FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Feed the Future Bangladesh Aquaculture and Nutrition Activity

Quarterly Progress Report: October – December 2021

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WorldFish

Contents

Acronyms

AIN	Aquaculture for Income and Nutrition
AOR	Agreement Officer's Representative
BFRI	Bangladesh Fish Research Institute
CLA	Collaborating, Learning, and Adapting
CoP	Chief of Party
DCoP	Deputy Chief of Party
DoF	Department of Fisheries
DU	Dhaka University
EMMP	Environmental Mitigation and Monitoring Plan
FtF	Feed the Future
GIP	Genetic improvement program
GIS	Geographical Information System
GoB	Government of Bangladesh
ICT	Information and Communications Technology
iDE	International Development Enterprises
IEE	Initial Environmental Examination
IPHN	Institute of Public Health Nutrition
INFS	Institute of Nutrition and Food Science
INGO	International Non-Governmental Organization
MoHFW	Ministry of Health and Family Welfare
MEL	Monitoring, Evaluation and Learning
MIS	Management Information System
MMC	Market Management Committee
NGO	Non-Governmental Organization
SBCC	Social and Behavior Change Communication
SDC	Swiss Agency for Development and Cooperation
SoP	Standard Operating Procedure
SOW	Scope of Work
ToR	Terms of Reference
USAID	United States Agency for International Development
ZOI	Zone of Influence
ZOR	Zone of Resilience

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1. Executive Summary

Feed the Future Bangladesh Aquaculture and Nutrition Activity is a USD 24.5 million, five-year assistance program, awarded to WorldFish on February 6, 2018, which is expected to continue until February 5, 2023. Aquaculture Activity aims to improve the livelihoods of at least 400,000 beneficiaries, including smallholder fish farmers and other actors in the aquaculture value chain . The interventions put emphasis on cross fertilizing knowledge, and sharing expertise so that the skills of the actors are developed, facilitating sustainable growth in the market. The Activity is being implemented by engaging partners from both private and public sectors located at 21 south-western districts and 2 south-eastern districts of Bangladesh, which are known as Feed the Future Zone of Influence (ZOI) and Zone of Resilience (ZOR), respectively.

Aquaculture Activity has undertaken a large-scale study to investigate and document if any systemic changes have occurred across its wide range of interventions. The study is being conducted at three different tiers: (1) implementing partners (IPs), (2) service providers and agents, and (3) farmers/beneficiaries. The first stage of the study, consisting of the IPs, has been completed and it is revealed that 64% of the IPs were satisfied with the interventions they integrated in their business with support from Aquaculture Activity, 27% were highly satisfied and 9% were moderately satisfied. None of the partners said they were dissatisfied with the performance of the intervention. Highest percentage (58%) of IPs said that their customers were satisfied with the service they extended while 35% were highly satisfied and the rests (7%) were not fully satisfied. All the partners confirmed that the intervention introduced some kind of innovation/transformation to their business, while 72% said that they have made autonomous changes to their business model since it was piloted with Aquaculture Activity assistance (*Annex 1*). This is an important indicator of systemic change, showing that the private sector partners are taking ownership over their business model and are likely to continue with them without further support from Aquaculture Activity.

Summary of highlights for the Quarter 1 of Year 5

Key activities performed	Remarks
Established and continued partnership with 37 partners	A total of USD 1,040,651 has been invested, with Aquaculture Activity contributing 36% of the total in the form of cost-sharing grants
Successfully completed 11 planned interventions with partners	Aquaculture Activity has improved access to institutional finance for smallholder fish farmers including women and youth; linked rural fish producers to consumers by strengthening distribution channels; and facilitated activities to drive better hygiene in fish market places.
Key market system activities in quarter 1 year 5	During this quarter, the Senior Management Team made field visits to most ongoing and some closed intervention partners to assess impact and seek opportunities to build on successes generated to date. Aquaculture Activity focuses to bring systemic change in the market through improving access to a) finance, b) quality inputs, in particular feed, c) information through digital platforms, d) increasing access to forward market, with special emphasis on international market, e) establishing one-stop service center.
Access to Finance for Women Producers	Mukti Cox's Bazar has disbursed BDT 16.11 million (USD 188,706) loans to 324 wone and 10 men dry fish actors during the reporting period. The micro-financing helped 638 dry fish actors sell 123 metric tons safe dry fish at a price of BDT 63.11 million (USD 749,503). The loan support coupled with improved financial knowledge is expected to recover the losses that dry fish producers incurred in 2021 due to nationwide lockdown.
Changes in Aquaculture Activity Management	Three staff stepped down from the Aquaculture Activity team during the reporting quarter. Aquaculture Activity will not fill these positions but has rearranged the team structure to mitigate impacts of this change.

Key activities performed	Remarks
COVID-19	There was limited impact of COVID-19 during the reporting quarter and the field team adopted appropriate mitigation measures to address the anticipated potential risks.
Strategy Review	A strategic review was conducted at the latter part of the year to identify and collate the lessons learnt over the reporting period and the previous years. This will inform future intervention design in order to identify and consolidate systemic change in the sector. The process seeks to identify and drive both 'copying' and 'crowding –in' by existing partners and others in the value chain not directly supported by Aquaculture Activity. The Activity has already started to capture the behavioral changes while implementing the interventions by not only the current partners but also previous partners.
Opportunities identified	There is clear evidence that partners have commenced adapting and expanding their activities as a result of the support they have received from Aquaculture Activity. These systemic changes have become more visible, particularly in the areas of getting access to finance, business through e-commerce, and adoption of best management practices (BMP) by the partners. This will form the core of programmatic output in the remaining program period.

New Partnerships:

Aquaculture Activity developed partnerships with 2 enterprises involved in the aquaculture sub-sector during the reporting period with a total value of USD 95,668 where Aquaculture Activity contributed USD 41,141 (43%) and partners contributed USD 54,527 (57%) (*Annex 2*). The brief descriptions of the new partnerships are as follows-

- **Maa Mothsha Hatchery and Nursery-** Maa Mothsha Hatchery and Nursery has started producing and marketing high quality carp seed with support from Aquaculture Activity. They have developed an aquaculture business plan to extend and sustain their business in the Bandarban region.
- **Satata Poultry**- Satata Poultry aims to ensure the supply of quality inputs and advisory services fish farmers and nursery operators of Lama and Alikadam upazila in the Zone of Resilience Satata Poultry will extend technical advisory services to address existing value chain constraints including testing of water quality parameters, and delivery of appropriate high quality feeds and seed at to farmers.

Completed partnerships:

A total of 11 contracts with partners were successfully ended in the 1st quarter of year 5;

- **The City Bank Limited-** the bank delivered training to more than 1,100 farmers on financial management literacy and disbursed USD 3.4 million in loans to the aquaculture farmers.
- **iSocial-** iSocial developed a women-inclusive last mile distribution model, by training and deploying 378 micro-franchisees, who have extended aquaculture services to 4,248 fish farmers.
- **ByteAlly** - the pilot initiative on rohu (*Lebeo rohita*) G3 block chain-based traceability was completed this year. A total of 50 participants (i.e., brood farm, nurseries, hatcheries, and farmers) involved with the rohu (*Labeo rohita*) G-3 supply chain, and 50 grow-out farmers were trained on blockchain applications.
- **BRAC and Bhola hatchery -** the supply of Genetically Improved Farmed Tilapia (GIFT) was increased and 132 million tilapia fries were sold.
- **MWORLD** - more than 10,000 farmers were reached through various events e.g., business

promotion events, market activation, networking meeting and field trials, with over 1,700 farmers adopted G3 rohu in their fish ponds.

- **KNB** – a total of 50 dealers and 150 Local Service Providers (LSPs) were supported, their capacity on advisory service was built and more than 16,000 farmers were reached through improved access to quality feed and services.
- **Bio-floc fish culture system** - Md. Shariful Islam, a youth entrepreneur has promoted bio-floc based aquaculture systems and established a demo bio-floc as a part of the consultancy service to target young entrepreneurs who have limited or no access to pond infrastructure. An online workshop has been organized where 38 potential entrepreneurs have attended to understand more about the bio-floc fish culture system.
- **Classic Melamine Industries Ltd. (CMIL)** - produced 5,018 plates and 5,005 bowls for commercial sale, containing important nutrition, WASH and aquaculture information to drive fish and diversified food consumption, thereby encouraging improved household nutrition

Ongoing Interventions:

- **Sea Natural Food Limited and MarGEn**- promoting ready-to-eat (RTE) processed fish through a variety of retail channels, making it affordable, and accessible to consumers from all walks of life, as a viable and palatable alternative to chicken and other meat-based products already available in the market place.
- **KNB and FishTech partnership**- improving access for smallholder farmers to quality extension services, feeds, and seeds.
- **Petrochem Bangladesh Limited (**PCL) aims to create a market-driven, women-inclusive distribution model to create access for rural farmers with aqua products.
- **Matrix Business Development Ltd** – strengthening business connections between small feed millers with relevant market actors to create access to quality ingredients for local production of quality feeds at a competitive price, increase production, and facilitate effective maintenance services for their machines.
- **Gorai Films** – promoting quality, branded fish seed from selected hatcheries through branding and promotional activities.
- **Bangladesh Shrimp & Fish Foundation** (BSFF) - aims to promote 'judicial' use of quality and approved aqua inputs with an emphasis on compliance issues.
- **Sardar Agro and Afil Aqua**– introduced In-Pond Raceway System (IPRS) technology, as a first mover in southern Bangladesh.
- **BMTH** – supporting the growth of *mola-based* (a small indigenous fish species) aquaculture systems through increasing access to seed for aquaculture farmers and nurseries, and brood for hatcheries, thereby delivering improved nutrition to rural families.
- **KAAS Trade** – aims to promote Best Management Practices (BMPs) through improving access to quality and approved Aqua Medicinal Products (AMPs) for aquaculture farmers, nurseries, and hatcheries.
- **Kiu Global** – developing a digital lending platform to drive better access to formal and mainstream financial institutions for aqua farmers.
- **Macher Gari -** MWorld to promote an app-based innovative transportation system for hatcheries, nurseries, and grow out farms, to enable the efficient and cost-effective carriage of fish whilst complying with all the required quality and compliance standards.
- **IMEXpro –** is promoting science-based aquaculture practices and the use of small-scale aqua machinery (e.g., Secchi disk, pH meter, DO meter) at the farm level
- **The Right Kind (TRK)-** The Right Kind with its tech partner SourceTrace International aims to promote access to online advisory support and digital trading for aquaculture subsector.
- **AIT and Aftab Feed** - promoting LSP-driven feed business, built around an app-based advisory services for smallholder farmers.
- **FishTech hHatchery** established two natural PG (Pituitary Gland) processing plants to collect, process, and market quality PG locally.

- **Shushilan** - promoting access to finance, combined with nutrition-sensitive messaging for rural families.
- **Nutri-Champs** is putting efforts to increase the level of production, sales, and consumption of fish along with disseminating the important nutrition messages and demonstrating best cooking practices among university students and communities.
- **CHHIP FOOD BD**- promoting fish consumption to meet the nutrient need of children, adolescents, pregnant and lactating women, meeting the need for protein, essential fats, and micronutrients through RTE/RTC fish-based products.
- **Bank Asia –** improving access to formal financial products and services for aquaculture stakeholders.
- **Shah Amanath Traders** and **Cox's Bazaar Shop-** advertised their dry fish products and advocated better dry fish Management Practices through social media, leaflet, sticker, display board in ZoR.
- **Mukti Cox's Bazar-** disbursed USD 215,588 loan to 301 individuals (292 women) working in the dry fish sector.
- **GRAUS**- is working in Bandarban sadar, Rowangchari & Nikhongchari upazila for market actors and market channels development for nutrition sensitive aquaculture with 250 new aquaculture participants and 330 graduated participants.
- **Cox's Bazar Shop** – is developing its dry fish retail business to grow sales of various safe dry fish products through promotion and branding, reaching target markets in Bangladesh using its online retail platform.

Monitoring, Evaluation, and Learning (MEL):

The MEL team deployed 25 Data Enumerators (DEs). During the period, DEs were engaged to collect quarterly and annual performance data. Some were also engaged to collect qualitative survey data from the field. The Activity has rolled out a qualitative information gathering initiative, collecting from its IPs, relevant market actors, and final service recipients. Primarily, the IPs whose intervention has already been completed, are considered under this survey which is called 'Tier-1 data collection'. The MEL team, with the help of the MSD and cross-cutting teams, is executing the survey in the field.

Key results: The key performance indicators of Aquaculture Activity and its progress are given in *Figure 1.*

Figure 1: Infographic of Aquaculture Activity key performance indicators progress

In the 1st quarter of year 5 the Activity leveraged USD 1,161,929 as investment, of which USG committed amount is USD 410,874 and private sector's investment is USD 751,055. Bank Asia, City Bank, Mukti Cox's Bazar and Shushilon disbursed USD 315,318 as customized loans packages to 705 stakeholders (*Table 1*).

Strategy Review: The outputs of the review, which was conducted last year, were followed to track and assess the impacts and sustainability of the current and previous interventions. The team has re-engaged partners to understand how the aquaculture space has evolved with the Activity's support for the private sector and NGO actors.

Table 1: Feed the Future Bangladesh Aquaculture and Nutrition Activity Indicators performance data summary

Indicator	Level	Unit	2022 Target	2022 Q1 Results	*% ACHV*	2023 Target (Up to Feb)
EG.3.1-14-Value of new USG commitments and private sector investment leveraged by the USG to support food security and nutrition [IM-level]	Private sector partner leveraged amount	US Dollars	2,292,555	751,055	33%	144,089
	USG commitment amount	US Dollars	1,921,184	410,874	21%	288,178
	Sub-total	***US Dollars***	***4,213,739***	***1,161,929***	***28%***	***432,266***
EG.3-2-Number of individuals participating in USG food security programs [IM-level]		Number	354,748			24,832
EG.3.2-24-Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance [IM-level]		Number	300,824			22,697
EG.3.2-25-Number of hectares under improved management practices or technologies with USG assistance [IM-level]	Commodity: Carp	Hectare	91,543			6,577
	Commodity: Tilapia	Hectare	1,108			80
	Sub-total		***92,651***			***6,657***
EG.3-10-11-12-Yield of targeted agricultural commodities among program participants with USG assistance [IM-level]	Yield: Carp	Kg/Ha	3,493			3,667
	Yield: Tilapia	Kg/Ha	7,741			7,896
EG.3.2-26-Value of annual sales of producers and firms receiving USG assistance [IM-level]	Commodity: Fish	US Dollars	433,257,135			31,113,803
	Firm -Enterprises	US Dollars	19,815,448			1,201,667
	Sub-total	***US Dollars***	***453,072,584***			***32,315,470***
EG.3.2-27 Value of agriculture-related financing accessed as a result of USG assistance	Number of recipients	Number	2,021	705	35%	505
	Size of recipient	US Dollars	816,597	315,318	39%	42,979
GNDR-2 Percentage of female participants in USG-assisted programs designed to increase access to productive economic resources [IM-level]	Number of female program participants (GNDR-2 numerator)	Number	1,617	633	39%	404
YOUTH-3 Percentage of participants in USG-assisted programs designed to increase access to productive economic resources who are youth (15-29) [IM-level]	Number of youth program participants	Number	101	150	149%	25

2. Introduction

The Feed the Future Bangladesh Aquaculture and Nutrition Activity aims to improve the sustainable livelihoods of fish farmers and other aquaculture market actors by applying a market systems approach. Aquaculture Activity takes the approach where the emphasis is on facilitation rather than direct implementation. Activity staff identify critical underlying issues constraining the sector and encourage co-investment by private sector companies and NGOs through grants to address these issues. A key principle is to encourage capacity building in existing value chains rather than supporting unsustainable capacity building initiatives that fade away at the end of the project support. The Activity focuses on improved nutrition through more productive aquaculture and has strong cross cutting elements of environment, youth, and gender which are inculcated into sub-grantees.

