

AN ASSESSMENT OF THE HUMAN-ELEPHANT CONFLICT IN SRI LANKA

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ABSTRACT

The association between man and elephant in Sri Lanka is ancient. Elephants being the largest terrestrial herbivores require relatively large areas and diversity of environments to forage. With the increase in human population density and changes in the land-use patterns, elephant habitat is being continuously reduced. As a result, much of the present day elephant range extends into and overlaps with agricultural lands resulting in conflict with man. The assessment of the human-elephant conflict was carried out from January to March 2008 through the use of a questionnaire in 100 villages selected randomly from five provinces whose combined extent is 42,559 km² which amounts roughly to 65% of the total land area of Sri Lanka. 65% of the respondents identified crop depredations with bull elephants, both young and old. At least 13 food items have been identified by the villagers as preferred by wild elephants in agricultural areas. Crop damage to paddy accounted for 69% of the complaints. At the same time, most of the farmers identified citrus trees as the most likely crop to be avoided by elephants. Failure to recognize the significance of the human-elephant conflict can result in a negative attitude to elephants and apathy or indifference to conservation initiatives. Although it is unlikely that the human-elephant conflict can be eliminated altogether, yet every effort must be taken to reduce it to tolerable levels.

Key words: Asian elephant, *Elephas maximus*, crop depredations, mortality

INTRODUCTION

The Asian elephant (*Elephas maximus*) is categorized as Endangered in the IUCN Red List (IUCN, 2007). The association between man and elephant in Sri Lanka is ancient. No other animal has had such a close relationship with the people of Sri Lanka. It would be difficult to imagine the island without the elephant as it is so much a part of the island's history, culture, religion, mythology, folklore and even politics. Despite its small size (65,610 km²), and high human population (>20 million), Sri Lanka is home to at least an estimated 4,400 elephants, which represent roughly 10% of the global total of the Asian elephant in the wild (Kemf and Santiapillai, 2000).

The survival of one of world's last remaining terrestrial megaherbivores in the wild in Sri Lanka in such significant numbers can be attributed in part to the tolerance of both Buddhists and Hindus to whom the elephant has a special religious significance. But lately the survival of the elephant in the wild has become a

matter of concern in Sri Lanka, given the number killed in the ever escalating conflict with man. As the human population grows and agricultural areas expand at the expense of forests, elephant habitat is being reduced continually. As a consequence, the Department of Wildlife Conservation recognizes that about 70% of the elephant's range lies outside the system of national parks and nature reserves. As both humans and elephants have similar ecological requirements, when both species inhabit the same area, conflict between them is inevitable. Elephants destroy crops, damage houses, and at times even kill people. Irrate farmers in return retaliate by shooting, wounding or killing elephants with home-made weapons. Hence, the tolerance traditionally shown to the elephant appears to be gradually weakening in farming communities when the elephant interferes with agriculture. Farmers and elephants are coming into conflict resulting in the deaths of both in agricultural areas. Chronic crop damage by elephants, if left to continue unchecked, will have a serious impact on livelihoods of subsistence farmers.

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As Ferrar (1983) points out, except at the lowest density, large wild animals and humans are fundamentally incompatible. This incompatibility increases rapidly as both animal and human densities increase. Unfortunately, elephants and people do not always mix well (Hoare and DuToit, 1999). If humans and elephants are to co-exist, the conflict must be minimized by reducing the costs and increasing the benefits to humans living with elephants, while conserving viable populations of elephants. It is now becoming increasingly clear that the only way this can be accomplished is through the conversion of the elephant from being a dangerous pest to an economic asset.

Our goal was to assess the human-elephant conflict to find out how widespread and serious the problem is? Where and when does it occur? What crops are cultivated? What crops are damaged? Are there any crops that elephants do not consume? What measures are adopted by farmers to deter elephant incursions into their areas? How much assistance farmers receive from the Government? How many elephants have been killed in the recent past? How many people were injured, or killed by wild elephants? What is the perception of the farmers vis-à-vis the wild elephant? It is hoped that such a questionnaire survey will provide a fair and reliable assessment of the problem from the stakeholders' perspective. As Kangwana (1996) cautions, it is important not to base all the assessments on the responses of the farmers alone. Thus, in addition to the questionnaire survey, hospital records for the years 2007 were checked at Anuradhapura for the number of admitted cases of people attacked or injured by wild elephants in the North-Central Province.

