Baseline Survey Final Report

Aquaculture for Income & Nutrition Project

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TABLE of CONTENTS

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ACRONYMS

CODEC	Community Development Center
DOF	Department of Fisheries
FGD	Focused Group Discussion
FtF	Feed the Future
FtF-A	Feed the Future Aquaculture Project
GDP	Gross Domestic Product
GO	Government Organization
GOB	Government of Bangladesh
HYV	High yielding Variety
IPAC	Integrated Protected Area Co-Management
IRG	
KAP	Knowledge, Attitude and Practice
M&E	Monitoring and Evaluation
MYAP	Multi Year Assistance Program
NGO	Non Government Organization
PL	Post Larvae
SIS	Small Indiginous Species
USAID	United States Agency for International Development

ESSENTIAL INDICATOR FACT SHEET

No.	FtF indicators			Outcome
1	Gross margin per unit of land, kilogram, or animal of selected product (rice, horticulture, fisheries production)	Fish	$/hectare	805
			$/Mt	373
		Shrimp	$/hectare	564
			$/Mt	2453
		Horticulture	$/hectare	1645
			$/Mt	187
2	Number of jobs attributed to FTF implementation (Permanent job of 90units)			542
3	Number of hectares under improved technologies or management practices as a result of USG assistance (Hectare)			-
4	Number of rural households benefitting directly from USG interventions			-
5	Value of incremental sales (collected at farm-level) attributed to FTF implementation			-
6	Number of farmers and others who have applied new technologies or management practices as a result of USG assistance			-
7	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training			-
8	Value of new private sector investment in the agriculture sector or food chain leveraged by FTF implementation (US $ Million) (Fixed cost only)			1.13
9	Number of public-private partnerships formed as a result of FTF assistance			-
10	Total value of sales increased of USG assisted businesses			-
11	Yields of rice, fish (fish/shrimp) and other major crops (Mt/hectare)		Total fish	1.32
			Shrimp	0.23
12	Increased value of crop (rice, maize, horticulture, fisheries etc.) production (in million USD)		Fish and Shrimp	6.41
			Fish pond	1.30
			Shrimp	4.98
			Horticulture	0.23
13	Number of children under five reached by USG-supported nutrition programs			-
14	Numbers of Policies/Regulations/Administrative Procedures in each of the following stages of development as a result of USG assistance in each case:			-
16	Percentage of HHs increased fish intake (small nutrient dense fish and other fish) per day (Kg)			1.6
17	Prevalence of households with moderate and/or severe hunger		Moderate	1.5%
			Severe	1.8%
18	Prevalence of exclusive breastfeeding under 6 months of age			52.5%
19	Children 6-23 months of age receiving a minimum acceptable diet			8.2%
20	Women's dietary diversity (expanded to show more on large and small fish consumption)			87.0%
21	Other need based indicators will be considered in the proposal considering the M&E needs			-

EXECUTIVE SUMMARY AND RECOMMENDATION

1. Background and Objectives

The World Fish Center, in collaboration with the GOB and USAID, has been implementing the FtF Aquaculture Project since October 2011 with a view to meet the government and FtF goals to sustainably reduce poverty and hunger. The project is funded by the USAID FtF initiative and covers a 5-year intervention in aquaculture focused on 20 southern districts in of the country. The project has four major objectives: (a) dissemination of improved quality fish and shrimp seed, (b) improving the nutrition and income status of farm households, (c) increasing investment, employment and fish production through commercial aquaculture, and (d) policy and regulatory reform and institutional capacity building to support sustainable aquaculture growth.

In order to achieve the objectives the project supports four major interventions: (a) supplies improved quality brood fish to public and private hatcheries which together with technical support for fish and shrimp and nursery management will lay the foundation for maintaining high quality seed production; (b) partners with other USAID supported projects to increase household incomes and nutrition; (c) works in commercial aquaculture to stimulate investment, employment, incomes and productivity including culture of brackish water commercial species that are resilient to salinity, water abstraction and climate change; (d) works with the GOB to assist with implementing existing policy and regulatory measures in the Hatchery and Fish Feed Acts in order to long term continuity and impact of investments involving institutional capacity building and expanding linkages between GOB as well as private sector associations and businesses. World Fish focuses on introducing income enhancing aquaculture technologies into the existing livelihood programs though training, demonstration and communication programs and nutrition education and promotion of nutritionally rich and income boosting vegetables production.

The project will be implemented in three phases. Phase 1 covers the first 18 months, phase 2 covers a total of 36 months and phase 3 covers all 60 months. The targets and results framework for each phase is specified. It targets to reach (a) 766,922 households in phase 1 extending to 971,525 in phase 2 and 1,172,933 in phase 3; (b) targets to cover 100,939 pond hectares in phase 1 extending to 148,398 ha in phase 2 and 206,550 ha in phase 3; (c) targets to increase fish, shrimp and vegetable production to 21,726 metric tons in phase 1 extending to 57,714 in phase 2 and 105,035 in

phase 3; (d) targets to produce additional value of US$ 42 million in phase 1 extending to 147 million in phase 2 and 354 million in phase 3; and (e) targets to increase employment of 10,000 work days in phase 1 extending to 50,000 in phase 2 and 75,000 in phase 3.

