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Enhanced Coastal Fisheries in Bangladesh II (ECOFISH II) Activity

Annual Report

January 1- November 30, 2024

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ENHANCED COASTAL FISHERIES IN BANGLADESH II (ECOFISH II) Activity

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ECOFISH

WorldFish

CGIAR




ANNUAL REPORT, YEAR 5

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COR/AOR: Gary Jahn (USAID Bureau of Food Security)
Activity Manager: Ashraful Haque, USAID/Economic Growth Office

Submitted by:

Mohammad Mokarrom Hossain, PhD
Chief of Party/Team Leader, ECOFISH II
WorldFish, Bangladesh and South Asia Office,
House 03, Road 13, Gulshan-1,
Dhaka 1212, Bangladesh
Tel: +880-9602320095
Email: Mokarrom.Hossain@cgiar.org

List of abbreviations

AIGA	Alternative Income Generating Activities
ALDFG	Abandoned, lost, or discarded fishing gear
BCG	Bangladesh Coast Guard
BHH	Beneficiary Household
BFDC	Bangladesh Fisheries Development Corporation
BFRI	Bangladesh Fisheries Research Institute
BLS	Business Literacy School
BSCMFP	Bangladesh Sustainable Coastal and Marine Fisheries Project
BSMRAU	Bangabandhu Sheikh Mujibur Rahman Agricultural University
CDCS	Country Development Cooperation Strategy
CMO	Co-management Organizations
CSG	Community Savings Group
CPUE	Catch Per Unit Effort
CRP	CGIAR Research Program
CVASU	Chattogram Veterinary and Animal Sciences University
DoF	Department of Fisheries
EAFM	Ecosystem Approach to Fisheries Management
ECOFISH	Enhanced Coastal Fisheries in Bangladesh
FCG	Fisheries Conservation Group
EMMP	Environmental Mitigation and Monitoring Plan
HCDF	Hilsa Conservation and Development Fund
HFMAP	Hilsa Fisheries Management Action Plan
IRs	Intermediate Results
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unreported and Unregulated
LFCC	Landing Center-based Fisheries Co-management Committee
MEL	Monitoring, Evaluation and Learning
MoFL	Ministry of Fisheries and Livestock
MPA	Marine Protected Area
MRE	Meghna River Ecosystem
MSY	Maximum Sustainable Yield
RDF	Recycling and Dumping Facilitator
NSTU	Noakhali Science and Technology University
PES	Payment for Ecosystem Services
PMP	Performance Management Plan
PSTU	Patuakhali Science and Technology University
SAU	Sher-e-Bangla Agricultural University
SUST	Shahjalal University of Science & Technology
TMSS	Thengamara Mohila Sabuj Sangha
ToO	Theatre of Operation
ToT	Training of Trainers
USAID	United States Agency for International Development
USG	United States Government
VFCG	Village Fisheries Conservation Group
WING	Women Income and Nutrition Group
ZOR	Zone of Resilience (Cox's Bazar)

Contents

1 Program overview/summary

Program name:	Enhanced Coastal Fisheries in Bangladesh II (ECOFISH II) Activity
Activity starts and end date:	December 1, 2019 to November 30, 2024
Name of prime implementing partner:	WorldFish
[Contract/Agreement] number:	PIO Grant BFS-G-11-00002
Name of subcontractors/sub-awardees:	BSMRAU, CVASU, NSTU, SUST, IUCN, Shushilan and TMSS
Major counterpart organization:	Department of Fisheries (DoF), Ministry of Fisheries and Livestock, Government of Bangladesh (GOB)
Geographic coverage:	*Barisal Division*: Barisal, Patuakhali, Barguna and Bhola Districts *Dhaka Division*: Shariatpur District *Chattogram Division*: Chandpur, Lakshmipur, Noakhali and Cox's Bazar Districts
Reporting period:	January 1 – November 30, 2024

1.1 Program description/introduction

1.1.1. Introduction

ECOFISH II Activity is a five-year long transformative project of ECOFISH[BD] that solely funded by the United States Agency for International Development (USAID) and implemented by WorldFish in collaboration with the Department of Fisheries (DoF), Bangladesh. Aside from the DoF, the project includes collaborations with universities, conservation organizations, and non-governmental organizations (NGOs). ECOFISH II is assisting the DoF and local coastal fishing communities in establishing collaborative management (co-management) organizations in accordance with the Ecosystem Approach to Fisheries Management (EAFM) framework, with a focus on Hilsa, river catfish, and other major coastal and marine fisheries resources. Project also assists the host-fishing communities in the USAID's Zone of Resilience (ZOR)- Cox's Bazar district (Teknaf including Saint Martin Island, Ukhiya, Cox's Bazar Sadar, Ramu, Maheshkhali and Kutubdia upazila), coastal artisanal fishing communities in Bhola, Patuakhali and Barguna districts in the Meghna River Ecosystem (MRE), and the Nijhum Dwip Marine Protected Area (MPA)[1].

ECOFISH II aiming at enhancing **ecosystem** resilience through establishing effective co-management of coastal fisheries resources in those areas focusing on Hilsa shad, riverine local catfish (Pangas) and other economically important coastal and marine fish species for the communities reliant on it, and conserving biodiversity including megafaunas. Following the pathway of ECOFISH[BD], ECOFISH II has been enhancing artisanal **fishing communities'** resilience by improving the food, nutrition, livelihood

[1] Marine protected areas (MPA) are specially demarcated protected areas of seas, oceans, or coastal region for better biodiversity and/or socio-ecological conservation. As per **Convention on Biological Diversity**, MPA can be defined as any area within or adjacent to the marine environment, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection than its surroundings.

and coping strategies of marginalized and poor host fishing communities in Cox's Bazar and in the MRE and MPA. The project emphasizes the sustainability of the ECOFISH^{BD} interventions and adopts its best practices in six Upazilas in Cox's Bazar and seven Upazilas of MRE region including MPA under the ECOFISH II Activity.

1.1.2. Objective and theory of change

The overarching goal of ECOFISH II Activity is improved social and ecological resilience of coastal fisheries securing equitable food, nutrition and livelihood benefits for artisanal fishing communities. The project would maintain or increase the productivity of fisheries, conserve biological diversity, and enhance ecosystem productivity and economic wellbeing of fishers in the ZOR and MRE including MPA. The project focuses on improved management of natural resources targeting biodiversity conservation leading to indirect adaptation benefits and enhanced adaptation capacity and resilience to shocks and stresses of the reliant communities. To achieve the goal, the project would achieve two Intermediate Results (IRs) and four Sub-IRs, which are as follows:

IR1: Improved management and governance of natural resources that form the foundation of fisheries

- Sub-IR1.1: Improved science outputs for decision-making (ecosystem health assessed; biodiversity assessed and conserved; fisheries dynamics monitored).
- Sub IR1.2: Improved adaptive co-management and fisheries governance (co-management institutions strengthened; EAFM mainstreamed and strengthened; fisheries governance improved).
- Sub IR1.3: Improved policy support (HFMAP implementation ensured; MPA legal framework formulated; Hilsa Conservation & Development Fund and Payment for Ecosystem Services introduced, and transboundary legal framework formulated).

IR2: Improved equity and resilience of food, nutrition and livelihood benefits

- Sub-IR 2.1 Improved livelihood resilience of coastal fishing communities (Livelihood capacity and options diversified; women's access to finance improved; access to improved technologies and market linkages strengthened, adaptive capacities to climate change and resilience improved).

The ECOFISH II Activity will contribute directly towards DO1 and DO3 of the USAID Bangladesh CDCS Results Framework. Through addressing the Results Framework, the ECOFISH II Theory of Change (ToC) will achieve the project goal of 'improved social and ecological resilience focusing on the climate adaptation of coastal fisheries securing equitable food, nutrition and income benefits for fisheries communities' by achieving the two intermediate results. These are- IRs: improved management and governance of natural resources that form the foundation of fisheries (IR1); and improved equity and resilience of food, nutrition and livelihood benefits from fisheries (IR2). These mean, for the sake of improved governance and management of fisheries resources (IR1), equity and resilience of fishers in terms of food, nutrition and livelihood benefits to be ensured (Figure 1). After achieving the specific objectives or IRs, the immediate outcomes would be improved fish stocks, improved ecosystems that are more resilient, strengthened fisheries governance, and improved biodiversity that would ultimately improve the livelihoods and resilience of the communities. Moreover, the project has been improving gender equity, creating opportunities for youth and improving environmental compliance in all the implementation stages for all the stakeholders, communities and habitats involved (Figure 1) and focused intervention areas are shown in Figure 2.

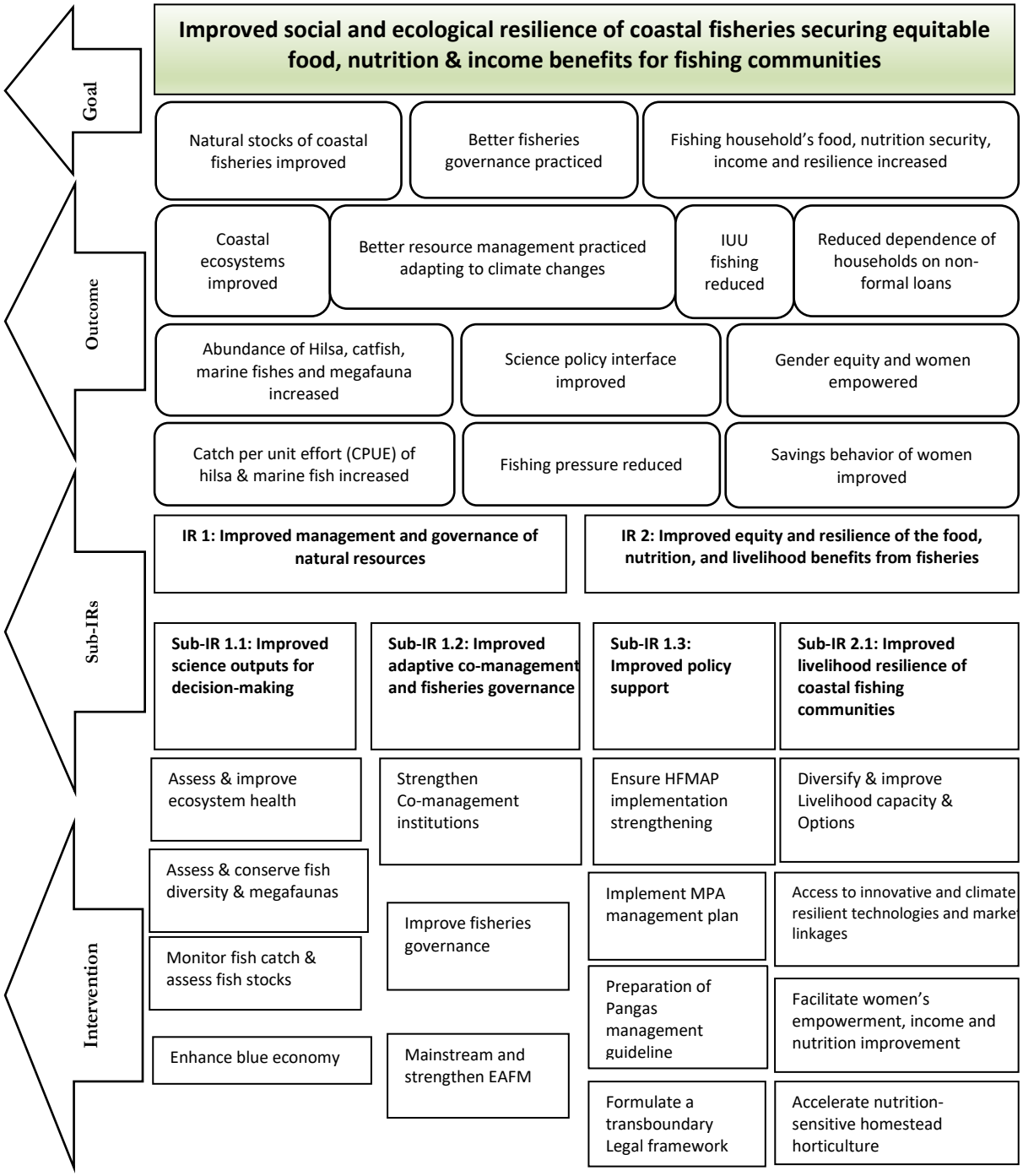


Figure 1: ECOFISH II Theory of Change (ToC)

Figure 2: ECOFISH II's focus areas of interventions

1.1.3 Theater of operation

The Theater of Operation (ToO) for ECOFISH II Activity mainly focused on the Zone of Resilience (ZOR), Meghna River Ecosystem (MRE), and the Nijum Dwip MPA areas (Figure 1). The ZOR encompasses the Cox's Bazar-Teknaf coasts, the Naf River/Estuary Ecosystem and the St. Martin's Island, covering Teknaf, Ukhiya, Cox's Bazar sadar, Ramu, Moheskhali and Kutubdia Upazilas. The MRE includes the Tentulia River in Patuakhali and the Bishkhali, Baleswar and Payra rivers in Barguna districts (Figure 3). The Nijhum Dwip MPA area specifically includes the declared 3,188 sq. km at the mouth of Meghna and Tentulia Rivers toward the Bay of Bengal around the Nijhum Dwip Island areas (Figure 3). The Nijhum Dwip MPA has a direct impact on the lives and livelihoods of the people living in 28 unions geographically covering 5 Upazilas (Hatiya, Manpura, Charfasson, Galachipa and Rangabali) designated as Direct Impact Area (DIA). The project continued several interventions in the Direct Impact Area (DIA) of the Nijhum Dwip MPA. The project continued its efforts in Alipur-Mohipur and the Kuakata sea beach, along with the surrounding fishing communities in Kalapara Upazila of Patuakhali District, and in the fishing communities around the Pyra River and Bishkhali River in Barguna District.

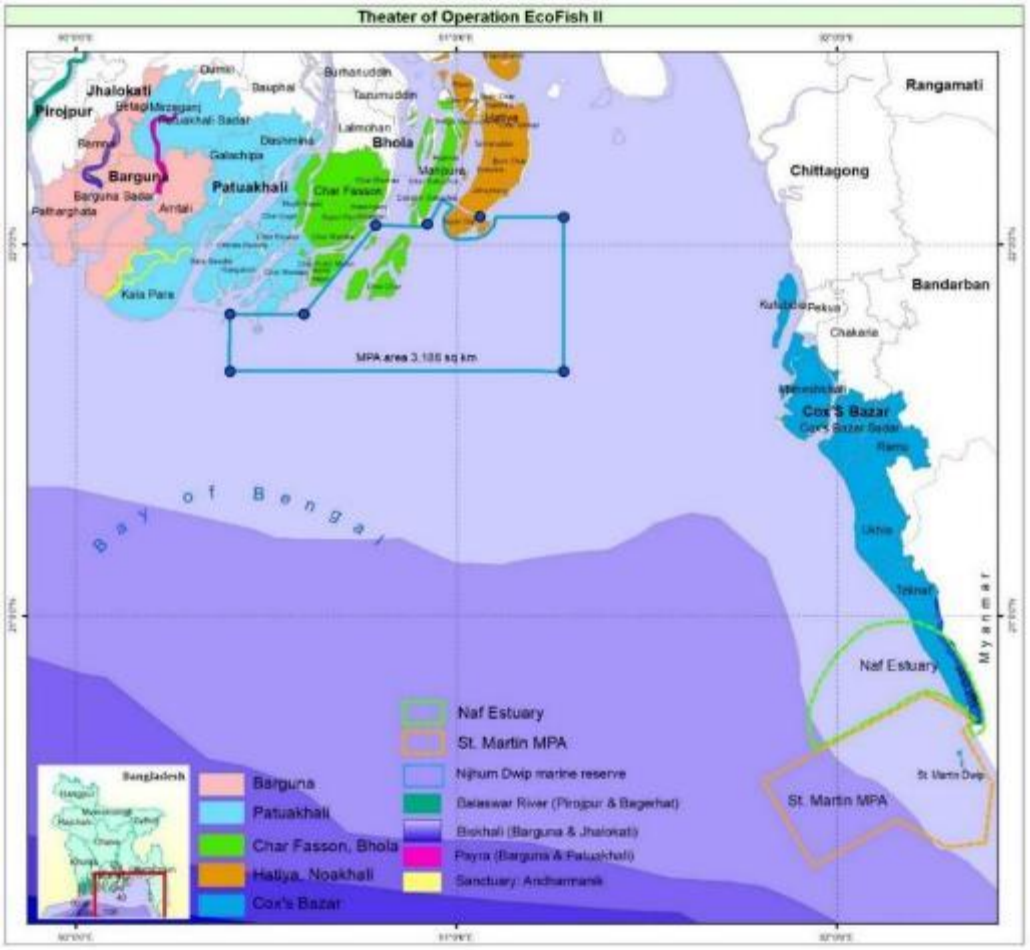


Figure 3. ECOFISH II Theater of Operations (ToO)

2 Activity implementation progress

2.1 Progress narrative

This annual report describes the accomplishments and achievements of ECOFISH II from January to November 2024. Activities were implemented using key partnerships with the NGO TMSS, Chattogram Veterinary and Animal Sciences University (CVASU), Shahjalal University of Science and Technology (SUST) and, Noakhali Science and Technology University (NSTU). In addition, six experts were engaged as consultants to undertake five critical tasks aimed at supporting policy development and future strategies for coastal and marine fisheries management in Bangladesh.

As a part of ecosystem assessment, ECOFISH II team monitored five climate change indicating water quality parameters (temperature, salinity, pH, dissolved oxygen and alkalinity) in Kutubdia, Moheskhali and the St. Martin's Island coast. The average monthly values of the parameters are shown graphically. To improve ecosystem health, awareness campaign, collection and safe disposal of plastic pollutants and discarded fishing net materials from the Teknaf, Ukhiya, Cox's Bazar Sadar, Moheshkhali, Kutubdia, Charfasson and the Kalapara coasts were conducted twice a month at each of the areas by engaging 140 local youths as Blue Guards. In year-5 (Jan-Nov 2024), the Blue Guards collected 8,640 kg of plastic, discarded nets and other garbage from the beaches and other coastal shore areas.

In ZOR, fish landing records from eleven Landing Center Facilitators (LCFs) indicated 56 predominant species/groups in the commercial marine fishery that contributed 7,162 MT of fish landing across ten fish landing centers in Cox's Bazar Sadar, Ukhiya, Teknaf, St. Martin, Charfasson, and Kalapara areas

during the reporting year. Other than Hilsa, croakers, anchovy, ribbonfish and Bombay duck were the dominant contributors, and within the Hilsa landings, small size Hilsa (<0.5kg) landed about 366 MT, medium size Hilsa (<1kg) landed 318 MT and the large size Hilsa (>1kg) landed 418 MT during the reporting period. Other fish combinedly contributed 6,060 MT. The LCFs also monitored the retail prices of the landed fish. The monthly variations of prices of small, medium and large sizes Hilsa are graphically shown to show the values of the landed fish in different seasons.

ECOFISH II engaged 40 trained boat skippers as Citizen Scientists (CSs), covering Cox's Bazar Sadar, Ukhiya, Moheshkhali, Teknaf and the Nijhum Dwip MPA. Based on the CS's data, catch per unit efforts (CPUEs) of Hilsa and other species/groups in major intervened areas were estimated. The highest CPUE for all species/group together was found in Cox's Bazar Sadar (1,286 kg/boat/day), followed by Moheshkhali (1,196 kg/boat/day), Charfasson (399 kg/boat/day), and Kutubdia (301 kg/boat/day), while the overall average catch was 564 kg/boat/day (Table 4). The CPUE indicated good daily catch of the major species in 2024. However, the highest CPUE for Hilsa was found in Charfasson (189 kg/boat/day) followed by Moheshkhali (126 kg/boat/day) as the boat size was bigger and engine power of the boat was higher, compared to other areas that facilitated them to fish in the deeper region.

For stock assessment, total 7,964 specimens of the selected five important marine fish species (Talang queenfish, Indian mackerel, Fringescale sardine, Big-eye Ilish and Sona Sea catfish), fish sizes were monitored monthly. The monthly size distributions of five species were assessed and graphically presented along with pictures and some descriptive statistics (Figure-10).

SUST completed the activities of data collection on biodiversity and ecological habitats from both the Salimpur, Chattogram and Kuakata, Patuakhali coasts to support DoF for new MPA declaration. A scientific article "Integration of socio-ecological data to prioritize biodiversity hot-spots for Marine Protected Area (MPA) delineation in the coastal zone of Bangladesh" based on the assessments to explore new MPAs in Kuakata, Patuakhali and Salimpur, Chattogram has been published in the Regional Marine Studies journal.

As a part of stakeholder's capacity building on fisheries co-management, ECOFISH II organized 2,000 beneficiary fishermen into 68 Fisheries Conservation Group (FCG) to improve coastal and marine biodiversity and responsible fishing during year-5 (Jan-Nov 2024). In addition, 16 Village-based Fisheries Conservation Groups (VFCGs) were formed engaging 257 fishers' representatives from 68 FCGs. The ECOFISH II team also provided training on biodiversity conservation, safety at sea and responsible fishing for 549 VFCG committee members from Year-5. Refresher training courses on biodiversity conservation, safety at sea and responsible fishing for 304 fishers were organized for the VFCG Year-4 members expecting these groups to resound forward the biodiversity conservation messages throughout the communities from their learnings.

In Year-5, ECOFISH II continued efforts toward developing and strengthening the fish landing center-based co-management approach. This year, 01 (one) new LFCC was formed at St. Martin Jetty Ghat, Teknaf along with 09 landing center-based fisheries co-management committee (LFCC) formed during Year 4. The total number of the members of 10 LFCCs was 412 from different levels of stakeholders including the artisanal fishers, *Arotders*, fish traders, local DoF officials, landing center-based elites and influentials. Capacity building training courses were organized for 92 LFCC executive Committee (EC) members through 09 sessions to make them understood and develop their capacity for operating LFCC. To support initial setup and capacity building for organization development and to perform activities, each of 10 LFCCs were provided with BDT 50,000.00 to Bank Accounts from ECOFISH II Activity after receiving formal proposals with a yearly activity plan for 2024-25.

ECOFISH II Activity successfully conducted a training course on the Ecosystem Approach to Fisheries Management (EAFM) for the stakeholders and developed an EAFM plan for marine and artisanal fisheries in the Bay of Bengal. The training was attended by 24 national professionals, including DoF, BFRI, BFDC, BORI, BCG, and Universities. The course covered sustainable fisheries management, ecosystem-based decision-making, stakeholder engagement, data collection and analysis, and monitoring and evaluation. The training methodology was interactive and participatory, and

participants were provided with training manuals, shown videos, and given case studies. A report on the training was shared with the Department of Fisheries, Bangladesh and USAID. The training is aimed at raising awareness and promoting EAFM among stakeholders and supporting the development of an EAFM plan for marine and artisanal fisheries in their fishing areas. Local level refresher training courses on EAFM were organized for 56 executive members from 04 LFCCs formed in Year-4.

For improving fisheries governance through resource conservation and awareness-building programs, ECOFISH II includes training for fishers on responsible fishing practices, providing safety equipment, and collaborating with government organizations to raise awareness on climate change and plastic pollution. The flagship program of these efforts is providing training to boat skippers (*Majhi*) on biodiversity conservation, safety at sea and responsible fishing practices to improve fisheries governance. ECOFISH II organized 10 batches of training for boat skippers and a total of 501 personnel trained through these events.

Further, all the field teams successfully conducted FirstAid training events as part of safety at sea and distributed 69 FirstAid Kits and 82 life jackets to selected fishers from the Activity command area. Medical professionals from the local Health Department in different regions facilitated these sessions alongside ECOFISH II staff. During Year 5, ECOFISH II continued fishers training on marine biodiversity conservation, safety at sea and responsible fishing and a total of 1,955 fishers were trained through 76 events. In Year 5, a total of 120 megafauna including turtles, sharks, skates and rays were released by trained fishers. In addition, 149 hatchlings were hatched from 467 olive ridley turtle eggs and safely released to the Bay of Bengal from the community led hatchery established with the support from ECOFIFH II Activity at Kutubdia, Cox's Bazar.

ECOFISH II conducted 09 awareness events related to 65-day marine fishing ban, 07 awareness events on 22-day hilsa ban, 07 awareness on Jatka conservation activities and a total of 1,350 stakeholders from different level stakeholders joined the events. Special awareness raising events on climate change, plastic pollution and fisheries nexus were arranged in Nazirertek fish landing center, Cox's Bazar Sadar and 32 participants from different levels joined the events. This year, ECOFISH II distributed a total of 40,000 posters on Jatka conservation, 65-day marine fishing ban and 22-day hilsa fishing ban.

Artisanal Fishers Congress were organized across all seven ECOFISH II field stations, assembled 692 participants, including representatives from DoF, BFRI, BFDC, local administrations, and fisher groups. The congress provided a platform for sharing project insights on biodiversity conservation, sustainable coastal fisheries management, discussing challenges such as illegal trawling, piracy, and inadequate savings among fishers, and emphasizing key issues like the 65-day marine fishing ban's sustainability, environmental stewardship, and women's empowerment. Participants called for stronger enforcement of fishing boundaries, better weather forecasts, and alternative income opportunities during bans. Recommendations included improved capacity and awareness of DoF officials and training on co-management, active fisher engagement in policymaking, and tackling marine plastics and "ghost gear" pollution.

The ECOFISH II hired four consultants to conduct seven studies to support policy formulation of DoF which are developed comprehensive review, consulted with experts and stakeholders, and recommendations: a. study report on organizational modalities of landing center-based fisheries co-management for sustainable coastal and marine fisheries; b. status of Bangladesh Marine Fish Stocks; c. evaluating the efficacy of the 65 day marine fishing Ban in the Bay of Bengal- should we re-evaluate this? d. characterizing small-scale fisheries in the Nijhum Dwip marine protected area and surrounding waters, Bangladesh; e. opportunities, challenges and way forward for the fisheries blue economy of Bangladesh; f. non-conventional fishery products to support blue economy and g. catalog on non-conventional marine fishery resources of Bangladesh". ECOFISH II submitted the formulated study reports to DoF for further revision and implementation.

The livelihood approach of ECOFISH II aims to enhance resilience in vulnerable coastal fishing communities by addressing challenges such as climatic shocks, fishing bans, and fluctuating marine catches. Aligned with the EAFM, it supports both community well-being, environmental conservation and good governance. The initiative focuses on capacity building, income diversification, innovative technologies, value chain improvements, and nutrition development, with a particular emphasis on empowering women. The approach engaged both men and women from artisanal fishing households (BHHs) through the Fisheries Conservation Groups (FCGs) and Women Income and Nutrition Groups (WINGs).

In the reporting year, 20 fishing villages, representing 2,000 poor artisanal households, were selected based on specific criteria. Profiling these communities highlighted their economic and climate-related vulnerabilities, which informed the design of tailored interventions. These villages, with an average of 739 households each, were primarily dependent on fishing, with 65% identifying it as their main livelihood. Notably, 60.19% of households were living in extreme poverty, which correlated with non-compliance with fishing regulations.

Recognizing the income uncertainty faced by most fishing households, which often engage in multiple small-scale ventures, the ECOFISH II project adjusted its strategy to provide training in various income-generating activities (IGAs), with a particular focus on small livestock rearing. In Year 5, the project successfully completed capacity-building training for 97.8% of WING members of 68 WINGs and distributed conditional cash assistance of BDT 5,500 to 1,942 women (99.6% of the target) through a digital system to support household-based micro-enterprises. Among the recipients, 1,929 households (99.3%) used the funds to purchase critical inputs for income-generating activities through a Local Procurement Committee. Vaccination campaigns were held for 2,414 goats and 8,178 poultry, and 8,000 booklets on livestock rearing were distributed to promote sustainable income activities.

The initiative significantly boosted household incomes. The 2024 performance survey showed an average income increase of BDT 75,727, a 68.27% improvement from the baseline, driven by both fishing and IGAs. By the end of Year 5, the average number of income sources per household increased to 4.13, enhancing both economic stability and conservation efforts. Households reported engaging in sustainable practices such as releasing endangered species and reducing illegal fishing.

ECOFISH II also advanced the value chains of seaweed and green mussels in collaboration with CVASU, demonstrating good returns on investment. The project further introduced a Low-Trophic Extractive Mariculture (LTEM) strategy, outlining a 10-year plan to develop mariculture and address value chain inefficiencies in Bangladesh.

Seaweed, rich in vitamins and minerals, holds great potential to improve nutrition in Bangladesh's coastal communities. However, its adoption remains low due to unfamiliarity and limited awareness. To promote its consumption, ECOFISH II organized four awareness events with 123 women from coastal areas engaged in seaweed farming trials. The events highlighted seaweed's nutritional benefits, including sensory testing, and provided dried seaweed for home use. Despite these efforts, participants showed reluctance, citing concerns about taste and flavor, indicating the need for continued efforts to overcome cultural barriers and promote seaweed consumption.

ECOFISH II and NSTU evaluated the market potential of Ready-to-Use (RTU) marine small pelagic fish and seaweed powders. The study showed strong consumer interest, with fish powder favored due to familiarity with dried fish. About 95% of retailers found the products profitable, and 60.71% of customers were willing to buy annually. The findings suggest RTU powders can help address malnutrition and improve dietary diversity in Bangladesh. To maximize public health benefits, strategic marketing, consumer education, and further research on scalability are needed.

In year-5, ECOFISH II expanded its team of Community Volunteers (CVs) by engaging 20 local women, bringing the total to 48 CVs across coastal fishing villages. Each volunteer oversees 100–120 households, playing a key role in engaging women in Women Income and Nutrition Groups (WING).

To enhance their skills, ECOFISH II conducted two batches of Training of Trainers (ToT) and a refresher course for 47 CVs, focusing on WING roles, alternative income-generating activities (AIGA), gender issues, and biodiversity conservation. Despite these efforts, concerns about the long-term sustainability of these services emerged after the project ended. To address this, ECOFISH II trained 43 CVs as Local Service Providers (LSPs), providing them with certificates and BDT 10,000 in conditional cash support to start small-scale poultry and agro inputs businesses and continue serving their communities, ensuring lasting impact beyond the project's conclusion.

In 2024, 2,000 women from fishing households formed 68 WINGs across 20 villages, guided by Community Volunteers. These groups, led by elected committees, played a key role in enhancing livelihoods and promoting learning. ECOFISH II strengthened 169 WINGs, benefiting 5,000 women, by organizing training for 517 leaders on topics like group management, conflict resolution, and biodiversity conservation. The project also promoted savings, with 4,543 women contributing BDT 100/month, totaling BDT 5,119,585 in savings by November 2024. WINGs meeting specific criteria received matching funds of BDT 1,550,000 to support income-generating activities. ECOFISH II also monitored 38 Community Savings Groups (CSGs) with 1,175 women, supporting document updates, savings collection, and loan repayments. In 48 meetings, the groups saved BDT 248,788, bringing their total savings to BDT 1,943,333 excluding the matching funds of BDT 850,000.

