

# Saving Elephants & Minimizing

## Human Elephant Conflict

by

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**Implemented By: CHILD REHABILITATION CENTRE IN SRI LANKA**

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**1.**

**INTRODUCTION**

Sri Lanka is a tropical island of 65,610 square kilometers (km<sup>2</sup>) and considered to be one of the worlds’ biodiversity hotspots (Myers, 2000). Sri Lanka’s globally significant biodiversity values are currently threatened by deforestation, land degradation, and unregulated exploitation of natural resources (Kumar, Pethiyagoda & Mudappa, 2004). The animal most affected by these activities is the endangered Sri Lankan elephant *Elephas maximus* (Corea 2001 & 2006). The Sri Lankan elephant, which has shared a special cultural bond with the people of Sri Lanka for centuries, now faces an uncertain future. The current population is estimated to be 3,250 (Santiapillai & Jackson, 1990), 4,000-4,500 (de Silva 1998) and 2,500-4,000 (Sukumar, 2006). Given the dense and tangled nature of the vegetation in which elephants live in Sri Lanka, Santiapillai (2002) states that no one really knows just how many elephants are there in the wild in Sri Lanka. Whatever the current population is de Silva (1998) states the Sri Lankan elephant’s survival is threatened by habitat loss, habitat fragmentation, habitat degradation, and poaching. Dedicated conservation efforts, backed by political will and commitment and adequate financial support, are needed to halt these threats and ensure the long-term conservation of the elephant (Corea, 2001). The conservation benefits would be far-reaching not only for the Sri Lankan elephant, but also for the many other species of plants and animals that share the elephant's range and the human communities that have co- existed with the elephant for so long.

Perhaps no other wild animal in Sri Lanka has had such a close relationship with people as the elephant and according to the Maha Wansa (The Great Chronicle) wild elephants and man co-existed without much conflict in the ancient times (de Silva 1998). In Asia, this unique relationship between people and elephants runs deep and dates back as far as 4,000 years, when elephants were first captured and trained as draft animals and for use in warfare and religious ceremonies. Beyond this unique relationship with human beings, the Asian elephant is a flagship for the conservation of the tropical forest habitats in which it is found. Elephants range over long distances and across a variety of habitats that are home to numerous other wildlife species. As they need very large areas to survive, effective conservation and management of elephants can deliver widespread benefits for other endangered species. Within the last half century Asian elephants’ number have declined significantly (Kemf & Santiapillai, 2000) and current Asian elephant population is estimated to be 25,600 to 32,750 (WWF, 2006).

**1.1. Background**

The population of Sri Lanka is 78 percent rural, about a third of the land area is under permanent cultivation, and marginal lands are increasingly brought into production. The present natural forest cover of Sri Lanka is less than 22 percent of the land area, and deforestation continues at an annual rate of 1.1 percent due to a high demand for fuel wood, timber, farmland, infrastructure projects, and agricultural land-clearance schemes. According to the Department of Census and Statistics (DCS) of Sri Lanka the official national poverty headcount ratio for Sri Lanka’s rural population in 2002 was

24.7 percent and the official national poverty line as of 2004 is Rs 1,526. Based on the official national poverty line it can be safely assumed that at least 70 percent of the rural people must live in significant poverty. In an Asian Development Bank funded survey villagers have identified poverty as the root cause of illegal and unsustainable exploitation of resources inside and outside of the Protected Areas (PAs). A Participatory Rural Appraisal conducted by Sri Lanka Wildlife Conservation Society sociologist, Zeenath Khalid in the Weheragalagama village showed that 65 percent of the population moved in a constant debt cycle. Such low and unpredictable incomes are key features of poverty. The resulting insecurity means that many households have at least one member who is searching for work opportunities, formal or otherwise. These individuals are used as casual labor by wealthier neighbors and outsiders and are vulnerable to being co-opted in support of livestock grazing, logging, poaching, and gemstone mining within and outside of the PAs. Adding to the considerable suffering of these people is human-elephant conflict. Today human-elephant conflict is perhaps one of the biggest environmental issues the country is facing and is the single most cause for extensive crop and property damages and for the death of a large number of elephants and humans (Corea, 2006).

**Table 1: Human and Elephant Deaths and Properties Damaged from 2018-2023**

	2018	2019	2020	2021	2022	2023
Humans Killed	18	25	27	39	32	34
Properties Damaged	276	346	411	289	n/a	n/a
Elephants Killed	56	71	65	68	74	86

Source: Biodiversity and Elephant Conservation Trust & The Department of Wildlife Conservation-Sri Lanka.

Sri Lanka has also been identified as one of the twenty-five global biodiversity hot spots of the world with more than half of its species endemic to the island (Myers, 2000). Sri Lanka has a fairly extensive system of PAs, covering about 12.5 percent of the land area (IUCN, 1990). Not all of them support elephants though. According to present estimates, the present 8,220 square kilometers of protected areas can support only 1600 elephants (about 50% of the estimated population of wild elephants). The remainder needs areas outside of the protected areas for their survival. Elephants being the largest terrestrial mammals frequently range outside the borders of even the largest national parks in Sri Lanka. Thus, setting aside enough habitats to support a large population of nomadic animals such as elephants is almost impossible. Nearly 70 percent of the elephants in Sri Lanka roam outside the protected areas (Kariyawasam, 2002). Therefore, the number of elephants that can be supported by a conservation area and its buffer zone will depend on the tolerance of the people who share their land with the elephants. The assumption is that people will tolerate elephants in their backyards only if they can benefit from their presence or if they are provided protection from the frequent elephant attacks on their crops, property and lives or if they are adequately compensated for their losses. Currently there are no incentives for farmers to support elephant conservation efforts.

## **1.2. History**

Conflict between humans and elephants is not a new phenomenon. Elephants have been raiding crops since time immemorial. However, the reverence people had for elephants in Sri Lanka historically ensured its peaceful coexistence and made them tolerant of the occasional intrusion. In recent times however, human settlements have been encroaching further and further into elephant habitat, and the incidence of crop raiding has increased phenomenally, leading to the destruction of crops, homes, and lives (Corea 2001, Thouless & Sakwa 1995). Most of these large-scale clearings of jungle for agriculture have not given due consideration to the ecological needs of the elephant and other wildlife. As people have suffered escalating losses to elephants, their tolerance has given way to anger and frustration. Elephants looking for food destroy hundreds of acres of agricultural crops, and considerable number of homes and other property every year. In recent years, an average of 100-150 elephants and 60 people die annually in Sri Lanka due to intense human-elephant conflicts. Many more elephant deaths go unrecorded in the jungle, which are unaccounted for. Almost all of these elephants are shot, poisoned and wounded by farmers in retaliation for damaged crops, property and life. If efforts are not made to resolve this issue soon there undoubtedly will be a drastic drop in the elephant population in Sri Lanka, probably leading to the eventual extinction of several important regional populations. Also, these losses would be a major obstacle to developing and implementing a long-term strategy to conserve and manage Sri Lankan elephants in the wild.

