

Human-elephant conflict and rural poverty in Sri Lanka

Overview

Elephants have a special status in Sri Lanka. Deeply ingrained in the local culture, the elephant image appears on everything from soft drink bottles to hardware items, while highly revered tame elephants star in important religious festivals. For more than 25 centuries, the people of Sri Lanka have placed a high value on their existence, with the result that Sri Lankan elephants (*Elephas maximus maximus*) have been well protected. However, these elephants are under threat from an expanding human population and its resulting demand for land.

A population explosion after the Second World War led to severe loss of elephant habitats as more lands were brought into cultivation to provide food. This is a problem since elephants are designed to live and roam in wide areas of forest. They have large biological ranges and migrate seasonally with the availability of water and foods. As a result, elephants have been "squeezed" into protected areas where there is less room for them to feed and roam. This human encroachment into elephant habitats is the primary cause of conflict because elephants now compete with the rural poor for scarce land and water resources.

Rural poverty persists in Sri Lanka, with around 28% of the rural population living below the poverty line. Poor people are often driven to live and work on marginal land, which in many cases is elephant territory. Some elephants, especially bulls, are crop-raiding fields, mostly at night time. In one night they can destroy a farmer's annual harvest, which represents a huge economic loss and personal tragedy for the family. It is a serious problem. People die when trying to chase elephants, whole crops get destroyed, houses get destroyed and family life gets disrupted. In recent years, an average of 150 elephants and 60 people have died annually in Sri Lanka. Almost all these elephants are shot, poisoned or wounded by farmers in defence of, or in retaliation for, damaged crops, property and life.

This project attempts to find ways of managing the conflict that benefit both the elephants and the rural poor. Surprisingly the most promising solution seems to be to allow the elephants to feed on the crops while compensating the farmer for the damage.



School outing to Pinnawale elephant orphanage

Issues facing policy-makers:

- What is the link between conflict and poverty as both poor people and elephants compete for the same land resources?
- What are the socio-economic dimensions of the conflict? Which groups suffer from the conflict, how large is the damage, what are their attitudes and what are their coping strategies?
- What amount is needed to compensate the damage?
- How do people trade off the conservation goals and community benefits?
- What are the best management strategies as perceived by experts in solving the conflict?

The approach

Trying to understand the conflict is complex, so a mixture of methods to collect and process information was used. Four different methods were used to collect data: (i) Expert interviews; (ii) Spatial analysis using GIS; (iii) Survey of 480 local households and (iv) Contingent valuation. Finally, with this information the best management alternative was selected using multicriteria analysis. The approach is visualised in Figure 1.

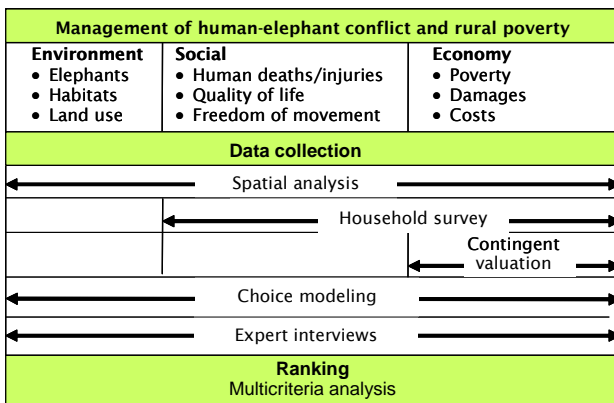


Figure 1: Human-elephant conflict and poverty

Conflict between people and elephants is strongly associated with space

Elephants compete with people for water, food and space. The location of elephant habitats, protected parks and areas, migratory routes, food and water sources, villages and crop fields are therefore all factors that affect the intensity of the conflict. A Geographical Information System (GIS) was used as an analytical tool to identify the scale and intensity of the conflict at the national level, as well as study the conflict more closely in high-risk areas. Figure 2 is a map that shows a clear link between conflict and poverty.

The level of conflict is highest in the Northwestern region as a result of severe forest fragmentation. Giribawa, Galnewa, Galgamuwa, Ehetuwewa and Lunugamwehera are identified as areas showing high levels of conflict and poverty, requiring immediate government attention.