ECOFISH II supported WINGs in celebrating "National Nutrition Week 2024" across 7 villages. The events included rallies, awareness meetings, nutritious food demonstrations, and quiz competitions. A total of 363 participants, with 90% women and 10% men, attended. The activities were led by WING leaders, Fisheries Conservation Group (FCG) members, and Community Volunteers. WING members participated in that event covering 32% of the total members. The results showed a significant improvement in business literacy, with key skills such as name-signing rising from 29% to 65%, reading and writing in Bengali from 20% to 55%, and calculation proficiency from 23% to 62%. A similar assessment was conducted for 632 Year 5 WING members, showing a marked increase in business literacy, with average scores rising from 21 to 56. For Year 4 WING members, average scores went from 22 to 58. In nutrition, significant knowledge improvements were observed. Year 5 members saw a jump in nutrition knowledge scores from 39 to 68, while Year 4 scores improved from 45 to 73.

ECOFISH II's qualitative assessment of the Women Income and Nutrition Groups (WING), Business Literacy School (BLS), and Community Volunteers (CVs) model highlighted their success in enhancing livelihoods, nutrition, and conservation. The WING initiative was praised for fostering collaboration, income generation, and social bonds but faced challenges like social conflicts and logistical issues. Key recommendations include implementing a three-year graduation plan to ensure long-term sustainability.

ECOFISH II organized seven one-day "Women Congress" events across seven stations, gathering 740 participants, 84% of whom were women from artisanal fishing households. The congress, themed "Women are becoming aware of biodiversity conservation, contributing to life and livelihood!" aimed to share experiences and discuss challenges and future group activities. Participants, including government officials, private sector representatives, CVs, female Blue Guards, and the ECOFISH II team, emphasized the program's impact, with government officials committing to ongoing support.

ECOFISH II has successfully phased out 169 Women Income and Nutrition Groups (WING) and 53 Community Savings Groups (CSGs) following their respective exit strategies. This included conducting 169 WING phase-out meetings with 4,883 women and 38 CSG phase-out meetings with 1,028 members. As part of the phase-out, 8,000 booklets on nutrition and gender awareness were developed and distributed to reinforce key messages, covering topics such as dietary diversity, hygiene, family planning, and the prevention of early marriage.

ECOFISH II aims to improve nutrition for vulnerable fishing households facing food shortages and low dietary diversity. While 66% of households struggle with food shortages, 80% have homestead space for vegetable farming. In Year 5, 98.4% of WING members (1,961 women) received training in

nutrition-sensitive homestead gardening. The initiative supported 7,733 households with seed packages and organic fertilizers across five years, and 4,883 households received winter vegetable seed packs. A survey in Year 4 showed improved vegetable production, with households averaging 164 kg, despite challenges from extreme weather. On average, households consumed 65 kg, shared 14 kg, and sold 85 kg, generating a surplus valued at 6,060 BDT. Year-round vegetable cultivation rose from 23% to 77%, and 65% of households now purchase seeds locally, indicating greater self-sufficiency.

The 2024 BHHI survey showed a rise in vegetable cultivation income, with 78.5% of households benefiting, up from 7%. Weekly vegetable and food consumption has improved, boosting dietary diversity. The Household Dietary Diversity Score (HDDS) increased from 5.3 to 7.94, with 73% of households meeting acceptable levels. However, 23% still have low dietary diversity, particularly in Ukhiya, where 47.5% of households face challenges, likely due to the Rohingya influx affecting food supply and prices.

The ECOFISH II Monitoring, Evaluation and Learning (MEL) team generated community-level information covering all the villages where the project is working in and integrated the information into the GIS map, Google Earth maps and maintained offline-online database. The MEL team conducted periodic and annual assessments to assess project performance against six standard USAID indicators and seven custom indicators and submitted the PIRS report to USAID. MEL team conducted internal Data Quality Assessment (DQA) for ZoR and MPA sites to assess the data quality, endline survey and performance of the ECOFISH II activities in the field levels.

In Year 5, USAID's ECOFISH II has successfully celebrated National Fish Week, Jatka Conservation Week, the 22-day Hilsa brood fishing ban period, the 65-day fishing ban period, National Nutrition Week, and other relevant national and international days in collaboration with the DoF and other relevant government officials. A total of 40,000 posters (10,000 posters for the Jatka Conservation Week, 20,000 posters for 65-day marine fishing ban and 10,000 posters for 22 days Hilsa Fishing Ban) were produced in collaboration with the DoF. Furthermore, 8,000 healthy food plates and 8,000 booklets on nutrition awareness were printed and distributed, and 2,200 T-shirts were produced to celebrate National Fish Week 2024 in collaboration with the DoF. To keep informing and learning the general audience 174 media engagements were ensured, 44 social media posts were made, and four blogs were published on the WorldFish website. ECOFISH II result sharing and closeout workshop organized successfully, participated by more than 250 participants from public departments, private sectors, coastal communities, national and international organizations. Advisor to the Ministry of Fisheries and Livestock and Mission Director of USAID among the dignitaries grace the workshop.

2.2 Implementation status

2.2.1 IR1: Improved management and governance of natural resources that form the foundation of fisheries

To achieve the IR1 component, science outputs for decision-making (Sub IR1.1), steps were taken to assess and improve coastal ecosystem health, marine biodiversity and conservation, and marine fisheries dynamics activities in line with improving the country's Blue Economy initiatives. Co-management building blocks were formed, and skill development activities were implemented to develop adaptive co-management organizations and improve fisheries governance (Sub IR1.2) in the ZOR and MRE, focusing on the Hilsa, catfish and other important coastal and marine fisheries. For effective fisheries resource management, some policy support activities, focusing on the delineation of three new MPA (one already declared) were conducted. The achievements of various IR1 activities from January to November 2024 (Year 5) are summarized in Table 1.

Table 1: Summary of progress under IR1. (completed in progress yet to start)

Activities	Progress	Status
Sub-IR1.1: Improved science outputs for decision-making		
Ecosystem health assessment and improvement	• In the St. Martin, Moheshkhali and Kutubdia coasts climate change indicating five water quality parameters (Temperature, DO, pH, salinity & alkalinity) were monitored and the monthly average values are shown graphically (Figure 4, 5 and 6). • For ecosystem health improvement, awareness campaigns, collection and safe disposal of plastic pollutants and discarded net materials were continued, and 8,640 kg of such materials were removed from Teknaf, Ukhiya, Cox's Bazar Sadar, Moheshkhali, Kutubdia, Charfasson and Kalapara coasts by engaging 140 local youths as Blue Guards.	
Biodiversity assessment and conservation	• SUST completed the activities of data collection on biodiversity and ecological habitats from both the Salimpur, Chattogram and Kuakata, Patuakhali coasts to support DoF for new MPA declaration. A scientific article "Integration of socio-ecological data to prioritize biodiversity hot-spots for Marine Protected Area (MPA) delineation in the coastal zone of Bangladesh" based on the assessments to explore new MPAs in Kuakata, Patuakhali and Salimpur, Chattogram has been published in the Regional Marine Studies journal.	
Fisheries dynamics monitoring	• Fish landing records of 11 LCFs revealed 65 species were landed of which 56 species/groups were predominant in the commercial marine fishery that contributed 7,162 MT of fish landing in Cox's Bazar Sadar, Kutubdia, Ukhiya, Teknaf, St. Martin, Charfasson and Kalapara areas. • On-board real-time fish catch was monitored engaging 40 Citizen Scientists (CSs) covering Cox's Bazar Sadar, Kutubdia, Ukhiya, Moheshkhali, Teknaf, and the Nijhum Dwip MPA. The highest CPUE for all species/groups together was found in Cox's Bazar (1286 kg/boat/day), followed by Moheshkhali (1,196 kg/boat/day), MPA (399 kg/boat/day) and Kutubdia (301 kg/boat/day), and, while the overall average value was 564 kg/boat/day. • As a part of stock assessment, total 7,964 specimens of the selected five species were measured fish size monitoring of five important species (Talang queenfish, Indian mackerel, Fringescale sardine, Big-eye Ilish and Sona Sea catfish).	
Sub-IR1.2: Improved adaptive co-management and fisheries governance		
Formation and strengthen co-management institutions	• ECOFISH II trained 1,955 artisanal coastal fishers (76 batches) from Year-5 on marine biodiversity conservation, safety at sea and responsible fishing. • Twenty (20) refresher training courses were organized for the FCG members on marine biodiversity conservation, safety at sea and responsible fishing involving 421 participants from Year-3 and Year-4. • ECOFISH II organized 2,000 beneficiary artisanal coastal fishermen into 68 FCGs to improve coastal and marine biodiversity and responsible fishing. In addition, 16 VFCGs were formed engaging 257 fisher representatives from 68 FCGs.	

Activities	Progress	Status
Formation and strengthen co-management institutions	• Thirty-nine (39) training on marine biodiversity conservation, safety at sea and responsible fishing were organized for 457 VFCG members from Year -5. • Twenty (20) refresher training on marine biodiversity conservation, safety at sea and responsible fishing were organized for the VFCG members encompassing 304 participants from Year 4. • Nine (09) capacity building training courses on leadership development and strengthening organizational capacity were conducted involving 92 LFCC members and 22 bi-monthly meetings were conducted with 523 LFCC members. • One (01) LFCC formed newly at St. Martin Fish Landing Center, Teknaf and each of 10 LFCCs were provided with BDT 50,000.00 to bank accounts from ECOFISH II Activity after receiving formal proposals for future operation towards sustainability with a yearly activity plan for 2024-25. • Nine (09) phase-out meetings were held involving 203 LFCC members.	
Strengthen Ecosystem Approach to Fisheries Management (EAFM)	• As part of promoting EAFM, ECOFISH II Activity conducted a national level training course on the Ecosystem Approach to Fisheries Management (EAFM) and was attended by 24 national professionals, including DoF, BFRI, BFDC, BORI, BCG and Universities. • Local level EAFM training courses were organized for 56 executive members from 04 LFCCs. The training aimed at raising awareness among stakeholders and supporting the development of an EAFM plan for marine and artisanal fisheries in their fishing area.	
Improve fisheries governance	• A total of 501 boat skippers were trained on biodiversity conservation, safety at sea and responsible fishing through 10 sessions and boat owners training on biodiversity conservation, co-management and responsible fishing were organized for 295 participants in 10 sessions. • Conducted 23 awareness building programs related to 65-day marine fishing ban, 22-day hilsa fishing ban and *Jatka* conservation and a total of 1,350 stakeholders attended these events. • Successfully conducted FirstAid training events and distributed 69 FirstAid Kit Boxes and 82 Life Jackets to selected trained fishers. • A total of 120 megafauna were released by trained fishers, including turtles, sharks, skates and rays. A total of 149 hatchlings were hatched from 467 olive ridley turtle eggs collected from the nearby beach and safely released to the Bay of Bengal from the ECOFISH II supported community managed hatchery at Kutubdia. • The "Artisanal Fisher Congress-2024" with the participation of FCG, VFCG, LFCC and BG members were organized at 07 field stations and 692 members with respective S/UFO from local DoF Offices joined the events.	
Sub-IR1.3: Improved policy support		
New MPA assessment and delineation	• ECOFISH II partner SUST reviewed the draft Gazette declaring the Naf MPA and submitted to DoF which was declared by the Ministry of Fisheries and Livestock (MoFL) on 28th May 2024. • SUST collected the socio-ecological data from Kuakata (Patuakhali) and Salimpur (Chattogram) areas to explore the possibility of declaring more MPAs by the DoF and MoFL in those areas.	

2.2.1.1 Sub-IR1.1: Improved science outputs for decision-making

To generate high quality scientific information to support decision-making for sustainable fisheries management and biodiversity conservations supporting fisheries blue economy as well as

mitigation and adaptation of the climate change impacts on the resources. The outputs will help to optimize the marine fishing ban, delineate new MPA in the Naf River Estuary, and explore the possibilities of other MPA delineations in the south-west and south central region- Kuakata (Patuakhali) and Salimpur (Chattogram).

2.2.1.1.1 Ecosystem health assessment and improvement

Ecosystem health assessment

For ecosystem health assessment, climate change indicating five water quality parameters such as temperature, salinity, pH, dissolved oxygen (DO) and alkalinity were monitored monthly using digital equipment at 03 sites in Kutubdia, Moheshkhali and St. Martin's Island coasts. All the parameters were found well within the acceptable limits that indicates healthy habitats for aquatic fauna and flora in the surrounding waters (Figure 4). However, as indicated in Figure 4, 5 and 6 water salinity and alkalinity dropped remarkably in August due to heavy rainfall.

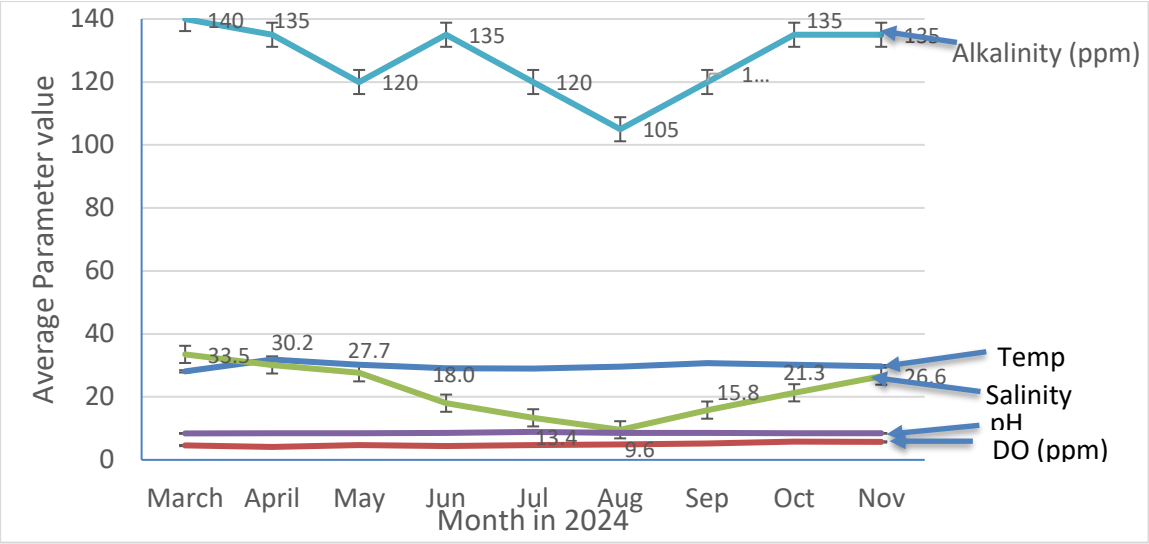


Figure 4: Monthly water quality parameters in the Kutubdia Island in 2024

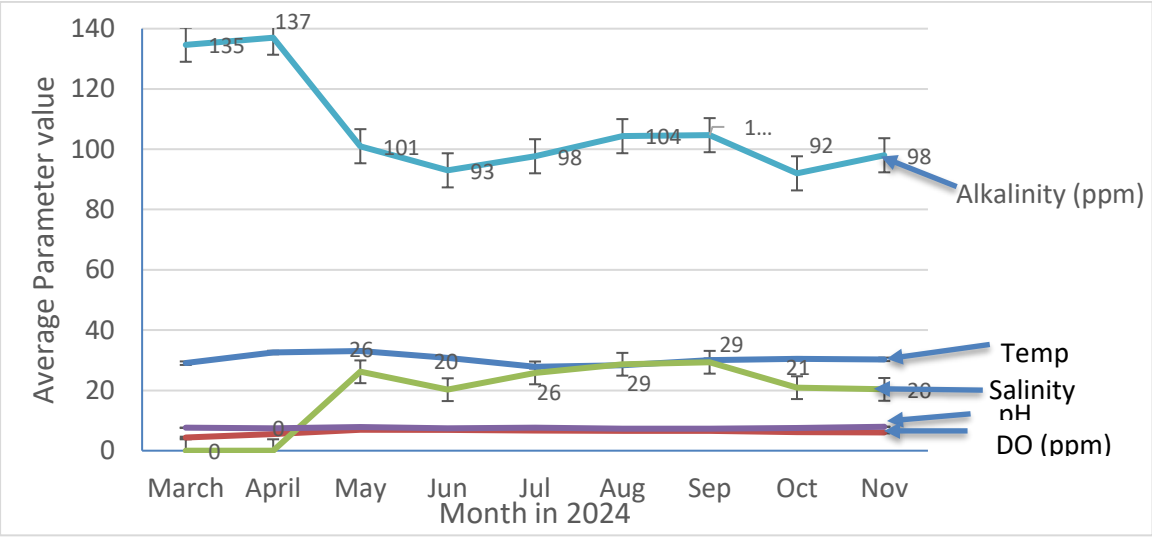


Figure 5: Monthly water quality parameters in the Moheshkhali in 2024

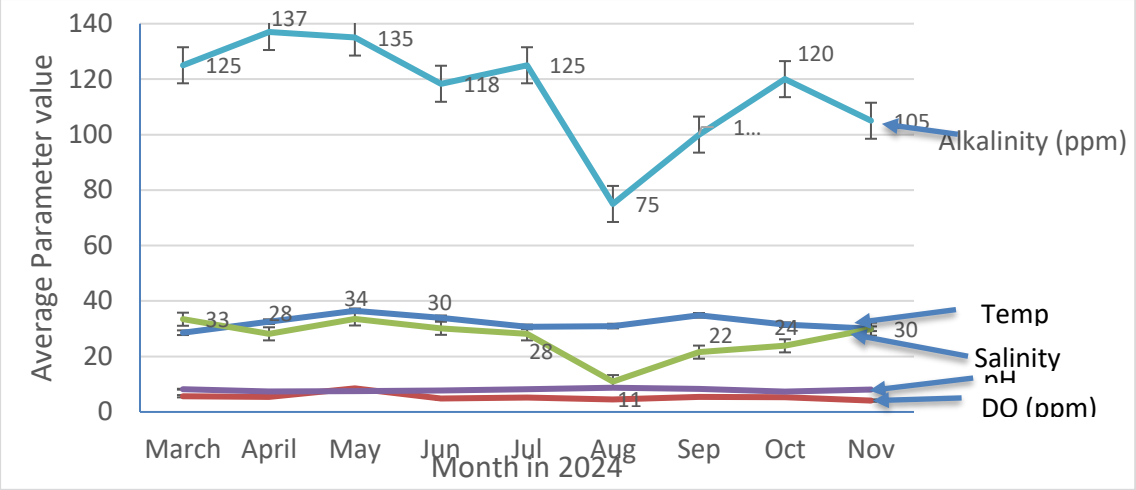


Figure 6: Monthly water quality parameters in the St. Martin Island coast in 2024.

Ecosystem health improvement

For ecosystem health improvement, ECOFISH II engaged 140 local youth as Blue Guards to conduct the campaign for reducing plastic pollutants and discarded net materials twice a month in each area around the seven target areas covering Cox's Bazar Sadar, Moheshkhali, Kutubdia, Ukhiya, Teknaf, Kalapara and Charfasson coasts. Blue Guards from all the areas were trained on ecosystem health, biodiversity conservation and gender sensitization issues and motivated to work closely with ECOFISH II in combating plastic pollution, ghost fishing by discarded nets and campaigning to create people's awareness about those issues.

In 2024, a total of 8,640 kg of plastic, polythene, nets and other garbage were removed from the beaches and coastal areas covering Cox's Bazar Sadar, Moheshkhali, Kutubdia, Ukhiya, Teknaf, Charfasson and Kalapara coasts. Collected waste includes 1,587 kg polythene and soft plastics, 1,148 kg of plastic bottles and hard plastics, 3,671 kg of net materials and 2,234 kg of non-decomsable other wastes (Table 2). Out of the collected wastes, 1614 kg of plastic bottles were connected to the local recycler for re-cycling or reusing the materials, and the remaining wastes were dumped to the nearby safar place from where local authorities take care of the wastes. The efforts will help in reducing the global problems of plastic and net materials, which will improve ecosystem health and ghost fishing issues for sustainable biodiversity conservation.

ECOFISH II organized annual training workshops for Blue Guards from Teknaf and St. Martin in Teknaf, and for Blue Guards from Cox's Bazar Sadar, Moheshkhali, Kutubdia, Ukhiya, Charfasson, at Cox's Bazar, Charfasson, and in Kalapara. A total of 29 Blue Guards were participated in the Teknaf event, and 96 Blue Guards for Cox's Bazar, 12 Blue Guards in the Charfasson event, and 28 Blue Guards were participated in Kalapara event in the workshops (Figure 7). Various important topics, including coastal and marine ecosystem health improvement, the adverse effects of ghost fishing on biodiversity, and the role of Blue Guards to support Landing Center-based Fisheries Co-management Committees (LFCC) were discussed. Additionally, sessions on gender sensitization, equity, and addressing family income and nutrition were integrated to ensure holistic development.

USAID's ECOFISH II arranged a school-based awareness-raising campaign on "biodiversity conservation and ecosystem health improvement" in the intervention areas of Cox's Bazar Sadar, Ukhiya, Kutubdia, Moheshkhali, Teknaf, Charfasson and Patuakhali. A total of 1,591 students from classes IX and X participated in the events. Representatives from the Secondary Education Department, Department of Fisheries, Journalists, Blue Guards, and Teachers were present as guests at the program (Figure 8).

Figure 7. Trained Blue Guards from Cox's Bazar Sadar, Moheshkhali, Kutubdia and Ukhiya.

Figure 8: School-based awareness-raising campaign on "biodiversity conservation and ecosystem health improvement Kutubdia and Moheshkhali"

Table 2: Quantities of different types of pollutants collected in 2024 from different coastal areas and disposed at the safer areas to improve the coastal ecosystem health

Station	Type of Pollutants with Quantity (kg)					
	Polythene	**Plastic bottles**	**Net materials**	**Other waste**	**Total**	**Connected for recycle/reuse**
Charfasson	71	100	141	119	431	103
Cox's Bazar Sadar	473	174	671	738	2,055	172
Kalapara	164	179	284	197	824	193
Kutubdia	272	288	262	44	866	0
Moeshkhali	268	93	259	596	1,217	23
Teknaf	137	164	1,682	293	2,274	1,102
Ukhiya	203	151	373	247	974	22
Total	**1,587**	**1,148**	**3,671**	**2,234**	**8,640**	**1,614**

2.2.1.1.2 Biodiversity assessment and conservation

SUST submitted a scientific article "Integration of socio-ecological data to prioritize biodiversity hot-spots for Marine Protected Area (MPA) delineation in the coastal zone of Bangladesh" based on the assessments to explore new MPAs in Kuakata, Patuakhali and Salimpur, Chattogram which is published in the Regional Marine Studies journal.

2.2.1.1.3 Fisheries dynamics monitoring

Species compositions of harvested fish covering bony fishes, cartilaginous fishes and shellfishes were monitored in the major landing centers in ZOR, Charfasson and Kalapara areas. The dynamics of the status of the fisheries were monitored basically in three ways, firstly- through fish landing monitoring in the major fish landing stations, secondly- through on-board real-time catch monitoring using Citizen Science approach, and thirdly- through monitoring the sizes (length & weight) of important species. Details of those approaches are described in the following sub-sections:

Fish landing and price monitoring

In Cox's Bazar, Ukhiya, Teknaf, St. Martin, Charfasson and Kalapara areas, eleven trained Landing Center Facilitators (LCFs) were engaged to monitor fish landings in nine major fish landing centers using smartphone with Bangla apps. LCFs from all the areas were trained on catch monitoring, ecosystem health, biodiversity conservation and gender sensitization issues. They recorded species-wise landing and approximate retail prices of those species. The fish landing records revealed 56 predominant species/groups in the commercial marine fishery that contributed 7,162 MT of fish landing in the major fish landing center in Cox's Bazar Sadar, Ukhiya, Teknaf, St. Martin, Charfasson, and Kalapara areas during the reporting year (Table 3). Other than Hilsa, croakers, anchovy, ribbonfish and Bombay duck were the dominant contributors, and within the Hilsa landings, small size Hilsa (<0.5kg) landed about 366 t, medium size Hilsa (<1kg) landed 318 t and the large size Hilsa (>1kg) landed 418 t in 2024. Other fish combinedly contributed 6,060 MT (Table 3).

Table 3: Different sizes of Hilsa and other marine fish monthly landed in the major landing stations in 2024

	Total monthly fish landing in major landing centers (**ton**)				
Month 2024	Small Hilsa (<0.5kg)	Medium Hilsa (<1kg)	Large Hilsa (>1kg)	Other fish	Total Landings
Jan	53.7	33.2	26.4	783.5	896.9
Feb	27.1	16.1	10.3	635.3	688.8
Mar	33.7	13.8	12.7	382.4	442.6
Apr	29.3	18.6	13.6	405.7	467.2
May	36.7	37.3	45.6	504.6	624.2
Jun	9.9	20.4	40.9	80.5	151.7
Jul	14.8	21.9	34.7	177.1	248.5
Aug	33.6	30.6	51.0	618.1	733.3
Sep	28.2	27.7	48.4	631.8	736.0
Oct	49.2	56.4	75.8	937.2	1,118.6
Nov	49.2	42.2	58.6	904.1	1,054.1
Annual	**366**	**318**	**418**	**,6060**	**7,162**

The LCFs also recorded the market price of the landed fish in all the landing centers in 2024. The monthly average price/kg of the landed fish revealed the actual commercial value of the landed fish and what extent the fish commodity supports fishers and other value chain actors in the coastal areas. The price of hilsa large size (Premium size, >1kg) showed extra high value during Apr-Jun, but reduced some extent in the peak harvesting season (Jul-Nov) as shown in Figure 9.

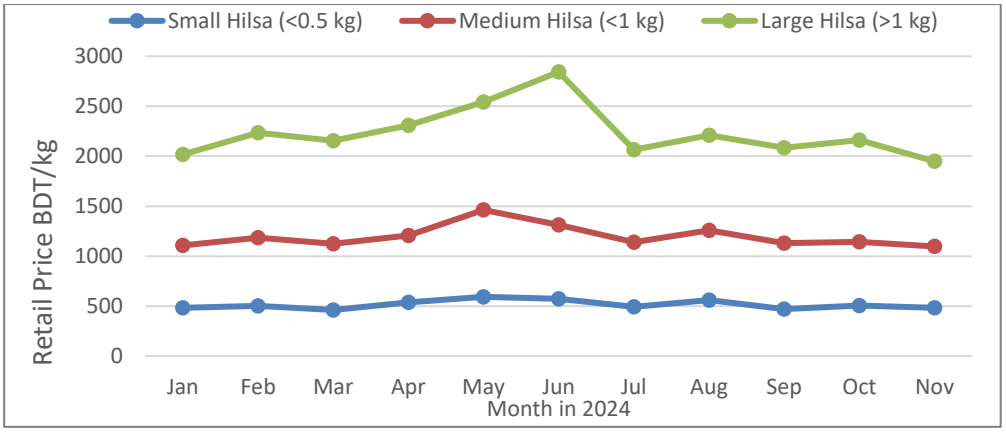


Figure 9: Monthly average retail price of different sizes of Hilsa in ZOR and MRE in 2024.

On-board catch per unit effort (CPUE) monitoring

Catch per unit effort (CPUE) is an important indicator for fish abundance monitoring. ECOFISH II introduced a real-time catch monitoring system using the Citizen Science approach, and engaged 40 trained Citizen Scientists (experienced and trained boat skippers). Citizen Scientists (CSs) from all the areas were trained to improve their skill on digital catch monitoring and improve their understanding on ecosystem health, biodiversity conservation and gender sensitization issues, and equipped with smartphones and KoBo Toolbox Mobile Apps in Bangla to provide the real-time catch data. In the six major intervened areas, based in Cox's Bazar Sadar, Moheshkhali, Kutubdia, Ukhiya, Teknaf and Charfasson, the CSs are operating their fishing vessels and providing the data helping in fisheries management decision making.

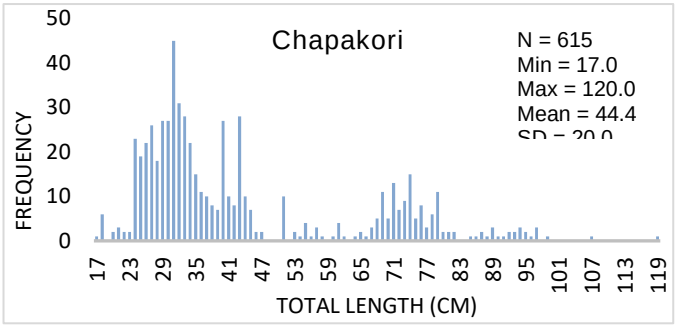
Analysis of the data reveals the catch per unit effort (CPUE) for Hilsa and all other important species/groups harvested and contributed increased significantly. Based on the CS's data stored in the database, CPUEs of Hilsa and other species/groups in major intervened areas were estimated. The highest CPUE for all species/group together was found in Cox's Bazar Sadar (1,286 kg/boat/day), followed by Moheshkhali (1,196 kg/boat/day), Charfasson (399 kg/boat/day), and Kutubdia (301 kg/boat/day), while the overall average catch was 564 kg/boat/day (Table 4). The CPUE indicated good daily catch of the major species in 2024. However, the highest CPUE for Hilsa was found in Charfasson (189 kg/boat/day) followed by Moheshkhali (126 kg/boat/day) as the boat size was bigger and engine power of the boat was higher, compared to other areas that facilitated them to fish in the deeper region (Table 4).

Table 4: Boat size and average daily catch per unit effort (CPUE) in kg/boat in ZOR and MRE in 2024

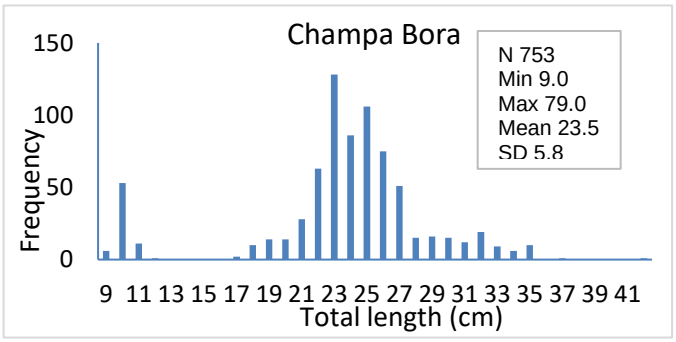
Station	Boat Dimensions			Catch per unit effort (CPUE, kg/boat/day)		
	Length m)	Width(m)	Engine power (hp)	Hilsa	Other fish	Total
Cox's Bazar	11	4	44	58	1228	1286
Moheshkhali	24	14	64	126	1070	1196
Kutubdia	12	4	32	16	285	301
Ukhiya	7	2	23	25	70	95
Teknaf	10	3	22	5	104	110
Charfassion	14	5	133	189	210	399
Average (all station)	***13***	***5***	***53***	***70***	***494***	***564***

Fish size monitoring for stock assessment

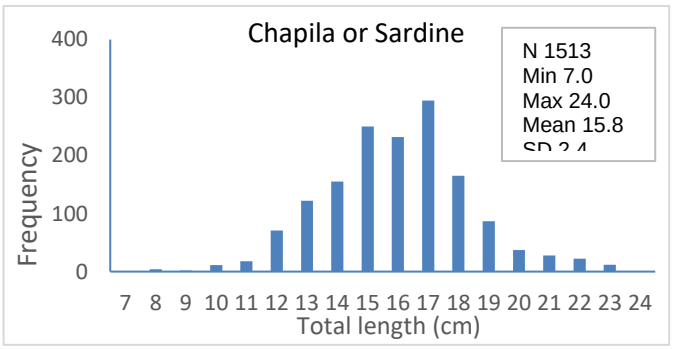
ECOFISH II started stock assessment activities of five important marine species other than Hilsa. The selected species were Talang queenfish, Indian mackerel, Fringescale sardine, Big-eye Ilish and Sona Sea catfish. As a part of stock assessment activities, ECOFISH II field teams collected morphometric data such as total length (TL), standard length (SL), fork Length (FL) and weight (W) of the species. In 2024, a total of 7,964 specimens of the selected five species were measured covering Cox's Bazar Sadar, Moheshkhali, Ukhiya, Teknaf, Charfasson and Kalapara areas. In addition, Kalapara and Patuakhali team measured 1,073 specimens of some important species (Hilsa, Pangas, Croaker and Silver) in their respective areas to observe the monthly variations of sizes of those species. Monthly size distributions (total length in cm) fish are shown graphically with some descriptive statistics in Figure 10 revealing vulnerable size groups having high fishing pressure of those species that will help in taking the management decision of those species.



