to access local communities and cultivation sites. Some of the farmers claimed that they own property inside the conservation area which they need to access. It is questionable who might be responsible for the hole in the electrical fence, the farmers claiming land on the other side, or the elephants. Neither suspects would reveal it to me. A DWC officer told me that the particular farm land belongs to the conservation areas and that the locals are not allowed to enter for risk to their lives. It seems that both parties should talk with each other and find a solution for this issue.

7.5. HEC and Agriculture

Most of the people in the Hambantota district are doing the agriculture for their livelihood and more than 50% of land areas cover with the agricultural activities and water resources. According to the feed backs of the villagers I could recognized that there are close relationship with the agricultural activities and HEC. Further, after the start of the development projects in the district the frequency of elephants entering villages has increased.

There are two major harvesting seasons in Sri Lanka, Yala and Maha. Just before the harvesting seasons the rice plants are very young and are in the process of maturing. The rice seeds have a milky taste which elephants love. Elephants have a very good technique to separate the rice seeds from plant using their trunks. It is common everywhere that elephant raids on rice paddies increase during these seasons. Therefore during these seasons farmers have to spend much more time guarding the paddies than during other months of the year. While, according to the

villagers, DWC officers' activities and patrolls in these seasons remain the same as the rest of the year.

The image below shows the frequency and times of elephant attacks over the course of a year. As you can see elephants are very active during the months of February, March, June, July and August in each and every year.
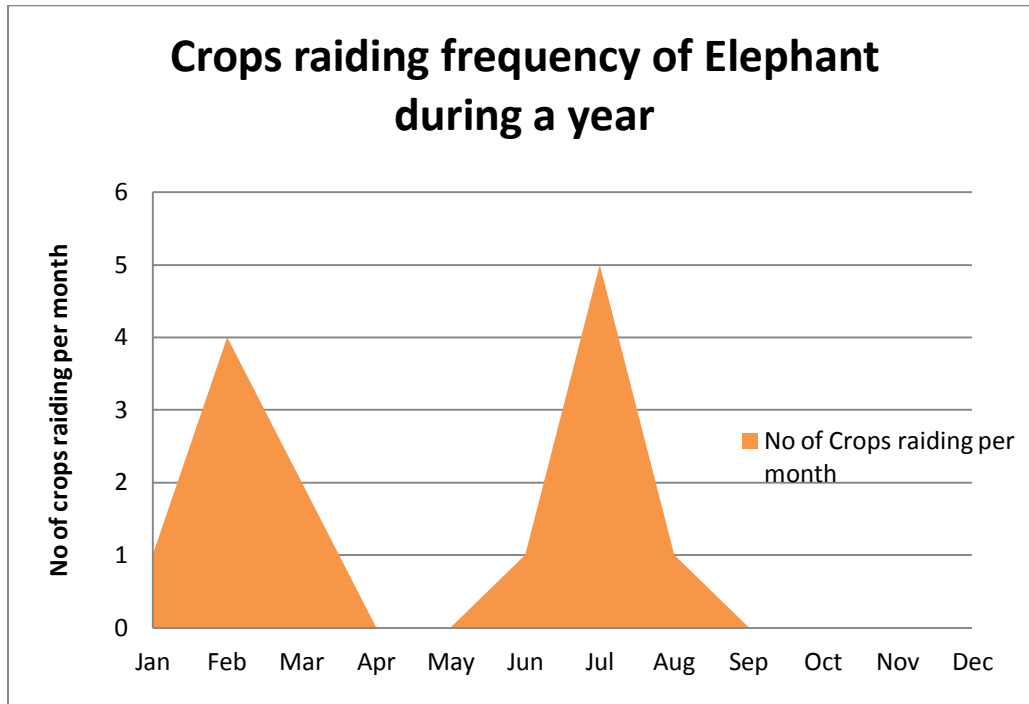
Figure 22: Crops raiding frequency of Elephants during a year.

Due to the mega development projects in Hambantota District the government has acquired vast wilderness lands and some cultivation areas for the development activities. Some farmers have received compensations while others have not. The majority of the respondents expressed challenges related to agricultural activities; elephants destroying paddy fields, cassava crops, paddy fields, coconut trees and banana plants. Most of the farmers who have been living in the research area more than 20 years explained that "we *have been cultivating for 20 years and have not had any kind of disturbances even though the number of elephants living in the area has increased.*" Further they added "*increasing of the number of human activities in conservation and nearby wild parks are major causes of this HEC today*"

As an example, one respondent reported huge losses of income due to elephants eating his banana plants: "*I spent SLRS 150.000 on one banana plant. I had 300 plants. Due to elephants I have only 6 banana plants left and I have started to grow coconut trees instead. I did not receive any financial assistance from the Government*". Most of the households included in the survey, sustain their livelihoods through agriculture. The respondents living close to the conservation areas have had numerous elephant problems, sometimes over 3 or 4 times. But still they live in the same place because they do not have anywhere else to go.

During the paddy cultivation season most farmers stay at the paddy field and protect the paddy lands from elephants. During this season there is no possibility for elephants to enter the villages because farmers send them off before they get a chance. At night the farmers staying in small shanties made in the trees where they make noises to keep elephants outside village borders.

But one farmer said, "*Protecting the paddy field at along before the harvest is possible, but most more difficult just after harvesting, because the elephants stop at nothing to get to the harvest, often destroying our houses and walls to consume the stored rice*".

Another villager exclaimed, "*Elephants can easily attack villages even though the village has an electric fence*" further he explained "*this electric fence was billed by the person who was taken from the tender (Auction sale), he built the fence according to what he deemed as appropriated for the situation. No locals were consulted by local authorities to present people's suffering from the issue*".

Further, "*The electric fence is powered by battery and both batteries loss their power from 10 o'clock at night, so after that the fence is worthless. Also the pillar of the fence loosens easily from the slightest wind, so we say this fence does not meet recommended standards*". This is an aggravating allegation to the local authority.

During my field work I was able to interview a number of farmers in the area. They are the most vulnerable and suffer the most due to the HEC in the area. As I have mentioned above Sri Lanka is an agricultural county whose contribution to GNP is 20% and 75% of the countries labor force depends on agricultural activities. Further, 66% of farmers are involved in cultivation of rice (paddy field) (Santiapillai C, Wijeyamohan S,etc :2010:21).

According to my analysis elephants are responsible for the greatest percentage of loss of crops within Hamabntota district. Most of the villagers have mentioned that when elephants raid their crops the damage is enormous for the entire village. During the crop raids the elephants only go for the crops which they like to eat, but the rest of the crops are also destroyed because they are trampled without being eaten. This is a very important problem they face which has not been discussed in any studies and have not received any kind of compensation for.

7.6. HEC and Security

People are vulnerable who live around the development projects area. The fear of elephant attacks limits people's mobility outside their houses in the evenings. One of the respondents referred to the elephants as "*night officers monitoring the streets*". Among the negative consequences related to such isolation, the villagers mentioned an inability to reach hospitals or tend to other emergencies at night. In cases of women giving birth or need for immediate medical attention, the villagers are in a vulnerable situation. However, despite high risks of encountering elephants the agricultural dependency among farmers in the area force them to spend nights in paddy fields protecting their crops from elephants.

More than 50% of families I have interviewed had some experiences with the elephant attacks such as deaths, injuries, crop depredations, chasing, totally disabled. I have interviewed 5 families out of my total respondents who have experienced loss of life of one of their relatives. Most of the time elephants raid crops during the night. According to the data I have collected elephant activities during the day time is rare. During day especially when there is scorching sun shine the elephants stay in the shaded forest. Therefore most of the people living in HEC areas finish their most important outdoor activities during the day in the heat before going to bed. Their lives are placed at risk due to nocturnal roaming elephants. Nobody can go out at night even in any emergency situations.