The Activity is now entering its fifth year of implementation, and is at a mature stage with significant learning from its interaction with all actors in the aquaculture value chain. The programis currently engaged in a process of critical assessment of impact and sustainability of its past and current interventions to scale up its activities in the areas that have shown promise for sustainable change in the value chain. The Activity will focus on market resilience, promotion of women and youth focused initiatives, access to affordable finance, the promotion of e-commerce and e-information platforms, and the further use ofLSPs to foster greater impact and long-term sustainability. The Activity will address MTE's recommendations and apply lessons, gained from past years. The MEL and KM systems will incorporate mechanisms for qualitative assessment, measure systematic changes and crowding-in, and capture lessons for wider dissemination and replication.

3. Activity goal and objectives

The overarching goal of this Activity is to achieve inclusive aquaculture sector growth through a market system approach. Specific objectives are:

1) Increased productivity of aquaculture production systems.
2) Strengthened aquaculture market system, with particular attention to expanding opportunities for women and youth.
3) Increased awareness and adoption of nutrition-related behaviors, with a particular focus on women and youth.

4. Activity targets

The Activity has the following higher-level targets during its implementation period:

1) 400,000 men, women, and youth in the FTF ZOI and ZOR have improved access to better quality aquaculture inputs, services, and/or market channels
2) 30 percent expansion of investment by the private sector in the FTF ZOI and ZOR in aquaculture production and market related to inputs and services (e.g., seed, feed, production/ market related information, technology, etc.)
3) 30 percent increase in productivity from ponds and *ghers* in the FTF ZOI and ZOR
4) 20 percent increase in the number of households adopting improved nutritional practices (consumption of nutritious food, dietary diversity and hygiene practices)

5. Approach

The Activity is applying an inclusive market systems approach in its interventions through engaging the private sector to reach smallholder farmers and relevant market actors. Aquaculture Activity is facilitating the process rather than delivering the interventions directly, stimulating co-investment which will then transfer ownership to the private sector. The approach includes analysis of the field context, identification of the problems and the underlying root causes of poorly functioning markets, and methods of catalyzing private sectors to bring market-based solutions. These problems and solutions are interrogated through a series of regular co-creation meetings. The Activity Team regularly follows investment rationale steps that justify the Activity investments that should leverage co-investment by the private sector.

The Activity is also seeking sustainability from the start by building capacity and resilience of local systems so that the interventions last beyond the Activity period. It follows the adopt, adapt, expand , respond (AAER) framework to underpin its market system approach to the systemic change of Aquaculture. It helps to analyze whether systemic change is happening, or requires further program action in order to take hold. In the yearlong pilot investment period, the Activity closely monitors and learns how the early systemic change symptoms in the adopt and adapt stage create win-win situations for market players such as private companies as well as for small and poor farmers across ZOI and ZOR. Once it shows promising results in terms of sustainability and profitability, the Activity goes for further investment to strengthen the business model to move to the expand phase to push the boundaries of the model to re-engage in order to include new players or new areas to serve more market actors with more benefits.

6. Geographical focus

The Activity is being implemented across 21 south-western districts under 3 divisions, and 2 south-eastern districts under the same division, which are popularly known as Zone of Influence (ZOI) and Zone of Resilience (ZOR), respectively *(Table 2 and Figure 2*). These areas present significant challenges in relation to the development of aquaculture sector and livelihoods opportunities. The growth in aquaculture in these areas can play in an important role to change this scenario by increasing production and income opportunities, through catalyzing systemic change in the market.

Table 2: Aquaculture Activity working districts

Division	District
Barishal	Barishal, Bhola, Jhalakathi, Pirojpur, Barguna, and Patuakhali
Dhaka	Faridpur, Gopalganj, Madaripur, Rajbari, and Shariatpur
Khulna	Jashore, Jhenaidah, Magura, Narail, Bagerhat, Khulna, Satkhira, Chuadanga, Meherpur, and Kushtia
Chattogram	Cox's Bazar and Bandarban

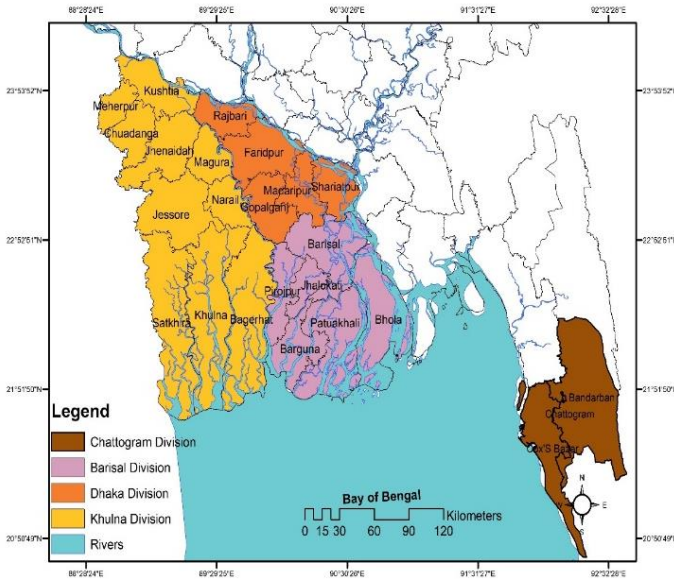

Figure 2: Aquaculture Activity working area

7. Quarter 1 of Year 5 (October-December 2021): Progress against the approved workplan:

IR 1. Increased Aquaculture Productivity

Context: Availability of quality fish seed and feed is a major constraint in the sustainable and profitable development of the aquaculture sector in Bangladesh. Fish hatcheries rarely maintain sufficient stock of quality broods to ensure genetic purity of the offspring, and pay little attention on biosecurity and other techniques to produce safe seed, as the infrastructure, machineries, and production facilities of fish feed producers, and availability of quality raw materials, are not always adequate to addressthese issues of input quality. In response to this, the Activity has been supporting the sub-sector to increase availability of quality fish seed and feed, as well as popularizing improved pond management practices.

Sub-IR 1.1 Increased availability of improved fish seed

Output- 1 Increased availability of high-quality brood fish and seed

1.1.1 Strengthen seed distribution channels through branding and promotion to ensure access to quality fish seeds

Gorai Films provides branding and market promotion services to selected hatcheries who follow best management practices but are unable to tap into new market opportunities due to lack of a fish seed marketing strategy. Gorai took a formal branding approach to improve marketability of quality fish seeds to nursery operators, fingerling traders and fish farmers mainly. Gorai Films has conducted a need assessment study of the hatcheries at Jashore, Rajbari, Khulna, Patuakhali and Barishal and has selected 12 hatcheries during the reporting quarter. The study focused on their existing operational procedure, individual market size against the local demand and linkage with other actors engaged in the trade. The key aim of this study is to primarily increase their marketing performance by conducting large-scale business promotion events. Gorai with technical assistance from the Activity, developed awareness and brand promotional materials including the use of t-shirts, posters, banners, signage, festoons and leaflets, and distribute those during the business promotion events.

1.1.4 Sustainable production and marketing of mola seed through establishing mola brood bank

Bhola Monosex Tilapia Hatchery (BMTH), has been producing and disseminating mola (*Amblypharyngodon mola*) seed to farmers. In addition, BMTH tried to breed mola naturally in hapa.

During the period, BMTH delivered ToT courses to 27 nursery owners, sales agents, and *patilwalas* on mola seed transportation and dissemination so that they can reach to a wider number of farmers. The partner also conducted 40 batches of farmers' training on mola fish production and marketing with 1,000 farmers (447 women).

1.1.6 Strengthen the supply chain of indigenous carp pituitary gland (PG) to produce and market quality PG locally

Widespread use of synthetic hormones in fish hatcheries for induced breeding results in low-quality fish seed production, posing a threat to the aquaculture sector in Bangladesh through poor economic performance.

Aquaculture Activity supported FishTech Hatchery to establish a high performing supply chain of natural Pituitary Gland (PG) from local sources. Through this supply chain, FishTech collects PG from fish markets, processes at their own lab and delivers the high quality PG to different fish hatcheries at a competitive price. FishTech has trained 218 fish cutters and 49 PG collectors on PG extraction from fish heads, together with cleaning, and preservation methods. This has created employment opportunities for fish cutters and PG collectors in the aquaculture value chain, especially for t local youth and women. FishTech promoted the benefits of using natural PG to 64 fish hatchery operators, encouraging change in the current practice of applying synthetic hormone for induced breeding. It has established 7 PG collection centers and 2 PG processing units to ensure a steady supply of PG to the local hatcheries in 7 districts in the Zone of Influence (ZOI).

As a result of these initiatives, within 6 months, FishTech Hatchery collected 2.3 kg PG, paid BDT 9.2 million (USD 109,500) to the fish cutters and PG collectors.

1.1.8 Ensure access and promotion of high-quality carp seeds for development of aquaculture business in the Bandarban region

The number of grow-out ponds existing in the Bandarban region is limited and overall growth of aquaculture in this area is far behind as compared to other parts of the country. Scarcity of quality fish fingerlings is one of the major constraints for commercial fish farming in this hilly and remote region of Bangladesh. This results in poor production and limited or no profit for farmers, leading to reducing

interest from farmers to invest in aquaculture production. Maa Mathshya Hatchery & Nursery (MMHN) in Bandarban aims to address this issue by increasing access to quality fingerlings to the farmers.

The objective of this partnership is to transform MMHN into a best practice hatchery that provides business benefits for the entire aquaculture value chain, including fish farmers, nurseries, inputs suppliers, processors, transporters and consumers. During the reporting period, MMHN conducted a project orientation workshop where 13 potential actors attended. The partner developed 3 brood ponds, almost completed construction of an overhead RCC water tank and the water supply network for the hatchery. MMHN also conducted a day-long capacity building training with 15 fry traders (*patilwalas*).

1.1.9 Ensure access to quality fingerling by strengthening supply and distribution networks in the Bandarban region

To unlock the potentiality of promoting aquaculture value chain in Bandarban, Aquaculture Activity plans to establish more partnership to strengthen and establish market linkages. A new solicitation has published on bdjobs.com and the proposals are being evaluated.

Output- 2 Promoted High Yielding Varieties of Carp

1.1.12 Monitor the dissemination of HYV carp brood stock

Considering the breeding season, most activities will be done in the following quarters.

1.1.14 Documentation on selective breeding program for DoF, MoFL, and stakeholders

A national level workshop will be organized during quarter 2 with DoF, MoFL and other stakeholders including private sectors to present the outcomes of the Carp Genetic Improvement Program (CGIP) and dissemination of GIFT in Bangladesh.

1.1.15 Form national forum on selective breeding and fish productivity

One of the agenda for the above national level workshop is to look at into the scope to develop a national forum with the aim to sustainably run the Genetic Improvement Program of carp and tilapia to benefits the farmers involved in aquaculture in Bangladesh.

1.1.16 Conduct field trial to assess growth performance of G3 rohu

The experiment is going on involving G-3 rohu, natural strain of rohu as control and one commercial hatchery strain of rohu with 10 aquaculture farmers in ZOI since May 15, 2021. As of December 2021, the sampling data showed that the G-3 rohu attained 15% to 60% higher body weight compared to the natural strain, and 40% to 70% higher body weight compared to the commercial hatchery strains in various replications.

Output- 3 Genetically Improved Farmed Tilapia (GIFT)

1.1.17 Provide technical assistance to the hatchery partners on multiplication and brood stock development (BRAC)

BRAC isolated 16,000 mixed sex GIFT fries from eight cohort ponds for the brood stock development program of BRAC Magura Cohort Breeding System (CBHs)**.** BRAC developed physical infrastructure (e.g., fencing with net, setting PVC lines over water) to promote biosecurity at the breeding and nursing units. To ensure dissemination of disease-free broods from CBHs to multiplier hatcheries, the partner tested 32 samples of GIFT future brood off-springs to identify if they were contaminated by Tilapia Lake Virus (TiLV) and Streptococcus diseases, but found none of them were contaminated. To further promote quality GIFT seeds, BRAC has conducted 3 awareness raising workshops at Sathkhira, Barishal, and Chattagram with 63 participants came from multiplier hatcheries and other market actors, 12 multipliers hatcheries already received mixed sex fry as broodstock from BRAC Magura CBHs and in coming years few multiplier hatcheries will come to BRAC for tilapia brood.

BRAC conducted the close-out workshop at BRAC Inn Center, Dhaka with 60 participants f including multiplier hatchery operators, feed dealers, lead farmers, DoF, BFRI, universities, WorldFish, and BRAC.

1.1.18 Foster linkages with BRAC nucleus and Bhola cohort

To facilitate effective communication and linkages between CBHs and multiplier hatcheries, the lists of active multiplier hatcheries and lead farmers has been shared with BRAC and BMTH.

1.1.19 Establish market and technical linkages with SPAITS (Scaling Systems and Partnerships for Accelerating the Adoption of Improved Tilapia Strains by Small-Scale Fish Farmers) participants

Drafted ToT manual for upcoming training of multiplier hatcheries and preparing for the events in next quarter.

Sub-IR 1.2 Increased availability of affordable quality fish feed

Output- 4 Increased availability of better quality feed through Local Service Providers (LSP)

1.2.2 Establish a joint business model to enhance the capacity of the aquaculture market chain actors while increasing their access to quality inputs

KNB and FishTech (BD) Limited have tied up under a mutual business promotion agreement to strengthen linkages between farmers and input supply chain actors that would support the service marketing aspects. During the period, KNB organized several business development events with the participation of 3,813 farmers (969 women).

1.2.4 Produce & promote quality native carp floating feed for small & marginal household fish farmers

AIT (Agro-Industrial Trust), a partner feed company, developed and launched a floating feed using local feed ingredients. It is also 5 to 8% cheaper at farmers level than the AIT floating feed that existed before. AIT sold 346 MT of the newly developed floating feed. During the period, AIT conducted 50 batches of product promotion events, where they disseminated messages on modern fish farming techniques, Best Management Practices (BMP), feeding, disease management, harvesting, marketing, LSP services, and AIT feed service center.

AIT also conducted 80 batches of tea stall campaign to promote & brand the new feed, BMP and its service in the rural hat/bazar area. The sessions were facilitated by the LSPs at different locations of Jashore, Khulna, Jenaidah & Kusthia, with participation of 2,491 farmers including 135 women farmers.

AIT also provided basic training to 15 potential input suppliers on input selection, handling, storage and transportation to strengthen the domestic input supply chain.

Output- 5 Introduced and promoted app-base feed supply chain and feeding management

1.2.6 Promote digital feed supply chain management and advisory services to ensure maximum efficiency of seed distribution and utilization

In order to develop an e-platform to collate and synchronize data on market demands, supply/storage at different tiers, and production status, Aquaculture Activity established a partnership with Aftab Feed Products Ltd. The e-platform would facilitate developing an effective and sound supply chain management system. Aftab developed the App, and organized three (3) types of capacity building training for its project staff, call center staff, LSPs, feed dealers, and sub-dealers. During the reporting period, Aftab in association with SourceTrace, conducted 3 batches of capacity building events for 50 dealers and sub-dealers on the use of its App, BMP technical services, and business promotion. They also organized 4 batches of capacity building events for 100 LSPs on the digital feed platform, app-based feed demand & supply, and BMP technical services & business promotion to farmers, and completed 135 batches of courtyard meetings with 2,784 farmers including 707 women farmers. They also arranged 15 batches of Hat Activation events to promote Aftab digital services and call centers with the participation of 450 fish farmers. The call center provided services to 583 fish farmers including 13 women farmers.

