

Project Completion Report

Strengthening tilapia seed market systems and promotion of better production technologies among farmers in Bandarban and Cox's Bazar districts



Submitted to



Bangladesh Aquaculture and Nutrition Activities (BANA)
World Fish, House 2/B, Road, Banani, Dhaka, Bangladesh

Submitted by

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1. List of Abbreviation

FtF	Feed the Future
BANA	Bangladesh Aquaculture & Nutrition Activity
CDA	Chittagong Development Authority
CMAIL	Cgittagong Meridian Agro Industries Limited
FCR	Food conversion Ratio
GAP	Good aquaculture practice
BMP	Best Management practice
FFD	Farmer's Field Day
FMCG	Fast-Moving Consumer Goods
BFRI	Bangladesh Fisheries Research Institute
GIFT	Genetically Improved farmed tilapia
DAP	Detail activity plan
TFO	Technical Field Organiger
HoA	Head of Aqua
I.C	Intervention Coordinator
AIN	Aquaculture Income & Nutrition
ZOR	Zone of Resilience
CVASU	Chittagong Vetenary and Science University
CU	Chittagong University
DU	Dhaka University
DoF	Department of Fiskeries
dec	Decimal
Kg	Kilogram
Pic	Pices
MSC	Merdian Service Center
R&D	Research and Development

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2. Executive Summary:

This is the annual Progress Report of the Chittagong Meridian Agro Industries limited (CMAIL) for the project named “Strengthening tilapia seed market systems and promotion of better production technologies among farmers in Bandarban and Cox’s Bazar districts” implementing the period June 2019 to March 2020 (10 month). This is a cost sharing project funded by Feed the Future Bangladesh Aquaculture and Nutrition activity of-World Fish and CMAIL. The total cost of the project was 109,917,25.00 BDT where FtF-BANA contribution was 66.09% and CMAIL 33.91%

Considering the present challenges of tilapia seed production & marketing process as well as projection of future threat CMAIL implemented the project which aims to strengthen tilapia seed market systems and promotion of better production technologies among farmers in Bandarban and Cox’s Bazar districts. The objective to adopt the advanced sustainable low-cost technology for farmers, establishment of Tilapia brood stock and ensuring Bio-security of Tilapia hatchery, improve best management practices (BMP) in the hatchery, capacity building on tilapia brood development and management, capacity building of farmers through training and extension of farming among coastal and mainland farmers through different promotional activities, supply quality fish seed, provide training and adequate knowledge on advanced techniques of fish farming. Also improve post-harvest management and diversify the current procurement channel for fish. Invention adaptability to process fish product in locally cultured fishes.

During this implementation period, a remarkable numbers of development and renovation works done in Chittagong Meridian hatchery complex at Mirashari under best management practices which helps to produce better quality seeds by addressing brood management and bio-security measure.

To strengthening the capacity of implementing staffs and farmers, the project conducted different training session during this period. Fifteen hatchery staffs, 09 project staffs, 14 seed agents, 18 lead farmers, 36 demo and 2228 small scale pond farmers directly benefited through receiving training and follow-up supports by different project interventions where 1995 male and 231 female participants participated in capacity building events and it was assuming that about 10000 farmers were indirectly benefited by observing demonstration performance, reading technical leaflets and exchange views with seed agents and lead farmers.

15 hatchery staffs received 02 days long training session on a) commercial seed production b) brood development and management, 14 seed agents and 10 lead farmers jointly received 01 day long technical training session on Tilapia nursery and grow-out management, 880 small scale pond farmers received 36 (day long) pond side training session of Tilapia nursery and grow-out management, 1254 no of commercial pond farmer received 18 training events (2-3 hour) on “Awareness training on commercial Tilapia culture technique”, 1273 no community farmer attained “Farmer Field day (FFD)” in 18 FFD events, 36 demonstrations were established in 09 Upazila under Cox’s Bazar and Bandarban districts which will help other indirect farmers to know about the technology of Tilapia culture management. Above these activities, 10 million of tilapia seed demand have already been created and verbal orders are placed to seed agents and hopefully coming year the fish production in this area would be increase remarkably than the last year.

With in this 10 month piloting project CMAIL gained a no lessons like appropriate target group selection, use of learning materials, maintaining Bio-security, cost effective year round production system, involvement of women & youth in main stream of production cycle etc those would help the organization to run any other interventions in coming days. Besides the lessons CMAIL also analyzed the gaps and laps both organizational and program operation systems like financial management, reporting, monitoring, staffing, record keeping etc

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3. Project Background

Meridian Group was established in 1992 and has over 1,800 employees to serve the nation, offering better quality products and services. The conglomerate consists of Meridian Foods Ltd, Meridian Agro Industries Ltd. (Agro & Fisheries), Meridian Hospitality etc. Among these concerns, Meridian Foods Ltd. is well known National Fast-Moving Consumer Goods (FMCG) brand having nationwide distributors which is producing high quality consumer products including snacks, culinary and confectionary products with nationwide distribution channel. Meridian Agro limited a sister organization of Maeidian group involved fish culture project and indian major carp and tilapia hatchery in Mirsarai under Chittagong division. To maintaed brood stock imported the best quality brood fry from Thailand, Phillipine and Vietnam. Also collected brood from Bangladesh Fisheries Research Institute (BFRI). We produce and supply high quality sex reversal (mono sex) Tilapia fry & induced breeding of different types of cat fishes, anabas and carp fishes which are sold out through 200 dealers and around 300 smallholder and lead farmers directly from our hatchery to Chittagong, Dhaka, Khulna, Barisal and Sylhet divisions. To transfer the technology and ensure bio-security, we organize training program for the fish farmer and provide the technical support to our stakeholders during the culture period for better yield.

As a business organization and sustainably of the business CMAIL faced lot of challenges in production as well as market system management and development of new market channel. Access to technologies, quality fish seed and feed, poor fish seed trading network and quality fish market system. There is also challenges of lack of proper knowledge of fish growing and management practices, post-harvest losses, low price in wholesale market, lack of marketing channel, climate change issues, bad transportation system during pre and post-operation activities.

