Project Completion Report

On

Aquaculture Market Channel Development in Alikadam

Submitted by

TAHZINGDONG

Submitted to

Feed the Future Bangladesh Aquaculture Activity

WorldFish

Date: 31 August, 2023

Project Title	Aquaculture Market Channel Development in Alikadam	
Agreement Period	Start Date: 16-03-2023	End Date: 31-08-2023
	Extension Date: 31-08-2023	
Duration	18 months	
Total Agreement Amount	US Dollar: **99,891**	
Feed the Future Bangladesh Aquaculture Activity Contribution	US Dollar: **88,722**	Percentage: 89 %
Sub-grantee Contribution	US Dollar: **11,169**	Percentage: 11 %
WorldFish Contact Person	Name: **Dr. Manjurul Karim**	Designation: **Chief of Party**
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List of Abbreviation:

AMCD	Aquaculture Market Channel Development in Alikadam
FtF	Feed the Future
BANA	Bangladesh Aquaculture & Nutrition Activity
CHT	Chittagong Hill Tracts
NGO	Non-Governmental Organization
GO	Governmental Organization
CFC	Community Feed Center
MMHN	Maa Matsha Hatchery and Nursery
PG	Pituitary Gland
HYV	High Yielding Variety
KPI	Key Performance Indicator
UNO	Upazila Nirbahi Officer
UAO	Upazila Agriculture Officer
WF	WorldFish
TZD	TAHZINGDONG
DIP	Detail Implementation Plan
BMP	Best Management practice
FFD	Farmer's Field Day
CE	Cost Extension
DoF	Department of Fisheries
PC	Project Coordinator
OSP	Orange Sweet Potato
MEL	Monitoring Evaluation and Learning
MF	Market Facilitator
USAID	United States Agency for International Development
OSSC	One Stop Service Center
ZOR	Zone of Resilience
ToT	Training of Trainer
BAA	Bangladesh Aquaculture Activity

Table of Content

1.0 Executive Summary

Fisheries sector is playing vital role in food, nutrition and employment of the country people. The people of Bangladesh get 58% of animal protein from fish (DoF, 2022) and more than 11 % of the total population of Bangladesh is directly and indirectly dependent on fish production and fish related trading for their livelihoods (DoF, 2018). Most of the people in Bandarban are of ethnic origin and here is a high demand for fish in the local markets in Bandarban. In spite of the high demand, fish production is very low compared to the other areas of Bangladesh. Such lower production is due to a number of confounding factors that include lack of technical knowledge, unavailability of fish fingerlings and feeds and other aquaculture inputs, and water crisis in the ponds/creeks. The fish farmers do not get sufficient technical support from relevant organizations (GO/NGO). Higher fish demand with lower productivity results in higher price in the local market. As a result, the poor people in the area cannot buy fish for their consumption and household nutrition. Although there are a number of problems for aquaculture in Bandarban, there are also some opportunities to improve aquaculture production for household nutrition. Many ponds and creeks (locally known as goda) are available in Lama, Alikadam and Naikhongchari Upazila of Bandarban district which are underutilized/unutilized. The present culture practice in these three Upazilas mostly traditional. The ponds/creeks can be used to their full potential for aquaculture production. Common aquaculture practice in these ponds/creek can be carp-mola polyculture, carp tilapia culture, catfish, snakeheads and pangas culture. Women are specially engaged in such type of fish culture but need to address proper management and technology. The pond dykes can be used for nutrient rich vegetable and orange sweet potato (OSP) production. As the area does not have enough and timely supply of fish seeds, local fish nurseries need to be established. There is a requirement to increase fish production in Bandarban district to meet the demand. In spite of the potential for carp fish farming and considering opportunity and to addressing the problem of Aquaculture & Nutrition in hill district of Bandarban district "Aquaculture Market Channel Development in Alikadam " (AMCD) project implemented by TAHZINGDONG. AMCD project is funded by FtF Bangladesh Aquaculture Activity (BAA) which technically supported by WorldFish Bangladesh. Initially the agreement of AMCD project was March, 2022-September'2022. But considering the opportunity and sustainability the project duration extended more 11 months Octber'2022- August'2023 (no cost extension). Finally, the project duration was March-2022 to August-2023.The total cost of the project was 99,85,722 BDT where FtF-BANA contribution was 89,27,389 BDT and Tahzingdong contribution was 10,58,333 BDT. This project mainly worked for 400 the small scale fish farmers (pond and creak),17 fish Nurserers, 4 harvesting group (17 Members), 02 carp fattening demo farmers, 02 community based creek (50 members) and 01 community feed center (CFC) in Lama, Alikadam and Naikhongchari Upazila of Bandarban hill district. Among the total beneficiary, 281 were female and 206 are male. So by implementing the project women have opportunity to access pond aquaculture system, pond dike cropping which fulfil household nutrition and aware about child and adolescent health hazard issue. Through this project 400 farmers received Aquaculture, Nutrition, pond dike/ homestead vegetable cultivation, Gender and Hygiene & cleanness focused 260 pond side training sessions. Total 42 batches of farmers training conducted during the project period where around 99% beneficiaries participated the training session. On the other hand, 250 graduated farmers received

refresher training by this project. Besides that, project organized market linkage events for local aquaculture service providers, exposure visit, observations of national & International days, and Farmer's Field day in Lama, Alikadam and Naikhongchari Upazila of Bandarban Hill district. By this project worked with MMHN to produce and supply good quality fingerling and HYV to Bandarban area. To introduce quality aquaculture inputs and developed linkages with service provider the project distributed fish fingerling, commercial fish feed, vegetable seed, OSP vine, Mola fish brood to all pond, creak farmers as input support. Nursery feed provided to all nursery farmers with other supports. During this period AMCD project distributed leaflet on technical aspects of aquaculture, developed and used Festoon on different training session, National Fish week, Module for farmers training and established signboard for all beneficiaries and billboard in different areas of Lama, Alikadam and Naikhongchari Upazila. To strengthening staff's capacity building the project organized need base meeting (ToT), training and follow-up support as required. It seemed that by doing different holistic interventions Fish Farmers of project area very much interested to know the technical aspects of fish culture as they did not get opportunity to learn aquaculture technical aspects previously. By practicing different aquaculture technology with availability of quality inputs and marketing of product make the aquaculture system sustainable and profitable in hill district of Bandarban. Due to adverse situation like communication, inputs unavailability and less scope marketing etc. aquaculture in the hill tracts area is not growing up like plain land. Here people usually used to traditional aquaculture system. During implementation period farmers know about different fish culture system, good aquaculture management, integrated pond fish farming system. Now they are starting to practice good aquaculture management techniques and produce more of fish & vegetable which make the project sustainable.

2.0 Introduction

2.1 Background of the Project

Bandarban district is one of the most remote hilly districts in Bangladesh. Most of the people are ethnic community and communication in rural villages of this upazila is hard to reach. Market challenges of Naikhongchari, Lama, Alikadam upazila are includes limited capacity of small scale fish producers (in terms of knowledge, skills, resources, financial ability); lack of access to quality inputs especially good quality seeds as there is no functional commercial nursery in this upazila; no commercial feeds agents; no professional fish harvesting groups and other aqua-inputs in the locality; lack or limited access to markets; poor road communication to hilly rural areas, in some areas have no roads to reach at pond/creek sites; lack or poor access to private services especially on fish harvesting and transportation services are very expensive. The practical experiences are telling that the hatcheries and nurseries are not willing to conduct capacity building trainings for the farmers and associated stakeholders; farmers have lack of motivation to accept the feed costs (it's almost 60-80%); and feed dealers/agents lack the skills and interest about business promotion & embedded service. These cause underperformance of fish culture and aquaculture production in these upazilas. As the aquaculture market actors yet to be develop, therefore, Tahzingdong is willing to play the role of a private company in developing aquaculture market systems. Besides The project planned to produce and market traceable quality spawns and fingerlings of various carp species with focus on product differentiation of genetic quality, sizes and prices such as spawns of carps, dhani, fingerlings, larger fingerlings, yearlings produce from wild or traceable sources and WorldFish G-3 broods to meet the markets' demand of this region through Maa Mothsha Hatchery and Nursery under Tahzingdong. The project also followed market development strategies to capture a larger share of the existing fish seeds market through market penetration and work to develop new markets at existing Bandarban areas for its current products.

