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Perspective

Benefits of marine aquaculture

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Bivalve shellfish and seaweed aquaculture represent a global opportunity to promote coastal ecosystem recovery while also providing tangible benefits to humans. We conducted a global spatial analysis using important environmental socioeconomic and human health parameters to identify marine ecoregions with the greatest potential for development of shellfish and seaweed aquaculture to fulfil this opportunity. Coastal ecosystems suffer a slew of complex and interconnected anthropogenic stressors around the world, including nutrient pollution, habitat loss, and the compounding effects of climate change. These stressors have the potential to challenge or disrupt the way ecosystems offer critical services to coastal communities, such as nutrient cycling and fisheries maintenance. Habitat-forming ecosystem engineers such as oyster reefs, sea grass beds, and kelp forests, as well as their associated biotic assemblages, provide critical ecosystem services, but have suffered significant losses worldwide as a result of overharvesting, nutrient pollution, and other harmful human activities.

Key words: Bafia, breed, diversity, phenotype, local chicken, weight

INTRODUCTION

Marine aquaculture complements and supports our wild fisheries production by providing a home source of economically and environmentally sustainable seafood. Consumers in the United States and around the world rely on shellfish, finfish, and seaweed farms for a consistent supply of safe, healthy, and sustainable seafood. Aquaculture has the ability to improve ecosystems and deliver significant benefits to mankind when managed within a broader ecosystem framework and plan, with values possibly returned through a wide range of regulating, provisioning, habitat, and cultural ecosystem services. Aquaculture encompasses a wide range of activities and goals, including large-scale food production, specialised operations aimed at improving environmental results or multi-species production for broader advantages, and native species restoration. Through improved habitat restoration, higher employment, and increased food security, it may be able to generate a stronger positive impact on ecological, economic, and social demands by actively developing aquaculture to supply ecosystem services. The deliberate use of aquaculture to positively improve these functions is referred to as "restorative aquaculture." For example, seaweed aquaculture, through photosynthetic uptake of carbon dioxide, can mitigate local effects of increased ocean acidification by increasing the aragonite saturation state.

Many bivalve shellfish and seaweed species absorb nutrients from the environment, resulting in improved water quality and clarity. Aquaculture of mussels, clams, and oysters can provide fish habitat as well as increase the diversity and output of benthic communities. Aquaculture of bivalve clam and seaweed can provide a variety of cultural ecological services and societal advantages, including better food security, new kinds of employment, and chances to improve gender equity. The direction and magnitude of shellfish and seaweed aquaculture's benefits to, and impacts on, ecosystem services and society ultimately depend on the coalescence of a wide range of farm-, regional-, and bio geographical-scale environmental and socioeconomic conditions, such as the species farmed, cultivation method, hydrodynamics, nutrient status of the ecosystem, and/or the ability to effectively manage the aquaculture sector. Global aquaculture production is one of the fastest growing food-producing sectors. In addition to helping feed the world, aquaculture can play a critical role in the economy. Together, the fisheries and aquaculture industries help support the livelihoods of 10%-12% of the world's population. Studies in different countries have shown the great importance of integrated fish culture in augmenting farm production, optimizing utilization of farm resources, generating employment, disposing of agricultural waste, producing adequate food for the population, and in generally improving the economy of the rural areas.

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ABOUT THE STUDY

Aquaculture can have a very positive impact on the development of local populations as it provides a readily available, high protein food source. Aquaculture projects also provide jobs for millions of people worldwide. Aquaculture can also be an industry that is highly accommodating of female labor.

Increase Jobs in the Market. Aquaculture increases the number of possible jobs in the market. It provides both new products for a market and creates job opportunities as labor is required to maintain the pools and harvest the organisms grown.

As one of the fastest growing forms of primary food production valued at US$243.5B globally, aquaculture has become a significant part of global food systems and agribusiness. Aligned with this growth trend, governments, international development organizations, and investors around the world are embarking on new efforts to increase development of the industry with the objectives of creating jobs, improving human nutrition, and bolstering food security. However, given the negative ecological consequences associated with aquaculture when inappropriately developed significant management attention is often placed on addressing these impacts. More rarely is the potential for localized environmental improvement through ecosystem service provision identified as significant rationale or driver for new aquaculture development efforts. Our global-scale spatial analysis identified marine Eco regions of significant environmental, socioeconomic, and human health opportunity that should be the focus of targeted efforts to drive change in aquaculture policy, capacity-building, and industry development. Development of shellfish and seaweed aquaculture within MEs with high RAOI scores does not guarantee provision of ecosystem services or that ecosystem function will be recovered. While the present study provides valuable insight at the global-scale to guide strategic aquaculture development initiatives at the scale of MEs, ultimately, multiple factors at successive geographic and ecosystem scales will affect the extent of ecosystem delivery of aquaculture and whether farms ultimately improve or degrade ecosystem function.

CONCLUSION

These factors include the functional traits of culture species, abiotic and biotic characteristics of the surrounding environment, farm-design, and farming practices. For example, when unsustainably developed and/or managed, intensive water column culture of bivalve shellfish beyond a water body's carrying capacity could generate sufficient pseudo fecal and fecal carbon loading to yield localized benthic hypoxia.