

IMPACTS OF TOPOGRAPHIC AND CLIMATIC FACTORS ON TEMPORAL AND SPATIAL CHANGES OF FLOODING - A CASE STUDY FROM MATARA DISTRICT

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Flooding is a natural hazard that becomes a disaster when the natural valley of a river overflows into the floodplain area, causing damage to the lives and properties of its residents. Flooding has recently become an annual occurrence in Sri Lanka and has become a hazard that causes economic and social damage. Therefore, this study was conducted to identify the impacts of topography and rainfall on the temporal and spatial changes in flood hazard in the Mulatiyana Divisional Secretariat Division (DSD) of Matara District. The spatial and temporal changes of flooding in the area have been identified with the integrated use of remote sensing data pertaining to flooding years 2003, 2017, 2019, 2020, 2021, and 2023 and Secondary data was related to the number of victims affected by flooding, collected from Disaster Management Centre of Mulatiyana DSD. Data analysis was accomplished by using Arc GIS 10.7 and Microsoft Excel Software. As per the study results, the area's altitude extends from 50m to 450m from sea level. The study highlights that topography and rainfall are decisive factors in flooding in Mulatiyana DSD. The analysis of this research shows that 53-62% of the areas highly affected by floods are located at 0-100 m elevation. The reason for that is because the water flow is slow as those areas are plain terrain. Also, 8% of the least affected areas are located at an elevation of 100-150 meters. Rainfall distribution data indicate that high flood-risk areas receive 1302.48-1531.3 mm of rain, while medium-risk areas receive 1220.84-1457.8 mm, and least affected areas receive 1139.2-1410.06 mm rainfall. These results underscore the combined impact of flat terrain and heavy rainfall on flood risk in the region. Based on these findings, it is recommended to enhance flood mitigation strategies in Mulatiyana DSD by improving drainage infrastructure in low-lying areas (0-100m elevation) and implementing better water management practices to handle heavy rainfall, thus reducing flood risk.

Keywords: Flood Hazard, Temporal Changes, Spatial Changes, Human Factors, Natural Disaster, Physical Factors

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