Damage is serious and affects the poor

Revenue from crop farming is the most important source of income for nearly half the households. Crop raiding elephants are a serious problem for poor farmers. Poverty is exacerbated through

Study Area

Sri Lanka covers 65,610 sq km and lies in the Indian Ocean in Southern Asia. The climate of the island is classified as a wet zone comprising the southwestern quarter, and a dry zone on the remainder of the island.

Study sites were chosen to represent the range of i) intensity of conflict and ii) severity of poverty. Four Divisional Secretariat Divisions were selected as representing a diverse range of HEC and poverty. Polpithigama, Ehetuwewa, and Giribawa are located in the Northwestern dry zone, while Lunugamwehera is located in the Southern wet zone.

frequent crop depredation and loss of working days through injuries and death from elephant attacks. Farmers in Lunugamwehera suffer the greatest relative crop losses and are the most vulnerable to the conflict, since in addition to major crop losses, many do not have the safety net of private and government sector wages contributing to household income that for instance many Giribawan families have. Protecting crops is expensive, requiring investments in labor, fire-crackers and watch-towers. It is also stressful and disruptive to family life. Almost 75% of households experienced sleepless nights patrolling their fields during the crop season. Elephants are large animals and can cause extensive damage to property (including houses, sheds and stored paddy). Damages to property and loss of income were significantly higher in Ehetuwewa and Lunugamwehera than in Giribawa and Polpithigama.

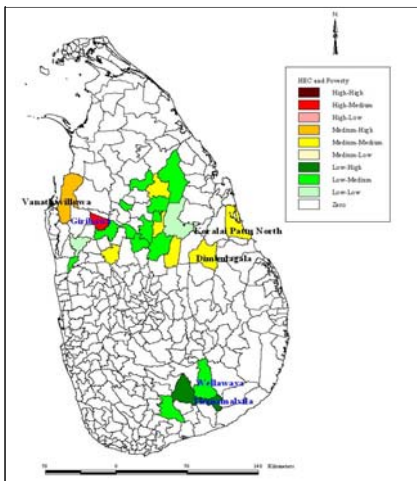


Figure 2: Human-elephant conflict and poverty

Willingness to accept compensation for elephant damage is greater than the extent of the damage

A Contingent Valuation (CV) approach was used to determine whether farmers were willing to accept the damage caused by wild elephants in return for financial compensation. Farmers were asked what the minimum amount of money was they would be prepared to accept for crops damaged or destroyed by elephants. Farmers were presented with an institutional scenario in which the current compensation scheme for crop damages would be improved (a decision on full compensation would be taken within 2 months).

The mean Willingness To Accept Compensation (WTAC) of four sites varied significantly from SLR 14,072 (Giribawa) to SLR 27,411 (Polpithigama). Obviously, the greater the level of crop damage, the more compensation demanded by the farmers. However, in Polpithigama and Lunugamwehera, farmers were willing to accept compensation less than the value of their crop damages (though variation between households was high). Crucially, the total cost of this compensation (the



WTAC amount aggregated across all farmers) can actually be covered by urban residents in Colombo. These residents have proved a willingness to pay to protect wild elephants in Sri Lanka. The total that they are willing to pay exceeds the cost of the compensation.

Poor people value elephants

Conserving the elephant population and associated habitats depends on the cooperation of the local population. It requires trade-offs in terms of access to protected areas, the availability of compensation, community infrastructure and freedom from the threat of injury or death from elephants. Choice modeling was used to investigate farmer preferences and trade-offs between several policy options, conservation goals, and community benefits.

Respondents were presented with an assortment of alternative scenarios (one of which involved maintaining the status quo) and asked to choose the best one. Figure 3 shows the chart used to interview the local population. The first column shows the different criteria involved: number of elephants, damage caused by elephants, deaths, compensation received and infrastructure. The three columns to the right show two hypothetical alternatives A and B and the current situation. For example: alternative A represents a situation with 100 elephants, 10% damage, no deaths, no compensation and some investment in infrastructure.