METHODS

The assessment of the human-elephant conflict (HEC) was carried out from January to March 2008 across an area that extends from Puttalam in the west to Pottuvil in the southeast, and includes the North-Western, North-Central, Central, Uva and Eastern provinces, whose combined extent is 42,559 km² amounting roughly to 65% of the total land area of Sri Lanka (Fig.1). Information on HEC was collected through the use of a questionnaire in 100 villages selected randomly from the five provinces within the elephant range (Appendix 1). The geographical coordinates of the villages were marked by using a "Grain eTrex Venture" GPS unit. The families questioned

included 79 Sinhalese, 12 Tamils, 8 Muslims, and 1 Vedda (the island's indigenous people). At every village, the eldest individual in the family was interviewed. Of the 100 adults who were interviewed, 65 were males and 35 females. The average family size was 4.4. Farmers represented 66% of the total number interviewed. Farmers vary in their economic condition, and so the kind of house (concrete or wattle and daub) they live in was taken as an indicator of wealth. By survey, we refer to the fact that only a fraction of the population was interviewed. Every effort was made to ensure that the fraction sampled constituted a good cross-section of the farming community, which bears the brunt of elephant predation.

RESULTS AND DISCUSSION

Land use

Sri Lanka being a predominantly agricultural country, farming contributes to 20% of its GNP, with about 75% of the country's labour force dependent on agriculture for its livelihood. Land is the dominant factor in agricultural production. Irrigated agricultural lands cover an area of 625,750 acres (250,300 ha). The land:man ratio has reduced significantly from 2.7 ha in 1871 when Sri Lanka had a human population of 2.4 million to 0.38 ha in 1990 when the population had reached about 17 million (Anon, 1991). Thus, farm size in Sri Lanka has been on the decline under continued population pressure. The agricultural landscape is dominated in the dry zone by thousands of man-made irrigation reservoirs or tanks. There are an estimated 160 large reservoirs and 25,000 smaller village tanks. Paddy cultivation is the principal agricultural activity. In the study area, 27% of the families managed small holdings less than 1 acre (0.4 ha), while 32% cultivated land between 1-2 acres (0.4-0.8 ha) in extent, and about 40% had lands larger than 2 acres (0.8 ha).

Rice being the staple food of Sri Lankans, paddy cultivation receives the highest attention in the agricultural sector. Paddy as their principal agricultural crop is grown by 66% of the farmers. Other subsidiary crops include banana, corn, sorghum, coconut, cow pea, winged bean, and cash crops such as tomato, manioc, chilli, cashew, mango, millet, lime, sweet potato, eggplant etc, which are mostly grown in home gardens on a smaller scale. Of these, vegetable cultivation was the most common with 48% of the families dependent on

it as a subsidiary crop. Other crops of importance are corn (17%), banana (16%) and manioc (11%).

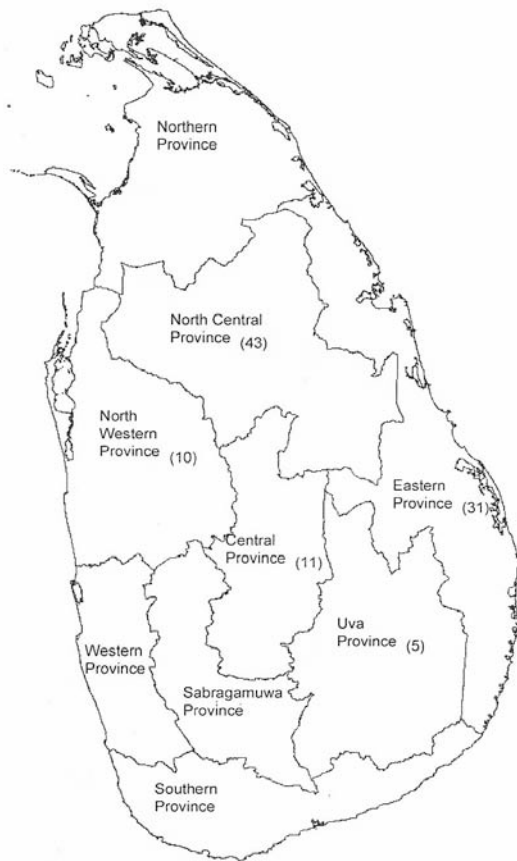


Figure 1. The Provinces (and the number of villages surveyed) in Sri Lanka.

Economic losses

Paddy is the principal crop damaged by elephants. Elephants find paddy especially attractive to eat just before and during the harvest time. They also eat paddy after harvesting when it is stored in houses. As Thouless (1994) points out, assessing the direct economic costs of crop raiding is difficult, because one has to calculate the projected crop yield in the absence of elephants. There are other additional indirect costs incurred due to the need of people to spend sleepless nights trying to chase elephants off their fields. The main economic damage inflicted by elephants in the agricultural areas surveyed was the destruction of crops. Although other wildlife species such as parrots, peafowl, wild boar, porcupine, monkeys and flying squirrel also damage crops, elephants

were most widely feared because of their ability to eat and trample large quantities of crops in a single night.

