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## Implications of Human Settlement Patterns on Human Elephant Conflict in Sri Lanka

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### Abstract

According to IUCN/SSC African Elephant Specialist Group (AfESG), the broad definition of Human elephant conflict (HEC) is "Any human-elephant interaction which results in negative effects on human social, economic or cultural life, on elephant conservation or on the environment". Connection between human and elephant in Sri Lanka is ancient. Elephants are the largest mammal in the forest and they need large area and diversified environment. Because of the increasing population density and human settlements the elephant habitats are rapidly decreasing. This causes to crop raiding by elephants. Because of this' increasing crop damage, novel methods to protect crops have been decided. But most of these methods are viable only in the short term and tend to fail in the long run. Currently in Sri Lanka Human Elephant Conflict causes deaths to around 160 elephant and 50 of human annually. Now a days it a major problem in Dry zone in Sri Lanka. Also it's a problem for wildlife managers, local communities and Elephants. There is a trend for human settlements expand even in elephant habitats. This research is supposed to spatially identify "Effects of different human settlement patterns on Human Elephant Conflict in Sri Lanka". Also it's intended to find out different settlement patterns which cause to increase this problem.

**Key Words:** Elephant Movement Pattern and Different Human Settlement patterns

### Introduction

Elephant Human conflict is not a modern observable fact in Sri Lanka and that has been emerged in 5<sup>th</sup> or 6<sup>th</sup> century BCE. It was also mentioned by Robert Knox in 1681 who was the prisoner of king Rejasinghe. According to the Knox he was mentioned that, "Elephant do them also great damage in their ground, by night coming into their field and eating up their corn and likewise their Coker- nut trees". A number of Ecologists, Sociologists and Economists are describing this problematical situation accordingly their point of views. And their scientific researchers furthermore illustrate that. Although there are different perspectives the problem situation is still remaining and the conflict alleviation techniques and deterrence techniques are not in sustainable manner. HEC in Sri Lanka is for the most part happen, because of the ad hoc developments which were carried out last fifty years without proper harmonization between Wild life conservation department and other different departments. One of the main causative factors for the increase Human Elephant Conflict is "Deficiently Planned Land Use development programs". Within this background there is a gap between planning intervention and Human Elephant Conflict in Sri Lankan context. Consequently a

research goal is to identify "How spatial planning point of view looks at this problematic situation" through identifying how far physical aspects of human settlement planning determinants and human settlement patterns are conflicting with elephant movement patterns. Nowadays most of the scholars are considering that the spatial relationship between elephants and human abundance should be priority topic for the future research. And most of the time it fails to identifies any strong spatial connection between HEC (Hoare 2001).

### Materials and Methods

#### Case study area

Based on the Number of Elephants and Human Deaths, Property Damages and Crop damages, Forest Cover existing with Elephant population, Cropping pattern and Presence of different settlement patterns selected 03 DSDs namely "Giribawa, Galgamuwa and Ehatuwewa" in North Western province Sri Lanka as a case study area.

#### Data collection techniques

##### Recordings

Recordings were the main data collected method.

which was used and it was based on institutions like, Wildlife Conservation Department Galgamuwa, Galgamuwa DSD, Ehatuwewa DSD and Giribawa DSD.

**Interviews from responded institutions**

The selected respondent institutions were, "Wildlife Conservation Department of Sri Lanka, Galgamuwa DSD, Ehatuwewa DSD, Giribawa DSD, Wildlife Conservation Department Galgamuwa and Wildlife and Nature Protection Society of Sri Lanka" to get an understand about their views and experienced about this matter.

