

# HUMAN-ELEPHANT CONFLICT AND SOLUTIONS TO IT IN SRI LANKA.

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One of the major instigators of human-wildlife conflict is competition for space. Destruction of forests through logging, encroachment, slash-and-burn, shifting cultivation, and monoculture tree plantations are major threats to the survival of elephants. Human-elephant conflicts occur when elephants raid crops of shifting cultivators in fields, which are scattered over a large area interspersed with forests. Depredation in human settlements is another major area of human-elephant conflict occurring in small forest pockets, encroachments into elephant habitat, and on elephant migration routes.



Between 1999 to the end of 2006 every year nearly 100 wild elephants were killed. Elephants are being killed by farmers to protect their crops and houses. (DWC, 1999 - 2006). Cost of human-wildlife conflicts is of three types: direct, indirect and opportunity costs. (Thirgood, Woodroffe & Rabinowitz, 2005)

## **Direct Cost**

### **Crop Damage**

Crop damage is perhaps the most prevalent form of conflict across the Asian and African continents. When elephants damage food and cash crops, they affect a rural farmer's livelihoods. Elephants in large groups can destroy large areas of crops in a single night. While elephants target staple food crops such as rice and maize, furthermore they were attacked to the cash crops such as sugarcane and coconuts. Santiapillai *et al.*, (2010) calculated that an average farmer in elephant affected areas of Sri Lanka losses over USD 200 annually for crop damage, while in Thailand, farmer cost of the conflict accounted for 25% of their annual income (Jarungrattanapong & Sajjand, 2011). The tragedy indirectly repercussions for health, nutrition, education and ultimately, development (Ekanayake *et al.*, 2011; Fernando *et al.*, 2011)

### **Human Death and Injury**

Elephants kill and injure people across the Asian and African continents. Most of those killed are men, and many of these incidents occur during the night. The research carried out in India, Sri Lanka and Kenya shows alcohol was found to be a key factor in one third of the deaths; victims were drunk and returning home from the bar (Parker *et al.*, 2007) Others died protecting their crops, herding cattle and walking at night between neighbouring villages.

## **Indirect Cost**

Farmers' lost time for protecting crops and property and compromised family security account for indirect costs. While indirect conflicts do not directly impact livelihoods, they still have a negative effect upon people's lives. For example, the fear of running into elephants may restrict people's movements between villages, especially where attacks have recently occurred. Such fear among

children may reduce school attendance, or interfere with the collection of fuel wood and thatch grass, or the collection of wild fruits or other resources (e.g.: Wood apple, Wild mango).

In the crop raiding season farmers and their families will be required to guard their crops and property, leading to loss of sleep and energy, poor employment opportunities, increased exposure to infectious diseases and psychological stress (Parker *et al.*, 2007). Such indirect costs do not translate well to economic value and so are difficult to compare conventionally.

### **Opportunity cost**

Opportunity cost of different conflict management approaches can be calculated by the forgone income for farmer household commitment to fight the conflict (Thirgood, Woodroffe & Rabinowitz, 2005) and can be presented as a percentage loss of annual income.

### **Solutions**

Government and non-governmental organisations have taken considerable effort in reducing Human elephant conflict. Some of these are:

#### **Governmental organisations:**

The most expensive but effective way of controlling elephant raids using electric fencing but the cost of design and materials used for electric fencing is quite high and Fernando et al. (2008) estimates it as USD 3,500-5,000/km in Sri Lanka.

The elephant conservation strategy of the Department of Wildlife Conservation (DWC) aims at conserving as many viable populations as possible in as wide a range of suitable habitats as is feasible. This means protecting elephants both within the system of protected areas and as many animals outside these areas that the land can support and landholders will accept, and not restricting elephants to the protected area network alone.

**Non-governmental organisations:** Ceylon Wildlife Agency's (CWA) aim is to provide effective solution to minimize human elephant conflict identified. Three approaches to address this issue are:

**Short-term approach:** Organise and mobilise farmers in conflict villages and raising deep awareness on elephant behaviour patterns.

**Midterm approach:** Erection of Dandu Weta (Log fence) along the areas where elephants cross. Villagers in some of the frequently raided areas have experienced that the invasion could be prevented with the Dandu Weta or the Wooden Fence. The fence is erected using large logs and does not fix strongly on the ground. When touched it moves as it is not steadily fixed. Usually elephants do not touch or move over fences those are swinging or unsteady (De silva and De Silva, 2007)

**Long term approach:** Habitat enrichment. This could be done by planting fodder trees in the elephants' forest areas. For example, cultivating Beru (a water grass elephants love to eat) in tanks (reservoirs) and other trees (such as Velang) that form main part of the diet of elephants. There are about 100 species of plants that are eaten by elephants.

The best and the long-run HEC mitigation approach is conservation policy planning precise for different geographical locations. This needs years of research, awareness and lobbying and more importantly, political willingness.

**References:**

- Annual Elephant Death Report ( Department of wildlife Conservation ) – (1999/2000/2001/2002/2003/2004/2005/2006/2007/2008/2009/2010/2011/2012/2013).
- De Silva, M. and De Silva, P.K. (2007). Sri Lankan Elephant: Its Evolution, *Ecology and Conservation*. WHT Publications.1, 11-12
- Ekanayake, S.K.K., Campos-Arceiz A., Rupasinghe, M., Pastorini, J. and Fernando, P. (2011). Patterns of crop raiding by Asian elephants in a human-dominated landscape in southeastern Sri Lanka. *Gajah*. 34, 20-25.
- Fernando, P., Jayewardene, J., Prasad, T., Hendavitharana, W. and Pastorini, J. (2011). Current Status of Asian Elephants in Sri Lanka. *Gajah*. 35, 93-103.
- Fernando, P., Kumara, M.A., Williams, A.C., Wickramanayake, E., Aziz, T., & Sing, S.M. (2008). Review of human-elephant conflict mitigation measures practiced in South Asia. World Wide Fund for Nature.
- Jarungrattanapong, R. and Sajjanand, S. (2011). Analysis of policy options to convert human elephant conflict into human-elephant harmony. Research Report No. 2011-RR14. Economy and Environment Program for Southeast Asia.
- Parker, G.E., Osborn, F.V., Hoare, R.E. and Niskanen, L.S.A. (2007). Training Course for Community-Based Approaches in Africa Participant's Manual. 1-76.
- Santiapillai, C., Wijeyamohan, S., Bandara, G., Athurupana, R., Dissanayake, N., and Read, B. (2010). An assessment of the human-elephant conflict in Sri Lanka. *Ceylon Journal of Science* (Bio.Sci.). Vol 39(1). 21-33.
- Thirgood, S., Woodroffe, R. and Rabinowitz, A. (2005). The impact of human-wildlife conflict on human lives and livelihoods in Woodroffe, R., Thirgood, S. and Rabinowitz, A. (eds). *People and Wildlife: Conflict or co-existence*. Cambridge University Press. The Edinburgh Building, Cambridge CB2 2RU, UK. 13-26.