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Land Based Activities and Their Impact on the Species Composition, Abundance and CPUE (Catch Per Unit Effort) of Shrimps at Selected Locations of 'Bolgoda Lake' Estuarine System

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Abstract

'Bolgoda Lake' is a semi-closed estuarine system located on the west coast of Sri Lanka. Shrimp fishery which is a main component of artisanal fishery of this water body reports a decline at present and the degradation of water quality of the estuary due to land-based activities has been identified as the main attributable factor. Present study was carried with the objective of determining the effects of land-based activities on the shrimp fishery in 'Bolgoda Lake' estuarine system. Three selected shrimp landing sites (i.e. Diggala, Indigahathotupola and Kithalanduwa) of the main fishing area, the North Lake of the estuary were studied. Sampling was carried out from January 2018 to December 2018 between 7.00 am to 12.00 noon. Species composition and catch data of shrimps were recorded. Shrimps were identified to species level. Data on the land-based activities that have direct effects on the water body and weather profile for the area was collected from the municipal councils associated with the estuarine system. The shrimp catches consisted of 7 brackish water/marine species. They included 3 species of genus *Penaeus*, namely, *P. monodon*, *P. semisulcatus* and *P. indicus* and four species of genus *Metapenaeus*, namely, *M. dobsoni*, *M. ensis*, *M. elegans* and *M. moyebi*. The annual shrimp catch for the year 2018 in the North Bolgoda Lake was 24.1 tons and shows a decline than previous records. When the total annual catches of shrimps at landing sites were considered they were always higher at Diggala than other two locations. The annual shrimp catches of the three locations were 11,021 kg at Diggala, 6,862 kg at Indigahathotupola and 4,033 kg at Kithalanduwa. Present study has identified 8 land-based activities associated with Kithalanduwa, 6 with Indigahathotupola and 5 with Diggala. Analysis carried out to investigate the effect of land-based activities on shrimp fishery revealed that there is a strong negative relationship of land-based activities to CPUE (Catch per unit effort) estimated for shrimp catches at three study locations. The results of this study revealed that at present Bolgoda Lake is heavily exposed to pollution from industrial effluents and different land-based activities and they have a direct adverse effect on the shrimp fishery. To avoid catastrophe, measures should be taken to reduce pollution by curtailing sewage disposal and treatment of effluents of nearby factories before being discharged into this Lake.

Keywords: Bolgoda-Lake, Land based activities, Shrimps, Pollution