Considering above challenges Chittagong Meridian Agro Industries limited proposed the assaigned project which aims to strengthening tilapia seed market systems and promotion of better production technologies among farmers in Bandarban and Cox's Bazar districts. This project addressed the advanced sustainable low-cost technology for farmers, establishment of Tilapia brood stock and ensuring Bio-security of Tilapia hatchery, improve best management practices (BMP) in the hatchery, capacity building on tilapia brood development and management, capacity building of farmers through training and extension of farming among coastal and mainland farmers through different promotional activities, supply quality fish seed, provide training and adequate knowledge on advanced techniques of fish farming. Also improve post-harvest management and diversify the current procurement channel for fish. This business model will help to ensure the nutritional facts like protein and essential amino acid to the targeted beneficiaries. We would disseminate our knowledge and provide our high-quality seeds at community level. These will increase the productivity of the farmers minimizing their production cost as well.

Our proposed concept will address the problem of quality seed supply, quality and low-cost natural feed, transportation difficulties including bringing relevant stakeholders involved in the market system to jointly identify the key market constraints and ways to improve the system. To strengthen our business relation with the clients (i.e. farmers) we will specifically target to reduce the gap by supplying quality seed, good fish feed source, modern culture technique, knowledge on optimum feed conversion ratio management, monitoring service and technical information. We will propose targeted training and promotional activities with the help of trader associations and farmer groups to raise awareness for improved aquaculture production. We are confident that our previous experience in market system development will help to implement this project.

In addition, as a hatchery owner and fish fry distributor, Meridian is committed to help their valued fish farmer by providing technical service for aquaculture production

4. Goal & objective of the proposed business:

The goal of this project is to increase the growth of tilapia fry and fish production with low cost and achieve maximum sales revenue through exclusive wholesales services by incorporating local women, youth and ethnic community. Advance technology and training disseminating and Capacity building of every stakeholders including for hatchery staffs, technicians, owners, rural farmers (women and youth) and distribution networks. Establishment of demo ponds for Periphyton based aquaculture system and to scope to process fish product development.

4.1 The objectives of the project are

- To Increase annual production both hatchery and farms by adapting modern technology
- Establishment of Tilapia brood stock and ensuring Bio-security of Tilapia hatchery area
- Improve best management practices (BMP) and Good Aquaculture Practice (GAP)
- Capacity building for hatchery staffs, technicians, owners, agents, sub-agents, lead farmers and distribution networks
- Capacity building of farmers through training and extension of farming among coastal and mainland farmers through different promotional activities
- Demonstration ponds (Input-seed/feed) setting within the smallholders' farmers by illustrating periphyton based, periphyton cum artificial feed and fully commercial feeding aquaculture
- Initiative for promotional activities that our product is medicine free, affordable by advertise in mass media
- Consultant deployment for scoping of process fish product development and marketing complying with the rules & regulations
- Easy excess of produced fish to exclusive wholesales or outlets to ensure better price

The Expected outcome of the proposed business

- Increase fish fry production and sale
- Tilapia production will be increased with low cost at the farmers level
- Post-harvest loss reduces
- Reduce transportation mortality
- Ensure buyback through exclusive wholesales markets
- Adopt Best Management Practice (BMP) and Good Aquaculture Practice (GAP)
- Diversified food consumption will be increased orienting with organic/semi-organic fishes
- Creation of new skill and employment especially for the youth and women.
- Increased formal partnership with stakeholders and fish farmers for fair pricing and market inclusiveness by end of project.
- Find out the scopes to process fish product development and marketing

4.2 Relationships:

Meridian will provide the low-price fish seed and advanced technology to improve the productivity with standard FCR. Farmers will adopt this technology and culture the fishes to get the maximum financial benefits. Meridian collect and sales most of the fishes to their exclusive outlets cum wholesales market where traders & others buyers have the provision purchase the fresh fish. Meridian has the facilities of wholesales in three areas like Lama, Chokaria and Pekua upazilla. They directly collect the fish from farmer and sales to the traders or consumers level. The retailers and consumers will purchase the BMP & GAP based fishes with standard prices which will ensure their nutrition value.

4.3 Geographic Coverage:

The proposed project will cover three upazilas under Bandarban and six upazilas under Cox'sbazar districts. [Bandarban Sadar upazila, Ali Kadam and Lama](#) will be under cluster -01 (Bandarban cluster). [Chakaria, Pekua, Cox's Bazar Sadar, Ramu, Teknaf and Ukhia](#) upazila will be under cluster -02 ([Cox's Bazar cluster](#)).

4.4 Target Group:

Meridian will work with 10 lead farmers, 900 rural farmers through our 18 seed agents. All level farmers will be direct beneficiaries and we will give preference the youth and women smallholders farmers. It is expected that around 12000 more farmers are involved in farming will be indirect beneficiary through our workshop, demo pond presentation, farmers day, training, awareness program, campaign and various promotional activities etc. The numerous consumers will be benefitted by getting BMP & GAP produced fishes from the local market.

4.5 Budget Summary

SUMMARY BUDGET				Currency conversion rate: USD 1 = BDT 83.48			
Ref. source: WF Exchange rate on Ist Half March,2019							
#	Category	FtF BANA Contribution in BDT	Grantee Contribution in BDT	Total Budget in BDT	FtF BANA Contribution in USD	Grantee Contribution in USD	Total Budget in USD
1	Direct Labor (Personnel)	3,500,000	2,325,000	5,825,000	41,926	27,851	69,777
2	Supplies, Equipments/Assets and Operating Expenses	150,000	59,000	209,000	1,797	707	2,504
3	Travel and Perdiem	408,000	55,200	463,200	4,887	661	5,549
4	Other Direct Cost (Rent, Communication)	43,200	51,300	94,500	517	615	1,132
5	Activity/Program Costs - Services, training, workshops, products	3,250,500	1,295,150	4,545,650	38,937	15,514	54,452
	TOTAL	7,351,700	3,785,650	11,137,350	88,065	45,348	133,413
	Percentage (%)	66.01	33.99				

4.6 : Sub-grantee's Field Implementation team:

Chairman (Part time, 05%):

This position will be the guiding and main contact person who will overall lead the activity on behalf of implementing partner.

