

## Conservation of mangrove forest covers in Kochi coast

Mangroves are salt-tolerant plants of tropical and subtropical intertidal regions of the world. The specific regions where these plants occur are called mangrove ecosystems. They are breeding, feeding and nursery grounds for many estuarine and marine organisms, including finfish and shell fish. India has only 2.66% of the world's mangroves, covering an estimated area of 4,827 sq. km (ref. 1). Kerala along the west coast of India has a coastline of 590 km and presently the mangrove area is estimated to be about 17 sq. km, of which 36% is either completely degraded or is degrading<sup>2</sup>. Mangroves are woody trees and shrubs. They played an important role in the economics of our coastal population for thousands of years, providing a wide variety of goods and services, including wood production, support for commercial and subsistence fisheries, aquaculture, salt production, and shoreline and coastal erosion control.

The human influence on mangroves has increased over the past three decades, with many countries showing losses of 60–80% or more of the mangrove forest cover that existed in the 1960s; but most of the data showed variable loss rates and there is a considerable margin of error in most estimates. The destruction of mangroves is usually proportional to human population density. Major reasons for destruction are urban development, mining, agriculture and overexploitation for timber and aquaculture, and overfishing which can cause imbalance in the mangrove fish communities<sup>3,4</sup>. The remaining mangrove forests are under massive pressure from clear-cutting, en-

croachment, hydrological alterations, fertilizers and pesticides, oil spills, storm and climate change<sup>5</sup>.

In the present study a small batch of mangrove forest near the Mangalavanam forest and Puthuvypu, Kochi coast, Kerala, was investigated. The state government had declared the 2.74 ha area of Mangalavanam as a Protected Area in 2004, considering its importance in the life and voyage of migratory birds. Earlier studies have reported the presence of 72 bird species here. The rest of the mangrove forest has to be included as notified. The Vembanad lake reservoir is the main reservoir that supplies water to Kochi coastal area; the stream travels a long distance and joins the sea at Kochi port inner harbour. Various industrial effluents join the stream and are ultimately discharged into the inner harbour waters. The approximate extent of mangrove area is 5.8 ha, which comes under Kochi Port Trust area. There are 12 true mangrove species present in the Kochi coast. Out of these, *Avicennia officinalis* and *Rhizophora mucronata* are the more dominant mangrove species found along with *Bruguiera gymnorhiza*, *B. cylindrica*, *Acrostrium aureum*, *Sonneratia alba* and *Sonneratia caseolaris*.

About 40% mangrove area has been depleted in recent times (Figure 1). There is an urgent need for conservation of the remaining mangrove area. In Kochi the mangrove islands are increasingly threatened by population pressure, aquaculture operations and mangrove environment conversion to new shrimp pond<sup>6</sup>. Industrial pollution, oil spills, storms, dredging for landfills and build-

ing ports, industrial estates and housing estates for human habitation have destroyed mangroves in Kochi. Formerly thriving shrimp production of Cochin backwaters has fallen almost too nil as the after effects of extensive mangrove clearance<sup>7</sup>. Conservation of these habitats is necessary for maintaining their rich biodiversity, sustainability of fishery, forestry and other products, and protection of coastal areas from natural calamity<sup>4</sup>. Increased erosion due to deforestation can increase the amount of sediments in the river and this can adversely affect the mangroves. Due to immense biotic interference and multiple uses of mangrove vegetation, this resource is threatened with great destruction. So there is an urgent need to restore degraded mangrove ecosystems for economic, social and sustainability reasons. Social awareness would enable participation of public in conservation and management of mangroves.

1. Ministry of Environment and Forests, India's Fourth National Report to the Convention on Biological Diversity, MoEF, GoI, 2009.
2. Forest Survey of India, In State of Forest Report 2005, FSI, Dehradun, 2005, pp. 26–30.
3. Spalding, M. D., Blasco, F. and Field, C. D., *World Mangrove Atlas*, The International Society for Mangrove Ecosystems, Okinawa, 1997.
4. Kathiresan, K. and Qasim, S. Z., *Biodiversity of Mangrove Ecosystem*, Hindustan Publishing Corporation (India), New Delhi, 2005, p. 251.
5. Blasco, F., Aizpuru, M. and Gers, C., *Wetland Ecol. Manage.*, 2001, **9**, 245–256.
6. Thomas, G. and Fernandez, T. V., *Indian For.*, 1995, **120**(5), 406–411.
7. Mastaller, M., *Nat. Res. Dev.*, 1996, **43/44**, 37–57.

ACKNOWLEDGEMENTS. We thank the Central Marine Fisheries Research Institute, Kochi for providing infrastructural facilities.

P. SATHEESHKUMAR\*  
U. MANJUSHA  
N. G. K. PILLAI

Central Marine Fisheries Research  
Institute,  
Fisheries Environment Management  
Division,  
Kochi 682 018, India  
\*e-mail: indianscientsathish@gmail.com



Figure 1. The damaged mangroves of Puthuvypu area.