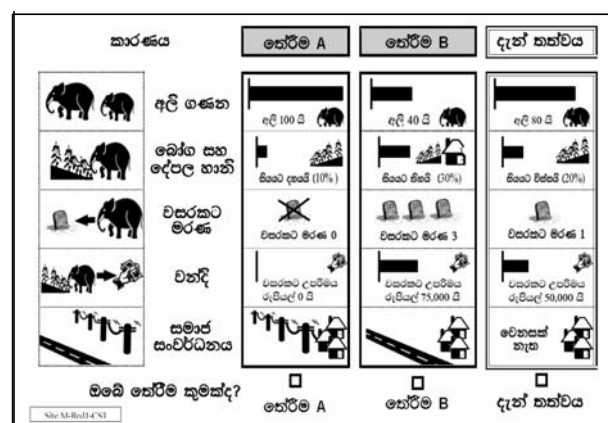


Figure 3: Chart used to interview the local farmers

People were most concerned about the number of human deaths in acute areas of conflict. Damage to property is more acceptable than crop damage. This is no surprise as crops are a vital source of food and income, while much of the damage to property can be repaired using family labor.

The number of elephants remained insignificant in the analysis, where the other attributes showed the expected signs. These results suggest that when the negative effects associated with elephants (as is the case with crop damage and deaths) can be eliminated or compensated for, then people are not opposed to the number of elephants per se.

Compensation is a promising policy option

A solution is needed that helps both the elephants and the rural poor. Several management alternatives are available to deal with the problem. One commonly used technical measure is an electric fence. This solves the problem for the people since the elephants can no longer enter the paddy fields but does not support the elephants because it reduces the size of elephant habitat. Interestingly, compensation is a very promising policy option in all four of the study sites. It is the best option in Megaleewa and the second best option in the other three sites. People are not concerned about the number of elephants living in the nearby forests since the right for the survival of elephants has been well accepted by them for generations. However, people are highly concerned about the number of human deaths.

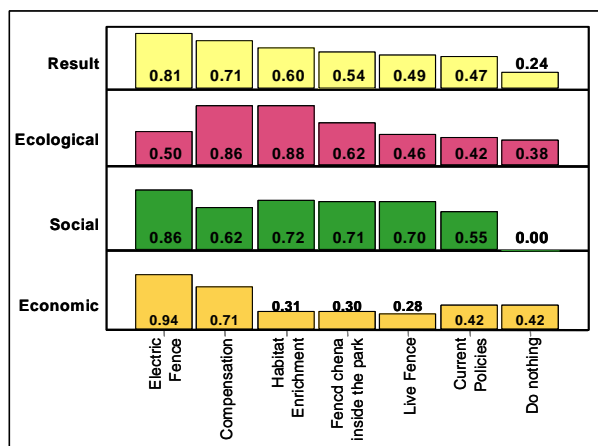


Figure 4: Compensation proves to be a promising policy option

By allowing the elephants to eat farmers' crops, additional food and habitat is created for the elephants. If farmers know that they are guaranteed financial compensation for the loss of their crops, they will not chase or try to frighten off the elephants by using firecrackers. Thus, the chances of being killed by a crop raiding elephant are much reduced. It is also no longer necessary to man the watchtowers at night, which would greatly improve the quality of life for farmers and their families.

In principle there is enough money available for compensation. However, due to administration costs and local corruption in handling these types of transactions, collecting and distributing the money is currently problematic. It would need to be handled by a different government institution since existing compensation schemes do not provide enough compensation to all those who are entitled to it. But the outlook is positive. The rural community has accepted the right for survival for elephants for generations, while forests in Sri Lanka can accommodate more wild elephants. Eventually, this conflict may be transformed into co-existence.

PREM: In brief

The Poverty Reduction and Environmental Management (PREM) programme aims to deepen and broaden the exposure of economic researchers and policy advisors in Africa and Asia to the theory and methods of natural resource management and environmental economics. It is anticipated that this will encourage policy changes that address both poverty reduction and sustainable environmental management.

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For further information about PREM, contact:

Pieter van Beukering
Institute for Environmental Studies (IVM)
Vrije Universiteit
De Boelelaan 1087
1081HV Amsterdam The Netherlands
Tel. +31(20)5989555/Fax. +31(20)5989553

beukering@ivm.vu.nl
www.prem-online.org - www.vu.nl/ivm

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