Director (Part time, 10%):

This position will be the guiding and main contact person who will overall lead the activity on behalf of implementing partner. Person of this position will participate in setting activity strategy and sometime meet the consultants, technical staffs,

Head of Operation-Aqua (05%):

This position will perform as an ‘Activity Manager’ who will design and implementing the business idea, responsible for whole planning budgeting and execution process. He will participate in setting activity strategy, fostering effective teamwork, and implementing facilitative activities that generate more inclusive growth in selected market systems within their area. He will assist the consultant according to assigning activity.

Manager-Accounts & Finance (Part time, 05%):

This position will lead and oversee the financial transaction of project planned activities according to the budgeted line item.

Intervention coordinator (Full Time, 100%):

This position will coordinate and manage the implementation of whole business idea. He is responsible for execution process according to the plan & budget. He will be guided by the Hatchery Manager contribute in setting activity strategy, fostering effective teamwork, and implementing facilitative activities that generate more inclusive growth in selected market systems within their area. He will lead the field team as planned for farmers, sales agent and others stakeholders.

Associate intervention coordinator (Part time, 20%):

This position will assist the hatchery team by dealing customers, maintaining sales register, keeping the sales related information with all invoice/bills/challans/receipt as needful

Technical cum Field Organizer (Part time, 50%)

This position will be based at Upazilla level and supervised by intervention coordinator. He closely worked CMAI seed agent. He assist the seed agent to selecting fish farmer, organizing training, distribution of seed support among fish farmers, engaging relevant stakeholder in different activities.

Finance and Admin officer (Full Time, 100%):

This position will be mostly office based and be supervised by Intervention Coordinator. Manager-Accounts & Finance will be the technical supervisor of this position. S/he will assist in documenting the financial transaction, process the procurement and maintaining supporting documents of project planned activities according to the budgeted line item. S/he will assist to prepare the monthly/quarterly reports for donor and support team during input distribution.

5. Project Implementation

5.1 A brief about the business model/activity model/ intervention model

Our proposed concept will address the problem of quality seed supply, quality and low-cost natural feed, transportation difficulties including bringing relevant stakeholders involved in the market system to jointly identify the key market constraints and ways to improve the system. To strengthen our business relation with the clients (i.e. farmers) we will specifically target to reduce the gap by supplying quality seed, good fish feed source, modern culture technique, knowledge on optimum feed conversion ratio management, monitoring service and technical information. We will propose targeted training and promotional activities with the help of trader associations and farmer groups to raise awareness for improved aquaculture production. We are confident that our previous experience in market system development will help to implement this project.

In addition, as a hatchery owner and fish fry distributor, Meridian is committed to help their valued fish farmer by providing technical service for aquaculture production as below focused;

- Building capacity of hatchery staffs, small and lead farmers to adapt modern technology of aquaculture
- Support to renovate existing hatcheries, aiming to purify water and improve cost benefit ratio for accessible and affordable fry and fingerlings production and supply for the fish farmers and small holder pond owners to boost up quality fish production and supply;
- Strengthen and establish improved fingerling production system and fingerling trading network through capacity building of stakeholders in the process of fry and fingerling production, nursing, trading, processing and marketing;
- 36 Demonstration ponds (Input-seed/feed) setting within the smallholders' farmers by illustrating periphyton based, periphyton cum artificial feed and fully commercial feeding aquaculture
- Deploying consultant for farmers training and scoping to process fish product development

Proposed business idea/model:

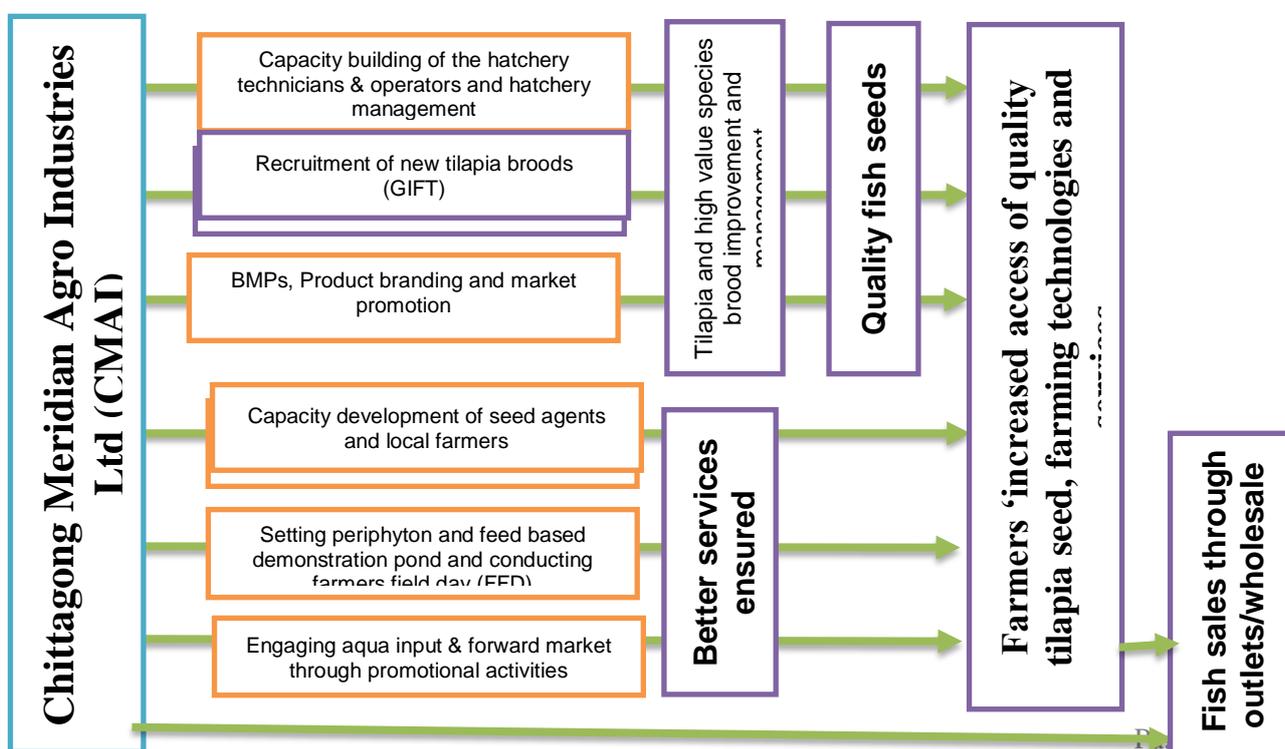


Figure: Proposed Business Model of Chittagong Meridian Agro Industries Ltd (CMAI)

