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BLUE EMPOWERMENT PROJECT QUARTERLY BULLETIN

QUARTER 2 BRIEF
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PREFACE

The Blue empowerment project is a low-carbon, gender transformative initiative, with the aim of contributing to tackling barriers for the empowerment of fisher women in the coastal region of Kenya. The project focuses on adoption of climate-smart integrated multi-trophic aquaculture (IMTA) of seaweeds and fish for improved livelihoods and resilience. It is anchored on Sustainable Development Goal (SDG) 5 on the crucial role of gender equality in development processes as well as in the Kenya Vision 2030. The expected main beneficiaries of the result of this project are women, and the core model will include building agency, resources, and institutional structures. The project engages the Beach Management Units (BMUs) ,technological institutions, women groups, private sector, policy makers and other stakeholders in the Blue Economy to study, co-design, deploy model IMTA farms and use them as platforms to gain practical insights , evidence and generate data for adoption towards sustainable development in the coastal region.

The methodological thrust of this project is a gender transformative approach that has been applied in recent studies to generate insights that can challenge gender norms and relations in ways that can result in gender equality and economic empowerment of diverse categories of women in the target fisher community. This bulletin provides an overview of field activities and engagements during the period between April and June 2025 in Kilifi and Kwale counties under the Blue Empowerment project. The activities highlighted in this bulletin include (i) fish value addition workshop and business incubation in Kwale county; (ii) county level policy dialogue on advancing women's participation, leadership, and economic empowerment, leveraging innovations such as Integrated Multi-Trophic Aquaculture (IMTA) and (iii) fish hatchery and experimental set up in Kibokoni and Kijiweni, respectively, to support proof of concept for IMTA.

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FISH VALUE ADDITION WORKSHOP AND BUSINESS INCUBATION – KWALE COUNTY- 14-16TH APRIL 2025

Figure 1: Participants from the Fish Value addition Training Training Partners :Kenyatta University and ACTS
Photo Credit:Anne Maina

The Kenya Industrial Research and Development Institute (KIRDI) in collaboration with other Blue Empowerment Project Consortium partners including Bahari Community Based Organization Network, SeaMoss Corporation, African Centre for Technology Studies (ACTS) and Kenyatta University conducted a 3-day **Fish Value Addition and Business Incubation workshop** at Kanana, Kwale County from **14th to 16th of April, 2025**. The workshop aimed at building the capacity of the fisherwomen in knowledge and skill on the diverse ways of increasing the market value of fish beyond its raw unprocessed form to more desirable products. It represents a strategic transition from selling raw fish to providing packaged, ready-to-cook, or ready-to-eat items that command higher prices and reach a larger market. It also reduces food waste by making value out of every part of the fish while increasing shelf life and profits.

The fish Value Addition training targeted individuals already engaged in small-scale trading or fishing, including members of women-led SACCOs, and community-based organizations active in the fisheries value chain. In total, 20 participants from Kwale County attended the Value Addition Training Workshop. The participants were grouped into groups of 5-6 people, and each unit allocated various recipe preparation duties which were shared to guide fish value addition processing. The Fish Value Added Products Prepared included Fish Sausages, Fish Crackers, Fish Balls, and Fish Samosas (Fig.2).