7.7. HEC and Department of Wildlife Conservation

The DWC officers play a major role in the issue and most of the DWC officers highly believe that strong and durable electric fence systems can solve the HEC problem in Hambantota district. Further, some of the officers are confidence that elephant relocation, taming and domestication

process are good solutions for the issue. The wild life officers did however not agree with the current elephant transport systems. According to their comments the present transport system is very crude and cannot guarantee the life of elephant until it reaches the destination. There were a couple of incidents in Sri Lanka where giant tuskers died during transportation accidents.

Elephant capturing is a dangerous process which places the lives of those involved at risk. They do not use proper technological equipment to track them. Primitive traditional and often crude methods are used to catch them which are often rather unsafe. Elephants intended for capture are often the most aggressive of elephants. DWC officers are disappointed with their remunerations and one DWC officer said that "*we do not get paid well according to our services, sometimes we work regardless of how dangerous some tasks may be.*"

More than 50% of the respondents mentioned that the officers did not visit or patrol properly. Sometimes they visited villages only if something very drastic has happened. Further they mentioned that elephant drives or relocations also happen rarely and that those actions only take place after local authorities get involved.

There are vast wells in the rural areas for collecting rain water to use for the agriculture during the drought seasons. There are plenty of incidents elephants Elephants come to find water and fall into these wells; some have fallen into wells with their calves and sometimes with other adult elephants. If they fall in to wells they cannot come out without help from humans. When villagers see elephants in the wells they inform the nearby wild life officers who come and remove the elephant from the well unless the elephant dies in the well.

One villager explained a recent incident: "*A big elephant had fallen into the well. The elephant was a very aggressive one and it had destroyed village cultivations a couple of times. A few hours later the wild life officers reached the place where elephants had fallen into the well and tried to take it out from the well. In the meantime most of the villagers were gathered at the site and obstructed the wild life officers job. They have made demands for the officers; such as they are allowed to taking out the elephant if they promised to bring the elephant to the sanctuary nearby. Firstly the officers did not initially agree with their request but eventually they were compelled by the people. In the end they released the elephant into jungle without listening to the villagers. The wild life officers told the people that there is not enough room to bring the heavy*

vehicle to the site which was a 17 ton vehicle to upload the elephant. The roads were very bad and even if they wanted to they could not go back with the huge weigh of an elephant added to it. After that the villagers dispersed. After the release of the elephant and when wild life officers were on their way back home the same evening the vehicle was stopped by an unidentified group which attacked the officers and vandalized the vehicle."

This is a good example of how the HEC can also cause conflict between wild life officers and villagers. Villagers are always worried about the service of officers. One villager expresses his opinion of wild life officers:

"*Gentleman some time you will not believe this but this is the truth, when the elephants come to our garden, paddy field or to our village we quickly start to call them to mention the presence of elephants.*"

According to the villager, DWC officers' replies are always a variant of these following:

1. They agreed to visit the place
2. There is no jeep at the moment when the jeep is back we will quickly come
3. There are not enough officers at the moment in our office, but we will try to come when we can.
4. Why you should try with the fire crackers which we have been given to your village to use in this type of situation.
5. Sometimes they come, but very late, when they reach the village the elephants have already destroyed the area and moved on.

The villager continues, "*those officers come after elephants have moved on to the jungle, sometimes they come after two days. It is very rare for them to come at night and on time, when we need them the most*".

There are some misunderstandings between the officers and the community. The information flow is really poor and the knowledge about the people how to deal with the officers, at least about what type of the services they are providing is poor.

According to the response of DWC officers their intention is to protect the human life and save the crops in their territory. The below picture is from the Hambantota district, a significant place

for elephants. It is a boundary of the Udawalawa national park. One of the park boundaries runs along the main road towards Lunugamwehera and Sooriyawewa. People travelling this road often feed elephants with banana, pineapple etc. In this picture two persons (including a Buddhist monk) give some fruits to a wild elephant. The elephant is inside the national park and today as a habit elephants come close to the fence for food handouts. Today there are a couple of fruit stalls near the fence and they make considerable profits by selling fruits to people who wish to feed the wild elephants.

Figure 23: (Source: "Daily news" National News Paper: 2012:02)

According to a DWC officer this is very risky and further they added that they will build a separate fence along the existing fence to keep people from feeding the elephants. They said that this can make the elephants less reliant on handouts from humans by in a sense making elephants not associate humans as indication of a nearby food source.

The process of actions taken by local authorities when there is a human attack on elephants as well as vice versa. Generally, they take action in both occasions, but according to the villagers they react fastest when they receive reports of a human attacking an elephant. If an elephant dies from a human attack the local authorities quickly take action and visit to the crime scene immediately.

As per the suggestion of the biodiversity and elephant conservation trust after their survey done specifically on the domesticated elephants they mentioned that there are some possibilities to capture the most belligerent elephants and add them to the domesticated elephant population after the proper training (Jayawardene J: 2003). This is, however, not a successful solution because "in recent times most captures from the wild have not been successful" (Jayawardene J: 2003) and they demonstrate the same belligerent behavior after training.

The view of some DWC officers is that more elephant corridors are a good idea yet this may involve resettling people to new areas. Unfortunately this may be a challenge because Sri Lankans normally do not want to move away from their original homes.

7.8. HEC and Respecting Elephant

Despite these challenges, a large majority of the respondents expressed concern for the elephants and embraced them as a cultural and religious symbol. More than 50% of my respondents did not like the idea of killing elephants for the purpose of solving the HEC. One woman said that she cried after learning that an impregnated elephant was killed, even though she and her family had experienced large devastating impacts on their house and outdoor kitchen. The villages unanimous religious belief in Buddhism was clearly also a defining factor in their explanation for not killing elephants, many explaining that "*Buddhism believes that even animals need to live like human beings*". One of the questions asked during the fieldwork was: *"When is it ok to kill an elephant?"* A female respondent answered "*As a Buddhist I could never kill an elephant*", whereby the researcher continued asking; *"You answered the question as a Buddhist, but how about as a mother protecting your child. Would you then be able to kill the elephant?"* Still, she answered "*No, I would not have the consciousness to kill an elephant, I would only be able to protect my child by screaming*". Further, one villager said "*if someone killed the elephant he or she will by punished by gods*" It is clear that cultural and religious elements influence the attitudes of many towards elephant killing as being seen as a bad activity at odds with the gods or

Lord Buddha. Further, according to a villager "*killing an elephant is like killing 40 human beings*".

According to Sri Lankan law it is illegal to kill elephants even if they have killed people. The only thing to do is relocate the aggressive elephants or put them through rehabilitation. Further some villagers have positive perspectives of elephants living within their territory. One inhabitant said that "*our village is always being protected because elephants roam at night and so thieves never come to our village*". "*We cannot say for certain whether an elephant can think. But we know that elephants have large brains that get bigger as they grow older.*" (From the community) In that way, elephants also have some human characteristics. Therefore like humans, elephants learn as they grow older. There are many stories about elephants and their good memory. One older villager said that they can remember good places for food and water they have been before, even if they have not visited them for many years. According to the most respondents elephants have a good memory as well as knowledge. One respondent stated:

"*We would not like to kill, maim or injure elephants deliberately, because the memory of the elephant is very clear and if we try to kill it and fail, the elephant will plan some sort of retaliation against the aggressors. Sometimes it keeps it in their memory for many years and later on if the elephant meets the same person somewhere else it may kill that person. That is why we would not like to harm them at all*".

Moreover, elephants belong to the group of animals that have high moral standing. "The [elephant is the] most magnificent of the land animals," that have a "special status amongst the large animal species," and they have "near-human qualities of character" (Lotter H.P.P, (2004-2006:11).

Further they may become aggressive if they come across the dead body of another elephant. "Elephants are very aware of death and fascinated by the dead bodies of their kin. They show specific reactions when they encounter an elephant carcass or merely dry elephant bones" Lotter H.P.P, (2004-2006:11). Therefore removing the carcasses or even bones immediately would be a way of keeping elephants from becoming belligerent.

There are natural barriers such as religious views to protecting elephant life from the humans. These are often found within cultural contexts. Most people living in the area are Sinhala

Buddhist and the Buddhism thoroughly discourages the killing of or harming of any kind of animals.