The vast majority (89%) of the farming families appear to earn less than Rs. 120,000 (US\$ 1,200) per year. Only in 10% of the cases does the annual income range between Rs. 120,000 and Rs. 240,000, while only 1% earn more than Rs. 240,000 (US\$ 2,400). The annual income of the families appears to be woefully inadequate. The poorest 45% earn less than Rs. 3,000 (US\$ 30) a month. As far as the losses are concerned, 25% incur an annual loss of less than Rs. 5,000 while 32% incur between Rs. 5,000 to Rs. 20,000 a year. But the majority (43%) suffers an annual loss of over Rs. 20,000 (US\$ 200). Farmers all over the world do exaggerate their losses, nevertheless, their losses are real and hence should not be ignored.

The plight of the small and marginal farmers is miserable, as evident from reports of their suicides. Many of them are in deep debt and are unable to move out of their poverty vortex. Their problems are compounded by wildlife, especially the elephant whose incursions into their farmlands can ruin their already perilous lives. Of the families interviewed, 94% received absolutely no compensation at all from the government for their losses due to elephant depredations. Only 6% received some compensation but that too, according to them, was too little and too late. In one case, a woman from Aluth oya in the North-Central province received a paltry sum of Rs. 250 (US\$ 2.50) as compensation from the Department of Wildlife Conservation (DWC) for damages incurred from elephant attack. In a village known as Kotavehera in the Eastern province, a total of 27 houses were destroyed by wild elephants in 2007, for which no compensation was given by the DWC.

Pattern of elephant incursions

Crop-raiding by wild elephants is influenced by various proximate factors such as density of elephants in the vicinity of the villages, phenophase of the agricultural crops, 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 (Daniel, 1995). The frequency and intensity of elephant depredations appear to be related to the geographical arrangement of the farming areas. Elephants are more likely to raid crops in areas that lie just next to the forests than

those at some distance away. Elephants respond to seasons as well as crops cultivated. Of the families interviewed, 35% experienced elephant incursions into their neighborhood on an almost daily basis, while the majority (65%) encountered elephants only seasonally. There appears to be two peaks of elephant movement into agricultural areas. Much of the elephant depredations occurred just before the paddy was ready to be harvested.

Elephants seem to enter agricultural lands or home gardens mostly during the night. Only one farmer mentioned encountering elephants in the daytime, while 73% raids took place in the night, while 20% was reported at dawn and 16% at dusk (Fig. 2). Of the animals that entered the area, 22% spent less than an hour, feeding, and 19% spent between 1-2 hrs, while 52% spent over 2 hours. Of the farmers, 84% reported incidents where elephants fed and trampled crops, 5% of them referred to elephants feeding, without trampling, and 1% reported elephants trampling without feeding. It was not possible to identify the sex of the individual elephants in view of the fact that almost all the reported cases of elephant depredations took place in the night. However, the consensus was that more bull elephants were implicated in crop depredations than herds or family units. According to Sukumar (2003), adult bulls are likely to enter cultivated areas six times more frequently than female led family units. Actual damage caused by elephant incursions, either trampling or consumption, or both would depend on the size of the groups that enter and for how long they linger. Family units undoubtedly would cause more such damage, but even a solitary bull that spends a much longer time can cause considerable damage to the cultivators.

Food items preferred by elephants

Wild elephants are catholic in their food preference. They seem to eat most of the crops grown by farmers. They are among the most versatile of all herbivores. Being both browsers and grazers, they are able to switch from a diet of leaves of trees and shrubs to grasses. Being non-ruminants, elephants have evolved a digestive system that enables them to consume a wider variety of food than other herbivores. In the wild, elephants are known to consume over 60 species of plants (McKay, 1973). However, most of these come from just a few plant groups, including those of the mallow family, legumes, palms, sedges and grasses (Tudge, 1994).

At least 13 food items have been identified by the villagers as preferred by wild elephants in agricultural areas, of which paddy appears to be the most sought after crop. Crop damage to paddy accounted for 69% of complaints (Fig. 3). Other major crops taken were banana (40%), coconut (31%), manioc and corn (23% respectively). Elephants seem to feed in the forest during the day and forage in agricultural areas during the night. Home gardens are especially vulnerable to elephant depredations given the high nutritive value of the fruits. Banana plantations, left unprotected, have no chance of survival. The observed pattern of elephant depredation in agricultural areas suggests that cultivated crops are indeed significant in the diet of some elephants that are chronic crop raiders. Furthermore, cultivated crops are even more important than wild plants, given their superior nutritional attributes (Sukumar, 2003).