At the turn of the 18<sup>th</sup> century there were 12,000 (McKay, 1973) to 19,500 elephants (Jayewardene, 1994) in the jungles of Sri Lanka. Since then their numbers have so seriously reduced that Clarke (1901) estimated there were 2,000 elephants in Sri Lanka by the turn of the 19<sup>th</sup> century. The present number of elephants that roam about in scattered areas in herds is estimated to be less than 4,000 elephants (Sukumar & Santiapillai, 1996). Considering the fact that killing of elephants is currently getting out of hand, with 3 elephants being killed on average every week for the past decade, the elephant population could well be around 2,000 or lower. The last island-wide census of elephants was done way back in the 1980s and the currently accepted estimate 'fixed' at ~4,000 could well be a guessing game.

Elephants are killed due to various reasons. The main reason is human-elephant conflict where elephants are simply killed because they interfere with agriculture. Some of the major causes of elephant mortality include injuries sustained from shotguns and trap guns, electrocution, poisoning, land mines, accidental fall into wells and abandoned gem pits, collision with trains, trucks and due to natural causes. Poaching for ivory though rare is now carried out under the guise of HEC and continues to contribute to eliminating the few tuskers in the population. From 1991 to 2001 alone 1,293 elephants and 558 people have died as a result of conflicts. In the year 2001 alone 162 elephants were killed, and the main reason of death was gunshot injuries, and in the same year 34 people was killed by wild elephants (Kariyawasam, 2002). Terrorism too has taken a toll and during this period over 17 elephants have been shot and killed.

According to Bandara and Tisdell (2004) the extent of crop and property damage caused to farmers by elephants is Rs.1,121.42 million (~US\$10 million) per annum. This is a substantial cost to bear for a population where possibly nearly 70 percent are living in significant poverty.

While the Department of Wildlife Conservation (DWC) is capable of protecting the elephant and other wildlife within the protected areas, they do acknowledge that ensuring the long-term survival of such a large and highly mobile animal as the elephant outside the network of protected areas though difficult is critical for the long-term conservation of the Sri Lankan elephant (Kariyawasam 2002). Thus, there is a need to change to some innovative approach to elephant conservation in Sri Lanka if elephants are to survive in significant numbers outside the system of protected areas. The DWC (2002) has realized that the management of HEC has to change from the fire-bridge method of responding to crisis to a system that is based on proper land utilization policies and the implementation of effective community integrated conflict management programs.

Recently the DWC (2006) formulated a national policy for the conservation and management of wild elephants. In the policy the DWC states that, "it is imperative that lands other than PAs that could support elephants be integrated into Elephant Conservation Areas (ECAs)." In addition to the ECAs, the DWC suggest that it is critical to establish Managed Elephant Reserves (MERs) by the inclusion of forest patches and isolated hamlets and then providing protection to people living in these MERs. Additionally, the DWC recognizes the need for public/private partnerships but admit that archaic administrative policies of the Department could be a hindrance to forming such partnerships (Kariyawasam, 2005). The reality of elephant conservation is that the magnitude and complexity of issues pertaining to the conservation and management of the Sri Lankan elephant far exceeds the resources and mandate of one government department. As a result, a diverse group of people and organizations must take the responsibility for conflict resolution and for the conservation and protection of the elephant (Corea 2006).

## 2. HUMAN ELEPHANT CONFLICT MANAGEMENT

### 2.1. Observations

Electric fences have been in use for more than fifty years in Africa and in South and Southeast Asia to deter elephants from raiding human settlements. The first electric fence in Sri Lanka was erected in 1966 (Jayewardene, 1994). Since then, over 1,000 kilometers of electric fencing has been constructed and their effectiveness to stop elephants has had various degrees of success and failure. In 1997, Corea (2001) of the Sri Lanka Wildlife Conservation Society (SLWCS) conducted an extensive survey of HEC in Sri Lanka to assess the success of the efforts ongoing at that time to resolve HEC. The findings from this survey showed that most of the electric fences that were operating at the time were not effective due to the following reasons:

- Fences were erected not along either human or elephant ecological boundaries
- Elephants are damaging the electric fences & lack of maintenance
- Lack of common ownership by the communities who are supposed to benefit from the fences

As a result of these finding, the SLWCS concluded that:

- The communities that were affected by crop raiding elephants must be actively involved in the efforts to resolve HEC. Therefore, projects to mitigate HEC need to be participatory.
- Electric fences were the most effective management tool against crop raiding elephants.
- To be effective, **innovative types of** electric fences (scientifically proved repellent etc.) need to be installed either along elephant or human ecological/economic boundaries. An example of management based on good science and conservation practice.

The fundamental concepts that form the basic foundation of the project are:

- Community involvement and participation is a key factor for the effective management of HEC.
- All the local stakeholders must maintain a dialogue, get involved and contribute to the planning and management process from the very beginning and continue to maintain the dialogue throughout.
- It is important to use a bottom to top process of planning as well as a top-down implementation, administrative and management strategy.
- Electric fences are effective as long as they are well maintained and erected along elephant or human

ecological/economic boundaries. In the absence of data to identify elephant ecological boundaries the better alternative is to erect the fences along visible village boundaries since they demarcate the socio-economic and ecological boundary of a village.

- Community development and local capacity building is essential to successfully resolve HEC and to garner local support for long-term elephant conservation.

Based on the success of the first fence a second fence was established in the adjoining village of Weheragalagama with funding from the Asian Elephant Conservation Fund of the U.S. Fish & Wildlife Service (Grant #: 98210-1-G049) and the International Elephant Foundation. These two projects have significantly helped to reduce human-elephant conflicts in these two villages as well in some adjacent villages. The electric fences have helped to raise the socio-economic standards of these villages by significantly reducing crop raiding by elephants. Prior to the electric fences nearly 70% of village land was abandoned due to frequent raiding and after the fences were constructed 100 percent of the arable land in both villages is being cultivated (Corea 2001). Though there are still infrequent incursions by elephants the damage to crops and property has declined tremendously as well as injury to people and elephants and killing of elephants since the fences were constructed.

This one fact has made a significant difference to the economic wellbeing of these villagers, and as a result the farmers are more supportive towards the long-term conservation of the elephant. Even though there is still the occasional intrusion by elephants, the SEHP project has made it possible for humans and elephants to co-exist in these two villages by making the interaction between humans and elephants less violent. SEHP introduced for the first time the concept of solar powered elephant repellent “OUT” from certain areas (human settlements, fields, etc.) rather than “IN” in protected areas thereby leaving them more room to range outside of the national parks . This is considering that 70 percent of the Sri Lankan elephant population ranges outside of the national parks . By establishing a buffer of similar electric-fenced villages it will be possible to open up more areas for elephants to roam outside of the protected areas without coming into conflict with humans and will also contribute to the implementation of **ECAs and MERs as suggested by the DWC** (2006). To identify the villages to develop such a buffer it is necessary to obtain data on the ecology of the local elephant populations and intensity of HEC.



### 3. PROBLEM STRUCTURE

First Level Problem:

Increased Human Elephant Conflicts

Second Level Problem:

Damage to Crops

Damage to homes

Threat to elephants

Food Insecurity

Financial insecurity

Poverty

Lower-Level Problems:

Poor mechanisms of dealing with elephant raiding

Lack of information & ideas

Weaknesses in preventative measures taken

Alternative measures too costly

Limited community participation

No formal structure for discussions and constructive actions

No access to scientific data or expert advice

Lack of skills & experience

Lack of funds

Lack of time & overworked farmers

### 4. THE PROJECT

This project is expected to save the lives of both Humans and Wild Elephants by minimizing the Human Elephant conflicts BY INTRODUCING A SUCCESSFULLY TESTED ELEPHANT REPELLENT GADGET in some selected villages of Dehiattakandiya DS Division of Ampara District of Sri Lanka.