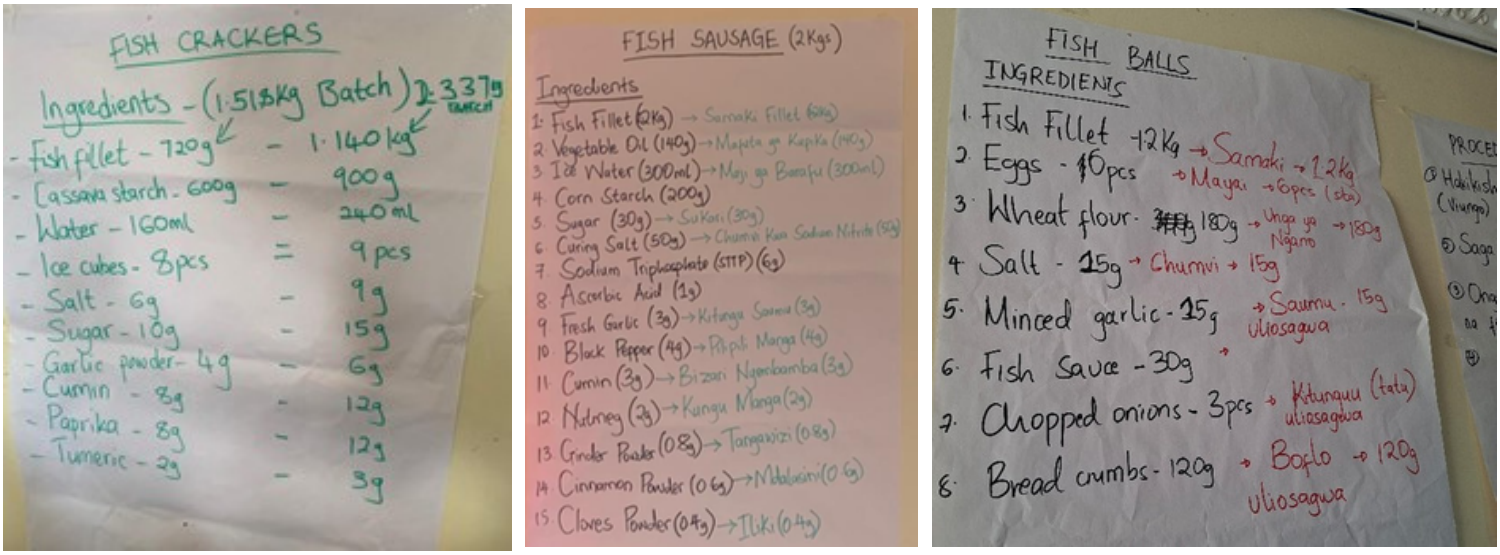

Figure 2: Ingredients for the fish value added products prepared – fish crackers, fish sausage and fish balls.

Additionally, participants received Sales Techniques training from the African Centre for Technology Studies (ACTS), which equipped them with practical skills to convert leads/walk-ins into consumers. The training covered key sales strategies, including business-to-consumer (B2C), business-to-business (B2B) approaches, and the effective application of sales process cycle.

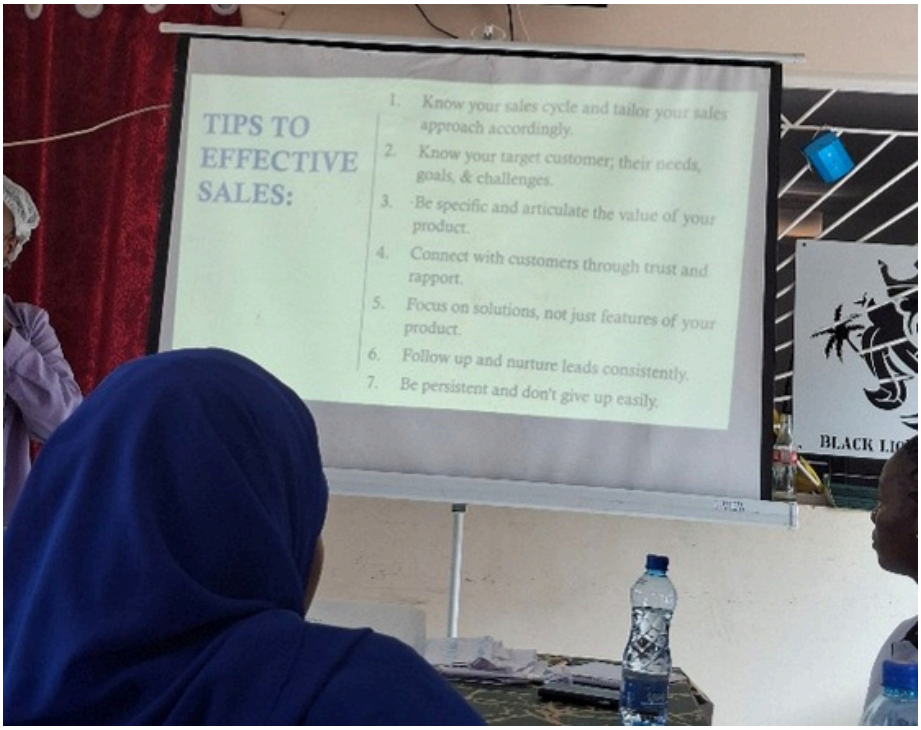

Figure 3: The sales strategies training session

Guest Representatives from the Department Tourism, Trade and Enterprise Development and Department of Agriculture, Livestock & Fisheries shared on the local government's mandate to support new and ongoing small and medium-sized businesses while emphasizing on the Business licensing procedures and regulatory registration requirements to be adhered to.