2.2 Proposed Solution

2.2.01 Specific objectives

- To build capacity of integrated nutrition sensitive aquaculture entrepreneurs.
- To develop market linkages among aquaculture market actors
- To promote collective input purchase and marketing of beneficiaries' farm produces
- To Facilitate carp and mola fish nursery development
- To develop and facilitation of fish harvesting groups
- To establish community-based fish feed center to supply fish feed among the fish farmers at reasonable price.
- To develop community feed center to supply fish feeds among fish farmers at reasonable price.
- New product lines of fish seeds of various carp fish species with high genetic quality will be produced at Maa Mothsha Hatchery and Nursery to meet the demand of fish and nursery operators living in this region.
- A strong distribution channel of spawn and fingerlings products will be developed in Bandarban and Cox's Bazar districts.

- Better Management Practices (BMP) will be followed in hatchery & nursery operations and as well as feed preparation.

2.2.02 Summary of the business proposal

Tahzingdong proposed to implement the project activities in Naikhongchari, Lama and Alikadam Upazila under Bandarban Hill District. Tahzingdong work with the 400 pond/creek owners for integrated nutrition-sensitive aquaculture with dike cropping, 250 graduated fish farmers, 17 carp-mola fish nurserers, 4 fish harvesting and marketing group consist of 4 persons, 1 Community feed center and 1 Carp Hatchery (MMHN) and 45 other backward and forward aquaculture market actors. Under these interventions at least 50% will be women. Out of total beneficiary about 20% youth. Priority also given to PLW and Child U2 mother.

In these upazilas, there are opportunities to develop the capacity of pond and creek owners, develop fish nursery to supply quality fingerlings to the pond owners in time at lower price.

For well running this carp hatchery, MMHN brined new innovation of improved quality carp seed (G-3) production by introducing quality broods, following BMPs and transforming value chain activities to hatching and nursing instead of only nursing.

Through MMHN, quality carp seeds produced using high quality broods and following BMPs, the sales quantity and volume will be increased rapidly especially to the local fish nurserers. The profit margins also increased with the increase of sales.

Community feed center produced fish feed at local level and sold fish feed among the fish farmers at reasonable price determined by the group and or the fish farmers bring fish feed ingredients to pelletize paying the service charge.

Market linkages among aquaculture actors can created an enabling business environment for all. There was also opportunity to develop fish harvesting groups, fish feed and aquaculture inputs seller group to create facilities for the fish producers. If the fish farmers have the linkages with the backward and forward markets, they will be able to reduce their production costs as well as will increase the profit margins. Thus, the aquaculture business will grow and sustain in these upazilas and people will be motivated to fish culture fish as livelihood strategy due increased productivity and income.

Tahzingdong has working experience with WorldFish with similar interventions through implementing “Enhancing Aquaculture and Nutrition Activity in Bandarban Hill District (EANA)” project during Oct 2019 to Dec 2020 in Lama & Alikadam upazila. They worked with 531 HHs on Aquaculture, established 20 fish nurseries. Currently Tahzingdong is implementing the project “Aquaculture market channel development in Alikadam” where worked with 400 aquaculture farmers, 17 fish nurserers and 4 fish harvesting group.

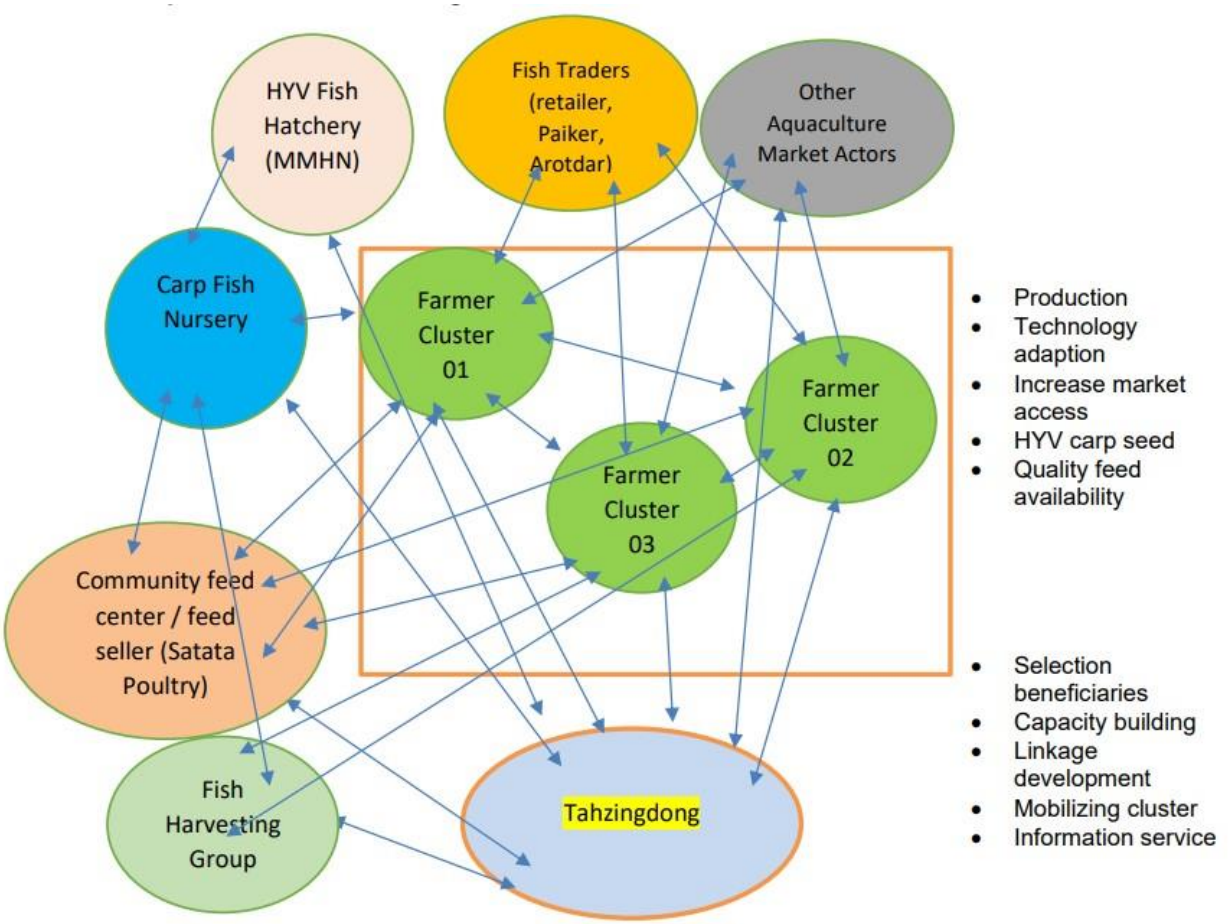

Figure 01: Business model for Aquaculture Market Channel Development in Alikadam

2.2.03: Expected results

Qualitative

- The farmers will practice collective purchasing and marketing initiatives
- Market linkage event will create market linkage with different backward and forward aquaculture market actors, increase availability and accessibility of the fingerlings, fish fry, fish feed and other aqua inputs and selling of produce fishes.
- Farmers Field Day will observe for result demonstration. FFD will increase farmer's confidence and replicate the better practices among farmers and neighbors.

Quantitative

- 400 farmers of Naikhongchari, Lama and Alikadam upazila will adopt the nutrition sensitive aquaculture and improve their productivity and income.
- 250 graduated fish farmers will continue the good aquaculture practices
- 17 fish nurseries will be developed and produce quality fingerlings. From the 17 nurseries 400 fish farmers will get quality and healthy fingerlings at lower price and on time.
- Mortality of fingerlings during transportation will be reduced.

- 4 fish harvesting groups will be developed with 4-6 members. From the fish harvesting group the 400 fish farmers will able to harvest fish in time
- The hatchery (MMHN) will produce quality spawn for the targeted and other nurserers. They will be linked and get quality spawn from the hatchery for producing quality fingerlings for the fish farmers.
- The hatchery (MMHN) will develop HYV broods and use these quality broods for the hatchery operation.
- 01 community feed center will develop to produce quality fish feed at local level and sell to the fish farmer at reasonable price.