#### 4.1 Project Site

#### JEHIATTAKANDIYA

Divisional Secretariat in Sri Lanka

**Population**  
The population development of Dehiattakandiya as well as related information and services (Wikipedia, Google, images).

Name	Status	Population Census 2001-07-17	Population Census 2012-03-20
Dehiattakandiya	Divisional Secretariat	63,908	60,178

**Dehiattakandiya**

- 60,178 Population [2012] - Census
- 394.0 km<sup>2</sup> Area
- 152.7/km<sup>2</sup> Population Density [2012]
- 0.56% Annual Population Change [2001 - 2012]

Dehiattakandiya Divisional Secretariat, Divisional Secretariat in Eastern Province, Sri Lanka

Sri Lanka Republic 18,797,257 20,359,439

Source: Department of Census and Statistics, Sri Lanka (web).

**Further information about the population structure:**

**Gender (C 2012)**

Males	29,897
Females	30,281

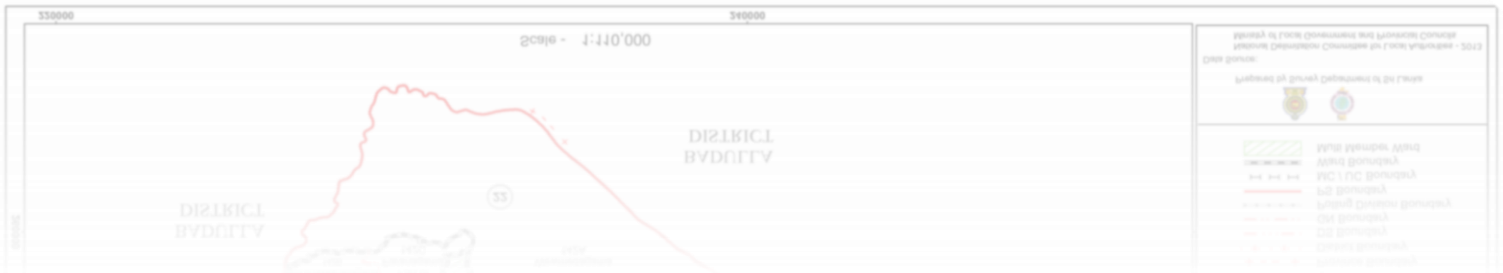
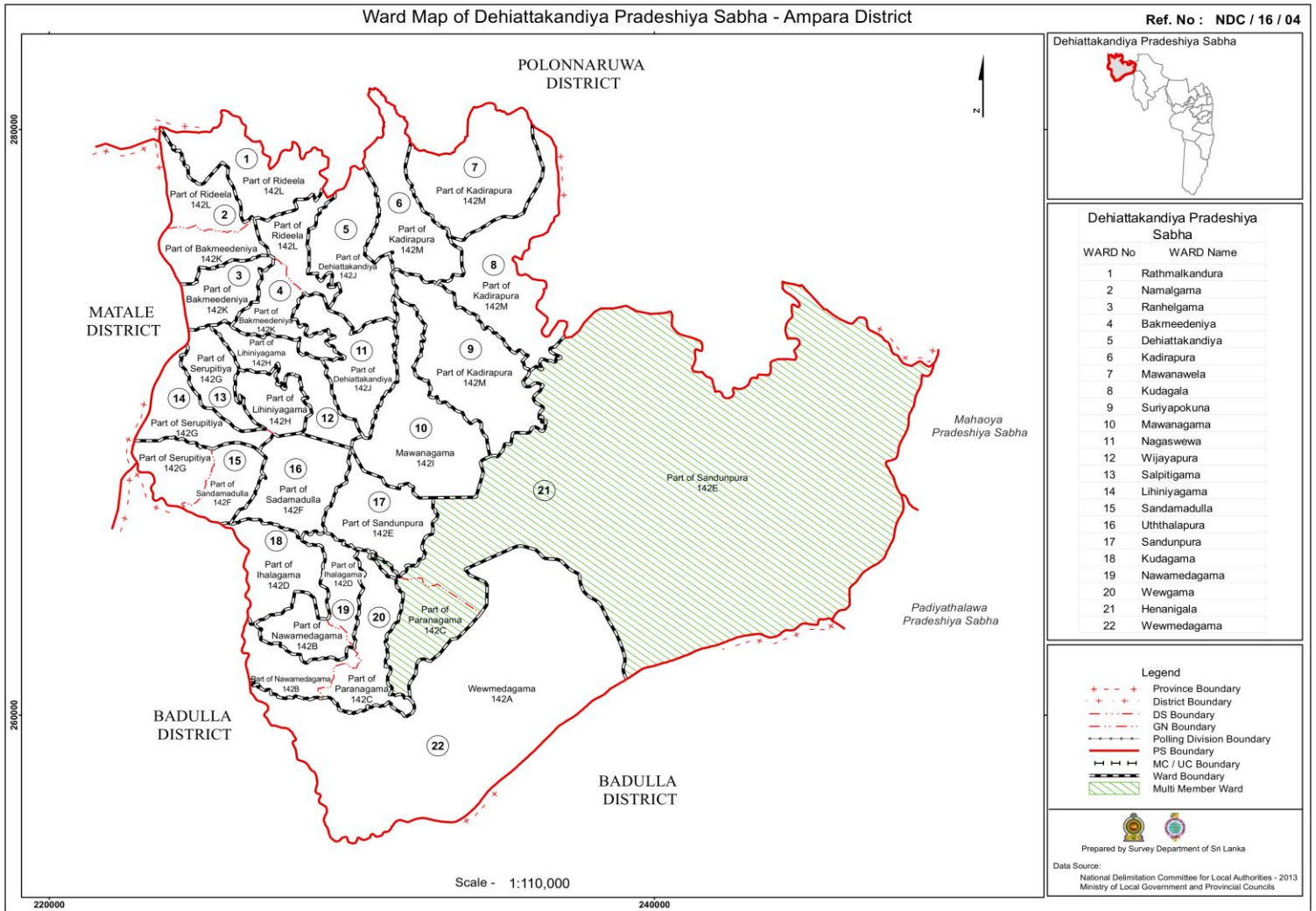
**Age Groups (C 2012)**

0-14 years	15,806
15-64 years	41,496
65+ years	2,876

**Age Distribution (C 2012)**

0-9 years	10,913
10-19 years	10,639
20-29 years	9,703
30-39 years	9,568
40-49 years	8,148
50-59 years	6,252
60-69 years	3,341
70-79 years	1,226
80+ years	388

Located in:  
→ Ampara district



### 3.1. Crop Raiding

Crop raiding by wild elephants is the biggest problem that is faced by farmers. Eighty percent of the surveyed farmers had their crops raided and rice (*Oryza sativa*) is the crop that is raided the most. Out of the total extent of land that was cultivated: 90 percent of the fields was raided in DK, by wild elephants. All of these raids were in paddy/rice cultivations. In addition to paddy, crops such as maize (*Zea mays*), coconut (*Cocos nucifera*) and bananas (*Musa* sp.) in home gardens were also raided. Compared to the raiding during the *Maha* (wet) cultivating season, crop raiding in the *Yala* (dry) cultivating season is higher. A possible reason could be that during the dry season most of the grasslands have dried out and food availability in the forests is low.