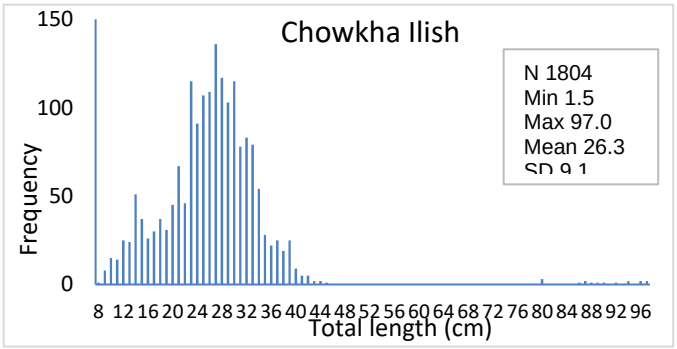
Local Name: Chapakori
Common Name: Talang Queenfish
Scientific Name: Scomberoides commersonnianus



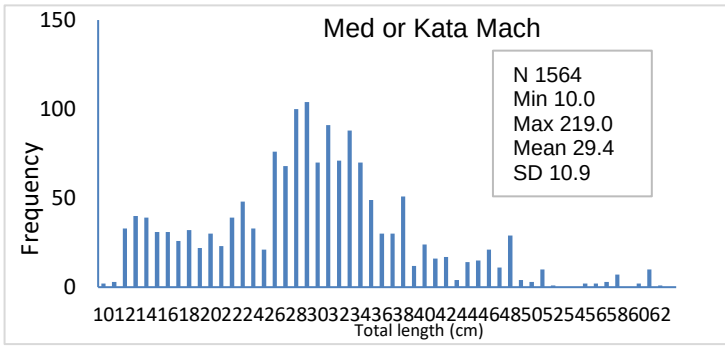
Local Name: Champa/Bora
Common Name: Indian Mackerel
Scientific Name: Rastrelliger kanagurta



Local Name: Chapila/Sardine
Common Name: Fringescale Sardine
Scientific Name: Sardinella fimbriata



Local Name: Chowkka Ilish
Common Name: Big-eye Ilish
Scientific Name: Ilisha filigera



Local Name: Med or Kata Mach
Common Name: sona sea Catfish
Scientific Name: Aciades sona/Arius sona

Figure 10: Size distributions of four major marine species in ZOR and MRE in 2024.

2.2.1.2 Sub-IR1.2: Improved adaptive co-management and fisheries governance

Fisheries co-management can play an essential role in conserving the biodiversity of coastal and marine fishes and megafaunas in the Bay of Bengal and its associated coastal ecosystems. During Year 5 (2024), ECOFISH II formed and strengthened village-level co-management building blocks and continued working with fish landing center-based co-management organizations (LFCC) to promote biodiversity conservation and enhance fisheries governance. Brief description of the important activities under Sub-IR1.2 are:

2.2.1.2.1 Forming and strengthening co-management institutions

During USAID's ECOFISH II Activity, WorldFish observed the complexities of establishing co-management structures in the coastal fishing villages. However, it became evident that key stakeholders are typically stationed at or frequently visit nearby fish landing centers for daily or business activities. Consequently, establishing a co-management model at fish landing centers offers a strategic advantage, as it enables stakeholders to collaborate and organize under the Landing Center-based Fisheries Co-management Committee (LFCC).

ECOFISH II continued its strategic action point in Year 5 to focus more on landing center based coastal and marine resource management, while continuing to work with local Village-based Fisheries Conservation Groups (VFCGs) in the nearby coastal fishing villages. Both village-based and landing center-based management are important for longer term behavior change toward biodiversity conservation and responsible fishing. However, ECOFISH II in consultation with DoF co-developed a landing center-based co-management model, considering several critical factors, including the socio-political context, stakeholder dynamics, geographical location, fishing activities, and the diversity and number of stakeholders involved (Figure 11).

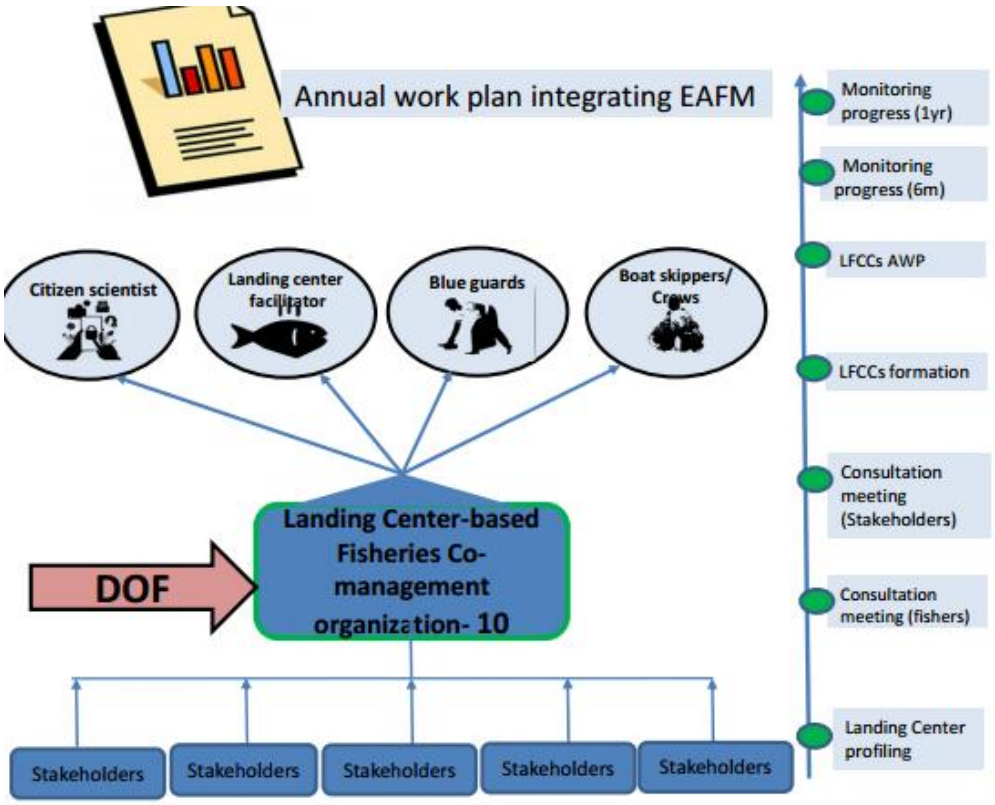


Figure 11: Fisheries Co-management Model for Fish Landing Center in the coastal area of Bangladesh.

In Year 5, ECOFISH II continued its efforts to educate fishers on the importance of marine biodiversity conservation, emphasizing key actions and the importance of complying with relevant government regulations. Building on the foundation of 3-4 Fisheries Conservation Groups (FCGs) established in each village and 76 training events were organized, reaching 1,955 Fisheries Conservation Group (FCG) members, reinforcing their commitment to sustainable marine resource management (Figure 12). ECOFISH II facilitated the formation of 16 Village-based Fisheries Conservation Groups (VFCGs), comprising 257 FCG members. Total 16 Village-based Fisheries Conservation Groups (VFCGs) were formed with FCG leaders lead by 03 executive committee members for each VFCG. These VFCGs are informal and community-led organizations created to empower local leaders with the skills and knowledge necessary to drive collective action for marine biodiversity conservation. By fostering collaboration and strengthening local stewardship of marine resources, VFCGs play a pivotal role in promoting sustainable practices that protect biodiversity. Through targeted capacity-building initiatives, VFCG leaders are trained to mobilize their communities, advocate responsible fishing practices, and ensure alignment with government regulations, contributing to the long-term conservation of marine ecosystems.

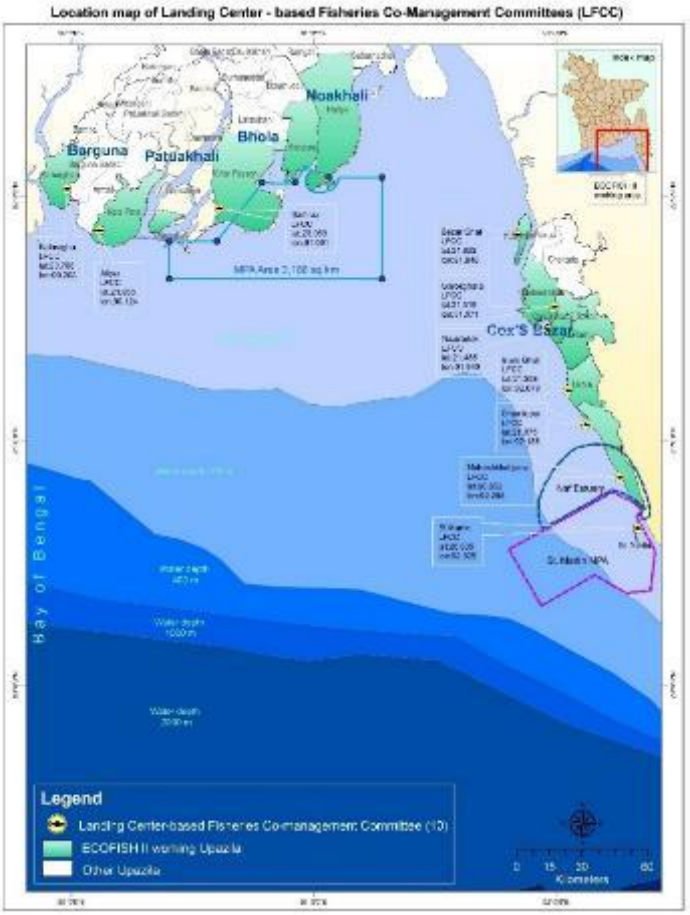


Figure 12: Location map fishing villages in 2024.

To build the capacity of VFCG members, ECOFISH II conducted 39 training courses, benefiting 457 participants from Year-5 and 20 training courses, 304 participants from Year-4. These sessions covered critical topics such as biodiversity conservation, safety at sea, and responsible fishing practices. The training courses were held across various locations, including Cox's Bazar Sadar (156 participants), Teknaf (90), Ukhiya (57), Moheshkhali (71), Kutubdia (42), Charfasson (49), and Kalapara (84) (Figure 13).

Figure 13: FCG's Training at Katabuniya, Teknaf (left) and VFCG's Training at Moheshkhali (right) on biodiversity conservation, safety at sea and responsible fishing

In addition to its focus on fishing villages, ECOFISH II continued its efforts to implement the fish landing center-based co-management model. Saint Martin's Island, the only coral island in Bangladesh, hosts a number of unique fish and lobster species, including *Cephalopholis boenak*, *Epinephelus coioides*, *E. lanceolatus*, *E. sexfasciatus*, *Panulirus versicolor*, and *P. polyphagus*. These species are significant not only for their limited migratory behavior within the Exclusive Economic Zone (EEZ) but also for their critical role in maintaining fisheries biodiversity. Recognizing the ecological and fisheries importance of these species, the Jetty Ghat at the St. Martin Fish Landing Center, Teknaf, was included for establishing co-management organization in the Year-5 Activity. This inclusion, made in consultation with local DoF officials, marked a step forward in promoting sustainable fisheries management and conservation in this unique ecological setting. Finally, including St. Martin's Island, ECOFISH II established fish landing center-based co-management organizations at a total of 10 landing centers.

ECOFISH II continued its support for the development of Landing Center-Based Fisheries Co-Management organizations/Committees (LFCCs) to assist the Department of Fisheries (DoF) in implementing Bangladesh's Marine Fisheries Management Plans, aligned with the Ecosystem Approach to Fisheries Management (EAFM). To facilitate their establishment and build organizational capacity, each of the 10 LFCCs received financial support of BDT 50,000, which was transferred directly to their respective bank accounts. This funding was provided alongside technical guidelines, following the submission of formal proposals and annual activity plans for 2024-25.

Recognizing the importance of capacity-building in establishing a robust co-management model, ECOFISH II organized several training initiatives. This year-5, the training sessions emphasized leadership development and organizational strengthening for LFCC members. These events were held across 09 (nine) LFCCs formed during Year-4, engaging 92 participants. Additionally, 22 bi-monthly meetings were conducted, with 523 LFCC members in attendance (Figure 14). These efforts aimed to equip members with the skills and knowledge needed to strengthen and operationalize LFCCs as effective co-management organizations, promoting collaboration and ensuring sustainable fisheries management.

Figure 14: Training on leadership development and strengthening organizational capacity at Shamlapur LFCC, Teknaf (left) and Bi-Monthly Meeting of the Sonarpara LFCC at Ukhiya (right).

ECOFISH II intended to enhance the management and monitoring of artisanal fishing practices. A total of 501 boat skippers were trained this Year-5 on biodiversity conservation, safety at sea and responsible fishing. Following training, they expressed a commitment to the conservation of fish and megafauna (dolphins, turtles, sharks and rays). The goal of this effort is to help reduce illegal, unregulated and unreported (IUU) fishing and improve management practices. At present, trained boat skippers are releasing entangled megafauna alive (Figure 15.). As of this year, 120 megafaunas, including turtles, skates, rays and sharks were released by the trained fishers. The conservation stories were prominently featured in the national print and electronic media.

Figure 15: Trained citizen scientist (CS) released an entangled Olive Ridley (left) and another beached while laying eggs in the seashore (right).

2.2.1.2.2 Strengthening the Ecosystem Approach to Fisheries Management (EAFM)

In multi-species, multi-gear fisheries, a complex type of fisheries in Bangladesh, effective management is always a challenge. EAFM is a more effective management solution than conventional stock-based management, which has proven effective in many parts of the world. EAFM offers better chances of making realistic, equitable, and sustainable management plans. EAFM is therefore an effective means of addressing these issues, particularly in the context of the coastal and marine fishery in the Bay of Bengal. ECOFISH II adheres to an EAFM approach and tries to involve government and non-government stakeholders in the decision-making process and implementation of fisheries governance.

The ECOFISH II Activity organized a national-level training course on the Ecosystem Approach to Fisheries Management (EAFM) to build a national pool of experts and raise awareness among stakeholders. The objective was to build capacity and motivate stakeholders to develop an EAFM plan for managing marine artisanal fisheries in the Bay of Bengal. The training was facilitated by an experienced international trainer from the Philippines, who brought extensive expertise in implementing the EAFM. The training was attended by 24 national professionals representing organizations such as the Department of Fisheries (DoF), Bangladesh Fisheries Research Institute (BFRI), Bangladesh Oceanographic Research Institute (BORI), Bangladesh Fisheries Development Corporation (BFDC), Bangladesh Coast Guard (BCG), and several universities (Figure 16). The course covered critical topics, including sustainable fisheries management, ecosystem-based decision-making, stakeholder engagement, data collection and analysis, and monitoring and evaluation. Delivered through an interactive and participatory methodology, the training incorporated a mix of lectures, case studies, videos, and group discussions. Participants were also provided with comprehensive training manuals to reinforce learning and support their future contributions to EAFM planning and implementation.

Figure 16: Director (Marine), Department of Fisheries handed over certificates in closing session of EAFM training (left). Participants engaged in an interactive discussion to develop EAFM plan (right).

The training received widespread recognition and was highly praised by the participants and stakeholders alike. Its success was highlighted in national daily newspapers, underscoring its importance and impact. A detailed report of the training was shared with the DoF and USAID, showcasing the outcomes and the significant contribution it made to enhancing local capacities in sustainable fisheries management.

Following the successful national-level training on the EAFM, localized training events were organized. These events were led by the trained professionals who had participated in the initial course, ensuring the knowledge gained cascaded down to grassroots levels. A total of 56 executive members from four local LFCCs attended these follow-up training events. The primary objective of these localized events was to raise awareness about EAFM principles and to support the development of a comprehensive EAFM plan tailored to the specific needs of marine and artisanal fisheries in the Bay of Bengal.

The training sessions at the local level allowed stakeholders to deliver deeper into the practical aspects of EAFM, with a particular focus on sustainable fisheries practices, ecosystem-based decision-making, and the active involvement of local communities. This capacity-building initiative aims to ensure that local stakeholders, including LFCC members, are empowered to make informed decisions and take proactive measures for the long-term conservation and sustainable management of fisheries resources in the region. These localized efforts contribute to strengthening the foundations for effective co-management systems, promoting a more inclusive, resilient, and sustainable fisheries sector in the Bay of Bengal.

2.2.1.2.3 Improved fisheries governance

Community engagement and training programs can help to improve fisheries governance by addressing the context-specific needs of the local community. ECOFISH II aimed to improve the management and monitoring the artisanal fishing practices. Most of the boat skippers (*Majhi*) are unaware of the rules and regulations of the government. The boat skipper training program is one of several initiatives designed to assist fishers in complying with fishing regulations and engaging in responsible fishing practices. Fishers' training on sustainable biodiversity and responsible fisheries can foster better fisheries governance. Ten (10) batches of boat skipper training were conducted this Year-5 in Cox's Bazar Sadar (2), Teknaf (2), Charfasson (1), Kutubdia (1), Moheshkhali (1), Ukhyia (1), Barguna (1), and Kalapara (1) with the participation of 501 boat skippers (Figure 17). Officials from DoF facilitated these sessions alongside ECOFISH II staff. Boat skippers were trained to guide fellow fishermen toward compliance with fishing regulations, ensuring safety at sea, and practicing responsible fishing practices. In addition, 10 (ten) batches of training on biodiversity conservation, co-management and responsible fishing for boat owners were organized from all the stations with the presence of 295 participants to make them understood about the resources and their management as well (Figure 17).

Figure 17: Boat Skipper training at Dakshinpara, Teknaf (left); and Boat Owners training at Cox's Bazar Sadar (right).

Artisanal boats in Bangladesh often lack essential lifesaving equipment, such as life buoys, radios, compasses, life jackets, and FirstAid kits, which are critical for ensuring the safety of fishers while they operate in open seas. Recognizing this gap, the ECOFISH II team took proactive steps to address this issue

by organizing FirstAid training sessions and distributing FirstAid kits to fishers in vulnerable areas. In total, 82 fishers from the coastal areas of Charfasson (15), Ukhiya (24), and Kalapara-Borguna (43) were selected to receive these vital resources. The FirstAid kits provided included supplies that can help prevent the spread of injuries, offering essential tools for managing minor injuries and stabilizing more serious conditions until medical assistance can be reached. The distribution of these FirstAid kits and life jackets was done in collaboration with local DoF officials (Figure 18). Their involvement ensured that the initiative was aligned with local priorities and met the specific needs of the artisanal fishing community. Local DoF officials have expressed their appreciation for this initiative, recognizing its importance in enhancing the safety and well-being of fishers, and have praised the program for its potential to reduce the risks associated with fishing in hazardous conditions.

Figure 18: Distribution of FirstAid kits at Cox's Bazar Sadar (left); and Life Jackets at Ukhiya (right)

Illegal, Unregulated, and Unreported (IUU) fishing practices have become increasingly prevalent in Bangladesh, particularly within small-scale fisheries. These practices threaten marine biodiversity and undermine sustainable fishing practices in the region. To address this issue, ECOFISH II organized seven (07) events in celebration of IUU Fishing Day at various field stations. The goal of these events was to raise awareness among stakeholders about the harmful impacts of destructive fishing gears and practices as well. A total of 328 participants attended the workshops, including DoF officials, members of BORI, fishers, boat owners, boat skippers, Blue Guards, Coast Guard, environmental activists, and media representatives (Figure 19). These workshops provided a platform for dialogue and collaboration among different sectors to combat IUU fishing and promote responsible fisheries management.

Furthermore, as part of the awareness events, Gorakghata LFCC, Moheshkhali organized a football tournament for unemployed fishers who were affected by the 65-day marine fishing ban in the Bay of Bengal. This tournament marked a significant event as it was the first time a fishing committee in the area had been recognized as an official institution and received widespread acceptance. The event attracted participation from various stakeholders, including the DoF, Upazila Administration, local elites, Blue Guards, citizen scientists, media representatives, and members of the fishing community. The football tournament not only provided recreational opportunities for the unemployed fishers but also helped foster a sense of community and solidarity among participants. At the conclusion of the tournament, the winning teams were awarded the 'Champion' and 'Runner Up' trophies, along with other valuable prizes (Figure 19). This event served as a meaningful initiative to support the fishing community during the challenging period of the fishing ban, while also highlighting the role of fisheries co-management organizations in promoting social inclusion and community engagement.

Figure 19: Celebration of IUU Fishing Reduction Day at LFCC office, Nazirartek Fish Landing Center, Cox's Bazar Sadar (left); and football tournament at Moheshkhali (right).

ECOFISH II continued efforts toward developing and strengthening 10 (ten) landing center-based co-management organizations during its activity period and it was obvious to leave behind those organizations due to the Activity closing. To make the process festive, phaseout meetings for Landing Center-based Fisheries Co-management Committee (LFCC) were organized to goodbye them and make them understand how they will drive onward during approaching days. Phaseout meetings were held in 09 (nine) LFCCs in ZoR, MRE and MPA with the participation of 96 EC members and representatives from DoF along with ECOFISH II staff attended the meeting (Figure 20).

Figure 20: LFCC's phaseout meeting at Kalmegha, Pathorghata (left); and Nazirertek, Cox's Bazar Sadar (right).

The conservation of marine turtles is of vital importance, not only because of their endangered status but also due to their role in maintaining the health of marine ecosystems. Turtles help in controlling jellyfish populations, which are a significant concern for the local fishing industry in Bangladesh. Over the past two to three years, there has been a noticeable increase in jellyfish abundance, particularly toward the early of the summer season. This surge in jellyfish numbers has negatively impacted fish catches, reducing catch efficiency, and even deterring fish from feeding. Marine turtles, particularly species like the olive ridley, feed on jellyfish and help to regulate their population, indirectly benefiting the local fishing communities. By focusing on the conservation of marine turtles, ECOFISH II not only supports the protection of an endangered species but also contributes to the restoration of a natural predator-prey balance in the marine ecosystem.

In 2024, the project supported local artisanal fishing community for establishment of an in-situ sea turtle hatchery in Kutubdia Upazila, Cox's Bazar, managed by the local volunteers of the fishing community. The local volunteers with previous experience in turtle conservation were engaged as watcher, responsible for safeguarding the eggs and overseeing their care. Throughout the year, 467 olive ridley turtle eggs were collected, and 149 hatchlings were successfully released into the Bay of Bengal, marking a successful contribution to the conservation of these endangered species (Figure 21). The successful hatchling release is a step forward in promoting biodiversity and improving the resilience of the marine ecosystem, benefiting both conservation and livelihoods in the region.

Figure 21: Marine Turtle Hatchery at Matbarpara, Kutubdia and newborn hatchling towards Bay of Bengal.

Under the ECOFISH II initiative, significant efforts were made to enhance awareness among stakeholders about critical issues related to fisheries management and marine conservation. A total of nine (09) awareness events were organized to highlight the importance of the 65-day marine fishing ban, aimed at ensuring sustainable fish stocks and protecting breeding grounds. Additionally, seven (07) awareness events focused on the 22-day hilsa fishing ban to support the protection of this economically and ecologically important species during its peak breeding season. Seven (07) events were also conducted on the conservation of *jatka* (juvenile hilsa), emphasizing the need to safeguard young fish for the sustainability of future hilsa populations. In total, 1,350 stakeholders from various levels, including fishers, community leaders, and local authorities, participated in these awareness campaigns, fostering a broader understanding and commitment to sustainable fishing practices (Figure 22). Furthermore, special awareness-raising events addressing the critical nexus between climate change, plastic pollution, and fisheries were conducted at the Nazirertek Fish Landing Center in Cox's Bazar Sadar. These events brought together 32 participants representing diverse sectors to discuss and deliberate on these pressing challenges and explore practical solutions.

Figure 22: Awareness program on 65-day marine ban at Teknaf (left); and 22-day brood hilsa ban at Cox's Bazar Sadar (right).

To reinforce the messaging from these events, ECOFISH II distributed 40,000 informational posters. These materials highlighted key topics such as *Jatka* conservation, the 65-day marine fishing ban, and the 22-day hilsa fishing ban, ensuring widespread dissemination of critical conservation information across the coastal fishing communities. Through these initiatives, ECOFISH II continues to drive awareness and behavioral change for the sustainable management of Bangladesh's vital fisheries resources. ECOFISH II celebrated National Fish Week 2024 at 07 Field Stations and 423 stakeholders from DoF, LFCC, FCG, VFCG, FCG, BG and WorldFish joined the events (Figure 23).

Figure 23: National Fish Week 2024 observation at Cox's Sadar (left); and Charfasson (right)

The "Artisanal Fishers Congress", organized by all seven ECOFISH II field stations, brought together 692 participants, including stakeholders from the DoF, BFRI, BFDC, local administrations, and various fisher groups (Figure 24). The events served as a platform for sharing insights from the Activity's research and development initiatives, strengthening collaboration among fisheries stakeholders, and providing fishers a voice to discuss achievements, challenges, and future needs. Key topics included the negative impacts of illegal industrial and foreign trawlers, the sustainability of the 65-day marine fishing ban, piracy, and the lack of savings among fishers. Participants emphasized the need for stronger enforcement of fishing boundaries, improved weather precautions, environmental stewardship, and exploration of alternative income-generating activities during fishing bans. The Fishers Congress highlighted the importance of empowering women within fishing households, reducing plastic waste, and addressing "ghost gear" in marine environments. It also recommended increased training for DoF officials on co-management practices and fostering more inclusive, adaptive fisheries management. The event underscored the need for the DoF to engage actively with local fishers to ensure their voices are considered in decisions impacting their livelihoods and marine resources.

Figure 24: Fishers Congress at Teknaf, Cox's Bazar.

Under this component, to further refine the co-management model, ECOFISH II engaged a consultant to conduct a comprehensive review, consult with experts and stakeholders, and propose standardized guidelines for implementing landing center-based co-management systems. The study focused on developing organizational modalities for Landing Center-based Fisheries Co-management Organizations and gathered insights from key stakeholders in marine fisheries management. This process was followed by a national workshop, where a key outcome was the creation of a detailed report that integrates participant feedback and provides standardized guidelines. These guidelines offer a framework for the broader adoption of adaptive co-management systems across Bangladesh, addressing the diverse challenges faced by coastal communities. At the national level, the report

informed policies and strategies for sustainable fisheries management, support the DoF in scaling adaptive co-management models for coastal fisheries management sustainably, and promote enhanced collaboration among stakeholders, ultimately strengthening the overall governance of marine fisheries in the country.

2.2.1.3 Sub-IR1.3: Improved policy support

ECOFISH II gathered valuable insights from the field experience, lessons learned, and science-based data to inform relevant agencies for policy recommendations, working with and providing supports to the DoF for policy formulation, approval, and implementation. This approach strengthens a sustainable fisheries management framework that combines community engagement, research, and adaptive practices for long-term impact. Key policy support activities facilitated by ECOFISH II for the DoF include:

Delineation and declaration of Marine Protected Area (MPA) and management

ECOFISH II, in collaboration with partner Sylhet University of Science and Technology (SUST) investigated the possibility of declaring a new Marine Protected Area (MPA) in the Naf River estuary and adjacent areas. ECOFISH II then submitted the proposal to the DoF to initiate the necessary steps for the declaration of the proposed MPA under the Marine Fisheries Act 2020. Finally, the Ministry of Fisheries and Livestock officially declared a 734.17 km² area as the Naf Marine Protected Area (MPA) through a gazette notification[2]. In recognition, the Director General of DoF sent an official appreciation letter to WorldFish (Record Number: 33.02.0000.109.11.059.18.366 Date: 27/06/2024), acknowledging and expressing gratitude for the support provided by the USAID/ECOFISH II in assessing and delineating MPAs in Bangladesh.

The declaration of the proposed Naf MPA would be very important as the Exclusive Economic Zone (EEZ) of Bangladesh covers 118,813-km² area and the Government has a plan to declare 10% of its EEZ as MPA to achieve the SDG target. After the declaration of the Naf MPA as the fifth MPA in the country, Bangladesh now has a total of 8,101.17 km², covering 6.82% of Bangladesh's total marine area, designated as MPAs (Table 5).

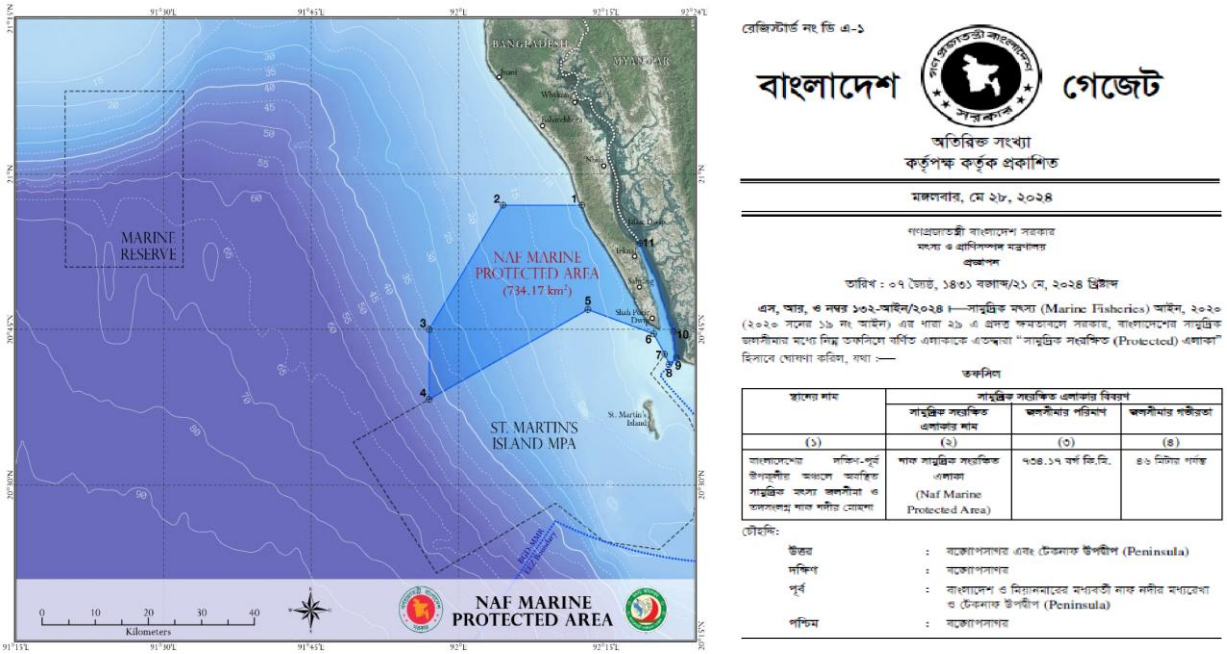


Figure 25. The map illustrates the designated area for the Naf MPA, the fifth MPA in Bangladesh (left) alongside the corresponding government gazette publication (right).