2.3 Objectives of the Partnership

The goal of the proposed project is to enhance aquaculture activities and improving nutritional status through increasing income generating of the fish farmers and community people in Bandarban District. The objectives of the partnership are:

- To extend aquaculture technologies and nutrition practices among the poor fish farmers in the rural areas of Bandarban district.
- To increase availability of fish seeds through facilitating fish nursery establishment
- To enhance fish and vegetable production to address malnutrition of the poor people.
- To increase income of the rural people especially women and youth and promote livelihood option
- Linkage establishes among the trader, retailer, suppler and with producer and ensuring the quality and availability of feed in the hard-to-reach area.
- To promote rice fish culture in the low land area for increasing production
- To sensitize adolescent girls and boys and young women and men in aquaculture & nutrition.

2.4 Geographic Coverage

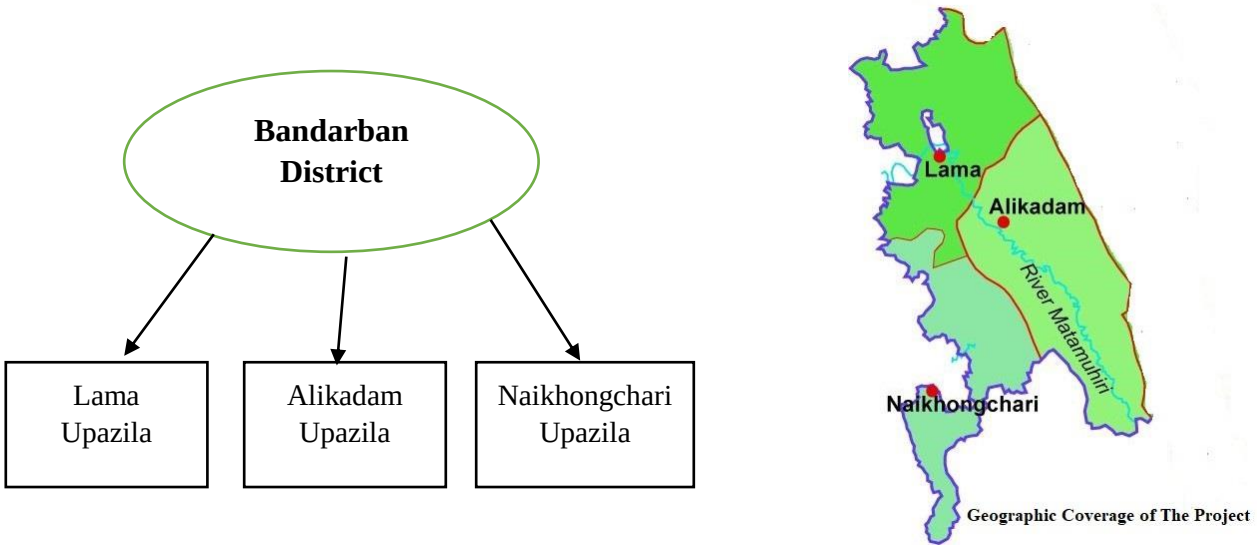

Figure 02: Geographical coverage of the project

2.5 Project KPI and Budget Summary

2.5.01 Overall Key Performance Indicator (KPI) of this project

Activity	KPI	Unit / Frequency	Targets	When	MOV
Community meeting, Farmer selection and data base preparation (14 meetings)	# of meeting	Number	14	Mar to Apr, 2022 Oct to Nov, 2023	Attendance sheet
Training on Nutrition sensitive aquaculture & business planning for new farmers 40 batches (10 per batches)- 11 sessions	# of Training	Number	40	Apr-Aug,2022 Jan to Apr-2023	Attendance sheet
Market linkages development among aquaculture actors -07 Batch (20 persons per event)	# of event	Number	7	June-2022 Jan-2023 July-2023	Attendance sheet
2 days Capacity building training on Nursery Management for Nurserers and Nursery Assistant	# of Training	Number	2	Apr-2022 Feb-2023	Attendance sheet
Capacity building training on business development for Harvesting group	# of Training	Number	2	Aug-2022 Dec-2022	Attendance sheet

2.5.02 Budget Summary

Budget:	Investment Ratio				
Activity Cost	% of WorldFish	% of Grantee	Total	FtF BAA	Grantee
Amount in BDT	89%	11%	9,984,622	8,926,289	1,058,333
Amount in USD	89%	11%	99,891	88,722	11,169

3.0 Project Performance

3.1 Outreach Summary

3.1.1 Beneficiary data

Sl no	Beneficiary Type	Beneficiary Total Number	Gender Disaggregation	
			Male	Female
1	Fish farmers	400	152	248
2	Nursery fish farmers	17	14	3
3	Harvesting group-04	16	8	8

4	Graduated fish farmers	250	87	163
5	Community creek aquaculture farmer	50	28	22
6	Demo pond farmer	2	2	0
	Total=	**735**	**291**	**444**

3.1.2 Beneficiary reached way

Sl no	Beneficiary Type	Beneficiary Total Number	Reached way
1	Fish farmers	400	Training, Input support, Day observation, HHs Visit, Counseling
2	Nursery fish farmers	17	Training, Input support, Exposure visit, Follow up support, Market linkage program, HHs Visit
3	Harvesting group-04	16	Training, Seine net support, Market linkage program
4	Graduated fish farmers	250	Refresher training, HHs Visit, Counseling
5	Community creek aquaculture farmer	50	Training, Input support, HHs Visit
6	Demo pond farmer	2	Input support, HHs Visit, Exposure visit
	Total=	**735**	

3.2 Key Performance Indicators

Activity SL#	Planned Activity Name (As per the agreement)	Total		
		Target (Number)	Achievement (Number)	Achievement (%)
5.A	DIP	1.00	1.00	100
5.01	Staff recruitment	1.00	1.00	100
5.02	Project/staff Orientation	1.00	1.00	100
5.03	ToT for project Staff on nutrition sensitive aquaculture (3 days)	1.00	1.00	100

Activity SL#	Planned Activity Name (As per the agreement)	Total		
		Target (Number)	Achievement (Number)	Achievement (%)
5.04	Project Inception Meeting with stakeholder	1.00	1.00	100
5.05	Bi-monthly progress review and planning meeting	3.00	3.00	100
5.06	Community meeting, Farmer selection and data base preparation (4 meetings)	4.00	4.00	100
5.07	Training on Nutrition sensitive aquaculture & business planning for new farmers 10 batches (10 per per batches)- 04 sessions	50.00	50.00	100
5.08	Market linkages development among aquaculture actors (20 persons)	1.00	1.00	100
5.09	2 days Capacity building training on Nursery Management for Nurserers and Nursery Assistant	1.00	1.00	100
5.10	Capacity building training on business development for Harvesting group	1.00	1.00	100
5.11	Day observation _IYD-Aug 12/NFW (July)/ Nutrition Day (April 23-29)	3.00	3.00	100
5.12	Farmer Field Day Observation (Per program 60 persons* 2) Total 120 person at Union level	2.00	2.00	100
5.13	Extension Input support to the Beneficiaries	-	-	100
5.13.1	Fingerling for aquaculture farmers (3-4")	20,000.00	20,000.00	100
5.13.2	Fish feed for aquaculture farmer	2,500.00	2,500.00	100
5.13.3	Vegetable seeds for dyke cropping & OSP Vine	100.00	100.00	100
5.13.4	Spawn/dhani support for fish nurserers	2.00	2.00	100
5.13.5	Oxygen Cylinder support for Nurserers for carrying facility increase in far distance	2.00	2.00	100
5.13.6	Best Management Practices for Nursery	2.00	2.00	100
5.13.7	Feed support for nurserers (50 kg per person) 2 nursurers	100.00	100.00	100
5.13.8	Seine Net support for harvesting group	1.00	1.00	100
5.14	IEC material development	-	-	100
5.14.1	leaflet development / Festoon	400.00	400.00	100