### 3.2. House Raiding

Raiding of houses by elephants is the second major problem that is faced by the villagers in the Dehiattakandiya area. Wild elephants damage houses mostly to feed on stored paddy, grains, and salt. From 1980 to 2004, 32 percent of the houses at DK had been raided.

## 4. PROJECT GOALS AND OBJECTIVES

### 4.1. The main project goals are:

1. Mitigation of human-elephant conflict in 07 villages of Dehiattakandiya DS Division in Ampara District .
2. Develop solutions to resolve HEC through a better understanding of elephant biology, ecology, human needs and aspirations, and elephant management technology.
3. Integrate community participation into project planning, implementation, and management
4. Develop local capacity to erect, operate and maintain a solar powered Elephant repellent over the long term.

The following photograph shows a Biological Corridor in a village in Sri Lanka.



5. The conservation and protection of the Sri Lankan elephant (*Elephas maximus maximus*) and its habitat (especially outside the protected areas).
6. Establishment of a sustainable community integrated conflict management program.
7. Creation of support for sustainable wildlife conservation and protection through community development, capacity building and sustainable livelihood development.
8. Development of economic incentives to support the long-term conservation of the Sri Lankan elephant and its habitat.

#### **4.2. The main project objectives are:**

1. Focus on the human aspects of human-elephant conflict and try to resolve them with the participation of the villagers who are victims of elephant crop raiding. By helping the farmers to initially protect their crops and property, the project will be building the credibility and integrity of the conservation process in the communities whose support is essential and crucial to the long-term conservation and management of the Sri Lankan elephant.
2. Help protect the Sri Lankan elephant by developing and providing management strategies for its conservation.
3. Develop processes to integrate community participation into human-elephant conflict management.
4. Develop an integrated human-elephant conflict management process, which can be applied island-wide wherever there is conflict.
5. Develop village level community networks and provide facilities for them to share and exchange ideas, information and experiences in regard to their efforts to resolve HEC. Field visits between project villages will increase the awareness of villagers and help build relationships and networks to mitigate HEC island-wide.
6. Bring economic relief to the farmers and help raise their standard of living by helping to stop crop depredation by elephants. A farmer who can reap the benefit of his endeavors would be more tolerant of the elephant, and more willing to help towards its' long-term conservation.
7. Increase public awareness as to the plight of the elephant and help garner their support for its conservation.
8. Develop incentives that would help the farmers to benefit from the elephant. Introduce the concept of ecotourism. Such activities will help to show the elephant as a resource rather than a liability and a deadly adversary.
9. **Develop the project as a model for possible replication in other range countries of the Asian Elephant.**
10. **Generate interest among other international bilateral and multi-lateral aid agencies the need to fund Asian Elephant Conservation programs**

## **5. PROJECT PLANNING**

### **5.1. ACTIVITIES, METHODS AND PROPOSED ACTIONS**

#### **5.1.1. Activities**

The main objective of the project is to develop a participatory community-based human elephant conflict resolution project, which includes the installation of **SCIENTIFICALLY TESTED SOLAR POWERED ELEPHANT REPELLENT** which was invented and manufactured by a Sri Lankan professional Engineer. This repellent has been successful in chasing out elephants, and it has helped to resolve human elephant conflicts in four villages situated in Monaragala District of Sri Lanka.



### 5.1.2. Methods

- Hold meetings with all the stakeholders to create a forum for all stakeholders to participate.
- Establish a “bottom-top” process to develop the project
- Develop a “top-down” administrative process to manage the project
- Conduct Participatory Rural Appraisals to gather socio economic data and assess “buy in” for the project.
- Conduct surveys and interviews to gather data on human elephant conflicts.
- Conduct series of community meetings to develop a dialogue with all the stakeholders: villagers, DWC regional personnel, National, local and provincial government officials.
- Identify clearly the boundary of the repellent-fence line.
- Establish village level committees to clear the fence line, dig the fence post-holes, and work in the erection of the fence and in the construction of the control room.
- Conduct field visits for village representatives to other SEHP sites at Dehiattakandiya DS Division.
- Select a team of technically adept villagers to undergo further training in repellent-fence operations and maintenance.
- Establish a fence society to administer the operations and management of the electric fence
- Establish a fence maintenance fund.
- Mobilize a team of Field Scouts to continuously monitor and assess the fence and gather data on HEC

### 5.1.3. Proposed Actions:

- Initiate surveys to gather HEC & socio-economic data (Already completed by CRC)
- Sign an MOU with the village officials.
- Installation of Solar Powered Elephant Repellents at the identified points of selected villages in project area (Funded by GLOBALGIVING).
- Construction of biological corridors for the wild elephant to safely move (FUNDED By GLOBALGIVING).
- Establish a Standard of Living index for the village.
- Conduct the project and monitor its success for one year.
- At the end of the first project year conduct a series of surveys of the four villages and compare this data with the data from the first surveys.
- Hand over the responsibility of the long-term management, maintenance and monitoring of the fence to the Village fence Committee.
- As a follow-up develop a paying volunteer program to promote community-based ecotourism in the village to establish a model for sustainable conservation.

#### 5.1.4. Stakeholder Coordination/Involvement:

The local communities will be involved in the project from project inception thru a bottom to top process. The project will apply the same concepts with some improvements that were developed by the CRC during 10 years of implementing community-based initiatives to resolve HEC successfully in the North, East & North Central Province of Sri Lanka. From the onset of the project the villagers will have an active participatory role in the project and will be organized into committees and will be trained to manage and maintain the electric fence as an ongoing activity of the village. In addition, whenever possible, material and other logistics needed for the project will be purchased from the village, thereby channeling some of the project funds into the village economy. The village committees will provide skills and labor to erect the repellent fence, and maintain, manage, and do minor repairs of the repellent fence or in case of larger problems contact the project managers or the technical contractors. Communication between the project team and villagers will be maintained by a Site Liaison appointed from the village.

The benefits of involving local communities in the project from planning to implementation to repellent fence operations and management are:

- Common ownership of the repellent fence and collective community responsibility for its maintenance.
- Facilitation of long-term operations and maintenance of the fence.
- Capacity building increases the ability of villagers to maintain and operate a technical elephant management tool such as a solar powered repellent fence successfully over the long term.
- Increased environmental awareness and appreciation of nature by locals who are otherwise likely to have adverse impacts on the environment.
- Obtain local support for the entire project and avoid conflict that often arises between local habitants and non-local scientists as a result of their differing interests.
- Reduced costs in long-term operations and maintenance.