2. Methodology

The present baseline survey is intended to inform the follow-up and end-line surveys for impact evaluation and allow project administrators for adaptive management and course adjustments. Specifically the survey interviewed 991 household aquaculture farms, 401 commercial fish culture farms, 570 commercial shrimp culture farms, 97 cage culture farms, 77 fish nursery, 30 fish and 7 shrimp hatcheries, 10 focus groups and 50 key informants to (a) describe the project indicators and M&E plan, (b) provide data to measure future impacts, plan future interventions and for advocacy; (c) provide inputs link to production economics and output; cost benefit analysis; and knowledge, attitude and practice of existing farms; (d) define households who needed quality seeds and service delivery points; and (e) identify control farms to track changes periodically; and (f) recommend performance monitoring tools and system for tracking hatchery and nursery business growth considering the baseline status.

3. Findings of the Survey

3.1. Household Aquaculture

Nearly two-thirds of the sample households were headed by male. Average size of the households was 4.6 members and most of the farmers were over 25 years of age and had some school education. On the average they had over a decade of involvement in pond fish culture and nearly one-third of them received one or more training in fish cultivation in the last three years of the survey.

Nearly 97% of the households owned a homestead and average homestead area was 23 decimals. Over half the households did not cultivate a homestead vegetable garden. Average area cultivated by per household was 7 . Nearly half of the households owned homestead tree area and one-quarter had over 5 decimals.

On an average a household earned income from 4.4 sources and average monthly income of the households was Tk. 12594 . Aquaculture, crops and vegetables, and business were the most important sources of income of the households.

Average number of fish ponds cultivated by a household was 2 and average water area cultivated by a household was 95 decimals. Average pond size was 16 decimals. Average water depth in the ponds was 5.4 ft in the culture season but water retained in the ponds for fish culture throughout the year. Most of the ponds were singly owned by the households; in case of jointly owned and jointly leased ponds the average number of owners was 3. Most of the ponds had loamy and clay soil On an average nearly 30% of the water area was shaded by trees and the average age of the ponds was 22 years.

Average cash cost of fish culture was Tk.464 per decimal and average return was Tk. 722. On an average a farmer got gross return Tk.258 per decimal and 63,726 per hectare . Around 54% of the product was consumed by the farmers and 36% sold.

Patilwala/Faria (fish vendors) was the predominant source of fish seeds distantly followed by private nursery and neighbors of the farmers. One in twenty farmers collected common carp seeds from hatchery and self raised seeds was one of the least common source to them.

Costs and Returns of Dike Vegetable Cultivation

Over the regions a quarter of the households cultivated dike in the year before the survey and the average size of the dike were 4 decimal per household. Almost all the labors used in the gardens were unpaid household labor and nearly three-fifths of the labors were females. Three-quarters of the households used inorganic fertilizers, two-thirds used manures and one-quarter used pesticides in home gardening.

The average cash cost of dike cultivation was Tk. 93 per decimal and the average return was Tk. 626 per decimal. On the average a farmer got gross return per decimal was over cash cost was Tk. 533 and average per household return was Tk. 3,145. Over the regions two-fifths of the households practiced home gardening in the year before the survey and

the average size of the gardens was 7 decimal per household.
Almost all the labors used in the gardens were unpaid household labor and nearly three-fifths of the labors were females. Average cash cost of home gardening was Tk. 82 per decimal and average return was Tk. 620. On an average a farmer got gross return over cash cost was Tk. 537 per decimal and average return per family was Tk. 3712 only. Nearly half of the garden outputs were consumed in the households, two-fifths were sold in the market and the rest was distributed to others as gifts.

Two-thirds to three-quarters of the farmers knew about the improved technologies of liming and weed control for better fish cultivation but a quarter to half of them knew about the other technologies. Most of the farmers who had the knowledge of testing natural feed adequacy in water, species selection, weed control, liming, growth monitoring and post harvest fish handling practiced the technologies On the average from each farmer knowledge of a particular technology was disseminated to 3-4 other farmers across the upazilas.

Household Decision Making in Fish Culture
Half the times farmers themselves took all the decisions on various aspects of fish cultivation and nearly one-third to half the times they took the decisions jointly with the other male and female members of the household.

Nutritional Status

Household Hunger
Household hunger score was estimated using the three generic questions formulated and validated in the Fanta 2 project. Using this approach almost all the fish farmers had little or no food hunger in the households (3.38).