[2] এস, আর, ও নম্বর ১৩২-আইন/২০২৪। Ministry of Fisheries and Livestock; Page: 18231-18232

Table 5. Overview of Marine Protected Areas (MPAs) and Marine Reserves (MRs) in Bangladesh

MPA	Area (Sq km)	%Marine Area Covered	Managed by	Year Declaration
Marine Reserve (MR)	698	0.59	DoF	2000
Swatch of No Ground MPA	1738	1.46	FD	2014
Nijhum Dwip MPA	3188	2.68	DoF	2019
Saint Martin MPA	1743	1.47	FD	2022
Naf MPA	734.17	0.62	DoF	2024
MPA + MR %	**8101.17**	6.82		
Total marine area	**118,813**			

At the request of the DoF, USAID/ECOFISH II continued collaborating with SUST to assess the feasibility of establishing two additional MPAs in the South-Eastern and south-central coastal region of Bangladesh, specifically focusing on Kuakata (Patuakhali) and Salimpur (Chattogram). This initiative was aimed at supporting Bangladesh in achieving its target of designating 10% of its Exclusive Economic Zone (EEZ) as MPAs, aligning with the broader goal of reaching 30% by 2030. The Kuakata coast in Patuakhali (south-central) was identified to support the conservation of threatened fish and megafauna species across three biodiversity hotspots. Another proposed area along the Salimpur coast in Chattogram is targeted for the conservation of vital saltmarsh habitats, dominated by *Porteresia coarctata*, which provide critical support for diverse species, including shorebirds, mudskippers, horseshoe crabs, and other benthic organisms. In this assessment, SUST incorporated citizen science (Figure 26), interviews, and local stakeholder consultations.

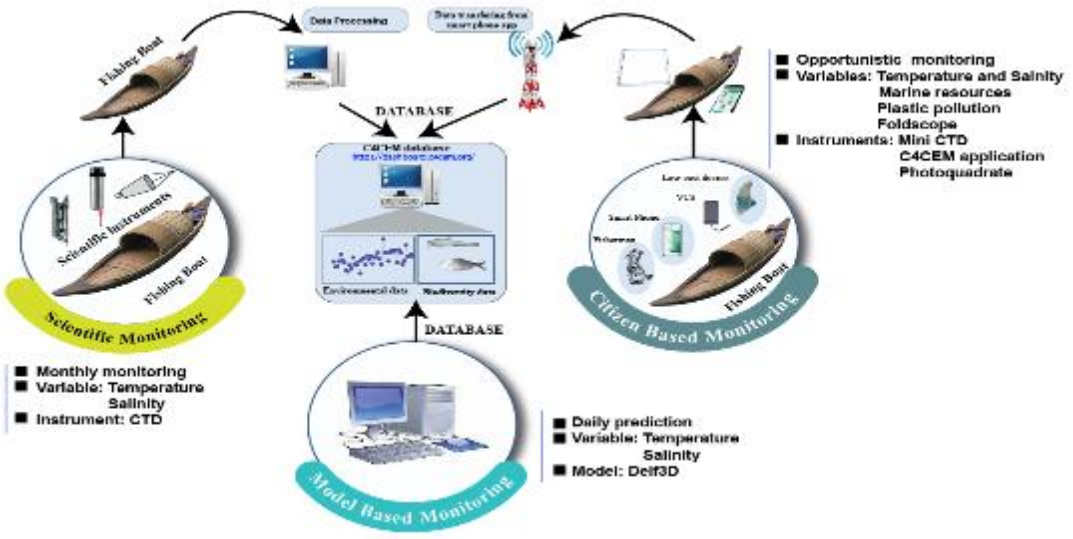


Figure 26. Citizen Science and model-based approach for scientific monitoring

The findings were presented in a central workshop in Dhaka, attended by the Director General, DoF, USAID representatives, and researchers and practitioners from the organizations such as WorldFish, CNRS, and SDF, along with experts from both technical and social science fields. Following the workshop, ECOFISH II has integrated the feedback received and submitted a comprehensive proposal to the DoF for the establishment of these new MPAs.

Previously, USAID/ECOFISH[BD] and ECOFISH II assisted the government in declaring the Nijhum Dwip MPA and developing its management plan, gaining valuable insights into the establishment and management of protected areas. The experiences gathered from ECOFISH II underscore that while the declaration of an MPA is a pivotal step in safeguarding aquatic biodiversity, it must be

accompanied by the development and implementation of a comprehensive management plan. Such implementation is essential for realizing the full benefits of conservation initiatives, both for ecosystems and the livelihoods of the communities depends on them. For the successful establishment and management of MPAs, it is crucial for the government, philanthropic organizations, and donors to increase their investments in marine biodiversity conservation.

Formulation of Guidelines to support Fisheries-centric Blue Economy

Bangladesh, located in the Indo-Pacific region, possesses significant potential to harness its marine resources for economic growth and development. Following the resolution of maritime boundary disputes with Myanmar in 2012 and India in 2014, the country gained rights to 118,813 square kilometers in the Bay of Bengal, including its territorial sea and Exclusive Economic Zone (EEZ). The fisheries blue economy represents a transformative approach to sustainable resource management, offering the potential to drive economic growth, protect vital ecosystems, and enhance the livelihoods of millions reliant on the coastal and marine aquatic resources. However, the sector faces challenges such as overfishing, climate change impacts, weak value chains, and inadequate infrastructure.

The Bangladesh government's blue economy framework aims to balance economic growth with environmental sustainability by promoting responsible fishing practices, sustainable marine fisheries management, the establishment of MPAs, and the protection of marine and freshwater habitats. Despite being an emerging sector, the blue economy offers significant growth opportunities within fisheries. To leverage this potential, the ECOFISH II project has commissioned a study to explore the opportunities, challenges, and way forward for advancing the fisheries blue economy in Bangladesh. The findings were presented in a consultation workshop in Dhaka, attended by the Director General, DoF, USAID representatives, and researchers and practitioners from national and international organizations (Figure 27). Participants were invited to discuss several key questions regarding the fisheries blue economy (FBE). They have explored the most promising investment opportunities within this sector and examined the role local communities can play in its development. Additionally, they considered which areas of scientific investigation are crucial for advancing the FBE and identified innovative approaches that could be adopted to enhance coastal aquaculture and mariculture initiatives. Through these discussions, participants aimed to uncover actionable insights that would contribute to the sustainable growth of the FBE. However, ECOFISH II has incorporated the feedback into the study and will subsequently submitted to the DoF.
The recommendations for future fisheries blue economy initiative -

• Innovative and sustainable fishing practices • Expansion of marine fishing activities • Development and modernization of mariculture • Value addition and diversification of markets • Enhancing market access and export competitiveness • Investment in infrastructure, technology, and high-seas tuna fisheries • Capacity building and stakeholder engagement • Research and development in fisheries management • Strengthening regulatory frameworks, governance, and policies • Marine Protected Area (MPA) management	• Implementing a mangrove-friendly ecosystem approach in coastal aquaculture • Advancing strategic initiatives in small-scale fisheries and community mobilization and livelihoods • Integrating Sustainable Development Goals (SDGs), certification, and a consumer-focused approach • Strengthening Monitoring, Control and Surveillance (MCS) • Protecting critical ecosystems to boost fishery productivity and blue carbon sequestration • Mapping and designating zones for fishing, aquaculture, mariculture, and critical habitats

Figure 27. Md. Zillur Rahman, Director General of the Department of Fisheries (DoF), Aditya Sood, Environment Officer at the Office of Economic Growth, USAID/Bangladesh, and Dr. Benoy Kumar Barman, Interim Country Representative for WorldFish Bangladesh, participated in the workshop focused on exploring opportunities, challenges, and pathways for the fisheries blue economy in Bangladesh, developing organizational modalities for landing center-based fisheries co-management system, and assessing site suitability for new Marine Protected Areas (MPAs) in the country. Due to political turmoil, three important topics were combined into a single workshop rather than organizing separate workshop for each.

Non-Conventional Fishery Products to Support Blue Economy

ECOFISH II has commisioned a study focused on identifying commercially valuable non-conventional fishery products to strengthen the blue economy in Bangladesh. This study aimed to gather essential biological and nutritional data and to explore the market potential of these non-traditional fishery products. Findings highlight that Bangladesh's marine and coastal waters host diverse ecosystems, rich in species such as fish, shrimp, molluscs, crabs, and seaweed, supporting both local consumption and export markets. Live mud crabs (*Scylla* spp.), highly sought after in East Asia, especially soft-shell varieties, generate higher returns but also increase pressures on wild stocks. Other species like swimming crabs (*Portunus* spp.), spiny lobsters (*Panulirus homarus*), and cephalopods hold significant export value, while nutrient-dense seafoods such as oysters, mussels, and clams offer opportunities for mariculture expansion to meet domestic and international demand. Species with medicinal and pharmaceutical potential, such as sea cucumbers, horseshoe crabs, edible jellyfish, and mineral-rich seaweed, are emerging as valuable resources for both health and food industries.

Despite their abundance, non-conventional species and bycatch, including swimming crabs and cephalopods, remain underutilized due to their size and appearance, though their use could reduce post-harvest losses. Sustainable exploitation of these species requires stock assessments and ecologically sound cultivation methods. Expanding mariculture for species like molluscs and seaweed could also support job creation, particularly for women in coastal communities. A deeper understanding of sustainable harvest levels and responsible practices for these species is essential to balancing ecological health with economic growth, advancing Bangladesh's Blue Economy goals.

Development of Mariculture Strategy

The mariculture sector in Bangladesh has great potential to enhance food security, create a resilient seafood supply chain, and provide socio-economic benefits to coastal communities. ECOFISH II, in collaboration with Chittagong Veterinary and Animal Science University (CVASU), developed a draft 10-year Low-Trophic Extractive Mariculture (LTEM) strategy[3]. This strategy incorporates lessons from the past four years and aims to address challenges such as weak value chains, coordination gaps, lack

[3] Advancing low-trophic extractive mariculture (LTEM): Strategies for a thriving blue economy in Bangladesh. Published in Marine Policy. https://doi.org/10.1016/j.marpol.2024.106557

of research investment, and insufficient regulatory frameworks that hinder mariculture growth and sustainability. Twelve thematic intervention areas were identified to overcome barriers to the growth of LTEM and support the blue economy in Bangladesh, based on literature reviews and key informant interviews. The strategy outlined a sequence of actions to maximize LTEM's growth potential, taking into account implementation timeframes and the likelihood of success for each intervention. This collaborative approach allowed stakeholders to prioritize and determine the most effective steps for advancing mariculture development.

Developing organizational modalities for the landing center-based fisheries co-management model

ECOFISH II commissioned a study on Organizational Modalities for Landing Center-Based Fisheries Co-Management aimed at promoting sustainable coastal and marine fisheries. This study was conducted by a national and an international consultant from the Philippines. It focused on conducting an in-depth review of existing fish landing center management systems to identify their strengths, weaknesses, opportunities, and threats. The study aimed to develop detailed institutional frameworks for a fish landing center-based co-management model that clearly defines roles, responsibilities, decision-making processes, and mechanisms for stakeholder collaboration. The goal was to produce comprehensive guidelines for effective organizational modalities in landing center-based fisheries co-management initiatives, thereby contributing to the sustainable management of coastal and marine fisheries.

Following this study, ECOFISH II hosted a Consultation Meeting on Fisheries Co-management at the Golden Tulip the Grandmark Dhaka in Banani. The event brought together key stakeholders from the DoF, Bangladesh Fisheries Research Institute (BFRI), Bangladesh Fisheries Development Corporation (BFDC), various universities, international and national NGOs, Fisher Associations, Accademia and USAID. Participants engaged in discussions about the future of Bangladesh's marine and coastal fisheries, with a particular emphasis on the Landing Center-based Fisheries Co-management Model for Coastal and Marine Fisheries Resources in Bangladesh. This consultation meeting paved the way for developing a legal framework for a fish landing center-based co-management system.

2.2.2. IR2: Improved equity and resilience of food, nutrition and livelihood benefits

Strengthening livelihood resilience is the core emphasis of ECOFISH II, which combines the EAFM concept in reaching well-being outcomes. This component prioritizes empowering the women of the fishing households through creating and diversifying productive assets, access to innovative technologies, improve existing value chains, and enhance life skill capacities focusing on gender, nutrition, and income to improve the livelihood resilience. This component also focuses on mobilizing partnerships with public and private sector agencies that could ensure the sustainability of livelihood interventions. The assumption is that the alternative income options of the fishing households will help to reduce IUU fishing, reducing the fishing pressure and contributing to the sustainable Blue Economy in Bangladesh and mitigating the carbon emissions. Altogether, the development of adaptive capacities equips them to withstand various shocks and stressors, making them more responsible in conserving aquatic biodiversity. The progress of various IR2 activities to ensure equitable livelihood benefits for both men and women are shown in Table 6. The following sections provide a synopsis of these accomplishments from January to November 2024.

Table 6. Summary of progress under IR2. (completed in progress yet to start)

Activities	Progress made	Status
Sub-IR2.1: Improved livelihood resilience of coastal fishing communities		
Diversify and improve livelihood capacity and options	• 2,000 new artisanal fishing households were selected from 20 fishing villages and formed 68 WINGs with the selected women of year 5 (Jan-Nov 2024) following the "*WING guideline*". • 1,955 participants representing 97.8% of all WING members have	

Activities	Progress made	Status
	received training on a combined module of income-generating options. • 2,927 participants, or 97.3% of Year-4 (Jan-Dec 2023) WING members, completed 101 refresher training courses on IGA. • Provided BDT 5,500 as critical input support to 1,942 WING members, reaching 99.6% of the target for acquiring startup inputs. • Facilitated 23 vaccination campaigns in the targeted fishing villages. • Developed and distributed 8,000 booklets on homestead small livestock and poultry rearing and distributed among the WING members.	
Access to innovative and climate resilient technology and market	• The tissue culture of *Gracilaria* sp. and *Ulva* has been developed, will ensure timely supply of seed for farming. • Nature-based captive breeding-based farming technology, and depuration protocols for cultured green mussels have been developed. • Presented a Low-Trophic Extractive Mariculture (LTEM) strategy (as draft) for Bangladesh in a workshop, jointly organized by WorldFish and DoF. • Arranged four awareness-building events on seaweed consumption in seaweed trial sites, engaging 123 WING members. • A seafood recipe book has been developed aiming to produce nutrient rich, and diversified food items with seaweed and fish powder. • ECOFISH II and NSTU assessed how market orientation influences the performance of Ready-to-Use (RTU) marine small pelagic fish and seaweed powders throughout the entire value chain.	
Facilitate women's empowerment, income and nutrition improvement	• Recruited 20 local young women as new Community Volunteers, bringing the total number of Community Volunteers to 48 and conducted 3 batches of Training of Trainers (ToT) for 47 Community Volunteers. • Organized 27 batches of institutional capacity building training of 517 WING leaders from 101 WINGs of year 4. • 639 members (32%) of year 5 WINGs participated in an initial knowledge assessment prior to starting BLS sessions. • Distributed 8,000 healthy food plates with message on dietary diversity among the ECOFISH II beneficiary households. • WING celebrated "National Nutrition Week 2024" in 7 villages of 07 ECOFISH II field offices, where 363 participants (90% female) were attended different events. • Seven 'Women Congress' events were held across seven locations, with 740 participants (84% women), to discuss experiences, challenges, and future directions for WING activities. • Developed and distributed 8,000 booklets on Nutrition and Gender Awareness for artisanal fishing communities. • A final knowledge assessment was conducted for Year 4 and 5 WING members, with 982 (32%) and 632 (32%) randomly selected participants. • Conducted three qualitative assessments on key approaches—WING, BLS, and CV. • Organized training for 43 CV and provided critical support to develop them as Local Service Provider (LSP) to serve the fishing community. • Year 4 and year 5 WING members have participated in 2028 BLS sessions maintaining an attendance of over 85% • 4,543 WING members from 169 WINGs have saved BDT 3,837,285 during this year with a cumulative savings of BDT 5,119,585. Also 1,175 members from 38 CSGs saved BDT 248,788 this year with a cumulative savings of BDT 1,943,333. • 169 WINGs and 38 CSGs have been phased out following the WING exit strategy and CSG exit strategy guideline	

Activities	Progress made	Status
	• Provided matching funds BDT 1,600,000 to 155 WINGs and 2 CSGs.	
Accelerate nutrition sensitive homestead horticulture	• Trained 1,961 WING members (98.4%) of year 5 on nutrition-sensitive homestead vegetables gardening. • 7,733 households across year 1-5 and 1,992 households of year 5 received vegetable seed packages and organic fertilizers for summer and winter season gardening, respectively. • Distributed a user-friendly booklet on nutrition-sensitive homestead vegetables gardening to 4,733 beneficiaries. • Assessed the vegetables production status for 958 beneficiaries of year 4 covering each WING and representing 32% of total.	

2.2.2.1 Sub-IR2.1: Improved livelihood resilience of coastal fishing communities

2.2.2.1.1 Diversify and improve livelihood capacity and options

ECOFISH II worked with 2,000 small-scale artisanal fishing households in Year 5 (Jan-Nov 2024) and continued follow-up support to the households selected in previous years. Like the previous years, ECOFISH II adopted a household approach, involving both men in Fisheries Conservation Group (FCG) and women in Women Income and Nutrition Group (WING), recognizing their respective roles in the household economy and biodiversity conservation.

Recognizing livelihood enhancement and diversification, ECOFISH II aligns with the understanding that such efforts should not be supply-driven or reliant on singular, pre-decided solutions. Rather, the effort is rooted in a holistic understanding of livelihood strategies, considering the challenges faced by the poor coastal and marine fishing households in diversifying their livelihoods. The conceptual framework (Figure 28) illustrates how ECOFISH II operates to enhance resilience within the context of income, social, economic, and climate vulnerabilities, aiming to achieve both well-being and biodiversity conservation outcomes.

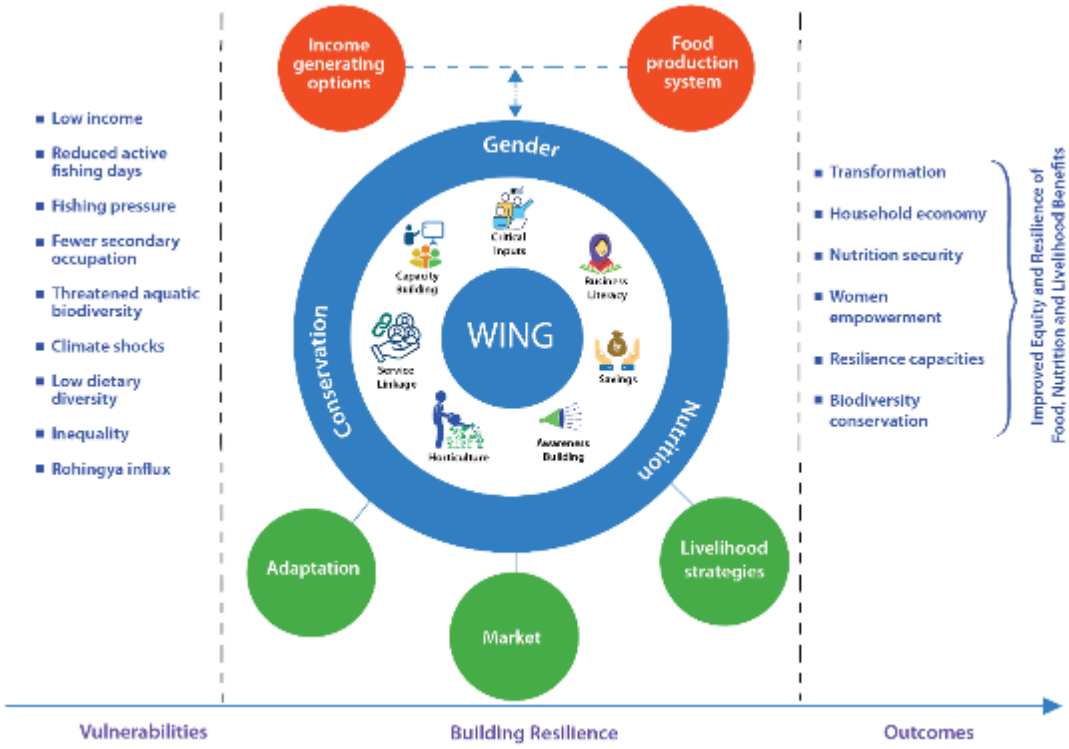


Figure 28. Conceptual framework of building livelihood resilience of the vulnerable artisanal fishing communities.

Fishing village selection

The first step of this component involved selecting fishing communities within its Theater of Operation (ToO). This step is crucial for engaging fishing communities in project interventions, given the pivotal role of fishers in protecting ecosystems and conserving marine biodiversity. The selection of fishing villages was based on key criteria, including, the availability of more than 100 poor artisanal fishing households, proximity to the Bay of Bengal and coastal rivers, increased vulnerability in terms of income and climate, and a history of poor compliance with government rules and regulations related to fisheries. In total, 20 fishing villages were selected across 9 upazilas in four coastal districts (Figure 29), following "*Fishing Village and Small-Scale Fishing Household Selection Guideline*".

There are 14,770 fishing households with an average of 739 households per village in 20 selected fishing villages. All villages mentioned have over 59% fishing households, averaging 65%, indicating the significance of fishing as a major economic activity in these communities. Of these fishing households, around 73% are small-scale artisanal fishing households among the fishing households, predominantly engaged as paid labor on artisanal fishing boats or as shared labor.

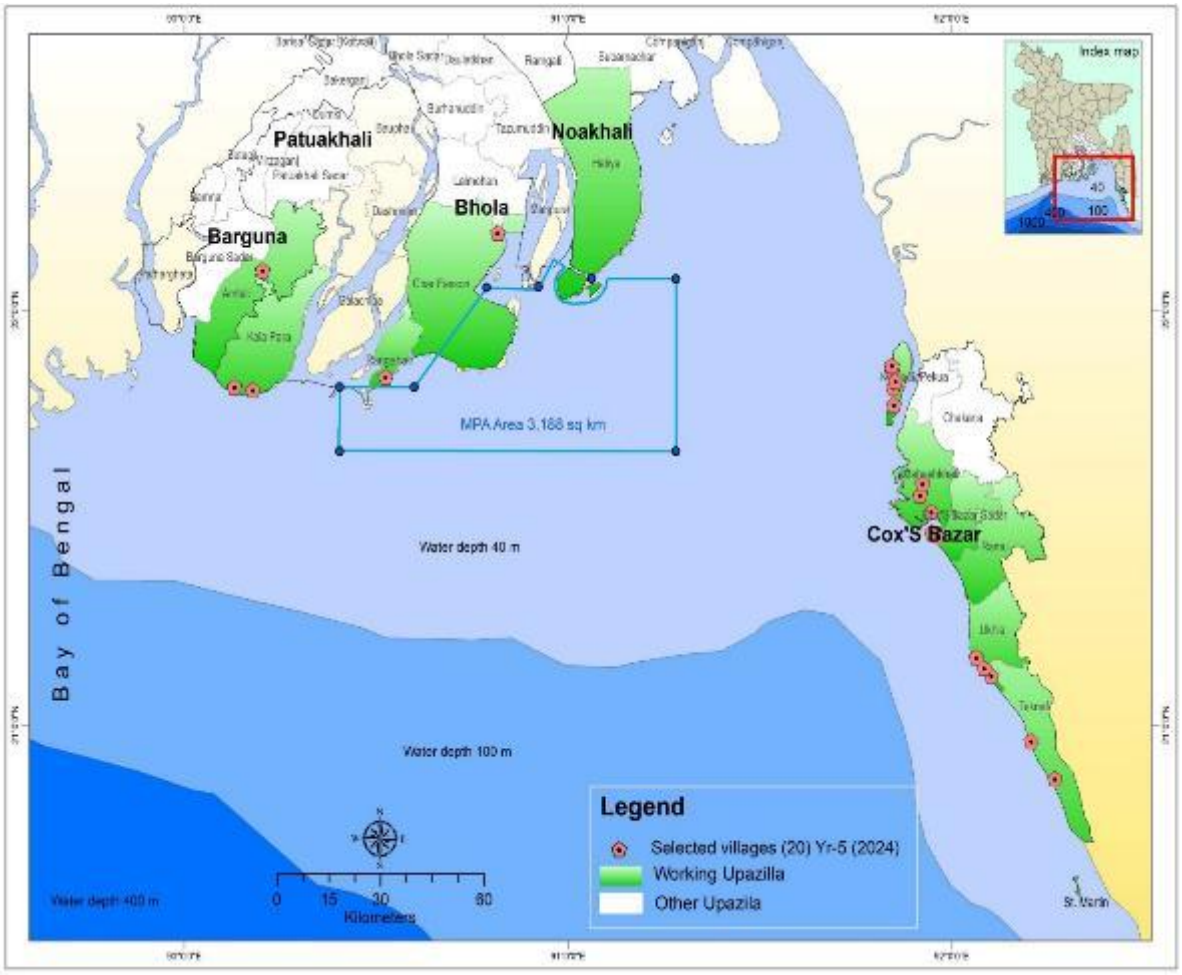


Figure 29. Map indicating the locations of the 20 fishing villages for intervention in 2024 (Year 5).

Selection and assessment of artisanal fishing household

In Year 5 (2024), the team selected 2,000 new artisanal fishing households across 20 existing and new fishing villages (Table 7). This selection followed the "*Fishing Village and Small-Scale Fishing Household Selection Guideline*," which involved informing, consulting, engaging, co-designing, and empowering the communities. In its fifth year, ECOFISH II successfully reached its target of assisting 15,000 artisanal fishing households over five years of implementation, including those in host communities impacted

by the Rohingya refugee influx and others along the Bay of Bengal coast in Bangladesh. These communities commonly face challenges like seasonal fishing bans, reduced marine biodiversity, climate change impacts, and unpredictable income sources. Like the previous year, a household approach has been applied with active engagement of women in WINGs and men participating in FCGs within different clusters in the chosen villages.

Table 7. Summary of the selected fishing villages for Year 5 (Jan-Nov 2024) interventions

Sl	Village name	Union	Upazila	District	Station	Targeted Fishing HH
1	Uttar Kutubdiapara	CXB Pouroshova	CXB Sadar	Cox's Bazar	CXB Sadar	200
2	Mostakpara	CXB Pouroshova	CXB Sadar	Cox's Bazar	CXB Sadar	100
3	Rastarmatha	Bara Maheshkhali	Moheshkhali	Cox's Bazar	Moheshkhali	120
4	Dholghatpara	Hoanak	Moheshkhali	Cox's Bazar	Moheshkhali	121
5	Khondakarpara	Kutubjom	Moheshkhali	Cox's Bazar	Moheshkhali	109
6	Purba Tabaler chor	Ali Akbar Deil	Kutubdia	Cox's Bazar	Kutubdia	120
7	Matbar Para*	Baraghop	Kutubdia	Cox's Bazar	Kutubdia	25
8	Pashchim Ali Fakir Dail Para	Dakkin Dhurung	Kutubdia	Cox's Bazar	Kutubdia	120
9	Mojjaler Para	Kaiyarbil	Kutubdia	Cox's Bazar	Kutubdia	100
10	Motir Baper Para	Kaiyarbil	Kutubdia	Cox's Bazar	Kutubdia	85
11	Bara deil*	Sabrang	Teknaf	Cox's Bazar	Teknaf	100
12	Daxin Langor bill*	Baharchhara	Teknaf	Cox's Bazar	Teknaf	100
13	Chohankhali*	Jaliapalong	Ukhiya	Cox's Bazar	Ukhiya	59
14	Madarbonia*	Jaliapalong	Ukhiya	Cox's Bazar	Ukhiya	60
15	Ruppoti*	Jaliapalong	Ukhiya	Cox's Bazar	Ukhiya	81
16	Ayeshabag	Aslampur	Charfassion	Bhola	Charfession	103
17	Char Lakshmi	Char Madraj	Rangabali	Patuakhali	Charfession	97
18	Baliyatali	AR-Pangasia	Amtoli	Barguna	Patuakhali	100
19	Panjupara	Kuakata	Kalapara	Patuakhali	Patuakhali	100
20	Gangamati	Latachapli	Kalapara	Patuakhali	Patuakhali	100
	Total					**2000**

**ECOFISH II previously intervened village*

In line with previous years, the selected artisanal fishing households exhibit similar types of economic, social, climate and environmental vulnerabilities. These households, residing along the oceanfront, display limited resilience, evidenced by lower dietary diversity and persistent gender inequalities. Importantly, a significant 60.19% are considered extremely poor, 35.89% fall under the poor category, while only 3.92% belong to the middle-income group among the selected fishing households. These categories into wealth ranks are based on community-driven criteria, encompassing monthly income and expenditure, dadan[4] (recipient or provider), housing patterns, land ownership, land size, types of fishers, gear and craft ownership, other assets, women's mobility, and social acceptance. Unfortunately, the fishers highlighted that poverty drives non-compliance and the use of illegal fishing gear even with the efforts from the government and various organizations. Nevertheless, fishing communities encounter social obstacles, price inflation, unpredictable weather conditions, and extended fishing bans, which further emphasize their need for sustainable income.

[4] The Dadan system in coastal Bangladesh is a unique money lending arrangement prevalent in fishing communities. This system operates through a verbal lending contract, establishing a complex and obligatory relationship between the borrower (fisher) and the lender (dadandar).

Provide training on the Alternate Income Generating Options

After selecting the artisanal fishing households, ECOFISH II formed 68 Women and Nutrition Groups (WING) with the women members from 2,000 artisanal fishing households and conducted trainings on income-generating activities for them. Field observations in previous years indicate that most fishing households engage in multiple income-generating activities to mitigate the impact of uncertain catches, fishing bans, or reduced income from their primary occupation of fishing. These additional enterprises, typically small-scale and household-based, often include activities related to small livestock. Consequently, ECOFISH II has adjusted its strategy to provide training for multiple enterprises instead of focusing solely on one enterprise aiming to strengthen household economic resilience. By diversifying income sources, households reduce risks, build resilience to market fluctuations, and improve overall livelihoods. Improved livelihoods are likely to enhance compliance and support local conservation initiatives. However, a daylong training on multiple IGAs was provided to 1,955 participants, representing 97.8% of all WING members in Year 5. The training, conducted by a collaborative team including Upazila Livestock Office members, a Local Service Provider (LSP), focused on small livestock rearing. The objective was to enhance the skills and motivation of WING members to initiate or improve household based IGAs using available resources. Likewise, a total of 101 batches refresher trainings were conducted, with 2,927 participants, representing 97.3% of the WING members from Year 4 (2023). These sessions aimed to reinforce their understanding and skills related to income-generating activities and troubleshooting ongoing ventures.

