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## Marine litter - A problem for stake net fishers: A case study in Vembanad Lake, Kerala

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Plastics have become an inevitable item in daily life. Since they are non-degradable and persist for centuries they are considered as one of the most serious threats to the marine ecosystem in the current century. Marine litter consisting of plastics and other non-biodegradable material reach the sea through rivers and estuaries due to improper disposal or sometimes are discarded directly into the ecosystem. The coastal waters are important fishing areas where traditional fishermen use different types of craft and gear to harvest the fish from the natural waters. The progressive increase in plastics and their indiscriminate discards have affected the ecosystem and also the fishers who depend on the ecosystem.

The present study was conducted among the stake net holders to estimate the abundance of plastic litter entering to Arabian Sea through Vembanadu Lake during the heavy rainfall season and also to know how it affects the fisheries. The study was conducted at Panambukadu village of Ernakulum district (Lat10°00'35''N and

Long76°14'547'' E) which is about 3.5 to 4 kms downstream of Vypin Ferry. The major livelihood of the people is fishing.

Stake nets are normally operated in the shallow waters and estuaries where the tidal currents are strong. They are fixed conical bag nets with rectangular mouth opening kept open against the current by means of stakes driven to the bottom. The principle of operation here is that the organisms which drift with the tidal current enter the net set against the current, and are filtered and retained in the cod end (Boopendranath and Hameed, 2010).

This conical bag net is made several cylindrical sections of the netting, diminishing in diameter progressively from the mouth to the cod end. The stakes are installed in series at a distance of 4.5 m, to facilitate the operation of a number of nets. The net is set at the onset of ebb tide. The hauling is done when the tide begins to slacken towards the end of the ebb tide. Stake nets are normally operated for catching prawns.

Many countries have started research on the marine litter and the United Nations Environment Programme (UNEP) has tried to sensitize the issue and attributed Remote Litter Codes (RLC) to categories the items which persist in the ecosystem for a long period.

Eighteen numbers of stake net holders were contacted individually and garbage bags were distributed to them. The collected litter was sorted as per UNEP guidelines, weighed and counted to estimate the abundance of the same. Out of the different categories of litter, plastic carry bags were predominant (RLC15) and recorded a maximum weight of 21.8 kg on the second day of observation, with an average weight of 1.67 Kg per stake net (Fig1). The volume of water passed through the net of dimension 12x4x6 m<sup>3</sup> during the operational period was 16981cubic meter of water per hour with an average flow rate of 0.21m/sec and a maximum number of 608 items were collected during a two hour operation. The maximum accumulation of plastic carry bags on individual stake was found on the fourth day of operation with an amount of 4.8 kg which was comparatively a heavy rainfall day contributing to heavy runoff and under water current resulting in dragging of more quantity of litter from the upstream and near shore areas. The other litter categories observed were plastic bottles, cups, metal caps, spoons, diapers etc.

The paper presents the quantity of plastics in each net, the average catch and a list of commonly and rarely occurring items in the stake nets.

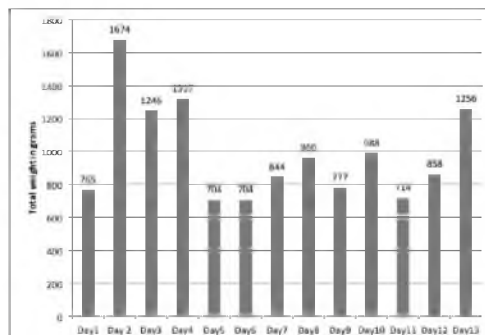


Fig. 1. Average weight of plastic covers (gm /stake net/ day) in the stake nets near Panambukad of Vembanad Lake during monsoon