Further, most respondents hope for sustainable solutions to the HEC and they are against killing elephants to solve the HEC in the area. I never met anybody who would like to kill elephants as a solution for the problem and all respondents emphasized the importance of protecting the elephant even though they killed their family members. I recognized that these intentions come from their cultures and religions. At the same time they never liked the idea of keeping wild elephants as their close neighbors.

7.9. HEC and Lack of Knowledge

The lack of knowledge about the elephant behavior has been cause for increasing the distance between humans and elephants. Some villagers consider elephants to be pests, while others consider them to be a national resource. Therefore some mitigation strategies need to fill this gap and should introduce new strategies which engage locals to change their view of elephants.

Observations during fieldwork indicated widespread lack of knowledge in relation to who was responsible for protecting both the villagers and the elephants. As an example, some villagers thought that the electrical fence was initiated and funded by the government, others believed it was funded by non-governmental organizations, while others again believed there was no external help and that the fence was paid for by the villagers themselves. This implies inadequate information between the local inhabitants and external agencies. Lack of communication is reflected through inadequate analysis of the route and behavior of the elephants before deciding where the fence should be. Despite widespread knowledge gaps, a majority of the inhabitants of several villages stated it was the government's responsibility to protect the elephants and build stronger fences for their security.

Actually they need some especial training on how to react during the elephant attacks as well as how to deal with the elephant. In some of the villages have some veteran peoples who know about the elephants and their behaviours. But that's not enough to protect from them and most of the elephants today are make considerable resistance to the strategies which they are using to drive out the elephants.

Many people believe that we should limit elephants to within the conservation areas and not allow them to roam anywhere else. They believe that the only reason the HEC exists today is because elephants are not properly contained. From the view of community this is quite right but from the view of a conservationist this does not explain enough. Elephants should also have the freedom to feed, mate and play according to their desire. Some villagers emphasized that "*wherever people and elephants coincide, human elephant conflict is being occurred*".

After analyzing data obtained from the UDA Hambantota office there are plans to extend the railway North Hamabnatota District. According to the plan there will be a network of railways linking the international harbor, airport, cricket stadium and Hambantota city. There have been plenty of incidents in Northern Sri Lanka where elephants have died in train accidents. Therefore proper planning to protect wild elephant from the hazards of train accidents is needed when the implementing the railway projects in Hamabntoa District. They should build a fence on both sides of the railway tracks and designate elephant crossing areas.

7.10. HEC and Financial Compensation

Local stakeholders who have been affected by elephants receive some financial support from the government. However, often economic support is only given when a person has been killed. Villagers however do not have a clear idea about how much victims are entitled to receive as compensation for the death of a loved one. Six respondents said that it is a SLR 75,000 (675 US $) and 4 respondents said that it is SLR 100,000 (900 US $). However, according to DWC officers, it is SLR 100,000 which they said is set to increase. For a person's death normally the bereaved receive Rs 100, 000 as compensation and also pay at totally disabled Rs 75,000. The villagers are unhappy with the scheme of compensation and they do not have one percent of confidence in these compensation schemes. According to the respondents, normally it takes more than a year to get the money. Not only that, the process is further delayed and the victims or family members have to go to local DWC and government offices ample times with long and complicated paper work which they do not understand. Further I did not meet any farmers who had received any kind of compensation for the damage of cultivation or crops. One villager said that "*officers are always arriving and documenting damages and taking photos and promise to pay the compensations, but they never return.*" Therefore they were really disappointed about the compensation system.

There is no system to cover for loss of income due to destroyed crops. Some respondents argued that; "*the government protects the elephants more than the humans*". The notion among a great majority of villagers reflected dissatisfaction towards the governmental repayment system, describing it as slow and too bureaucratic. According to the villagers it takes between one and two years to receive the financial coverage. More than 80% of respondents' answers for the question of "was it adequate enough to cover the damages?" was negative.
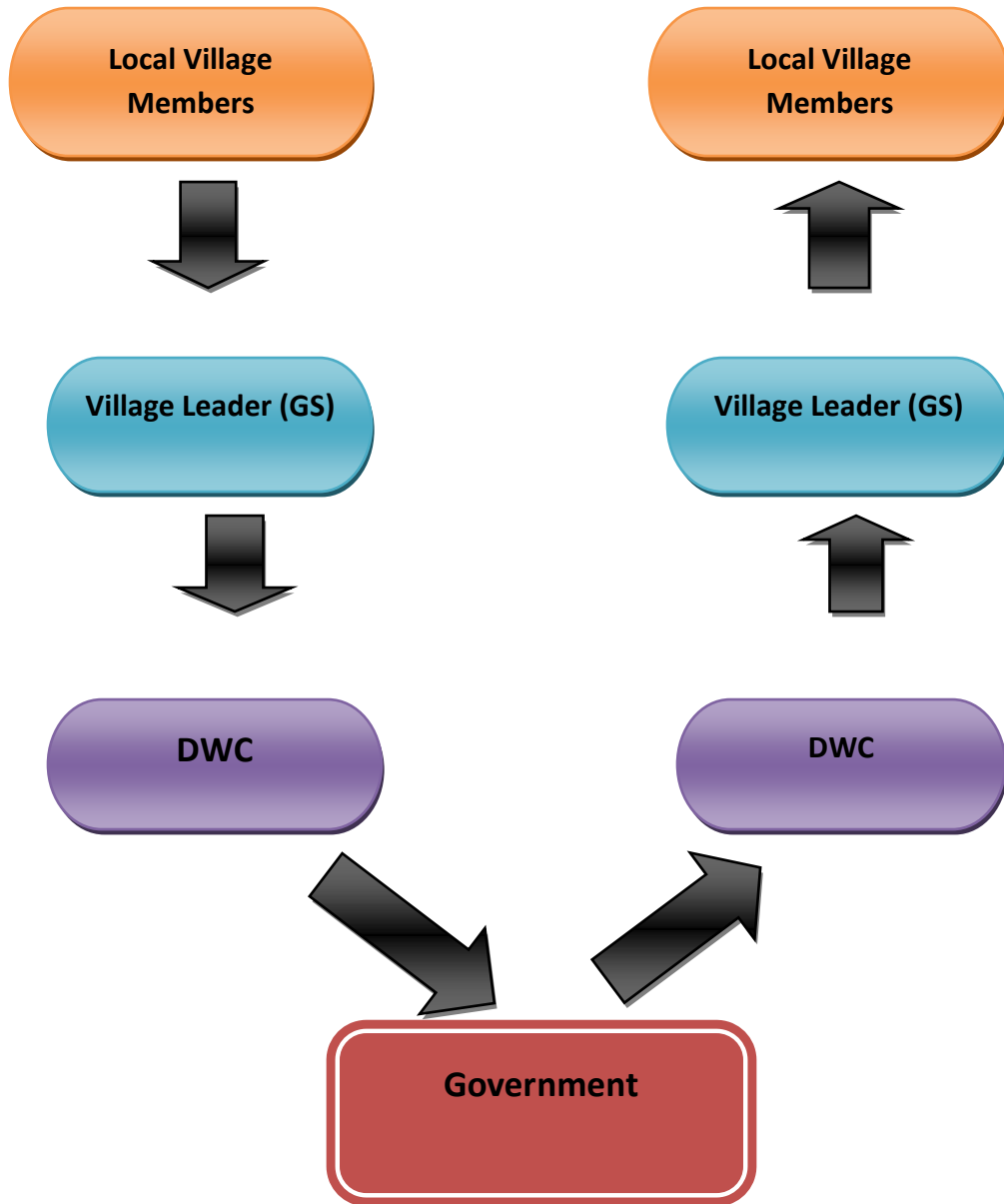
"We have a big problem of pumping water for irrigation and pay SLRS 600 a day for water motors and gasoline, and after irrigating the elephants come and destroy everything and we end up with losses".

