

## **The Impact of Shrimp Farming on the Diversity of Mangroves in Puttalam Lagoon, Sri Lanka**

M.D.K.L. Gunathilaka <sup>1</sup>

Mangroves are one of the most threatened ecosystems dominated along the periphery of lagoons and estuaries while these are the prime areas for aquaculture, particularly shrimp farming. Therefore, the encroachment of shrimp farms towards the densely grown mangrove forests had become tragic. At first, shrimp farming started in the northwestern western coast pioneering the Chilaw lagoon, sequentially expanded up to the Puttalam lagoon area. The Puttalam lagoon is the second largest lagoon having densely grown mangrove vegetation in Kala Oya estuary. With the expansion of shrimp farming, mangroves were the most threatened and disturbed. Hence, the study was aimed to ascertain the impact of shrimp farming on the diversity of mangrove species in Puttalam lagoon. A total of 30 quadrant samples consists of a 5m x 5m area were selected for the mangrove vegetation survey. Randomly selected 300 individuals along the periphery of the lagoon have interviewed to find out the existing sustainable shrimp farming methods. Shannon-wiener diversity index calculated for the mangrove diversity. Statistical and Inverse Distant Weighted (IDW) interpolation in ArcGIS software package with MS excel version were used for the analysis of data. Google Earth satellite image used to digitize shrimp ponds in the area. Interviewed information was applied to the thematic content analysis. Results showed that the mangrove cover has been reduced into a patchy distribution where the active shrimp ponds were significant. Mangrove diversity ranged from 0 to 1.5 indicating comparatively a lower diversity of mangroves. Particular floral composition could be identified among shrimp pond areas including rare and very rare mangrove species; *Aegiceras corniculata* and *Scyphiphora hydrophyllacea*. *Avicennia officinalis* and *Avicennia marina* were the common true mangrove species while *Suaeda maritima* was the abandoned associate species found in shrimp pond areas. Diversity hotspots were identified within the abandoned shrimp pond areas indicating natural succession act as a passive approach. Apart from shrimp farming, salt pans and crab fattening also identified as increasing threats on the diversity of mangrove species. Active restoration with standard technical knowledge identified as an immediate action to restore mangroves in abandoned shrimp ponds before becoming an ecological disaster. The earthen mounds and integrated mangrove farming and fish/crab culture models identified as suitable methods for a win-win approach for both aquaculture and mangrove ecosystem. It is timely important to restore abandoned shrimp ponds to rejuvenate the species diversity of mangroves

**Keywords:** Mangrove Diversity, Models; Puttalam Lagoon, Shrimp Farming

---

<sup>1</sup> Department of Geography, University of Colombo, Sri Lanka