

**ASSESSMENT OF THE IMPACT OF
AQUACULTURE PRACTICES IN THE PUTTALAM
LAGOON ON THE MANGROVE ECOSYSTEM BY
USING REMOTE SENSING AND GIS
TECHNOLOGY**

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by

Rathukohe Mudiyanse Lage Harshani Nayana Kumari Nisansala

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Uva Wellassa University**

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Abstract

Mangrove ecosystems dominate the coastal wetlands throughout the world as well as in Sri Lanka. At the same time, mangroves are among one of the most threatened and vulnerable ecosystems. Presently managing and conservation of such resources is a promising need. Thus it is essential to have relevant information regarding the resource condition. The study was conducted having the main objective of observing the mangrove cover changes in Puttalam lagoon over the past seven decades. Recognizing whether there was an impact from the shrimp farming industry for the changes in mangrove coverage was the second objective of the study. Presently remote sensing and GIS technology are significantly applied in coastal resource monitoring and management and for this study also high resolution remotely sensed images were used. Aerial Photographs (for year 1956, 1981, 1992), IKONOS satellite images (for year 2005) and Google Earth images (for year 2014) with a spatial resolution $\leq 1\text{m}$ were used as the base data sources. Tone, texture, shape and association like visual interpretation keys were used to identify mangroves, shrimp farms and salt pans from the images. For the data extraction on mangroves, salt pans and shrimp farms on screen digitizing was done. Final extent calculations were conducted using ArcGIS software. As to the final results there are 1642.3 ha of mangrove cover presently at the Puttalam lagoon and it is a 1.45 % reduction compared to the extent in 1956. Shrimp farm extent in lagoon has gone up from 21.40 % compared to 1992. Presently it can observe 880.32 ha of abandoned shrimp farm all over the lagoon and number of active farms is very low compared to abandon. Statistically it shows that there was no any significant impact happened to mangrove ecosystems due to shrimp farm establishments in the lagoon. For the sustainable management of mangrove resources it need to restore the abandoned shrimp farm areas with mangrove. For that declare mangrove regenerating abandoned shrimp farm areas as protected areas, community base mangrove restoration projects and conducting community awareness programs is essential.

Key words: Mangrove, Remote sensing, Geographic Information System, Shrimp farms, Salt pans