None of the villagers had any idea of how to use the elephants for making money rather than thinking that they are only liabilities causing loss and damages. But on the other hand empowering the locals to make the money using the elephants is an untapped resource. It is possible to domesticate elephants and looking after them under the special authorizations (who has both finance and experiences to bring up a baby elephant) of the government. The government has banned all unauthorized capture of elephants from the jungle. Further the government has advised the elephant orphanage to release baby elephants to the forest after they grow fit enough to survive on their own. According to a survey conducted by the Biodiversity and Elephant Conservation Trust people gradually withdraw from domesticating elephants due to high costs (Jayawardene J: 2003). "The survey of 1982 compared to the survey of 1970 showed a reduction of 188 elephants in12 years" (Jayawardene J: 2003). Most elephant owners suffer from inability to find enough food for their elephants. There are some micro benefits to be gained from elephants in farming communities as elephants can and often do "create paths to water, dig dams, and break branches that people can use for firewood" (Lotter H.P.P, (2004-2006:03).

Most electric fences had been handed over to the villagers after they were built by the government or non government organizations to protect and maintain on a regular basis in my research area. There were some incidents where fences have collapsed due to maladministration in some areas. There is a particular person to protect the fence, switch it on the evening and off in the morning and do the maintenance among other things. These persons are paid by village committees. There are small organizations in the villages consisting of inhabitants in the area

who agree to collect a monthly fee from the all the people of the village who benefit from the fence. But due to the mistakes and irresponsibility of those in charge of paying for the maintenance eventually the maintenance worker gave up the job. With no one there to protect the fence and after some time the fence deteriorated and elephants again started to raid the crops. This could not be happen if the government could have allocated a salary for such a worker. Most of the wild life officers are dissatisfied with their salary scales provided by the government. Most of the officers who met me during the field work said that they do not get paid well, that the government should pay more attention to them and that their services are not admired or appreciated so that their job satisfaction is very low. Further they added that they would work harder and on time if they got a decent wage.

Figure 24: HEC and Communication

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┌─────────────────┐              ┌─────────────────┐
│  Local Village  │              │  Local Village  │
│    Members      │              │    Members      │
└─────────────────┘              └─────────────────┘
         │                                ▲
         ▼                                │
┌─────────────────┐              ┌─────────────────┐
│ Village Leader  │              │ Village Leader  │
│     (GS)        │              │     (GS)        │
└─────────────────┘              └─────────────────┘
         │                                ▲
         ▼                                │
┌─────────────────┐              ┌─────────────────┐
│      DWC        │              │      DWC        │
└─────────────────┘              └─────────────────┘
            ╲                      ╱
             ╲                    ╱
              ▼                  ╱
           ┌──────────────────────┐
           │     Government       │
           └──────────────────────┘
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The above flow chart illustrates the information flow between villagers, village leaders, DWC officers and government. There are gaps in the information flow which fails to link to the grass root level most of the time. While most villagers described the communication model as sketched above, others argued that some stakeholders receive particular benefits due to special relations with governmental authorities and NGOs. The survey also detected some aberrations in terms of the amount of money elephant victims are to receive. Further, most of the villagers are

aware that killing elephant is illegal and if someone kills an elephant jail time is the normal penalty although how much time is unknown. More than 80% of respondents do not know about these penalty times. Not only that some people do not know whether they are entitled to any kind of compensation after an elephant damages their crops. The existing national conservation policy should include discussions of elephants as well as humans. The improvement of community conservation policy and practice is needed. Updating of records/ data related to the HEC is very poor, nobody is designated to record incidents and report to the responsible officers in many of these villagers.

7.11. HEC and Tourism

When compared with African elephants there is a very big potential to train and tame the Asian elephants (Lotter H.P.P, (2004-2006:14). Therefore there is a big opportunity to use these elephant as a resource for the development of the district. "When Asian elephants trained by these methods perform degrading tricks in a circus that make them look ridiculous, animal lovers rightfully object to these inhumane practices" (Lotter H.P.P, (2004-2006:14). Even though trained elephants can be used to carry humans on their backs for safaris, there is also a possibility that elephants can be used by game rangers to patrol conservation areas, to limit poaching, and track down poachers etc. (Lotter H.P.P, (2004-2006:14). The community's answer for the question "what are the possibilities of using the elephants for development and tourism sector in the Hambantota district?" is very poor. Because they never thinking out of the box. Their only belief is that watching elephant in wild parks is the only thing they can do with the elephant related to the tourism.

After analyzing the respondents' data and other research about the elephants of Sri Lanka I recognized that there are shortages of tamed elephants in Sri Lanka. In Sri Lanka they are used especially for cultural pageants (At the moment there are only 137 tamed elephants in Sri Lanka even though annually there are around 72 pageants conducting every year. One pageant, the Kandy Pageants, include more than 125 tamed elephants in a row) (Colombo Page: 2007).

7.12. HEC and Development Projects of Hambantota

Some of the Hambantota development project administrators said that there are some relationships with the HEC existing in the district today in relation to their projects. But they did

not say the issue is occurred directly as a direct result of the projects. They mentioned that there are some peripheral influences to increase elephant activity after the commencement of the projects. Further they added that at the beginning of the project planning the HEC was considered as a major concern. One officer said that "*most of the lands we have obtained for the projects were wilderness areas a couple of years ago and were inhabited by elephants.*" They added "*before starting this big project it was rare to see a single elephant openly and today we can see whole herds of elephants often.*" It is clear that existing mega projects of the Hambantota have affected the HEC to some extent.

Figure 25: (Photograph by Researcher: The Hambantota International convention center is being constructed amidst elephant habitats)

During the planning stage of developments projects the UDA has been discuss that they would face many problems about the Elephants during the implement stages. But still they did not have any particular strategies to facilitate to the displaced Elephants due the development projects. There for quickly taking actions and allocate especial committee can be a good solutions for

mitigate the damages and save the life of Elephants as well as Humans. 30% of respondents agree with me that the urbanization of the Hambantota district influenced the human elephant conflict directly. And 40% of respondents did not have an idea and 30% of respondents disagree with the urbanization of the Hambantota district influenced the human elephant conflict directly. The most of the respondents were who have agreed with me from the area of the current International Airport project. Couple villagers answered for the question "how do you perceive the relationship between the Hambantota development projects and the human elephant conflict" "We like the development, because in the future our kids can get the maximum benefits, but we are not recommend the clearing jungles without plan for the development activities, if they did so we would have to suffer, because then frequency of Elephants attacks to the villages and crops are increasing."

Figure 26: (Researcher in white pants while conducting an interview with a villager)

Chapter 8: Conclusion and Recommendations

8.1. Conclusion

This study has assessed the possibility for developing sustainable solutions for Human Elephant conflict in Hambantota District. There are no any proper solutions for the HEC even today. There are some hand full studies on the issue which were conducted for find out the sustainable solution for the issue. After couple of dead due to elephant attacks the HEC is quite famous as well as controversial circumstances in the Hambantota District today. But the techniques used to mitigate the HEC have been increasing in several ways within the last years even though the HEC still exists.

However, some people argued that there is no HEC in the Hambantota District as we think and most Medias and some environmentalist are making the HEC issue as a most controversial issue. But after the research I could recognize that actually there are some people who are suffering from the HEC in most rural areas in Hambantota District. Most of the time the incidents are not reported or talked about in the public media or within the local authority if at all the particular victims do not lobby to responsible sectors. Mainly there are problems of information flow and further most of the villagers feel disappointed and lonely without having a responsible person, organizations or authority to convey their grievances. According to the research findings, majority of villagers do not have enough sources to obtain the information or share the information about the HEC. Further the HEC is highly affecting the livelihood of some community members and they have decided to live with the problem because they have no solution for it.

 The HEC issue is affecting the community in several ways, some time they cannot go the school, some time they have lost their livelihoods , some time they have lost their family members, some time limited their freedom etc. These consequences show us how much they have suffered from the issue as well as   to what extent does the elephant represent a serious problem to local communities in Hambantota District`s community etc.

After the research I could recognize that how can elephants be utilized as an important resource for Hambantota District development. The community did not have any kind of intention to use the elephant's existing in the district for development matters rather than living them in the

national parks. Nobody wants to think out of the box. In this view their perspective is very poor and the awareness for community in relation to the elephants and development is indeed.

