

Importance of Ecological Connectivity Establishment as an Effective Approach to Mitigate Human Elephant Conflict in Sri Lanka**Ranasinghe P.^{1*}, Dissanayake D.M.S.B.²**¹*Faculty of Graduate Studies, University of Colombo, Sri Lanka*¹*The City University of New York, NY, USA*²*Faculty of Graduate Studies, University of Colombo, Sri Lanka***padmi.ranasinghe@gmail.com***Abstract**

Natural habitat distraction for human needs occurring at an alarming rate countrywide. Human Elephant Conflict (HEC) has averagely resulted over 250 elephant deaths, 75 human deaths, 70 human injuries, 1,400 property damages, and considerable crop damages annually. Lack of connectivity among Protected Areas (PAs), forestlands and other environmentally sensitive areas due to forest fragmentation strongly stands as leading causes of HEC. Establishment of ecological connectivity via ecological corridors allows necessary roaming space, fodder and water accessibility for elephants. Simultaneously, it allows in-situ conservation of elephants and improve biodiversity and ecological services to the area. Therefore, this study analyzed importance of establishment of ecological connectivity as an effective approach of HEC mitigation in Sri Lanka. Spatial changes of forest cover in seven Divisional Secretariat Divisions (DSD) in Polonnaruwa District was examined. Correlation of ecological connectivity and human, elephant deaths was analyzed in comparison to DSDs with ecological connectivity and without. Vegetation cover changes of the given areas were analyzed by NDVI method based on the satellite images extracted from Landsat 8 and Arc GIS 10.1. KII was conducted with officers of Department of Wildlife Conservation. To eliminate area differences in each DS division, HEC Density was calculated by sq.Km per HEC related human and elephant deaths for each DS Division from 2013-2017. Population of each DSD also taking in to consideration. Severe fragmentation and highest elephant, human deaths and HEC Density were identified in Dimbulagala DSD in each year of the study period and followed by Welikanda DSD. Hingurakgoda DSD had the lowest HEC intensity per sq.Km among all the other DSDs. Sri Lanka's only ecological corridor/ Elephant corridor establishment present at PAs within Hingurakgoda DSD. Minneriya-Kaudulla National Parks facilitate as a corridor between the Minneriya and Somawathie National Parks, and increases seasonal movement and free roaming among Minneriya-Kudulla National Parks and Hururu Forest Reserve and surrounding wilderness, which brings an evidence for strong positive co-relation between ecological connectivity and HEC. In comprising of Dimbulagala or Walikanda DSDs that no ecological connectivity and situated in between Maduru Oya and Mahaweli Flood Plain protected areas. Indeed, lack of forest connectivity due to land use pattern changes has positive correlation with Human elephant conflict. Therefore, serious attention needs to be given for establishment of Ecological connectivity as an effective HEC mitigation approach in vulnerable areas.

Keywords: HEC, Habitat fragmentation, Ecological connectivity, Ecological corridors, Conservation