This infrastructure enables women to develop and scale their fish-based businesses, transforming raw catch into higher-value products like smoked fish, fish fillets, and processed snacks. By offering organized access to essential tools, the hub creates a solid foundation for these entrepreneurs to launch and sustain their ventures, improving product quality, reducing waste, and expanding market opportunities

Figure 4: Participants preparing the fish value-added products

Crucially, the hub acts as a catalyst for community-driven economic growth, empowering women and small-scale fishers to diversify income streams and enhance their livelihoods through sustainable, value-added fish processing.

At the tail end, the women filled-in a post-training capacity assessment questionnaire, to assess their knowledge, skills, and confidence levels after they've completed the fish value addition training.
It was concluded by a high-spirited certificate issuance moment, where attendees and facilitators were recognized for their participation and facilitation, respectively.

Figure 5: The prepared fish value-added products. Fish Samosas, Fish Crackers, Fish Balls and Sausages.

County Level Policy Dialogue: Kwale and Kilifi Counties

Theme: Institutionalizing and Catalyzing Gender-Responsive Policies and Bolstering Collaboration and Coordination in the Fisheries & Aquaculture Sector in Kenya

As part of the Blue Empowerment Project Advocacy and Policy efforts, two county-level policy dialogues were convened to promote inclusive governance in the fisheries and aquaculture sectors. These dialogues took place in **Kwale County** on **27th May 2025 and in Kilifi County on 29th May 2025.** The sessions brought together diverse stakeholders, including county government representatives, fisheries officials, women's groups, youth organizations, and private sector actors. The aim of the Policy dialoques was to discuss policy gaps, share evidence and lessons from the project, and co-design strategies that enhance gender-responsive, climate-smart, and economically inclusive fisheries governance frameworks.

The dialogues provided a platform for advancing women's participation, leadership, and economic empowerment, while highlighting innovations such as Integrated Multi-Trophic Aquaculture (IMTA) as viable solutions for sustainability and resilience.

Figure 6: Participants from the Kwale and Killfi county Policy Dialogue.
Photo Credit: Fiona Makayoto

Each forum brought together more than 40 stakeholders, with wide-ranging representation from the State Department for Blue Economy, Kilifi and Kwale County Governments, research institutions, fisherfolk groups, community-based organizations (CBOs), the Kenya Coast Guard Service, Kenya Fisheries Service (KeFS), cooperatives, and regional actors such as Jumuiya ya Kaunti za Pwani (JKP). Non-governmental organizations, including Coastal and Marine Resource Development (COMRED), also participated, reflecting the spirit of collaboration and multi-level engagement that the project seeks to cultivate.

