SPATIAL ANALYSIS OF DENGUE RISK IN *KANDY* DISTRICT USING REMOTE SENSING AND GIS

J.P.S.L.S. Jayalath, K.G.S. Nirmanee, M.K.N. Kumari and M.H.J.P. Gunarathna

Department of Agricultural Engineering and Soil Science, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

Dengue has emerged as one of the major public health problems in Sri Lanka. Since there is no specific antiviral therapy or vaccination against dengue virus, the vector mosquito control is practiced. This study aims to identify the high-risk zones by using factors that affect the emergence of dengue. Population density, rainfall, land surface temperature (LST), and normalized difference vegetation index (NDVI) were taken as independent variables and studied the effect on confirmed dengue cases in *Kandy* district, which is the third-highest risk area in Sri Lanka. The study uses epidemiological, population, and meteorological data from the Regional Director of Health-*Kandy,* the Department of Census and Statistics, and the Department of Meteorology for the period of 2009 to 2018. Rainfall distribution maps were created using Inverse Distance Weighted interpolation. LST was obtained using Google Earth Engine, and NDVI was calculated using Landsat 8 satellite images for the study period. Based on Pearson correlation analysis, all variables had statistically significant ($p \leq 0.01$) correlations with the number of confirmed dengue cases. Coefficient test results showed that population density (0.71) has the highest impact on dengue distribution in *Kandy*, followed by rainfall (0.28) and LST (0.07). However, NDVI showed a negative relationship (-0.04). All the layers were reclassified based on the risk level for dengue cases as low, medium, and high. Pairwise comparison among factors was conducted based on the β values of regression analysis, and the results were used for the mapping of risk zones using the weighted overlay tool in ArcGIS 10.2.1. Accordingly, *Akurana, Bambaradeniya, Gangawata Korale, Harispattuwa, Kandy* municipal council, *Kundasale, Menikhinna, Pathadumbara, Udunuwara,* and *Yatinuwara* Medical Officer of Health (MOH) areas were identified as high-risk areas for dengue in *Kandy* district. Regular removal of possible mosquito breeding sites and an increasing number of public awareness programs should be practiced at these MOH areas to mitigate the dengue risk in *Kandy* district.

Keywords: Dengue, GIS, Google Earth engine, *Kandy* district, Spatial analysis