Provide startup capital for purchasing the critical inputs

After completion of all capacity-building training for selected Year 5 beneficiary fishing households, ECOFISH II distributed conditional cash of BDT 5,500 per beneficiary to 1,942 women from fishing households through a digital system, achieving 99.6% of the target. This support enabled the women to acquire crucial inputs for their household-based micro-enterprises. However, the remaining eight women did not receive the cash transfer due to migration, a common coping strategy among coastal

ECOFISH II's Response to Cyclone Remal

The artisanal fishing communities in Bangladesh were severely impacted by Cyclone Remal, which struck the southern coast on May 26, 2024. The storm caused extensive damage, affecting over 3,000 fishing households supported by ECOFISH II, including the destruction of vegetable gardens as seen in the photo captured in Kutubdia. ECOFISH II identified 30 households with losses ranging from 60% to 100% in Year 5 and provided additional conditional cash support of BDT 5,000 per household to help them recover and resume their livelihoods.

fishing communities. Out of the recipients, 1,929 households (99.3%) purchased critical inputs to either initiate or enhance their existing income-generating activities. WING members procured these inputs through a Local Procurement Committee (LPC), which included the WING president, secretary, cashier, FCG president, and the community volunteer.
The ECOFISH II team continues to follow up with beneficiary households to ensure proper utilization of support funds and access to essential services for their small businesses. In collaboration with the Department of Livestock Services (DLS), ECOFISH II has worked to improve access to animal vaccines for fishing households. Despite challenges such as heavy rainfall and political unrest, the team facilitated 23 vaccination campaigns across the targeted fishing villages. These campaigns vaccinated 2,414 goats and 8,178 poultry birds, benefiting ECOFISH II participants and other community members. Recognizing the need for sustainable vaccination services, community members have expressed interest in training local vaccinators and para-veterinarians to ensure ongoing and accessible support within their villages.

The ECOFISH II Year 5 work plan emphasizes phase-out and exit strategies. As part of this effort, 8,000 booklets[5] on homestead small livestock and poultry rearing were distributed. Designed to complement the training received by beneficiaries, the booklets aim to reinforce key messages necessary to successfully engage in alternative income-generating activities.

Evidence indicates that ECOFISH II interventions have successfully contributed to increasing household incomes. The performance survey 2024 of 540 fishing households of year-4 revealed an income growth, combining earnings from fishing and IGAs. On average, each household experienced an increase of BDT 75,727, representing a 68.27% improvement compared to the baseline (detailed in the MEL section, Figure 30). These results highlight the success of ECOFISH II's integrated approach in enhancing the livelihoods of fishing communities.

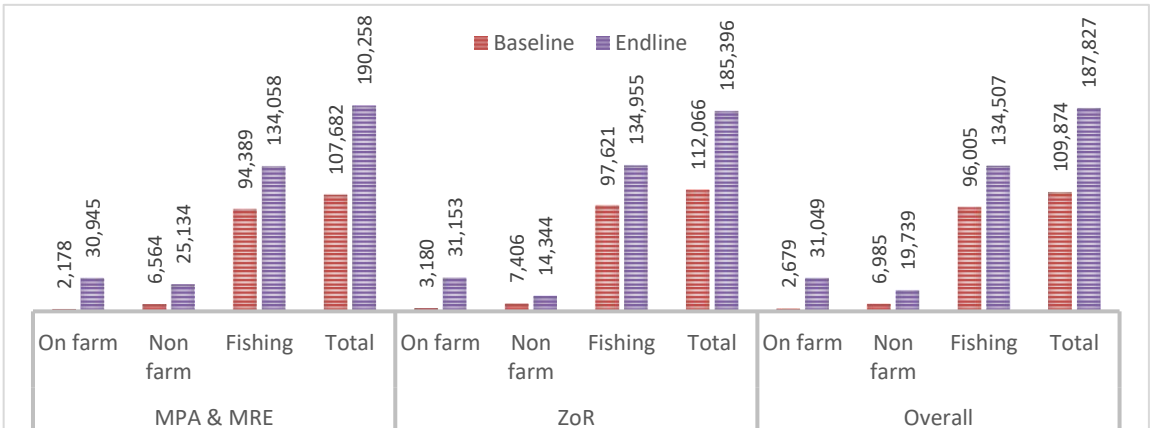


Figure 30: Survey results on income growth among artisanal fishing households through fishing and IGAs.

The baseline survey revealed that over 90% of fishing households relied solely on fishing for income. By contrast, the performance survey showed a significant shift, with the average number of income sources rising to 4.13. Now, 56% of households engage in both farm and non-farm activities, 95% in farm activities, and 37% in non-farm activities. Regarding the homestead horticulture component, among the 540 sampled households, 516 (95.5%) continued the activity. Similarly, in chicken rearing, out of 332 sampled households, 329 (99%) continued, in duck rearing, out of 182 sampled household 177 (97%) continued, and in goat rearing, 269 (95%) of the 284 sampled households continued the activity. These high continuation rates underscore the sustained interest and success of participants in these diversified income-generating activities.

Increased income from diversified livelihoods has positively influenced biodiversity conservation

[5] Islam and Zahura. 2024. Booklet on homestead small livestock and poultry rearing. Printed in *Bengali*.

efforts among fishing households. Awareness raising events along with enhanced financial stability has encouraged many to release endangered megafauna and reduce illegal fishing practices. The additional income serves as a strong incentive for adopting sustainable fishing methods, ensuring better compliance with conservation regulations and fostering responsible resource management. This demonstrates how economic empowerment can drive environmental stewardship in coastal communities.

To further explore these impacts, ECOFISH II engaged a Social Scientist to study the effects of livelihood interventions on the resilience of artisanal fishing households to vulnerabilities. The study also aimed to assess how these efforts contribute to biodiversity conservation and evaluate whether the ECOFISH II livelihood model could serve as a scalable solution for artisanal fishers. However, political unrest significantly disrupted the study, delaying its completion. Despite these challenges, the consultant successfully concluded the study and submitted the final report.

Empowering Communities for Conservation
Illegal shrimp larvae harvesting has become a growing threat to biodiversity in the coastal areas of Bangladesh. Nur Mohammad, a fisherman from the Teknaf coast, once relied on this illegal practice during fishing bans to support his family. However, after gaining knowledge through USAID's ECOFISH II project, he became aware of the harmful impact this activity had on marine ecosystems. With the support of the project, Rujina, his wife, transitioned to a more sustainable and profitable livelihood—goat rearing. Her efforts were rewarded when she successfully sold four goats, earning 47,000 BDT. Additionally, she retained five goats, valued at 60,000 BDT, which further boosted their family's financial stability. Rujina's success story is a powerful example of how ECOFISH II is transforming the livelihoods of coastal communities. Through technical and financial support, the project has empowered them to adopt sustainable practices, fostering both economic stability and marine ecosystem conservation. (*Story: Md. Shohel Rana, Research Assistant, Teknaf*)

Facilitate women empowerment, income and nutrition improvement

Engaging Community Volunteers

In year 5 (Jan-Nov 2024), ECOFISH II engaged 20 additional local women as Community Volunteers (CV)[6], bringing the total to 48 CVs across coastal fishing villages, with each overseeing 100–120 beneficiary fishing households. These trained volunteers are instrumental in engaging women from artisanal fishing households as active participants in Women Income and Nutrition Groups (WING). They have facilitated income-generating activities, basic and business literacy programs, and awareness sessions on gender, nutrition, climate change, and biodiversity conservation. CVs also

[6] Sharmin, R. and Sharmin, D. 2024. Community Volunteers' Journey of Empowering Women. WorldFish blog.

conducted household visits, manage financial records for IGAs, promote savings, and support Fisheries Conservation Groups (FCGs). Their efforts drive behavioral change toward sustainable practices and biodiversity conservation. By equipping CVs with knowledge and skills, the project enhances the likelihood of sustaining its positive impacts on marine biodiversity and community livelihoods.

Capacity building of Community Volunteers

During this year, ECOFISH II conducted two batches of Training of Trainers (ToT) and one refresher training (Figure 36) for the 47 local Community Volunteers (CVs) as part of capacity-building efforts. The training sessions clarified their roles within WING, focused on WING's institutional development, imparted knowledge on AIGA, and emphasized gender-related issues and biodiversity conservation. The training also equipped them with skills to organize and lead Business Literacy School (BLS) sessions for WING, and to conduct nutrition awareness sessions tailored for WING members. Facilitation for these sessions was provided by experts from WorldFish, the Department of Livestock Services (DLS), and the Department of Agriculture (DAE). Discussions on sustainability and phase-out strategies were integral parts of these training events.

Figure 36: Community Volunteers participated in the training on ECOFISH II implementation strategy for year 5 and Training of Trainers.

Community Volunteers as LSP development support

Fishing communities have limited access to essential services like vaccination for small livestock and poultry, ECOFISH II enhanced community access to quality livestock services and agricultural inputs by training of interested 43 out of 48 Community Volunteers (CVs) as Local Service Providers (LSPs). The training, led by experts from the Department of Livestock Services (DLS) and the Department of Agricultural Extension (DAE), connected volunteers with local private and public sector stakeholders. Training materials, including a primary treatment guidebook and kit boxes, were provided. After completion, CVs received certificates authorizing them as LSPs. Additionally, each trained CV received BDT 10,000 (ten thousand) conditional cash support to start small-scale business activities and serve their communities (Figure 37).

Figure 37: LSP development training for Community Volunteer at Kutubdia

The LSP development support strengthens community resilience by improving access to essential services like vaccination, poultry & livestock care, and agricultural inputs, reducing reliance on distant providers. By building local capacity and expertise, it fosters self-reliance and enables communities to better manage resources. The initiative also empowers Community Volunteers (CVs), enhancing their roles in community development and boosting social capital. Additionally, LSPs stimulate local economic activity by providing affordable, high-quality inputs and technical support, leading to better yields and healthier livestock, ultimately improving incomes and livelihoods.

Formation and operationalization of WING

In this year, 2,000 women from fishing households formed 68 Women Income and Nutrition Groups (WING) across 20 fishing villages under 07 ECOFISH II field offices, with a Community Volunteer guiding each group. These groups played a key role in implementing project interventions to enhance livelihood resilience and foster learning. Each WING formed an executive committee of 5 members (President, Secretary, Cashier, and 2 EC members), selected by the group following set guidelines.

ECOFISH II continues to strengthen the institutional development of the 169 Women Income and Nutrition Groups (WINGs) established in year 4 (Jan-Dec 2023) and Year-5, benefiting 5,000 women. The focus is on regular meetings, Business Literacy Schools (BLS), savings mobilization, income-generating activities (IGAs), and leadership development. Identifying gaps in the operational effectiveness of year-4 (2023) WINGs, ECOFISH II organized 27 batches of institutional capacity-building training for 517 WING leaders. This training covered group activities, work plan preparation, documentation, conflict resolution, savings management, and biodiversity conservation. Empowered leaders are expected to sustain group activities beyond the project period.

ECOFISH II has promoted savings among WING members, with 4,543 women from 155 WINGs continuing savings activities in 2024, contributing BDT 100/month to designated bank accounts. The field team assisted with updating financial documents during monthly meetings. In total, the 155 WINGs saved BDT 3,837,285 this year, bringing their cumulative savings to BDT 5,119,585 as of November 2024. WINGs meeting specific criteria, such as 80% regular savings, accurate documentation, and satisfactory IGA performance, received a matching fund of BDT 10,000 per WING. This initiative motivates savings and supports income-generating activities like poultry, small livestock rearing, homestead vegetable gardening, and small-scale businesses. All 155 WINGs received a matching fund totaling BDT 1,550,000.

Business Literacy School (BLS) is a key component of WING, with ECOFISH II offering 12 BLS sessions for Year 5 WINGs, covering topics such as basic literacy, income, nutrition, gender, biodiversity conservation, and climate change adaptation. Each WING attends 2 sessions monthly, consisting of BLS and WING meetings. These sessions help members develop skills in reading and writing Bangla, numerical literacy, and basic arithmetic. The project provided each WING member with a BLS book, which includes assessments to track progress. Community Volunteers played a central role in facilitating these sessions, addressing skill gaps with a tailored curriculum. They used visual aids, including AIGA festoons, for discussions on livestock care, vaccination schedules, and disease treatment. Additionally, a nutrition education session, supported by a flipchart, was developed to impart knowledge on nutrition, hygiene, family planning, and prevention of early marriage. In total, 101 WINGs from Year 4 and 68 WINGs from Year 5 completed 2,028 sessions, with over 85% attendance in each session during this reporting year.

WING celebrates National Nutrition Week 2024

ECOFISH II facilitated WING to celebrate "National Nutrition Week 2024" in 7 villages, engaging the community through rallies, awareness meetings, nutritious food demonstrations, and quiz competitions. A total of 363 participants (90% women and 10% men) attended the events, which were actively supported by WING leaders, FCG members, and Community Volunteers. This year's theme, "স্মার্ট বাংলাদেশ বিনির্মাণে, খাবার খাবো পুষ্টিগুণে (Eat nutritious food to build a smart Bangladesh), highlighted the importance of nutrition. Women, including pregnant and lactating mothers, and fishermen, received key nutrition messages on dietary diversity, maternal and child nutrition, and hygiene. WING members prepared nutritious foods and participated in food demonstrations and quiz competitions. Winners received prizes such as hand wash kits and soap. The events were attended by local authorities, including the Senior Upazila Fisheries Officer and the Senior Nutrition Specialist, and attracted coverage from 8 media outlets. To further promote nutrition, ECOFISH II distributed 8,000 colorful healthy food plates with dietary diversity messages to beneficiaries. The plates helped orient recipients on nutrition and encouraged them to adopt healthier eating habits. Anecdotal feedback suggested that the vibrant plates were well received, especially by children, and contributed to dietary changes within households.

WING member's knowledge assessment

The team has conducted final knowledge assessment of BLS with 982 members of year 4 WINGs which is 32% of the total members representing each WING. This assessment evaluated changes in knowledge and practices related to nutrition, gender, conservation, and business literacy after completing 24 sessions. Results show a significant enhancement in business literacy. Skills improved notably: the percentage of participants able to sign their names rose from 29% to 65%, those reading and writing in Bengali increased from 20% to 55%, and general calculation proficiency improved from 23% to 62% (Figure 38). The BLS program has had a substantial impact, empowering women economically and increasing their involvement in household and community decision-making while raising awareness of gender issues, nutrition, and aquatic biodiversity conservation. In a similar way the team has also conducted the knowledge assessment of BLS with 632 members of year 5 WINGs which is 32% of the total members representing each WING. Results show a significant enhancement in business literacy, with average scores increasing from 21 in the initial assessment to 56 in the final evaluation. Whereas for year 4 WINGs average scores increased from 22 in the initial assessment to 58 in the final evaluation.

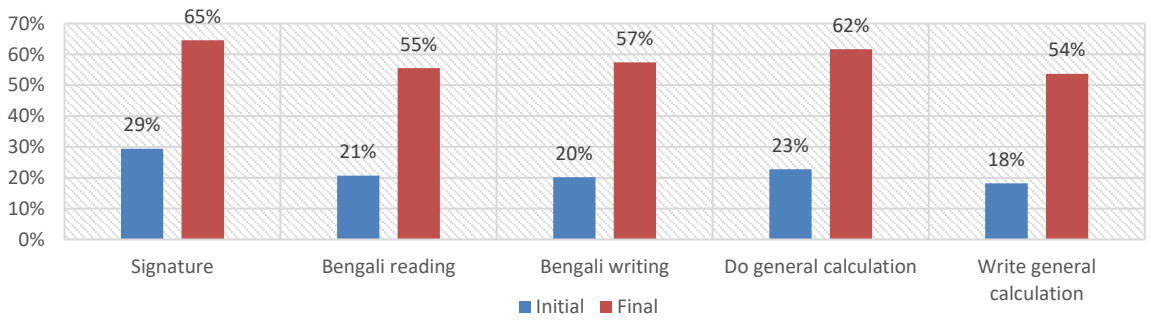


Figure 38: Changes in knowledge on business literacy of the year 4 WING members

On the nutrition front, a notable shift in nutritional knowledge and practices has been observed. Their knowledge score increased to 73 at final assessment while it was 45 at initial stage signifying their overall understanding of child and maternal nutrition and other essential nutritional practices. Basic nutrition related ten questions were asked, and the figure 40 presented the change in their knowledge level on the specific subject matter; knowledge has improved in every aspect, but remarkable changes are found for dietary diversity, nutrition for first 1000 days of children, vegetable importance, and critical times of handwashing.

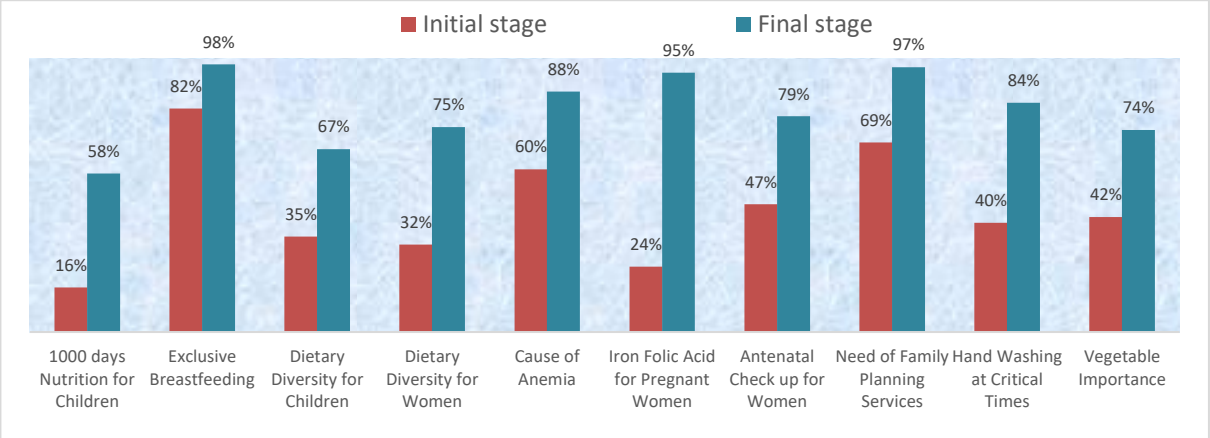


Figure 39: Percent of year 4 WING members have knowledge on 10 aspects of nutrition at initial and final stage.

Similar assessment with year 5 beneficiaries shows that knowledge score increased to 68 at final assessment while it was 39 at initial stage. However, for year 4 the knowledge score was 45 and 73 at the initial and final stage respectively (Figure 40). The score is quite lower in ZoR than in MPA and MRE for both years. The changes in the score signifying their overall understanding of child and maternal nutrition and other essential nutritional practices.

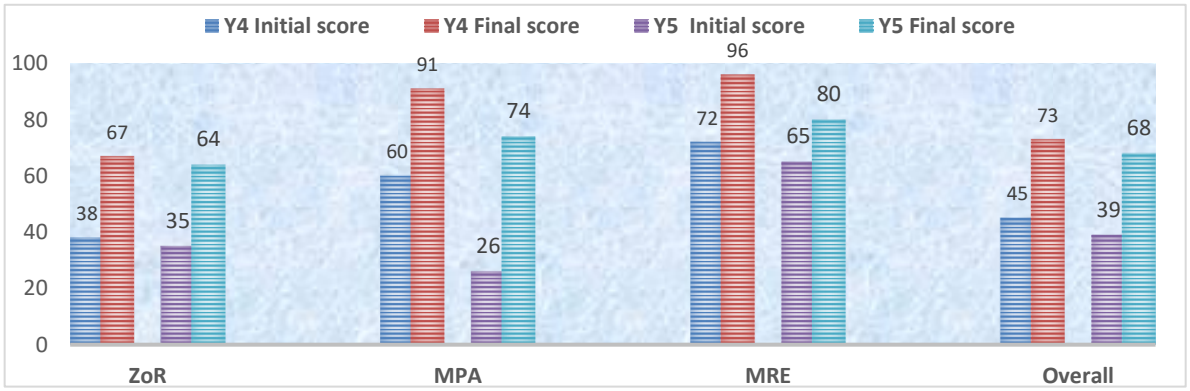


Figure 40: Changes in the nutrition knowledge score for the year 4 and year 5 WING members.

Community Savings Group (CSG)

ECOFISH II continued its rigorous monitoring of the activities of 38 Community Savings Groups (CSGs) formed in years 2 and 3 comprising 1,175 women of the fishing households. During this year, the team has assisted 38 groups by updating their documents, collecting monthly savings, and ensuring smooth loan repayment processes. The team organized 48 meetings with 1,091 CSG members. These groups have collectively saved BDT 248,788 during this year, and they have cumulative savings of BDT 1,943,333 up to November 2024. ECOFISH II has transferred matching funds to 2 CSGs following the CSGs matching fund distribution guideline during this reporting year.

Qualitative assessment of WING, BLS and CV approach

The Women Income and Nutrition Group (WING), together with the Business Literacy School (BLS) and the engagement of local women Community Volunteers, has emerged as a promising model for

promoting scalable best practices that enhance income, nutrition, conservation, and other positive, albeit unintended outcomes. However, before endorsing this approach for livelihood enhancement and conservation efforts, or for any future rural development initiatives, ECOFISH II assessed its outcomes. This evaluation examined the strengths and weaknesses of the current framework and offered actionable recommendations for refining these initiatives.

The WING Initiative: A Platform for Resilient Livelihoods[7]

The assessment of the WING aimed to evaluate its effectiveness and determine the extent to which intended outcomes were achieved. Utilizing a qualitative approach, the evaluation involved 17 Focus Group Discussions (FGDs) with WING leaders across 17 villages, ensuring representation from the participants in both Year 4 and Year 5. Additionally, 18 interviews were conducted with CVs, supplemented by Key Informant Interviews with Research Associates and TMSS representatives, to gather insights into the implementation and effectiveness of WING. The performance of the WING was commendable, with 81% rated as "Outstanding" or "Very Good," reflecting significant contributions toward achieving WING objectives. The initiative successfully fostered collaboration among members, emphasizing income-generating activities and improved nutrition, while participants acknowledged the value of social bonds through shared learnings and community support. However, challenges such as social conflicts, varying capacities among members, and logistical issues regarding meeting spaces and savings collection were identified. To enhance the sustainability of the WING initiative, it is recommended to implement a three-year plan featuring a graduation model and a clear sustainability strategy focused on capacity-building for leaders, strengthening group management, and promoting community stewardship activities. Overall, the WING initiative has effectively strengthened social bonds and created a supportive environment for community development.

Business Literacy School (BLS): Integrating Literacy, Nutrition, Gender, and Conservation practices

The Business Literacy School (BLS) effectively enhanced business literacy, basic education, and awareness of income, nutrition, gender, and conservation among WING members in fishing communities. Conducted over 12 months with 24 sessions facilitated by CVs, the program used user-friendly tools like flipcharts, engaging stories such as *Jorinar Golpo*, and rhythmic elements to make learning accessible and enjoyable. Participants gained reading, writing, and basic math skills, fostering self-reliance and improved decision-making, with many advocating for their children's education. Key challenges included distractions, limited session time, rapid topic coverage, and inadequate study spaces. Recommendations included extending session durations, reducing daily topic load, providing a dedicated learning space, and enhancing facilitator training. Participants valued all materials and suggested adding larger flashcards, more writing practices, and integrating real-field demonstrations. Family and community support significantly bolstered attendance, though some hesitated to participate due to project-related stigma.

CVs highlighted improved problem-solving skills through training but faced communication challenges when outsiders were present. Recommendations for improvement included offering BLS to men, integrating awareness topics into materials, streamlining documentation, and expanding the curriculum to include basic English and higher education levels.

Community Volunteers: Bridging the gaps[8]

ECOFISH II has mobilized 48 local women as CVs, each supporting 100-120 beneficiary fishing households with a focus on income generation, nutrition, literacy, and conservation. These volunteers have played a key role in promoting savings, biodiversity conservation, and community development, particularly among WING members and FCGs. The evaluation, based on interviews and focus group discussions, shows that 86% of CVs are rated as "Outstanding" or "Very Good." They have facilitated BLS classes, training sessions, and nutrition awareness, leading to improved household income

[7] Sharmin, D. 2024. Power Dynamics in Marginalized Fishing Communities Shift with Women's Empowerment. WorldFish blog

[8] Sharmin, R. and Sharmin, D. 2024. Community Volunteers' Journey of Empowering Women. WorldFish blog.

activities and better nutrition knowledge in their communities. The capacity development of CVs has empowered them with skills in public speaking, resourcefulness, and leadership, fostering unity and advocacy for conservation. However, sustaining their work requires continued support, as phase-out could disrupt progress. Challenges like partial engagement, skills gaps, and biases must be addressed.

Women Congress: Upazila level exposure workshop for WING and CSG leaders

ECOFISH II organized seven day-long "Women Congress"[9] events across seven field stations, uniting 740 participants, 84% of whom were women from artisanal fishing households (Figure 41). Held under the slogan "Women are becoming aware of biodiversity conservation, contributing to life and livelihood" the congress aimed to share experiences, address challenges, and discuss the future of women's group activities. Stakeholders included government officials, private sector representatives, CVs, female Blue Guards, and ECOFISH II team members. Women participants celebrated the positive impact of ECOFISH II, citing alternative income opportunities, climate-resilient technologies, and improved vegetable cultivation practices like sack bag and rooftop gardening. These initiatives enhanced financial and nutritional well-being, supported education and health costs, and fostered savings habits. The BLS sessions improved literacy, basic math, and awareness of nutrition, gender, and conservation, empowering women to manage finances and engage with banking services.

Community Volunteers and Blue Guards shared successes in income generation and conservation, earning recognition within their communities. However, participants noted challenges such as climate change impacts, limited market access, and the need for advanced skills training and infrastructure improvements. Government officials pledged continued support, including Fisher Identification Cards (FID) for ECOFISH II fishers, enabling access to social safety net programs. The congress underscored the importance of sustained capacity building and market linkages to empower fishing communities and strengthen their resilience.

Figure 41: Glimpse of Women Congress at different stations in participations of women from fishing households and other relevant stakeholders.

Phase out meeting

During this reporting period, ECOFISH II has completed the phase out of 169 Women Income and Nutrition Groups (WING) with the participation of 4,883 women (Figure 42) following "WING exit strategy." This achievement follows the implementation of a structured "WING exit strategy," which was designed to ensure that the groups can sustain their activities and benefits independently after the project's support ends. . Additionally, ECOFISH II has completed the phase out of all 53 CSGs following the "CSG Exit Strategy" guideline, aiming to empower CSG members to independently manage group operations, leading to the conclusion of associated activities. During this year, it has conducted 38 CSGs phased out meetings with 1,028 members.

[9] Sarmin, 2024. Strengthening Social Capital: Women as Catalysts for Change in Coastal Bangladesh. WorldFish blog

As part of the phase out strategy, a booklet[10] on nutrition and gender awareness has been developed with thematic illustrations to make the key messages more understandable for all WING members, reinforcing what they have learned during the WING awareness sessions. The booklet covers essential nutrition topics, including dietary diversity, optimal nutrition practices during the critical 1,000-day window, adolescent nutrition, hygiene promotion, sanitation, safe drinking water, family planning, and the prevention of early marriage. Gender awareness is also integrated as a crucial component. A total of 8,000 booklets have been printed and distributed to the ECOFISH II beneficiaries across years 1 to 5.

Figure 42: ECOFISH II officials facilitating the phase out meeting with WING members.

Accelerate nutrition sensitive homestead horticulture

ECOFISH II has a special focus on improving the nutrition situation of the poor fishing HHs considering their nutrition vulnerabilities. A combination of factors, including lower income levels, limited technical knowledge, limited availability, and constraints in homestead space, all of which may lead to reduced consumption. On the other hand, the villages are relatively vulnerable to natural disasters. In the project areas, about 66% of fishing households face food deficits, with 40% experiencing occasional shortages and 26% facing chronic scarcity. Food shortages are most common in July, August, and November, particularly during and after the fishing ban. This affects dietary diversity, with 52.4% of households having low diversity scores. Among households with pregnant women (59.3%) and children under 2 years (51.2%), dietary diversity is also low, indicating inadequate nutrient intake. The 2024 BHHI survey found that only 12% of households own agricultural land, while 80% have homestead space for vegetable farming. However, just 57% engage in year-round cultivation, while 9% and 26% farm in summer and winter, respectively, and 7% don't grow vegetables. Despite daily recommendations for vegetable consumption, the average consumption is 3.98 days per week, reflecting micronutrient insufficiency.

ECOFISH II has worked to encourage fishing households to utilize their available space and underused homestead land for vegetable cultivation and promote a shift in their dietary patterns. These efforts involve introducing climate-smart appropriate improved practices that enable year-round access to a diverse range of nutritious foods, as well as providing extension services. In the long term, this initiative aims to enhance food and nutrition security and dietary diversity and habits within households, particularly benefiting women and children. Additionally, it strengthens women's participation in economic activities, contributing to the overall income of the households.

A total of 1,961 WING members (98.4%) from year 5 have received training in nutrition-sensitive homestead vegetable gardening (Figure 43), despite facing challenges from unusually heavy rainfall

[10] Islam and Sharmin, 2024. Booklet on Nutrition and Gender Awareness for Women in Marine and Coastal Artisanal Fishing Communities. Printed in *Bengali*.

and political unrest. The training was designed to enhance participants' technical skills in homestead gardening, allowing them to utilize these skills beyond the ECOFISH II program. Beneficiaries were connected with the essential services and markets through the training, which was facilitated by Sub-Assistant Agriculture Officers (SAAOs) from the Department of Agriculture Extension (DAE) or Local Service Providers (LSPs) from the private sector.

Figure 43: Orientation for beneficiaries along with distribution of nutrient-rich vegetable seed and organic fertilizer packs in Cox's Bazar Sadar.

During summer, ECOFISH II has provided vegetable seed packages and organic fertilizers to 7,733 beneficiary households across year 1-5. Considering the effect of cyclone Remal and other climatic events like heavy rain, and winter as a good season for vegetable production, year 4 WING members also were included to provide winter vegetable seed pack along with the year 5 members. Thus, a total of 4,883 received a winter vegetable seed package to enhance year-round production and consumption of nutrient-rich vegetables. Based on the nutritional diversity, season, and local context, beneficiaries were provided with 6-9 types of vegetable seed packages in each season. In addition, a user-friendly booklet[11] on nutrition-sensitive homestead vegetables gardening has been distributed to 6,733 beneficiaries of year 4 & 5 and selected beneficiaries of year 1-3.

In March 2024, the team assessed the vegetables production status among 958 year-4 beneficiaries, 32% of total covering each WING who have received the seasonal vegetable seed package earlier. The assessment covered production, consumption, sales, and captured the learning and challenges and the climate-resilient techniques and local-level adaptive solutions. Despite challenges like cyclones and saltwater intrusion, all households successfully grew vegetables. On average, each household produced 50.2 kg of winter vegetables, consumed 31.4 kg, and sold 18.9 kg, generating an average income of BDT 1,103 per household from surplus sales.

Assessment result revealed that vegetable cultivation among artisanal fishing households varied significantly before joining ECOFISH II, with 40% not engaging in it at all. Only 5% grew vegetables in the summer, 32% in the winter, and 23% year-round. After ECOFISH II interventions, there was a marked improvement. Only 2% of households reported no cultivation, and year-round cultivation rose sharply to 77%, indicating a positive shift towards consistent food production (Figure 45). Additionally, 65% of fishing households began purchasing seeds locally, showing increased self-sufficiency.