Activity SL#	Planned Activity Name (As per the agreement)	Total		
		Target (Number)	Achievement (Number)	Achievement (%)
5.14.2	Module for project staff	2.00	2.00	100
5.14.3	Printing pond record book	110.00	110.00	100
5.14.4	Printing & installation pond signboard	102.00	102.00	100
5.14.5	Office signboard printing and Installation	1.00	1.00	100
5.15	Attending training on environment and climate organized by WorldFish	1.00	1.00	100
5.16	Learning Sharing meeting and Project Close-out	1.00	1.00	100
	CE Activity	-	-	-
5.01	Staff recruitment	1.00	1.00	100
5.02	Staff Orientation	1.00	1.00	100
5.03	ToT for project Staff on nutrition sensitive aquaculture (3 days)	1.00	1.00	100
5.04	Project Inception Meeting with Stakeholder	1.00	1.00	100
5.05	Bi-monthly progress review and planning meeting	5.00	5.00	100
5.06	Community meeting- 10 meeting	10.00	10.00	100
5.07	Farmer level training on Nutrition sensitive aquaculture-7 session,300 farmer	210.00	210.00	100
5.8	Best Management practices for hatcheries	-	-	100
5.8.1	Brood development program	300.00	300.00	100
5.8.2	Brood transportation cost	2.00	2.00	100
5.8.3	Feed for brood nursing	1.00	1.00	100
5.8.4	PG and other chemical	1.00	1.00	100
5.8.5	Sun protecting shed net	1.00	1.00	100

Activity SL#	Planned Activity Name (As per the agreement)	Total		
		Target (Number)	Achievement (Number)	Achievement (%)
5.8.6	Hapa for nursing	1.00	1.00	100
5.8.7	Oxygen refill	1.00	1.00	100
5.8.8	Printed polybag for spawn and fingerlings selling	1.00	1.00	100
5.8.9	Air blower for nursing fry	1.00	1.00	100
5.8.10	Oxygen Tower	1.00	1.00	100
5.8.11	Spawn keeping filter net for Jar bottle	1.00	1.00	100
5.8.12	Digital (.01 g) scale for PG measurement	1.00	1.00	100
5.8.13	Weighing scale for weighting fingerlings	1.00	1.00	100
5.8.14	Brood Pond excavate for segregation of Brood	2.00	2.00	100
5.8.15	BMP training for Hatchery staff (2day Training)	1.00	1.00	100
5.8.16	Training on collecting pituitary gland	1.00	1.00	100
5.8.16.6 & 5.8.16.7	Hatchery Technician	6.00	6.00	100
5.09	Market linkages Event	6.00	6.00	100
5.10	2 days Nursery Management training	1.00	1.00	100
5.11	Training for fish harvesting groups	1.00	1.00	100
5.12	Day observation_ Mens Day-Nov, IWD-Mar 8, Nutrition Week-Apr)	9.00	9.00	100
5.13	Farmer Field Day Observation	5.00	5.00	100
5.14	Video Documentary Show	6.00	6.00	100
5.15	Community Feed center establishment (Community)	1.00	1.00	100
5.16.1	Fingerling for aquaculture farmers	300.00	300.00	100

Activity SL#	Planned Activity Name (As per the agreement)	Total		
		Target (Number)	Achievement (Number)	Achievement (%)
5.16.2	Mola broods supports (200 gm/ persons	300.00	300.00	100
5.16.3	Fish feed for aquaculture farmer	300.00	300.00	100
5.16.4	Vegetable seeds (4-5 types)	300.00	300.00	100
5.16.5	Orange sweet potato vine (10 pcs)	300.00	300.00	100
5.16.6	Feed support for nurserers (20 kg per person)	15.00	15.00	100
5.16.7	Spawn -15 nurserers	7.50	7.50	100
5.16.8	Seine Net support for harvesting group	3.00	3.00	100
5.17.1	Festoon	1.00	1.00	100
5.17.2	Printing pond record book	1.00	1.00	100
5.17.3	Printing & installation pond signboard	1.00	1.00	100
5.17.4	Module- Nutrition sensitive aquaculture	1.00	1.00	100
5.17.5	Office signboard printing and Installation	1.00	1.00	100
5.18	Participate in different programs organized by WorldFish	1.00	5.00	500
5.19	Refresher Training for Graduated Farmers (250 Farmers)	250.00	250.00	100
5.20	Project Close-out meeting	1.00	1.00	100
5.21	Larger size fish culture demo pond	2.00	2.00	100
5.22	Community based creek aquaculture-2 creeks	2.00	2.00	100
5.23	Exposure visits for the fish nurserer at Hatchery	1.00	1.00	100
5.24	Follow up support for the fish nursery	5.00	5.00	100
5.25	Celebration of National fisheries week 2023 in 3 upazila	3.00	3.00	100
26	Program Progress Report	18.00	18.00	100

Activity SL#	Planned Activity Name (As per the agreement)	Total		
		Target (Number)	Achievement (Number)	Achievement (%)
27	Project Completion report	1.00	1.00	100
28	MEL data collection, processing and submission (as applicable)	-	-	
29	Success story collection and dissemination (as applicable)	-	3.00	300
30	Staffs Salary and Benefit	18.00	18.00	100
31	Equipment, Supplies and Operation Cost	18.00	18.00	100
32	Travel	18.00	18.00	100

3.3 Activity Performance

3.3.01 Time line: 16 March, 2022 to 30 September, 2022

Activity	Description	Picture
DIP	Detail Implementation Plan (DIP) prepared before starting of the project activities	
Staff recruitment	Recruited staff Project Coordinator=1 Market facilitator=1	
Project/ staff Orientation	After joining of all staff, a day long project orientation meeting organized before starting of the field activities. Total 10 person (WF-3, TZD-3, Staff-2, DoF-2) were present at the meeting among new recruited staff (Male-10, Female-0)	

ToT for project staff	Before implant the activities, training, and plan in the field, WF & TZD arrange a very effective T.o.T for 3 Days. Herewith facilitator were WF,DoF,TZD. Venue: BNKS Head Office Date: 19-21 April, 2022	
Project inception meeting with stakeholder	The meeting was held in Alikadam about introduce with Project activity and project goal, presence of UNO, Police, UFO, UAO, Two UP Chairman, ED TZD, FO-WF, Staff on June 15,2022.	
Bi-monthly progress review and planning meeting	Meeting was to share about the progress on target, achievements of last two month and planning for next two month with implementation strategy. Total 03 meeting were happened in that period	
Community meeting for farmer identification and selection	4 community meeting held in 2 union for introduce of the project & colleting primary data for final selection of farmers. PC & MF were facilitated the program at the very beginning of the project	

Capacity building training for the fish farmer on nutrition sensitive aquaculture	7 Session on Aquaculture, nutrition, Gender & Vegetable through 50 training were arranged for fish farmers capacity build -up. Facilitate by PC, MF & WF representative. Total farmers-100 (Male-35, Female-65)	
Market linkage events among aquaculture market actors	M.L.E happened for outstanding supply chain & build a strong linkage among all aquaculture actors. Total Participants were 24 (Male-21, Female-01) Date: 22 June, 2022	
Capacity building training on Carp mola fish nursery farmer	This effective & dedicated training was for nurserers as they know latest learning, technology, business strategy, marketing. Total 12 participants (Male-12, Female-0) were present there.	

Capacity building training for fish harvesting group on harvesting & post harvesting technology and fish marketing	A day long training was held. for Harvest group for their capture fish updated procedure, system, tech. Total participants were 10 (Male-10, Female-0) Harvest group member were -5 (Male-05, Female-0)	
Day Observation_ International Youth Day-National Fisheries Week, National Nutrition Week	3 Days celebrated in Alikadam with brief discuss & learning on the day observation. After session of learning a warmful & competitive quiz program held sequentially per program. Total participants were 24/per program.	
Farmers' Field Day to demonstrate results-2 unions	TZD arranged 2 FFD in Alikadam upazila to share the major results of the demonstrations among the fish farmers. Total participants -106 (Male-44, Female-62)	
Extension inputs Support for Aquaculture Participants	Fingerling-200 Pcs (Carp mix), Fish feed-25 kg (1 Bag), Nursery Dhani (750 gm/ per nurserer), Nursery Feed-20 kg (1 bag), Vegetables, OSP Vine, 02 cylinder (02 nurserer, Seine Net-01 Pcs etc	

IEC material develop & printing	Festoon & Module for staff and Pond record book & Pond sign Signboard bord for beneficiary provided.	
Attending training on environment and climate organized by WorldFish / any meeting invited by WorldFish	Staff from TZD participated in Environmental compliance training at Cox`s Bazar called by WorldFish.	
Learning Sharing and Project Close-out meeting	Project closeout meeting reflect the achievements and success of the project, what changes have been made through this project, lessons learned, major challenge faced and future recommendation from the project.	