5.2 Approved Gantt chart for the intervention

Sl. No.	Activities	Time line (Jun 19- Feb 20)									
		Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan 20	Feb-20	Mar-20
1.1	Program Orientation										
1.2	Project coordination meeting (bi-monthly meeting)										
1.3	Consultant hiring for conducting staff training										
1.4	Consultant hiring for scoping of process fish product development and marketing										
2	Establishment of good quality brood stock and its management										
3.1	2days long training on commercial seed production:										
3.1.	2 days long training on carp brood development and management										
3.2	Capacity building for seed agents and lead farmers										
3.3	Capacity building of tilapia farmers										
3.4	Farmer's awareness training on Tilapia grow-out and post harvesting management										
4	Setting demonstration within the smallholder farmers' pond										
5	Farmers Field day celebration										
6	Improve the Best Management Practices (BMP) in the hatchery										
7	Designing, printing and distribution of communication materials										

5.3 List of activities conducted

SI	Activity	Planned	Achieved	Remarks
1	Program Orientation meeting	01	01	
2	Project Co-ordination meeting (Bi-monthly)	03	03	
3	Capacity building of hatchery staffs and technicians	02 batch	02	
4	Training of Seed agents and lead farmers	02 batches	01 batches	
5	Establishment of emonstartion	36	26	
6	Farmer training on Tilapia nursery and grow-out management system	36	36	
7	Farmer awareness training on tilapia grow-out and post hrvest technology	18	18	
8	Farmer's Field day (FFD)	18	18	
9	Consultant hiring for conducting staff training	01	01	
10	Consultant hiring for scoping of process fish product development & marketing	01	01	
11	Improve BMP in Hatchery			
12	Desiging, Printing & distribution of communication materials			

5.4 Activity wise implementation details with pictures (small pictures alongside the right margin of the documents)

5.4.1 : Program Orientation Meeting:

To discuss and sharing the detail activity of CMAIL- FTF BANA project a day long orientation meeting was held on 12th September'19 in the conference room of hotel Meridian. Honourable Chairman of Meridian group, ZOR coordinator, Gender & Youth specialist, Market Development Specialist of WorldFish BANA project, HoA IC and all field level staffs (TFOs) of the project was present in the meeting. The goal & objective, Detail information of project, detail activity plan (DAP), Budget, Achievement till to date, Cross cutting issues, Demo pond preparation and next month plan was discussed in the meeting, ZOR coordinator, Gender Specialist, Intervention coordinator and HoA presented and discussed the topics in the meeting



FIGURE 1-PROGRAM ORIENTATION MEETING

Date	Venue	No of participants		
		Male	Female	Total
12-9-2019	Meridian Hotel	22	3	25

5.4.2 :Project Coordination meeting (Bi-monthly)

Project coordination meeting played an important role to know the progress of activities, challenges and lesson learnt to run the project, work delegation, future plan to achieve the deliverables within budget and time frame. Considering these and according to plan, 03 project coordination meetings held during this project period. The main agenda was discussed-Plan activities vs Progress , challenges, lesson learnt, next month plan of activities, accounts and budget issues and support and follow-up strategies for smooth implementation of interventions, etc.



FIGURE 2 PROJECT COORDINATION MEETING-02-02-2020

Date	Venue	No of participants		
		Male	Female	Total
07-08-2019	Meridian corporate office conference room	20	2	22
31-10-2019	II	20	2	22
02-02-2020	II	20	2	22

5.4.3 :Capacity building of the hatchery technicians/operators on commercial seed production:

A two day-long training was conducted on 7-8 August 2019 on “Commercial seed production of Tilapia” at Meridian tilapia hatchery complex in Mirashari. The training session facilitated by Mr. Dr. Sk. Ahmad-Al-Nahid and 15 technicians of Meridian hatchery were present in the training sessions. Both the theoretical discussion & practical demonstration were included in the training sessions. The main discussing point of the training were Significance of Brood stock management, selection of brood, cull and save, family selection, breeding characteristics, Male & female identification, sex identification, Brood management, Pond preparation, hapa setting, Conditioning of breeders, feeding schedule, disease control and treatment, etc.



FIGURE 3-HATCHERY STAFF TRAINING 1ST BATCH

5.4.4 :Capacity building on tilapia brood development and management:

In coordination with Mr. Showkat Ali, Tilapia Breeding Specialist (WorldFish) & Dr. SK Al Nahid, Professor CVASU a two day-long (1-2 September'19) training was conducted in Meridian hatchery complex. A total of 15 participants from Meridian hatchery participated in the training sessions.

The contents of training session were as follows:

Historical background of Tilapia, Life cycle, feeding biology, sex identification, advantages of tilapia culture, site selection, different parts of a hatchery, water management, pond management, brood collection and rearing, setting breeding hapa, feeding of broods, collection of eggs, separation of egg, stages of eggs, hatching of eggs in jar, preparation of hormone mixed feed and stock solution, Mixing of hormone in feed, 1st feeding in Tanks, Nursery hapa management, feeding of fries in nursery hapa, Sex identification process of tilapia fry, Fry conditioning before sell, counting, packing & transportation, etc.