Paddy is preferentially eaten by wild elephants when the plants are ripe and ready for harvesting. Even if they are protected against elephant depredations, paddy is still consumed, after harvesting, when it is stored in houses. There were a number of instances when elephants had broken into houses to feed on stored paddy, much to the shock and dismay of the occupants. They also go in a small way to stored salt. Coconut trees are also preferred for their fibrous nature. Elephants also eat a lot of bark to meet their demand for calcium, trace metals such as boron, copper and manganese, and perhaps linoleic acid, an essential fatty acid (Tudge, 1994).

Crops avoided by elephants

Given the catholicity of the elephant's diet, very few plants among those cultivated by man, are immune to depredation. Nevertheless, as can be seen from Fig. 4, farmers identified a number of crops that appear least attractive to the elephant. Most of the farmers identified citrus trees (e.g. lime and orange) as the most likely crop to be avoided by elephants. Nevertheless, it became clear that elephants would still eat the fruits, but avoid the trees. Many farmers reported that elephants usually eschewed feeding on cashew (*Anacardium occidentale*) plants, but according to Varma *et al.*, (2008), in Vietnam, it appears that such cashew is a major attraction for elephants. Sesame to a certain extent is also unpalatable to the elephant, but of all the plants referred to by the farmers, the one that stands out is the Neem tree (*Azadirachta indica*) a fast growing, drought resistant species that belongs

to the Mahogany family Meliaceae. It is considered a major component of Ayurvedic medicine. Therefore, if a green buffer is to be established between agricultural areas and elephant reserves, then the neem tree would be the best candidate to establish plantations. A buffer of this nature would have zero-appeal to elephants. Besides, the people would benefit from exploiting the Neem tree referred to as “Nature’s Drugstore” given its medicinal properties. What elephants avoid feeding depends on what is available. If there is a preferred item available in the home gardens, then elephants would go for such resources and avoid others even though they are palatable. This is the reason why many farmers identified citrus plants as items ignored by elephants.

Manslaughter by elephants

Human injury and death at the hands of wild elephants is one of the most serious aspects of the human-elephant conflict. However, despite

the escalation of the conflict, far more people are killed by poisonous snakes and motor vehicles in Sri Lanka than by elephants. On average about 1,500 people are killed annually by poisonous snakes in Sri Lanka. Nevertheless, manslaughter by elephants receives greater publicity and evokes stronger emotions. In 2007, according to the Minister of Environment and Natural Resources, 50 people were killed in Sri Lanka by wild elephants. During the same year, 56 people died of rabid dog bites (Gunatileke, 2008). In the five provinces that were surveyed, a total of 45 people were killed by elephants, while 33 were injured (Fig. 5). Human fatalities were highest in the Eastern province (42%), while none were reported from the Central province. Elephants have injured people in all five provinces, with North-Central province accounting for 42% of the injuries. All incidents of the reported human fatalities were due to the action of solitary elephants, most probably bulls.

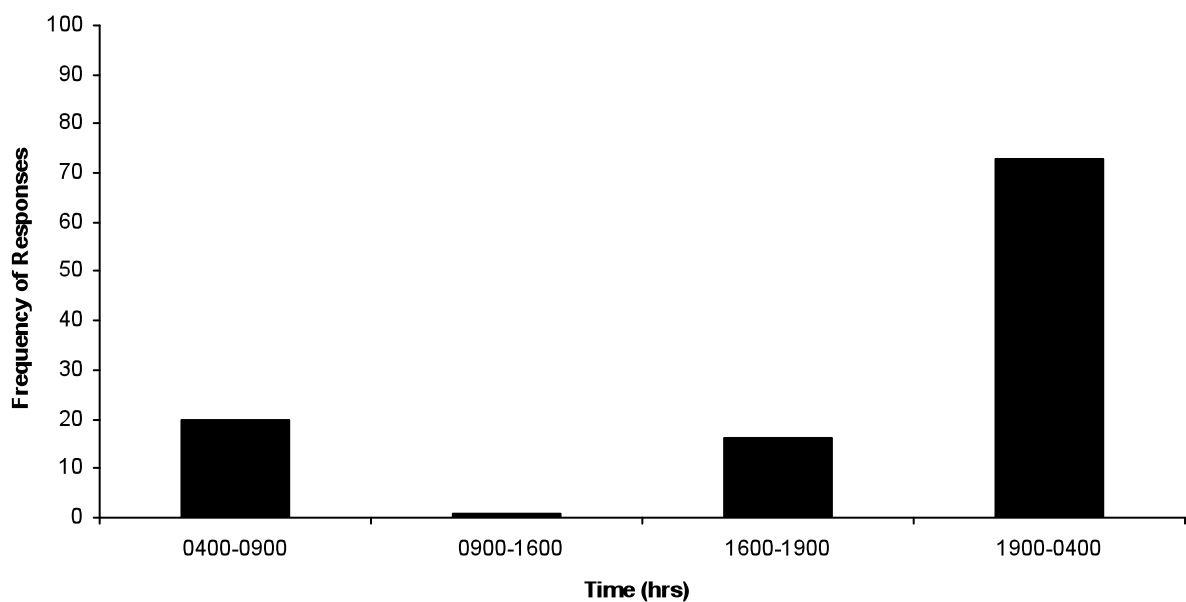


Figure 2. Frequency of incursions by wild elephants into agricultural areas.