3.3.02 Timeline: 01 October, 2022 to 31 August, 2023 (CE Activity)

Activity No	Activity	Description	Picture
5.01	Staff recruitment	According to the Tahzingdong Human Recourse Policy completed the recruitment for the project. The positions were, Project Coordinator - 01 Technical Coordinator – 01 Finance and Admin Officer- 01 Sr. Market Facilitator-01 Market Facilitator – 04 Support Staff – 01 (Male-08, Female-01) Date: 16 October, 2022	

5.02	Staff Orientation	After joining of all staff, a day long (26.10.2022) project orientation organized before starting of the field activities at Project office, Lama. Different topic covered such as Detail Implementation Plan (DIP), Beneficiary Selection Criteria, MEL formats, Milestone and Deliverables and Gantt Chart etc. Total 14 persons participated on that program (Project staff-09, TZD-01, WF-04)	
5.03	ToT for project Staff on nutrition sensitive aquaculture (3 days)	3 days "ToT on Integrated Nutrition Sensitive Aquaculture, Business planning and development" performed for the 8 project staff. Date: 12-14/11/2022 Venue: Project office, Lama	
5.04	Project Inception Meeting with Stakeholder	To understanding and share the project details, project goal, objectives, activities etc a day long "Project Inception Meeting with Stakeholder" program have been organized for GoB officials and other stakeholders at Naikhongchari. Date: 13 December, 2022 Participants: 19 (Male-18, Female-01).	

5.05	Bi-monthly progress review and planning meeting	Meeting was to share about the progress on target, achievements of last two month and planning for next two month with implementation strategy. Total 05 meeting were happened in that period	
5.06	Community meeting- 10 meeting	During the reporting period, TZD had completed 10 community meetings in Lama, Alikodom and Naikkhongchari upazila. Total 291 community persons participated on that programs (Male-176, Female-115) and gave information about the ponds in that area.	
5.07	Farmer level training on Nutrition sensitive aquaculture-7 session,300 farmer	Tahzingdong facilitated Training on nutrition sensitive aquaculture and business planning for selected 300 aquaculture farmers (Male-117, Female-183) at community level. The training equipped with 7 sessions: 1 session on dyke cropping (vegetable) and 2 sessions on nutrition, 1 session on gender and 3 sessions on Aquaculture.	
5.8	Best Management practices for hatcheries		

5.8.1	Brood development program	Tahzingdong hand overed 300 kg (Common carp-100 kg, Catla-55 kg, Mrigel-60 kg, Grass carp-75 kg and Sharpoti-10 kg) good quality brood fish to MMHN for strong backup of brood stock and management	
5.8.2	Brood transportation cost	Tahzingdong delivered 300 kg quality brood fish to MMHN and paid brood transportation cost according to budget agreement with MMHN	
5.8.3	Feed for brood nursing	To maintain the quality of brood fish Tazingdong hand over 750 kg floating fish feed to MMHN for brood nursing.	
5.8.4	PG and other chemical	Tahzingdong provided to MMHN 2600 pieces of PG in 01/02/2023 purchased from M/S Rahman Enterprise, RBK road, Chacra, Jessore Which helped MMHN to cover a big contribution into production of that season.	

5.8.5	Sun protecting shed net	Sun protecting shed net is very useful for keeping fishes to normal temperature from surrounding hot temperature in the concrete tank under open sky. MMHN owner purchased this important input by own funding with on 2 February 2023 consultation of Assigned Technical Coordinator. This shed net is 30 feet length and 16 feet width.	
5.8.6	Hapa for nursing	Hapa is very important input for multiple operation in Aquaculture sector. By the allocated budget with funding and support of USAID & WorldFish, Tahzingdong provided 10 hapa to MMHN for their multiple uses and handover to MMHN authority on 01/02/2023.	
5.8.7	Oxygen refill	MMHN has purchased 1 cylinder (2500 lb) and refill 6 times (02/01/23, 27/01/23, 14/02/23, 28/02/23, 12/03/23, 28 /03/23) of oxygen which uses for delivery of fingerling, fry and dhani. Along with this sometimes-brood fishes also required more dissolve oxygen at the absence of electricity and oxygen tower operation off.	

5.8.8	Printed polybag for spawn and fingerlings selling	MMHN authority completed the task under the supervision of Technical Coordinator of Tahzingdong on January 17, 2023. By maintaining the budget amount, they were able to purchase 1500 copy of Printed polybag for MMHN (Price: 1500 X 13.34=20,010 BDT). Which is actually will perform also the brand name of MMHN	
5.8.9	Air blower for nursing fry	According to the allocated budget for the project Tahzingdong has given 3 set air blower and electric set up to MMHN on 03/03/2023 for Best management practice in Hatchery. Air blower increases dissolve oxygen into tank for fingerling, brood fish, fry etc. By increasing dissolve oxygenation.	
5.8.10	Oxygen Tower	Tahzingdong provided 40% & MMHN owner 60% cost to purchase and installed this very essential part in MMHN campus. Moreover, this oxygen tower has been in operation for first week of February, 2023 Characteristics of Oxygen Tower: Layer: 3, Height: 7 feet, Width: 3 Feet, Made by: Iron and Stainless steel,	

5.8.11	Spawn keeping filter net for Jar bottle	Spawn keeping filter net for Jar bottle is a sensitive aquaculture input specially for duration of hatch-out of spawn. Tahzingdong did handover one bundle (5 pcs) filter net (Price: 5 X 600=3,000 BDT) on 14/02/2023	
5.8.12	Digital (.01 g) scale for PG measurement	Digital scale for PG measurement is a sharp weight device. MMHN owner purchases PG from multiple stores from various shop around the country especially from Jessore. As this sensitive and high price, moreover PG measurement is very important for Inject amount. Technical Coordinator did handover to MMHN a digital scale (0.01 g to 600 g)	
5.8.13	Weighing scale for weighting fingerlings	Weighing scale for weighting fingerlings is an essential weight measurement device. MMHN owner sells fingerling to buyers around the multiple regions in the country. TZD handover a digital weighting scale (100g to 100 kg) to MMHN	

5.8.14	Brood Pond excavates for segregation of Brood	MMHN completed excavate 2 brood pond it from 03 November 2022 to January 29, 2023 from their own cost. The big brood pond size is 75 decimals which length 275 feet and width were 120 feet another was 10 decimals which length is 80 feet and width were 55 feet both depth is 4 feet average.	
5.8.15	BMP training for Hatchery staff (2day Training)	Best management practice is the key issues for a successful hatchery management. It controls all the quality, challenges, problems mitigate. TZD arranged a two days BMP Training at Maa Matsha Hatchery on 13-14 June 2023 for hatchery staff.	
5.8.16	Training on collecting pituitary gland	It is beyond description that the PG Collection is very important for Fisheries and Aquaculture sector. According to project activity conducted a training program on Collection of pituitary glands at Maa Matsha Hatchery and Nursery on 12 June 2023 for hatchery staff.	
5.8.16.6 & 5.8.16.7	Hatchery Technician	MMHN appointed a hatchery technician for spawn production by their own cost for six month (January, 2023 to June, 2023).	

