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Diversity of Fishing Practices and Resources Conservation in Negombo Lagoon

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Abstract

Negombo lagoon is an estuarine ecosystem with an extent of 3502 ha under water, located in Attanagalu Oya basin. It is characterized with a large freshwater supply from 932.4 square kilometer catchments area and restricted water exchange with the open ocean. The lagoon considerably choked in tidal amplitudes due to its narrow inlet. The lagoon is rich in biodiversity and also in fishing gear diversity. The geomorphology of the lagoon, tidal exchange pattern, distribution pattern of the mangrove vegetation, extent of the inter-tidal area around the lagoon leads to a greater niche diversification within the lagoon. This leads to high faunal diversity resulting to high fishing gear diversity. Fishing is the most important economic activity in the lagoon with over 10,000 people directly or indirectly dependent on fishing for their livelihood. Present study, which was carried out during January to December 2004, revealed the existence of 34 fishing practices of which 17 were operated targeting juvenile and sub-adult stages of Penaeid prawns. Cast nets, Gill nets, Stake seine nets, Brush piles, Trawl type of collecting nets, Trammel nets, Crab nets and Crab pots are the important fishing gear types operated in the lagoon. Lagoon has four major ecological zones - Lagoon mouth, Lagoon proper, Transitional swamp and the Marsh. A zonal distribution pattern was observed for certain fishing gear types. Although the transitional swamp is a small area when compared to the other parts of the lagoon, it showed the highest fishing gear diversity.

Key words : Diversity, Fishing gear, Negombo, Biodiversity, Sri Lanka

Introduction

Negombo lagoon is situated on the west coast of Sri Lanka, approximately 45 km north of Colombo at 7° 10' N and 79° 50' E. The lagoon is shallow and has a narrow inlet connecting to the open sea. The lagoon is surrounded by mangroves and mangrove associates. Around 70 % of the lagoon area is less than 1.0 m in depth during the low tide. Comparatively a deeper channel towards the middle part of the lagoon separates the lagoon proper into two parts, the deeper channel and the shallow lagoon proper. Although there is one opening to the sea, the channel is divided into two towards the lagoon proper. The lagoon is approximately 10 km in length, 3.5 km wide and the mean depth is 1.2 m. It is characterized with a large freshwater supply and restricted water exchange with the open sea. The rivers Dandugam Oya and Ja - Ela are the main freshwater sources, both entering in the southern end. The lagoon experiences a strongly variable freshwater discharging pattern (Rajapaksha *et al.*, unpublished; Rydberg & Wickbom, 1996). The seasonal fluctuations in species diversity, narrow opening of the lagoon to the sea, distribution pattern of mangrove vegetation around the lagoon and the salinity distribution pattern of the lagoon has resulted a greater niche diversification within the lagoon leading to a high species diversity. A total of 62 species of fish belonging to 36 families were recorded from the fishery (De Silva and Silva, 1979). CEA / Euroconsult (1994) reported 15 Amphibian species, 37 reptile species, 125 bird species and 30 mammal species from Multhurajawela and Negombo Lagoon. To harvest the resources in the lagoon, 34 fishing gear types were employed during the study period of which 07 major types were responsible for the harvesting of around 70% of the resources. Penaeid prawns are the staple income generating resource of the lagoon. Out of the above 34 fishing gear types 17 were operated targeting juvenile and sub-adult stages of Penaeid prawns.

Managing the fishery in the estuary involves regulating the behaviour of the fishermen whose activities affect that

resource. For effective management, it is essential to study not only the resource itself, but also the fishing methods need to harvest that resource. Considerable number of studies have been done in Negombo lagoon on the resource availability and potential (De Silva & Silva, 1979; Samarakoon & Van Zon, 1991; Sanders *et al.*, 2000) but no detailed information is available in the literature on the harvesting practices. Hence this study was initiated to obtain information on harvesting practices that are employed in the estuarine system, and to assess their suitability for rational exploitation of the resources.

Materials and Methods

Negombo lagoon is divided into 10 management areas for management purposes.

Table 1: Management areas of Negombo lagoon

Management Area	Names of Villages
No. 1	Sea Street, Main Street, Duwa, Pitipana Street
No. 2	Thaladuwa, Kaolkele, Kurana, Bolawalana
No. 3	Mangkuliya, Munnakkara, Siriwardane Place
No. 4	Pitipana north, Pitipana central
No. 5	Pitipana south
No. 6	Thalahena, Basiyawatta, Aluthkuruwa
No. 7	Settapaduwa, Kepundoda, Dungalpitiya
No. 8	Linus-wella, Delathura, Uswatta, Dandugama, Thudella
No. 9	Katunayake area
No. 10	Pamunugama, Sarakuwa

During the year 2004, fortnightly visits were made to the above management areas for collecting information on the following;

1. Fishing gear types operated in each management area
2. Seasonality of the fishing gear types
3. Numbers of each fishing gear type operated in each management area