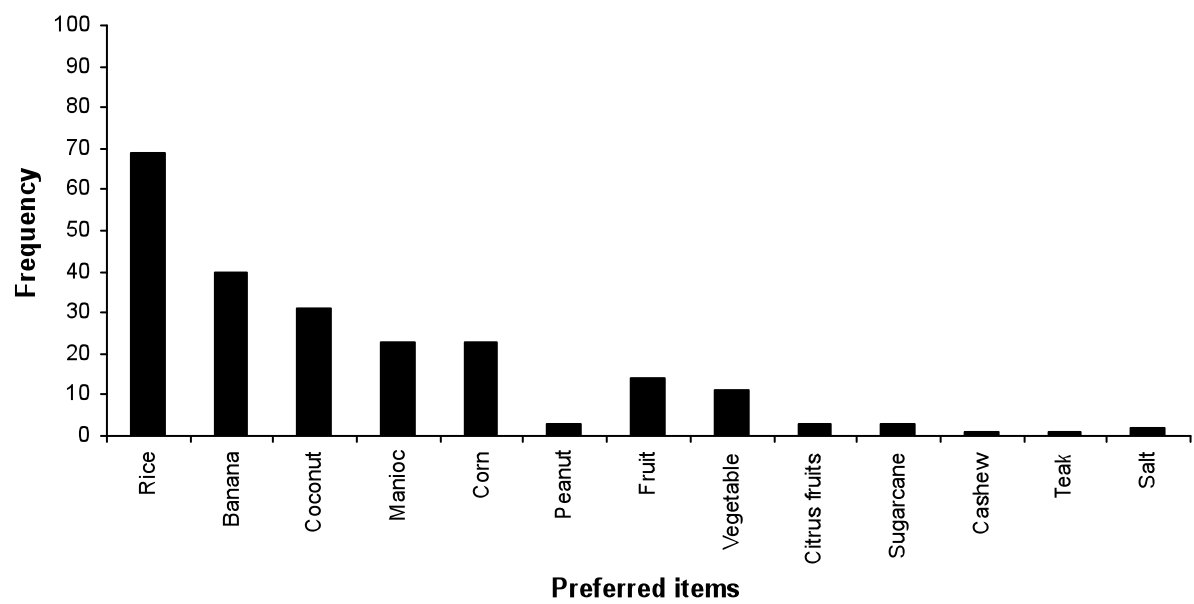


Figure 3. Food items preferred by wild elephants.

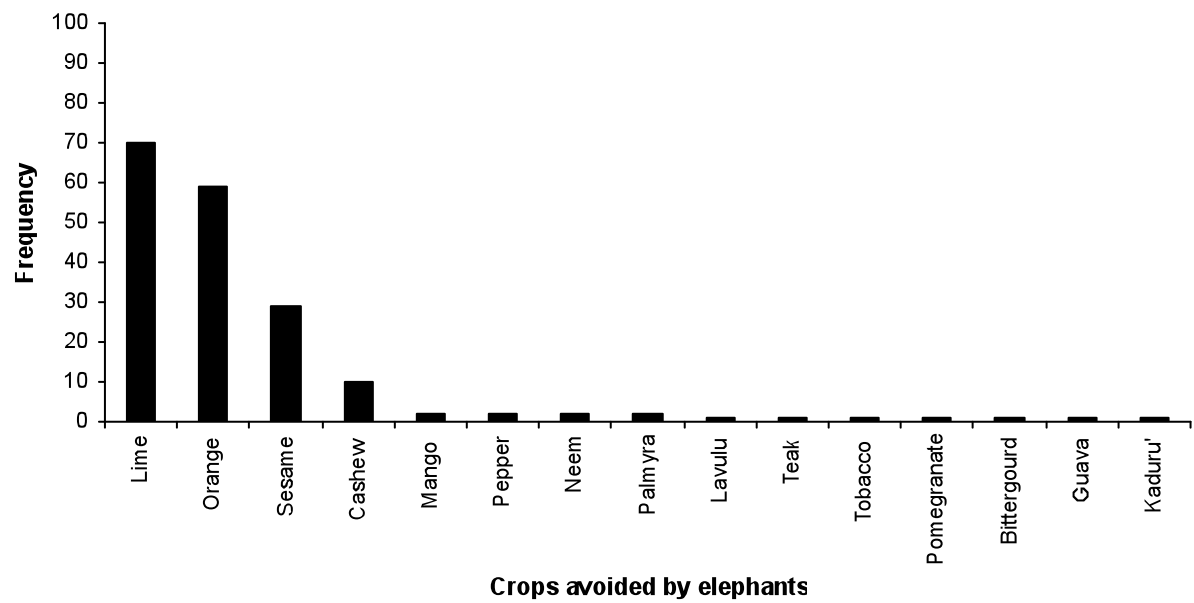


Figure 4. Cultivated crops avoided by wild elephants in agricultural areas.