5.09	Market linkages Event	To build up the linkage and bonding with different aquaculture market actors day long “Market linkage event with different aquaculture market actors” have been organized at Alikadam, Lama, Naikhongcjhari upazila in Bandarban by Tahzingdong. Total event=6, Participants=126, Male-86, Female-40)	
5.10	2 days Nursery Management training	To develop the capacity of Nursery fish farmers on improved aquaculture business 2 day`s long “Nursery Management Training” organized on 13-14 February, 15-16 February and 22-23 February, 2023 at Lama and Naikhongchari. Participants-15 (Male-12, Female-3)	
5.11	Training for fish harvesting groups	To develop knowledge and skill of fish harvesting group members a day long “Fish Harvesting Group Training” program have been organized by TAHZINGDONG on 27 December, 2022 at Lama Powroshova hall room. Participants= 12 (3 Group), Male-04, Female-08	
5.12	Day observation_ Mens Day-Nov, IWD-Mar 8, Nutrition Week-Apr)	To understanding the Men`s and Women`s rights and contribution in family and society as well as importants of nutrition in Lama, Alikodom and Naikkhongchari upazila observed 9 events by TZD. Total participants-368, Male-169, Female-199	

5.13	Farmer Field Day Observation	Tahzingdong organized 5 farmers field day at 3 Upazila. Average more than 50 farmers participated on that program. Programs were very color full and decorated and model demonstration pond made for the learning. Project staff and WorldFish representative presented and demonstrated to farmers. Tahzingdong awarded best 3 fish farmers on each program with organizational crest.	
5.14	Video Documentary Show	To increase awareness of community to improve knowledge on Basic Concept of Nutrition and importance of Nutrition for Family and improve knowledge of carp fish aquaculture overview Tahzingdong organized 6 Video Documentary Show events for community people. Mainly the show equipped on Basic concept on Nutrition and Nutrition for family members and Hand washing and aquaculture overview. Total participants-234, Male-140, Female-94	

5.15	Community Feed center establishment (Community)	According to planed activity a community feed center has been established at Lama, Bandarban on August 2023. Tahzingdong provided the Hammer mill, Pellet mill, Vibratory sieve and horizontal mixture machine to CFC owner at Lama.	
5.16.1	Fingerling for aquaculture farmers	To develop the capacity of farmer level, improve knowledge and skill of nutrition sensitive aquaculture Tahzingdong given small support by the good quality of carp fish fingerlings for 300 Farmers. Each farmer received 1.5 kg of carp fish (Carp mix; Rui, Catla, Mrigel and Common carp) fingerlings (150 g -200 g per pcs).	
5.16.2	Mola broods supports (200 gm/ persons	Tahzingdong given Mola brood to 300 farmers in Lama, Alikadam and Naikhongchari upazila. Each farmer received 200g of Mola brood fish in standard size.	
5.16.3	Fish feed for aquaculture farmer	To develop the capacity of farmer level, improve knowledge and skill of nutrition sensitive aquaculture Tahzingdong given small support by the good quality of fish feed for 300 farmers. Each farmer received 25 kg (1 bag) of carp mixer mess fish feed (Sinking)	

5.16.4	Vegetable seeds (4-5 types)	Tahzingdong provided 5 types of seasonal vegetable seed to 300 selected farmers in Lama, Alikadam and Naikhongchari upazila. Each farmer received 5 variety vegetable seeds, which are suitable for dyke cropping (Bottle gourd-20 gm, Pumpkin-20 gm, Red amaranth-50 gm, Kidney vetch/ Lady`s finger - 20gm, Yard long bean-50 gm).	
5.16.5	Orange sweet potato vine (10 pcs)	Tahzingdong provided 5 vine of Orange sweet potato to 300 selected farmers in Lama, Alikadam and Naikhongchari upazila. Each farmer received 5 vines of Orange sweet, which are suitable for dyke cropping and home state area cropping.	
5.16.6	Feed support for nurserers (20 kg per person)	To develop the capacity of nursery farmer level, improve knowledge and skill of nutrition sensitive aquaculture Tahzingdong given small support by the good quality of nursery fish feed. Each farmer received 20 kg of carp nursery fish feed (Sinking).	
5.16.7	Spawn -15 nurserers	To develop the capacity of nursery farmer level, improve knowledge and skill of nutrition sensitive aquaculture Tahzingdong given small support by the good quality of carp fish spawn. Each nursery farmer received 0.5 kg of carp fish (G-3 Rui, Grass carp and Common carp) spawn.	

5.16.8	Seine Net support for harvesting group	To develop capacity for fish harvesting group members 3 harvesting seine nets (150 feet X 30 feet) support given by Tazingdong. Tazingdong formed 3 Harvesting group in Lama and Naikkhongchari Upazila (Lama -2, Naikkhongchari-1)	
5.17.1 5.17.2 5.17.3 5.17.4 5.17.5	IEC material development	Training Festoon- 6 set, Printing pond record book-315 Printing & installation pond signboard-315 Module- Nutrition sensitive aquaculture-7 Office signboard printing and Installation-1	
5.18	Participate in different programs organized by WorldFish	Project staff and TZD Management participated different programs called by WorlFish in project period such as Gender training, Real time monitoring app training etc	
5.19	Refresher Training for Graduated Farmers (250 Farmers)	Tahzingdong trained 250 graduated farmers on integrated nutrition sensitive aquaculture, business planning (refresher training) in 3 upazila. The session topics covered aquaculture, Nutrition, dyke cropping and nutrition as well as business planning. Participants-250 (Male-87, Female-163)	

5.20	Project Close-out meeting	The closeout meeting of project was to reflect the achievements and success of the project, what changes have been made through this project, lessons learned, major challenge faced and future recommendation from the project. Date: 23-08-2023 Participants: 31 (Male-28, Female-3)	
5.21	Larger size fish culture demo pond	To develop the capacity of carp fattening fish farmer level, improve knowledge and skill of nutrition sensitive aquaculture Tahzingdong provide small support by larger size fish and fish feed. Tahzingdong selected 2 demo ponds for the practice and support. Each farmer received 40 kg larger size carp (Rui, Catla, Mrigel and common carp) fish (500g per pcs), 1 Bag fish feed (floating) and 1 signboard.	
5.22	Community based creek aquaculture-2 creeks	To develop the capacity of community fish farmers on improve aquaculture business, knowledge and skill of fish farmers Tahzingdong organized 2 days long training on nutrition sensitive aquaculture and business planning for selected 50 aquaculture farmers at 2 creek-based community. Moreover they received 66 kg carp fish fingerlings (33 kg per creek), 200 kg Urea (100 kg per creek), 80 kg TSP (40 kg per creek) and 2 signboard (1 signboard per creek) as inputs support from the project	

5.23	Exposure visits for the fish nurserer at Hatchery	To motivate and develop the capacity of carp fish nursery farmers by observe best practice of aquaculture business a day long "Exposure visit for the fish Nurserer at Hatchery" have been organized on 20 June, 2023 at MMHN and and Coral reef hatchery Fashiakhali, Lama. 10 Carp and Tilapia fish nursery farmer (Male-8, Female-2) participated in that program	
5.24	Follow up support for the fish nursery	Tahzingdong selected best-5 nurserer out of 15 for the follow up support. Each nursery farmer received Blue net-01 (150 feet X 4.5 feet), Bird protecting net-01 (60 feet X 30 feet), Hapa01 (12 feet X 5 feet), Spring balance-01 and Oxygen cylinder-01 with pipe and regulator (6.8)	
5.25	Celebration of National fisheries week 2023 in 3 upazila	Tahzingdong observed 3 event for Fisheries week based on nutrition sensitive aquaculture and safe fish. With the discussion session Tahzingdong organized rally and Quiz competition for participants and given prize to the winners. Tahzingdong also given a crest for the host schools.	

4.0 Lessons Learned

4.1 Key Lessons Learned

- It has changed the attitude of fish farmers towards farming in a modern way
- Some farmers commented that they did not eat orange sweet potato leaves earlier. They are eating mola fish with head from their ponds.
- Adolescent student's basic hygiene and nutrition knowledge is very much poor. Quiz competition of school sessions, girls had highest scored but boys are not good scored.
- The farmers who applied lime and salt during winter, their fishes are not affected diseases.
- Need to available aquaculture Inputs in remote areas
- Farmer arrange net to harvest fish in low price from their pond and marketing to their community
- Some farmer cultured Tilapia and carp mix culture (Polyculture) and got high value from seasonal
- Need to develop marketing opportunities for woman framer
- Have to work on Aquaculture market system with market actors.