FIGURE 4-HATCHERY STAFF TRAINING 2ND BATCH

4.4.5 :Capacity building of seed agents and lead farmers:

On 12-11-2019, CMAIL conducted a day long Capacity building training for Seed agents and lead farmers at Ruposhi Bangla restaurant at Chokoria, Cox's bazar. Total 30 participants attained the training session. Fourteen seed selected agents and 10 lead farmers shared their problems, ideas and future plan to support each other business activities as well as farmer's interest to make their business sustainable. Md. Abdul Baten bhuyan, Aquaculture Specialist of WorldFish facilitated the technical session on feed management in pond aquaculture. Mr. Hasan-Uz-Zaman discussed the future plan on CMAIL fry marketing and distribution plan. All participants requested to ensure quality and back up supports after marketing seed to the farmers. The Senior Upazila Fisheries Officer, Mr. Aminul Islam and Field Assistant were participated in the training session and facilitated the technical session and discussed field issue raised by agents.



FIGURE 5 SEED AGENT & LEAD FARMER TRAINING

5.4.6 :Establishment of demonstration within the smallholder farmer's pond:

As a part of technology result demonstration and practical hands-on of learning as well as covering indirect beneficiaries, 36 demonstration ponds were established in 36 farmer groups under 09 Upazilas of Cox's bazar and Bandarban districts. Three types of stocking & feeding management introduced in 36 demo ponds. 12 ponds were introducing commercial feeding, 12 ponds commercial feeds plus periphyton, and 12 ponds used only periphyton. Meridian hatchery supplied all the seeds from their own cost to demo ponds and farmers were providing feed and fertilizer as per recommendation by technical team.



FIGURE 6 DEMO POND WITH SIGN BOARD

At a glance of CMAIL Demo information

Sl	Activities	Description
1	Location selection	02 districts and 09 Upazilas and 36 Unions
2	Selection of Demo ponds	36 demo ponds selected
3	Total area	867 decimal (Ranges from 15-30 dec)
4	No of Fry stocked	125000 no.s
5	Weight of fry	4-5 gm
6	Cost of fry	03 Tk/pcs
7	Stocking date	26-09-2019
8	Stocking number/decimal	140-150/ dec
9	Feeding	Pheriphyton, Homemade and commercial feed
10	Fry cost	356400/=
11	Transportation cost	57600/=
12	Expected return (Kg)	16 ton (Survival 112000pcs *150 gm/1000=kg/1000)
13	Expected return in BDT	16 lac (@ 100/kg)
14	No of farmer involved with this technology in next year	180 farmer and approximately 50 lac seed market would be developed in these areas.



FIGURE 8-SEED DISTRIBUTION TO DEMO FARMER



FIGURE 7-OBSERVING GROWTH OF TILAPIA IN DEMO

5.4.7 : Capacity building of farmers:

Farmer capacity building was one of the important events of this project. A day long (4-5 hour) training had been design with the help of existing AIN Farmer Tilapia training guide. The objective of farmer training was to change farmer knowledge, skill and attitude to cultivate tilapia in commercial manner their small scale pond as well as involve woman and youth to create opportunities for future business intervention. The session was organized jointly by seed agent & lead farmers which would create a good relation with farmers and service providers. Due to lack of confidence of agents to facilitate, the session mainly facilitated by TFO of CMAIL. The session was divided into two part, 1st part discussed theoretical discussion and 2nd part practical demonstrations. All the farmers were enjoying the practical sessions.



FIGURE 9-FARMER TRAINING AT SHEELKHALI, PEKUA

The main contents of the session were as:

- a. Introduction Projects-Name, duration, working area, target group, goal and objectives of project and supporting agencies (Donor, technical partner and implantation partners) and their role and responsibilities
- b. Sharing ideas of Business and impotence of business plan, Basic Contents of business plan
- c. Technical discussion (Participatory)
- d. Nursery management (Pond preparation, stocking management, feeding rationing)
- e. Grow out pond management (Pond preparation, predator control, liming, fertilizer, natural food test,)

- Stocking management: Number of fry stocking, size, contact to agent, acclimatization and adaptation
- Post stocking: Feeding rationing, health check, sampling
- Harvesting & Marketing: Importance of harvesting and partial harvesting and marketing system and techniques of marketing

f. Practical session:

Types of lime, lime application, Types of fertilizer and application process, testing of natural food, identification of good and bad quality seed, Different types of feed and application



FIGURE 10 FRAMER TRAINING AT RAMU

Summary of Farmer Training event

SL	Total events & participant	Male	Female	% of Female
1	36 events (880 participants)	755	125	15

5.4.8 :Farmers Awareness training tilapia grow-out & post harvest management :

According to approved budget and activity plan CMAIL implemented the maximum activities in time lime but due to late stocking of seed in demo pond, winter have hampered the growth of fry in demonstration ponds. So Farmer Field Day (FFD) not perform as per activity plan. To conduct FFD and result demonstration to neighbouring farmers CMAI applied for one month no cost extension.

In approved proposal under one month no cost extension, CMAIL also proposed to reach more farmer to aware about the basic technology of tilapia culture techniques. CMAIL proposed 18 batches (18*80) of farmer training in this proposal. During this reporting period, CMAIL conducted 18 batches of farmer awareness trainings (2-3 hour) on Tilapia culture under 09 Upazilas of Bandarban & Cox’s Bazar districts with support of seed agents and lead farmers. The event started at 3.00 pm and closed at 5.30 pm. Only snakes of BDT 50) was provided to all participants. The key discussion points were-briefing on project, donor and partners, Importance of inputs in aquaculture, Quality of inputs, technical aspects of nursery and grow



FIGURE 11 FRAMER AWARENESS TRAINING AT LAMA



FIGURE 12 FARMER AWARENESS TRAINING AT ILISHIA, CHOKORIA

out tilapia culture management (Importance nursery, pond preparation, water management, stocking density, liming, fertilizing, sampling, testing natural food organisms in pond water and post-harvest techniques and open discussion.

