



# ASSESSMENT OF PROVISIONAL ECOSYSTEM SERVICES IN VYPIN ISLAND, COCHIN BACKWATER AND PAYMENT FOR COASTAL ECOSYSTEM SERVICES

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## Introduction:

Ecosystems play an important role in human societies by providing services that directly or indirectly benefit humans (Daily 1997). However, there is growing evidence that ecosystems are being negatively affected by human pressures such as overfishing, eutrophication, toxic pollution, and habitat degradation (e.g., Daily 1997).

Cochin (Kochi) is considered as the land of spices and "Queen of the Arabian Sea," it is endowed with unique tropical ecosystem with large backwaters, natural harbor, and is a favourite tourist destination. The Cochin Backwater System is the second largest estuarine system in India, is a semi-enclosed water body (~256 km<sup>2</sup> area) extending from Azheekode to Alappuzha. In recent years, this ecosystem has come under immense anthropogenic pressure due to increased urbanization, pollution and land reclamations.

Fishery being the major source of income alongside shrimp culture among the social community living along the backwaters. This study is an initial approach to assess the ecosystem and the services harnessed by the various social communities depending on the coastal waters of Vypin Island, Cochin.

## Study Area:

- The Cochin backwaters including Vembanad Lake, occupy an area of about 256 square kilometers. The area is about 96 km long and 3-4 km wide on an average. It extends from about 9°30' to 10°20' lat N and 76°13' to 76°50' long E.
- The study area is Vypin island of Ernakulam district in Kerala,
- The area surveyed during the study was Njarakkal, Nayarambalam, Edavankad and Kuzhupilly which are panchayath villages under Vypin intermediate panchayath.

## Methodology:

- The household (n=75) survey was carried out to determine the dependency on the surrounding ecosystem. The survey was carried out in all four panchayaths using random sampling method.
- The questionnaire was distributed among the resident (fishermen) of different panchayths and also were interviewed to know their opinion on the ecosystem sustainability.
- The questions were grouped into six sections:
  - Identification
  - Demography
  - Livelihood assessment
  - Resource Use Pattern
  - Food Security and Health
  - Perceptions on Payment for Ecosystem Services

## Observation:

- The marital status (Fig. 1) of the respondents were 93% (n=69).
- The maximum age group (40%) among them was analyzed to be 35-40years followed by 55-60years (28%) and the least age group was 20-25years (3%) (Fig.2).
- The major group of respondents had only primary education (60%) followed by 23% of secondary educated (SSLC), 12% of higher secondary (12thclass) and the least 5% were graduates (Fig.3).
- It was analyzed that 41% of the respondents were experienced (20-25 yrs) in fishing (Fig.4).
- The annual income from each house of the respondent is approximately Rs. 1.5 lakhs per annum. 83% of fishermen are fully depended on fishing from backwater and rest of them was involved with masonry work, boat and net repairing work during non-fishing time.
- The income spends for household expenditure which included maintenance of house, education, water, electricity health needs and travelling were approximately Rs.36000 per annum.
- All the fishermen reported that while fish prices have increased in recent years, fish catch has decreased and cost of fuels, fishing gear and boat upkeep have increased, resulting in a decrease in their net income.
- In past ten years there has been a drastic change on the availability of fin fishes in the backwater. The 52% of respondents opined the drastic decline of fish catch to change in water quality, 25% attributed it to water body shrinkage and 23% to species decline (Fig.5).
- The reason for the change in water quality were ranked highest (52%) due to pollution followed by overfishing and over population (Fig.6)
- The major pollutant is plastic dumping by urban population followed by poultry waste discharge, industrial waste discharge and release of peeling shed waste into the backwaters system (Fig.7).
- The respondents were not aware of payment for ecosystem services.
- After understanding about payment for ecosystem services, 10% of respondents were not ready to pay for the purpose.
- 31% of the respondents were ready to pay 1-5% of their annual income to reduce marine pollution and increase fish resources (Fig.8 and 9).

## Discussion:

- The fundamental characteristic of rural coastal villages is the utilization of resources from their ecosystems (Hanazaki and Begossi, 2003), and Vypin Island is coastal village for which this statement holds true.
- When analyzing ecosystem services for Vypin Island, the study had allowed for a closer examination of villagers' dependence on their ecosystems.
- Dependence level has been measured by studying the number of households that use the ecosystems for essentials (provisioning services) which benefit their well-being.
- Pollution of the backwater system has affected the livelihood of the common fishermen community by interfering in the availability of fish resources.

## Conclusion:

- Our work on provisional services provides critical information for awareness, advocacy and policy work for ensuring the maintenance of ecological functions for ecosystem services in order to support human well being.
- Strict measures, proper management and awareness of plastic pollution is the necessity for the sustainability of ecosystem.

## Reference:

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