CMPA Technical Report Series

06

The Ecological Baseline Assessment of the Palk Bay

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SACON

Indo-German Biodiversity Programme
Conservation and Sustainable Management of Coastal and Marine Protected Areas

CMPA Technical Report Series No. 06
The Ecological Baseline Assessment of the Palk Bay

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Acknowledgement

Palk Bay is an ecosystem that has held our attention since the time we have known about its biodiversity and maritime importance. When we were given the opportunity to conduct the "Ecological baseline assessment for Palk Bay" we felt blessed with the chance to learn more about this unique ecosystem. This study was possible due to efforts of the scientific team from GIZ, New Delhi and the PCCF, Tamil Nadu Forest Department. We thank them for giving us this opportunity to be a part of the larger goal of Conservation of Palk Bay.

The present study involved interactions with a number of research institutions, educational institutions, NGO's and the community, all of whom were cooperative in sharing information and helped us in various ways. Most important was the cooperation of librarians from all the institutions who went out of their way to help our literature survey. In the field we were immensely helped by Mr. Raju from Devipattinam who always spared time for the study, the dedication and concern he showed for the conservation is contagious. We also thank Dr. Deepak Bilgi, DFO and Mr. Gyanapazhalam RFO, Ramanathapuram and their field staff for assistance during the study. The support from various sources helped in gathering diverse perceptives on the bay.

Here, we take the opportunity to thank all the officials from the GIZ, New Delhi, especially Ms. Neena Koshy and Mr. P.D. Francis for their timely help.

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We are grateful to the Director, SACON Dr. K. Sankar for permitting us to undertake the project facilitating its execution. We also thank the administrative and the finance department for coordination during field work. Finally, we acknowledge with gratitude the faculty, support staff and researchers from SACON for their interest in our work and their encouragement.

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Executive Summary

Marine coastal areas are among the world's most productive ecosystems. In the course of time, the world over these coastal ecosystems are increasingly coming under immense pressure from various human activities. In India, coastal habitats sustain the livelihoods of over 20 million people. India has a long coastline, which is under tremendous developmental pressure. In this context, the present study was undertaken to consolidate baseline ecological information on the Palk Bay in the southeastern coast of India. The present scientific literature available on the Palk Bay is relatively limited compared with that of the Gulf of Mannar. This study was undertaken on the request of GIZ and their sponsorship. The overall objective of the GIZ in sponsoring the project is 'to contribute to the improvement of the conservation and sustainable use of biodiversity in the pilot protected areas, while taking into consideration the economic circumstances of the local population'. The objective set for this specific study was to conduct a rapid ecological baseline survey for Palk Bay (off the Ramanathapuram coast), Tamil Nadu. The work was taken up based on the "Conceptual Framework for a Baseline Study on the Ecological Status of the Pilot Sites for the CMPA Project by the Leibniz Center for Tropical Marine Ecology, Bremen, Germany", but contextualized for Palk Bay, the selected pilot site in Tamil Nadu. The present study explored water quality and sediment quality across the Palk Bays along specific transects, various habitats in the coastal ecosystem (focusing on mangroves, seagrass and corals), and issues related to aquaculture farms in the area and their interactions with the local fishers.

The study (based on the Terms of Reference provided by GIZ) focused only on the coastal stretch of the Palk Bay along the Ramanathapuram District. A quick literature survey, rapid field surveys and laboratory

analyses were undertaken to generate data mainly on habitat features of various ecosystems and the flora and fauna within. The perceptions of the fishing communities on the same especially on the ecological changes happening in the area. Grids of 1 x 1 km^2 size were laid on the study covering the full 126 km of the Ramanathapuram coast of the Palk Bay. In total 269 grids were marked covering at least 800 m seawards and 200 m landwards from the high tide line. From the bay so far 392 species, which includes only one floral endemic species were reported. The mangroves in the study area currently are in fragmented patches. Natural forest growth is seen only in a very minor scale. Mangroves with marshland are the highest in proportion, followed by patches where mangrove restoration is attempted by adopting the common fishbone techniques.