4.2 Challenges

- It was a big challenge to have group meetings at the right time due to the distance from venue to farmer's home due to geographical constants.
- Getting fish feed and others aquaculture inputs at the right time in Bandarban one of the major challenges, the farmers had to go out most of the time to collect fish feed. As a result, fish farmers have lost money and time. Produce a balanced diet of fish locally can save a fish farmer both time and money.
- Quality fish fry is not available in Bandarban, Fish farmers have to depend on outsider vendors to get quality fish fry. To solve this problem, it is a significant lesson to adopt the strategy of creating fish fry producers at the local level.
- The water quality parameters testing knowledge for fish was a very valuable learning. Despite the interest of the farmers in the ponds or creeks in remote areas, the farmers could not receive in the way of fish farming. It is such a challenge to get advisory services. To overcome this challenge, need to introduce learning point and testing center at low cost in local area level.
- Break down the old mindset of fish farmers in the region also was a mentionable challenge. Enriching fish farming by continuously gaining new conceptual knowledge through training, discussion and personal communication on new methods and technologies of fish farming was an important learning point.
- Short time project duration was faced challenge to ensuring the quality of work at the field level. And ensuring the inputs support from project (fish feed and other inputs) to the project participants in proper time However, need to plan for long time project implementation to get better result and sustainability.
- Due to insufficient manpower in the Fisheries Department, coordinating and developed linkage between the government resource people was also one of the challenges. As a result, the fish farmers that no cooperation could be obtained. It was a lesson that the

coordination and linkage between the Department of Fisheries has given a good start to the supply of Aquaculture inputs, technical and advisory services.

- Fish farmers in Bandarban affected due to the flash flood by heavy rainfall. Most of the farmers lost their crop (Fish).

4.3 Key Innovation of the Project

Community meetings & farmer selection: THZINGDONG arranged and successfully organized 12 community meeting in different places of Lama, Alikadam and Naikhongchari Upazila & by the community meeting 42 farmers group was formed (Lama-12, Alikadam-18, and Naikhingchari-12). Through individual household visit 400 farmers was selected to implement the project activities and all farmer's data have been recorded in MEL data base system. Thus, make a database for all final farmers according to related criteria. So, anytime need to find the all data of any farmers easily got from that data base.

Framer Training: Successfully organized 210 batches of farmer training on 7 session technical module (Aquaculture, Nutrition, Gender, Homestead vegetable cropping etc) during the project period. In an average 99% participants were attended the training program and all farmer training recorded in MEL data base system in due time.

Training for Nursery farmers: Successfully organized 02 days technical training for fish nurserer on pond preparation, stocking management, feed management, common diseases of fish, common problems in nursery fish ponds and solutions, better management practices for nursery fish culture, fish harvesting, packing & delivery and business strategy, etc. All 17 Nurserers (Lama-06, Alikadam-05 and Naikhongchari-06) attended the training session and by the training now they are more confident to established more nursery pond to support the farmer in their community.

Developed IEC materials: TAHZINGDONG has developed some information, education and communication materials like module, Festoon, pond record book distributed to the field level. with support of WorldFish relevant specialist.

Inputs distribution: By this project distributed different aquaculture inputs like fish fingerling, mola brood, fish feed to the farmers which helped farmer to know about the quality inputs as well as established linkages with the service providers. Besides aqua inputs also distributed vegetable seed and OSP vine to encourage farmer to produce vegetable in the pond dike which ultimately helped framer for more income and intake more house hold nutrition.

Harvesting group formation: To develop capacity for fish harvesting group members 4 harvesting seine nets support given by Tahzingdong. Tahzingdong formed 4 harvesting group in Lama and Naikhongchari Upazila (Lama -02, Alikadam-01 and Naikkhongchari-01). Before received the nets, harvesting group members (Male-9, Female-8) received a day long training on harvesting net operations, maintenance, post-harvest technology and business expansion technique. By that farmers get harvesting services from the harvester at low cost.

Market linkage Program: To build up the linkage and bonding with different aquaculture market actors day long "Market linkage event with different aquaculture market actors" have been organized at Alikadam, Lama, Naikhongchari upazila in Bandarban by Tahzingdong, WorldFish representatives, Tahzingdong management, respective project staff and deferent types of aquaculture market actors participated in that programs such as Fish feed seller, technical service provider, Fish seller, Arodder, Fish harvester, Fish farmer group leader, Nursery farmer, hatchery owner and fisheries officer of respective upazila. By that events market actors exchanged their business card and contact numbers. Relationship between actors and farmers will be stronger than before.

Quality brood management and spawn production: By this project Tahzingdong provided 300 kg quality carp brood fish to Maa Mathsha Hatchery & Nursery (MMHN) and technical services. Besides this support also provided Aquaculture inputs such as feed for brood nursing, Air blower, Oxygen tower, Pituitary Gland (PG) and other chemical, weight scale machine, Sun protecting net etc. MMHN staff received BMP training for hatchery management and PG collection training. By this intervention MMHN introduced G-3 Rui production in Bandarban and sallied 32 kg spawn in project period.

4.4 Impact and Sustainability of the Intervention

4.4.1 Impact of the Intervention Model: After successfully completion farmers training and follow-up support by field staff a remarkable impact has seen in project area like farmer now can smartly told the basic technology of aquaculture and start practicing in their pond. They are communicating with nurserer for fingerling. Collect mobile number of other aquaculture service providers. They are searching leaflet on technical aspect of aquaculture. Searching harvesting and marketing to sale their product etc. Through Farmers Field Day secondary farmer known about the success of the aquaculture intervention which create opportunity to adopt same technology to their pond in near future. This project provided training on carp mola polyculture, dike cropping/home stead gardening, hygiene and basic nutrition. The farmers have been given training on vegetable production on pond dikes/homesteads where they have learned methods of pre preparation for seed sowing, fertilization, irrigation, biological control of pests and insects, artificial pollination, harvesting, cooking process, marketing, etc. The farmers have showed these seeds on their pond dikes and homestead and are taking care of the seedlings. They are now choosing right foods that are affordable to them considering nutrition. They are also using soap for handwashing as a basic practice to ensure hygiene among the household members. During field visit we observed that farmers started utilizing their gained knowledge and brought change in their total farming behavior in pond preparation, fertilization, feeding regime, dike cropping especially artificial pollination etc. As a result of practicing improved methods of aquaculture and vegetable cultivation, farmers have got higher production compared to the past. MMHN applied Best Management Practices (BMP) in Hatchery and collecting PG from fish after trained.

4.4.2 Sustainability of the Intervention Model: Sustainability of Intervention model focuses on training, courtyard meeting, established market linkage, networking meeting with Govt. officials the needs of the present without compromising the ability of future generations to meet their needs.

Through implementing the project TAHZINGDONG developed a remarkable number of skilled human resources which would help to run the project demonstration as well as field level marketing channel in sustainable manner. Besides that, TAHZINGDONG build a win win network with quality fish seeds sources throughout the country. After completion of the project the activity is running in the community level people. Introduced Mola brood and OSP vine & aware mass community people about nutrition through courtyard meeting which boost up nutrition status at household level especially children or adolescents as well as aware about health hygiene issues. Now, they use tippy tap for their cleanliness and also motivated other of the community to use tippy tap. At present, household level farmers apply modern fish culture technology to increase their production. Farmers now sowing vegetables and do artificial propagation for more vegetable production which are great indicators for future sustainability.

4.5 Recommendations / Future Directions

- Have to work more on aquaculture technical support for farmers
- Need to developed available market actors on aquaculture
- Need to utilize water resource and reach more farmers in these Upazila
- Should be more focus on technical and business training through inclusive market approach to the farmers of the community.
- Need to increase community-based approaches with co-management systems.
- Need to introduce climate adapted service in Fisheries sector.
- Should be facilitated to BMP and establish ideal fish hatchery to get quality fish seeds especially carp fishes
- Need to build a strong linkage and make easily accessible common online market platform.
- Should be introducing native fisheries culture such as eel culture, pearl culture in community level.
- Need to providing more finance becomes a farmer to successful entrepreneur as well as women entrepreneurship.
- Have to establish One Stop Service Center (OSSC)
- Need to linkage to access to fish feed availability in the ZOR area for commercialization of aquaculture
- Need to establish Community Feed Center (CFC)
- Need to more focus on gender-based training at root level of the community.

