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GIS based site selection and Marine Spatial Planning: A step towards sustainable seaweed farming

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Abstract

Seaweeds are globally expanding due to increasing demand and the various livelihood opportunities they provide for local communities. Apart from their industrial applications, seaweeds are a vital dietary component in many countries. India, through its seaweed mission, aims to elevate national seaweed production from 30,000 to 11 million tonnes by 2025. However, the growth of seaweed farming in India faces several challenges, particularly on robust site selection and assignment process. This factor significantly impacts the economic returns and viability of the farming system and also for entrepreneurship investments. Spatial planning for seaweed farming sites, aided by advanced GIS-based technology, proved instrumental in successful planning before the initiation of cultivation process. Conducting a preliminary site selection survey across all maritime states of India, ICAR-CMFRI identified 23,970 hectares suitable as potential seaweed farming sites. Gujarat and Tamil Nadu possess over 10,000 and 5,000 hectares respectively as potential areas for seaweed farming. Within Gujarat, the best-suited sites for seaweed farming were demarcated along Devbhumi Dwaraka, followed by Gir-Somnath and Katchch. The ground truth data were digitized on a GIS platform to support marine spatial planning for seaweed farming activities. To further aid the stakeholders, a dedicated GIS-based open-access portal highlighting the most suitable locations for seaweed farming for the country was developed and made available in the public domain. Introducing a novel spatial planning framework for seaweed mariculture activities in territorial waters is crucial for sustainable sea space management. This preliminary plan can guide towards conflicts resolution, seaweed mariculture policy development and legislation in maritime states, serving as a foundation for India's broader marine spatial planning initiatives. The adaptable concept on MSP on seaweed mariculture is relevant and essential to regions with diverse techno-scientific and socio-political scenarios.

Keywords: Seaweed farming, mariculture, marine spatial planning (MSP), GIS, decision-making