As I said earlier the potential of finding new strategies as well as trying and experiment of new mitigation methods are very high today. They have been moved to new techniques since the elephants are becoming familiar with the existing techniques. Most of the villagers as well as DWC officers also agreed unanimously that the most common and sustainable solution for the HEC is strong and well functioned fence established after well analysis of the area. Further the DWC officers are experimenting new methods with the combination of traditional mitigation methods such as culling, taming, relocation, birth control, high techniques fences etc. Further as new concepts they are using strategies such as human elephant living together, introducing new crops to avoid the crop raiding of elephants, establishing more translocation places, elephant corridors, more elephant orphanage etc.

The role of the DWC officer`s are always monotonous due to less remunerations packages and dissatisfaction of their jobs today. Further, I could recognize that they have been using their maximum strengths to mitigate the issue even though they did not have sufficient infrastructures. Less pay and being vulnerable is making their life disappointing most of the time. Further I could recognize that there is some conflict between Human and DWC officers. Most of the HEC issue is existing this conflict is quite big and the role of DWC officer in this issue did not highly consider and satisfy the community. But there are some officers who are working with the good objective and the bad attitude occur on the DWC officer due to their bad behaviors during the couple of incidents that previously happened.

Finally, the existing mega development project`s of the Hambantota district have influenced the enhancement of HEC in the Hamabntota District to some extent. I met some respondents during the field work who have agreed with that the development has a relationship with the HEC. The development is indeed in any country, any province and any district today. But it is not good to think about the development without thinking the nature of the area. Thus conducting the Environmental Impact Assessment at the beginning of the project can be minimizing the harm for the nature. From the data analysis I could recognize that still there is a possibility to consider the nature and continue it as a sustainable development projects.

8.2. Recommendations

- The government should have good strategies to allow domesticating the elephants if someone willing to. If the DWC can control the size of elephant's herds by removing couple of male elephants from the group without make big mentally effective to the herd could be a good solution to minimize the elephant's depredation frequency to the villages. According to the Survey done by Biodiversity and elephant conservation trust still there are some people as well as Buddhist temple who would like to keep an elephant under their observation. There for DWC can capture the elephant and handover to them to look after and prepare for the Religious pageants etc. Today there are good demands for the elephants from the religious pageants during the festival seasons. There for the government policies should be released.

- Improved veterinary service is really important to take immediate action when Elephants are ill, injured or shot in this region.

- There should be a large scale cultivation of trees and plants which can elephant attractive within the elephant`s territories. This is a long time plan. After long time they may never come back to urbanize area if they have enough foods in their territory. Especially elephants are like to eat plants/Trees such as jak, kitul *(Caryota urens)* and coconut *(Cocosmagnifera)*. There should be a plan to find alternatives foods for elephants.

- The Department of Wild life Conservation has to play active role to support Elephant as well as people who suffer from the HEC in this region.

- Central Government or local authorities should organize an effective awareness program all over the areas the HEC existing to protect from the elephants. The awareness programs should discuss facts such as How to prevent the elephant depredations, Cultivation of elephant do not attractive vegetables and crops, How to behave when elephant attacks to the village, Aggressive elephant`s behaviors' etc.

- After recognize the elephant territory in the region and should analyze the maximum number of elephant can be living in the territory. Then every year should capture the additional elephant and hand over to Udawalawa Elephant transit home or elephant Orphanage at Kandy. When the size of herds becoming bigger the territory for their

feeding also should be starting to bigger, there for we can maintain such situation and can limits the consequences to the community of the area. The Kruger National Park in north-eastern South Africa has been following this concept for a long time. "From 1967 to 1994 the Kruger National Park in north-eastern South Africa annually culled approximately 500 elephants to keep their elephant numbers steady between 6,000 and 8,000." (Lotter H.P.P: 2004-2006: 01) As well as the government should introduce the safety elephant transport systems.

- A one and only Elephant orphanage is situated in Kandy (Pinnawala) in Sri Lanka. The capacity is not enough to cater the elephants when compare with the elephant populations in Sri Lanka today. There for government should establish a fully equipped elephant orphanage in the southern province of Sri Lanka to cater the elephants as well as develop the tourism industry in the southern Sri Lanka. There is a good potential to develop the Hambantota District as major tourism destinations in the Deep South. After set up the elephant orphanage there will be a possibility to provide the training for wild elephant and allocate them to tourism activities such as Elephant rides, elephant`s paintings, Elephants dance, pageants etc. There for its worth to aware the community about the commercial value of the elephants. Eg. Elephant`s dung`s paper.(This is an environmental friendly product and can highly obtained the attention of foreigners)

- There should be a sustainable strategy when colonization's in the wilderness area of the district. (Good land use policy) I have been clearly recognized from the research that most of the newly located people living in the land belong to the elephants in the history. The peoples also mentioning that during the field work, I was remember one villager said *"All this lands Today we are living was belongs to the Elephants couple of years ago and these area was fertile with bushes and grass. We are living in their territory and now they do not have place to go feeding and their attacking us aggressively. We cannot blame them."* I could have been seen during the field work there are some villagers in the territory of elephants and other part out of the territory.

- There should be a good understanding about elephant territories to the officers as well as communities. When they implement their projects plans they should consider the elephant territories. Should not encourage doing any type of development or human activities within this territories.

- Recognizing the best practices for the captive elephant well being. As an example freedom of movement, confinement, fencing, water features, food, exercise, Bathing etc. (J.D.K. Lisa, F.Debra, H. David :2005)

- Encourage the humans to treat the elephant humanely. According to the Lotter "Elephants deserve a special moral status within the animal kingdom, as they have some of the most complex sets of behavior and intricate inner lives of all animals. (Lotter H.P.P, (2004-2006). Further there should be a plan to increase the tolerable level within the community in HEC.

- Simulation of nature – Most of the conservation areas of the district have been encircling with lot of human activities as well as conservation areas also getting smaller day by day. There for there should be a proper strategy to limit the influences to the conservations areas from the community.

- Translocation – According to the villagers this impossible because they have explained that, they have some evidence to the similar incidents of the elephant relocation. Because after the relocation they have been come back to the previous territory within the couple of days. But my recommendation is that is not the strategy to relocate the elephant. After capturing they should have interim period to recognize the behavior of the elephant and then must decide to where could be the idlest place to replace the elephant.

- Contraception – This also a good strategy to control to propagate of the elephants. "New research on elephants suggests that contraception might provide a long-term solution for limiting elephant numbers in game reserves." (Lotter H.P.P, (2004-2006:07), besides this solution would be more attractive rather than culling (Killing selected elephant of the group) in the Buddhist country like Sri Lanka.

- Making the artificial waterholes during the drought seasons within the elephant`s most attractive areas can be a minimizing the barnstorm of the elephants. This should be happen after recognize the most attractive areas of the elephant`s territories.

- Increase the number of awareness program for the DWC officers and train them properly with the support of international level. Provide good technological equipment and train them properly to catch the elephants. As an example the countries like India, Nepal, and Thailand using the elephants for the development activities as well as entertainment

activities to earn the income. The awareness about the use of elephant commercial purpose is highly needed.

- As a custodian of the elephants the Wild life officers should built a good interrelationship with the stakeholders in the area to minimize the deleterious of the HEC.

- Establish the DWC franchise service offices within the most vulnerable areas.

- Community should get the responsibility to protect the electric fences in their area. If they can check the functions, repairing damages, cutting the branches close to the fence, etc regularly the fences will be long last.

- Should start with a pilot projects before implementing the activities related to the HEC.

- Develop best national policy for the HEC and implementing proper standard monitoring and data analyzing system. Further the policy should discuss the factors like "National census programme for elephant, Distribution of elephants and definition of their internal and trans-boundary range, Protection of elephants and strategy against poaching, Definition of policy on ivory retention and its use or trade, Measures to assess and mitigate HEC, Topics and priorities for elephant research." (Hoare R: 2009:10) The methods for analyzing the crop damage system in indispensable.