### 6. PROJECT IMPLEMENTATION

#### 6.1. Economic Background

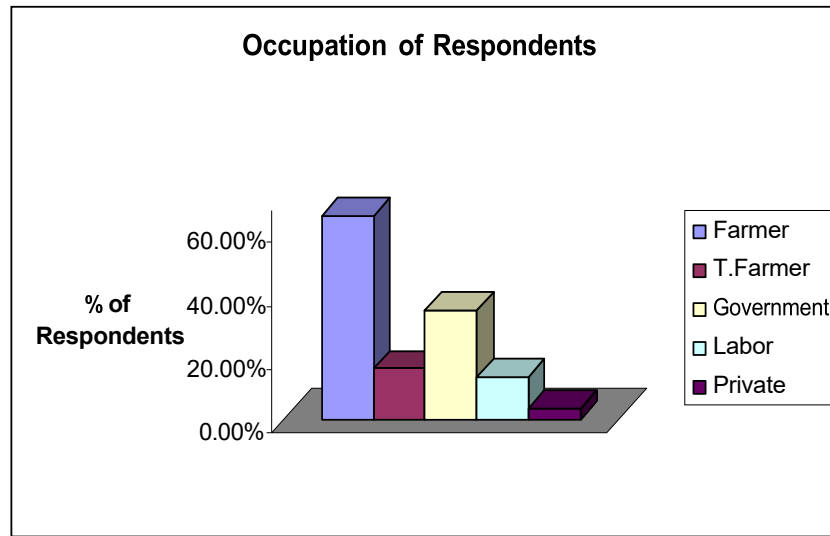
##### 6.1.1. Land Use and Cultivation Patterns

Generally, Sri Lankan farmers practice two cultivating seasons per year. The *Yala* or the dry planting season is from May to September and the *Maha* or the wet planting season is from October to January. However, the two cultivating seasons, which are both approximately four months in duration, is highly dependent on the monsoonal rains. During the wet planting season, the staple crop that is cultivated the most is paddy or rice (*Oryza sativa*) and in the dry planting season cash crops such as maize (*Zea mays*), green gram (*Vigna radiata*), and chili (*Capsicum annuum*) are cultivated. If there is enough irrigation some farmers cultivate paddy for the *Yala* season too. Perennial crops such as coconut (*Cocos nucifera*), mango (*Mangifera indica*), jack (*Artocarpus heterophyllus*), breadfruit (*Artocarpus altilis*), and tamarind (*Tamarindus indica*) and semi perennials such as bananas (*Musa* sp.) and papaya (*Carica papaya*) are grown in their home gardens. Sometimes farmers also grow vegetables in their home gardens. However, 19.8 percent of the farmers have abandoned cultivating during the dry planting season because of water scarcity and elephant problems.

### 6.1.2. Occupation & Monthly Income

### 6.1.3. Employment Trends

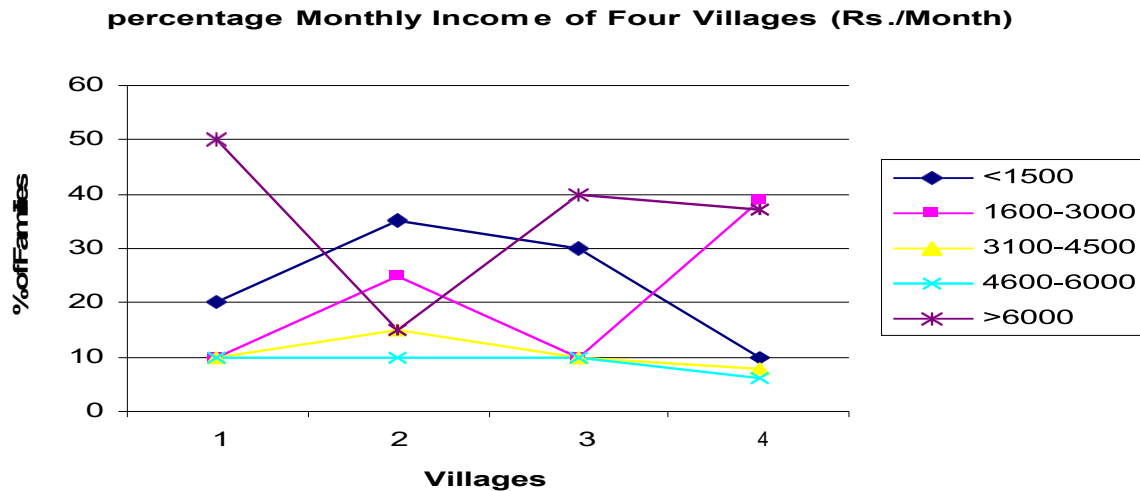
Eighty percent of the people in the area are involved in farming and most of them are landowners. The surveys show that 64 percent of the farmers own their land, and the other 16 percent are tenant farmers. Additionally, 34 percent of the households have someone working for the government sector.



Graph 01: Occupation/employment of the Villagers

### 6.1.4. Income

As seen from the Graph 02 incomes in the area are not very high. Average monthly earnings fall between the range of two thousand (~\$20) to and five thousand (~\$50) rupees.



Graph 02: Average Monthly Income of Villagers

### 6.1.5. Social Networks & Institutions

Rural villages have a number of institutions that generally indicates a strong presence of social organization and networking, especially when communities see opportunities that supports their individual, household and communal needs and interests. Through these institutions varying needs are fulfilled again at the individual, household, and community level. These organizations fall into two categories: 1). Institutions established by the villagers and governed by their own charter, i.e. Welfare Society<sup>7</sup>, Buddhist Society<sup>8</sup>, Village Development Society<sup>9</sup>, and School Development Society<sup>10</sup>. 2). Village level

chapters of government and national non-governmental organizations, i.e. the Farmers’ Society<sup>11</sup>, Sarvodaya<sup>13</sup>, and the Samurdhi Organization<sup>15</sup>. The membership in these institutions is directly linked to the importance of these institutions to the individual as well as to the community. To obtain membership in these institutions an initial enrolment fee and a monthly or annual membership fee is required. As is summarized in Table 04 the Welfare Society has the most membership followed by Samurdhi and Farmers’ Society. People are also reliant on taking loans from banks for farming and purchasing of property and construction of houses etc.

<sup>7</sup> The Welfare Society provides support to families during funerals.

<sup>8</sup> The Buddhist Society manages religious activities and the maintenance and upkeep of the village temple

<sup>9</sup> The Village Society contributes to village development such as road construction and maintenance, repairing of wells, and help to obtain legal ownership to non-entitled tenants, community problem solving, and distribution of government aid to villagers.

<sup>10</sup> The School Society undertakes the overall management of children’s school activities, developing skills and talents in various academic fields, construction of school buildings, clearing of school grounds, raising money for children through school fairs, etc.

<sup>11</sup> The Farmers’ Society is established by the Irrigation Department to assist farmers to plan the seasonal cultivating calendar based on water availability, repair and maintain reservoirs and irrigation canals and provide loans and subsidies to purchase seeds and fertilizer.

<sup>13</sup> Sarvodaya is the largest national welfare and social service NGO in Sri Lanka.

<sup>15</sup> Samurdhi is a government administered poverty alleviation program that provides loans to families for farming and small businesses.

In addition to membership in formal Societies, people also have informal networks through which they exchange labor for agricultural activities and rely heavily on loans from neighbors or local boutiques or shops. These are small loans that help to fulfill daily requirements for groceries and school supplies. These formal and informal institutions have active participation of both men and women. Villagers also practice *Shramadana* which means “donate effort” in Sanskrit where they work collectively on mutually beneficial activities such as road maintenance, repairing of temple and school buildings, and construction of wells. The most important organization in a village is the Welfare Society which provides manpower, money: Rs5000 (~US\$50) per member, chairs, tents and other material support when there is a funeral in a member’s household. Forty one percent of the respondents surveyed had membership in the Welfare Society and 35 percent had membership in the Samurdhi Society. Eighty-nine percent of the households that were surveyed had membership at least in one of these organizations.