Women's Dietary Diversity
Most of the women ate grains, roots or tubers, animal protein and fruits and vegetables, some half to two-thirds ate legumes and vitamin A rich dark green leafy vegetables, and a quarter to two-fifths ate the other food groups including eggs, dairy products and other vitamin A rich fruits and vegetables on the day before the survey. Overall, four-fifths of the women ate four or more food groups which is regarded to provide adequate nutritional diversity and their diet was nutritionally adequate. On the other hand diet of some one-fifths of the women was not nutritionally adequate (3.39).

Nutritional Status of Children 6-23 Months Old
Almost all the children were fed colostrums and none was never breastfed. Three-fifths of the children were initiated breastfeeding immediately after birth. Nearly half the children were exclusively breastfed for six months but a fifth of them were introduced complementary feeding right after six months. A quarter of those who were given complementary foods right after six months were given solids, semisolids or soft foods and most of them were continued breastfeeding along with complementary feeding. Half the children were fed supplementary foods four times or more in the last 24 hours of the survey and most of them were fed foods from four or more food groups.

Children's Dietary Diversity

The study observed 80 children aged 6-23 months across the regions. Nearly three-quarters of the children ate grains, roots or tubers and some two-thirds ate fruits and vegetables. Two-fifths ate vitamin A rich vegetables and fruits but fewer ate the other food groups including legumes, dairy products and eggs on the day before the survey. Overall, two-thirds of the children ate four food groups which is regarded to provide adequate nutritional diversity and their diet was nutritionally adequate. On the other hand diet of over one-third of the children was not nutritionally adequate.

3.2. Commercial Fish

Average number of fish ponds cultivated by per household was 3.2 and some two-third of the households cultivated over 2 ghers/ponds. Average water area cultivated by per household was 183 decimal and it ranges from 4 decimals to 3000 decimals. More than 25% of the farmer leased-in the pond

Average area cultivated by per household was 182 decimals and nearly 10% households leased-in and 20% leased-out their land. Nearly 90% of the households owned a homestead garden. Average homestead area was 28 decimals and around half of the households had an area of 20 decimals or less. Over half the households had a homestead vegetable garden. Nearly half of the households owned homestead trees. One-quarter had trees over 5 decimals of land and average area of homestead trees was 15 decimal.

On an average a household earned income from more than 4.7 sources and average monthly income of the households was Tk 4,498. Aquaculture was found the major sources of income and it contributed more than 40% of the income /
More than 75% of the ghers were singly owned by the households. Average area of pond was around 60 decimals of which 50 decimals was water area Average water depth was 2.7 ft in the culture season but average water retained period in the ponds for fish culture was 4.7 months. On the average nearly 18% of the water area was shaded by trees and average age of the ponds was 10 years.

Patilwala/Faria (fish vendors) was the predominant source of fish seeds distantly followed by private nursery other sources for almost all the fishes. Only 20% of the farmers collected katla from the wild source. A good number of farmers (22%) collected fish seed of Mola/Dhela/Tengra from other farmers.

Gross return per hectare of aquaculture at commercial level was Tk. 3,58,644 and cash cost was Tk.2,93,844, so gross margin per hectare was Tk.64,800. Benefit-cost ratio over the cash cost was 1.22..

Most of the farmers were found had the knowledge of weed control (84%) and liming (76%). Half of the farmers knew testing natural feed adequacy in water, species selection, supplementary feeding, growth monitoring, post-harvest handling and use of quality seeds. Most of the farmers who had knowledge they were practicing the technologies.

Major cause of not pract icing the technologies was lack of seriousness about it. On the average from each farmer knowledge of a technology was disseminated to 3-4 other

farmers across the upazilas.

3.3. Commercial Shrimp Culture

All the respondents were shrimp farmers and of them 93% were male. Most of the farmers were 25 to 54 years of age.Educational level of one-third of the shrimp farmers below primary level, 27% of them passed primary level and 24% had SSC or HSC certificate and 5.8% had education more than HSC. So, the educational level of the shrimp farmers better than the national average. Out of 570 respondents 40%received training on fish shrimp culture during last three years, among them 69% received the training once and 30% twice.

Average number of fish ghers cultivated by per household was 2.6 and one-third of the household's cultivated more than 2 ghers. Average water area of the cultivated gher was 195 decimals. Around 60% leased-in and 50% leased-out their ghers. Average areas of leased-in and leased-out ghers were 173 and 149 decimals, respectively. It indicates that the same farmer leased-in and leased-out their land for possibly for convenient of prepare and other management of the ghers for the shrimp cultivation.

Earning income from more than one source was common among the households. On an average a household earned income from 4.2 sources and average monthly income of the households was Tk.1, 90,463. All the households either involve in aquaculture or other fisheries activities. Highest income (55%) of these households' was aquaculture and average income from this activity per family was Tk.1, 09,255. These households are involved in shrimp culture and their major income derived from this source.