**Questioner survey from Villagers**

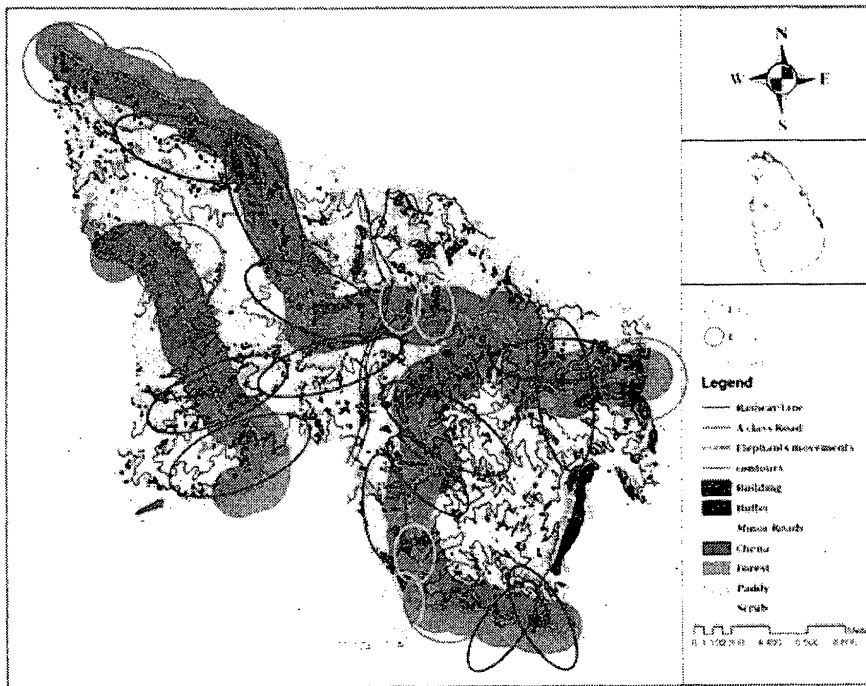
They are the people who know about real situation of this conflict. Therefore 35 Questioners were selected and it was divided in to 03 DSDs according to the number of affected population. After that, selected questionnaire samples randomly from each DSD to collect relevant data and information.

**Analysis Methods**

Spatial representation of Recordings by using GIS analytical tool and Descriptive analysis on conflicting settlement patterns and its elements based on results of Questioner survey and Interviews.

**Results and Discussions**

This study was carried out to "Spatially identify Effect of different human settlement patterns and its elements on Human Elephant Conflict in Sri Lanka" using GIS analytical tool and Descriptive analysis based on 35 questioner surveys and interviews which were conducted from villagers and Respondent institutions to identify elephant movement patterns and their opinion. The work carried out were 03 DSDs in Kurunegala District, North Western Province of Sri Lanka. Based on the Recordings from Respondent institutions and Villagers able to demarcate elephant movement buffer zone and by overlapping rural



Source: Compiled by author using GIS/RS Lab- Department of Town & Country Planning, University of Moratuwa

**Map 1: Conflicting Human Settlement patterns and its Elements**

**Table 1: percentage of Conflicting elements of human settlement patterns in study area**

	Vegetation Cover	Hydro Systems	Road Network
Within Buffer Zone Area	72	18	10
Out of relevent physical element of wholestudy area	75	23	88

settlement patterns on it's, identified conflicting Human settlement patterns. Outcome of this analysis concluded that, 73% of Dispersed and Linear Settlements comes under the entire study area and out of that 83% appeared in demarcated elephant movement Buffer zone. Then the outcomes of questioner survey from villagers highlighted that there is a High influence for the Dispersed and Linear settlements to increase human and elephant attraction. Not only that among respondent institutions interviews 83% have been identified Dispersed and Linear settlements have greater influence for the enhance Human Elephant Conflict in Sri Lanka.

According to the Table 1 it's concluded that Percentages of conflicting elements of human settlement patterns which come under elephant movement buffer zone out of total elements of study area. And according to the villager's questioner survey, 58.5% cited that there was an influence of the above elements for the existing Human Elephant Conflict. Also Elephant movement buffer zone is identified as low elevation areas which are having high elephant movements. Simultaneously, respondent institutions gave high weight to the "Vegetation cover" accordingly influence severity. All at once result of this research concluded that, there was an influence of different settlement patterns to increase human and elephant conflict which were located in elephant movement path. Because it reveals that cluster settlements had potentials such as, It is easy to

chase elephants before entering the villages (Because 5 or 10 villagers have one home garden). Elephants fear to enter the crop fields and easy to use traditional conflict mitigation measures.

Can be erected temporary fencing for the cultivation purposes.

Easy to give conflict management strategies

By taking into account all the recordings, Map no 1 concluded that how this settlement patterns with physical elements influenced increasing Human Elephant Conflict in selected Study Area. By considering all the above facts and figures it's concluded that there is a huge relationship between different human settlement patterns for increasing human and elephant attraction in Sri Lanka.

#### References

- Hoare RE (2001) Determinance of Human Elephant Conflict in Land-use mosaic, Article publish online: 25 DEC 2001
- Gunetilake J and Jayasooriya AP (2007) The Human -Elephant Conflict HEC: Background and current situation in the North-Western wildlife region of Sri Lanka, Faculty of veterinary medicine and animal science, Faculty of agriculture and Faculty of science, University of Peradeniya, LORIS, Journal of the wildlife and nature protection society of Sri Lanka, P 10-20