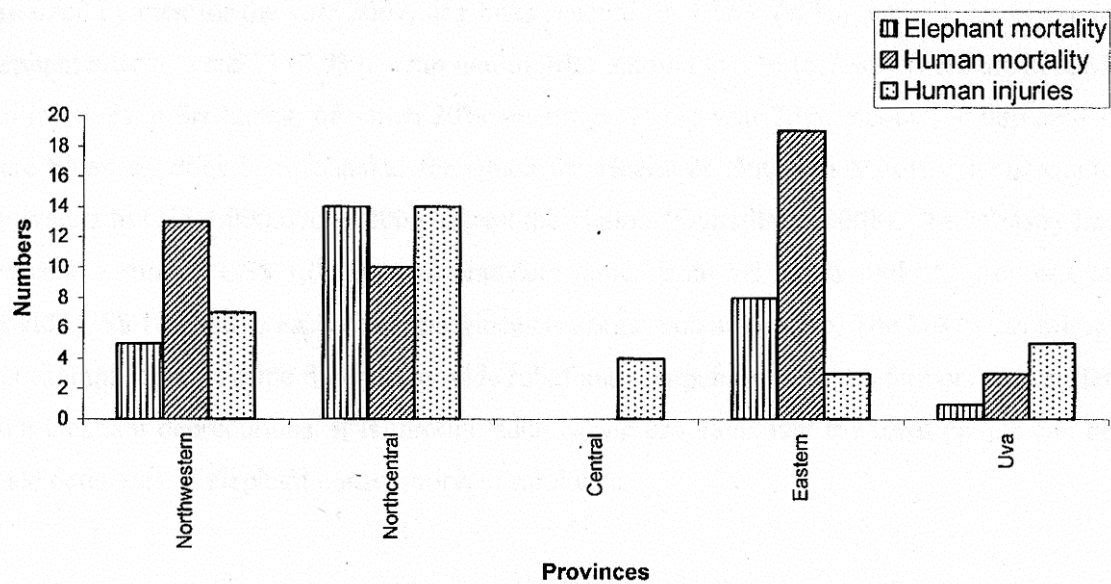


Figure 5. Number of elephants and humans killed or injured in the conflict.

An examination of the records maintained at the Anuradhapura Hospital in the North-Central province indicates that out of the 1,736 reported cases of injuries sustained by men for the year 2007, dog bites account for 1,563 (90%), while injuries due to elephant attacks were 17 (0.9%). Trap gun injuries amount to 116 (6.7%).

Elephant mortality

Although the human-elephant conflict may appear to replace ivory poaching as one of the most serious conservation problems in Sri Lanka, its impact on elephant numbers has been overstated. From the available records, between 1950 and 1970, a total of 1,163 elephants were lost in the wild in Sri Lanka, of which 639 were killed by farmers in defence of their crops. This translates into an annual loss of about 32 elephants. More recent data from the DWC shows that in the year 2007 alone, about 183 elephants lost their lives, of which 80 died by 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". Although the number of elephants that were killed intentionally was put at 110 (Ranawaka, 2008), it appears that 87 animals (i.e. 80 shot + 7 poisoned) were intentionally killed in 2007. Elephants also die of old age, but the statistics do not account for natural mortality. In the same year, the DWC statistics shows that 50 people were killed by wild elephants. However, our survey in the five provinces in Sri Lanka shows that in 2007 a total of 28 elephants

and 45 people were killed in the conflict. 50% of elephant mortality was recorded from the North Central province and none from the Central province (Fig. 5). The vast majority of elephants reported killed in the conflict succumbed to gun shot injuries. In desperation farmers also use poison, often concealed inside palatable fruits such as pineapple, to kill elephants. In addition, elephants are also electrocuted, knocked down by trucks and trains, and maimed or killed by land mines.

