

Studying the Impacts of Urbanization on Wetland Degradation in Colombo Flood Detention Area using GIS/RS Techniques

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Rapid development of the countries directly effects on their natural environment. Population growth, urbanization and industrialization are the major anthropogenic process that caused to environmental degradation. These processes always push to occupy the unused lands in developed areas. This study aimed to identify the wetland degradation and impacts of urbanization on wetlands in Colombo Flood Detention Area (CFDA). It described the temporal changes of the wetlands and the relationship among wetland degradation, urbanization and flooding. Another objective of this study was to identify the most important wetlands that should be protected for the flood mitigation.

Wetland degradation and spreading of urban areas were extracted using Aerial photographs, topographical sheets and Google images while flood affected areas identified by using the data of Disaster Management Center, Sri Lanka. Slope and sinks of study area where have the high storage capacity of storm water were identified by using LIDAR contour data. GIS & RS techniques and Arc Map 10.3 software were used for obtaining major results of the study.

The results show the degradation of wetlands by 44% within the period from 1956 to 2017. Total extent of wetlands was 2,202 ha in 1956 and it had been declined to the total of 1,231 ha in 2017. Along with that it was distinct urban areas had been increased by 50 % in same period. Thus, it was clear the negative correlation between wetland degradation and urbanization. Increase of flood effected areas had also increased within this period and 63 Grama Niladhari Divisions (GNDs) had affected out of 155 GNDs in 2010. Built- up areas were increased by 70% while the wetland areas were declined by 52% of the flooded GNDs in CFDA from 1956 to 2017. According to that negative correlation between wetland degradation and flood could be identified clearly. The 698 ha of wetlands located in sinks where has the high storage capacity of water has identified as important wetland that should be protected for flood mitigation.

This research concluded the relationship among urbanization, wetland degradation and flood events with the evidences. Results of the study will be helped to mitigate the negative impacts of wetland degradation by identification of the environmental and economic value of them. Thus, based on the results it is recommended to develop a better mechanism to ensure the protection of important wetlands in CFDA that identified by this research.

Key words; Wetlands, Colombo Flood Detention Area, urbanization, Flood