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Effects of anthropogenic disturbance on nursery habitat function with special reference to pollution in the Negombo Estuary

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Estuaries serve as nursery grounds for many fish and crustacean species. However, increasing human activities within estuaries and the surrounding areas lead to significant habitat loss for juveniles and decrease the quality of the remaining habitats. The present study was carried out to assess the effects of anthropogenic disturbances on the nursery function of estuaries with a multispecific approach based on the ecosystem. The objectives of the study were to measure the status of pollution of water and identify the land-based pollution sources.

Eight sampling sites were selected in the Negombo estuary, mainly within the Negombo Pitipana, Aluthkuruwa, Sethapaduwa, Hamilton canal opening to the estuary, Dandugam Oya opening to the estuary, Liyanagemulla, Airport Garden Hotel Katunayake and Kurana. Indices of pH, turbidity, nutrients, dissolve oxygen, biochemical oxygen, total suspended solids, oil and grease and fecal coliform levels were used to estimate anthropogenic disturbances impacting this nursery habitat in the seagrass beds in the Negombo estuary.

There are two industrial zones established in the upstream areas of the Negombo estuary. The treated effluent from the Katunayake Export Processing Zone is discharged into the Dandugam Oya and untreated industrial effluent from the enterprises in Ekala is discharged into Ja-ela which finally flows into the Negombo estuary. This industrial effluent may contain a high load of organic matter, textile dyes and heavy metals. The ammonia levels range from 0.12 mg/l to 0.99 mg/l, nitrate level 0.24 mg/l to 0.55 mg/l nitrite 0.02 mg/l to 0.144 mg/l and phosphate level 0.11 mg/l to 0.58 mg/l, Biochemical Oxygen Demand range from 10 mg/l to 50 mg/l, Oil and Grease range from 28 mg/l to 1500 mg/l and Fecal coliform range from 16 mg/l to 1400 mg/l. The surrounding area of Negombo Pitipana is densely populated and due to the lack of proper sanitary facilities, fecal pollution can be expected.