

Survey on fishery in the Nayaru Lagoon, Mullativu, Sri Lanka

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Abstract

Lagoon fisheries contribute significantly to the coastal fishery sector in Sri Lanka. The status of the fishery in the Nayaru lagoon and its contribution to local economy has not been assessed before due to civil war related accessibility issues. This study aimed at to assess the present status of the fishery in Nayaru lagoon based on catch data obtained over a period of six months from April to September 2014. Fishery is an important activity in the Nayaru lagoon. Gill nets, cast nets and hook and line are the major fishing gear used by the fishermen. Crab traps are also used on a year round basis. Seventeen species of finfish belonging to 15 families, the mangrove crab *Scylla serrata* and *Fenneropenaeus indicus* were harvested from the lagoon. The bulk of the catch was represented by *Mugil cephalus* (52%); other abundant species were *Chanos chanos*, *Lates calcarifer*, *Arius bilineatus* and *Eleutheronema tetradactylum*. About 29 % of the total catch was represented by shellfish species of which *Scylla serrata* was the most abundant. The estimated annual yield of the lagoon was 9.237 kg ha⁻¹ year⁻¹ which is a lower amount compared to other shallow coastal lagoons in Sri Lanka. Furthermore, the lagoon exhibits seasonal fluctuations in fish yield due to water level changes. Market price does not seem to fluctuate much in response to catch effort, weather conditions or availability of fish. Thus study showed that the fish production in the lagoon was relatively low hence a proper management plan is proposed to ensure its sustainability.

Keywords: Fisheries, lagoon, yield, sustainability

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Introduction

Lagoons are highly productive ecosystems and are important not only for fisheries but also as nursery grounds for a number of species of fin fish and shell fish (Jayawickrema, 1992). Mangrove and lagoon ecosystems in the north and east coasts of the country have not been assessed for the last 30 years due the war however now the areas are accessible to the scientific community and has provided an opportunity to obtain fish catch records from a neglected lagoon. The Nayaru Lagoon is approximately 1,267.3 ha in extent. A wide lagoon mouth is located at the southeastern part of the lagoon. Nay Aru and Palidai Aru are the main freshwater sources to the lagoon and open to the lagoon from its western side. The Mullativu – Kokilai road runs parallel to the eastern border of the lagoon. Eastern shore of the lagoon supports very little mangrove cover, while well-developed mangrove cover is seen on the southern and western shores. Lagoon fishery is the main livelihood of the people living in Nayaru, Chenmalai and Kumulamunai villages.

Materials and Methods

A frame survey was conducted to identify basic characteristics of fishery in the Nayaru Lagoon. The data were collected from April to September 2014. The fish collecting site was visited daily and catch records were taken at the time when individual fishermen catch was weighed at the collecting center. At fish landing sites, data on species composition and weight of each species was collected. Records maintained by fish collectors were also checked to obtain the prices paid to the fishermen and selling prices of the fish.

Results

Different fishing gear types are used at various places of the lagoon. Among them drifting gill nets and hook and line method are the most common. Cast nets are mainly used to catch Indian prawn (*Fenneropenaeus indicus*) while crab traps are used to catch *Scylla serrata*. In the lagoon area bordering Kumulamunai village, hand picking of Indian prawn was practiced by the villagers. Fiber glass canoes with an outrigger were the main fishing craft used. Seventeen species of finfish belonging to 15 families were harvested as food fish from the Nayaru lagoon. From the percentage weight of monthly average fish yield harvested, more than half was comprised of *M. cephalus* (52 %). The bulk of the catch was represented by finfish (79 %) and 21% was represented by shellfish. Other species such as *Eleuthronema tetradactylum* (9 %), *Lates calcarifer* (5 %), *Chanos chanos* (4 %) and *Arius bilineatus* (4 %) have a minor importance in the fish catch of the Nayaru lagoon. Among the shellfish caught *Fenneropenaeus indicus* and *Scylla serrata* were more prominent. The overall estimated annual productivity of the lagoon was 9.237 Kg ha⁻¹ y⁻¹. In terms of species abundance, *Mugil cephalus* was the most abundant fish caught from the Nayaru Lagoon. Other abundant species were *Chanos chanos*, *Lates calcarifer*, *Arius bilineatus*, *Eleuthronema tetradactylum*, and *Scylla serrata*.

M. cephalus has the highest average catch per day (13.17 Individuals day⁻¹). It was caught throughout the sampling period with a higher number of individuals (750) getting captured in July. The second most caught fish *Chanos chanos* does not seem to show a significant variation throughout the month. However, there was a trend that during July most of the fish catch had declined except for *M. cephalus*. *Scylla serrata* also does not seem to have a significant variation throughout the sampling period. Considerable amount of molted *Scylla serrata* was also caught. According to the data, small crabs are prominent in April, May and June and then decline suggesting that this period may be their breeding period in the lagoon.

Discussion

Nayaru Lagoon was surrounded by a well-developed mangrove and is reported to have been supporting a rich prawn fishery. However, due to civil war in the area and the recent development activities resulted in clearing some mangrove patches and constructing a narrow bridge over the lagoon mouth. This changed the hydrological regime of the lagoon drastically resulting in the collapse of the fishery and declining of the mangrove vegetation cover around. From the percentage of monthly average fish yield harvested, more than half the harvest is

comprised of *M. cephalus*. The ability of *M. cephalus* to tolerate wide ranges of salinity levels enables them to inhabit in the low saline waters of the Nayaru Lagoon in large schools. Further, the use of limited types of fishing gear may also have an effect on this.

The estimated annual yield of the lagoon was $9.237 \text{ kg ha}^{-1} \text{ y}^{-1}$. This is low compared to other lagoons in Sri Lanka. Schuster (1951) estimated the average annual production of Sri Lanka's brackish watersto be less than $22 \text{ kg ha}^{-1} \text{ y}^{-1}$. Pillai (1965) has estimated the productivityof Negombo estuary in 1960 to be $72.9 \text{ kg ha}^{-1} \text{ y}^{-1}$, indicating that the Nayaru lagoon has a lower yield. However, it has the capacity to become a very productive lagoon if proper sustainable management plan is introduced to ensure wise management and sustainable utilization of this lagoon ecosystem.

Conclusion

Fishery in Nayaru Lagoon seems to be fairly organized. Its annual yield is comparatively low which means that if proper management plans are introduced productivity could be raised and strengthen livelihoods of the fisher folks residing around the lagoon.

References

- Jayawickrema, S.J.C. 1992. Status of fishery in the Chilaw estuary. *Journal of Natural Sciences Council Sri Lanka*.**20(2)**: 199-207
- Pillai, T. G. 1965. Brackish-water Fishery Resources. *Bull. Fish. Res. Stn. Ceylon*, **18**, No. 2.
- Schuster, W. H. 1951. Surveys of the Inland Fisheries of Ceylon. Govt. Pub. Bureau, Ceylon Sess. Pap. No. XXIV, pp: 4-15.