- Introducing the community Based crop protection strategies.

- Establish better elephant corridors to move within the conservation areas without going through the human habitat areas.

- The process of Compensation systems should be expedite and should reduce to one month after the incidents. As well as the amount of paying in several categories should increase annually.

References

1. Abdeen J S M, (2008), *Call to protect elephants*, Sunday Observer national news paper Sri Lanka, URL, http://www.sundayobserver.lk/2008/08/24/new15.asp, (Accessed 2012/05/16).

2. Alawathugoda, (2005-2010), *Chena cultivation Of Sri Lanka*, URL, http://www.alawathugoda.com/chena.htm, (Accessed 2012/05/01).

3. Bagheera, (2010), *Asian Elephant and African Elephant an endangered species*, URL, http://www.bagheera.com/inthewild/van_anim_elephant.htm, (Accessed 2011/03/26).

4. Bandara R, Tisdell C, (2002), *Comparison of rural and urban attitudes to the conservation of Asian elephants in Sri Lanka: empirical evidence*, URL, www.asesg.org/PDFfiles/Gajah/30-41-Perera.pdf, (Accessed 2012/05/20).

5. Biodiversity and Elephant conservation trust, (2011), URL, http://www.elephantsinsrilanka.org/elephants.htm, (Accessed 2012/02/03).

6. Bryman, A. (2008), *Social Research Methods 3rd Edition*, New York: Oxford University Press.

7. Burke J, (2011), *Sri Lankan wildlife activists boycott wild elephant census*, URL, http://www.guardian.co.uk/world/2011/aug/10/sri-lanka-boycott-elephant-census, (Accessed 26/04/2012).

8. Colombo Page, (2007), *Rs 10 Billions need to manage the elephants in Sri Lanka*, Sri Lankan Internet news paper, URL, http://www.colombopage.com/archive_07/August31134754SL.html, (Accessed 2012/05/06).

9. Center for Conversation and Research, (2009), *Herd of Elephant (Female and Juvenile) at Hambantota*, URL, http://www.ccrsl.org/CCR/WhoWeAre.htm, (Accessed 2012/05/27).

10. Department of wild life conversations, (2006), *National elephant conservation policy*, URL, http://203.143.23.34/index.php/policies-a-legislations/national-elephant-conservation-policy.html?showall=1, (Accessed 2012/04/28).

11. De Silva P, (n.d), *Status and conservation of the elephant and the alleviation of man-elephant conflict in Sri Lanka*, URL, www.asesg.org/PDFfiles/Gajah/19-01-deSilva.pdf, (Accessed 2012/04/27).

12. District Secretariat Official web site Hambantota, URL, http://www.ds.gov.lk/dist_hambantota/english/index.php, (Accessed 2012/03/20).

13. Elephants and elephants conservation in Sri Lanka, (n.d), *Elephants in Sri Lanka*, URL, http://www.eleaid.com/index.php?page=elephantsinsrilanka, (Accessed 2011/11/12).

14. ERA, (2009), *New Environmental Resource Alliance, Problem with Chena cultivation*, URL, http://newera.lk/index.php?option=com_content&view=article&id=61:problem-with-chena-cultivation&catid=25:the-project, (Accessed 2012/04/03).

15. ETR Associates, (2012), *Conducting Focus group discussions*, URL, http://www.etr.org/FFN/FGcourse/focusGroupCourse.html, (Accessed 2012/04/26).

16. Fernando P, Jayewardene J, Prasad T, Hendavitharana W and Pastorini J, (2011), *Current status of Asian Elephants in Sri Lanka*, URL, www.asesg.org/PDFfiles/2012/35-93-Fernando.pdf, (Accessed 2012/04/06).

17. Fernando P, Kumar M.A, Williams A.C, Wikramanayake, Aziz T and Singh M (2008), *Review of Human Elephant conflict mitigation measures practiced in South Asia, World wide fund for nature*, URL, http://www.ccrsl.org/Downloads/Fernando-ReviewHEC.pdf, (Accessed 2011/10/22).

18. Frank D, (n.d), *Research for Marketing and Communications*, URL, http://www.dfrank.com/focusdis.htm, (Accessed 2012/03/06).

19. Gunathilaka T (2012:17) *is there an anybody to hear these disturbances from the elephants*; Divaina National News Paper, Sri Lanka.

20. Hambantota 2018 the commonwealth game candidate city, (2011), *location of the district*, URL, http://www.hambantota2018.com/, (Accessed 2011/12/20).

21. Hennayaka S.V, (2012), *Everyday disturbances to the people in the Wellawaya*, Dinamina Sri Lankan national news paper, 17th May 2012.

22. Hettiarchchi K, (2012), *pregnant female jumbo felled by shotgun*, the Sunday Times News Paper 15th January 2012.

23. Hettiarachchi K, (2009), *Why do elephants come back home*? Sunday Times news National paper Sri Lanka, 5th April 2009, URL,

http://www.sundaytimes.lk/090405/News/sundaytimesnews_28.html, (Accessed 2011/11/12).

24. Hoare R, (2009), *A case study "Vertically integrated Human elephant conflict management system in Tanzania: Back ground and next steps"*, URL, www.african-elephant.org/hec/pdfs/heccstzvertint.pdf, (Accessed 2012/12/06).

25. Hoare R E, (1990), *Determinants of Human Elephant in land use mosaic*, URL, www.african-elephant.org/hec/pdfs/heclessons.pdf, (Accessed 2012/05/06).

26. Holstein J.A. and J.F.Gubrium, (2011), *Qualitative Research*, URL, http://www.novelguide.com/a/discover/eoa_04/eoa_04_00343.html, (Accessed 2012/04/01).

27. IRI Technical Report 10 - 02, (2005), *Climate influences on Human-Conflict in Sri Lanka, International Research Institute for Climate and society*, Earth Institute at Columbia University. URL, http://iri.columbia.edu/publications/id=983, (Accessed 2012/03/20).

28. Jayasundare O, (2009), *Humans mainly to blame for elephant conflict*, URL, http://www.elephantsinsrilanka.com/human_elephant_conflict_in_sri_lanka.htm, (Accessed 2012/03/20).

29. Jayawardene J, (2003), *Study to ascertain the status of the domestic elephant population in Sri Lanka*, Final report to International elephant foundation, Biodiversity and elephant conservation trust. URL, www.elephantsinsrilanka.org/.../status_domestic_elephants_sl_2003.p, (Accessed 2012/05/20).

30. Jayawardane J, (2006), *Wild Life, History and culture of elephant in Sri Lanka*, URL, http://amazinglanka.com/wildlife/articles/dn_elephants1.php, (Accessed 2012/01/20).

31. J.D.K. Lisa, F.Debra, H. David, (2005), *Best practices by the Coalition for Captive elephant Well-Being*, URL, www.elephantcare.org/protodoc.../CCEWBCoreBestPractices.2.pdf, (Accessed 2012704/05).

32. Karimi R R, (2011), *an assessment of perceived crop damage in a Tanzanian village impacted by Human elephant conflict etc*, Michigan state university, URL,

dspaceprod.georgiasouthern.edu:8080/xmlui/handle/10518/2594, (Accessed 2012704/02).

33. Kawulich B B, (2005), *Participant Observation as a Data Collection method*, URL, http://www.qualitative-research.net/index.php/fqs/article/view/466/996, (Accessed 2012/04/06).

34. Kulkarni J, Mehta P and Hiremath U, (2008), *Man-Elephant Conflict in Sindhudurg and Kolhapur Districts of Maharashtra*, India, Final technical report, URL, www.envirosearch.in/Reports%20for%20uploading/..., (Accessed 2012/03/22).

35. Kumara L.W.G.C, (2005), *Human Elephant conflict in Sri Lanka*, URL, http://www.elefantasia.org/spip.php?breve103, (Accessed 2011/03730).

36. Kurt F, (2005), *History and Biology of Traditional Elephant Management*, URL, www.colyerinstitute.org/pdf/feems1.pdf, (Accessed 2012/05/05).

