

Blue Empowerment Info Note

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Socio-Technical Perspectives for Enabling Adoption and Scaling of Sustainable and Gender-Transformative Mariculture Development: The Case of IMTA in Coastal Kenya

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Key Messages

- Despite the growth in marine fisheries and aquaculture sector in Coastal Kenya, sustainable challenges related to environmental and socio-economic impacts especially for differentiated gendered and social groups can hamper progress.
- There is need to deploy optimal mariculture socio-technical pathways that simultaneously enhance environmental sustainability, inclusive institutional options, and socio-economic development.
- IMTA can offer a socio-technical pathway for sustainable mariculture development in Kenya. However, the barriers and enablers for successful IMTA adoption relate to how it enables sustainability and gender and socially inclusive governance frameworks to stimulate economic opportunities especially for women and other marginalized groups in Coastal communities.

Overview

This information brief summarizes the research under WP 3 that focuses on assessing the socio-technical gaps and opportunities critical for the adoption and upscaling of Integrated Multi-Trophic Aquaculture (IMTA) technology. Using sociotechnical pathways approach WP 3 conducted social, technological, and institutional analyses on the barriers, challenges, and opportunities for leveraging IMTA of seaweed and fish as a low-carbon, gender-transformative, environmentally, and economically sustainable innovation for equitable empowerment in coastal Kenya (Magondu et al, 2021). The ex-ante assessment was conducted through literature review that draw out insights from research related to fisheries and aquaculture development in developing region, including Kenya. The focus was on drivers and barriers to sustainable, inclusive development with specific bearing on gender equity and women's economic empowerment in the growing aquaculture sectors. The review was used to develop a framework for assessment of the various mariculture technologies and systems that have been develop in coastal Kenya to understand the socio-technical positioning vis a vis IMTA, which is being tested and deployed under the Blue Empowerment project in Coastal Kenya. The assessment was done using multi-criteria mapping (MCM) a participatory approach where different stakeholders including diverse community members and experts, review sustainability, policy, and governance dimensions of diverse marine fisheries and mariculture systems. An MCM workshop facilitated a technology assessment for identification of an optimal sustainable and gender-transformative socio-technical pathway for mariculture development in coastal Kenya.

The brief shares some of the key findings from the review and the MCM participatory workshop that will inform the design and deployment of the optimal sustainable and socio-technical mariculture development pathway.

Key Findings

The review confirms that coastal fisheries and mariculture sector development is rapidly growing and making a key contributions in the blue economy in sub-Saharan Africa. The vast aquatic and marine natural resources in the region that have remained largely underexploited but whose potential contribution to inclusive and sustainable development is being recognized including in Kenya. Despite the vast ocean waters in Kenya, coastal and marine fisheries including mariculture accounts for only about 17% of the total fish production in the country.

To address these challenges, there is concerted effort by national and county governments to address some of the challenges which has resulted in advances in technology innovation intensification of coastal fishing including through mariculture. Despite the growth and contribution, the expanding fresh and marine aquaculture sector is equally facing sustainable development challenges related to environmental and socio-economic outcomes and impact. Evidence shows that widespread adoption of sustainable, technological mariculture options in low-income regions remain low and is hampered especially by myriad of socio-economic factors that shape equitable access, participation, and benefits for diverse gendered and social groups. A key factor relates to the governance systems that are necessary to provide the institutional framework on how marine resources are managed to enhance sustainable and inclusive, marine fisheries and mariculture development.

Optimal Socio-Technical Pathways: Insights from MCM Workshop

From the MCM participatory workshop on identification of optimal mariculture socio-technical options, the results showed that IMTA and seaweed farming were the most preferred technology options by both the all stakeholders, in contrast to cage culture and pond-based mariculture. However, further segregation of the results showed that the community mostly preferred the seaweed option with less preference for cage culture system while the experts' strong preference was the IMTA option with less preference for the cage culture system. It is evident that both the community and the experts had less preference for the stand-alone cage culture system. The community's hesitation of cage culture system was informed by previous experiences an unsuccessful cage culture project. Based on this experience they expressed their optimism in learning more about the IMTA technology which is perceived to improve their incomes. Further, the communities' preference for the seaweed farming option was informed by the fact that the option had previously undergone research and had been demonstrated to be effective. Additionally, seaweed farming was noted to be quite profitable with less requirements on inputs and maintenance costs and thus supported the need to upscale the seaweed farming owing to its economic benefits.