CONCLUSION

The human-elephant conflict in Sri Lanka is not a modern phenomenon. It has been going on ever since man started cultivating in areas frequented by elephants. The problem is therefore ancient. Even Robert Knox who was held prisoner by Rajasingha II, the King of Kandy from 1660 to 1697, refers to the damage caused by wild elephants to orchards and plantations (Knox, 1681). According to Knox (1681), "They (i.e. elephants) do them also great damage in their Grounds, by Night coming into their Fields and eating up their Corn and likewise their Coker-nut-Trees, etc." Today, conflict between man and wildlife is recognized as a significant threat to the success of conservation initiatives across the world (Strum, 1994; Osborn and Hill, 2005; Woodroffe *et al.*, 2005).

The results from the survey indicate that the farming community by and large suffers chronic crop depredation by wild elephants. All the 100 villages randomly selected and surveyed had experienced elephant depredation. Despite the fact that many farming families suffered extensive losses from elephant depredations, most of them are against killing elephants as a solution to the human-elephant conflict. They appreciate the intrinsic value of the elephant and its place in their culture and religion. Their response to the statement, “elephants deserve protection” was often a resounding “yes, but not on my farmland”. The long-term future of elephants outside the protected areas in Sri Lanka is inextricably linked to the tolerance of man. Conflict between man and elephant is inevitable when both compete for resources in an area given that both species have similar ecological requirements. To a strict preservationist, the elephant may be seen as a gentle giant, nature’s masterpiece, but the poor villager who bears the brunt of its depredations may not regret its disappearance from his neighborhood. In the absence of adequate compensation for crop losses caused by elephant depredation, farmers regard the wild elephant as a destructive and dangerous pest. The growing conflict between man and elephant is one of the serious conservation problems in Sri Lanka that needs to be resolved if elephants are to survive outside the system of protected areas. While the international conservation organizations are concerned over the trade in ivory, non-tuskers or makhnas continue to be killed in Sri Lanka. As long as farmers perceive elephants to be a problem, some of them will continue to persecute them. Thus understanding the reasons for and identifying potential solutions to these conflict is necessary to improve relationships between man and elephants in agricultural areas (Nyhus *et al.*, 2000). Failure to recognize the significance of the human-elephant conflict can result in a negative attitude to elephants and apathy or indifference to conservation initiatives. These problems, as emphasized by Webber *et al.*, (2007), will have a detrimental effect on the long-term success of conservation programs.

Many of the farming communities have been ignored or beyond the reach of the Department of Wildlife Conservation. Farmers in such areas are therefore left with the responsibility of defending their crops, goods and chattel from wild elephants in the only effective way they know – by shooting or poisoning. As Osborn and Parker (2003) argue, there is a need to find farm-based deterrent systems that are not only

simple in application but also affordable to deter elephants. In addition, any program designed to mitigate the human-elephant conflict in Sri Lanka should include improvement of education among the people and raising the awareness of the possible benefits that could accrue from allowing wild elephants to range in the neighborhood of farming communities as in the case of eco-tourism. People, once they are properly informed and educated, do appreciate the value of eco-tourism, provided they are involved with the decision making process. We successfully involved the fishing community in the Giant’s Tank area in Northwestern Sri Lanka in a village-oriented ecotourism, where the profits are shared by the local community and not by the owners of big hotels.

There is however no room for complacency for as Pimm (2008) points out so eloquently, “Elephant populations live on a demographic knife edge where small differences in hard-to-estimate parameters can mean boom or bust”. If elephants are protected and cared for, they will increase as long as they do not over-exploit their food resources. Conversely, as Pimm (2008) argues, killing more than one in 15 every year will reduce their numbers to extinction. In the so called conflict areas that were surveyed, it appears that there could well be an excess of elephants. This is the perception of the farmers. The challenge is to limit elephant numbers without resorting to culling (Gough and Kerley, 2006). One way of doing this is through capture of the so called ‘problem’ animals and bringing them into captivity, so that they could be used in the service of man.

Despite the growing concern and measures adopted to deal with the human-elephant conflict to-date, the problem still remains unresolved. Thus there is a need to adopt innovative measures if elephants are to survive in significant numbers outside the system of protected areas. The management of human-elephant conflict has to be integrated into a proper land-use policy and also must recognize the elephant as an economic asset to the community. Unless people value living with elephants, the killing of elephants will go on. If the local people could perceive the elephant as an economic asset instead of as an agricultural pest, then they will tolerate it on their land. One way that local people can benefit from the elephant in their midst is from the tourist revenues it generates, whether through small-scale ecotourism or through the manufacture of paper from dung, production of biogas from

dung, or the promotion of organic farming using dung. The debate over elephants is an emotional one, between the preservationists and the pragmatists. The problem with wildlife is that the people who wish to preserve it are rarely those who have to bear the cost. Given that the human-elephant conflict is already bad today, it may become worse tomorrow. Although it is unlikely that the human-elephant conflict can be eliminated altogether, every effort must be taken to reduce it to tolerable levels.

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Appendix 1. Provincial breakdown of the villages where the survey was carried out together with their GPS co-ordinates.