37. Liganga L, (2010), *The Human Elephant Conflict*, URL, http://www.thecitizen.co.tz/news/3-features/1595-the-human-elephant-conflict.html, (Accessed 2012/03/26).

38. Lotter H.P.P, (2004-2006), *the ethics of Managing Elephants*, University of Johannesburg Chairperson, Ethics Society of South Africa URL, www.tuskertrails.co.za/Ethics_of_Managing_Elephants.pdf, (Accessed 2012/04/07).

39. Moran K, (2010), *Traditional Elephant Management in Sri Lanka*, URL, http://www.culturalsurvival.org/ourpublications/csq/article/traditional-elephant-management-sri-lanka, (Accessed 2012/04/30).

40. Munn. P. & Drever E, (1990), *self-completed questionnaire*, using questionnaires in small-scale research: a teacher's guide. Edinburgh. URL, www.westlothian.gov.uk/media/educationdocs/researchquestiondoc, (Accessed 2012/05/28).

41. Nelson A, Bidwell P and Zubiri S, (2003), *a review of human-elephant conflict management strategies*, URL, www.peopleandwildlife.org.uk/.../Human-ElephantConflictP&WMan..., (Accessed 2012/05/02).

42. Official Government News Portal of Sri Lanka, (2009), *Elephant conservation to be improved*, Press Release, URL, http://elephantssrilanka.blogspot.com/, (Accessed 2012/04/17).

43. Ospina S, (2004), *Qualitative Research*, URL, http://wagner.nyu.edu/leadership/publications/files/Qualitative_Research.pdf, (Accessed 2012/03/28).

44. Parker G E and Anstey S G, (2002), *Human-Elephant Conflict and Community Development in Niassa Province*, Mozambique, URL, www.elephantpepper.org/.../Niassa%20Trip%20Report-final.pdf, (Accessed 2012/02/24).

45. Perera O B M A, (2009), *The Human-Elephant Confl ict:A Review of Current Status and Mitigation Methods*, Faculty of Veterinary Medicine & Animal Science, University of Peradeniya, Peradeniya, Sri Lanka, URL, course.ku.ac.th/lms/files/resources_files/19872/147531/hec1.pdf, (Accessed 2011712/23).

46. Sakwa J, Thouless C R, (1994), *Shocking Elephants. Fences and crop raiders in Laikipia District*, Kenya, URL, http://www.sciencedirect.com/science/article/pii/000632079400071W, (Accessed 2012/04/28).

47. Santiapillai C, Wijeyamohan S, Bandara G, Athurupana R, Dissanayake N and Read B, (2010), *An assessment of the Human – Elephant Conflict in Sri Lanka*, University of Peradeniya and Center for elephant conservation USA, URL, www.sljol.info/index.php/CJSBS/article/download/2350/1933, (Accessed 2012/03/27).

48. ScenicSrilanka.com, (n.d.), URL, http://www.scenicsrilanka.com/, (Accessed 2012/01/29).

49. Silva D P, (2012), *second electrified fence coming up at Udawalawa national park*, Daily news national news paper Sri Lanka, 14th of May 2012.

50. Tchambe M N, (1995), *History and present status of the Human/Elephant conflict in the Waza-Logon region*, Cameroon, West Africa, URL, www.sciencedirect.com/science/article/pii/0006320795000402, (Accessed 2012/04/30).

51. The Mahawamsam (2007), URL, http://mahavamsa.org/, (Accessed 2012/02/02).

52. Vavoula A, (2010), *Self-Completion Questionnaire*, URL, http://www.proz.com/kudoz/english_to_greek/surveying/3637483-self_completion_questionnaire.html, (Accessed 2012/03/09).

53. Weerasinghe C, (2010), *Over 70 jumbos storm Hambantota project`s site*, Daily news National news paper 9th August 2010 Sri Lanka.

54. Wharton C, (2006), *Document Analysis*, URL, http://www.srmo.sagepub.com/view/the-sage-dictionary-of-social-research-methods/n57.xml, (Accessed 2012/04/07).

55. Wijayaratne S.M, (2008), *Wildlife Dept expedites payments to victims of elephant attacks*, Daily news national news paper Sri Lanka, URL, http://www.dailynews.lk/2008/11/18/news15.asp, (Accessed 2012/05/12).

56. World Wild life fund, (2008), *Humans and Elephants on collision course in south Asia*, URL, http://elephantssrilanka.blogspot.com/search/label/wild%20elephants, (Accessed 2012/05/17).

57. Zhang L, Wang N, (2002), *An initial study on habitat conservation of Asian elephant (Elephas maximus), with a focus on human elephant conflict in Simao, China*, URL, http://www.sciencedirect.com/science/article/pii/S000632070200335X, (Accessed 2012/04/26).

Appendix 01-

Quantitative questionnaire

Community – Name of the GS Division (The lowest Administrative system) – The Hambantota district has consisted with 526 GS Divisions) –

Questions about the community

01. GS Division:

02. No of Families:

03. Major Livelihood of the community members:

04. No. of annual human damages in Human elephant conflicts:

| | Deaths | | Injured | | Totally Disable | | Just Chased | | Other |

05. No. of annual elephant damages in Human elephant conflicts:

| | Deaths | | Injured | | Totally Disable | | Just Chased | | Other |

06. Reasons for elephants deaths/woundings:

| | Shot | | Poisoned | | Electrocuted | | Pitfall | | Other |

08. Name of the village?

09. Years lived in the community:

| | 1-5 years | | 5-10 years | | 10-20 years | | More than 20 |

10. No. of members in the family:

| | Male | | Female |

11. Major income for the family/Household:

13. Distance between the house and elephant habitats (Periphery):

☐ 100m   ☐ 300m   ☐ 1km   ☐ More than 1Km

14. Do you have:

☐ Electric Fence   ☐ Trench   ☐ Elephant warning System   ☐ Biological Fence   ☐ Wire Fence

☐ Stone Walls   ☐ Other around the village?

15. Are you maintaining your own fence around the House?

☐ Yes   ☐ No

16. If yes, what type of fence?

☐ Electric Fence   ☐ Trench   ☐ Alarming System   ☐ Biological Fence   ☐ Wire Fence

☐ Stone Walls   ☐ Other

17. If the Electric fence, what is the voltage/Ampere?

18. How much does the electricity cost of month?

☐ Rs. 0-150   ☐ Rs. 151-750   ☐ More than Rs. 751   ☐ Other

19. Have you ever been affected by the elephants?

☐ Yes   ☐ No

20. If yes, in what way?

☐ Life/s   ☐ Lands/Crops   ☐ House   ☐ Any other property   ☐ Indirect Way

21. If Life, Male Female

☐ Age 1-5   ☐ Age 5-18   ☐ Age 18-50   ☐ Age over 50

22. If lands/crops

☐ Rice   ☐ Banana   ☐ Coconut   ☐ Vegetable   ☐ Other

23. Size of destroyed area

☐ ¼ Acre or less   ☐ ¾ Acre or less   ☐ 1 acre   ☐ More than 1 acre

24. If House, temporary Permanent

☐ Wattle and daub   ☐ Timber   ☐ Bricks   ☐ Other

If the indirect way please specify

25. How many times have wild elephants damaged your crops/House

☐ 1 time   ☐ 2 times   ☐ 3 times   ☐ More

26. What was the Damage? In Rs. ……..(Total)

☐ 1st time   ☐ 2nd time   ☐ 3rd time   ☐ Or more

27. How much did you receive as a compensation?

☐ 1st time   ☐ 2nd time   ☐ 3rd time   ☐ Or more

28. Was it adequate enough to cover the damages?

☐ Yes   ☐ No

29. Have you obtained the bank loan? How much?

30. How do you repay it now?

31. What is the closest developing project in the periphery?

☐ Airport   ☐ Harbor   ☐ Five star hotel   ☐ Sport Complex

☐ Highway   ☐ Administration Complex   ☐ Convention center   ☐ Other

32. Distance between house and project

☐ 100m   ☐ 300m   ☐ 1Km   ☐ More than 1Km

Appendix 02-

Qualitative interview guide

Wild life office staff Interview Guide GS Division/Location: Date: Time: from………………to…………. Name of the Organization/Interviewer: Address: Contact No:	
Questions	**Follow up questions**
What is your general opinion about the current Human elephant conflict in Hambantota District?	Why?
Can you tell me about the history of the Human Elephant conflict in the area?	
Do elephant populations represent a serious threat to local communities in Hambantota?	
What is your duty as a wild life officer?	How long have you worked as a wild life officer and are you happy with your job?
Are you satisfied with government concerns about wild life officers?	
Is there enough land for living and grazing for elephants as well as for the living and cultivation needs of human populations in the district?	
What kind of mitigative measures are you taking to control/solve the issue? (elephants attacks in villages)	What do you think could be the best alternative solution for the issue?
Do you believe that there are any sustainable solutions for the issue?	Why?
Do you believe that existing development projects in the Hambanota district have a significant relationship to the issue?	Why?
What do you think is the best way to protect the elephants while continuing district development projects?	
How do you plan with the communities to face the issue?	
Does the community participate in the decision making process with you?	If yes, is useful? If not, Why?