On governance options, while the assessment investigated hybrid models, it was noted that there is a need for convergence between the government, community, and other stakeholders like the private sector to enable inclusive governance. It was also noted that the selection of the ideal governance models needs to enhance market access, which is a key challenge facing fishing communities, and especially for marginal groups including women. It was recognized that women have had success in self-organizing and can offer lessons for inclusive governance models. On the policy options, there was a split in deciding on which option, with some favoring engendering blue economy policies because the current policies do not include gender aspects. Others preferred the inclusion of new practices; however, they indicated the need for more women to be included in the new practices.

Implications of the Findings

The findings point out to the potential for IMTA as a socio-technical option that can enhance sustainable mariculture development in Kenya. This potential should be linked to social, environmental, and economic sustainability enhancement options (Hossain et al; 2022). As mariculture technology advances these need to be accompanied by innovative governance models of managing marine fisheries and related ocean resources. Crucially, is the recognition of the gendered experiences with access to marine and coastal resources and participation in their governance, and related livelihoods where men and women in coastal communities are seen to use and occupy coastal marine spaces and resources differently (Barrington et al; 2010). However, the MCM did not enable a deeper governance and institutional development analysis, in terms of aquaculture governance and management policies, laws and regulations, which has been shown to be at the core of weak IMTA engagement (Hossain et al; 2022).

The WP has investigated the critical areas related to governance and policy dimensions and that would need refining to allow for adoption and upscaling of IMTA. However, there are gaps in relation to understanding the extent to which IMTA can stimulate a gender-inclusive development of the socio-technical innovation with potential for women's economic empowerment. This calls for enhancing this analysis in the design and deployment of whichever IMTA system will be deployed under the Blue Empowerment project.

The insights provide evidence that can be widely shared with different stakeholder meetings as part of advocacy for policy decisions and related investment that can catalyze mariculture development to benefit diverse women and men from coastal communities in Kenya.

Conclusions

IMTA as envisaged in the blue empowerment project extends beyond a mere technological innovation as it offers a socio-technical pathway to accelerate development of sustainable, gender transformative mariculture development in coastal Kenya. To enhance the uptake and scaling of IMTA there is need to consider diversity of gender and social groups that are involved in the sector but face different challenges and become barriers for them to equitably benefit from opportunities that come with such as socio-technical options. In order to develop viable solutions that overcome the barriers related to these groups., it is imperative to design, test and deploy new technologies that considers and address some of the issues faced by the different gender and social groups within a community, especially women who

have been most marginalized from high value nodes of coastal fisheries value chain.

Realizing the true potential of IMTA demands a deep understanding of these challenges. The journey towards fostering a more gender-inclusive mariculture development hinges on a holistic approach. It is crucial to not only identify the disparities faced by different gender and social groups but to also tailor practical solutions that cater to their specific needs

As authors, we find ourselves invigorated by the prospect of our findings contributing to policy discourse, shaping investments, and ultimately catalyzing mariculture's evolution for the benefit of the diverse coastal communities.

Further Readings

Barrington, K., Ridler, N., Chopin, T., Robinson, S. and Robinson, B., 2010. Social aspects of the sustainability of integrated multi-trophic aquaculture. *Aquaculture International*, 18, pp.201-211.

Hossain, A., Senff, P. and Glaser, M., 2022. Lessons for Coastal Applications of IMTA as a Way towards Sustainable Development: A Review. *Applied Sciences*, 12(23), p.11920.

Magondu, E.W., Munguti, J.M., Fulanda, B.M. and Mlewa, C.M., 2021. Productivity in marine shrimp ponds using integrated multi-trophic aquaculture technology. *East African Agricultural and Forestry Journal*, 85(1 & 2), pp.13-13.

Author Information

This series of briefs summarizes findings of a project entitled “Aquaculture Of Seaweeds And Fish: Opportunities For Blue Economic Empowerment And Covid-19 Resilience Of Fisher Women In Kenya” undertaken by researchers and practitioners from the African Centre for Technology Studies (ACTS), Kenya Industrial Research And Development Institute (KIRDI), Bahari CBO Network, Kenya Marine and Fisheries Research Institute (KMFRI), Kenyatta University (KU), and Sea Moss Corporation. The overall aim of the project is to contribute to the tackling of barriers for the empowerment of fisher women in Kenya’s coastal region through adoption of climate-smart integrated multi-trophic aquaculture (IMTA) of seaweeds and fish for improved livelihoods and resilience.

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