5.0 Project Budget and Financial Management

Budget:	Investment Ratio				
Activity Cost	% of WorldFish	% of Grantee	Total	FtF BAA	Grantee
Amount in BDT	89%	11%	9,984,622	8,926,289	1,058,333
Amount in USD	89%	11%	99,891	88,722	11,169

Tahzingdong Project management budgeting the action of determining the total funds that are allocated for a specific project. The budget is usually estimated by the project coordinator along with the project management team and consists of all the projected costs for the implemented project.

Financial Management performed as per financial guideline of Tahzingdong. Finance Officer was assigned to keep all fincial documents and Finance Manager oversee the financial parts. As it is fixed grant, all milestone deliverables are strictly checked by finance team.

6.0 Annexure

Annex 6.1: Impact of the intervention on core business

Carp seeds are produced by Maa Mathsha Hatchery and Nursery (MMHN) and the sell data are given below-

Quarter	Time line	Customer reached	Sell data (kg)				Amount (BDT)
			Spawn	Dhani	Fingerling	Large	
1st	April to June, 2022	300	0	40	320	200	3,50,000
2nd	July to September, 2022	300	0	45	430	120	3,65,000
3rd	October to December, 2022	200	0	40	400	80	2,80,000
4th	January to March, 2023	100	17	60	300	100	3,10,000
5th	April to June, 2023	650	40	70	535	130	6,20,000
6th	July to August, 2023	220	15	40	225	156	2,10,000
	Total=	**1770**	**72**	**295**	**2210**	**786**	**21,35,000**

Maa Matsha Hatchery and Nursery (MMHN) Brood stock data:

Sl	Brood Species Name	Amount (Kg)	Male (Pcs)	Female (Pcs)	Total (Pcs)	Total BDT	
						WF	TZD
1	Common Carp	100	50	35	85	108000	0
2	Catla	55	25	15	40		
3	Mrigel	60	25	21	46	0	72000
4	Grass Carp	75	30	25	55		

5	Shor Puti	10	14	11	25		
Total=		**300 kg**	**144**	**107**	**251**	**108000**	**72000**

Harvesting group service data:

Sl	Group Name	Group Member	Services area	Total farmer serviced	Total catch fish (kg)	Total earned (BDT)	Deposit amount (BDT)
1	Alikadam Jele Dol	5	Alikadam	55	5025	40000	5500
2	Saroi Jele Dol	4	Lama	19	2220	13300	1900
3	Aziz Nagor Jele Dol	4	Lama	15	1430	10700	1500
4	Naikhongchari Jele Dol	4	Naikhongchari	38	4880	30250	3800
Total=		**17**		**127**	**13555**	**94250**	**12700**

6.2 Annex 2: Case Story-1

A story of women fish harvesting group development in Telunia village of Lama upazila

STANDARD UPDATE: About 50 fish farmers of Marma and Bengali community in Telunia village and nearby area of Lama upazila are facing problems of poor access to aquaculture inputs and absence of fish harvesting facilities as major constraints for aquaculture in this area. It hinders maximization of productivity from ponds through partial harvesting on time results less profit for farmers and lower consumption of fish by farmers.

To address this issue, Feed the Future Bangladesh Aquaculture and Nutrition Activity supported Tahzingdong, a local development organization of Bandarban, to find out the solution of developing an aquaculture market actor particularly a fish harvesting group in the community. As part of the initiative, on December 27, 2022, Tahzingdong provided a fish harvesting seine net to 4 women of Telunia para of Lama upazila and capacitated them on harvesting technique, post-harvest handling and marketing of fish. Tahzingdong also guided them on net maintenance, increased their communication skills with customers and record keeping, etc.

As a result of this initiative, women led harvesting group has started to catch fish in this area along with their husbands as an alternative livelihood option. They earned 4000 BDT (39 USD) in January 2023 with 3 successful attempts. Besides, they saved 10% from their income to their savings fund for maintenance and buying a new harvesting net in future. The women members of this group are day laborer though they do not get job most of the times of the year and struggling to survive. On the very first of this initiative, some people laughed at them assuming that it would

be impossible to do such kind of tiresome non-traditional job by women. But these courageous women made it possible and created a positive view in their society. The initial result has made the women enthusiastic and people from this village are happy as they got a new harvesting group near to their hand with comparatively low cost. The group is expecting more income from fish harvesting profession with the increase of fish culture in near future.

QUOTES FROM BENEFICIARIES: Mairong Marma, Leader of harvesting group says, "We are grateful to Tahzingdong and WorldFish as they showed us the alternative livelihood option by providing net and training. Hopefully, we will get higher income in near future and will be able to educate our children and feed them nutritious food".

Photo-1: Harvesting net handover to Telunia women fish harvesting group

Photo-2: Telunia women fish harvesting group is catching fish from a pond.

6.3 Annex 3: Case Story-2

Oxygen Tower in MMHN- a regeneration of dreams

STANDARD UPDATE: Beginning of Maa Mothsha Hatchery and Nursery (MMHN) is an emerging initiative for supplying of quality fish seeds near to the fisheries actors of Bandarban hill district. However, the hatchery experienced high mortality and low hatching rates of spawns due to lower oxygen levels in the water. This led to significant losses in revenue and threatened the sustainability of the hatchery.

To address this issue, Feed the Future Bangladesh Aquaculture and Nutrition Activity (BANA) supported Tahzingdong, a local NGO of Bandarban, established an oxygen tower top of the overhead water tank of the hatchery complex. Setting up of oxygen tower was a game changer, which solved many problems alone.

As a result of this effective initiative, the waters are now adequately aerated and providing sufficient oxygen to the spawns. MMHN experienced a remarkable improvement in its hatching rates (95%) as well as significant reduction in spawn mortality rates. The production of healthier, first swimmers' spawns have flowered laughing face of the hatchery owner.

QUOTES FROM BENEFICIARIES: Md. Elias khan, owner of MMHN said, "I am grateful to WorldFish and Tahzingdong for providing a significant solution through a magical oxygen tower. It brings rebirth of my dreams".

Photo-1: Oxygen tower in the overhead water tank of MMHN

Photo-2: Proprietor of MMHN, in front of the Oxygen tower

Conclusion: Bandarban Hill District has become known as a significant district in terms of natural beauty. Comparing to the other two districts in the CHT. Among the Selling fish at local market Vegetable cultivating on dykes of creek beside aquaculture various similarities and differences, there are many similarities between the ethnics here; and that is to eliminate the lack of nutrition by collecting fish, crabs, snails and other fish related food from rivers and streams. If we analyze properly, it will be seen that the amount of fish food that indigenous men and women derive from rivers, ponds and streams is not able to fully meet their nutritional deficiencies. On the other hand, all these ethnic groups, who believe in traditional rules and regulations, have never thought of fish farming by building creeks or ponds in streams.

Tahzingdong has implemented AMCD project in Lama, Alikadam and Naikhongchari Upazila to ensure that the people of the areas are involved in fish farming for financial profit as well as to ensure nutrition to the families of poor fish farmers. Positive steps have been taken to identify and overcome the weaknesses of fish farming in this area. Tahzingdong has coordinated with government fisheries officials to facilitate fish farming and fish farmers in this area face problems in selling the fish they produce. Tahzingdong has established business relationships with all market actors, including local wholesale fish retailers, fish fry producers and sellers, fish feed sellers, fish and fish fry transporters, fish collectors and medicine sellers established market linkages to ensure that fish farmers benefit financially from fish farming. As a result of introducing the mixed technology or poly culture of fish farming among the farmers, new technological transformation

of fish farming of different species in the same ponds or creeks has started to be implemented. In addition to this, fish farmers have started to fish farming their own ponds or creeks by adopting on the mixed technology of farming fast growing fish like Mola-Carp fish. Farmers have gained knowledge through training, new ideas in fish farming have been able to dream of bringing family prosperity to the fish farmers of Bandarban District. And here is the success of the AMCD project.

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Date: 31 August, 2023