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SPATIO-TEMPORAL CORRELATION ANALYSIS OF ENVIRONMENTAL AND CLIMATIC DETERMINANTS WITH VARIOUS INFECTIOUS DISEASES IN TAMIL NADU AND WEST BENGAL

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Abstract

Ocean warming is causing shifts in environmental and climatic patterns worldwide. This change is inevitable and poses threats to an increase infectious diseases in the near future. A study of the correlation of various infectious diseases with Environmental and Climatic Determinants (ECDs) is essential for overcoming these challenges. This research relates to the study and analysis of the spatio-temporal correlation of ECDs with the most affected infectious diseases in Tamil Nadu (TN) and West Bengal (WB) states in India. Ten different ECDs were derived and extracted from Earth Observation (EO) data using the geospatial tools and correlated with infectious diseases that occurred in TN and WB using RStudio. In the analysis, geographical variations were revealed in the association of ECDs with infectious diseases from one location to another. Dengue is found to be correlated with 3 ECDs in TN, such as the Normalized Difference Vegetation Index, Normalized Difference Water Index, and Enhanced Vegetation Index, but in WB, it correlates with 4 different ECDs, including land surface temperature, precipitation, enhanced vegetation index, and surface pressure. Similarly, the association of ECDs with other infectious diseases in TN and WB were analyzed. By using associated ECDs as predictors and strongly associated ECDs as key risk factors, researchers can develop prediction models for specific infectious diseases. Furthermore, the estabilishment of an ECD monitoring system could offer early warnings for infectious diseases.

Key words: climate change, early warning, environment, infectious disease, spatial analysis

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