Society	Percentage of Membership
Welfare Society	41
Samurdhi Organization	35
Farmers’ Society	29
Sewalanka	20
Community Development Society	18
Sarvodaya	18

**Table 05: The main Societies and Organizations Present in the Area**

## **7. CAPACITY BUILDING**

Two community-based committees will be established during the project implementation process: the Fence Administration Committee (FAC) and Fence Operations Committee (FOC). The FAC consisted of personnel from the CRC, DWC, DS, STF/Police, Provincial Council, and representatives from the four villages.

The FOC consisted of the village headman or Grama Niladhari (GN) from each village, and up to ten village representatives from each village. The responsibilities of the FAC included but were not limited to:

- Making the final decision on the fence line
- Administration and supervision of the FOC

- Provide guidance and advise to the FOC
- Fiscal management
- Problem solving and taking disciplinary actions

The responsibilities of the FOC are:

- Provide labor for fence construction and repairs
- Maintenance and operation of the fence
- Collect the monthly Fence Society fee
- Follow the FAC guidelines
- Oversee and supervise fence maintenance and repair activities

In addition to establishing the FAC and the FOC to manage the repellent fence four Technical Assistants (TAs) will be recruited to attend to the day-to-day operations of the fence. After the repellent fence construction is completed, the TAs are responsible for the following activities under the supervision and guidance of Sri Lanka Wild Life Department Scientific/Research Managers.

- Fence operation and supervising fence maintenance and repairs.
- Fence monitoring to assess the effectiveness of the fence and its' maintenance
- Elephant damage surveys to monitor the effectiveness of the fence
- Conduct elephant field observations: apply direct and non-direct methods to gather data to understand the temporal and spatial distribution of elephants in the study area
- Biodiversity surveys to record the fauna and flora of the study area.

In addition to the above activities the CRC with Wild Life Department will conduct annual Rapid Rural Appraisals to measure how the GLOBALGIVING funded Elephant Repellent development/conservation activities mitigate HEC, alleviate poverty and reduce forest and other non-sustainable resource uses in the project area.

## **8. FENCE CONSTRUCTION**

A meeting with all the stakeholders was held in the Dehiattakandiya Village and the three main topics that were discussed were:

- All the stakeholders agreed on the final repellent fence line
- Selected a day to start clearing of the fence line
- An agreement will be signed with the Fence Administrative Committee that they will be totally responsible for the entire fence and to its safety, security and operations.
- The villagers (beneficiaries) agreed to provide required manpower which is required for the whole project including repellent fence construction.

## **9. FENCE OPERATIONS, MANAGEMENT AND MAINTENANCE**

It was realized that a disciplinary process to penalize villagers who will fail to fulfill their obligations to maintain the fence needed to be integrated into the Fence Administrative Committee (FAC) and Fence Operations Committee (FOC). One of the biggest concerns during the fence planning and construction process will be how to integrate such a disciplinary process to the FAC and FOC so that they could penalize villagers who did not fulfill their fence operations and maintenance obligations and commitments. From the inception of the project the CRC was addressing this issue and bringing it up for discussion at the numerous meetings that were held with the stakeholders to discuss matters pertaining to the construction and management of the repellent fence. Once the fence was completed, it is important to discuss matters pertaining to the maintenance, operations and management of the fence. The FAC and FOC members, SLWCS and CRC project personnel decided to include the Samurdhi Program Officers who managed the government poverty alleviation program into the FAC and FOC which would oversee the day-to-day operations, maintenance and management of the repellent fence. The

Samurdhi Program officers are being held in deference by the villagers because they wield a lot of power and authority since they dispensed government aid funds to the villagers. They could at their discretion withhold or deduct funds from villagers if they do not participate in Samurdhi activities. Similarly, the Samurdhi officers will be asked to withhold or deduct aid funds from villagers who do not meet their obligations and commitments to maintaining and managing the fence sections which they were responsible for. FOC gives them the muscle to effectively enforce disciplinary actions and to penalize villagers who do not fulfill their obligations to the maintenance, management and operations of the repellent fence.

All the fenced repellent posts will be numbered and divided amongst the four TAs who are responsible for the fence operations. The TAs work with the FOC and they also address issues such as obtaining necessary labor for the maintenance of the fence.

## **10. ANTICIPATED BENEFITS AND OUTPUTS**

### **10.1. Project Outputs:**

1. The installation of a 16-kilometer solar powered Repellent Fence with local community participation.
2. Resolution of human-elephant conflicts.
3. The establishment of biological elephant Corridors connecting the vulnerable villages and forest area where wild elephants are living.

### **10.2. Project Benefits:**

1. Develop a successful human-elephant conflict management program using a solar-powered repellent fence to protect large agriculture settlements in DK DS Division to reduce human-elephant conflicts.
2. Release more land for elephant conservation, especially in buffers around parks.
3. Bring economic benefit to the farmers.
4. Obtain the support of the farmers and the general public for long-term elephant conservation.
5. Obtain empirical data on the annual economic and social costs caused to villages by crop raiding elephants.
6. Establish the credibility and integrity of the conservation process.
7. Educate the public and create a deeper awareness of environmental issues and the need to conserve the elephant.
8. Advance the chances for long-term elephant conservation in Sri Lanka.
9. Publish and promote the results of the project including project development, implementation, administration, management, methods, problems, and troubleshooting, procedures, outcomes, discussions and conclusions.
10. Publish a manual for developing integrated community participatory programs for human-elephant conflict management.

## **11. CONSERVATION IMPACT**

With no definite information in regard to the elephant population of Sri Lanka and with estimates ranging from 3,250 (Santiapillai & Jackson, 1990), to 4,000-4,500 (de Silva 1998), to 2,500-4,000 (Sukumar, 2006) it could be anyone's guess as to what the elephant population currently is. Even for DK the estimates are highly variable. McKay (1973) estimated 100-150 elephants. Santiapillai and Jackson (1990) give an estimate of 80-100 elephants and Jayewardene (1994) gives an estimate of 300-325 elephants for the total area of Gal Oya, Bibile, Ampara, DK and Lahugala. This lack of population data alone is a valid indicator as to how important it is to initiate a long-term project to study the elephant population in the Eastern Region.

Taking any of the above population estimates it can be inferred that the DK elephant population is approximately 10 percent of the total elephant population of Sri Lanka. The forest of DK constitutes the last large forests available for elephants as well as provides vital corridors for elephants to move between the Maduruoya National Park to the south and the Galoya National Park to the north. It is crucial and critically important to initiate programs to conserve these elephants and protect

their habitats to ensure the long-term conservation of the endangered Sri Lankan elephant (*Elephas maximus maximus*). The project developed and implemented strategies that will contribute to the conservation and protection of elephants and their habitats in DK. In addition, the project will contribute to the establishment of ECAs, and MERS as proposed in the national policy formulated by the DWC (2006) for the conservation and management of wild elephants in Sri Lanka.