[11] Islam et al., 2024. Booklet on nutrition sensitive homestead horticulture for marine and coastal fishing communities. https://hdl.handle.net/20.500.12348/5964

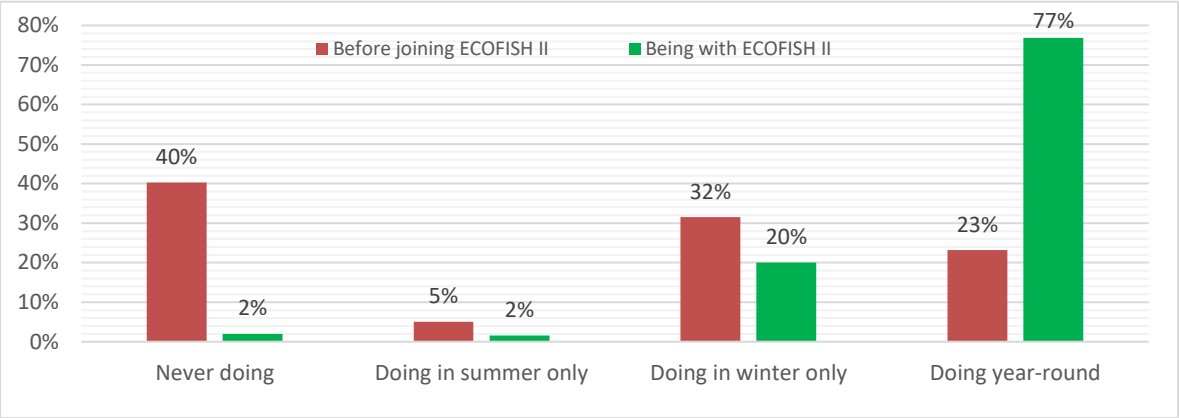


Figure 44: Improvement in vegetable production by the ECOFISH II beneficiary households

Beneficiaries, particularly women, adopted climate-resilient techniques like rooftop gardening and sack or tray planting to overcome land constraints and soil infertility from salinity and sand intrusion. These methods have boosted their confidence, enabling them to support their families' food supply and earn income. ECOFISH II's interventions have played a key role in promoting year-round vegetable cultivation, enhancing food and nutrition security, and improving livelihood resilience.

The Year-5 ECOFISH II performance survey revealed that households under intervention achieved an average vegetable production of 164 kg, with Marine Protected Areas (MPA) producing 180 kg and Zone of Resilience (ZoR) producing 147 kg. Due to heavy rain and extreme weather, vegetable production was lower than the previous year's 211.2 kg per household. Beneficiaries consumed 65 kg of their vegetables, shared 14 kg as gifts, and sold 85 kg, generating a surplus valued at 6,060 BDT, with production costs of 1,058 BDT per household.

Innovative farming thriving families
Rabeya Khatun (38), a housewife, and Aman Ullah (40), a fisher from Dakkhin Lengur Beel village in Teknaf, benefited from an ECOFISH II training on climate-smart vegetable cultivation using sack bags, rice beds, and bamboo lofts. With the vegetable seeds provided by ECOFISH II, Rabeya earned 16,000 BDT by selling surplus produce after household consumption. She is pleased to contribute to her family's nutritional needs and her children's education. (*Story: Md. Shohel Rana, Research Assistant, Teknaf*)

The 2024 BHHI survey showed that only 7% of households previously earned income from vegetable cultivation, while 78.5% now benefitted from it, highlighting the positive impact of project

interventions. Weekly vegetable consumption, along with other food groups like fruits, eggs, meat, fish, milk, and sweets, has improved, contributing to a more diverse diet. The survey also showed an increase in food availability, reducing food deficits and boosting food surpluses, as shown in Figure 45.

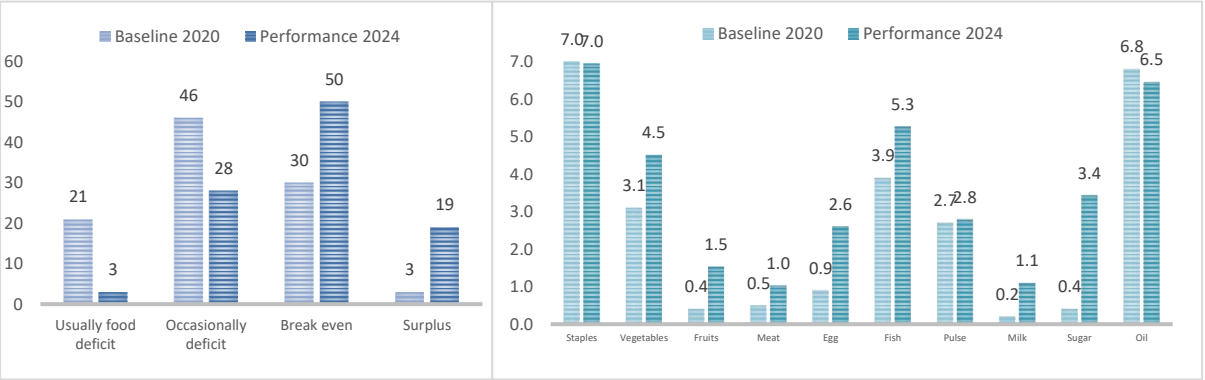


Figure 45: Changes in household food availability (% of HHs) and weekly consumption of different food groups by artisanal fishing community (number of days consumed the specific food groups).

Finaly, the Household Dietary Diversity Score (HDDS)[12], a key indicator of ECOFISH II, has improved to 7.94 from 5.3 at baseline, with 73% of households reaching the score to an acceptable level. The highest 8.9 score of 8.9 was in Kutubdia and lowest in Rangabali (7.08) and second lowest in Ukhiya (7.67). However, the overall HDDS is still low/unacceptable for 23% fishing households; the percentage of HH with lower dietary diversity is highest 47.5% in Ukhiya among all the surveyed upazilas. This is probably due to the pressure created by Rohingya influx in the supply and price of the foods.

Access to improved technology and market linkages

Seaweed offers significant benefits for carbon sequestration, climate change mitigation, and alternative income generation, making them a promising nature-based solution. ECOFISH II partnered with Chattogram Veterinary and Animal Sciences University (CVASU) to advance seaweed farming through research and development. This collaboration led to the creation of floating culture technologies for *Gracilaria* and *Hypnea musciformis* seaweeds, with results published in Aquaculture[13] and Aquaculture Reports[14]. ECOFISH II also developed a habitat suitability map for three seaweed culture systems, focusing on four species, providing valuable insights for the growing seaweed industry in Bangladesh. The findings were published in Algal Research[15].

Seaweed farming in Bangladesh holds significant potential, but challenges persist in both seaweed and green mussel farming, including technical, social, economic, and climate-related issues that must be addressed to fully realize their benefits. To tackle some of these challenges, the partnership with CVASU was extended to strengthen mariculture efforts in Bangladesh. Together, they co-designed several field trials, detailed in Table 8, to achieve specific objectives.

[12]The household dietary diversity score (HDDS) is a qualitative proxy measure of the socio-economic level of the household food consumption that reflects household access to a variety of foods. It uses a simple count of 12 different food groups (cereals, pulse, root and tubers, leafy vegetables, fruits, meat, eggs, fresh or dried fish, dairy products, sugar, and edible oil) that a household has consumed over the preceding 24 hours. The indicator employed and calculation methods were developed by the USAID-funded Food and Nutrition Technical Assistance (FANTA) project. HDDS ≥7 represents a household having acceptable dietary diversity score.

[13] Banik, et al. 2023. Comparative performances of different farming systems and associated influence of ecological factors on *Gracilaria* sp. seaweed at the south-east coast of the Bay of Bengal, Bangladesh. *Aquaculture*

[14] Mohiuddin et al. 2023. Influence of cultivation systems and associated environmental factors on the growth performance of *Hypnea musciformis* seaweed at the south-east coast of the Bay of Bengal, Bangladesh. *Aquaculture Reports*

[15] Tasnim et al. 2024 Site suitability mapping for different seaweed cultivation systems along the coastal and marine waters of Bangladesh: A Generalized Additive Modelling approach for prediction. *Algal Research*

Table 8. Results of different trials on seaweed and green mussel initiatives in 2024

Trial	Objectives	Results
Bio-economic analysis of seaweed under different culture systems	Understand the economic efficiencies of different seaweed farming systems	Seaweed cultivation offers a return on investment (ROI) ranging from 42.7% to 295%. While off-bottom systems yield the highest ROI at 118.5% to 295%, they are limited by cultivation space. The newly introduced floating long-line system provides a ROI of 42.7%.
Culture feasibility of new agar and carrageenan-enriched seaweeds	Agar and carrageenan-enriched seaweed species adapted in culture conditions	Among the two *Gracilaria* species, *G. gracilis* thrived in the indoor system, while *G. textori* was not collected from St. Martin's Island. Of the two *Hypnea* species, *H. valenti* performed well in both indoor and outdoor culture systems, whereas *H. cervicornis* survived indoors but lacked sufficient seed for outdoor cultivation.
Seaweed culture in indoor facilities	Year-round seaweed seed availability	The tissue culture of *Gracilaria* sp. has been successful. *Ulva lactuca* and *Gracilaria* sp. grow well in both aquarium and tank using different nutrient media.
Seaweed culture in saline shrimp gher	Scale out the technology to the southwestern coast of Bangladesh.	*Gracilaria* sp. grow well in shrimp farming gher. Among culture systems, hapa and broadcast systems perform well compared to the floating longline system. In large ghers, floating long-line system would perform better.
Multi-layer seaweed farming	Utilizing ecosystem niche and increase production	Seaweed grows well in the surface layer. In lower depth, seaweed washed away due to strong tidal surge. The initial observation suggested multi-layer seaweed farming is not commercially feasible.
Nature-based captive breeding techniques for green mussels	Availability of natural green mussel spat Conservation	Significant spat settlement has been observed at both Khurushkul and Moheshkhali sites, indicating the suitability of commercial-scale green mussel cultivation. Initial findings suggest that captive breeding approaches can increase spat settlement by 8–10 times.
Develop depuration protocols for cultured green mussels	Supply safe green mussels to the consumers	After 72 hours of depuration with UV treated water, the pathogenic bacterial loads of green mussels significantly reduced and suitable for human consumption.
Feasibility of seaweed farming at open sea in Kutubdia	Understand the challenges at open sea seaweed farming	Strong tidal surge of open sea washed away seaweed from rope in some cases. Seaweed growth has been observed in the floating system, but further trials are required to draw conclusions regarding its feasibility.

Figure 32: Observed the highest spat (seedling) settlement in two locations in the Bakkhali River (Khuruskhul, Cox's Bazar Sadar and Mudirsara, Moheshkhali over the course of the three-year research.

Figure 31: Developed tissue culture protocols for two important seaweed species, *Gracilaria* and *Ulva*. The left image shows tissue growth of *Gracilaria* in a petri dish, while the right image depicts various trials conducted to optimize growth media for *Gracilaria* and *Ulva*.

Figure 33: Depuration protocol trial of green mussels to ensure safety for consumption (left) and bacterial load assessment under laboratory conditions (right)

ECOFISH II, in collaboration with the Department of Fisheries, conducted a national-level workshop on August 27, 2024. The event engaged 60 key stakeholders, including policymakers, industry representatives, academics, NGOs, and entrepreneurs (Figure 34). Its purpose was to share findings and insights from ECOFISH II's research and development efforts related to the seaweed and bivalve value chains and to discuss future directions for unlocking the potential of mariculture in Bangladesh. During the workshop, ECOFISH II presented a draft 10-year Low-Trophic Extractive Mariculture (LTEM) strategy[16] for Bangladesh, developed with CVASU. The strategy addresses challenges in mariculture, including inefficiencies from project-focused approaches, a weak value chain, poor stakeholder coordination, lack of research investment, and inadequate regulatory frameworks. Twelve key intervention areas were identified through literature reviews and interviews, and stakeholders collaboratively selected and prioritized actions to support LTEM growth and a blue economy in Bangladesh. This approach ensured a strategic, phased plan for advancing mariculture development.

Figure 34: The Director General,DoF, Director (Blue Economy) at DoF, and the Interim Country Director of WorldFish participated in a workshop titled "*Seaweed and Bivalve Seafood Value Chain in Bangladesh: Research Outcomes and Future Directions*" held at the DoF.

Unlocking the Nutritional Potential of Seaweed for Coastal Communities

Seaweed is a nutrient-rich food, packed with vitamins A, C, E, K, and essential minerals like iodine, calcium, and magnesium, offering significant potential to improve nutrition in Bangladesh's coastal communities. However, its adoption remains limited due to unfamiliarity and a lack of awareness about its nutritional benefits, resulting in low demand. This low demand contributes to the slow growth of seaweed farming in Bangladesh. To promote seaweed consumption in coastal communities, ECOFISH II organized four awareness-building events, engaging 123 women from fishing households in Ukhiya, Cox's Bazar Sadar, Moheshkhali, and Kutubdia, areas involved in seaweed farming trials. The events educated participants on seaweed's nutritional benefits, included sensory testing of seaweed-based foods, and assessed interest in its use. Women received 250g of dried seaweed to try at home but showed reluctance due to concerns about taste, color, and flavor. This highlights the need for further motivational efforts to address cultural barriers and encourage seaweed adoption as a food source, emphasizing the need for continued motivational initiatives to promote its acceptance.

Aiming to produce nutrient rich, diversified and locally acceptable food items with seaweed and fish powder, a seafood recipe book[17] has been developed with support from a national renowned chef. Seaweed and dried fish powder have been used as much as possible to increase the amount of protein, iron and other nutrients. Additionally, a range of delicious, visually appealing, and easily preparable dishes has been developed using locally available ingredients. These recipes are designed to appeal to the entire family, promoting the consumption of these nutritious ingredients. The book emphasizes

[16] Advancing low-trophic extractive mariculture (LTEM): Strategies for a thriving blue economy in Bangladesh. Published in Marine Policy. https://doi.org/10.1016/j.marpol.2024.106557

[17] Islam. Samiul, 2024. Seafood recipe book with seaweed and fish powder. WorldFish

the nutritional benefits of seaweed and small marine fish, highlighting their importance in enhancing the nutritional contents of meals.

Figure 35: Seaweed harvested from trial ponds, used in local awareness-building and cooking demonstration events in Ukhiya

Support safe and hygiene dried fish production and marketing

Despite facing challenges in scaling up safe and hygienic dried fish production as a business other than household nutrition, the project further explored the feasibility of small-scale dried fish production as an alternative income-generating option for artisanal fishing households. Therefore, ECOFISH II engaged 50 women of the fishing households in the safe and hygienic production and marketing of dried marine fish during the last winter season in Cox's Bazar and Kutubdia. Mixed results have been observed in terms of profit making in an assessment of 47 beneficiaries. During the winter season from December to February, households earned an average profit of BDT 807 per cycle from dried fish production investing an average BDT 3,105. This led to an overall average profit of BDT 2,575 per season engaging in an average of 3.19 cycles. The households, on average, produced 34.13 kilograms of dried fish, consumed 1.48 kilograms, and sold the rest, averaging 31.97 kilograms, at BDT 525 per kilogram. This resulted in a total value of BDT 17,918 of dried fish produced per household.

All 47 beneficiaries (100%) sourced raw fish from nearby fish-landing centers, with 51% also utilizing scattered locations. Selling practices varied: 40% sold dried fish wholesale from home, 9% engaged in retail sales at home, and 47% adopted a mixed approach. Key challenges included high raw fish costs and limited availability, reported by all respondents. Additionally, 41% emphasized the need for more processing time to ensure safe and hygienic production, requiring extra labor. Use of mosquito nets extended drying time for 32%, while 36% cited low market prices, and 26% noted low demand for safe dried fish. Weather issues, such as rain and fog, affected 60% of respondents.

Ready-to-use fish and seaweed products

NSTU has developed a composite nutrient-rich ready-to-use (RTU) dried fish powder using seven indigenous small marine fish species from the Bay of Bengal. Based on the research outcomes, ECOFISH II Senior Nutrition Specialist has articulated the nutritional importance of the developed powder in a recently published blog titled "Combating Malnutrition with Small Pelagic Marine Fish in Bangladesh." Additionally, another blog titled "New Study Highlights Nutritional Benefits of Dried Small Fish in Bangladesh" was published online by Dried Fish Matters, emphasizing the findings.

ECOFISH II and NSTU evaluated the market orientation impact on Ready-to-Use (RTU) marine small

pelagic fish and seaweed powders. The study revealed strong consumer interest, with fish powder recipes rated highest due to familiarity with dried fish. About 95% of retailers viewed the products as profitable, and 60.71% of customers expressed willingness to purchase them annually. Findings highlight the potential of RTU powders to address malnutrition and improve dietary diversity in Bangladesh. Strategic marketing, consumer education, and further research on long-term behavior and production scalability are essential for maximizing public health benefits.

Strengthening the Dried Fish Value Chain: Insights from ECOFISH II

One study was commissioned to investigate the dried fish sector in southeastern Bangladesh, focusing on Cox's Bazar Sadar, Ukhiya, and Teknaf. Originally dominated by Ribbon fish and Bombay duck, the industry has expanded to include 21 species, such as anchovy and shrimp. Overfishing of key species like Bombay duck and Ribbon fish has led to supply shortages, prompting imports from India and Myanmar. Large-scale fisheries (LSF) now account for approximately 70% of the dried fish supply in Cox's Bazar, a significant increase from virtually none two decades ago. The volume of dried fish production has tripled in the past 20 years, with the dry season (October-April) contributing to over 70% of annual production. While modern drying technologies, such as UC Davis Chimney and mechanical dryers, have been trialed, they have faced challenges with long-term sustainability. Traditional sun drying, utilizing available yard space and better supply chain management, remains the favored method. Cold storage facilities are urgently needed to preserve both products and raw fish, particularly during the wet season. Producers face challenges from monopolistic traders in Chattogram and limited access to diverse markets. Although women entrepreneurs have enhanced drying practices to produce higher-quality products, gender disparities and restricted market access continue to hinder progress. ECOFISH II initiatives have provided support at the household level, but challenges such as raw fish shortages and high production costs make long-term sustainability difficult. Research should focus on improving packaging, storage, and processing to meet the growing demand of export markets. However, advancements in cold storage and market infrastructure are crucial for fostering business growth, reducing costs, and enhancing product quality. At the consumer level, the establishment of a local certification system could help boost confidence in premium-quality dried fish, enabling producers to command higher prices for their products.

3 Communications

In 2024, USAID's ECOFISH II successfully collaborated with the Department of Fisheries during all the significant events like National Fish Week, Jatka Conservation Week, the 22-day Hilsa brood fishing ban period, the 65-day marine fishing ban period and the awareness-raising and communication advocacy materials printed under their supervision. For mass awareness creation, in collaboration with the DoF, 40,000 posters (10,000 posters for the Jatka Conservation Week, 20,000 posters for 65-day marine fishing ban period and 10,000 posters for 22 days Hilsha Fishing Ban period) were produced and disseminated in collaboration with the DoF. In addition, 8,000 healthy food plates and 8,000 booklets on nutrition awareness were printed and distributed and 2,200 T-shirts were produced to celebrate National Fish Week in collaboration with the DoF.

One thousand seven hundred and fifty (1,750) mementos (mugs) for biodiversity awareness raising campaigns among boys and girls of higher secondary schools, 760 mugs to celebrate "Women Congress" and 665 mugs to celebrate "Artisanal Fishers Congress" were produced and distributed. 150 uniforms for Blue Guards (cap, t-shirt, trouser, shoe/ gumboot) were produced and distributed. 300 caps for the ECOFISH II team, stakeholders and government representatives were produced and distributed. 271 banners, 267 festoons, and 04 billboards were designed and printed for the events, trainings, workshops and other purposes. 200 stickers were produced on biodiversity conservation and ecosystem health improvement.

Five blogs posted on intervention as follows-

- Combating Malnutrition with Small Pelagic Marine Fish in Bangladesh.
- Power Dynamics in Marginalized Fishing Communities Shift with Women's Empowerment,
- Community Volunteers' Journey of Empowering Women,
- Women Driving Change: Blue Guards Combat Ghost Gear and Plastics
- Strengthening Social Capital: Women as Catalysts for Change in Coastal Bangladesh

In collaboration with the Department of Fisheries, two talk shows were telecasted on-

- Jatka conservation and Hilsha Management with the DBC channel
- Celebrating National Fish Week

174 media engagements were received from print, electronic and online media through ECOFISH II's comprehensive activities to improve fishers' livelihood resilience, conserve biodiversity, and enhance ecosystem resilience. Thirteen social media posts have also been created during the past eleven months.

Table 9: Media engagement list during January –November 2024:

S.N.	News Title/ Event Name	Name of the Media	Links
1.	Jatka Conservation Week	Talk show on DBC csb24.com, Rupantor News, Daily Trityiomatra, Naf Radio, Uttorer Somoy, The Daily Hawor Barta, Cox's Bazar Tribune	DBC csb24.com, Rupantor News, Daily Trityiomatra, Naf Radio, Uttorer Somoy, The Daily Hawor Barta, Cox's Bazar Tribune,
2.	Training workshop for Blue Guards	Bangladesh Pratidin, Ekattor TV, Ajker Rupantor, Ekusheysongbad.com, Themailbd.com, Banglatimes, Daily Observer, Bijoy TV, Tritiyamatra, Current Connect News, Daily Agamir Songbad, newsno24.com, Coxbazar Barta	Bangladesh Pratidin, Ekattor TV, Ajker Rupantor, Ekusheysongbad.com, Themailbd.com, Banglatimes, Daily Observer, Bijoy TV, Tritiyamatra, Current Connect News, Daily Agamir Songbad, newsno24.com, Coxbazar Barta
3.	The unexpected death of jellyfish is alarming.	BBC Bangla, Daily Star, Daily Prothom Alo, Somoy TV, Ekattor TV	BBC Bangla, Daily Star, Daily Prothom Alo, Somoy TV, Ekattor TV
4.	Blue Guard's beach cleaning	Daily Sokaler shomoy	Daily Sokaler Shomoy
5.	International Women's Day	Daily Bhorer Dak, cbnbd.com, Uttorer Somoy, daily agamir songbad, Barishal Bani, Sangbad Chitra	Daily Bhorer Dak, cbnbd.com, Uttorer Somoy, daily agamir songbad, Barishal Bani, Sangbad Chitra
6.	Biodiversity conservation, safety at sea and responsible fishing	Daily Jaijaidin, Asian TV, CSB24.com, Tritiyamatra, cbnbd.com	Daily Jaijaidin, Asian TV, CSB24.com, Tritiyamatra, cbnbd.com
7.	Rarest species catch	Daily Prothom Alo, Daily Samakal	Daily Prothom Alo, Daily Samakal
8.	First aid kit distribution	cbnbd.com, Daily Shangu	cbnbd.com, Daily Shangu
9.	Pocketed Gillnets and other illegal nets pose a danger to fish spawn and fingerlings	Bangla Vision, Daily Samakal	Bangla Vision, Daily Samakal
10.	St Martin LFCC gets new body	Daily Observer	Daily Observer
11.	Turtle egg hatchery:	Daily Sokaler shomoy	Shokaler Somoy
12.	Dead species in sea-beach		Daily Prothom Alo,

S.N.	News Title/ Event Name	Name of the Media	Links
13.	World Ocean Day celebration	Daily Bangladesh Pratidin, Daily Jugantor, Daily Jaijaidin, Ekattor TV, Daily Sokaler Somoy, Jagonews24.com, Tritiyamatra.com, Rupantor News.tv, Daily Sangu, Dhakatimes24.com, Amadersomoy.com, Naf Radio	Daily Banlgadesh Pratidin, Daily Jugantor, Daily Jaijaidin, Ekattor TV, Daily Sokaler Somoy, Jagonews24.com, Tritiyamatra.com, Rupantar News.tv, Daily Sangu, Dhakatimes24.com, amadersomoy.com, Naf Radio.
14.	IUU fishing Day	Daily Bangladesh Pratidin, Amadersomoy.com, Amader Cox's Bazar	Daily Bangladesh Pratidin, Amadersomoy.com, Amader Cox's Bazar,
15.	65 days marine fishing ban period	Daily Shokaler Somoy, Rupantor News	Daily Shokaler Somoy, Rupantor News
16.	Training on biodiversity conservation	Daily Kaler Kantho, Daily Nayadiganta, Muktinews24.com, Ruantor news, Amader cox's Bazar, 71 news ctg,	Daily Kaler Kantho, Daily Nayadiganta, Muktinews24.com, Ruantor news, Amader cox's Bazar, 71 news ctg,
17.	Annual workplan and experience sharing workshop with the Department of Fisheries	BTV, My TV, Cox's Bazar Betar Barta, Daily Cox's Bazar, Dainik Cox's Bazar, Ajker Cox's Bazar Barta, Dainik Ruposhi Gram	BTV, My TV, Cox's Bazar Betar Barta, Daily Cox's Bazar, Dainik Cox's Bazar, Ajker Cox's Bazar Barta and Dainik Ruposhi Gram
18.	National Nutrition Week	Bangladesh Pratidin, Fns.com, Daily Tritiyamatra, csb24.com, 71newsctg.com	Bangladesh Pratidin, Fns.com, Daily Tritiyamatra, csb24.com, 71newsctg.com,
19.	Turtle hatchery; egg collection and releasing baby turtle	Daily Shokaler Somoy, Bangladesh Today	Daily Shokaler Somoy, Bangladesh Today
20.	Training for Citizen Scientists and boat skippers	Daily Observer, Daily Tritiyamatra , Rupantor News	Daily Observer, Daily Tritiyamatra , Rupantor News
21.	School based campaign on biodiversity conservation	71newsctg.com, cbnbd.com, Amader Cox's Bazar, Daily Ajker Moheshkhali	71newsctg.com, cbnbd.com, Amader Cox's Bazar, Daily Ajker Moheshkhali
22.	Fisher's football match	71news.com	71news.com
23.	Blue Guards activity on beach cleaning	Cox'sbazartimes24.com, Amader cox's Bazar, 71news ctg	Cox'sbazartimes24.com, Amader cox's Bazar, 71news ctg
24.	National Fish Week	Daily Bangladesh Pratidin, Daily Observer, Daily Jaijaidin, dhakatimes24, amarsangbad, barta24.com, Ctgsangbadbd24.com	Daily Bangladesh Pratidin, Daily Observer, Daily Jaijaidin, dhakatimes24, amarsangbad, barta24.com, Ctgsangbadbd24.com
25.	Boat skipper training	Daily Bangladesh Pratidin, Barishaltimes, Daily Kaler Kantha	Daily Bangladesh Pratidin, Barishaltimes , Daily Kaler Kantha
26.	Coastal cleanup day	Daily bd-pratidin (Kalapara), Daily bd-pratidin (Teknaf) , Daily Observer, Daily Jaijai Din, barta bazar, somoyer konthosor, Banglar awaz, Cox news today, Coxs Bazar Life	Daily bd-pratidin (Kalapara), Daily bd-pratidin (Teknaf) , Daily Observer, Daily Jaijai Din, barta bazar, somoyer konthosor, Banglar awaz, Cox news today, Coxs Bazar

S.N.	News Title/ Event Name	Name of the Media	Links
			Life
27.	Women congress	Ekattor.tv, Daily bd-pratidin, Daily Observer, My TV, Bangladesh post, Daily jaijai din, Alokito Protidin, barishaltimes, daily post, amar sangbad, CBC news , Ajker Bhola	ekattor.tv, Daily bd-pratidin, Daily Observer, My TV, Bangladesh post, Daily jaijai din, Alokito Protidin, barishaltimes, daily post, amar sangbad, CBC news , Ajker Bhola
28.	Consultation Meeting on blue economy, marine conservation	Financial Express, Daily Observer, Bangladesh Post, Daily Sun	Financial Express, Daily Observer, Bangladesh Post, Daily Sun
29.	ECOFISH II Result Sharing and Closeout Workshop	Prothom Alo, Bangladesh Pratidin, The Business Standard, Financial Express, Samakal, Bangladesh Post, Kaler Kantho, Banik Barta, Ajker Patrika, JaiJai Din, Protidiner Bangladesh, Manabzamin, Bhorer Dak, Channel 24, News 24, DBC, GTV, Mohona TV, Asian TV, Desh TV, Bangladesh Songbad Songstha , Somoy TV Online, Rising BD, Daily Bhorer Dak, Jago News 24, Barta 24	Prothom Alo, Bangladesh Pratidin, The Business Standard, Financial Express, Samakal, Bangladesh Post, Kaler Kantho, Banik Barta, Ajker Patrika, JaiJai Din, Protidiner Bangladesh, Manabzamin, Bhorer Dak, Channel 24, News 24, DBC, GTV, Mohona TV, Asian TV, Desh TV, Bangladesh Songbad Songstha , Somoy TV Online, Rising BD, Daily Bhorer Dak, Jago News 24, Barta 24
30.	Dead Dolphin	The Business Standard, Bangla Tribune, Dhaka post, barta24	The Business Standard, Bangla Tribune, Dhaka post, barta24
31.	22-day ban period awareness	kuakatabarta, kalerproticchobi, Cox's News Today	kuakatabarta, kalerproticchobi, Cox's News Today
32.	Fishers Congress	BTV, Bangladesh-pratidin, JaiJai Din, Cox's News Today, Cox's Bazar Life, Bangladesh Pratidin (Bhola), Ajker Bhola	BTV, Bangladesh-pratidin, JaiJai Din, Cox's News Today, Cox's Bazar Life, Bangladesh Pratidin (Bhola), Ajker Bhola
33.	Boat skipper training and life jacket distribution	Cox's News Today	Cox's News Today
34.	Beach cleaning	barta24, bartabazar, dainikmanobadhikarprotidin	barta24, bartabazar, dainikmanobadhikarprotidin
35.	Livestock Service Provider develop training	Coxnewstoday	Coxnewstoday

Social media engagement list:

Organization	Facebook	Twitter
WorldFish Bangladesh	• Blue Guards proactively preventing air pollution, • USAID's ECOFISH II trains community volunteers, • Community Volunteer: A driving force improving livelihood resilience, • Blue Guard Roksana; breaks stereotypes by passion • releasing accidentally entangled live megafauna, • turtle release • Padmasree Shil, an inspiration breaking the barrier, • Hasina changing her life and her families lives. • Turtle egg collected and safely placed in a hatchery, • Celebrating International Women's Day, • Providing technical capacity building support, • Seaweed awareness raising and community engagement training, • training workshop on ecosystem health improvement and biodiversity conservation for Blue Guards,	

Organization	Facebook	Twitter
	• Success story of Hasina Akter • Megafauna release, • Jatka conservation week, • story of a community volunteer: becoming special from random, • Alternative livelihood support had significantly changed Ismat's life. • USAID's visit to Cox's Bazar, • Turtle hatchery; egg collection and baby release, • National Nutrition Week Celebration, • Annual workplan and experience sharing workshop with the Department of Fisheries. • Shahena: story of a successful dry fish entrepreneur, • school-based awareness-raising campaign on "biodiversity conservation and ecosystem health improvement of the ocean", • Citizen Scientists releasing megafauna, • Institutionalization of Landing center based Fisheries co management committee through a unique football match. • USAID's ECOFISH II celebrated National Fisheries Week-2024 with the Department of Fisheries in Cox's Bazar, Ukhiya, Teknaf, Moheshkhali, Kutubdia, Charfassion, and Kalapara. • Seaweed and Bivalve Seafood Value Chain in Bangladesh: Research Outcomes and Future Directions' showcasing research on seaweed and green mussel farming in collaboration with the Department of Fisheries • Coastal Cleanup Day, • Consultation Meeting on blue economy, marine conservation, • Women Congress	
WorldFish HQ	• Turtle Hatchery to conserve biodiversity • Coastal Cleanup Day • ECOFISH II Result Sharing and Closeout Workshop • Blue Guard Roksana, • International Rural Women's Day, Women Congress, • Stakeholder's Consultation Meeting, • Blog post	• Turtle Hatchery • Women Congress • Stakeholder consultation meeting • Blog post • Coastal Cleanup Day • Sea food and Bivalve value chain • ECOFISH II Result Sharing and Closeout Workshop

