

SPATIAL PATTERNS AND MAJOR CAUSES OF ELEPHANT MORTALITIES IN MAHAWELI WILDLIFE CONSERVATION AREA, SRI LANKA

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In Sri Lanka, a major form of Human-Elephant Conflict (HEC) occurs due to crop raiding by elephants in agricultural lands. The farmers take matters into their own hands and a majority of elephant deaths are due to the farmers' retributory actions. Such unabated killing, if not addressed, may threaten the future survival of elephants in the wild. Therefore, understanding major causes of elephant deaths is crucial in order to explore practical mitigation measures that can be implemented to reduce HEC. In this study, the major factors responsible for elephant mortalities in the Mahaweli Wildlife Conservation Area at the divisional secretarial and district level were investigated. Official elephant mortality data from the post-mortem (PM) reports of elephant deaths were used for this study. A total of 107 PM reports from 2017 to 2018 were used for the analysis. A PM report includes detailed information about the cause of the death of an elephant. In Polonnaruwa District, human-caused elephant deaths were significantly higher than the deaths due to natural and unknown deaths ($\chi^2 = 33.24$; $p < 0.0001$). However, the cause of elephant mortalities was not significantly different within the Matale District ($\chi^2 = 0.53$; $p > 0.05$). It was found that hakkapatas, gunshot and electrocution were mainly responsible for direct human related elephant mortalities. Furthermore, road accidents accounted for a significant portion of elephant mortalities. The mortalities were biased towards adult male elephants ($\chi^2 = 30.25$; $p < 0.0001$). Even though frequencies of elephant mortalities in dry and wet seasons were not significantly different ($\chi^2 = 0.348$; $p > 0.05$), monthly elephant mortality shows two distinct peaks: highest in August and October and lowest in September. Further, the study shows that occurrence of conflict is not random. Dimbulagala and Welikanda are the two main hotspots identified with respect to elephant mortality in Polonnaruwa (Gi-Bin Score 3 at 99% confidence). According to the findings, conservation actions to mitigate HEC and thereby to reduce elephant mortalities should focus on identifying the factors that contribute to elephant mortalities at local level and also should study the spatial distribution of conflicts to identify hotspots of conflicts. Exploring those factors at the local level will facilitate in developing site-specific mitigation strategies rather than taking broader level conflict mitigation measures for effective resolutions to reduce HEC and thereby to conserve elephants.

Keywords: Elephant Mortality, Human-Elephant Conflict (HEC), Mahaweli Wildlife Conservation Area