Assess Elephant Habitat Suitability using Remote Sensing in Sri Lanka

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The Elephant is the largest animal in all Asian countries. The Existence of elephants is rare, mostly owing to habitat loss. Surviving areas of appropriate elephant habitat are essential to be secure from human development and also from the elephants themselves. Thus, execution of methods for the area where elephants are usually present is a challenge and needs a large volume of resources and time. As such, it is vital to implement a cost-effective method for assessing the present and possible elephant habitats. The objective of this study was to utilize Remote Sensing techniques in identifying the habitats of elephants. The study was carried out in the Hambantota, Ratnapura, Monaragala and Kurunegala district wildlife region. Timely accurate satellite data (Landsat 4, 5, and 8 with medium resolution acquired in the year 2005, 2007, and 2013) were used to analyze the behavioural patterns of wild elephants by taking advantages of semi-automatic and automatic advanced image processing algorithms rather than using conventional mapping methods. Two supervised classification methods, Neural Network (NN) and Support Vector Machines (SVM), were used to identify the possible elephant habitat boundary areas by using the training data. This was followed by Decision Tree (DT) classification to classify the elephants' living and non-living areas. The predicted elephant preference area was matched and accuracy was checked with the actual preference areas generated using GPS collar data. It was shown that the proposed DT-based model could be applied in envisaging areas that fit elephants with 83%, 72.5%, and 85.5% for the years 2005, 2007, and 2013 respectively. Thus, the method can be used in real work. The method could be enhanced by including various parameters more related to elephant disturbances.

Keywords: Elephant, Human-Elephant Conflict, Habitat Preference, Remote Sensing