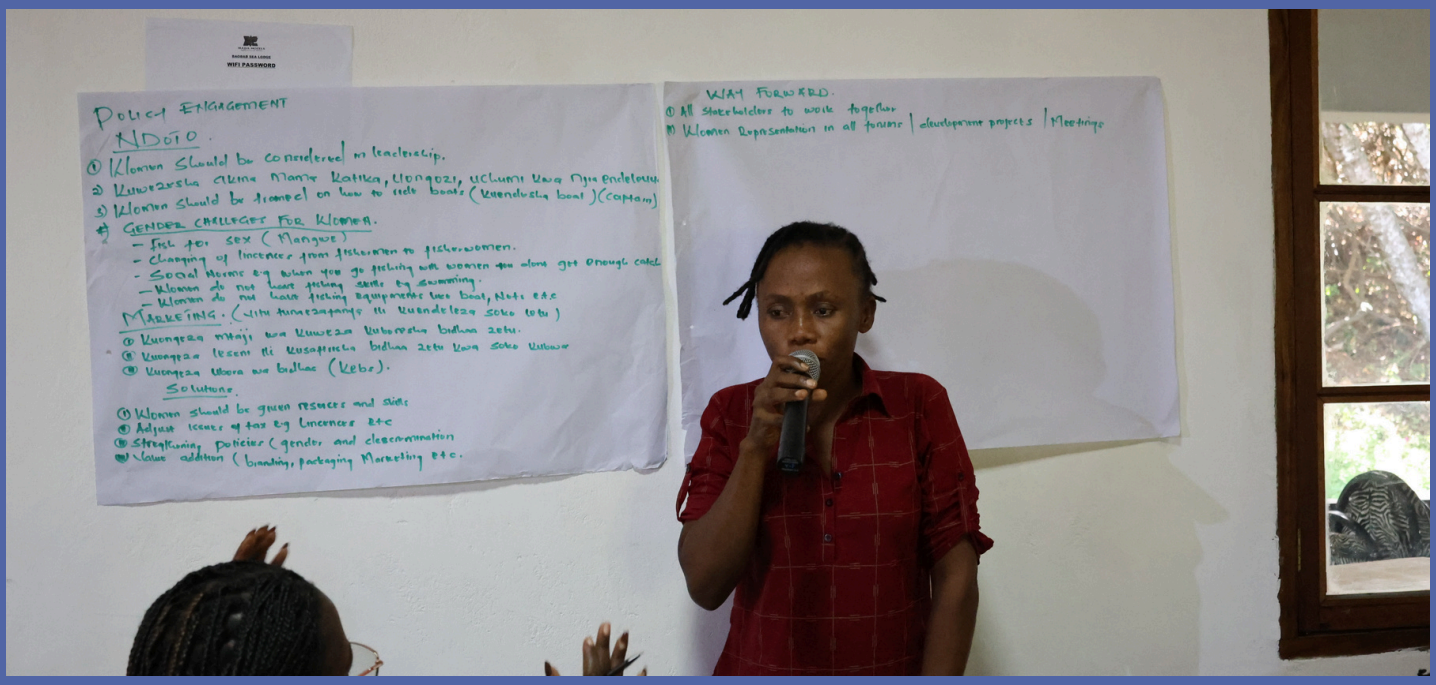

Figure 7: Participant during group presentations on the vision for Killfl county on Blue Economy
Photo Credit: Fiona Makayoto

The discussions revealed several pressing policy gaps and barriers undermining women's full participation in the sector. Participants underscored the limited recognition of women in Beach Management Units (BMUs) leadership structures, as well as the absence of gender-responsive budgeting and inclusive policy review mechanisms at both county and national levels. Socio-cultural restrictions, lack of sanitation facilities on boats, exploitative practices such as "sex for fish," and inadequate market infrastructure were highlighted as persistent barriers to women's empowerment. Additionally, the continued use of non-inclusive language such as "fishermen" in licensing and regulatory documents was flagged as an impediment to recognition and equity.

In response to these gaps, the dialogues generated concrete recommendations aimed at reshaping policy and practice. Stakeholders emphasized the need to integrate gender analysis at every stage of program design and to formally recognize and support women's leadership roles in BMUs. Expanding women's access to finance, aquaculture inputs, and technical support was identified as central to fostering equal opportunity. There was also strong consensus on strengthening fisheries and aquaculture value chains through investment in storage facilities, branding, and collective marketing, alongside institutionalizing gender accountability mechanisms through audits and participatory tools. Improving data systems to allow for intersectional tracking and evidence-based policymaking was also noted as an urgent priority.

This quarter, the dialogues culminated in tangible outputs including the preparation of two county-level policy dialogue reports, the development of one policy memo, and the finalization of a gender-responsive fisheries policy brief that will inform wider policy engagement. Looking ahead, preparations are already underway for a National Policy Dialogue in the next quarter, which will bring together a broader range of stakeholders to build on county-level momentum and catalyze systemic reforms in support of gender-responsive fisheries and aquaculture governance.

BE Aquaculture Fieldwork Report

The blue empowerment project team conducted various field work activitiesFrom **4th June 2025 to 19th June 2025** the field work was conducted to prepare and renovate the ponds and cage nets and have them in conditions favorable for the implementation of the project. The major activities during this period included:

i. Renovation and stocking of one pond at Mwazaro
ii. Incubation unit trials and brood stock sampling and separation at Kibokoni
iii. Cage net redesign and feeding experimental set-up at Kijiweni

Renovation and stocking of one pond at Mwazaro

Figure 8: The pond renovation process: (a) illustrates the condition of the pond before renovation works was started, notice the eroded and irregularly shaped dykes; (b) renovation began with the shaping and compaction of dykes with definite measurements to give the regular shape as illustrated in (c); this was followed by laying the liner as shown in (d) after which inlets and outlet pipes were fitted and the pond filled with water as in (e) (Images by Victor Omondi).

Following a site survey by the ACTS Blue Empowerment team in March, it was determined that the pond conditions were unsuitable for stocking. This was due to poor soil quality characterized by high organic matter content and poor water quality within the ponds. Consequently, it was recommended that the ponds undergo renovation, including the installation of a liner to prevent direct contact between the soil and water. Such renovation practices align with best aquaculture pond management, which involves removing accumulated organic sediments that can deplete oxygen and release harmful compounds, repairing embankments, and introducing impermeable liners to enhance water retention and pond health. These intervention measures aimed at improving the overall pond environment, making it more conducive to aquaculture and supporting better fish growth and survival rates.

