

Assessing the degradation of mangrove ecosystems in the Puttalam Lagoon

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DPSIR is an abbreviation for Driving forces, Pressures, State, Impact, and Responses. The framework is appropriate for describing the relationship between the origins and consequences of environmental problems, their dynamics, and linked causes and effects. The Puttalam Lagoon, located in the North Western Province in Sri Lanka, was selected as the study area. The objectives of the study were to identify the mangrove species diversity and assess the degradation of mangrove diversity. A field survey, interviews and a literature survey were used as data collection methods for the study. A total of 25 quadrant samples consisting of 5m X 5m area were selected for the mangrove vegetation survey. A total of 100 individuals living on the periphery of the lagoon were interviewed. The analysis was carried out based on the DPSIR framework. The Statistical and Inverse Distance Weighted (IDW) interpolation technique in ArcGIS mapping technique has been used for the analysis of data. A total of 15 mangrove species types belonging to 13 genera and nine families were enumerated. Among them, eight species represented true mangroves and seven species represented mangrove associates. The results revealed that there is degradation of the mangrove diversity of the Puttalam Lagoon due to both human and physical reasons. The results of the survey revealed that the drivers of the degradation were aquaculture, fishing, population in-migration, transportation, industry, land use, and climate. The pressures exerted by the driving forces were expansion of human settlements and agricultural areas; destruction of mangrove species; exploitation of mangrove ecosystems; unsuitable restoration methods; gas emission; and increase of the chemical content of water resources. The state of the ecosystem of the study area is highly impacted by these pressures. The critical impacts were identified as fragmentation and loss of mangrove habitats; decreasing diversity of mangroves; increasing abundance of mangrove species; and coastal erosion.

Keywords: *DPSIR, degradation, mangrove diversity, Puttalam Lagoon*