Is it possible to use elephants as a resource for the Development of the area?	If yes, how? If no, why not?
What are the actions are taken when elephants cause damages in the community?	Are community members satisfied with your reactions?
What are the strategies presently employed to send elephants back to the jungles?	
What policies do you have in related to the human elephant conflict?	Are you satisfied with them?
Do you think that elephant's relocation is effective solutions for the issue?	Why or why not?

Appendix 03:	
Community Interview Guide GS Division/Location: Date: Time: from………………to…………. Name of the Interviewer: Address: Contact No:	
Questions	**Follow up questions**
What is your general opinion about the current Human elephant conflict in Hambantota District?	Why?
What do you think could be the major causes of the issue?	Are there any other sub issues?
How do you perceive the importance of environmental and social protection in relation to development?	
How do you perceive the relationship between the Hambantota development projects and the human elephant conflict?	
Do you like to keep elephants as your neighbors?	Why or why not?
What types of subsidies do you receiving from the government? (When elephants are attacked)	Are they adequate enough to offset the damages?
What are the strategies used to deal with elephant issues?	Are they effective?
Are you happy with the service of wild life officers?	Why or why not?
What do you think could be the best solutions for the issue?	
Do you believe that development projects are	If yes, are you at odds with development

|	
largely to blame for much of the human-elephant conflict?	projects in Hambantota district?
Have you ever had any disturbances/attacks from the elephants?	In what ways?
Have you ever lost any relatives or acquaintances due to elephant attacks?	If yes, elaborate.
Is it true that peoples try to kill elephants due to their violent interactions with people and their destructive tendencies in farming contexts?	Do you know that killing elephants is considered poaching and is illegal? /do you know the fine for killing an elephant?
What are the strategies peoples use to kill the elephants?	
How is the reaction of wild life officers when someone kills an elephant?	How is the reaction of wild life officers when an elephant kills a person?
What are the possibilities of using the elephants for development/tourism sector in the district?	Are there any other sustainable ways to use them?
Are you satisfied with the existing fence (electric/wire fence) system in the area?	If dissatisfied? What are your suggestions for alternatives?

Appendix 04:

Focus Group Interview Guide
GS Division/Location:
Date:
Time: from………………to………….
Name of the group/team/meeting
Address:
Contact No:

Questions	Follow up questions
What is your general opinion about the current Human elephant conflict in Hambantota District?	Why or why not?
How do you (all the villagers) behave when elephants attack?	What are the strategies are used to drive them back to the jungle?
Are you satisfied with the existing development projects in the district?	Do you think that you will benefit in the future because of this mega development projects?
What could be the main cause of elephant attacks here today?	
Do you believe that there is a relationship between elephant attacks and Hambantota development projects?	
How was the situation here before the commencement of these projects?	If yes, to what extent were there elephant attacks, crop raiding etc?

Are you satisfied with the wild life officers activities in line with the HEC (Human Elephant Conflict)? Do they come when you report elephant raids?	Are they taking actions quickly when the emergency (Elephants attacking)

Appendix 05:

Hambantota Development project`s staff Interview Guide
(Harbour, Airport, Oil Refinery, Sport complex, High ways, Administration complex, Convention center, Dry zone botanical garden, Safari park etc.)
GS Division/Location:
Date:
Time: from………………to………….
Name of the Organization/Interviewer:
Address:
Contact No:

Questions	Follow up questions
How do you perceive the current Human elephant conflict in Hambantota District?	
Have you considered nature/elephants from the area in planning the development projects in the district?	If yes, what was the plan for the elephant element? Did you apply the plan in the projects?
Are there any plans or strategies to use/utilize nature (animals and jungles) for the development of the district?	If yes, were they also involved during the planning stage of the development projects?
Elephants could be used for the development of tourism in the district; was that considered in the planning?	
Do you agree that a major cause of the HEC in the district could be the mega development projects?	
What is your plan/strategy for conservation of elephant herds in the district that have been displaced due to mega development projects?	Are there any alternative grassing areas for the elephants in the district?
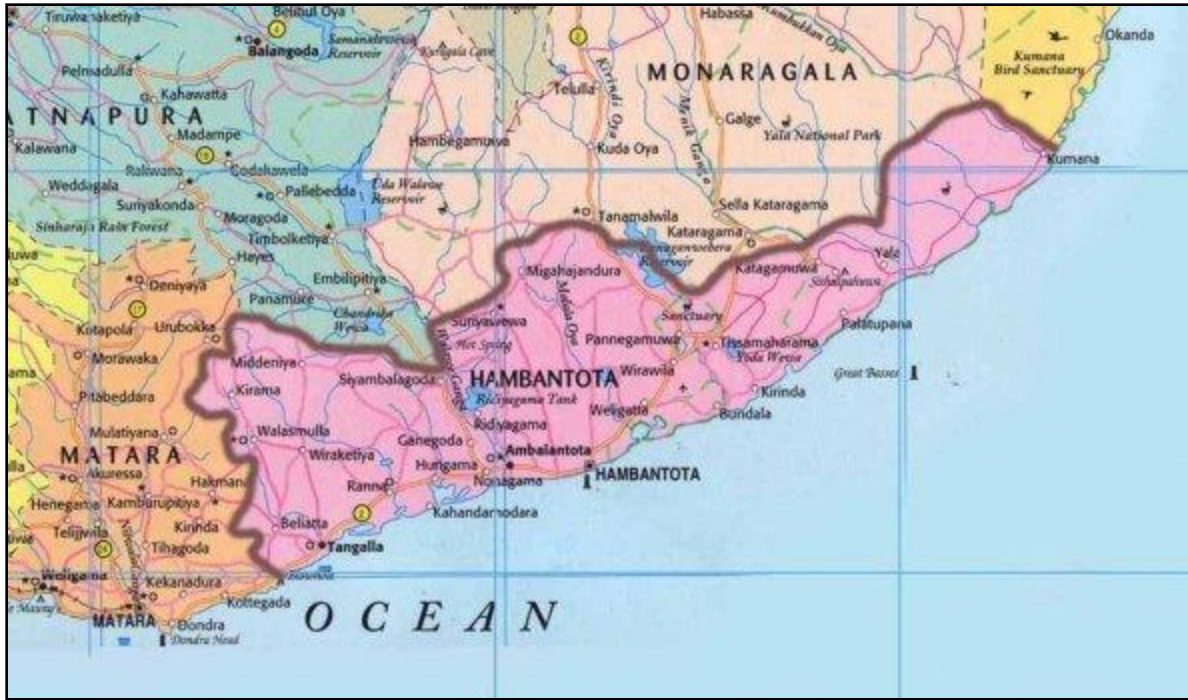
Figure 27: Map Hambantota District (Source: http://www.squidoo.com/hambantota-2018)

Figure 28: (Sources : www.elephantsinsrilanka.org : Elephant and Mahout)

Figure 29: Few Ankus use to control the Elephants. (Kurt F:2005: 03)