The four-day pond renovation at Mwazaro included shaping and compacting the dyke, clearing and sloping the pond floor, followed by constructing inlets and outlets. A liner was installed to prevent direct contact between the pond water and soil, effectively blocking toxic elements from decomposing organic matter from mixing into the water. Afterward, the pond was filled to the required water level, then limed and fertilized to prepare it for fingerling stocking. Liming stabilizes water alkalinity and neutralizes harmful elements, while fertilization using DAP or urea fertilizers to stimulates primary productivity and increase the availability of natural food such as phytoplankton for the fish.

With pond floor measurements of 13.50 m by 18 m and dyke measurements of 16.50 m by 21 m, the pond can hold approximately 313 m^3 of water when filled to an average depth of 1 meter. Given this capacity, we aim to stock 2,000 fingerlings of milkfish (*Chanos chanos*), a commonly cultured species in the coastal region. Studies indicate that milkfish stocking densities commonly range from 2 to 5 fish per square meter, depending on culture methods and environmental conditions, with survival rates typically high under good management. This stocking density balances fish growth and pond carrying capacity, optimizing production and ensuring adequate space and resources for healthy fingerling development in semi-intensive aquaculture systems.

Broodstock separation at Kibokoni and Incubation Unit trials

Marine tilapia generally refers to tilapia species with enhanced tolerance to saline conditions, enabling them to thrive in brackish or marine water environments. They share many biological traits with common freshwater species like the Nile Tilapia (*Oreochromis niloticus*) but they are specially adapted to survive in saltier water, making them suitable for aquaculture systems using marine or brackish water. Like Nile Tilapia, marine tilapia breed spontaneously in captivity.

Figure 9: hand sexing, sampling and separation of male and female tilapia into the hapa nets. Hand sexing involves the eye observation of the male or female genitalia as shown in (a) and (b). once the sex is determined, the fish is counted and weighed (c) to determine the total biomass and the average weights before being introduced into separated hapa nets as shown in (d
Photo Credit : Victor Omondi.

To manage breeding effectively, broodstock are separated into different hapa nets for males and females (fig. 6d) and only brought together during reproduction. This separation helps to control breeding cycles and improve fingerling production.

Marine tilapia species vary in their salinity tolerance, with some like blue tilapia (Oreochromis aureus) tolerating salinities as high as 30 ppt or more, while Nile Tilapia have moderate tolerance around 20 ppt, and survival decreases beyond that. These salt-tolerant strains extend aquaculture possibilities to coastal areas where freshwater may be scarce

At Kibokoni, a sampling and hand sexing exercise was conducted for marine tilapia broodstock stocked in March 2025. During this process, fish were removed from the pond, weighed, counted, and hand sexed before separation into hapa nets, for males and females. A total of 35 specimens were sampled, comprising 21 males and 14 females, with an average total weight of 161.4 kg. However, this number was small for sustainable fingerling production, and it was recommended to increase broodstock to at least 100 fish: 60 females and 40 males, for continuous breeding. The broodstock were fed at 3% of their body weight daily for five weeks, in preparation for breeding in August 2025. Best practices suggest maintaining appropriate sex ratios and feeding regimes to optimize spawning success and fry production, ensuring steady fish seed availability for aquaculture.

The team also conducted a test run for the hatchery incubation unit (fig.7), which operates by filtering and recirculating water through the hatching jars, to ensure optimal conditions for egg development. The unit has various features, including the reservoir tank that holds water, biofilters which utilize microorganisms attached to filter media to break down and remove organic contaminants, a submersible water pump that pumps water up into the jars, and UV light system for further water treatment.

How it operates: Overflow water from the jars returns to reservoir compartments equipped with biofilters and filtration mats, where particulate matter is filtered out, and biological oxygen demand, chemical oxygen demand, nitrogen, ammonia, and phosphorus are reduced via bio filtration. The UV light treatment disinfects the water, controlling pathogen load. This closed-loop system uses electricity to run and must be connected to a power source for continuous operation, maintaining clean water and promoting healthy hatching conditions.

Figure 10: The fry incubation unit. The components include the incubation jars (blue arrow) in which fertilized eggs are placed; inlet pipes (black arrow) through which water flows into the jars; UV light section (red arrow) through which water flows and is treated in the process; outlet pipe (yellow arrow) that brings back overflow water from the jars into the tank reservoir (green arrow) (Image by Victor Omondi).