With an increasing human population of nearly 20 million people and their increasing demand for land, human-elephant conflict seems likely to increase in the future if effective and proven HEC management solutions are not implemented immediately. It is also important to identify the habitats critical for elephants such as corridors, buffers and extensions and give them legal protection. The existing national parks cannot sustain the present Sri Lankan elephant population. With an estimated 70 percent of the elephants roaming outside the national parks (Kariyawasam, 2002), it will be necessary to apply proven conflict management programs to allow people and elephants to co-exist in areas where they share space. By applying the methods developed by this GLOBALGIVING funded project to successfully manage conflict in villages along national park boundaries it will result in the following:

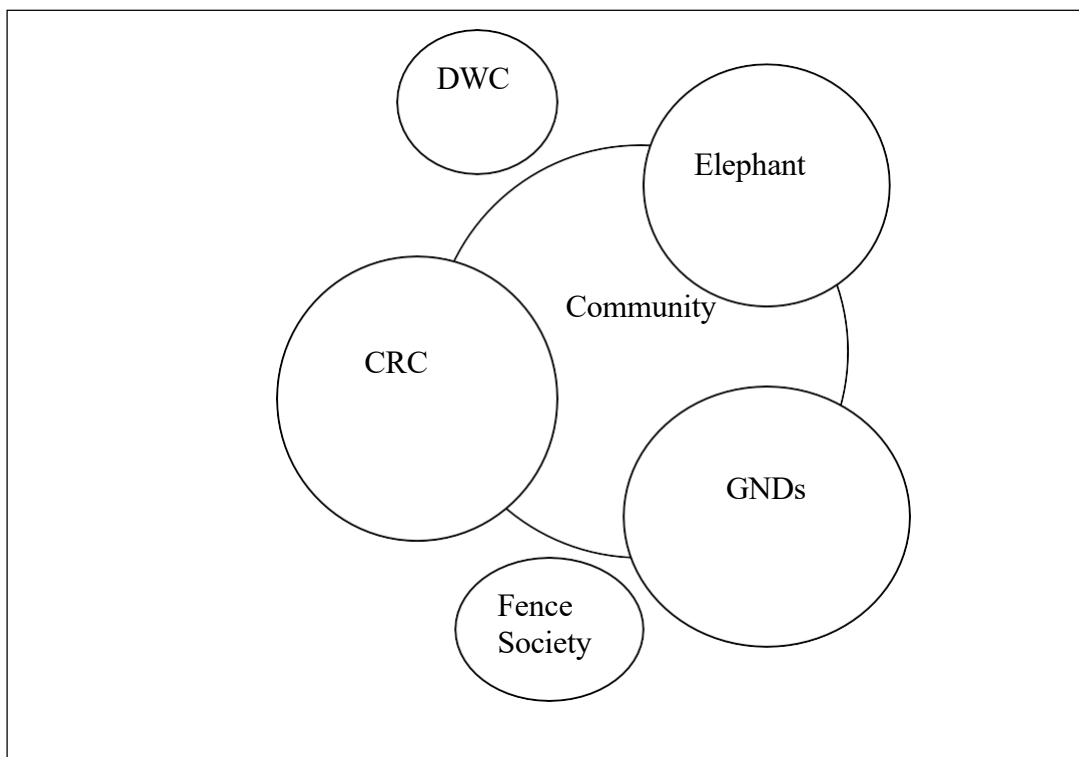
- Release more land for elephants to range without being fenced in national parks.
- Reduce human elephant conflicts.
- Help to facilitate the establishment of safe corridors, ECAs, and MERs for elephant movement.
- Help farmers to realize the economic potential of the elephant for their wellbeing.
- Obtain local support for the long-term conservation of the Sri Lankan elephant.

### **11.1. Sustainable Conservation:**

Working with the assumption that protected area management requires active community participation for sustainable conservation and human development, the relationship between local communities and conservation calls for a new understanding and that is the need to recognize that communities themselves can conserve their resources. However, community-based approaches to wildlife conservation usually have a strong economic rationale that is based on the premise that if local people participate in wildlife management and economically benefit from this participation, then a situation will arise whereby wildlife is conserved at the same time as community welfare improves. While most community conservation activities have the ultimate goal of maintaining wildlife populations, they also simultaneously aim to improve the socio-economic status of human communities in wildlife areas. Therefore, it is essential that communities are involved, and they participate in order to benefit from wildlife and be willing and able to conserve it.

Community-based projects are an incremental learning process. It is not possible to apply a “cookie cutter” approach to community projects because each community has issues and concerns that are integral and indigenous to that community. The DK Repellent Fence project also clearly demonstrated while it is important to have a “bottom to top” process during the initial development stages of a project so that the wishes, needs and aspirations of a community is taken into account, it is equally important to have a “top-down” administrative process to implement as well as manage the project over the long term. In addition, it is very important to integrate a disciplinary process from the beginning to make sure that the community members fulfill their project obligations without defaulting. Finally, the success of the project lies in how well the targeted communities have “bought into” the project and how well they perceive the tangible and un-tangible benefits the project can give them. From the donor agencies and CRC’s perspective it is important keep in mind a project of this nature and magnitude does not really come to an end. While electric fences can stop elephants from coming into villages, they do not stop villages from continuing to degrade the forests that are vital for the elephants to survive. With no universally applicable as well as one hundred percent successful HEC mitigation strategy existing, it is important to keep in mind that an electric fence is not a means by itself to an end.

It is important to find a way to formalize the organization and structure of the FAC. Currently the participation of local officials in the FAC is voluntary. To maintain the level of competence and effectiveness of the FAC over the long term it is necessary to make it obligatory for the various officials to participate in the FAC as part of their official responsibilities.