Sub-IR 1.3 Increased adoption of improved pond management practices

Output- 6 Introduce and promote intensive farming in Aquaculture production systems

1.3.1 Promotion and adaptation of In-Pond Raceway System (IPRS) in the south-western part of Bangladesh

Afil Aqua Fish Limited has delivered training courses on the establishment of In-Pond Raceway System (IPRS) to 63 advanced farmers. Six out of them are planning to establish IPRS in the next year at their respective local areas. In collaboration with Jashore University of Science and Technology (JUST), Khulna Agricultural University and Khulna University, Afil has completed ten scientific studies on growth performances of shol (snakehead), rohu, grass carp, tilapia and magur fish with water quality assessment and cost-benefit analysis of culturing those fish in IPRS ponds. Afil harvested shol fish from one of the four production cells and sold 16.10 MT shol fish at a price of USD 52,572. Afil Aqua Fish Ltd. has also prepared an audio-visual to demonstrate the IPRS technology and broadcasted it in a YouTube channel (https://youtu.be/yOe_3PYWxgs).

1.3.3 Promotion and adaptation of Bottom-clean (IPRS) in the south-western part of Bangladesh

Rapid industrialization and population growth caused reduction of agricultural land and aquaculture ponds. Sardar Agro collaborated with Aquaculture Activity to promote the bottom sludge removal IPRS method in the ZOI. During the period, Sardar Agro harvested their 1st crop, which was about 7,200 KG fish from a 50 decimals IPRS pond. Among them 6,600 KG were pabda *(Ompok Bimaculatus)* fish and 600 KG were carp fishes. All pabda fishes were exported to India. They also arranged an exposure visit to the project site for fisheries students of Jashore University of Science and Technology (JUST) on 19th October 2021. A total of 21 students (including 6 women) visited the IPRS technology. Sardar Agro also conducted 5 batches of capacity-building training on IPRS where 127 participants including 23 women attended.

Output- 7 Farmers adopted improved fish farming practices

1.3.5 Ensure Advisory Services and availability of quality Aqua-Inputs for Small-scale Aquaculture Farmers

The absence of quality raw materials, advisory services, and knowledge on better management practices (BMP) prevents smallholder farmers from unlocking their economic potential. To address these constraints, KAAS Trade began strengthening the distribution channel of Aqua Medicinal Products (AMP). In association with three other companies (Argon, Agro Based, and Unique Agro Care), KAAS will reach 17,400 fish farmers, 360 nursery farmers, 36 hatchery owners, and 45 dealers and retailers. They will establish 30 AMP Schools to create improved access to quality inputs and advisory services for the fish farmers along with water and soil quality parameter testing facilities (DO, pH, NH3, H2S).

During the reporting period, KAAS Trade on boarded the project staff and completed orientation on field operations, and selected and trained 66 dealers and 38 last-mile local service providers (LSPs) to extend technical assistance to farmers. They also provided training on AMP and aquaculture technique to provide 360-degree services to a large number of farmers, 44 hatchery owners and technicians, as well as 301 nursery owners. Technical and business capacity of 3 women as nursery operators were also developed to extend technical services to farmers. A total of 224 farmers have already received products and advisory services through product promotion events organized at their one stop service centers (AMP Schools).

1.3.6 Ensure Advisory Services for Small-scale Aquaculture Farmers through Developing Women Micro-franchises

Farmers in remote areas struggle to access quality inputs and advisory services. Petrochem Bangladesh Limited (PCL), with support from Aquaculture Activity, extended advisory services to small-scale aquaculture farmers through 60 women micro-franchisees (WMF) who are linked with the master franchisees (company dealers). PCL will reach 4,800 smallholder farmers directly through courtyard

meetings, and support 2,400 smallholder farmers through embedded advisory services from the WMFs, who will also supply inputs as agents of the company dealers

During the reporting period, PCL has onboarded all of its project staff; conducted project orientation for the project staff; selected the women micro-franchises as well as the affiliated master franchisees/dealers; and provided basic, technical and business development trainings to 58 women micro-franchises. PCL also developed marketing and promotional materials including product brochure-cum-technical handbook, business record-keeping books for WMFs, leaflets, and festoons for large-scale promotion.

1.3.12 Develop market actors and Channels for promoting nutrition-sensitive aquaculture in Bandarban

Aquaculture Activity established a partnership with GRAUS to promote nutrition-sensitive integrated carp-mola polyculture along with dike cropping in Bandarban. During the period, GRAUS completed profiling of 250 farmers (including 115 women farmers) and delivered training on integrated nutrition-sensitive aquaculture, business planning, and carp-mola fish nursery technologies. They have developed 15 new Nursery operators in Bandarban Sadar, Rowangchari and Nikhongchari upazila, and organized 2 market linkage development events with 52 aquaculture market actors, including 18 women, from Rowangchari and Naikhongchari upazila. As part of the aquaculture extension service, GRAUS has distributed carp and mola seeds as inputs to 250 aquaculture farmers including 115 women farmers, and spawn (dhani) to 15 fish nurseries. GRAUS has also distributed fish feed and nursery feed to the 250 aquaculture farmers including 115 women and 15 fish nursery owners. GRAUS has completed the capacity building training on safe handling and transportation techniques of aquatic products and quality transport services for 10 fish transporters.

1.3.13 Strengthen supply of quality inputs and advisory services for fish farmers in Bandarban

The partnership with Satata Poultry is expected to bring improved aquaculture technologies and technical advice on farmers' problems, including testing of water quality parameters and delivery of feeds, to their farm gate. The partnership agreement has been started during this reporting quarter. The project plans to supply quality fish feeds and other aqua inputs at a competitive prices to 200 fish farmers for improved aquaculture business, also supplying feeds to 3 mini agents, 10 nurseries, 1 hatchery and 37 commercial farms for improved production and income from aquaculture. Aquaculture markets will be developed through farmers training/meeting, technical advices, water quality testing, transport and harvesting facilities as embedded services to the clients, and conducting linkage development events. This activity is in the remote Bandarban area, which currently has limited a presence of aquaculture infrastructure.

During this quarter, Satata Poultry has completed staff recruitment, hired a Market Development Officer and has provided project orientation to the newly hired staff. Satata Poultry stocked 18 MT fish feed, 2 MT lime, and other aqua-medicinal products from renowned companies. and sold 10 MT fish feed to 39 local fish farmers. GRAUS facilitated to sell 6 MT of fish feed to 250 farmers and 1 MT lime to 12 fish farmers located at Bandarban sadar, Rowangchari and Naikhongchari upazila. GRAUS also provided advisory services, testing water quality parameters using HACC Kit. A total of 22 farmers of Lama and Alikadam received information and advices on fish culture technology, liming, fertilizing, feeding, and management.

Challenges encountered while implementing activities in IR 1 during this year:

Some of the challenges that have been encountered while implementing the task during this reporting quarter involves delay in tasks for most of the private organizations like KAAS, Petrochem, AIT, KNB and Aftab Feeds due to their engagement in financial year closing in December 2021. Given that hatcheries are closed at this period, FishTech hatchery has also faced challenges to meet their sales target.

Major activity plans for the next quarter:

- **Satata Poultry** will a) provide vehicle support to 15 fish farmers for carrying fish feed; b) extend advisory services; and support for testing water quality parameters to farmers.

- **Maa Matshay Khamar** will a) commence hatchery operation and install a deep tube-well b) develop 400 kg quality broods; c) deliver training and organize market linkage events for market actors.
- **GRAUS** will deliver a) training on Integrated Nutrition Sensitive Aquaculture, Business Planning and Development to new 250 Fish farmers, 6 feed dealers/agents/fish manufacturers on business /market development, b) distribute fingerling transportation facilities to best 15 nursery owners and c) provide input support vegetable seed and OSP vine to 250 aquaculture farmers.
- **CoxsBazarShop.com** will organize consumers' acceptance test of different RTE *Balachao* products by a consultant as a part of new product development and commercialization of widely accepted products.
- **Shah Amanath Traders** will conduct a research to assess the quality and economics of different dried fish products that produced using improved dryers with solar and electric fans.

IR 2. Strengthened Aquaculture Value Chains

Context: Strengthening of aquaculture value chains is important to ensure that aquaculture products reach the market in good condition, waste is minimized in the supply chain and there are effective governance and policy support mechanisms for all aquaculture value chain actors. As aquaculture production grows in particular localities, local consumers can no longer absorb local production, creating opportunities for SMEs to specialize in trading, transporting and marketing of fish and fish products. The Activity is addressing this by encouraging innovation in key value chains while providing background information that will be useful to businesses wanting to invest in value chain improvements.

Sub-IR 2.1 Increased market linkages

Output- 8 Ensured efficient ways of fish transportation systems

2.1.1 Develop and promote an uber-like model for efficient fish transportation

MWorld has launched the 'Macher Gari' app to help farmers, hatchery and nursery owners to transport fish efficiently, maintaining quality and minimizing transportation costs. The app was downloaded 220 times by interested market actors. A total of 78 vehicles have been registered to provide the transportation service through this app so far. To make the app more user friendly, MWorld has also established a call center (09678789987) for those who do not have smartphones. MWorld has conducted 50 promotional events with 846 farmers (746 men and 165 women) and 83 vehicle owners. Already 10 farmers have transported their fish through using the app and call center. Out of 10 farmers, 4 have used the app and 6 have used the call center. The link to the 'Macher Gari' app is https://play.google.com/store/apps/details?id=com.mworld.masergari.

Output- 9 Developed effective business linkage to ensure the availability of better quality aqua inputs

2.1.3 Establish an effective and inclusive business linkage for small feed millers to get on-time access to quality input, machinery service and feed sales

Matrix Business Development Limited has been selected for this partnership. They have developed the training materials for small feed millers and delivered training to 30 small feed millers up to the end of November 2021.

2.1.4 Establish market linkage to ensure the availability of quality seed, feed and embedded service in Cox's Bazar district

Aquaculture value chain actors particularly, fingerlings traders (patilwala), nursery owners, feed dealers, aqua medicinal product (AMP) traders are less available in Cox's Bazar. In addition, they lack appropriate technical knowledge and skills on aquaculture. Therefore, the Activity has planned to extend the aquaculture services to the wider market actors by strengthening market linkages with the

private sector by forming an LSP-driven business model. A solicitation was published on bdjobs.com, several proposals have been submitted by private organizations, and the evaluation process is underway.

Sub IR 2.2 Increased engagement of private sector in aquaculture markets

Output- 10 Built a sustainable farm-to-fork supply chain to promote processed fish foods

2.2.1 Develop a Cool Chain Management Model for the Aquaculture sector to reduce post-harvest loss

Aquaculture sector suffers from serious post-harvest loss every year due to ignorance and negligence in handling and processing at different stages of the supply chain from the harvest to retail distribution. Improper handling and processing reduce the quality of the products. Low quality fish is of great concern to food security and public health. Breaks in the cool chain result in damage or spoilage that makes the product unusable. The efficient management of a cool chain supply line could address this problem. Availability and quality of ice, and the method of icing have been the key elements for quality loss in wet fish.

MarGEn is providing support to the producers and market actors to minimize the post-harvest loss by developing a cool chain management model for the farm-to-fork supply of fish. During this reporting quarter, they conducted a need assessment by using structured survey questionnaires and collected information from 83 respondents. Findings from the assessment identified ways and strategies to reduce post-harvest management and tackle process loss by establishing cool chain facilities.

MarGEn conducted 8 batches of training with 316 market actors (fish traders, fish labor, transporters, ice labor, and helpers) on its newly developed plastic crate in association with N.M Plastic. They have conducted 13 business networking events with 456 participants. For increasing awareness, they completed branding of 10 fish selling mobile vans.

MarGEn designed and printed 120,000 leaflets, 3,000 posters and distributed one-third of these materials by the end of this reporting quarter. They have completed branding of 5 puller vans for selling fish and one freezer van (motorized) for short distance product delivery, and upgraded 5 local storage facilities. They have promoted ‘Halda’ fish brand through 10 advertisements posted in various social media platform, especially in Facebook.

2.2.2 Develop Sales & Distribution model to promote Processed, Frozen and Diversified Fish Item (RTC &RTE)

Demand for fish-derived items readily available to eat or cook, safe processed food, and discontinuation of overdependence on cereals is a significant opportunity for the sector. To increase availability and to promote processed fish products, WorldFish has signed sub-grant agreements with two organizations: Sea Natural Fish Limited (Roja) and MarGEn limited. MarGEn will process and sell both ready-to-cook (RTC) and ready-to-eat (RTE) fish products in Dhaka city while Roja will process and promote RTE fish products in major cities like- Dhaka, Chattogram, Narayanganj, Sylhet etc.

During the reporting period, MarGEn trained more than 700 fish farmers on post-harvest management techniques. They have purchased 72 Tons fish from these farmers during July-December and processed them in Dhaka at their own processing center.

Along with 20 types of RTC fish products, MarGEn has introduced four ready-to-eat (RTE) fish items with the help of their associate partner, Euro Foods. All four products have been tested in the food technology lab of Bangladesh Agriculture University (BAU) and Sylhet Agricultural University (SAU) to ensure utmost consumer protection and quality.

MarGEn has developed a mobile application named “eMargen” to ease the process of ordering RTC and RTE fish products online. Five insulated puller vans have been included in their fleet to deliver fish at retail outlets maintaining the cool chain.

2.2.3 Promote Fish based Ready-to-Eat (RTE) foods in the mainstream market channels

Sea Natural Fish Limited (Roja) have started working from September 2021 and have already distributed marketing materials in 50 stores of Dhaka within a month. Gradually, they will brand and promote their products with another 100 stores including both retail and super stores in Dhaka, Chattogram, and Narayanganj.

Roja has got the interest in cultured fish due to the demand from their buyers in Europe and Canada. Roja has been exporting marine fish to Japan, Europe, and Canada for last 40 years. For past few years, there is a demand from their foreign buyers for the cultured fish. Roja sees this as an opportunity to expand their portfolio and create a new brand for cultured fish similar to their marine fish. On the other hand, the byers are also interested to buy fish from a single point which will save their operational cost and time. As a result of these demands, Roja has reached out to WorldFish to get connected to the fish farmers for quality fish. And to ensure quality, they want to source fish only from those farmers who will follow BMP (best management practice).

Output- 11 Increased access to financial products and services

2.2.5 Improve access to formal financial package for aquaculture stakeholders: Access to Finance

Bank Asia has entered into a second phase with the goal to expand their business in Aquaculture sector in August ’2021. Bank Asia plans to give more than BDT 3.1 million (USD 354,000) as loans to over 450 aquaculture producers in the year 2022. In addition, Bank Asia will build capacity of 1,500 aquaculture stakeholders including 100 input sellers on financial literacy. Another important expansion they plan to make is the loan's ticket size. The initial ticket size for aquaculture was BDT 50,000 (USD 595), which has been increased up to BDT 150,000 (USD 1,785).
So far, Bank Asia disbursed BDT 4.1 million (USD 49,000) as loans to 90 aquaculture farmers including 8 women. Among the total loan disbursed to date, the bank has provided BDT 895,000 (USD 10,654) loans to 20 fish farmers in the last reporting quarter.