Cage net stitching and experimental set-up at Kijiweni

In preparation for the set-up of fish feeding experiment at the IMTA Cage, the nets were lined on the inside with a hapa net material to prevent the loss of feeds during feeding. Hapa nets are fine mesh enclosures typically used in aquaculture to contain and protect fish or fingerlings while allowing water exchange. By stitching the hapa net lining inside the cages (fig.8), feed pellets are less likely to escape through the mesh, improving feed efficiency and reducing waste. This setup is commonly used in fish farming systems to maintain optimal feeding conditions and improve growth performance of cultured species.

Figure 11: Cage stitching in process. The hapa net lining (blue net) is stitched around the black cage net to help prevent feeds from escaping when the fish are fed
Photo Credit: Victor Omondi

The aim of the feeding experiment was to evaluate growth performance under different diets and guide optimal nutrition strategies for rabbitfish aquaculture.
The experimental set up consist of three treatments, each with 20 rabbitfish (*Siganus sutor*) fingerlings in separate cages (Fig. 9).

Figure 12: The experimental set-up for the feeding experiment at Kijiweni cage site
Photo Credit : Benard Simiyu

Feeding: In **Cage 1,** fingerlings are fed on formulated feeds, **Cage 2**, they are fed on a combination of formulated feeds and fresh seaweed, and **Cage 3**, fingerlings are fed on fresh seaweed only.
The feed amount is calculated as 10% of the average body weight of fish in each cage. The fish are fed daily for six months, with biweekly sampling to determine wet weight (grams) and total length measured in centimeters.

Lessons Learnt and Recommendations

Value Addition & Business Incubation

- Women already show strong interest and creativity in diversifying fish products; however, they face significant barriers such as limited access to equipment, markets, and financing. The establishment of the Community Business Incubation Hub has been a step forward, yet its long-term sustainability depends on affordable user fees, mentorship, and access to small loans or grants. To enhance success, future efforts should incorporate cooperative marketing models, branding support, and linkages to microfinance institutions. These strategies can help women establish profitable ventures, enable them to scale within the fish value chain, and build resilient, sustainable enterprises in the fish industry. Policymakers and development agencies need to focus on creating enabling environments that address these systemic constraints to unlock women's full potential in fish product diversification and market participation.

Policy Dialogue & Governance

- The dialogues revealed that women's participation in fisheries governance is often symbolic rather than substantive, with leadership positions in Beach Management Units (BMUs) predominantly occupied by men. Without institutional reforms, entrenched cultural barriers will continue to exclude women from meaningful decision-making roles. It is recommended that BMUs formalize women's leadership through quotas or reserved positions and integrate gender-responsive budgeting into fisheries budgets. Additionally, adopting inclusive policy language and harmonizing gender equity standards via inter-county bodies can build collective momentum for reform. These measures aim to move beyond symbolic inclusion and ensure women have real influence in fisheries governance, fostering more equitable and sustainable fisheries management.

Aquaculture Fieldwork & Technical Lessons

- Poor site selection and workmanship can led to wasted resources and diminished productivity. This underscores that technical capacity is as critical as resource availability for successful aquaculture. Additionally, limited broodstock numbers present challenges for consistent fingerling production, and losses of cage nets exposed design weaknesses. To address these issues, it is recommended that structured technical training be provided on critical areas, such as pond engineering, broodstock management, and hatchery operations. Furthermore, scaling up trials on seaweed-based feeds, which have shown promise for sustainable Integrated Multi-Trophic Aquaculture (IMTA), will support the development of resilient and productive aquaculture systems. These measures will enhance project outcomes and overall sector sustainability.

Lessons Learnt and Recommendations

Generally, empowering women in fisheries requires a holistic approach linking technical capacity building, business development, and governance reform. Women's leadership in Beach Management Units (BMUs) remains limited, with most leadership roles dominated by men. Formalizing women's roles in BMUs through quotas or reserved positions, embedding inclusive gender-responsive policies are key recommendations. Strengthening women's participation not only fosters equity but also improves resource management and community well-being. Integrating these governance reforms with business incubation and technical training ensures empowerment gains reinforce each other, leading to lasting resilience for fisherwomen and more sustainable fisheries.

NEXT QUARTER

Other activities, including the National Policy dialogue and launch of the Blue Empowerment Sacco program have been planned for the third Quarter.

PARTNERS

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