Venn diagram of DK Project stakeholder relationships and influence

## 11.2. Conclusion

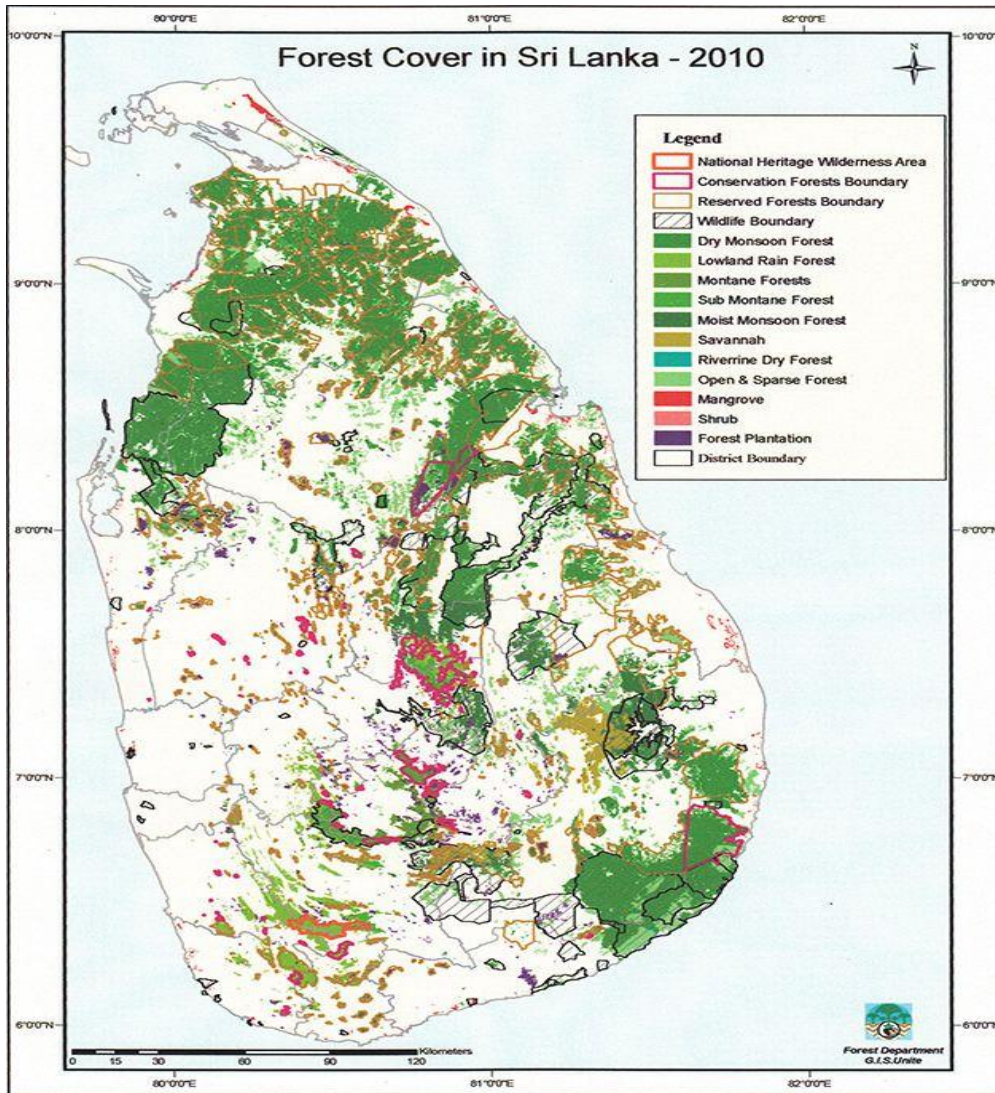
The DK Elephant Repellent Fence Project will prove that for all the pitfalls and obstacles it will face - if there is good support from donors it is possible to overcome these obstacles and develop a successful project for the mitigation of HEC. The project also provides an incredible opportunity to initiate a livelihood development and field research project due to the sense of goodwill it has helped generate amongst CRC's donors, and local stakeholders. It is important that such a project is established and implemented immediately. The Project will also help to establish the credibility and integrity of the area. The CRC has found that villagers are willing to accept new ideas as well as participate in projects and programs based purely on the trust they have placed on the Wild Life Department & CRC. In conclusion it must be stated that for a conservation project to be successful it is important from the very beginning to establish the credibility and integrity of the conservation process as well as that of the implementing organization.

## 11.3. Prognosis for the future

Taking into the consideration the data deficiency in regard to the elephant population as well as HEC in the DK area, the current efforts of the CRC & Wild Life Department is to address human elephant conflicts at DK offer a great opportunity to develop a long-term project with the following objectives:

- Mitigate human elephant conflicts – Conduct research on the intensity and temporal and spatial scale of HEC to develop innovative programs, i.e. community repellent fences, biological fences, alternative agriculture, agro-forestry, intercropping, and organic farming to reduce HEC.
- Establish a long-term elephant research program to gather ecological and behavioral data on wild elephants to understand their temporal and spatial distribution. Establish a Field Scouts Program to train locally recruited youth to do research.
- Minimize deforestation - Develop sustainable resource and land use practices to improve the livelihoods of economically depressed communities, i.e. Livelihood improvement through home garden development and sustainable livestock husbandry.
- Improve livelihoods of the buffer zone communities - Create multi-purpose, multi-use forests for both humans and wildlife through participatory social-forestry & agro-forestry programs.

- Biodiversity conservation - Awareness building to garner the support especially of the younger generation as well as to inculcate in them a conservation ethic to safeguard their environment for posterity.



## **12. FUTURE PLANS**

### **Long Term:**

- To create support for the sustainable conservation and protection of forests through community development, capacity building and sustainable livelihood development
- To introduce participatory sustainable forest resource use and management by providing local communities with the knowledge, training and tools to carry out social and agro-forestry projects and provide them with practical solutions to improve their livelihoods. Concurrently the project will work with these communities to identify viable solutions to reduce their impact on fragile forest ecosystems.
- To promote financial security through sustainable livelihoods, sustainable resource management, income generation, and by providing access to financial safety nets and resources such as micro-finance, insurance, savings, and credit.
- An important aim is to target women specifically during the data gathering process and to encourage them to participate actively in the dialogues and interviews. This will provide insights as to the prevalent gender issues and differences in regard to resource access, resource use, decision making at household and community level, women's contributions to forest degradation and the involvement of women in the project
- To promote novel and improved income generation activities to reduce reliance on forest resources, provide market access and financing services, encourage intra and inter village information sharing, technology transfer, and collaborations.

### **Short Term:**

- Minimize deforestation - Develop sustainable resource use practices to improve the livelihoods of economically depressed communities.
- Mitigate human elephant conflicts - Provide elephant management technology and build the capacity of these communities to protect their homes and fields from crop raiding elephants.
- Improve livelihoods of the buffer zone communities - Create multi-purpose, multi-use forests for both humans and wildlife through participatory social forestry & agroforestry programs.
- Biodiversity conservation - Awareness building to garner the support especially of the younger generation as well as to inculcate in them a conservation ethic to safeguard their environment for posterity.
- Address the increasing hostility and conflicts between communities due to illegal encroachment.
- 

### **12.1. OUTCOMES, OUTPUTS & BENEFICIARIES**

#### **Outcomes:**

- Reduction in illicit logging, forest degradation and poaching
- Reduction in human elephant conflicts
- Reduction in poverty

#### **Outputs:**

- Increased awareness in the local communities of the need to conserve the forests and wildlife habitats
- Increased protection to wildlife and forests due to community cooperation and participation
- Increase in crop yields and reduced risks to property and lives due to decreasing HEC.
- Increase in income and economic opportunities.

**Beneficiaries:**

The project will benefit 800 families from 07 villages of Dehiattakandiya DS division.

**Additional benefits include:**

- Improved socio-economic status
- A healthy environment
- Reduced conflicts with wildlife, especially elephants

Once this project is initiated it will take at least 3 to 5 years to complete and to ensure its' success it is essential for CRC to have a permanent presence at Dehiattakandiya similar to its operations at other places in Sri Lanka. In addition, a team of locally recruited and trained Field Scouts needs to be developed to make the project viable and sustainable over the long-term. As the Field Scouts build up their capacity and become proficient in conducting field research and working with CRC Project.

**The estimated budget for the above HEC project is given below.**

Se.No.	Activity Description	Unit Cost in USD	Number of Units	Total Cost in USD	REMARKS
<b>GLOBALGIVING CONTRIBUTION</b>					
01	Manufacturing, Transportation & Establishment of Solar Powered Elephant Repellent Units.	2,590.00	52	134,680.00	
02	Construction of Biological Corridors	20,000.00	02	40,000.00	
03	Livelihood Support for Affected farmers	300.00	50 Families	15,000.00	
<b>TOTAL GLOBALGIVING COST</b>				<b>189,680.00</b>	
<b>CRC CONTRIBUTION</b>					
04	Management Cost for the 10 Field Officers For 06 months	150.00	60 (10 Officers x 06 months)	9,000.00	
<b>TOTAL CRC COST</b>				<b>9,000.00</b>	
<b>GRAND TOTAL</b>				<b>198,680.00</b>	

**Total GLOBALGIVING Contribution = 189,680.00 USD**