2.2.6 Improve Financial Literacy of the aquaculture stakeholder through Formal Financial Institute

Lack of knowledge on financial literacy is one of the key challenges for small and medium-sized enterprises (SMEs), including small-scale aquaculture farmers, to operate their businesses successfully. However, opportunities to access such knowledge from public and private sectors are limited. Aquaculture Activity has partnered with City Bank to improve financial literacy of aquaculture market actors. City Bank with North South University and Bangladesh Institute of Banking Management (BIBM), delivered training on financial literacy to 1,200 fish farmers in 50 batches. In total, City Bank provided BDT 300 million (USD 3.6 milliion) in loans to 184 fish farmers, nursery owners and hatchery operators through 13 Aquaculture Access/Service Points that enabled easy access to loans and consulting services for smallholder farmers.In this quarter, City Bank provided BDT 9 million (USD .11 million) loans to 11 aquaculture market actors.

2.2.8 Introduce 'digital lending' platform to promote easy, cash flow finance for the smallholder farmers

Lack of access to formal financial services is a significant obstacle to growth for fish farmers and aquaculture enterprises. Over 77% of farmers use local informal money lenders and Micro Finance Institutes (MFI) and take loans at exorbitant interest rates (25-30%) (BSFF-2018). A data-driven digital lending system (cash flow-based model) could be a potential solution to reduce perceived risk for formal

financial inclusion. To explore the opportunity of connecting fish farmers to formal banking services, Aquaculture Activity made a partnership with Kiu-Bangladesh (a fintech company).

The Kiu Bookkeeping App and Lending-As-A-Service (LAAS) Platform are being used to improve access to finance (*Annex 3* & *Annex 4*). Fish Farmers/ Retailers insert their business transaction data in the Kiu Bookkeeping App. Based on the transaction data, a credit rating profile is generated. Using that credit rating profile, fish farmers/retailers apply for loans to financial institutions.
In the last reporting quarter, Kiu has on boarded 1,200 aquaculture farmers in Khulna and Bagerhat and oriented on its digital business record keeping platform. Out of 1200, Kiu trained 550 farmers and 50 retailers (252 were women out of 600) on "Kiu Digital Application."

Kiu and AB Bank Limited have concluded a tripartite agreement for loan disbursement to selected aquaculture farmers and other stakeholders. KiU will provide loan to 300 farmers and average loan size will be BDT 50K (USD 488). A Toal of BDT 1.50 cr (USD 1.76 million) will be disbursed. Furthermore, Kiu Bookkeeping App has recently been translated into Bangla to comply with local company process and loan application standards.

2.2.9 Provide microfinance support to promote nutrition-sensitive aquaculture

Smallholder farmers usually access loans from local Mahajan (moneylenders) with an excessively high rate of interest that becomes a burden for them to repay. A significant portion of their income go to these Mahajan which makes it very difficult for these farmers to manage their family and business.

The Activity engaged Shushilan who executed a project named "Shudin", in 2019-2020. During that period, Shushilan trained 3,060 women and youth farmers. The intervention provided shock recovery financial support linking with Shushilan's existing micro-finance program to more than 1,800 Aquaculture farmers to overcome Cyclone Amphan, Cyclone Yaas, and COVID-19 crisis by helping farmers continue their production.

Based on the success from 1st phase, Shushilan is awarded with a 2nd phase. During this reporting period, Shushilan has completed its staff recruitment, staff training and project orientation, and has conducted one staff quarterly meeting. In addition, they disbursed an amount of BDT 10.82 million (USD 127,271) in loans to 446 fish farmers (17 men and 429 women) with an annual interest rate of 12.5-14.3% depending on the context, 14 to 15 times lower than the local money lenders (Mahajan). Moreover, their 5 field facilitators have conducted 45 courtyard sessions and provided information on aquaculture, basic nutrition, and effective utilization of credits.

2.2.10 Ensure access to micro-Finance Services for dry fish businesses in Cox's Bazar

Dry fish actors in Cox's Bazar lack access to affordable formal finance to operate their business. Instead there are limited opportunities for processors to get access to loan from local lenders at prohibitively high interest rates which impacts negatively on the profitability of their business. Aquaculture Activity, in partnership with Mukti Cox's Bazar, is working to provide access for dry fish actors to finance from formal institutions to address capital shortage of the dry fish entrepreneurs.

Mukti Cox's Bazar has provided BDT 16.11 million (USD 191,327) to 329 women and 08 men dry fish actors as loans during the reporting period. They have also delivered training to 420 participants including 412 women dry fish actors on financial management and 441 dry fish actors including 432 women on savings and credit management. A total of 638 dry fish actors sold 123 metric tons of safe dry fish worth BDT 63.11 million (USD 749,503) during the reporting period. With this loan support and improved financial knowledge, dry fish producers are expecting to recover the losses they incurred in 2021 due to nationwide lockdown.

2.2.11 Ensure access to microfinance and technical services for dry fish and aquaculture actors in Cox's Bazar

The dried fish and aquaculture actors are suffering from shortage of capital due to lack of access to finance from formal financial institutions, poor sales of dry fish products, poor production of fish and price reduced. During COVID-19, dry fish and aquaculture business were almost on the verge of of bankruptcy. In response to this situation, Aquaculture Activity plans to engage with microfinance institutions for the provision of microcredit and technical support for the business growth. Aquaculture Activity will arrange co creation meetings with MFIs like Mukti or others with the aim to build partnerships from May 2022 onwards.

Output- 12 Promoted Mechanization and technology in aquaculture

2.2.12 Promote small-scale machineries to foster mechanization in the aquaculture sector

Most small scale fish farmers are reluctant to use aquaculture machinery due to lack of knowledge of its benefit, necessary usage information and after-sales service. Aquaculture Activity made a partnership with IMEXpro (BD) Corporation to promote small-scale aquaculture machinery such as pH meters, DO meters and Secchi Discs that can help improve pond performance and productivity.

In this reporting period, IMEXpro created a database of 45 LSPs and1030 farmers, and have organized business promotion and B2B events with 44 LSPs on aqua machinery, science-based aquaculture management, and incentives to use mechanisation and testing equipment. Also, a total of 6 one-stop service centers have been established by end of the reporting quarter.

Output- 13 Recovered Dry fish market from the effects of the pandemic

2.2.14 Promote Dry Fish Business through Marketing and Branding

Due to the lack of proper marketing and branding strategies, dry fish entrepreneurs are struggling to maintain and grow their businesses. Aquaculture Activity made a partnership with Shah Amanath Traders (SAT) to address branding and promotional activities around safe dry fish and fish products.

SAT has conducted training courses on sorting, grading and cleaning for 60 women workers. SAT sold 7,546 kg dry fish valued at BDT 3.51 million (USD 41,646) in this quarter through online, offline and their distributors. By employing different strategies such as advertisements through social media platforms such as Facebook boosting, webpage hosting, bill boards, smart packaging and by following better management practices, SAT has increased their sales volume by 56% than last year.

2.2.15 Promote and branding safe Dry fish business

Aquaculture Activity made a partnership with Cox's Bazar Shop to develop its dry fish business and improve sales of different dry fish products through promotion and branding, to reach target markets all over Bangladesh.

Cox's Bazar Shop conducted advertising through social media, developed an Android App, and prepared 30 different digital contents. In this quarter, the partner has sold 3,750 Kg dry fish and 1,620 jars *Balchao* products (285% higher than last year's sales volume) valued at BDT 2.81 million (USD 33,269) (240% higher than last year's sales value) to 1,374 customers (245% higher than last year's number of customers).

Sub IR 2.3 Improved enabling environment for inclusive growth in aquaculture

Output- 15 Developed advisory services for farmers

2.3.1 Promote Digital Advisory Services for Aquaculture stakeholders (TRK, SourceTrace) to effectively connect them to the backward and forward market

The Right Kind (TRK) with its tech partner SourceTrace International aims to promote widespread 360-degree advisory support along with digital trading for the aquaculture sector. It is expected that farmers will get multiple support from this two-way digital communication channel such as (a) advisory support (b) product purchasing support (c) access to finance support (d) fish selling support and (e) weather information. Also, private companies will also be able to expand their business opportunities. The Right Kind named this platform as "The Right Haat**"** (*Annex 3* & *Annex 4*).

By the end of this quarter, TRK has on-boarded around 31,000 farmers through its different advisory service points and events (e.g., cluster meetings, field visits, input sellers, call center). They have established 143 retailers as their service referral points in 6 districts in the ZOI. During year 4, TRK also conducted 45 cluster meetings with smallholder farmers, three orientation training sessions with government stakeholders, and 15 onboarding meetings with input retailers. The main ground activity of the project is to move door to door of farmers' houses and inform them about this advisory platform. So far, TRK moved to the doorsteps of 10,000 farmers in person and made them aware of this advisory platform.

One of the most important aspects of this business model's financial viability is private company participation, and so far, they have approached over 50 aquaculture private companies; and 6 companies were on-boarded in TRK's platform during this reporting quarter.

TRK's Facebook page has gained 15,000 farmer followers to date since inception and participated in live sessions on a regular basis. So far, 17 live sessions with various aquaculture specialists were organized, during which farmers posted questions to the experts in real time. Farmers also registered their queries as an official post and received answers within 24 hours. 500 aquaculture stakeholders have downloaded "The Right Fish" app and started getting advisory services.

2.3.2 Standardizing and Developing Dried Fish Products and Consumers' Preference Test

The solicitation has been published in the media and two companies have submitted their technical and financial proposals and the proposals which are now under the evaluation process of Aquaculture Activity.

2.3.3 Advocacy on ensuring optimal and sustainable utilization of aqua inputs in Bangladesh with a focus on compliance-related issues

With the intensification of aquaculture practice, use of aqua inputs such as feed and aqua medicinal products are increasing by the fish farmers in Bangladesh. However, inappropriate usage of inputs such as application of harmful doses or usage of banned inputs have severe adverse consequences on the quality of final output. Use of prohibited aqua inputs may severely compromise the quality of fish procured.

Bangladesh Shrimp and Fish Foundation (BSFF) facilitates intra-governmental and public-private sector consultation to create awareness on prohibited aqua inputs. In this reporting quarter, BSFF organized a stakeholder consultation meeting with key government stakeholders i.e., Department of Fisheries (DoF), Bangladesh Fisheries Research Institute (BFRI), Ministry of Commerce (MoC) and Directorate General of Drug Administration (DGDA), and discussed about the definition and classification of aqua inputs in the country context.

2.3.4 Promote door-to-door access to quality aqua-inputs and services through the expansion of women-centric Micro-franchise

iSocial is developing a robust supply chain in aquaculture input market by forming a women-inclusive Last Mile Distribution model. They are testing the commercial viability of such model in the Bottom of the Pyramid (BoP) market for major aquaculture products and services. Seven partnerships were made with local and regional level aqua-input dealers and distributors who use iSocial's alternative distribution channel to sell products - feed, fertilizer and lime in particular.

iSocial identified and deployed 378 women as its aquaculture micro-franchisees. These women micro-franchisees were trained on small trading, product basket, aquaculture services, sales and marketing techniques in 33 capacity-building sessions. These micro-franchisees have now formed a network of small businesses and are providing essential aqua inputs and services to their communities. To date, they have extended aquaculture services to 4,248 fish farmers and sold aqua input products worth BDT 2.6 million (USD 31,065).

While doing the distribution business, iSocial mobilized BDT 1.5 million (USD 17,900) as working capital for 20 women micro-franchisees for selling aqua inputs. iSocial and Bank Asia entered into an agreement where Bank Asia will provide Trade Credit or Working Capital Loans to iSocial's micro-franchisees in the coming months.

Challenges encountered while implementing activities in IR 2 during this year:

Kiu and TRK are facing challenges as digital literacy of fish farmers is a concern for adoption of digital tools and mobile application. Micro-franchisees of iSocial had hard time to get access to finance for their working capital. As a result, they could not sell aqua inputs as per the original projection. Marketing and promotion for the aqua machinery of IMEXpro took a slow turnaround because these are expensive pieces of equipment and smallholder farmers find this hard to purchase. Unlike local and national MFIs, City and Bank Asia found it difficult to ensure documentation to meet up the requirement of formal finance as well as Bangladesh Bank to open accounts and disburse loans. Shushilan also had a hard time to disburse microcredit through its "Shudin" microfinance program as many farmers have relocated themselves due to internal migration.

Major activity plans for the next year:
During the next quarterMatrix Business Development Limited will train 20 feed millers. MarGEn will conduct 20 training and awareness sessions for urban homemaker/ office going women to aware them about diversified fish item preparation. A brand ambassador for MarGEn (recipe expert) will be appointed who will train 200 women (10 in each event) on different RTE fish item preparation. Roja will train 2,000 fish farmers on past-harvest management maintaining an international standard. Mukti in Cox's Bazar will provide loan to 62 dry fish actors and disburse BDT 1.8 million (USD 21,377). They will provide training on financial management to 140 dry fish actors and savings and credit management to 159 dry fish actors. They will also conduct an impact study among dry fish actors. Shah Amanath Traders will organize an exhibition in a trade fair at Cox's Bazar and also continue their promotion and advertisements through Facebook and Webpage.

IR 3. Improved Nutrition-related Behavior of Rural Households

Context:

Food security has significantly improved in Bangladesh; however, under-nutrition rates remain unacceptably high, and dietary quality for the majority remains low. Inadequate intake of vitamins and minerals such as iron, zinc, calcium, vitamin B 12, and vitamin A in infant child development contribute to stunting, which leads to a lifetime of cognitive impairment, reduced productivity, and lowered earning potential. Stunting, combined with other nutritional deficiencies associated with poverty, undermines the trend of improvement in national development. Fish is the culturally preferred animal-source food in Bangladesh and is uniquely placed to contribute to reducing undernutrition. Focus is being given to significantly increasing the production of micronutrient-rich small fish. The following Sub-IRs will contribute to improving nutrition-related behaviors of rural households in a gender-equitable manner.

Sub-IR 3.1 Improved nutrition awareness and practices

Output- 16 Improved access to information on nutrition

3.1.1 Support Nutri-champs winning chefs as ambassadors to promote consumption of fish in Cox's Bazar

A total of six Nutri-champs were selected from the champion chefs who participated in the cooking competition organized jointly by the five USAID-supported projects and Save the Children, in 2019-20. The five USAID supported projects are FTF Aquaculture Activity of WorldFish, SBCC Activity of Johns Hopkins Center for Communication Program, FTF LPIN of ACDI-VOCA, FTF RDC ACDI-VOCA, and FTF BNA of Abt Associates. One of the key objectives of this collaboration is to increase the level of production, sales and consumption of fish along with disseminating the key essential nutrition messages. The Aquaculture Activity nutrition team has been demonstrating cooking methods and disseminating messages through the support of six champion chefs, the Nutri-champs, in three – teams, one each in Cox's Bazar, Jashore and Patuakhali since March 2021.

In the reporting quarter, three Nutri-champs organized 10 sensitization meetings with canteen catering staff, university authorities (e.g., Provost, house tutors, etc.), at Patuakhali Science and Technology University, Cox's Bazar Govt. College, Jashore Govt. Mahila College, 4 school-based events, 2 fish-market-based events and 1 special program to demonstrate best cooking methods of fish and disseminated nutrition messages at the community level in Cox's Bazar, Jashore, and Patuakhali. A total of 1,305 participants including 509 women have participated in those events. In addition, the Nutri-champs disseminated essential nutrition, WASH, and COVID-19 messages, and distributed different IEC materials on nutrition, aquaculture and nutritious fish recipes to the participants of these programs.