Summary of Farmer Awareness Training

Sl	Total events & no of participant	Male	Female	% of Female
1	18 events (1254 participants)	1153	101	8

5.4.9 :Farmer’s Field Day (FFD) celebration:

Framer Field Day (FFD) was one of the vital events to expose the results of demonstration ponds to other neighbouring farmers observing nearby demo pond. CMAIL established 36 demonstration ponds in different areas of Cox’s Bazar and Bandarban districts. As per approved budget, CMAIL conducted 18 farmer field days (FFDs) near demo ponds. In this events, demo farmers shared their experiences during project intervention and presented their production status, survival rate, costs and profits in front other farmers. It was 2-3 hours’ program. Seed agents and lead farmers assisted demo farmers to take preparation for this event. After hearing from demo farmers and other farmers finally CMAIL personnel motivated farmer to culture tilapia in their ponds from next season. In this circumstances, the seed agents discussed about the quality inputs and marketing issues among farmers and finally recorded the seed demand from interested farmers for next season.



FIGURE 13 FFD AT NATUN OFFICE, COX'S BAZAR

Summary of Farmer Field Day (FFD)

Sl	Total events & no of participant	Male	Female	% of Female
1	18 (1273)	1198	75	6



FIGURE 15 FFD AT LAMA



FIGURE 14 FFD AT BANDARBAN

2.4.10 :Improve best management practices (BMP) in the Tilapia hatchery

Improvement of tilapia hatchery is a continuous process. Every year Meridian Hatchery management did different renovation work in hatchery complex. This reporting year with the assistance of WorldFish technical staffs, a number of renovation as well as newly development works had been done for ensuring the best management practices in hatchery complex.

The following works were done with support of FtF BANA project

- Net fencing of individual unit of hatcheries (nursery, brood rearing unit, disposal area, quarantine area setting bird fence, etc.)
- Introduced vehicle wheel and foot bath at the entrance of hatchery
- Renovate entrance gate, guard room, visitors room, toilet facilities with washing hands
- Renew water purification tank
- Renovate existing water inlet and outlet
- Develop waste water treatment plant



FIGURE 17 NET AND SURFACE FENCING OF BROOD POND



FIGURE 16 FOOT BATCH INSIDE ENTRANCE GATE

5.4.11 :Consultant hiring for conduction staff training & scoping of process fish product development and marketing:

As per proposed and approved budgets, 02 consultants were hired; one for conducting staff training and revised AIN hatchery manual and another for scoping of process fish products development and marketing. Both the consultants did their assignments in time and performed activities as per ToR. Two consultants submitted their reports and necessary documents by this reporting period.



FIGURE 18 MEETING WITH CONSULTANT

5.4.12 :Visitors program:

Within this project period a number of visitors visited the project area to monitor and guide the project activities which help to run the project in smooth manner.



FIGURE 19- SUAID TEAM & ZOR COORDINATOR VISITED TRAINING PROGRAM



FIGURE 20-USAID MONITORING TEAM INTERVIEW OF WOMAN FARMER



FIGURE 22- DCOP VISITED MARIDIAN HATCHERY



FIGURE 21- HOA MERIDIAN VISITED DEMO POND

6. Key Innovation of the project:

Meridian Agro worked for sustainable business development from the beginning of journey. CMAIL believed that R&D, networking, linkage, knowledge sharing is one of the best strategy for continuing any business with sustainable manner. In this respect CMAIL management always give effort for staffs capacity building through research and development . Through research and development (R & D) project management gained the experience and modify for further development. By implementing this project CMAIL gained a lot of innovative knowledge /intervention which would help the organization for future development. These are as follows

- Development of environment and climate adaptive hatchery infrastructure to ensure one-stop supply of quality seed in minimizing cost
- Establishment of Meridian Service Centre (MSC) to ensure technical information dissemination & basic water & soil testing support for rural fish farmer
- Develop Meridian Safe Fish consumer point to aware fish seller and consumer about safe fish marketing at rural market
- Introduce a new fish species to increase production and productivity as well as export market
- Export: We have planned to explore export market mainly Middle East for Tilapia fish
- Meridian Service Centre (MSC) will provide technical knowledge for using equipment such as test kit, learning materials along with a dedicated skilled resource person for guiding various aqua culture issues.
- Community Partnership: Collaboration with fisheries research and knowledge institutions (BFRI, DoF, CVASU, CU and DU) to develop adaptive strategies for small scale fish farming communities
- Hatchery Modernization: Gradual diversification of existing hatchery into environment and eco-friendly technology
- Knowledge: Research on the impacts of climate change faced by small scale fish farmers, nurserer and adaptation & develop market solutions to support the farmers

7. Sustainability of the business/ intervention model

A **business Sustainability** focuses on meeting the needs of the present without compromising the ability of future generations to meet their needs. Through implementing the project CMAIL developed a remarkable number of technical human resources which would help to run the hatchery as well as field level marketing channel in sustainable manner. Besides that CMAIL build a win win network with quality brood sources in Bangladesh and abroad. CMAIL started to maintain biosecurity in all respect of hatchery operation which address the environmental threat and climate change impact in long run of hatchery operation

In field level CMAIL developed marketing agents (Seed agent/lead farmer) with GAP knowledge which would help to increase demand of fry as well as ensure back up support as needful of farmer's community. A number of small scale farmer already tested the quality of Meridian tilapia seed and that message would spread the whole area of Cox's Bazar and Bandarban district. So this business model would be sustainable

8. Impact of the business/intervention model on the overall business in the intervention period

Through implementing short duration (09 month) project. Some visible impact happened just after completion of the activities/intervention. For example after completion farmer training instead seed demand for tilapia seed came from farmers, and some farmer's paid booking for next year. The following table of sale figure of tilapia seed proven the impact of this project.