North-Central Province			
house#	village name	longitude	latitude
1	Hatharas Kotuwa	80.831	8.138
2	Aluth Oya	80.886	8.221
3	Kithul Uthuwa	80.940	8.292
4	Sinhagama	80.918	8.259
5	Galoya Handiya	80.858	8.139
6	Rotawewa	80.884	8.116
7	Maharathmale	80.904	8.065
8	Paluaddana	80.926	8.103
9	Viharagama	80.945	8.124
10	Katukeliyawa	80.901	8.003
11	Katukeliyawa Paranagama	80.880	7.978
12	Diyabeduma	80.874	7.940
13	Ihakuluwewa	80.861	7.934
14	Koduruwewa	80.855	7.911
15	12th-Post	80.788	7.720
16	Karndagolla	80.800	7.754
17	Orubendi siyabalawa	80.801	7.758
18	3,Nikapitiya	80.821	7.780
19	Track 21,Sagala	80.837	7.836
20	Bakamoonna	80.827	7.764
21	Aththaragallawa	80.833	7.727
23	Aththaragallawa	80.820	7.733
33	Moragaswewa	80.773	8.028
34	2nd post,Manampitiya	81.132	7.885
35	Thispane	81.160	7.793
36	Dimbulagala	81.160	7.793
37	Kalukale	81.062	7.777
56	Kithul Uthuwa	80.956	8.310
60	Rajanganaya	80.120	8.200
61	Balaluwewa	80.522	7.989
62	Puliankulama	80.540	8.050
63	Ganewalpolu	80.628	8.090
64	Moragoda	80.670	8.718
65	Maithreegama	80.754	8.217
66	Mahameegaswewa	80.744	8.132
67	Siyambalagaswewa	80.560	8.370
68	Rampathwela	80.651	8.407
69	Divulwewa	80.672	8.460
70	Etawtiagollewa	80.677	8.549
71	Kirikatuwewa	80.719	8.615
72	Hijrapura	80.720	8.604
73	Nawehera	80.756	8.570
74	Rathmale-Pothana	80.877	8.517

North-Western Province

42	Sellakandal, Pahalamanaewriya	79.892	8.053
43	Sellakandal, Pahalamanaewriya	79.892	8.053
44	Kaluwaragaswewa	79.990	8.076
45	Buddhidasungama	79.990	8.076
46	Parana-eluwankuluma	79.861	8.273
47	Parana-eluwankuluma	79.865	8.273
48	Ralmoduwa	79.889	8.266
57	Sellankandal	79.911	8.041
58	Karuwalagaswewa	79.972	8.063
59	Aluthgama	80.047	8.140

Eastern Province

38	Hungamalgama	81.013	7.695
39	Uththalapura	81.040	7.623
49	Alankulam (Vahaneri)	81.503	7.946
50	Beredipuram	81.502	7.970
51	Mavadiodai	81.468	8.029
52	Periyathumunai	81.419	8.121
53	Puchchakani	81.405	8.212
54	Wattawan	81.371	8.265
55	Samagipura	81.156	8.327
75	Kambakotte	80.994	8.630
76	Waroodhayam	81.200	8.603
77	Mangaiuththu	81.178	8.602
78	Welagam vihara	81.169	8.641
79	Saddhapura	81.159	8.565
80	Kappalthurai	81.147	8.550
81	Saliyapura	81.056	8.418
86	Poolawala	81.405	7.571
87	Pullumalai	81.494	7.656
88	Kithulwela		
89	Piyasaragama	81.419	7.534
90	Mangalagama	81.504	7.591
91	Piyangala	81.628	7.505
92	Karangawa	81.662	7.319
93	Norochchole	81.762	7.204
94	Sakamam	81.798	7.132
95	Thandiadi	81.846	7.027
96	Pothuvil	81.801	6.884
97	Hulannuge	81.670	6.912
98	Wadinagala	81.570	7.127
99	Eggaloya	81.630	7.172
100	Kotawehera	81.626	7.265

Central Province

22	Dasgiriya	80.835	7.629
24	Udahaduwa	80.683	7.734
25	wattegammedda	80.686	7.758
26	Atubendiyawa	80.686	7.767
27	Walgamwewa	80.686	7.767
28	Angunawel palassa	80.721	7.821
29	Kandalama wam Ela	80.721	7.821
30	Kandalama ,25	80.699	7.892
31	Seegirimulla	80.755	7.905
32	Maileththewa	80.760	7.932
82	Siyambalakumbura	80.852	7.145

Uva Province

40	Theldeniya	81.018	7.545
41	Bathalayaya	80.994	7.428
83	Kahagollarawa	80.983	7.207
84	Dambana	81.113	7.398
85	Dambana	81.113	7.413