3.1.2 Support Nutri-champs winning chefs as ambassadors to promote consumption of fish in Jashore

Detailed compiled progress of three Nutri-champs team are given in 3.1.1

3.1.3 Support Nutri-champs winning chefs as ambassadors to promote consumption of fish at Patuakhali

Detailed compiled progress of three Nutri-champs team are given in 3.1.1

3.1.5 Facilitate coordination meetings with the government stakeholders to increase the message dissemination on the benefits of fish consumption

The Aquaculture Activity nutrition team will facilitate a coordination meeting with government stakeholders in January 2022 to boost nutrition message dissemination on the benefits of fish consumption.

3.1.6 Promote handwashing practices at the aquaculture farmer community by partnering with a soap company (e.g. Unilever)

Not applicable for this quarter. Aquaculture Activity will circulate a solicitation in January 2022 to identify and engage with a soap-producing company. The Aquaculture Activity nutrition team communicated with Unilever, one of the prominent soap-producing companies in Bangladesh, and found their interest in working with Aquaculture Activity.

Sub-IR 3.2 Improved access to diverse and nutritious foods

Output- 17 Increased nutritious food intake

3.2.1 Establish partnership with fish processor for wholesale fish supply

Bangladesh has progressed outstandingly in fish production and achieved self-sufficiency in recent times. However, the new generation, particularly the school-going and college-going children, are less interested in eating fish due to the fear of fish-bones and monotonous traditional fish curries. To promote

fish consumption to meet the nutritional need of children, adolescents, pregnant and lactating women, particularly meeting their demand for protein, essential fats, and micronutrients, Aquaculture Activity has made a partnership with CHHIP Food BD. This intervention mainly targets school-going children and community people to increase the consumption of fish-based products as snacks replacing traditional unhealthy foods for better health.

CHHIP Food BD has developed 17 fish-based RTE/RTC products, including fish balls, fish fingers, fish nuggets, fish sausage, fish burger patty, fish samosa, fish spring roll, etc. The Aquaculture Activity nutrition team linked CHHIP Food BD with its identified 28 potential last mile sales agents (LMSAs) of Bangladesh Nutrition Activity (BNA) for selling RTE/RTC fish products. CHHIP FOOD BD also selected 20 supermarkets in Dhaka to sell RTE/RTC fish products.

During this reporting quarter, CHHIP Food BD has organized 60 promotional activities at 20 super shops food corners and disseminated promotional materials (leaflets, posters) on the benefits of eating fish-products and fish as a whole to increase fish consumption, conducted three staff sanitation programs to maintain a hygienic environment at their production factory, developed promotional materials (leaflets, poster cum stickers, x-banners, festoons, etc.) on the benefits of eating CHHIPs products to boost their sales, set up and strengthened one subsidized distribution channel covering 28 outlets in Patuakhali, for smooth supply of their fish-based products in the Barishal division, developed and disseminated 24 promotional still pictures on the benefits of eating fish products, conducted 2 free food sampling (fish ball, fish finger, fish nuggets, and fish sausage) events and online marketing through Facebook and YouTube for selling their fish-based products.

They have also displayed and distributed posters and leaflets to the consumers to promote the consumption of fish and fish products. In addition, CHHIP FOOD BD has selected 28 outlets in different locations at Kalapara Upazila in the Patuakhali district. They have sold RTE/RTC fish-based products in Dhaka city through 20 super shops worth BDT 2.5 million (USD 30,000) during this reporting quarter, raising the aggregate sales throughout the project period to BDT 12.63 million (USD 151,590). In addition, they sold fish-based products worth BDT 83,800 (USD 1,000) in the 28 outlets within the same period in Patuakhali and Faridpur districts. Moreover, they have handed over a deep freezer to the dealer for storing and selling the products. Now, CHHIP FOOD BD is transporting their products through their own freezer van.

Challenges encountered while implementing activities in IR 3 during this quarter:
CHHIP FOOD BD encountered challenges due to staff drop out while introducing new fish-based products in the rural districts. The activities of Nutri-champs have been delayed given the long-time closure of educational institutions due to Covid-19, and the continuous occurrence of public examinations in these institutions.

Major activity plans for the next quarter:

Shushilan will distribute loans to more than 850 aquaculture farmers and educate them on improved aquaculture practices, basic nutrition, and effective utilization of microfinance through 170 courtyard sessions. The Nutri-champs chefs will carry out one special program on cooking demonstration and nutrition messages dissemination at the community level, facilitate 4 central events at parents day/sports event/student gatherings at University (Patuakhali Science and Technology University, Cox's Bazar Govt. College, Jashore Govt. Mahila College) to widely disseminate the nutritional value of fish, best cooking practices and dietary diversity. CHHIP Food BD will continue its promotional activities at 20 super shop food corners through promotional materials (Leaflets, posters, etc.). They will also continue their free food sampling (Fish ball, Fish finger, Fish nuggets, and Fish Sausage) at Patuakhali and Faridpur districts

8. Project management and cross-cutting

8.1. Activity Management

Common Programs

8.1.2 SMT/coordination meetings

Senior Management Team (SMT) members attended weekly SMT meetings regularly to discuss on relevant agendas to strengthen the implementation and timely accomplishment of all the deliverables as listed in the Year 5 Workplan. SMT members also met to review intervention proposals of interested entities as part of Implementing Partner (IP) selection process. Activity all staff meeting was also held time-to-time to discuss the progress against target, associated constraints, measures taken to address problems, way forward, etc. Besides, other meetings at SMT, all staff and individual team levels on specific agenda, issues, were held time to time to strengthen team work to increase output. Weekly and other time-to-time meetings with USAID, monthly and other meeting with Activity IPs and time-time meeting with other USAID implementing partners and organizations were also held.

Consultant

8.1.3 Assessing performance of Market System Approach

Aquaculture Activity is conducting a thorough in-depth study involving a wide range of market actors operating in ZOI and ZOR districts and beyond to unfold and dig-out the effectiveness, impacts and performances on the programmatic interventions and innovations that occurred over the project period at various forms and shapes. The details on methodology and sampling protocol are available in *Annex 5*. The aim of the study is to explore scope for scalability of the interventions, market resilience and increase more meaningful participation of women and youth. Also, it is intended to categorize and rank the existing and phased out partners' interventions based on the solid facts, evidences and findings and help guide implementation over the rest of the project period.

The in-depth qualitative survey aims to discover/unfold changes in the market system and pattern of crowding-in, copying-in, and spillover effect/ replication and its potentials for scalability and market resilience. It is also expected that through this study Aquaculture Activity will better understand how an individual partner/market actor subjectively perceives and gives meaning to their business reality and context and categorize them based on their performance and innovation. Most importantly, effectiveness of the Activity implemented so far and how the extent of market constraints addressed through different interventions will be well identified and documented.

Aquaculture Activity team have already collected data from Activity partners (tier 1) through a semi-structured questionnaire (*Annex 6*). The next stage is to carry our further surveys with the IPs' clients i.e., 2nd tier market actors (e.g., dealers, retailers, wholesalers, traders) and participants (tier 3) (e.g., Fish farmers, nursery operators) using two different semi-structured questionnaires (*Annex 7* & *Annex 8*). Initial findings from tier 1 survey are summarized in *Annex 1*.

8.1.4 Collaboration with DoF

In connection with the official letter from the Regional Director, Bangladesh and South Asia, WorldFish to the Director General of DoF, Bangladesh, requesting collaboration between WorldFish and DoF in the areas: 1) Capacity building and engaging Local Extension Agent for Fisheries (LEAF) to support aquaculture market actors, 2) Fish hatchery branding protocol and monitoring and 3) Monitoring quality of aquaculture inputs, One senior Activity staff along with another senior WorldFish staff, met with DG, DoF and some other senior most DoF officials to discuss on the subject to start work in the proposed areas (to learn more please see *Annex 9* minutes of the meeting). The outcome of the meeting, the Director General assigned one officer as the focal point for the collaboration between WorldFish

and DoF (*Annex 9*). The new focal point has already taken initiative to set a meeting for Aquaculture Activity senior staff with the DG and other relevant senior staff of DoF.

8.1.5 Enhancing MSD Monitoring, Evaluation and Learning system

The Activity took the initiative to strengthen wider areas of its MEL system with special focus on market systems development project monitoring and evaluation with the support of a consultant. The key accomplishments of the initiative area as follows:

- Reviewed Activity's existing MEL system and suggested ways of improving it (*Annex 10*).
- Improved several existing tools and built new ones to better and more accurately capture impact of its private sector partnership investments not only within the primary partners but also other value/supply chain actors, secondary beneficiaries that benefit/invest as a result of these interventions.
- Helped with the design of instruments both qualitative and quantitative, for the assessment of systemic change.
- Developed infographics to communicate the results generated by the Activity.

8.2. Finance and Grants

Budget

8.2.1 Year 5 Budget development

Aquaculture Activity Year 5 budget was rigorously developed with the program and senior management team having the detailed list of interventions and activity set in the work-plan as main reference. The information used in budget development came from historical data, previous activity costing and assumptions. The Activity's Year 5 budget is $5,087,427 (*Table 3*).

By the end of Year 5, Aquaculture Activity will have an estimated remaining budget of $4,377,656. This projection assumed the need for a No Cost Extension (NCE).

The Activity budget will also need a request for budget realignment from USAID as there are additional consultant required in Year 5. The Activity, needed to sign a contract with Dr. Charles Kirby as Market Systems Consultant and Mohammed Nurul Azam as Market Systems Development Project Monitoring, Evaluation and Learning Consultant. This budget line item will fall short of $155,172 in this budget year.

Table 3: Aquaculture Activity year 5 budget

Bangladesh Aquaculture Activity		Actual Expense				Plan Budget		
Budget Line	AEC	Approved Budget	Year 1 (8 months) (Feb'18-Sept'18)	Year 2 (12 months) (Oct'18-Sept'19)	Year 3 (12 months) (Oct'19-Sept'20)	Year 4 (12 months) (Oct'20-Sept'21)	Year 5 (12 months) (Oct'21-Sept'22)	Budget Balance end of Sept 2022
Direct Labor	G001	5,474,565	414,022	926,710	1,082,060	1,162,779	1,296,564	592,430
Fringe Benefits	G002	1,765,430	131,311	294,843	375,758	360,918	364,212	238,388
Consultant	G003	288,593		70,998	73,348	57,419	242,000	(155,172)
Supplies, Equipment and Operating	G004	1,741,916	153,671	478,943	325,368	173,893	216,720	393,321
Travel and Per Diem	G006	967,676	51,841	206,295	141,701	103,476	134,244	330,119
Other Direct Cost	G007	4,282,319	112,324	695,954	333,383	599,437	574,293	1,966,928
Sub-Grants	G008	5,800,365		1,274,492	1,607,383	1,248,560	1,398,809	271,121
Total Direct Cost		**20,320,864**	**863,169**	**3,948,235**	**3,939,001**	**3,706,481**	**4,226,842**	**3,637,136**
Indirect Cost	OH	**3,657,756**	**155,370**	**710,682**	**709,020**	**667,167**	**760,832**	654,685
CGIAR Cost Sharing Fee [@ 2% of total direct + indirect cost]	CSP	**479,572**	**20,371**	**93,178**	**92,961**	**87,474**	**99,753**	85,835
Total Activity Cost		**24,458,192**	**1,038,910**	**4,752,095**	**4,740,982**	**4,461,122**	**5,087,427**	**4,377,656**

8.2.2 Quarterly Forecast

Aquaculture Activity spent a total amount of $1,250,980 for the quarter October-December 2021. $95,216 higher than the forecast (*Figure 3*).

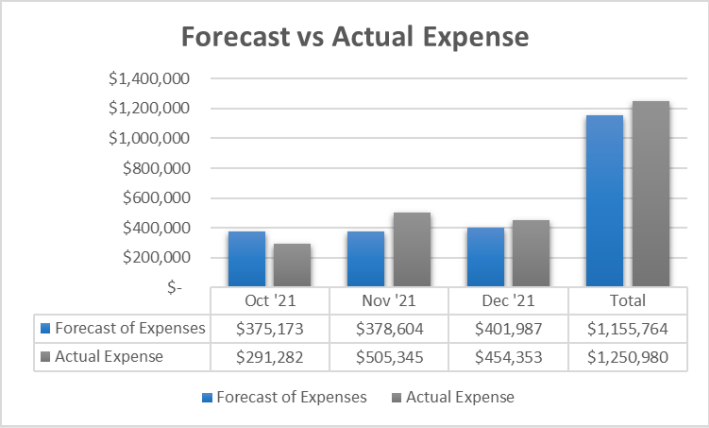

Figure 3: Forecast vs actual expense

8.2.3 Midyear budget review

The Activity budgeted an amount of $5,087,427 for year 5 (October 2021-September 2022) and have already burnt a total amount of $1,250,980 by the end of the first quarter October-December 2021 leaving an available budget of $3,836,447 until September 31, 2022 (*Figure 4*).

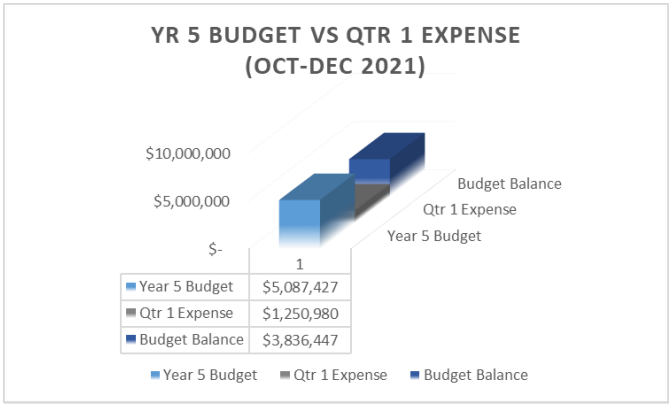

Figure 4: Year 5 budget Vs Quarter-1 expense

The accumulated expenses from 2018 to date recorded at $ 16,244,088 leaving an available budget balance of $8,214,104 as of December 31, 2021 (*Table 4*).

Table 4: Aquaculture Activity actual expenses

Cost Categories	LOP Budget	Actual Expenditure								Cumulative Expenditure as of December 31, 2021	Budget Balance as of December 31, 2021
		Year-1 (Feb'18-Sept'18)	Year-2 (Oct'18-Sept'19)	Year-3 (Oct'19-Sept'20)	Year-4 (Oct'20-Sept'21)	October 2021	November 2021	December 2021	October-December 2021		
	$	$	$	$	$	$	$	$	$	$	$
Direct Labor	5,474,565	**414,022**	**926,710**	**1,082,060**	**1,162,779**	103,855	106,948	118,176	**328,978**	**3,914,549**	1,560,016
Fringe Benefits	1,765,430	**131,311**	**294,843**	**375,758**	**360,918**	29,528	29,188	28,081	**86,796**	**1,249,625**	515,805
Consultants	288,593	-	**70,998**	**73,348**	**57,419**	15,671	16,933	26,063	**58,667**	**260,431**	28,162
Supplies, Equipment and Operating	1,741,916	**153,671**	**478,943**	**325,368**	**173,893**	10,216	37,727	14,990	**62,933**	**1,194,809**	547,107
Travel and Per Diem	967,676	**51,841**	**206,295**	**141,701**	**103,476**	10,194	17,494	14,833	**42,521**	**545,833**	421,843
Other Direct Cost (Activity)	4,282,319	**112,324**	**695,954**	**333,383**	**599,437**	33,745	12,015	59,770	**105,529**	**1,846,627**	2,435,692
Sub-Grants	5,800,365	-	**1,274,492**	**1,607,383**	**1,248,560**	38,801	199,556	115,584	**353,942**	**4,484,377**	1,315,988
Total Direct Cost	**20,320,864**	**863,168**	**3,948,235**	**3,939,001**	**3,706,481**	**242,009**	**419,861**	**377,495**	**1,039,365**	**13,496,251**	**6,824,613**
Indirect Cost	3,657,756	**155,370**	**710,682**	**709,020**	**667,167**	43,562	75,575	67,949	**187,086**	**2,429,325**	1,228,431
CGIAR Cost Sharing Fee [@ 2% of total direct + indirect cost]	479,572	**20,371**	**93,178**	**92,961**	**87,474**	5,711	9,908	8,909	**24,529**	**318,512**	161,060
Total Activity Cost	**24,458,192**	**1,038,909**	**4,752,095**	**4,740,982**	**4,461,122**	**291,282**	**505,345**	**454,353**	**1,250,980**	**16,244,088**	**8,214,104**

Sub-grants:
The Activity signed two sub-grants (Maa Motsha Khamar, Satata Poultry) in this quarter with a total value of $95,668 where Aquaculture Activity investment is amounting to $41,141 and sub-grantees' investment is a total of $54,527 (*Annex 2*).