A total of 7,405 birds belonging to 130 species representing 46 families were recorded from the area during our survey. Of the 130 species, the birds belonging to the family Laridae and the familiy Scolopacidae were higher in number. Opportunistic observations during the survey recorded six lizards, two snakes and one turtle species. In total, 27 species of insect and 5 species of Arachnid were recorded from the mangrove patches along the coast. Lepidopterans were the most observed group with 12 species, followed by seven species of Odonata.

The benthos studies revealed the dominance of gastropoda followed by bivalves and polychaeta. The gastropods were represented by 41 species while bivalves had a representation of 15 species and five species of crabs were observed. However, we observed that the benthos number and composition were mainly governed by the organic enrichment in the entire Palk Bay. The benthos also differed with the habitats as the mangrove ecosystem were dominated by polychaetes whereas the offshore habitat had the influence of seagrass and corals that influenced the faunal distribution and occurrence.

The water and sediment quality surveys did not indicate serious changes. In some locations, oil and grease levels were found to be high, due to local boating activities and anchorage. In Palk Bay, the sediment texture is mainly sandy and at certain locations more clay and silt were found based on, depth and currents. During the present study, organic carbon varying between 1.37% and 8.11% (average 3.46%) were recorded. The organic carbon content can be attributed to several factors including the abiogenic inputs of nutrients and organic matter. The salinity within the mangrove swamps was higher than the offshore locations, which is characteristic of mangrove ecosystems. The mangrove sediment is mostly silty-clay rather than the sandy substratum from the offshore regions.

To elicit the perceptions of local inhabitants on the local ecology and changes, mainly active fishers, we interviewed randomly selected people who gave their informed consent for the interview using a structured questionnaire with open and close-ended questions. Fishing being their primary occupation, the income of the respondents varied between INR 2,500 and 10,000 per month. A large proportions of the respondents reported fell much below the poverty line. The survey also provided valuable information on habitat-wise occurrence of species and the reason for their disappearance from the area etc.

The findings from the questionnaire survey gave a clearer picture of the ground reality with respect to the coastal ecosystem in the Palk Bay. These results present a picture of the environment and the apparent resource conflicts with different fishery techniques including aquaculture. Generally, fishers tend to be anxious about the resource depletion and conflict in the sea rather than that in the land. Respondents were furious while answering questions about trawlers. Though aware of the ill effects of aquafarms, fishing communities were more bothered about the impacts of mechanised fishing.

Availability of potable water appears to be one of the major issues faced by the fishing community of the area. Most of them depend on the informal water sector in the area. No one pointed out the seepage and associated impact of aquaculture farms on quality of local water. The expressed changes were about the direct impact of aquaculture farm drainage to their fishing grounds. The discharges is said to keep the fishes away from the coast and at times lead to death of fishes.

The traditional practice of resource sharing is in vogue among the traditional fishing community. The trawlers are forcing changes in the practices. The capital-intensive bottom trawling and aquaculture farms are making the life of the traditional fishing community increasingly difficult. The interactions indicate the need for an extensive work investigating the resource conflicts between fishers from local and elsewhere and bigger investors having access to more effective but most times damaging the natural resource base.

About the Study

The study *The Ecological Baseline Assessment of the Palk Bay* was done on the request of the CMPA Project of GIZ-India. The objective was to conduct a rapid ecological baseline survey for Palk Bay (off the Ramanathapuram coast) of the southern coastal state of Tamil Nadu. The work was based on the "Conceptual Framework for a Baseline Study on the Ecological Status of the Pilot Sites for the CMPA Project" by the Leibniz Center for Tropical Marine Ecology, Bremen, Germany, but contextualized for Palk Bay. The study explored water quality and sediment quality across the Palk Bays along specific transects; various habitats in the coastal ecosystem (focusing on mangroves, seagrass and corals); etc. It also delved into the issues and concerns of the booming aquaculture industry and the impact of the same on the ecology and dependent livelihoods.

The CMPA Project

The Project "Conservation and Sustainable Management of Coastal and Marine Protected Areas" (CMPA) is a project of the Indo-German technical cooperation. It is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and implemented by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of BMUB.

Established to support the achievement of the Aichi targets of the Convention on Biological Diversity, the Project's overall goal is to contribute to conservation and sustainable use of biodiversity in selected areas along the coast of India. Taking into consideration the economic importance of the coastal zone for large segments of the population, the Project's approach is people-centered, thus ensuring the support for conservation by those depending on coastal ecosystems.

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