

A Spatial Analysis of the Human-Elephant Conflict in Sri Lanka

S. Thiripura³, P. Wijekoon¹, C. Santiapillai² and S. Wijeyamohan³

*¹Department of Statistics and Computer Science, Faculty of Science,
University of Peradeniya*

²Department of Zoology, Faculty of Science, University of Peradeniya

³Postgraduate Institute of Science, University of Peradeniya

The Human-Elephant Conflict (HEC) is normally viewed from the point of view of the elephants, but this survey was conducted to identify the difficulties farmers face due to elephants in their day-to-day life. With the increase in human population density and changes in land-use patterns, elephant habitat is being continuously reduced and as a result, much of the present day elephant range extends into and overlaps with agricultural lands. The main objectives of the survey were to discover a spatial pattern of the conflict, identify hot spots and formulate a plan to decrease HEC in Sri Lanka based on the identified spatial pattern.

An assessment of HEC by the Ringling Center for Elephant Conservation (CEC) was carried out from January to March, 2009, within 186 villages in seven provinces (Central, Northern, Uva, Eastern, North Central, North Western and Southern). The sample was selected using judgmental sampling within the elephant range and was collected by stopping every 10 km. Ordinary statistics and geospatial statistics were used to analyse in this survey. All variables were examined separately in order to identify its behaviour and plots were drawn based on preliminary analysis. A spatial analysis was performed to identify the high conflict areas. The tabular and graphical forms of the severity points were included and a spatial model found. R, Minitab and SPSS statistical software and ArcGIS spatial software were used in this analysis.

According to the spatial analysis, a Gaussian model could be identified as the spatial model for severity of the conflict. The minimum minimised square was obtained using weighted least square methods (WLS). Therefore, the model obtained for WLS was used as the best-estimated variogram. Due to small sample size, a provincial level krigging could not be done.

Based on the plots and model obtained, it was noted that Puttalam and Kuchavelli are the areas with the highest level of conflict. Correlations among parameters affect the spatial distribution of the conflict level. Therefore, krigging and co-krigging methods could be used to identify highly correlated variables in further studies.