To date, the Activity has signed seventy nine (79) sub-grants with a total value of $10,233,151, where Aquaculture Activity investment of $5,875,668 and sub-grantees' investment of $4,357,483. Among these seventy nine, four were terminated and forty eight were completed by the end of December.

A total of $ 4,786,262.96 was expended under the Sub-grant budget that gave a remaining budget balance of $ 1,601,780.71 by the end of this reporting period.

Workshops and Training

8.2.14 Sub-grant orientation to new sub-grantees

The orientation program for new sub-grantees took place on October 24, 2021. The project focal and project finance from the newly signed agreement were invited to the training. The invitee partner organization were Bank Asia, IMEXpro (BD) Corporation, Aftab Feed Ltd., Shushilan, GRAUS, Petrochem, Gorai Films, Matrix, Margen Ltd., KNB, Fishtech, Sea Natural Food Ltd., and Sardar Agro, BSFF, Kiu Bangladesh Ltd., Afil Aqua Fish Ltd. Fishtech Hatchery Ltd. and M-World. WorldFish-Aquaculture Activity employees especially newly joined staff were also invited to join this training. Number of attendees: 44.

The training was facilitated and conducted by Ms. Faria Islam, Grants Specialist of Aquaculture Activity. The training covered key discussion areas such as introduction on sub-grant agreement, sub-award management, Responsibilities of Grantees and Sub Grantees, collaboration between grantee and sub-grantees, financial management. The training materials were later shared among the participants for their reference and guidance (*Annex 11*).

8.2.15 Compliance and Fraud Prevention workshop
The training on Fraud Prevention and Compliance was conducted on October 25, 2021, followed by grants orientation training where the same attendees were invited and participated in the training. The training was facilitated by Ms. Faria Islam, Grants Specialist of Aquaculture Activity and was conducted by Ms. Glenda Munyukwi, Global Risk and Compliance Lead, Ms. Sally Mallari, Finance and Grants Manager of WF- Aquaculture Activity, Ms. Azira Azmi, Risk and Compliance Analyst, and Ms. Faria Islam, Grants Specialist of Aquaculture Activity. Number of attendees: 48

Topics that were discussed were key definition, corruption index, examples of fraud and unethical behavior in the workplace, red flags, consequences of fraud, how to response on fraud, risk management strategy, importance of internal control, role of project focal, finance focal and senior management in risk management etc. The training materials were later shared among the participants for their reference and guidance (*Annex 12*).

8.2.17 Procurement planning and execution

On November 10, 2021 training on procurement policy and process was conducted. The project focal and project finance from the newly signed agreement were invited to the training. The invitee partner organization were Bank Asia, IMEXpro (BD) Corporation, Aftab Feed Ltd., Shushilan, GRAUS, Petrochem, Gorai Films, Matrix, Margen Ltd., KNB, Fishtech, Sea Natural Food Ltd., and Sardar Agro, BSFF, Kiu Bangladesh Ltd., Afil Aqua Fish Ltd. Fishtech Hatchery Ltd. and M-World. WorldFish-Aquaculture Activity employees were also invited to this training. WorldFish staff including core admin and procurement were also invited to this training. Number of attendees 41.

The training was facilitated and conducted by Ms. Sally Mallari, Finance and Grants Manager of WF-Aquaculture Activity The presented topics were procurement planning, key definitions, procurement process and documentation, retention of documents, responsibilities of procurement committee, terms and condition, inventory management, disposal of equipment and additional guideline. The training materials were later shared among the participants for their reference and guidance (*Annex 13*).

8.3. Monitoring Evaluation and Learning (MEL)

8.3.1 Review and update the MEL plan

The Activity's MEL plan is annually updated to reflect new targets against the indicators as new partnerships are formed or contract are extended. To capture partners' business models effectiveness and sustainability, the Activity has initiated a qualitative assessment to measure the changes in aquaculture market system, from this quarter. Detailed qualitative assessment methods, tools and protocol will be incorporated in the MEL plan.

8.3.2 Review and update Aquaculture Activity Theory of Change (ToC)

The Activity has rolled out the survey on 'Measuring Change in the Market System: Qualitative Assessment'. Based on the survey findings, the Activity's Theory of Change (ToC) will be updated.

8.3.3 Address Mid-Term Evaluation's recommendations made on MEL

The Mid-Term Evaluation (MTE) made a number of recommendations on MEL system and TOC/ RF. To address those the MEL will organize regular monitoring and follow-up sessions with sub-grantees/ IPs, design and include qualitative indicators in the MEL framework, review and update the TOC paying more priority in capturing capacity development level changes and organize extensive workshop with all the project team members to go through the TOC.

8.3.4 Data collection pool development for surveys

The MEL team deployed 25 Data Enumerators (DEs) last year; of them contract of 21 DEs renewed this year based on their last year performance. Additional four DEs were hired through competitive process to further strengthen the data collection pool aiming to ensure data quality across. During the period, DEs were engaged to collect quarterly and annual performance data. Some were also engaged to collect qualitative survey data from field.

8.3.5 Updating Aquaculture Activity MEL MIS platform

The web-based MIS is continuously upgraded to collect and gather the Activity information.

8.3.6 IPs' activity performance monitoring and internal data quality assessment (iDQA)

The IPs progress are monitored using specific key performance indicators (KPI) that are set into their agreement document. MEL deliverables are tracked using the KPIs and associated timeframe. The single matrix database containing program, grants and MEL aspects are also kept up to date to track the progress. The quality of MEL deliverables was checked based on MEL standard formats and using verification tools. MEL feedback was shared with the IPs to help them understand the process and improve data quality of the MEL deliverables.

8.3.7 Assist Aquaculture Activity teams to upgrade/ maintain the IPs progress monitoring dashboard

Aquaculture Activity developed a MIS based solution to kept IPs monthly progress reports and track the progress as well (*Figure 5*).

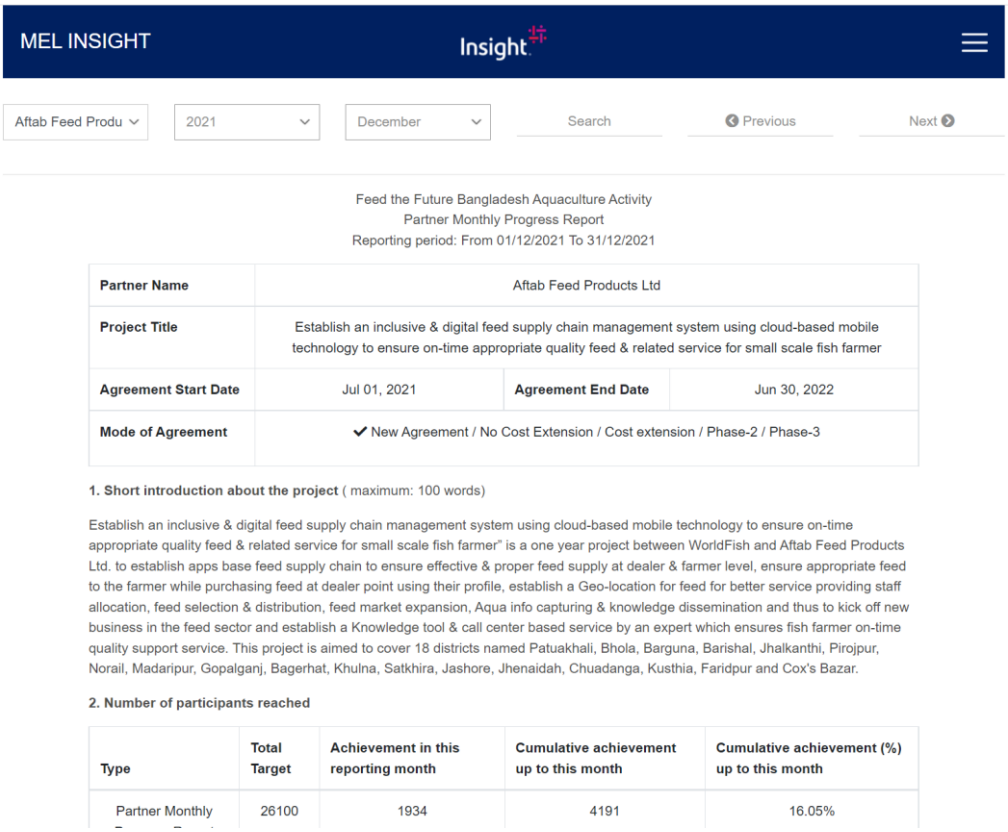

Figure 5: IPs progress monitoring dashboard

8.3.8 USAID DQA activity

The Activity submitted FY 2021 results into USAID DIS system in October 2021. The Activity also shared brief methodologies for the data collection and reporting results in the Y4 annual report. Following the last USAID DQA recommendations, the Activity is preparing ahead for the USAID DQA on FY 2021 DIS/FTFMS/PPR reporting.

Surveys

8.3.9 Quarterly performance survey

The MEL team collected leverage investment and loan data from the IPs and their preferences.

8.3.12 Programmatic data collection from IPs

The MEL team collected need based programmatic data from its implementing partners.

8.3.14 Assess effectiveness of capacity development initiatives for Aquaculture Activity participants

MEL team has prepared a draft protocol to conduct the survey. And as planned, the survey will be conducted in next quarter.

MEL Reports

8.3.15 Quarterly MEL report

MEL team provided inputs into the quarterly reports incorporating MEL updates.

8.3.16 Annual MEL report

MEL team provided inputs into the Y4 Annual report incorporating MEL updates and FY 2021 results.

8.3.17 FTFMS PIRS report
Data analysis and reporting for Y4 Annual Performance Survey (FY2021) was completed in November 2021 followed by data verification and data cleaning. Standard indicator results including appropriate disaggregates, respective deviation narratives, and out-years target (FY2022-FY2023) were entered in to the FTF module on the newly introduced Development Information Solution (DIS) platform.

8.3.18 USAID Development Information Solution (DIS) report
Results for FY 2021 was uploaded into the DIS system of USAID. Disaggregated data for nine standard indicators and associated deviation narratives against FY 2021 results along with the out-year targets were reported into the system. Input

Measuring Change in the Market System: Qualitative Assessment

8.3.19 Assessment methodology and protocol development
A protocol has been developed containing the assessment objective, target groups, sampling frame, and data collection methods, timeframe and data collection checklist.

8.3.20 Data collection tools development
Three separate tools were developed to assess impact in the different tiers of each of the interventions- one to interview the implementing partners, second to interview the market actors and third from the final service recipients. In addition to the main tools, some brief tools were also developed to capture information from the intervened markets regarding the secondary adaptation and spill-over effect of the Activity.

8.3.21 Recruit facilitators/ moderators to support qualitative survey
The Activity is working with the consultants to design, update and perform the survey. Primarily the information is collected and translated by the Activity staff and engaging existing DEs pool. Data will be analyzed by the consultants.

8.3.22 Orient Aquaculture Activity team on data collection tools
MEL team organized a three-day long training for the selected 12 DEs who were selected based on their previous performance regarding qualitative information collection for the Activity. Field test, demo data collection was integrated with the training package. Another day-long training was also organized for the Activity staff to collect information from the implementing partners.

8.3.23 Capture qualitative information from IPs and relevant stakeholders
The Activity has rolled out qualitative information collection from its IPs, relevant market actors and final service recipients. Primarily, the IPs whose intervention have already completed or to be completed by December 2021, are considered under this survey- which is called ‘Tier-1 data collection’. MEL team with the help of MSD and Cross-cutting team is executing the survey in the the field.

8.3.24 Data transcription, analysis, synthesis and reports preparation
The MEL team engaged selected data enumerators from its pool to transcript translated data and prepared a data storing template using MS Access to accumulate and preserve the data. After completion of all data upload, the file will be handed over to the MEL consultant for further analysis and report preparation.

8.3.25 Working towards a framework to assess systemic change: AAER
This MEL team will use AAER model to gather the systemic change data using the qualitative data collected from each intervention systemic change progress using the framework which is planned to be started in next reporting quarter.

Geo-graphic Information System (GIS):

8.3.26 Aquaculture Activity beneficiaries GIS data collection and submission to USAID
The MEL team worked to update the activity participants GIS data and collected beneficiary data from field survey. The GIS data collection tools was updated based on the type of beneficiary to collect programmatic data. The MEL team started to collect GIS data in December 2021. A total of 7,580 beneficiary data will be submitted to USAID (*Annex 14*).

8.3.31 Introduce an Android app for GIS data collection
An introductory level training on data collection using Android app has been provided to the WorldFish Aquaculture Activity staffs using SW Maps android app. Staffs were provided a virtual training and a training module on the training topic was also provided.

Capacity development

8.3.32 Training to the survey pool on data collection and quality assurance
The MEL team facilitated capacity strengthening trainings for all data enumerators (DE) (
Table 5). The training courses included performance surveys, qualitative data collection, GIS data collection, safety measures, precautions and directives that each and every one must adhere if they engage in field works.

Table 5: Major MEL trainings for DEs in Q1, Y5

Sl.	Date	Title	Participants		
			Total	Men	Women
1	Oct 26-28, 2021	Annual performance survey: farm productivity and nutrition household farmers survey	20	18	2
2	Nov 8-10, 2021	Training on qualitative assessment data collection	12	12	0

The training helped to develop a common understanding on data collection requirements, tools, protocol and data quality. As a result, the surveys produced accurate data from the field which was verified from desk check and field observation.

8.3.33 Capacitate IPs on MEL
MEL team conducted orientation and trainings for Shushilan, GRAUS and Shah Amanat on data collection tools, online data collection platform, reporting and record keeping, data quality assurance etc. The team also supported the partners through regular IP meetings where MEL issues were discussed.

The Activity MEL team conducted field visits to review and strengthen partners' record keeping systems and reporting processes. The findings were shared with the activity's program team for follow up.

8.3.34 Hands-on training on tab-based data collection for IPs
MEL team delivered hands on training to eight staff from GRAUS and Shah Amanat Traders (SAT) on Tab-based data collection. The trained staff collected data from 265 and 235 farmers supported by GRAUS and SAT respectively and developed their basic profile.

8.3.35 Participate MEL related training (face-to-face/Online courses)
The MEL team is searching available online training courses which will help them to be up-to date with the current MEL practice and apply suitable methods in capturing and report the interventions results and learnings.

