

Current status of four coastal lagoons in Sri Lanka: Need for urgent conservation

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Abstract

The lagoons in the western and north-western coast of Sri Lanka, are becoming more vulnerable, to changes due to urbanization along with immense disturbances of the human domain and the unavoidable impacts of intensified climate change. The time and the cost that take to restore and rehabilitate them may further increase. Therefore, it is timely and spatially important to assess the current status of selected lagoon ecosystems by using DPSIR (Drivers-Pressures-State-Impact-Response). The study was focused on three lagoons in the North Western coast and one from the west coast in Negombo. Both primary and secondary data were used in order to fulfil the objective of the study. Primary data collection was a two-step process; I) transect walk with field observation and II) non-structured interviews. Land use and land cover maps were used to detect the changes in the study areas. In-situ field testing of salinity, pH, EC and temperature were carried out. Further, water quality data were obtained by conducting a comprehensive literature-based survey. Arc GIS and Google Earth software packages were used for preparing maps. DPSIR framework and thematic content analyses were applied for data analysis. Detected 'state' of lagoon environments was included directly influenced morphological features of lagoons, degraded aquatic and wetland vegetation, encroachment of shrimp farms and saltpans, higher production of nutrients and heavy metal concentration, in turn, intensify ecosystem degradation. Degraded water quality, vector-borne diseases among lagoon species, decreasing fish species population, decreasing the number of bird species that inhabit lagoon environment and altered lagoon food chain disrupting lagoon food web were the identified 'impacts'. Finally, these dramatic changes will intensify the impacts of climate change; long-term seasonal drying of water bodies, especially in the Puttalam lagoon. This has increased the evaporation of lagoon water bodies and extremely high evaporation coincided with high salinity levels in Mundal and Puttalam lagoons. Human disturbance being the root cause associated with several 'drivers' for this deterioration of study areas, the existing conservation measures have to be implemented along with ecosystem restoration in a more sustainable approach to prevent an ecology of a disaster.

Keywords: *Climate change, Conservation, DPSIR, Ecology, Lagoon*

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