USAID	• World Ocean Day with ECOFISH II's activity on turtle hatchery.
	• Coastal Cleanup Day
	  • Staff Achievement
	  • ECOFISH II Result Sharing and Closeout Workshop
	  • World Ocean's Day
		• Turtle Hatchery
		• ECOFISH II Result Sharing and Closeout Workshop
		• Blue Guard Roksana's story

CGAIR	• Turtle Hatchery	• Turtle Hatchery

List of Communication Advocacy Materials produced in 2024:

S.N.	Communication Material	Link
1.	Booklet	Booklet on Nutrition and Gender Awareness
2.	Recipe Book	Seafood Recipe Book
3.	Project story book	Human Story Book
4.	Catalog	Catalog on Non-conventional Marine Fishery Resources of Bangladesh
5.	Result Sharing Book	Project Result Sharing Book

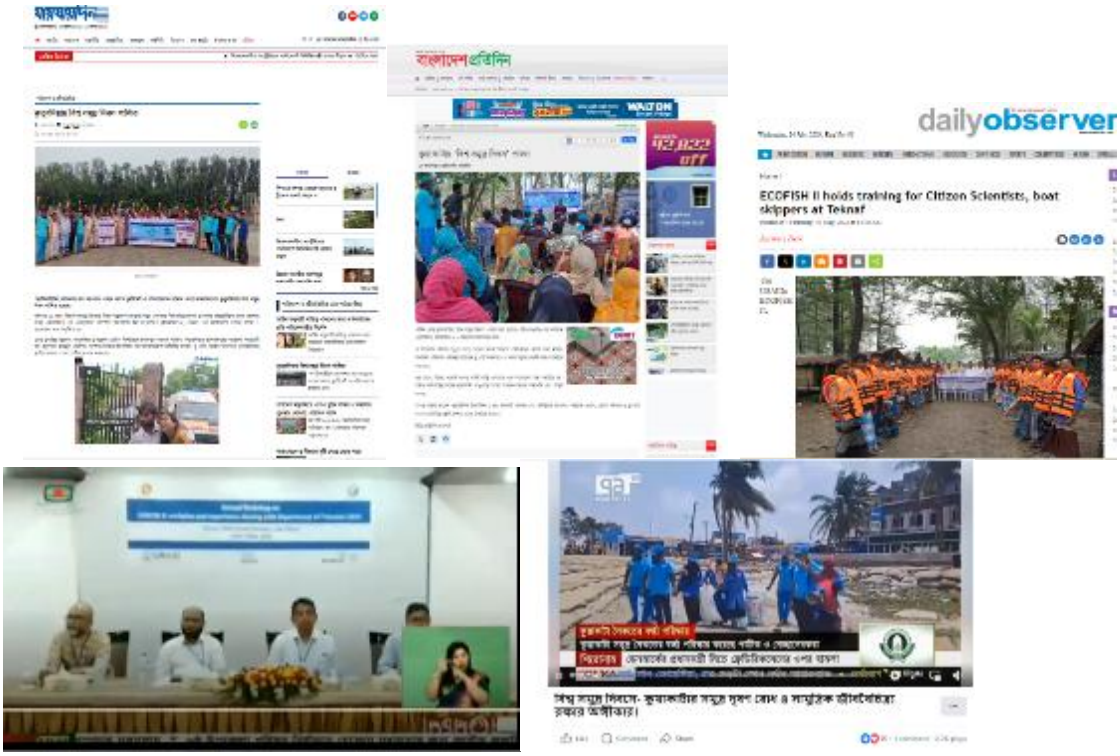


Figure 46: Media engagement

4 Environment

The Environmental Monitoring and Mitigation Plan (EMMP) provides a basis for systematic implementation of Initial Environmental Examination (IEE) and Environmental Assessment (EA) conditions. Its purpose is to determine whether the proposed project interventions have any potential adverse impacts on the environment as well as to suggest a mitigation plan to reduce environmental consequences. The ECOFISH II Activity strengthens the ability of fishing communities to extract maximum benefit from coastal environments using sustainable practices and to mitigate the adverse effects of climate change. As throughout the project implementation period, in the year 2024 (January - November), the project carefully followed the EMMP guidelines.

- ECOFISH II ensured to meet EMMP requirements or exceed the requirements complying with the approved EMMP guideline.
- Activities that are “Categorically Excluded” like training, community mobilization, other capacity building activities, studies, academic or research workshops or meetings, and document and information transfers are those for which no environmental impacts are expected. ECOFISH II has played a greater role in engaging blue guards (BG) to build awareness on keeping the coastal beach environment clean, pollution free, plastic removal / disposals, biodiversity conservations etc.
- The EMMP establishes “Negative Determination with Conditions” for activities that have the potential for negative impact on the environment but where the inclusion of mitigation measures can prevent significant impacts. For example, ECOFISH II conducted many studies that are scalable to established environmentally friendly and climate resilient mariculture activities (Seaweed and bivalve culture in natural environment) which can cope with climate variables.
- The EMMP does not identify any proposed activities that have the potential for a significant effect on the environment (Positive Determination), requiring an Environmental Assessment. ECOFISH II always be careful during implementation of project activities, keeping consideration of EMMP guidelines.

5 Monitoring, Evaluation and Learning (MEL)

5.1 Summary of results: USAID and ECOFISH II indicators

ECOFISH II helped in achieving the predefined USAID standard and ECOFISH II custom indicators (Table 10 and Figure 47) as a result of assistance from the USG.

Table 10: Summary of ECOFISH II results to date with performance monitoring standard indicators.

Standard indicators	Target	Achievement	Achievement (%)
EG.10.2-1 Number of hectares of biologically significant areas showing improved biophysical conditions as a result of USG assistance	62,890	60,760	97
EG.10.2-2: Number of hectares of biological significance and/or natural resources under improved NRM as a result of USG assistance	237,190	233,000	98
EG.10.2-3: Number of people with improved economic benefits derived from sustainable natural resource management and/or biodiversity conservation as a result of USG assistance	15,000	15,156	101
EG.10.2-4: Number of people trained in sustainable natural resource management and/or biodiversity conservation as a result of USG assistance	2,000	2,784	139
EG.10.2-5: Number of laws, policies or regulations that address biodiversity conservation and/or other environmental themes officially proposed, adopted or implemented as a result of USG assistance	2	2	100
CBLD-9: Percentage of USG-assisted organizations with improved performance	85%	87.5%	102
Custom indicators			
Number of species newly appeared or reappeared or improved in fishers' catch along the coast of Cox's Bazar as a result of USG assistance	5	5	100
Percentage increase in hilsa and other important marine species (CPUE) along the coast of Cox's Bazar as a result of USG assistance	5%	5	100
Number of fishing households practicing better fisheries management	3,000	2,733	91
Number of households with increased food and nutrition security (Household Dietary Diversity Score and Food Consumption Score) as a result of USG assistance	3,000	2,728	90
Number of households with improved well-being and diversified sources of income as a result of USG assistance	3,000	2,756	92
Number of people gaining employment from sustainable fisheries management	50	50	100
Number of youths with access to improved technologies and market links in ZOR sites as a result of USG assistance	65	60	92

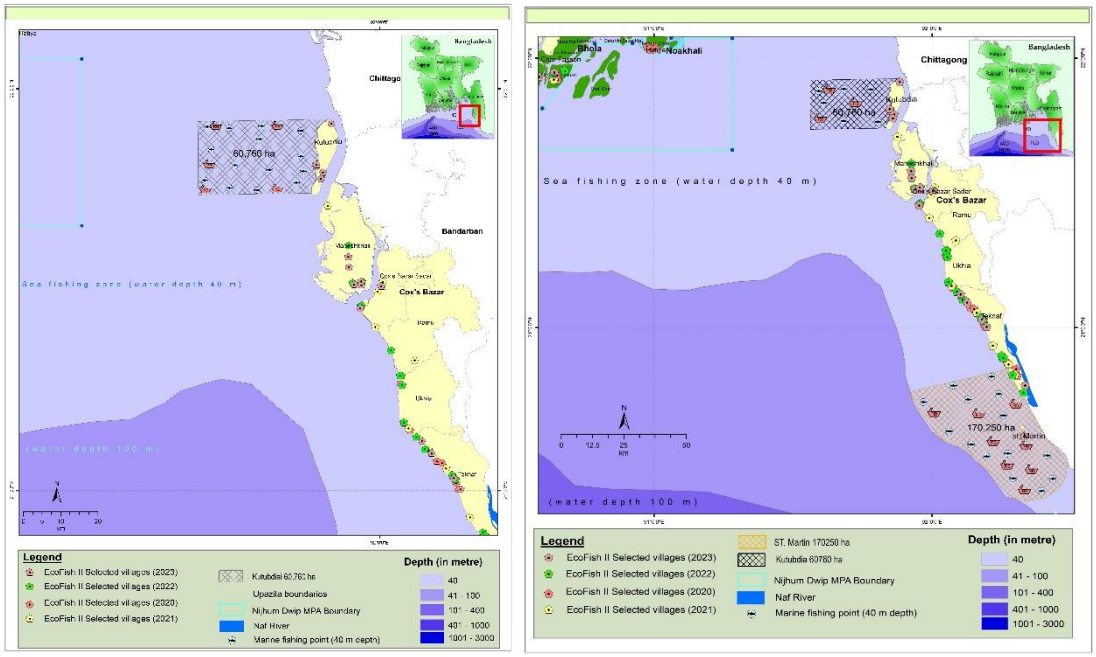


Figure 47: Biophysically and NRM improved areas as result of USG assistance.

In year 5 (Jan-Nov 2024), the biodiversity of the coastal ecosystems in the Zone of Resilience (ZOR, focusing on Kutubdia coasts have been enhanced through the following ways: a) increased the abundance or distribution of targeted species population; and b) improved ecosystem health focusing on water quality and plastic pollutants. In year 5, the overall target was 62,890 hectares, and achieved 60,760, and the area was measured using Arc GIS and validated with the existing 40m depth zone of EEZ designated for the artisanal fisheries.

To conserve biodiversity, ECOFISH II took several conservation measures focusing on juvenile conservation and broods' protection of important species through training and other awareness raising activities. The target species were Hilsa and five other important fish species as well as megafauna (turtles, dolphins, and sharks). The project focused on specific regions and communities, primarily small-scale artisanal fishers in the coastal region of Bangladesh. Particularly, these areas included the Zone of Resilience (ZOR) in the Cox's Bazar, the lower Meghna River Ecosystem (MRE), and two declared Marine Protected Areas (MPAs), the Nijhum Dwip MPA and the newly declared St. Martin MPA.

The activity facilitated the formation and strengthening of co-management building blocks to enhance marine biodiversity conservation and promote responsible fishing practices. These building blocks included fisher-level organizations such as Fisheries Conservation Groups (FCGs), Village Fisheries Conservation Groups (VFCG), Landing Center-based Fisheries Conservation Groups (LFCCs) for men, and Women Income and Nutrition Groups (WINGs) for women in all fishing villages. At the village level, 2,000 beneficiaries were trained on biodiversity conservation and responsible fishing practices. Additionally, ten batches of boat skipper training were conducted, involving 501 participants engaged in coastal and marine fishing. These trained skippers now adhere to fishing regulations, prioritize safety at sea, and practice responsible fishing, further spreading conservation knowledge among their crew members. In 2024, 68 FCGs, 13 VFCGs for fishermen and 68 WINGs for women were established, consisting of members from 2,000 selected artisanal fishing households. These groups received training and were actively involved in promoting awareness and implementing measures to conserve marine biodiversity, adopt responsible fishing practices, and enhance livelihood resilience. The co-management building blocks have significantly contributed to ecosystem improvement by fostering responsible fishing practices and empowering fishers and other stakeholders to engage in biodiversity conservation in the targeted ecosystems.

ECOFISH II recognized that strengthening of landing center-based co-management initiatives would benefit conservation initiatives and reduce IUU fishing. This year, 10 landing center-based fisheries co-management committee (LFCC) formed with 412 participants and building their capacity for ecosystem-based co-management organization development. All related stakeholders including boat skippers, Arotdar, local elites, local fisher leaders, and other traders with considerable influence on IUU fishing participated in the consultation meetings. Thus, the community-led conservation initiatives are taking place and appeared to have been successful in reducing IUU fishing and improving management practices.

Citizen Scientists (40) and boat skippers (140) continued contributing through releasing entangled megafauna alive targeting sharks, turtles and dolphins for maintaining healthy ecosystem balance in the coastal and marine habitats. ECOFISH II provided incentives for the documented megafauna live release. The Citizen Scientists of the project reported that they released a remarkable 426 threatened megafauna back into their natural habitats. This included 75 Olive Ridley Sea turtles, 77 sharks, 245 rays, 5 guitarfish, 23 horseshoe crabs, and 1 Irrawaddy dolphin.

To monitor the impacts of the conservation measures in terms of the fish abundances in fisher's catch, ECOFISH II engaged 40 Citizen Scientists, who provide species-wise catch composition of their harvest directly to the database. From the real-time digital catch monitoring data, catch per unit effort (CPUE) was estimated to assess the abundances of important species for fisheries management decision-making. The estimated CPUE showed an increasing trend taking all species together, focusing on five important species, but showed a declining trend of Hilsa CPUE in Year 5, compared to that of in Year 4. The holistic efforts of ECOFISH II, alongside the ongoing initiatives of various government and non-government organizations, have contributed to a notable improvement in marine fisheries production. The total marine catch increased from 0.679 million tons in the year 2022-2023 to 0.682 million tons in 2022-2021. Hilsa production also rose, reaching 0.571 million tons in 2021-2022, up from 0.567 million tons in the previous year. Additionally, riverine catfish (Pangas) production saw a remarkable jump, increasing from 1,070 tons to 2,123 tons over the same period, demonstrating significant progress in native fish species recovery. Efforts to reduce megafauna bycatch were also successful, with many turtles being released alive after becoming entangled.

In 2024, training on specific topics is the major intervention for capacity building of the target groups. Capacity building of fishers at the village level includes leadership development, co-management, NRM, biodiversity conservation, climate change, and livelihoods and social development. Fishermen and women of the artisanal fishing households, different stakeholders attended day-long training to gain knowledge that would help change their behavior toward compliance with government rules and regulations for fish and biodiversity conservation and involvement in co-management activities. ECOFISH II conducted 94 training sessions and trained 2,784 people from artisanal fishers including boat skippers, equipping them with the skills and knowledge to be responsible and compliant with Government regulations. Furthermore, these trained fishers play a vital role in representing the co-management bodies at the landing centers, contributing to the sustainable management of this complex fishery. It is quite evident that the trained fishers started contributing to the biodiversity conservation. These small efforts are encouraged through incentives from ECOFISH II and disseminated to other fishers for the greater contributions in the megafauna conservation alongside their fishing efforts.

5.2 Basic household information

During Year-5, the ECOFISH-II project identified and engaged with 20 fishing villages selected based on a combination of critical factors, including the concentration of fishing households, community attitudes towards conservation practices, and the geo-physical suitability of the villages. A GIS-based

approach utilizing Google Earth was employed to ensure precision in village selection. In year-5, 2,000 basic household information were partially analyzed, which collected data using ODK-based application for Year-4 interventions, that consists of ZOR 75% (1,500 BHHs), MPA 20% (397 BHHs), and MRE 5% (103 BHHs). The findings revealed a significant variance in various aspects. Firstly, the average family size exhibited regional diversity, ranging from a modest 4.4 individuals to a more substantial 5.6. In terms of active fishing days, the survey unveiled a range, with the number of active fishing days per year ranging from 90 days to a maximum of 179 days. Secondary occupations were common among roughly 53% of community members, whereas the remaining 47% solely depended on fishing for their livelihood. The possession of fisher's ID cards was unevenly distributed, with 43% having the identification cards and 57% lacking them. Fisher categories encompassed boat skippers (14%), hired labor (40%), shared labor (23%), and bonded labor (23%). Boat ownership was varied, with 6% owning their boats, 90% working on another person's boat, and 4% sharing ownership. Only 17% of fishermen owned fishing nets, while the majority 83% did not possess fishing nets. Additionally, the fisher categories based on the distance they traveled for fishing revealed that 2% used daily non-engine boats, 29% utilized daily mechanized boats, 4% employed long-distanced mechanized boats for 2-4 days, and 42% depended on long-distanced mechanized boats for more than five days, illustrating the intricate web of factors impacting the lives of fishing communities across regions.

5.3 Database Development and Activity Monitoring System

In 2024, significant progress was made in the development and operation of a centralized online system for data collection, storage, and dissemination of information to strengthen the monitoring and evaluation processes of ECOFISH II. This system integrates both hardware and software components to enhance the overall monitoring framework and ensure seamless functionality. Throughout the year, staff members were trained and oriented in the proper utilization and access to the offline-online database system. The database played a critical role in tracking ECOFISH II activities and associated features, such as the locations of project villages, which were visualized through Google Earth for a more comprehensive geographical understanding. During this year, rechecks of both the online and offline databases was conducted, along with a detailed review of hard copy records for all informal institutions under ECOFISH II. These efforts ensured the accuracy, completeness, and reliability of the monitoring system. All necessary tools for monitoring Year-5 (Jan-Nov 2024) activities were finalized, and historical data from previous years were successfully integrated into the system. This allowed the project management team to gain valuable insights into key features of ECOFISH II interventions, facilitating evidence-based planning, decision-making, and adaptive management. The consistent focus on database development and activity monitoring throughout the year reflects the project's commitment to leveraging climate-smart adaptive technologies and systematic approaches for robust program management and achieving its objectives effectively.

5.4 Baseline and Endline/Post-Intervention Assessment of Non-Formal Organizations

In Year 5 (2024), the Monitoring, Evaluation and Learning (MEL) team continued its efforts to evaluate the capacity development of 120 non-formal organizations in addressing climate change issues and their ability to adapt to adverse situations resulting from these challenges. The assessment focused on institutional indicators that measure resilience and adaptive capacity. The baseline data for this assessment were collected at the end of last year (2023) and conducted a comprehensive post-intervention assessment to measure progress and changes in November'24. Key findings and comparisons between baseline and endline data revealed that the project achieved 120 organizational capacity development and 105 for improved capacity, respectively. Using the index scale points, relative weights have been allocated to the six broad areas and for specific indicators within each area based on prior experience regarding their relative importance in CBOs capacity

development process. The final assessment of institutional capacity revealed that 26 non-formal institutions were strong and 79 moderately strong, but 15 institutions were moderately weak covering above five indicators.

5.5 Internal Data Quality Assessment

Throughout the year, the Monitoring, Evaluation and Learning (MEL) team conducted a comprehensive Internal Data Quality Assessment (DQA) across all intervention areas to ensure the robustness and integrity of project data. The DQA focused on key data quality dimensions: Validity, Precision, Reliability, Integrity, and Timeliness. This initiative was pivotal in verifying the accuracy of reported data and enhancing the credibility of project outcomes to facilitate informed decision-making. The team meticulously reviewed station-level documents including household census data, group lists (e.g., FCG, VFCG, WING/CSG, LFCC), and training/event records. Additionally, field visits were made to three randomly selected communities per station to conduct interviews with community group members. Discussions revolved around training quality, implementation processes, project support, and satisfaction with supervision. The findings were disseminated to the technical staffs including Research Associates, Research Assistants, PNGO staffs including Field Facilitators, and Community Volunteers. Insights from the DQA informed project management decisions and strengthened overall data management systems, laying the foundation for improved accountability and project outcomes in the future.

5.6 Annual performance survey of fishing HHs

In the reporting year, the Monitoring, Evaluation and Learning (MEL) team successfully conducted the Annual Performance Survey to support indicator reporting. This initiative aimed to evaluate progress against project goals and inform decision-making. The survey focused on key project areas, including Cox's Bazar district (Teknaf, Ukhiya, Cox's Bazar Sadar, Kutubdia, and Moheshkhali), Bhola district (Charfasson Upazila), Patuakhali district (Rangabali and Kalapara), and Barguna district (Barguna Sadar). Also, to measure different standard and custom indicators, annual performance survey has been conducted for 540 sample beneficiary fishing households of involved 2792 BHHs in Year-4. This assessment covers the level of applying or adopting diversified livelihood opportunities, AIGA activities, better management practices because of participation in ECOFISH II trainings, follow-up services and other project-supported activities.

In 2024, the ECOFISH II Activity continued supporting 3,000 fishing households of Year-4 (Jan-Dec 2023). Among these households, a total of 2,756 households, comprising 15,156 members (based on an average family size of 5.5), with 7,716 men and 7,440 women reported improved economic benefits from both fishing and alternative income sources. The baseline threshold income BDT 110,929 per household for the sampled households was determined as a reference point. The results indicated a significant increase in the average annual household income of over 68% (BDT 75,727) from both fishing and alternative income sources compared to the baseline. Specifically, the annual income from alternative income sources rose by BDT 34,093 per household, marking a 241% increase from the baseline. Additionally, when evaluating non-cash benefits, the Household Dietary Diversity Score (HDDS) improved for 92% of households, with 73% reaching an acceptable level. This overall HDDS of 7.6 signifies a notable diversity in food options among artisanal fishing households. The survey results revealed that 72% of the sampled households experienced increased fishing-related income due to increased catch. Diversifying income through alternative livelihoods can assist communities in adapting to seasonal fishing bans, other restrictions, and changing environmental challenges. Involving communities in conservation efforts promotes responsible stewardship of marine resources.

5.7 Endline Survey for Final Evaluation

Preparation of the ECOFISH II endline survey, which began in July and continued up to November 2024. After finalizing the research firm, the MEL team supported the survey by providing a comprehensive beneficiary list for random sampling. The MEL team also conducted regular follow-up and coordinated

with the beneficiaries, who are primarily fishermen and spend extended periods at sea. For the quantitative data collection, we planned a sample size of 600 fisher households from 12 intervention villages under ZOR (Cox's Bazar Sadar, Teknaf, Ukhiya, and Moheshkhali) and under MRE & MPA (Char Fesson, Hatiya, and Rangabali). Similarly, we sampled 600 fisher households from 11 non-intervention villages under ZOR (Cox's Bazar Sadar, Teknaf, and Moheshkhali) and under MRE & MPA (Char Fesson, Hatiya, and Rangabali). For the qualitative data collection, 20 FGDs were conducted 13 at the community/village level and 7 at the Fish Landing Center/Machghat level. Both qualitative and quantitative data collection have been completed, and final report preparations are currently ongoing.

6 Implementation challenges

During the reporting year, the project faced substantial challenges due to countrywide political turmoil/unrest and extreme weather like frequent cyclone, heavy rain, draught and hot weather, severely impacted field operations and necessitating several adjustments. Additional safety protocols were implemented to mitigate risks associated with both political unrest and hazardous weather conditions, ensuring the well-being of field staffs and volunteers. Some specific challenges are given below:

- Bringing multilevel stakeholders under the same management umbrella is a complex challenge, particularly in projects involving diverse stakeholders such as government agencies, NGOs, local communities, and the private sector like fish traders, boat owners.
- The communication and working conditions along the St. Martin route (under Teknaf Upazila) have significantly deteriorated, posing risks during both the rainy and dry seasons. The area is also under threat from gunfire originating from the Myanmar navy or the Arakan Army along the Bangladesh-Myanmar border coast. Government restrictions have further impacted the timely implementation of certain activities.
- Power shifts have been observed at the community level, particularly within the landing center-based fisheries co-management organizations (LFCC), following the political turmoil, shifting of power due to government change in August 2024.
- Marine and coastal fisheries co-management differ significantly from wetland fisheries management due to the distinct ecological, social, and economic characteristics of these environments. Marine and coastal fisheries are multi gear, species open systems, making it difficult for stakeholders to immediately recognize the economic benefits of co-management initiatives. In contrast, wetland fisheries are typically closed systems, allowing stakeholders to observe and experience the direct benefits of effective management more quickly. As a result, implementing a fisheries co-management system in coastal and marine areas requires more time and effort and adaptation.
- Artisanal fishers are marginalized in the fishing industry, lacking influence in decision-making and access to resources, education, services, and climate-smart adaptive technologies. This power imbalance limits their ability to advocate for fair compensation, better working conditions, and sustainable practices.
- Fishers especially poor fishers are entirely reliant on fishing for their livelihoods and show little interest in exploring alternative or supplementary income sources based on natural resources.
- Ghost fishing, IUU fishing and non-conventional fishing awareness is a prime need to establishing sustainable coastal and marine fisheries resource management which take longer time for policy development with multisectoral departments of Bangladesh Government.
- Management of declared MPA is crucial that is very much needed to protect, make effective Marine Spatial Plan (MSP) development to increase biodiversity conservation and realize the potentials.
- Market and business model as well as climate-smart technology development for dried fish, fish powder, seaweed and green mussel takes time and needs to identify business stakeholders.

- Engagement of stakeholders (public, private) in Blue Economy initiatives is a big challenge, which will take longer time for mainstreaming.
- Promote and establish adaptive fisheries co-management under the ecosystem approach to fisheries management (EAFM).
- Massive efforts for alternative skill development, awareness development, safety at sea, incentivized fisheries co-management for sustainable biodiversity conservation and capture.
- The dry fish sector encounters challenges such as uncertain catches, climate change, increased prices of raw materials, and a lack of connections with premium markets and prices for better quality products.

7 Integrating crosscutting issues and USAID forward priorities

7.1 Gender equality and women's empowerment

Patriarchic social norms are a significant barrier for women of the coastal fishing communities in Bangladesh. These norms limit women's income autonomy, access to productive resources, decision making capacity and mobility, which negatively affects their economic empowerment and overall well-being. To assess the gender disparities ECOFISH II commissioned Gender Formative Research by adopting the Project level Women's Empowerment Fisheries Index (Pro-WEFI). Findings reveal that only 14% of women are empowered compared to 37% of men, with women scoring lower on the 3DE (0.57 vs. 0.75 for men). Additionally, only 31% of households have achieved gender parity, emphasizing the need for targeted interventions to address these inequalities and promote gender equality. Women had additionally constrained access to and decisions about credit, control over the use of income, contribution in productive decisions, and mobility in public places. The formative research suggested that context-specific and needs-based development interventions are required to alter or change the situation. ECOFISH's Gender Strategy is designed to empower women while simultaneously sensitize men towards gender equality. It is providing household-based IGA and nutrition-sensitive homestead horticulture training, business literacy, savings, and sessions on income, nutrition, biodiversity conservation, and adaptation to climate change impacts to women through Women Income and Nutrition Groups (WINGs) whereas men are receiving gender sensitization sessions.

ECOFISH II's interventions are structured around Intermediate Results (IRs), with science-based decision-making and adaptive co-management under IR1, and improved livelihood resilience under IR2. Gender is a key crosscutting component of the project, with 20% of the 140 local youth volunteers (Blue Guard) participants being women who are actively engaged in ecosystem health improvement. To promote gender equality and encourage behavioral change, ECOFISH II organized 4 training sessions on Ecosystem Health Improvement, Biodiversity Conservation, and Gender Sensitization for 120 youth Blue Guards. Additionally, the project facilitated 126 gender sensitization sessions for 2,833 members of Village-based Fisheries Conservation Groups (VFCGs), Fisheries Conservation Groups (FCGs), and Boat Owners, addressing topics such as gender roles, workload sharing, women's participation in productive activities, and reducing gender-based violence. ECOFISH II also organized school-based awareness campaigns on biodiversity conservation and ecosystem health improvement in 7 field stations, engaging 1,544 students, 75% of whom were girls. These initiatives create spaces for women to contribute to biodiversity conservation, ecosystem improvement, and fisheries governance, with ECOFISH II playing a key role in facilitating their participation.
In the IR2 component, to strengthen women's collective agency, ECOFISH II has supported the operationalization of 169 Women Income Generating Groups (WINGs), established in years 4

and 5, directly benefiting 5,000 women from artisanal fishing households. This year, all 169 WINGs actively participated in 2,028 sessions of Basic Literacy Skills (BLS), maintaining an impressive attendance rate of over 85%. This high engagement indicates that women valued the sessions and that ECOFISH II successfully created space for them to take a break from their household chores. ECOFISH II also provided training on income-generating opportunities and nutrition-sensitive homestead vegetable gardening, which has opened new avenues for nutritious food and income for WING members. In addition, 27 batches of institutional capacity-building training were organized for 517 WING leaders during this year. These training courses equipped the leaders with essential skills in community leadership and the operational management of WINGs. The project also worked to improve savings behavior through Community Savings Groups (CSG) and WINGs, resulting in a collective savings of BDT 7,062,918, reflecting better access to finance. Evidence of progress is reflected in the 3DE score, which increased to 0.61 from 0.57 at baseline, and surpassed the 0.51 score in control areas. The Gender Parity Index (GPI) score reached 0.93, with 61% of households now exhibiting gender parity, compared to 31% at baseline. Furthermore, the average empowerment gap has narrowed, decreasing to 19% from 31% at baseline. These positive changes demonstrate that ECOFISH II's interventions have effectively contributed to enhancing women's empowerment within these communities.

Another important gender dimension of the project involved in engaging 48 local young women as Community Volunteers (CVs) and provided trainings for capacity building from various selected fishing villages, with one CV assigned to each village to act as a bridge between the community and ECOFISH II. These volunteers have played a crucial role in empowering women by promoting sustainable income generation, improving nutrition, and supporting biodiversity conservation through community-based initiatives.

Recognizing the importance of exposure, ECOFISH II organized seven "Women Congress" events in seven upazila where ECOFISH II field offices, bringing together 740 participants (84% women) from artisanal fishing communities. Designed as part of the project's exit strategy, the Congress gave women leaders from remote coastal villages a valuable platform to share their experiences, challenges, and goals with high-level stakeholders in an urban setting. The women engaged with officials from key government departments, private sector representatives, and ECOFISH II team members, celebrating their achievements in income generation, business literacy, and awareness on nutrition, biodiversity conservation etc. Participants emphasized how training, start-up support for income-generating activities, business literacy, savings, and homestead gardening have significantly improved their nutritional and financial well-being.

In alignment with the theme of International Women's Day 2024, "Invest in women: Accelerate progress", ECOFISH II organized a series of events to provide women with a platform to discuss empowerment (Figure 48). The activities included rallies, awareness meetings, quiz competitions, and games held across seven stations, with 324 participants (70% female, 30% male). The attendees included representatives from the Department of Fisheries, Jatio Mohila Songstha, local government officials, Women Income and Nutrition Groups, Fisheries Conservation Groups, Landing Center-based Fisheries Co-management Committees, blue guards, citizen scientists, implementing partners, teachers, and religious leaders. The event highlighted the importance of gender equality, women's empowerment, and the active participation of both men and women in daily life.

