ISSN: 1391-8796
Proceedings of 9th Ruhuna International Science & Technology Conference
University of Ruhuna, Matara, Sri Lanka
January 19, 2022

Identification of suitable sites for freshwater aquaculture in the flood-prone areas of the Nilwala river basin, using land-use patterns and soil quality

Amaraweera K.W.R.R.[1*], Deepananda K.H.M.A.[2] and Jayasinghe U.A.D.[2]
[1]*National Aquatic Resources Research & Development Agency, Crow Island, Colombo 15, Sri Lanka.*
[2]*Faculty of Fisheries and Marine Sciences & Technology, University of Ruhuna, Matara, Sri Lanka.*

Flood-prone areas (FPA) are land areas susceptible to being inundated by water and, preparation of FPA maps are important in disaster management and planning further development activities. The present study ascertains the areas suitable for aquaculture in flood-prone areas of the Nilwala River basin, using land-use patterns and soil quality. Five GIS maps of the most flooded District Secretariat (DS) divisions of Matara district, viz, Thihagoda, Malimbada, Athuraliya, Matara, and Kamburupitiya were developed. Relative abundance of sand, clay, and silt and the pH and electrical conductivity (EC) were measured. Basic soil textural classes were ascertained in 20 selected locations having high aquaculture potential. Developed GIS maps indicate that potential areas for aquaculture were highest in the Matara DS division (9.64 km^2) followed by Thihagoda (6.25 km^2), Athuraliya (2.13 km^2), Malimbada (2.08 km^2), and Kamburupitiya (1.53 km^2) DS divisions, having a cumulative value of 21.63 km^2, accounting for 22% of FPA in five DS divisions. Abandoned paddy fields (10.52 km^2) accounted for the highest aquaculture potential areas followed by marshlands (7.38 km^2), rivers and canals (2.6 km^2), and minor reservoirs (0.59 km^2). Soil quality analysis in twelve sampling locations indicates the optimal distribution of sand, clay, and silts which consisted of silt clay loam and clay loam soil textural classes that are suitable for aquaculture fishpond contraction. The recorded low EC values (<800 $\mu S\ cm^{-1}$) and higher pH values (>7.5) indicate that almost all studied locations are suitable for freshwater fish and prawn culture. Present findings unfold the suitable sites for freshwater aquaculture development in FPA of the Nilwala river basin.

Keywords: Aquaculture, Flood-prone, Nilwala river basin, Soil quality

Acknowledgments: *The project, 'Assessment of Fisheries and Aquaculture potential in floodplain ecosystems of Nilwala river basin, Sri Lanka' funded by NARA-2019 is acknowledged for financial assistance*.

*Corresponding author: ruciraamaraweera2@gmail.com