Aquaculture and marine energy integration for coastal ecosystem management and restoration.

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Introduction

Coastal areas have a large potential for developing renewable energy projects, which are generally regarded as green energy sources. However, the construction of such projects may have a negative environmental impact on the surrounding waters. Projects based on seaweed and fisheries, known as integrated multitrophic aquaculture (IMTA), can help to mitigate these effects. Although the goal of any IMTA is to recirculate waste products from cultivated species rather than to mitigate the environmental impacts of energy projects, IMTA can be used as a complementary activity to compensate for the environmental impacts of marine energy projects [1].

Marine energy projects in their respective areas can provide a few facilities to IMTA projects. IMTA projects are already being implemented in some parts of the world; however, only a few examples of marine energy projects are available. This study aims to generate ideas for potential IMTA projects in the vicinity of India's proposed first offshore wind farm. This study also suggests that the potential tidal energy plant in the estuary be used as a nursery for a few species in IMTA on India's western coast. Furthermore, the current study discussed some major challenges, such as seasonal variations, ecological risks, IMTA component selection, legal, economic, and regulatory considerations, and social acceptance [2].

When waterways are dredged, wetlands are filled in, ports are built, housing and resorts are built, and resources are over-exploited, the health of the ecosystem is jeopardised. Land and freshwater use in watersheds have a significant impact on sediment transport and hydrology. Coastal waters are among the most chemically altered environments on the planet, with too many nutrients reaching our shores from agricultural run-off and sewage. Coastal populations are at risk due to major impacts from sea level rise, erosion, and storm events, and many marine systems are nearing healthy operating thresholds.

Management of ocean uses has repeatedly failed. Despite the proliferation of coastal zone management agencies, the inability to control land-based pollution sources has contributed to dramatic declines in ecosystem health in coastal waters worldwide. To develop effective management regimes, both natural and social science expertise are required. Natural science is required to limit or constrain the ecosystem under management, to comprehend basic facts about its operation, and to articulate linkages between and within ecosystems. To assess the state of ecosystems and to look at trends in condition to determine whether thresholds are being approached and to predict future conditions, basic ecological understanding is required. Natural science can also assist in identifying use limits that allow for staying within sustainable bounds [3,4].

Coastal marine ecosystems provide vital goods and services to humanity, but many are rapidly degrading. In the face of increasing climatic stress, there has never been a greater need for effective restoration tools capable of promoting large-scale recovery of coastal ecosystems.

Recognize coastal MER and accelerate investment and promotion. To reverse the accelerating decline of marine ecosystems, we discuss potential approaches for meeting these challenges through the use of science-based and actionable coastal MER tools. To have a global impact, coastal restoration must incorporate social science, technological and conceptual advances, and plan for future climate scenarios. In addition to promoting the health and services of degraded coastal marine ecosystems, restoration tools can be used to promote adaptation to climate change climate-change. Promoted adaptation can be implemented in two ways: the "*Predict-and-Prescribe*" approaches which attempt to predict future conditions, and the "*Portfolio*" approach, which takes into account the range of uncertainty in future conditions. To improve their long-term success, we argue that MER-based practises that promote adaptation should be included in coastal zone management plans [5].

References

1. Abelson A. Are we sacrificing the future of coral reefs on the altar of the “climate change” narrative? ICES J Mar Sci. 2020;77:40–5
2. Abelson A, Halpern BS, Reed DC, et al. Upgrading marine ecosystem restoration using ecological–social concepts. Biosci. 2015;66:156–63.
3. Abelson A, Nelson P, Edgar G, et al. Expanding marine protected areas to include degraded coral reefs. Conserv Biol. 2016;30:1182–91.
4. Adger WN, Hughes TP, Folke C, et al. Social-ecological resilience to coastal disasters. Sci. 2005; 309:1036–9
5. Barbier EB. Progress and challenges in valuing coastal and marine ecosystem services. Rev Environ Econ Policy. 2012;6:1–19.

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