Figure 48: Celebration of International Women's Day 2024 (left-Kalapara, right-Kutubdia)

ECOFISH II has encountered several challenges in addressing preexisting gender norms in fishing communities, including social and cultural barriers, illiteracy, limited market access for women, and difficulties in connecting women with government officials due to the remote locations of these communities. Additionally, there has been a lack of opportunities for women's direct involvement in aquatic resource management. Despite these challenges, the involvement of community volunteers has proven valuable in empowering women. Initiatives such as connecting women with local service providers, offering capacity development training, providing conditional cash support, establishing Business Literacy Schools (BLS), and conducting gender sensitization sessions for men have contributed to improving women's positions within households, enabling them to participate in decision-making, access finance, and receive extension services. However, short-term interventions alone are not sufficient to ensure the long-term resilience of artisanal fishing households. Ongoing follow-up, periodic incentives, continued gender awareness efforts, and registering women's groups with government departments are essential for sustaining these improvements.

7.2. Sustainability mechanisms

The following steps have been taken to ensure the sustainability of the project:

- The sustainability mechanism for ECOFISH II local volunteers focuses on capacity building, integration with landing center-based co-management organizations (LFCC), and fostering stronger connections with the Department of Fisheries (DoF). Acknowledging their contributions, all 248 volunteers, including Blue Guards, Citizen Scientists, Landing Center Facilitators, and Community Volunteers, were issued experience certificates to enhance their credibility. Additionally, the volunteer list was shared with the local DoF offices to ensure future collaboration and institutional recognition.
- The sustainability mechanism for ECOFISH II institutions such as WING, CSG, FCG, VFCG, and LFCC emphasizes capacity building in leadership, governance, and technical knowledge, ensuring stronger connections with the Department of Fisheries (DoF). A comprehensive list of trained leaders was shared with the local DoF offices, accompanied by advocacy efforts encouraging their involvement in the department's regular initiatives.
- ECOFISH II strengthened the capacities of Landing Center-based Co-management Committees (LFCCs) by providing training on key areas such as biodiversity conservation, institutional and financial management, leadership, conflict resolution, and Ecosystem Approach to Fisheries Management (EAFM) planning. This capacity-building enhances the LFCC's ability to plan, implement, and monitor fisheries management strategies, increasing their chances of sustainability. The collaborative and adaptive design of the co-management model, developed in

partnership with the Department of Fisheries (DoF) and stakeholders, ensures local ownership and relevance. Additionally, advocacy efforts with the government support the integration of co-management principles into national policies, securing long-term sustainability.

- Nutrition-sensitive homestead horticulture has gained widespread acceptance and adoption among women in artisanal fishing households, providing a valuable opportunity to improve household nutritious food and income. This practice is being increasingly supported by Community Volunteers (CVs), who are evolving into local service providers (LSPs) and playing a key role in sustaining and scaling up these efforts within communities.
- The revised approach of incorporating multiple household-based income-generating activities (IGAs) is proving to be an effective strategy to reduce financial risks and diversify income sources. By strengthening the capacity of existing LSPs and local community volunteers as LSP to deliver services and provide technical support for these IGAs, access to resources and opportunities has improved, leading to more sustainable livelihoods. Collectively, these efforts create a positive feedback loop, where improved nutrition, economic resilience, and local service delivery reinforce each other, ensuring the long-term sustainability of these initiatives within the fishing communities.
- Increasing nutrition knowledge has led to positive changes in practices, with many households already experiencing the benefits of improved dietary habits. As individuals and communities continue to build on this knowledge, there is significant potential to further enhance their nutrition behaviors.
- Another key sustainability mechanism is the creation and dissemination of knowledge products, advocacy materials, scientific outputs, and grey literature, all of which are published on the WorldFish website. These resources, which capture scalable conservation solutions, best practices, and lessons learned, are available for adoption by individuals, institutions, and development practitioners, providing a foundation for future initiatives. The scientific knowledge generated contributes to policy development, with studies submitted to the Department of Fisheries (DoF) and published in reputable journals, also enhancing global discourse through contributions to well-regarded publications.
- A key sustainability mechanism involves engaging with the policy system by generating credible scientific information and drawing on development experiences. This process includes participating in meaningful dialogues with stakeholders and supporting the government when necessary. As part of this effort, ECOFISH II has contributed to several important initiatives, including the submission of a revised Hilsa Fisheries Management Action Plan (HFMAP), a proposal for the Naf Marine Protected Area (MPA), a Transboundary Hilsa Management Framework, a future blue economy plan, and, most recently, the findings of a feasibility study on the potential establishment of two new MPAs in Bangladesh.

7.3 Global climate change

ECOFISH II contributes to climate change mitigation and adaptation efforts by monitoring key climate variables and assessing water quality in vulnerable coastal areas such as St. Martin's Island, the Moheshkhali Channel, and Kutubdia. In collaboration with SUST, the project conducted research to identify biodiversity hotspots along Bangladesh's southeast and south-central coasts, prioritizing areas for potential Marine Protected Areas (MPAs). This effort supports SDG 14 by advancing the goal of protecting at least 10% of marine areas and provides critical data for the effective management of MPAs. Findings from this research have been published in the Regional Studies in Marine Science, facilitating evidence-based decision-making.

The project also promotes climate-resilient mariculture practices, such as seaweed and green mussel farming, which offer dual benefits of climate mitigation and ecosystem enhancement. Seaweed farming acts as a carbon sink, capturing CO_2 to combat ocean acidification, while green

mussel farming improves water quality and supports marine biodiversity. These practices contribute to coastal protection, biodiversity conservation, and economic stability for vulnerable communities. In partnership with CVASU and NSTU, ECOFISH II worked to strengthen value chains for these emerging blue food systems.

ECOFISH II also enhances the adaptive capacity of fishing communities by supporting sustainable fisheries, promoting alternative income-generating activities (AIGAs), and fostering gender equality. By building resilience to climate-induced events like cyclones and heavy rainfall, the project strengthens the social and economic capital of these communities, aligning local efforts with global climate resilience goals.

7.4 Policy and governance support

ECOFISH II plays a vital role in supporting policy and governance by generating credible scientific data and development insights that inform and guide decision-making processes in marine and fisheries management. The project has built the capacity of key stakeholders across various aspects of fisheries management, including creating a national pool of experts on Ecosystem Approach to Fisheries Management (EAFM). Additionally, it has contributed to meaningful awareness-building efforts and facilitated dialogues among epistemic communities, stakeholders, and resource users, ensuring that diverse perspectives are incorporated into decision-making. Through active engagement with government bodies and other stakeholders, ECOFISH II advocates for sustainable fisheries management, biodiversity conservation, and environmental protection. The project has made significant contributions to policy frameworks by submitting essential documents, such as the revised Hilsa Fisheries Management Action Plan, the Naf Marine Protected Area proposal, and the Transboundary Hilsa Management Framework, delineation of two potential MPAs in Kuakata of Patuakhali and Salimpur of Chattogram costs and finally developed a proposal for Kuakata MPA for DoF, which have all influenced national policies.

7.5 Local capacity development

Arrangement of different awareness building initiatives/events like trainings, meetings, awareness events and learning sessions organized for the project beneficiaries/groups were a continuous effort in ECOFISH II project to achieve the project objectives and goals. The project provided capacity building services to the project staff, local volunteers, target beneficiaries/groups and public private sector professionals to strengthen individual performance, efficiency and empowerment sustainable development. Participating the capacity building events also enabled individual growth and development.

In ECOFISH II most of the capacity building format was participatory. It was a one to one or collective approach. During the reporting year 2024, several capacity building/awareness events were organized for the technical capacity development of the project staff, DoF officials. partner staff, local volunteers (Community Volunteers, Citizen Scientist, Blue guards) on project implementation strategies, Co-management and resilience livelihood issues. The major events organized by the project in 2024 are enclosed in Annexure 2 (Annex 1, Table 14).

The ECOFISH II Activity organized a national-level training course on the Ecosystem Approach to Fisheries Management (EAFM) to build a national pool of experts and raise awareness among stakeholders. The objective was to build capacity and motivate stakeholders to develop an EAFM plan for managing marine artisanal fisheries in the Bay of Bengal. The training was facilitated by an experienced international trainer from the Philippines, who brought extensive expertise in implementing the EAFM. The training was attended by 24 national professionals representing organizations such as the Department of Fisheries (DoF), Bangladesh Fisheries Research Institute (BFRI), Bangladesh Oceanographic Research Institute (BORI), Bangladesh Fisheries Development Corporation (BFDC), Bangladesh Coast Guard (BCG), and several universities.

The conducted events and training courses developed participants awareness on fisheries biodiversity conservation, importance of ecosystem approach in fisheries co-management. The fishers' groups (FCG, VFCG, LFCC) understand the importance of fishing ban and follow the rules of responsible fishing, now they are aware about megafauna conservation. The school campaign activities also have a great impact on biodiversity conservation. The school children learn the importance of biodiversity conservation.

The local volunteers called Citizen Scientist (CS), Landing Center Based Fishers (LCF), provided the data on fish catch monitoring which supported to develop project science outputs. The youth volunteers named Blue Guards (BG) were responsible for the development of a healthy marine environment through beach cleaning and campaign activities. They were motivated to collect the pollutants (Plastic materials and discarded nets etc.) of the fishing boats and dumped those properly at a fixed place. They also volunteered in different issue-based awareness campaigns and national event of day celebration.

The women members of the fishers' family (WING member) supported the family financially through different AIGA activities, they also played a big role in family nutrition and savings. Additionally, they shared their learnings of the training about megafauna, biodiversity conservation, ban period with their husbands. Thus, they recognized their contribution in biodiversity conservation and fisheries co-management. One vital volunteers' group that is community volunteer (CV) were engaged in supported the resilience livelihood components in WING mobilization activities. The project provided an incentive to upgrade the community volunteer as a local service provider (LSP) of agricultural and livestock inputs and support. They were provided hands on training and financially supported from the project to established as local service provider (LSP) of the community.

List of developed Extension Materials:

During the reporting period following modules and guidebook and teaching to use in the capacity building training:

Table 11: Modules and guidebook and teaching to use in the capacity building training:

Sl. No.	Title of the Module/Guidebook	Purpose	Remarks
01	Training module on Conservation of Marine Biodiversity, Safety at sea and Responsible Fishing	To use in Boat Owners training	The hard copy of all the module is shared with the LFCC, and coastal stations of DoF, BFDC and BFRI
02	Training module on Conservation of Marine Biodiversity, Co-Management and Responsible Fishing	To use for VFCG training session	Do
03	Training module on Leadership skill and Organizational development	To use in LFCC training	Do
04	Training module on Ecosystem Approach to Fisheries Management (EAFM)	To use in LFCC training	do
05	Training module on Conservation of Marine Biodiversity, Safety at sea and Responsible Fishing	To use in FCG training session	do
06	Guidebook on Alternative Income Generating Activities for Women in Marine and Coastal Artisanal Fishing Communities	To use in AIGA training of WING members	Distributed to the WING members
07	Guidebook on gender development and nutrition awareness	To use	Do

7.6 Public private partnership and Global Development Alliance impacts

ECOFISH II contributes to public-private partnerships and global development alliances by fostering collaboration among government agencies, local communities, private sector entities, and international organizations. This multi-stakeholder approach creates synergies that enhance the

effectiveness and sustainability of the project's initiatives. In terms of public-private partnerships, ECOFISH II works closely with the Bangladesh Department of Fisheries (DoF), Bangladesh Fisheries Development Corporation (BFDC) and other government bodies to align project activities with national policies on fisheries and marine conservation. The project also collaborates with private sector stakeholders, such as local fishers and businesses involved in sustainable fisheries, to create economic opportunities while promoting environmental sustainability. Additionally, to increase access to services, ECOFISH II facilitated linkages with the Department of Agriculture Extension (DAE) and the Department of Livestock Services (DLS), as well as private sector companies and entrepreneurs, to provide quality vegetable seeds and organic fertilizers. Furthermore, ECOFISH II improves partnerships between the Department of Fisheries and fish traders to develop a co-management system that strengthens the capacity of stakeholders to manage and sustain marine resources effectively. This collaborative approach not only enhances resource management but also ensures that sustainable practices are embedded in the fisheries value chain, contributing to long-term ecological and economic resilience.

7.7 Science, technology and innovations

To generate high quality management oriented scientific information to support decision making for sustainable fisheries management, the project integrated 'improved science outputs for decision-making' component through assessing and improving ecosystem health, assessing and conserving biodiversity, and fisheries dynamics monitoring activities. These activities were implemented in partnership with CVASU and SUST. In addition, the project developed some farming and production technologies for alternative income generating activities (AIGAs) through 'research in development'. Key achievements in science and innovation as the continued effort of the project are summarized below:

- The qualitative and quantitative information generated on coastal fish diversity targeting vulnerable fish and megafauna' species will get management priority.
- Juveniles' information will guide in determining the breeding season of the important commercial fish species to help the government in fine-tuning the marine fishing ban.
- The innovation in seaweed farming technology disseminated to coastal communities might be generating employment and income and supporting the families to build resilience.
- TECOFISH II tackled the challenges of sourcing seaweed seedlings from the wild by developing a tissue culture protocol, offering farmers a dependable and sustainable solution for year-round seedling production his would help to reduce the fishing pressure on coastal marine fisheries.
- ECOFISH II developed an in situ captive breeding-based green mussel farming technology alongside a depuration protocol to ensure the supply of safe and hygienic green mussels to consumers.
- Identification of spawning and nursery grounds of river catfish, Pangas, along the Meghna River systems carried out under this activity, would help the DoF to introduce appropriate management measures.
- Through biophysical and socio-economic information around the Naf-St. Martin's Island areas, sustainable management plan would be formulated to help manage the biodiversity hotspots covering both the Naf estuary, and St. Martin's corals reefs, Moheshkhali and Kutubdia channel.
- The exploration and declaration of the Naf MPA, and other new MPAs in the south-west region focusing on the Kuakata, Patuakhali and Salimpur, Chattogram will provide tools to sustainably manage marine fisheries in Bangladesh. ECOFISH II submitted proposals for the designation of two new Marine Protected Areas (MPAs) along the south-central coast in Kuakata and the southwestern coast in Salimpur.
- Finally, the continued efforts on the innovative digital approach "Citizen Science" in catch monitoring would generate new tools for sustainable resource management involving the fishers.

Lists of Publications

1. Integration of socio-ecological data to prioritize biodiversity hot-spots for Marine Protected Area (MPA) delineation in the coastal zone of Bangladesh. *Regional Studies in Marine Science*. https://doi.org/10.1016/j.rsma.2024.103622
2. Conservation efforts mitigate effects of human disturbance on ghost crab (*Ocypode macrocera*) abundance and behavior on a sandy beach in Kuakata, Bangladesh. *Regional Studies in Marine Science*. https://doi.org/10.1016/j.rsma.2024.103670
3. Combining Local Ecological Knowledge (LEK) and Conventional Scientific Knowledge (CSK) for Exploring Nursery Grounds and Spawning Biology of Yellowtail Catfish *Pangasius pangasius* in the Meghna River Estuary, Bangladesh. *Fisheries Management and Ecology* http://dx.doi.org/10.1111/fme.12746
4. Production performance and biochemical profile of sea lettuce (*Ulva lactuca*): Influence of site-specific ecological factors and cultivation strategies. *Aquaculture.* https://doi.org/10.1016/j.aquaculture.2024.741436
5. Nutrient composition of dried marine small fish in Bangladesh and their potential to address hidden hunger. *Journal of Food Composition and Analysis*. https://doi.org/10.1016/j.jfca.2024.106241
6. Economic well-being induced Women's empowerment: Evidence from coastal fishing communities of Bangladesh. *Heliyon* 10 (2024): e28743. http://dx.doi.org/10.1016/j.heliyon.2024.e28743
7. Women Empowerment Status in the Coastal Fishing Communities of Bangladesh. SAGE Open 14(2). http://dx.doi.org/10.1177/21582440241250114
8. Enhanced Coastal Fisheries in Bangladesh (ECOFISH II) Activity: Key Results and Outcomes. https://hdl.handle.net/20.500.12348/6171
9. Ecology intersects with mariculture: How cultivation depth and site-specific environmental factors shape growth and nutritional profile of green mussels (Perna viridis). https://doi.org/10.1016/j.rsma.2024.103981
10. Advancing low-trophic extractive mariculture (LTEM): Strategies for a thriving blue economy in Bangladesh. Accepted in Marine Policy. https://doi.org/10.1016/j.marpol.2024.106557

8 Stakeholder participation and involvement

The ECOFISH II continued partnership with the Department of Fisheries, three Universities and with NGO- TMSS. In all cases, relevant officials, fishers and other local stakeholders played important roles in planning, implementing and supporting in implementing the activities. Many of the following important stakeholders' consultation meetings, visits and other discussions were held during the reporting year of 2024.

USIAD Field visit

Dr. Muhammad Khan, Director of the Office of Economic Growth, Mr. Ashraful Haque, Project Management Specialist and ECOFISH II Activity Manager, and Mr. Abid Azad, Development and

Figure 49: USAID and WorldFish team had a details discussion on ECOFISH II's achievements, lessons, challenges, and future areas of intervention towards realizing the Blue Economy potential around marine and coastal fisheries resources took place

Communication Specialist of USAID Bangladesh, were scheduled to visit USAID's ECOFISH II intervention areas in Cox's Bazar and Teknaf on May 26 and 27, 2024. However, despite their arrival in Cox's Bazar, all outdoor activities had to be canceled due to Tropical Cyclone Remal. Instead, a detailed discussion was held on ECOFISH II's achievements, lessons learned, challenges, and future opportunities for advancing the Blue Economy potential in marine and coastal fisheries resources.

Consultation Workshops and Meeting

- In January 2024, ECOFISH II, with support from SUST, organized a workshop at the Department of Fisheries (DoF) in Ramna, Dhaka, where preliminary findings based on data from three sites were presented. Following the presentation, the Director General recommended continuing further exploration of Marine Protected Areas (MPAs) in Salimpur, Chattogram, and Kuakata, Patuakhali.
- On May 9, 2024, USAID's ECOFISH II WorldFish Bangladesh organized a day-long workshop in Cox's Bazar with Department of Fisheries officials to discuss the project's fifth-year work plan and exchange experiences. The workshop was attended by 26 officials, including the Mr. Md. Alamgir Hossain, Director General, Chief Scientific Officer, Director of the Marine, and DoF officials from various District and Upazila offices.
- A team of experts from Kenya, supported by the Asia-Africa BlueTech Superhighway project of WorldFish, funded by the Blue Planet Fund of the Foreign, Commonwealth, and Development Office, visited seaweed and green mussel trial sites of USAID/ECOFISH II in May 2024. This exchange of insights holds great promise for significant advancements in promoting sustainable aquatic food systems in the regions across the global south.

Figure 50: Workshop with the officials of the Department of Fisheries to discuss the project's fifth-year work plan and share experiences.

- In local partnership with the Department of Livestock Services (DLS) and Department of Agriculture Extension (DAE) conducted many trainings and vaccination campaigns in 07 field areas of ECOFISH II.
- USAID's ECOFISH II successfully hosted a Consultation Meeting on 28th September'24 at the hotel Golden Tulip, the Grandmark, Banani, Dhaka. The event brought together key stakeholders to deliberate on the future of Bangladesh's marine and coastal fisheries, focusing on the Fisheries Blue Economy, Fisheries Co-management, and Delineation of new Marine Protected Areas (MPAs) in Bangladesh. The Consultation Meeting was a platform to disseminate insights and lessons learned from the ECOFISH II Activity's extensive research and development initiatives. The discussions were structured around Exploring Opportunities, Challenges, and Way Forward for the Fisheries Blue Economy of Bangladesh; Developing Organizational Modalities for Landing Centre-based Fisheries Co-management Committees (LFCCs); Conducting Site Suitability Assessments for New MPAs in Bangladesh.

Figure 51: Consultation Meeting on disseminating insights and lessons learned from the studies on new MPA, Blue Economy and LFCC-based co-management modalities at the Golden Tulip the Grandmark Dhaka.

- ECOFISH II organized "Result Sharing and Closeout workshop" on 21st October 2024, at the Grand Ballroom of Hotel Intercontinental to share the achievements, key findings, impacts on coastal and marine fisheries management in Bangladesh. About 230 participants attended the event. They were representatives of the government agencies, coastal fishing communities, co-management organizations, women member of the coastal fishing households, local women community volunteers, youth volunteers- Blue Guard, citizen scientists, development partners, and policymakers. Ms. Farida Akhter, Honorable Adviser, Ministry of Fisheries and Livestock, Government of the People's Republic of Bangladesh was present as a Chief Guest of this event. Moreover, Sayeed Mahmood Belal Haider, Secretary, Ministry of Fisheries and Livestock and Reed J. Aeschliman, Mission Director, USAID Bangladesh were present as the Special Guests. Dr. Anuradha Bhadra, Director General, Bangladesh Fisheries Research Institute and Dr. Ann E. Flemming, Director Programs and Impact Management, WorldFish participated as the Guest of Honor. The event was chaired by Md. Zillur Rahman, Director General, Department of Fisheries. Dr. Mohammad Mokarrom Hossain, Chief of Party, USAID's ECOFISH II, WorldFish given presentation on ECOFISH II Activity: Overview, Key Results, Lessons and Recommendations for sustainable coastal and marine fisheries management in Bangladesh

Figure 52: Chief guest, Ms. Farida Akhter, Honorable Adviser, Ministry of Fisheries and Livestock, Government of the People's Republic of Bangladesh (upper left) and special guest, Mr. Reed J. Aeschliman, Mission Director, USAID Bangladesh (upper right) are delivering speech in the result sharing and closeout workshop. The guests featured on stage during the event (Middle). Group photos of the guests and participants (lower)

Partnership

Key implementing partners (Universities and NGO) and their sub-projects, activities and their progress made so far are shown in Table 12. All agreements with TMSS, SUST, CVASU and NSTU have closed after successful completion of agreed milestones/activities.

Table 12: Major partners with their objectives/activities and progress to implement ECOFISH II Activity in year 5

Sl #	Name of Partners	Name of Sub-project	Progress in brief
1	Shahjalal University of Science and Technology (SUST)	Zoning of MPA for Naf River estuary, Teknaf Peninsula and evaluation of the geospatial suitability of new MPAs in Bangladesh	The partnership with SUST has been successfully concluded and officially closed.

Sl #	Name of Partners	Name of Sub-project	Progress in brief
2	Chattogram Veterinary and Animal Sciences University (CVASU)	Blue Food Production through Seaweeds and Green Mussels Farming in the South-East Coastal Waters of Bangladesh	The partnership with CVASU has been successfully concluded and officially closed.
3	Noakhali Science and Technology University (NSTU)	Impact of market orientation on nutrient rich ready-to-use (RTU) fish and seaweed powder.	The partnership with NSTU has been successfully concluded and officially closed.
4	TMSS	Improved livelihood resilience of coastal fishing communities (ECOFISH II).	The partnership with NGO TMSS has been successfully concluded and officially closed.

Table 13: Studies conducted by the consultants and firm in year 5

Name of study	Name of Consultant/firm	Study period
Exploring opportunities, challenges and way-forward for the Fisheries Blue Economy of Bangladesh	Dr. Harunur Rashid, Professor, Bangladesh Agricultural University, Mymensingh	June- September, 2024
Non-Conventional Fishery Products to Support Blue Economy	Dr. Enamul Haque, Independent Consultant Dhaka, Bangladesh	June- August, 2024
Developing organizational modalities for the landing center-based fisheries co-management model	Md. Masud Rana, Bangladesh and Dr Romy Cabungel, Independent Consultant, Philippines	June- August, 2024
Endline Gender Study on socio-economic and women's empowerment in coastal fishing communities: An application of the WEFI	Dr. Md. Wakilur Rahman Department of Rural Sociology, Bangladesh Agricultural University, Mymensingh	June-October, 2024
Evaluating the efficacy of the 65-day marine fishing ban in the Bay of Bengal: should we re-evaluate this?	Dr. Md Hadayet Ullah Independent Consultant Adelaide, Australia	September-November, 2024
Characterizing Small-Scale Fisheries in the Nijhum Dwip Marine Protected Area and Surrounding Waters, Bangladesh	Dr. Md Hadayet Ullah Independent Consultant Adelaide, Australia	September-November, 2024
Evaluation of Livelihood Interventions Targeting Conservation Outcomes	Dr. Siddiqur Rahman Department of Anthropology, Jahangirnagar University	August-October, 2024
Endline study of ECOFISH II Interventions in the Coastal Fishing Communities	Development Research Initiative (dRi), Private Research Firm, Bangladesh	August-November. 2024

9 Management and administrative issues

Based in the WorldFish offices in Dhaka, the Activity Management Team (AMT) consists of the ECOFISH II Chief of Party/Team Leader, three/two IR Scientists, MEL Manager, Project Manager, Senior Nutrition Specialist, Training Specialist, Gender Specialist (based in Cox's Bazar), Communication Specialist, and a Senior Project Accountant responsible for decision making, planning and implementing the activities of the annual work plan, guiding and supporting field team, partners, volunteers and maintain relationship with the Department of Fisheries, different public-private organizations, and ensuring USAID and WorldFish compliances. An Assistant Project Accountant is also deployed in Cox's Bazar to look after regional financial activities of Cox's Bazar. In the seven field offices, seven Research Associates and nine Research Assistants, and seven Office & Admin Assistants have been employed in implementing the project field activities. A Monitoring Officer (based in Cox's

Bazar) and a GIS & Data Analyst (based in Dhaka) working with MEL team. The Field Offices are in Cox's Bazar Sadar, Ukhiya, Teknaf, Moheshkhali, and Kutubdia in the ZOR, Cox's Bazar district; and in Kalapara of Patuakhali district, Charfasson of Bhola district in the MRE. At each of the offices, normally a 3-member team with a Research Associate, Research Assistant, and an Office & Admin Assistant are deployed, however, two Research Assistants deployed in Cox's Bazar Sadar and Kalapara (including Patharghata of Barguna district), considering the workload.

As ECOFISH II formally ended on 30 November 2024 (1st December 2019 to 30 November 2024), all 07 field offices have been closed and disposed of assets/inventories to local communities, partner NGOs, local DoF and retained to WorldFish, following formal procedures. Besides this, all necessary MEL and Financial documents (hard copies) are brought back from field offices and preserved in WorldFish's custody at Dhaka. During the extended 3-month period (01 December 2024 to 28 February 2025), 08 key staffs (CoP, Scientists-2, Project Manager, MEL team-2, Finance Team-2) will continue work to finalize Financial and Technical reports and other deliverables as committed to USAID.

10 Lessons learned

- Government recognition and support to adaptive co-management in sustainable coastal and marine fisheries management is essential. Stakeholders' and community participation in biodiversity and fisheries management is important.
- The government needs to address the issues of fishers' access to finance for getting ownership of fishing crafts and gears.
- Women empowerment and gender role in households' decision and co-management have greater scope in coastal fishing communities.
- Reduce IUU & Ghost fishing, and promotion of non-conventional fishery products necessary to support Blue Economy.
- Boat skippers training on biodiversity conservation was an important and effective step to build awareness on marine biodiversity conservation and responsible fishing.
- Involvement of local youth volunteers (BG, CS, LCF and CV) in coastal/marine resources management can play an important role to conserving biodiversity, improving ecosystem health, preventing pollution, and catch monitoring as a part of science-based activities, and empowering women.
- Collaboration with GoB departments, especially Department of Fisheries, played important roles in strengthening project activities / policy supportive activities.
- Fishing ban (22 days' brood Hilsa ban, 65-day marine ban, and 61 days Jatka ban) temporally affecting the resilience of fishers' livelihoods led to higher catch in the coastal areas.
- Rather than focusing on supporting one IG option, the priority needs to enhance their expertise and experience in the household economy. WING leaders and Community volunteers demonstrated potential in various fronts.
- Learning tools such as a BLS book, nutrition flip chart, manuals, and festoons contribute to enhancing key wellbeing outcomes.
- Mariculture is in its early stage, need emphasis on the development of economically efficient technologies, and markets.
- Climate considerations play a significant role in the design and implementation of interventions in coastal areas.
- Business literacy school (BLS) in WING helped rural women in developing reading skills and simple calculation for managing their small business

Annexure-1

Table 14: Different capacity building trainings

Activity	Objective	Achievement
ECOFISH II Implementation Strategy Meeting for PNGO's staff	The training aimed to familiarize participants with the implementation guidelines of ECOFISH-II for the year 5	This was a two-day course held on 13-14 January 2024 where 12 TMSS Field Facilitators, Project Coordinator, and Monitoring, Evaluation, and Learning (MEL) Officer attended.
ToT on ECOFISH II Implementation Strategy for Community Volunteers (CV)	The training aimed to provide participants with a thorough understanding of ECOFISH-II's objectives, working areas, stakeholders, and strategies.	A total no. of 20 new Community volunteers of ZOR MPA and MRE attended the course in two batches held in Cox's Bazar and Barishal .
ToT on ECOFISH II Implementation Strategy for old Community Volunteers (CV)	The training aimed to provide participants with a refreshing understanding of ECOFISH-II's objectives, working areas, stakeholders, and strategies.	A total no of 27 old Community volunteers of ZOR attended the course. They shared the previous years' experience, lessons, challenges and working strategies of Y5 activities.
Capacity Development and Implementation strategy on Y5 Work Plan for WorldFish ECOFISH II team	The objectives were to learn and understand necessary technical Know-how to implement the ECOFISH II Activity year-5 activities and MEL system and also orient with the WorldFish finance, administration and HR policy and issues.	Beside the regular activities a day-long exposure visits to observe the BFDC fish landing center, Industrial fishing trawlers, Orientation on monitoring, control and surveillance and vessel based survey activities at Chittagong.
Training of Trainers (ToT) course on Ecosystem Approach to Fisheries Management (EAFM)	The objectives of this training is to aware the participants about the necessity , importance and the necessary technical knowledge to implement EAFM in Bangladesh	A total of 24 participants from the DoF, BFRI, BFDC, BORI, BG, Universities, and WorldFish attended the course.
A day-long workshop on project's fifth-year work plan and achievement share.	To share the ECOFISH II-year 5 work plan and achievements	A total of 26 officials from the Department of Fisheries, including the Director General, Chief Scientific Officer, Director Marine, and officials from various District and Upazila participated in the workshop.
Mid-Year Progress Review and Way Forward Meeting on Year-5 work plan held in 7-8 July 2024	To discuss the progress up to June 2024 and review the planning of July-October 2024 activities.	Developed exit strategy of local volunteers, and handover procedure of the data/results generated by the Volunteers
International Coastal Cleanup Day 2024 celebration	Highlights the importance of conserving marine biodiversity and enhancing ecosystem health by removing harmful waste.	Around 400 participants actively participated in seven events. The celebration included a rally, discussion meeting and beach cleaning.
ECOFISH II Activity Management Team (AMT) Meeting	Share the activity plan with the AMT members to guide the field team smoothly	A total no. of 12 regular AMT meetings along with some special meetings held during the reporting period.
ECOFISH II Team (All Staff) Meeting	Discussed progress, challenges and future activities.	11 team meetings held during the reporting period.

"Working together to conserve biodiversity, improve ecosystem health and fishers' livelihood"

Photo credit: Dilruba