MEL Meeting/Workshop

8.3.36 MEL team meetings

The MEL team is performing weekly team meetings on regular basis. In addition, the ream is continuing its work is team approach and sit together using its official virtual platform (MS Teams) as and when requires.

8.3.39 Changes in Market System': Learning sharing workshop

The MEL team is working with the MEL consultant to accumulate the systemic change information and will arrange a workshop in next quarter to share the results using the systemic change model.

8.4. Capacity Building

8.4.1 Arrange capacity building training & workshop for IPs and Aquaculture Activity staff

BRAC organized an awareness raising workshop on quality tilapia seed business for the multiplier hatcheries in Satkhira on November 18, 2021. Tilapia Breeding Specialist facilitated the daylong event and assisted the participants in identifying current problem and possible solutions. Shushilan organized a two-day long ToT for project staff on promotion of nutrition-sensitive aquaculture through microfinance support. They also oriented the team about Sushilan's policies, project interventions, and working areas. Online technical sessions were conducted by Aquaculture Specialists over MS Teams for IPs staff. Trainings on financial procedures and reporting were also delivered by Aquaculture Activity for the partners during this reporting quarter.

8.4.2 Identify and develop suitable training materials, e.g., flipchart, posters, picture, models, leaflets, real objects based on target groups needs

An inventory of existing training materials of the USAID AIN project has already been developed. A committee including Aquaculture Activity staff has been formed to review the capacity building materials developed on a) Dyke cropping guidebook for farmers, b) Dyke cropping brochure for farmers and c) importance of patilwala in fish farming brochure. After completion of the review, the materials will be revised and reprint with prior approval in next quarter.

Around 10,000 copies of Aquaculture pocket book, 18,000 copies of leaflets on Secchi disk, and 1,000 copies of leaflets on Better Management Practices in Hatcheries were distributed among Aquaculture Activity IPs for project participants.

8.4.3 Conduct trainings and impact evaluation provided /carried out by the project

The Activity staff supported different events, such as workshops, Training of Trainers (ToT), Business Market Promotion Input system etc. to ensure training quality.

8.4.4 Develop/ regenerate training guidebook, slides, video documentary etc. for the project participants

Internal meetings have been held with different teams to prepare video documentary and success story books. Field visits were made to the activities to hatcheries, women entrepreneurs (gill net, mola fish) and business promotion events to identify themes for future production of training and communication materials.

The Activity developed and distributed information and training guidebook such as Small-scale Aquaculture Technology Guidebook, Aquaculture Training Festoon and Business Development Handbook. Besides, awareness and promotional materials were developed and distributed among the project participants such as Secchi Disk leaflets. Initiatives are taken to prepare video documentary to demonstrate successful impact stories.

8.5. Gender

Output- 18 Increased access to productive economic resources for women

8.5.1 Promote women's employment and self-employment through mola fish supply to the consumers from Women Business Center (WBC) outlet

A business outlet has been established in Khulna city. The WBC Social Enterprise is trying to create linkages raise between the WBC members and support traditional businesses for the members. This is a continuation from the previous year's task and it is on-going.

8.5.2 Strengthen capacity of 100 women Entrepreneurs on Business Development Services (BDS) to adopt their business in COVID-19 situation

Mentorship between 100 Aquaculture Activity women entrepreneurs and Young Business Graduates have been completed within December 2021. Tools and methods to monitor impacts of COVID19 and how to help them to mitigate impacts will be developed. To operate the business activities at the field level during the Covid 19 restrictions, a monitoring and evaluation framework has been developed by the Aquaculture Activity Participants. Concept note on ways to encourage private sector engagement is under progress. 150 copies handbook 'My business development book', has been printed and distributed among the BDS training participants.

8.5.3 Business Development Service (BDS) to support 1,225 Local Service Providers (LSP) in ZoI

A 1st draft of the Executive Summary for a Sub-Grant is ready to review. This model will have a clear and realistic incentive structure for the LSPs to ensure profitability and to develop the capacity on Business Development Services (BDS). Solicitation is in progress. This task will be conducted during quarter 3 of Year 5.

8.5.7 Gender Strategy

During this quarter a Gender Strategy has been prepared to give a pathway on the gender integration throughout the activities of Feed the Future Bangladesh Aquaculture Activity. The strategy has been shared in the *Annex 15*.

8.6. Youth

Output- 19 Increased access to productive economic resources for Youth

8.6.1 Ensure access to quality aquaculture inputs and expert Guideline Services

The main objective of the grant is to provide quality aquaculture inputs and expert guideline services through the physical entity called FishBooth. As a one-stop service point FishBooths have been established in September 2020 with the start-up grant money from Aquaculture Activity to provide advisory services to the remote areas where these kinds of services do not exist. During the first year they have created linkage with the feed, seed and AMP market and have provided services to the farmers. The main purpose of this grant is to form a proper structure of the FishBooth and establish marketing and promotional activities to attract more people to access the services. This initiative will be further developed in the next quarter.

8.6.2 Establish and Consulting Bio-floc Fish Culture System & Marketing

The youth partner Shariful Islam, who is providing a consultancy service to promote bio-floc based aquaculture systems, has established a demo bio-floc to further support his consultancy service. An online workshop has been organized where 38 potential entrepreneurs have attended to understand more about the biofloc fish culture system and the services that will be provided by Shariful Islam. After the workshop, Shariful has provided consultancy services to 2 clients and communicated with 3 other

potential clients who are interested to undertake efficient bio-floc businesses. With Shariful Islam, 3 other youth team members are working to make this business a successful one. The partnership agreement with this youth has been closed in 30 November 2021, and an assessment of impact is now being undertaken.

8.6.3 Process and marketing of ready to cook (RTC) fish through youth entrepreneurs

The main objective of this task is to support the fish supply and processing business in the ready to cook fish sector. This partnership will focus on the marketing of their business to increase the sale of RTC products This will also be a replicable intervention for the other youth entrepreneurs. This task has been designed for the next quarter.

8.6.4 Partnering with youth entrepreneurs to scaling up the dry fish powder business

This task will support a youth entrepreneur in expanding the business of dry fish powder which has a demand countrywide. Aquaculture Activity will help to marketing and branding of the product and help to create a better supply process for the dry fish powder. This task has been designed for the next quarter.

8.6.5 Youth engagement in the modern fish farming; bio-floc initiative

Through this activity Aquaculture Activity will be supporting to expand an already established bio-floc business throughout the overall harvesting processing in a year. This task has been designed for the next quarter.

8.6.7 Business skill development training for the future generation of the hatchery and nursery owners

This will be a business skill development training for the children (age 15-29) of the Hatchery and Nursery owners. This training will help the potential future generation who are interested to work or carry on the hatchery or nursery business in the future. This task has been designed for the next quarter.

8.6.9 Training/ workshop to all new partners on issues related to youth in aqua-business

The purpose of this task is to sensitize the matter of youth inclusion throughout the overall activities of Aquaculture Activity.

8.6.11 Youth Strategy

During the reporting period a Youth Strategy has been prepared to give an idea on the youth inclusion in the aquaculture sector throughout the Aquaculture Activity activities and sheds some light on the scopes and opportunities for further inclusion of youth into the Activity. The strategy is under review for finalization. A draft version of the strategy is attached in *Annex 16*.

8.7. Environment and climate change

Being the implementing partner, WorldFish is responsible and accountable to ensure that none of the interventions of the Activity leaves negative impacts on the environment or on human health.

8.7.1 Assist AOR to update the IEE (Asia 17-078), which will be expired in September 2022

The current IEE (Asia 17-078) will expire in September 2022, which made it essential to be updated. WorldFish is ready to work closely with the AOR to facilitate the process as and when AOR asks for.

8.7.2 Update the EMMP to (re)allign with the new IEE, and submit to USAID for the approval of AOR and MEO

Updating the EMMP for Aquaculture Activity will be done soon after the IEE updating is completed.

8.7.3 Conduct EDD and setting mitigation actions against the agreed interventions as specified in the SGAs

As yet in Y5Q1, Aquaculture Activity proceeds with only 1 sub-grant application to complete SGA therefore, 1 EDD is done accordingly (cumulative 93 LOP).

8.7.4 Train project personnel on environmental compliance and CRM

A batch of the training was held during the reporting period where 23 partner staff and 5 new WorldFish staffs were trained.

8.7.5 Provide backstop support to HYV CARP and GIFT team to promote BMP and safe fish seed production

Assistance to the HYV CARP and GIFT teams is being done as and when required.

8.7.6 Conduct a qualitative environmental assessment on IPRS/high density fish farming

The methodology/framework for the study has been developed. Field assessment is also done in early December at 2 partners (Afil Aqua Fish Ltd. and Sardar Agro), engaged in high density aquaculture (e.g. bottom clean system, IPRS). The key findings that have been revealed as yet can be illustrated as below -

Both Sardar Agro and Afil Aqua Fish Ltd. have found the new aquaculture regimes are promising and wish to scale it up by adopting the lessons learnt.

They need to transform their initiatives from ‘conceptual’ to ‘context’ specific. The new technology results in getting better pond environment against a very high stocking density that in turn multiplies the yield several times. The ‘concept’ of new technology may not fetch same kind of yield unless they are able to identify –

- What are the things (e.g., physico-chemical parameters of water/bed, dieses infestation, feed intake, yield) that have been successful?
- Are they able to identify the reasons behind this success (e.g., what steps/actions regulate what) ?
- Are they able to quantify the state of the water flow rate and other physico-chemical parameters including pH, DO, ammonia (NH4+- N), total nitrogen (TN), total phosphorous (TP), and chemical oxygen demand (CODMn) that achieve optimum profitability?
- Are they able to manage aforesaid water quality indexes below the level III standard as specified by SEPA & AQSIQ (2002)?

They need to internalize; aquaculture has a direct linkage with human health and environment. Therefore, they need to avoid using unnecessary and harmful aqua-medicinal products (AMPs). In addition, because of aquaculture, different types of gases including some greenhouse gases (e.g., carbon dioxide, nitrous oxide, methane) are emitted into the air that contribute in climate change.

Homestead ponds that do not get direct sunlight because of tree shade, and if mitigation measures are not taken, (e.g., drying the bottom, liming) then ponds emit substantial amount of aforesaid greenhouse gases (GHGs). In contrast, the aquaculture regimes that are followed by Sardar Agro and Afil Aqua Fish Ltd. take continuous mitigation measures to maintain a better and healthy pond environment. Apart from other mitigation measures, they put emphasis on excluding fish wastes (e.g., fish excreta, unused feed, debris) from the system, as soon as possible, and reuse them in growing fodder or vegetables. This approach facilitates capturing the sources of aforesaid GHGs, thereby minimizing emission of them from the system. Sardar Agro and Afil Aqua Fish Ltd. should try using this sludge in a biogas plant along with/without cow dung or poultry litter. If the sludge is found promising in biogas production, then it will be possible to capture additional amount of GHGs.

However, the environmental assessment report will be completed within the stipulated time.

8.7.7 Oversee the compliance of mitigation actions and CRM against the X interventions as specified in the SGAs

Environment and climate change unit have been overseeing the process in collaboration with the Program POCs. More joint field visits will be done in the months to come.

8.7.8 Provide backstop support to sub-grantees to integrate environmental compliance and CRM in their training and communication materials

Backstop supports are being provided to partners through the Program POCs as and when required. During the reporting period, 4 training and communication materials of KAAS Trade, and a product brochure-cum-technical handbook of Petrochem BD have been reviewed.

8.7.9 Collaborate with International Centre for Climate Change and Development (ICCCAD) to organize International Conference on Climate Knowledge and Service

An online lecture was delivered on "*Climate risk and challenges of coastal aquaculture communities in Bangladesh*" in CBA 15 organized by ICCCAD. Close relationship and networking are being maintained with ICCCAD in order to facilitate such conferences in future.

8.7.10 Collaborate with Bangladesh Academy for Climate Services (BACS) to organize training courses on Climate Services

Close relationship and networking with ICCCAD are being maintained by the Environment and Climate change unit of Aquaculture Activity in order to organize such training.

Table 6: Current interventions and future plans to promote climate smart/resilient aquaculture by integrating climate risk management (CRM)

	Current interventions	Future plan
1.	Potential climate risks against the proposed individual interventions of the sub-grant applicants are **assessed**, and based on the identified risks, appropriate **mitigation actions** are being suggested by Aquaculture Activity so that the actors in the aquaculture sub-sector can avoid/minimize the climate-induced risks. We follow **USAID's *Climate Risk Screening and Management Tool*** in this connection.	Aquaculture Activity will continue the service.
2.	Aquaculture Activity provides **training** and extends **advisory services** to the partners so that they can assist the actors in the aquaculture sub-sector to become climate resilient.	Aquaculture Activity will continue the service.
3.	Aquaculture Activity developed **IEC materials** including video documents (https://youtu.be/e9xZPPnEgOU) to popularize CRM in pond-aquaculture and hatchery operation.	Aquaculture Activity will continue disseminating messages.
4.	Aquaculture Activity established partnership with competent proponents (like ACI, MWORLD) to promote **climate-smart aquaculture** techniques.	Aquaculture Activity will continue the services, and will explore other options.
5.	Because of the impacts of climate change, aquaculture contexts (e.g., growing period, salinity intrusion) are increasingly becoming more unpredictable. To cope with the challenges and to maximize the yield in shortest possible time, Aquaculture Activity promotes **climate-resilient aquaculture**, which include – a. making available genetically improved fish seed (that came to exist because of CGIP and GIFT initiatives); b. disseminating messages on the advantages of stocking	Aquaculture Activity will continue the existing techniques, and will explore new options, which include but not limited to – 1. cultivation of eurythermal and euryhaline fish species (e.g., monosex tilapia)

	Current interventions	Future plan
	yearlings and fast-growing species.	with fast growing fish (e.g., Thai sarputi, silver carp); 2. carp fattening (using farm fish of 500-700 g bodyweight).
6.	Because of aquaculture, some obnoxious substances including couple of greenhouse gases (e.g. carbon-di-oxide, methane) may be generated/emitted. Aquaculture Activity has been exploring viable solutions for maximizing production from aquaculture while addressing to the issues not only relating to **adaptation** to climate change but also **mitigation** of the same. Aquaculture Activity established partnership with two proponents to examine if high-density aquaculture with '**bottom clean**' and/or 'in-pond raceway (**IPRS**)' systems could be a pertaining solution. However, it has already been turned out that both the systems take continuous mitigation measures to maintain a better and healthy pond environment. They exclude fish wastes (e.g., fish excreta, unused feed, debris) from the system, and reuse it to grow fodder or vegetable before they are transformed into obnoxious substances, which prevents even generating **GHGs**. On the other hand, they make the **land resources efficient** as they are able to yield more fish by several folds (e.g., 5 to 10 times) from the same unit areas.	Aquaculture Activity will complete the assessment, first, then will decide if they are scalable.
7.	Scientific researches revealed that only 20-25% of nitrogen and 25-40% of phosphorus in conventional fish feeds are utilized for fish growth, while the rest are discharged into water as feces and metabolites, which in turn may generate **GHGs**. Aquaculture Activity established partnerships with a few fish feed manufacturers if they can formulate more **nutrition-sensitive fish feeds**.	Aquaculture Activity will continue the initiative to take part in mitigating climate change.
8.	A huge quantity of safe water is required for fish hatcheries. To cope with erratic rainfall (the major source of water), and hence for **water security**, Aquaculture Activity promotes water filtration and recirculating systems to reusing the water that comes out from the breeding shed.	Aquaculture Activity will continue the existing techniques, and will explore new options.
9.	To cope with such bad weather events that lower the dissolved oxygen (DO) level in water, Aquaculture Activity promotes different **climate-smart techniques and devices** to replenish DO as and where applicable. For instance – a. when hatcheries allow water to be down flown through an **oxygen tower**, air-water interaction takes place that add more oxygen into the water; b. to maintain a favorable water temperature and DO in breeding tanks/jars, water flow is regulated and devices like hand **showers** and **air-stones** should be used; c. to maintain a favorable water temperature and DO in ponds, devices like shallow **pumps**, **diffusers**, **paddle wheelers**, and **air blowers** should be used.	Aquaculture Activity will continue the existing techniques, and will explore new options.