8.1 sales figures of Tilapia seed over the intervention period (quarter on quarter sales)

March 2019 to February 2020

Quarter	Month	Sales Qty	Sales (Tk.)
1st	March - May	48,768,162	39,502,211
2nd	June-August	24,428,627	19,787,188
3rd	September-November	13,972,308	11,317,569
4th	December - February	2,387,135	1,933,579
		89,556,232	72,540,548

8.2 Project area coverage over the intervention period (quarter on quarter reach)

Quarter	Area	Qty	Remarks
1 st Quarter Mar-May	Chittagong	18,044,219.94	
	Coxbazar	3,169,930.53	
	Bandarban	1,463,044.86	
	Kagrachori	975,363.24	
2nd Quarter June-August	Area	Qty	
	Chittagong	9527165	
	Coxbazar	1221431	
	Bandarban	610716	
	Kagrachori	488573	
3rd Quarter September-November	Area	Qty	
	Chittagong	6706707.84	
	Coxbazar	1117784.64	
	Bandarban	419169.24	
	Kagrachori	419169.24	
4th Quarter December - February	Area	Qty	Remarks
	Chittagong	1,098,082	
	Coxbazar	214,842	
	Bandarban	95,485	
	Kagrachori	71,614	

9. Business Risk and Intervention Strategy

Every business have challenges/risk. CMAIL also figure out some challenges by implementing the project/ intervention. Some measurable risk have been identified as well as identified the coping strategy in future intervention of the business such as

- Resigned/drop out of Skilled technicians/ staffs
- New dimation of climate change effect
- More competition (more business player)in market
- Changing of culture system
- Demand of other value added species
- Fall down market price of tilapia
- Less satisfaction of agents

To cope the above business risk CMAIL also have to think and aware the managent to address the challenges in future intervention of the business

10. Project budget and financial management

This is a cost sharing technical project. The approved project budget cleary mentioned that 66.01% contribution shared by FtF BANA and 33.99% shared by sub Grantee.According to budget guideling both contribution would be deposited in individual the bank account and cost would be shared as per approved budget of the project proposal. All the invoice adjusted in daily basis with USAID standard accounting system. At the end of each month finance officer developed the monthly financial report as per approved format given by FtF BANA.Every quarter finance officer developed quarterly financial report . Every quarter internal and external audit have been completed by both parties.

Under five major head (Direct Labor,Supplies & Equipment, Travell & perdiun, other direct cost and Activity cost) the budget of this project was **11,137,350 BDT. FtF BANA Contribution in 7,351,700 BDT & Grantee Contribution in 3,785,650 BDT**

11. Monitoring and reporting

Both direct and participatory monitoring tools is applied for the development in this project.On going activities as well as result was monitored by FtF BANA and meridian management in regular basis.CMAIL have submitted the weekly activity plan to Maridian management in each week and submitted the weekly progress report to both management at the end of each week. Basis on weekly plan and progress report management planed to monitores the field activities and assist the field team to complet the targeted activities with budget line in time lime. Due to regular and participatory monitoring accept very few limitation all the assaigned task had been completed in project time frame.

This project had intensive reporting system with standard reporting format supplied by FtF-BANA office. At the end of each week. Project coordinator compiling the report and send to FtF-BANA management with out any delay. At the end of each month monthly program and financial report was submitted to both management in standard monthly reporting format. In each quarter submitted the quarterly repport and at the end of the project submitted the final project completionrepot to the management

12. Challenges/ Lesson learned

CMAIL is one of the pioneer agro based business organization in Bangladesh. CMAIL have long experiences to operate different business in different sectors. For growth of business, CMAIL take different strategies to run the business smoothly and profitably. But in respect to implement any development project, CMAIL have a few experiences. So though this was very short time project, CMAIL gained a number of lessons that would help the organization to run any other project in coming days.

- **Lesson no 1:** Selection of field staff & nature of employment
Proper & skill staff selection was very important to run any project, at the same time need full time staff rather sharing staff i.e one employee work two place and give partial time in project works that would hampered works of both sides as well as field operations.
- **Lesson no-02:** Capacity building of staffs was very essential before starting any job. So after recruitment, staffs need proper capacity building and provide information before deploying in field.
- **Lesson no-03:** Aquaculture is a season based business. Therefore launching any aquaculture intervention, need to consider season.
- **Lesson no-04:** Farmer selection was a most important activity for any project. Therefore, more time was needed for appropriate farmer selection.
- **Lesson no-05:** *Geographical location & resources availability was also important to select any areas for project interventions.*

Challenges

- Training facilitation was very difficult by less skilled TFOs and Seed agents
- Performances of demonstration ponds were not up to the mark due to winter season
- ToR of the consultants should be clear before giving tasks to consultants
- Short time contact
- Organize a suitable venue for training/event in remote area during rain was a challenge
- Appropriate preparation of demo ponds during rainy season was a challenge
- Manage budget allocation for traveling remote hilly areas is challenge

13. Areas of Improvement/Recommendation

Room of improvement is a continuous process for the success of any development project. By implementing the project CMAIL identified the some areas of improvement for future intervention of the the business

- Eco friendly hatchery operation
- Carefull about climate hazards and coping mechanism
- Hatchery desposal management system
- Diversification of production system
- Year round production mechanism
- Farmer friendly marketing system
- Low cost cututre techniques for small scale farmer
- Post harvest and simple marketing mechanism for farmer

- live fish marketing to ensure quality and adulteration
- Developing community level technical resource person and service center
- Awareness about personal sanitation & hygiene in all level of beneficiaries in this sector.

14. Conclusion

As a business organization, it was an opportunity for CMAIL to work as development partner with USAID funded FtF BANA project of WorldFish. Within this 09-month short project journey, CMAIL learned a lot which would help the organization to identify the laps and gaps of their business interventions as well as sustainably concerns and also products diversification. In business a term is very much popular that is Win-Win business model. From this project, the organization has learned the practical win- win business model. CMAI hope that due to the capacity building of management and staffs, both are more confident to run the business in more sustainable manner and also run any development works if needed in near future. So CMAIL acknowledged contribution of the activity and express gratitude to FtF BANA project of WorldFish and expects more supports for on new interventions in near future to deliver the benefits of the business among the entire aquaculture value chains.

15. Appendics:

Table:1-Summary of Farmer training

Sl	Date	Venue	No of participants		
			Male	Female	Total
1	22/08/2019	Framer house at Moulobipar, Pekua	22	5	27
2	25/08/2019	Saida Khatun Eatimkhana, Pekua	23	2	25
3	27/08/2019	Konakhali Sikderpara Primary school	21	6	27
4	29/09/2019	Badar sha Accademy, Bodor khali	18	9	27
5	21/09/2019	Koilash ghona , Napith khali, Coxbazar	20	5	25
6	22/09/2019	Khiaju para, Sorui, Lama, Bandarban	19	1	20
7	23/09/2019	Uttor Soltanpor, Soalong, Bandorban	5	20	25
8	23/09/2019	Jonokollan somobay somiti, Soalong, Bandarban	22	3	25
9	24/09/2019	Kauarkhop, Ramu, Cox`s Bazar	25	0	25
10	05/10/2019	Ichakhali Madrasha, Cox's bazar	21	4	25
11	06/10/2019	Fatekharkul School, Ramu	21	0	21
12	07/10/2019	Nulbunia, PatabariUkhia	22	3	25
13	12/10/2019	Kheazupaa, Lama	17	1	18
14	13/10/2019	Pekua Kira complex, Pekua	21	5	25
15	14/10/2019	Islampur Madrasha, Cox's bazar	19	3	22
16	24/10/2019	Babupara, Alikodom	18	4	22
17	24/10/2019	Upazila resource centre, Ali kodom	15	3	18
18	30/10/2019	Noa bazar Club. Teknaf	21	4	25

19	30/10/2019	Kanjorpara club, Teknaf	22	0	22
20	04/11/2019	Eid Moni Primary school, Chokoria	24	1	25
21	06/11/2019	Gumdhom primar school, Ukhia	22	1	23
22	13/11/2019	Chakmarkul, Chokoria	21	4	25
23	19/11/2019	Alikodom samitee office	28	0	28
24	22/11/2019	Valikia palog high school	20	6	26
25	22/11/2019	Valikia palog high school	27	4	31
26	23/11/2019	Killakhola bazar, Lama	23	2	25
27	24/11/2019	Sikdar para	20	5	25
28	02/12/2019	Baiggakul IDF club	16	6	25
29	03/12/2019	Nafitkhali G.p.School	22	6	28
30	04/12/2019	Seed agent sales point, Dulahazara	26	0	26
31	06/12/2019	Kaowerkhop Bazar	25		25
32	18/12/2019	Kharankhali Eye Hospital	25	0	25
33	18/12/2019	Moulobi bazar Madrasha, tekna	20	0	20
34	19/12/2019	Gatiram para farmer house	16	9	25
35	23/01/2020	Pekua Kira complex, Pekua	23	3	26
36	19/02/2020	Baritoli rastar math Salekuzaman Farm	25	0	25
Total			755	125	880

Table:2 Summary of Farmer awareness training on basic tilapia culture management

Sl	Date	Venue	No of participants		
			Male	Female	Total
1	01/02/2020	Mobin Para Primary school,Chokoria	73	0	73
2	03/02/2020	Chinar Gona School, Chokoria	81	0	81
3	04/02/2020	Takpara,Islamabad- pond side of Kasem,Cox's bazar	81	0	81
4	5-2-20	Maizgona Govt. Primary school	69	1	70
5	07/02/2020	Saheb bari-Baroitoli, Chokoria	72	0	72
6	10/02/2020	Manikpur, Chokoria	71	0	71
7	11/02/2020	Madham Soadagar Gona, Chokoria	72	0	72
8	12/02/2020	Aquaculture Project, Khuruskul	70	0	70
9	13/02/2020	Furutia Khali School, Kona khali	72	0	72

10	14/02/2020	Lama Fisheries complex	47	16	63
11	16/02/2020	Aung hari primary school, Yang cha	64	15	79
12	18/02/2020	Buripukur Union Parishad,Cirigna	41	25	66
13	24/02/2020	Demosia Primary School,Demosia	65	0	65
14	25/02/2020	Degree khola Madrasha Math	67	0	67
15	26/02/2020	Lulaing Bazar	68	0	68
16	27/02/2020	Fukkhali Madrasham,Ilishia,Chokoria	65	0	65
17	01/03/2020	West Boro Veola,Ilishia	61	0	61
18	07/03/2020	Shapura, Shahar beel,	14	44	58
			1153	101	1254

Table:3 Summary of farmer field day (FFD) events

Sl	Date	Venue	No of participants		
			Male	Female	Total
1	01/01/2020	Natun office,Cox's bazar	74	0	74
2	04/01/2020	Badar Sha Accdemy,Badar kahli,Chokoria	80	0	80
3	06/01/2020	Sikdar para, Pekua	72	0	72
4	07/01/2020	Nafitkhali, Islampur, Cox's Bazar	82	0	82
5	09/01/2020	Bat tali Bazar, Idmoni, Chokoria	85	0	85
6	12/01/2020	Valukia High School, Ukhia	79	0	79
7	14/01/2020	Patabari Bazar, Holudia Palong, Ukhia	81	0	81
8	16/01/2020	Keazupara, Lama, Bandarban	72	8	80
9	18/01/2020	Sikderpara, Sualok, bandarban	65	9	74

10	26/01/2020	Babu para, Alikodom, Bandarban	64	15	79
11	17/02/2020	Sakor par Shilkhali, Pekua	48	23	71
12	08/03/2020	Osin marma farm, sheelertua, Lama	45	18	63
13	09/03/2020	Zamal miar farm, Voro veola	64	0	64
14	10/03/2020	Dudu Demo pond side,Lal bridge, Chokoria	62	0	62
15	15/03/2020	Kanjor Para Hoykong, Teknaf	65	0	65
16	16/03/2020	Patabari Bazar, Holudia Palong, Ukhia	57	0	57
17	17/03/2010	Banani Fish farm	53	2	55
18	18/03/2020	Yunus Farm, Harbung, chokoria	50	0	50
Total			1198	75	1273