	Current interventions	Future plan
10.	To cope with **climate-induced risks** because of adverse climatic/weather events (e.g., irritating rainfall, temperature), Aquaculture Activity promotes **integration** with aquaculture, which include dike cropping, nutrition-sensitive aquaculture with self-recruiting indigenous fish species (e.g., carp-mola polyculture), etc.	Aquaculture Activity will continue the existing techniques, and will explore new options, which include but not limited to – 1. rice-cum-fish in irrigated land; 2. multi-tropic aquaculture; 3. SIS (small indigenous fish species) cultivation in *sorjan*; 4. vertical horticulture on pond dikes and homestead.
11.	In the face of climate change, water becomes less available at the creeks (*charas*) of Bandarban (ZOR) that leaves great impacts on the livelihoods of nearby households as creek water is very important to many of them for their homestead purposes as well as agriculture. As part of a project, Bangladesh Agricultural Development Corporation (BADC) is channeling creek water through several PVC pipping networks to foster agriculture. Aquaculture Activity encourages (those who can) to take advantage of the BADC intervention to channel **creek water** into their ponds to make water available for their domestic uses, horticulture/agriculture, and **alternative aquaculture**.	Aquaculture Activity will continue the existing techniques, and will explore new options for alternative aquaculture.
12.	Aquaculture Activity established partnerships to promote using improvised **solar driers** in producing **safe dry fish** to cope with bad weather events. The technique that uses **green energy** contributes in both adaptation and mitigation to climate change.	Aquaculture Activity will continue the existing techniques, and will explore new options.
13.	**Tilapia seed production** becomes interrupted severely when water temperature exceeds 32 degree Celsius. Aquaculture Activity promotes means (e.g., setting orchid net above water, aeration, replacing water partially with underground water) to maintain a favorable pond environment.	Aquaculture Activity will continue the existing techniques, and will explore new options.
14.	Aquaculture Activity established partnerships with a few financial institutions (e.g., banks) to make soft **climate financing** available for the climate vulnerable actors involved in aquaculture sub-sectors.	Aquaculture Activity will continue the existing means, and will explore new options.

8.8. Knowledge Management and Communications

8.8.4 Document and publish stories (success & impact) on Aquaculture Activity interventions

Throughout the reporting period, the Activity collected and documented 22 different success stories *Annex 17*. These stories were shared with different stakeholders and USAID on fortnightly basis. Moreover, USAID Bangladesh published two stories, along with photos, in their Official Facebook page which received huge digital reach.

8.8.11 Video production on thematic areas and key learning pieces (IP videos)

In this reporting period, three videos were produced and shared with wider audience. A brief on each video is given below:

Video on 16 Days of Activism

The Activity produced a video demonstrates how the gender inclusive approach empowers women in aquaculture market system and subsequently contribute to end Gender-based Violence. This was widely shared with target audience. USAID Bangladesh shared this video through their official Facebook page with an informative post (viewed around 1k times) on this digital material developed by the Activity.

Video on 'Aftab Agro Care' Digital App and Call Center
A video was developed to cover the launching ceremony of 'Aftab Agro Care' Digital App and Call Center held in Hotel Platinum Grand on October 30, 2021. This digital agro service using cloud based mobile technology will ensure on-time appropriate quality feed and relevant advisory services for small scale fish farmers. This video contains the detail of the event where the Chief Guest, Qazi Shams Afroz, Honorable Director General, Department of Fisheries (DoF), Mohammad Sayed Shibly, Project Management Specialist, USAID Bangladesh,Abu Luthfe Fazle Rahim Khan, Managing Director, Aftab Feed Products Limited, and Dr. Manjurul Karim, Chief of Party,the Aquaculture Activity, WorldFish, along with other stakeholders and guests, were present in the ceremony and provided valuable comments, feedbacks and recommendations.

Video on the USAID visit to Activity site in Cox's Bazaar

This video was developed on the Cox's Bazaar visit by the high officials from USAID Bangladesh on December 15, 2021 to observe the progress and impact of interventions of the Aquaculture Activity. The video portrayed details about the visit and valuable comments, feedback and suggestions from the visiting team. The visiting team comprised of Ms. Rebecca Robinson, Deputy Office Director- FtF, Office of Economic Growth along with Mohammad Sayed Shibly, Project Management Specialist and AOR, Aquaculture Activity, Aniruddha Hom Roy, Private Sector Advisor and Chris Meservy, Private Enterprise Officer from USAID Bangladesh. The video covered their visit to observe the training on nutrition sensitive aquaculture and the fish harvesting at Pannyshiya village in Ukhiya upazilla, and the safe dry fish production systems at Shah Amanath Traders (SAT) in Sadar upazilla. Action photos from this visit were published on the USAID Bangladesh Official Facebook page.

8.8.12 Media brief and media tour with journalists (exposure visit) to publish news and learnings on Aquaculture Activity interventions (TV & Press)

A total of 16 news articles were published in the national and the local media on the events and results generated through Activity interventions. All the media coverage that the Activity received during the reporting period are available in *Annex 18*.

'Prothom Alo' coverage on Carp Pituitary Gland (CPG)
Prothom Alo, the country's most popular daily newspaper, covered the news on Activity's first initiative regarding establishing the supply chain of Carp Pituitary Gland (CPG). The media published a detailed report on the CPG intervention. A video documentary on the same was also published in Prothom Alo YouTube channel and posted on Facebook. They shared both the article and documentary through their social media official platforms which were viewed 1.4 million times and shared more than 5,000 times. The news article featured how the Activity in partnership with United Agro Fisheries putting efforts to increase supply of CPG domestically and provided market information.

Links:
মাছের মুড়ার দানা ৯০ লাখ টাকা কেজি - prothomalo.com
মাছের মুড়ার দানা ৯০ লাখ টাকা কেজি –Facebook Post
Video:
মাছের পিজির ৪৫ কোটি টাকার বাজার - Facebook
মাছের পিজির ৪৫ কোটি টাকার বাজার - YouTube

'The Somoy News' and 'The Report' published news on IPRS
The Daily Somoy News and the Daily Report published an interesting and informative article on In-Pond Raceway System (IPRS). The activity, partnering with the Afil Aqua Fish Ltd., has established an IPRS to promote and adapt the technology in south-western Bangladesh. This local coverage created keen interest in IPRS among the local fish farmers, other beneficiaries and community people.

IPRS Unleashes Export Opportunities for White Fis... - Somoy News
IPRS unleashes export opportunities for Bangladesh white fish market (thereport.live)

News on closing event of the GIFT intervention by 'the NewsHour'
The NewsHour published a detail report titled 'Tilapia will play a critical role in meeting fish demand in Bangladesh by 2041'. According to the report, in the year 2019-20, Bangladesh produced 45.03 MT of fish among which the production of Tilapia was 3.71 MT. It fulfills 8.24% of total fish demand as a single species. Its contribution will likely to increase in coming days. Considering its importance, the Activity partnering with BRAC Fisheries Enterprise, undertook activities to disseminate improved and disease-free mixed-sex fry as brood of Genetically Improved Farmed Tilapia (GIFT) strain to multiplier hatcheries. It aims quality seed production useful to improve the productivity and profitability of farmers involved in the culture of Tilapia in Bangladesh.

Link: Tilapia will play a critical role in meeting fish demand in Bangladesh by 2041

Local media coverage on the capacity building training on IPRS
The news on the inauguration of Capacity Building Training on In-Pond Raceway System (IPRS), implemented by Afil Aqua Fish Ltd. and supported by the Aquaculture Activity, was published in 6 local newspapers (The Daily Gramer Kagoj, The Daily Jashore, The Daily Kallan, The Daily Nawapara, The Daily Samajer Kotha and The Daily Spondon). The training was conducted on October 31, 2021 at the conference room of Afil Agro Ltd., Chanchra, Jashore. To read the news click here.

'Aftab Agro Care' Digital App and Call Center
'Aftab Agro Care' Digital App and Call Center will open new window for the fish farmers to get access to right information regarding product, price and services. This digital agro services, using cloud based mobile technology, will ensure on-time appropriate quality feed and relevant advisory services for small scale fish farmers. The launching ceremony of 'Aftab Agro care' Digital App and Call Center held in Hotel Platinum Grand on October 30, 2021. The news on this digital solution was broadly covered by different TV, print and online media (The Daily Bonik Barta, DBC News, The AgriView and The AgriLife). Links are given below:

আফতাবের ডিজিটাল অ্যাপস ও কল সেন্টার চালু
The Daily Bonik Barta (বণিক বার্তা), November 2, 2021

প্রান্তিক মাছ চাষীদের উৎপাদন বাড়াতে চালু হলো অ্যাগ্রো কেয়ার অ্যাপ
DBC News, October 30, 2021

আফতাব ডিজিটাল অ্যাপস্ ও কল সেন্টার-মৎস্যচাষ ও মানসম্পন্ন সেবার এক নবদিগন্ত
The AgriLife; October 30, 2021

মৎস্য চাষিদের জন্য আফতাব নিয়ে এলো ডিজিটাল অ্যাপস ও কল সেন্টার
The AgriView, October 31, 2021

8.8.14 Social media campaign and maintenance of social media platforms and contents generation (posts, stories, blogs, articles, news, events, reports, IEC materials, etc.) for social media and website

Throughout the reporting timeline, eight contents on different interventions and successes were developed and shared for official social media platforms of USAID and WorldFish (*Figure 6*). There were some significant posts on Aquaculture Activity interventions by USAID Bangladesh in this

quarter. In total four social media posts on digital solutions, 16 days of activism and USAID visit were made by USAID.

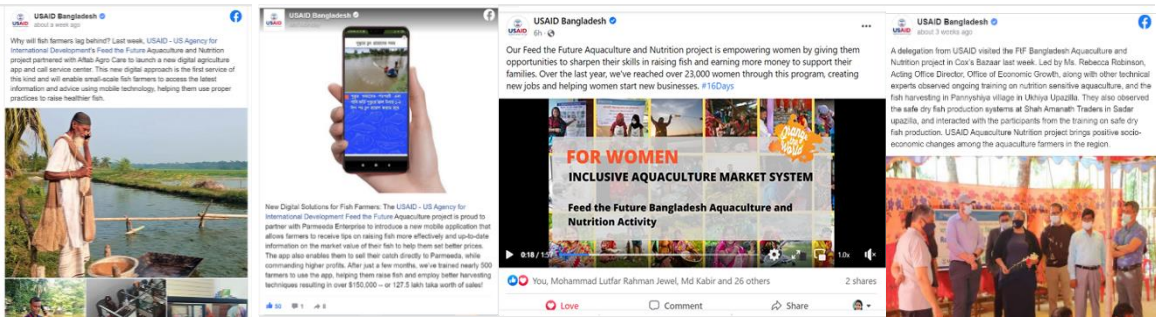

Figure 6: Social media posts of Aquaculture Activity interventions

8.8.15 Produce and disseminate blogs, infographics, articles, monthly knowledge ration on regular basis

During the reporting period, the Activity developed different IEC and promotional materials (*Annex 19*) on regular basis. These materials e.g., banners, festoons, signboards, one pager, brochures, etc. were disseminated for using in different workshop, trainings, events and also for overall promotion of the activity. Furthermore, two blogs on youth engagement and success were developed for the publication in CGIAR platforms.

8.8.16 Design, production & publication of Aquaculture Activity merchandise/ promotional materials (briefs, folders, festoons, banners, flyers, pocketbook, brochures, pen, notebook, diary, calendar, bags, tshirt, cardholder, umbrella, etc.)- as required

IEC materials to be used commonly at the stakeholder level. It provides information, creating awareness and to motivate in practicing a new habit to care and attention. The dynamics of the materials help communicating, practicing and sustainable changing in the best ways. The broader aspect of IEC is simple and technical document for positive behavioral change. The materials focused on having real knowledge and utmost importance to the targeted users by using simple language, social norms, and depiction. During the reporting period (Y5Q1) the Aquaculture Activity team has printed and disseminated the following IEC materials in the project working areas (ZOI and ZOR). See the *Annex 19* contains all list of the published IEC materials of the reporting quarter by the Activity.

6 signboards in Bangla language

Moreover, the Activity developed 6 signboards in Bangla language for raising awareness around aquaculture, nutrition, hygiene, etc. (*Figure 7*). The Activity will produce more signboards/ billboards and disseminate across the working areas in the next quarter.

Signboard 1: Small fish and vegetables provide a nutritious meal that nourishes the whole family.
Signboard 2: Fish can be added to mashed rice; a good complementary food for children over 6 months.
Signboard 3: Stocking large fish fingerlings can decrease mortality and increase fish production.
Signboard 4: Apply fertilizers in pond regularly to keep your pond water color green.
Signboard 5: Wash hands properly for 20-30 seconds with soap and clean water often to protect you, your family and the community from diseases.
Signboard 6: Keeping your house and the environment clean makes you healthy and happy.

Figure 7: Signboards for raising awareness around aquaculture

Aquaculture Activity Factsheet

For further dissemination, the Activity revised and reproduced the factsheet for wider and regular sharing. This factsheet contains information about the Activity in brief. Apart from highlighting the goal and overall objectives, this factsheet grab attention on the targets and achievements as well. To read the latest factsheet see the *Annex 20*.

Aquaculture booklet on modern fish farming in ponds

During the reporting months, The Activity worked on a publication, titled 'Modern fish farming practices in ponds' (in Bangla) which describes ponds management before, during and after the fingerlings stocking and general tips for the fish culture. This handy booklet will be disseminated among implementing partners and farmers. This booklet will also be shared during relevant trainings, field level events, gatherings and in other platforms (*Annex 21*).

9. ANNEX

Annex 1: Measuring change in the market system, qualitative assessment (attached)

Annex 2: List of Aquaculture Activity IPs (attached)

Annex 3: Aquaculture Activity digital initiatives (attached)

Annex 4: Interface of developed apps (attached)

Annex 5: Assessing performance of market system approach sampling protocol (attached)

Annex 6: Qualitative survey form tier 1 (attached)

Annex 7: Qualitative survey form tier 2 (attached)

Annex 8: Qualitative survey form tier 3 (attached)

Annex 9 Collaboration between WorldFish and DoF (attached)

Annex 10: Assessment and improvement of Aquaculture Activity MEL system (attached)

Annex 11: Post award orientation program for sub-grantees (attached)

Annex 12: Compliance and fraud prevention workshop (attached)

Annex 13: Procurement planning and execution (attached)

Annex 14: Aquaculture activity participants GIS information (attached)

Annex 15: Gender strategy (attached)

Annex 16: Youth strategy (attached)

Annex 17: Success stories (attached)

Annex 18: Media coverage (attached)

Annex 19: List of IEC materials developed by aquaculture activity (attached)

Annex 20: Aquaculture activity factsheet (attached)

Annex 21: Aquaculture booklet on modern fish farming in ponds (attached)

Annex 22: Photo (attached)

Annex 23: Bangladesh aquaculture activity indicators (attached)

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