Most of the ghers (85%) were singly owned by the households. Soil characteristics of the majority (65%) of the ghers either sandy loam or clay loam. Average gher area was 105 decimals of which water area was 89 decimals and the average dike area was 15.5 decimals. Average water depth in the ghers was one meter in the culture season but water retained in the gher for fish shrimp cuture for 8.6 months. Average age of the ghers was 11.6 years.

More than 72% of the farmers cultivate Bagda and Golda. Around 18% cultivated Harina/Chali shrimp and 14% cultivated carp fish in the shrimp gher. Average cash cost of fish culture was Tk.54, 340 per hectare and return was Tk 99,460. On an average a farmer got gross margin of Tk. 45,120 and Benefit-Cost Ratio was 1.83..

Nearly 70% of the product was sold in the market and very few Galda and Bagda was consumed. However, around 18% of the Harina/Chali was consumed by the farmers themselves. A very few amount was distributed to the relatives or friends as gift.

Main sources of Bagda were hatchery, around 20% were collected from natural source and around 90% of Golda was collected from hatchery. However, Harina/Chali was collected from natural sources only.

More than 70% of the farmers knew about the improved technologies of liming and weed control for better fish cultivation. Around half of them knew testing natural feed adequacy

in water, species selection, supplementary feeding, growth monitoring, use of quality seeds and feed application procedures. Quater of the faremrs knew other technologies. Most of the farmers who knew the technologies practiced them.

In general lack of seriousness in adopting a particular technology by the farmers was the major reason for not practicing in culture followed by 'Lack of enough knowledge' and 'lack of capital' .On the average from each farmer knowledge about a technology was disseminated to 3-4 other farmers across the upazilas.

3.4. Nursery

Nursery Complex
Most of the nurseries were not well equipped with the facilities needed for a nursery its smooth operation. Physical infrastructure like office room, net drying shed, store room, labor shed and guest room were found at 49%, 38%, 32%, 17% and 13% nurseries, respectively. Water filtration unit was found only in 17% and overhead tank was available in 7% nurseries. etc.

Most of the common species of the fish were nursing. More than 60% were found nursing carp type fish like Rui, Catla and Mrigal. Silver carp and Grass carp were found in 52% and 40% nurseries respectively. Thai sorputi was nursed by 41% nurseries. Bagda and Golda shrimp were found nursing by 25% and 11% nurseries, respectively.

Use of lime, urea, inorganic fertilizers and organic fertilizer like cow dung were found to use by most of the farmers. Half had used ready commercial feed purchased from market and around 40% prepared the feed at their own farm or at home using locally available ingredients.

Out of 77 nurseries 53 had permanent male labors. Average number of permanent labors was 2.3 and average labor days were 538 in one year. Average male daily labors worked for 543 labor days per year and that was only 18 labor . Participation of family labor was very low and insignificant in number because nursery operation is all most of technical nature and in most of the cases depend on hired skilled labors for its successful operation

Most of the nursery personnel knew high density nursing in earthen ponds and around 60% knew about nursing in hapas, one and two stage nursing. Half of them knew Nursing in cemented concrete tanks and 26% knew nursing of Pangus fry. Practice of the knowledge was found all most equal to the level of knowledge they have.

Total 88 staffs of 54 nurseries operator received training. These persons participated at 202 training course. So on an average, 1.6 persons received training and each of the them participated at 3.7 courses.

Total input cost was Tk. 19,319,572 for all the 77 nurseries and average cost per nursery was Tk. 250,904. Average price of production per nursery was Tk 644,877.0 and average selling return was Tk. 596,428. Benefit-cost ratio was around 2.5,. On an average profit per nursery was Tk 380225. So if proper support is given in technical and financial matter this business can attract the investor and protein deficiency of the country can be solved. Even

foreign currency can be earned by exporting those fishes which has demand in the world market.

Major reason for not practicing the improve nursing practices were they did not have enough capital (50%) and lack of enough skill (44%). Other reasons were input are not easily available and do not have faith on performance of improve technologies. Constraints of operating nurseries were natural climates like heavy rainfall and draught, high cost of inputs and marketing of product, and credit facilities, etc.

3.5. Cage Fish Culture

Around 62% of the cage farmers were female and rest 38% were male. Most of the farmers were between 25 to 44 years old and average family size of these farmers was 4.5. Educational level of the cage farmers was lower than the other fish farmers. Around 30% of them had no education at all and 32% were educated within I-V class. As majority of the cage farmers were female main occupation of most of them (56%) was housewifery and 20% were agricultural farmer who were mainly male. Secondary occupation of most of the farmers (68%) was found fish culture and around 20% had no secondary occupation.

It was found that a large number of the cage farmers (40%) had no cultivable land at all and around 20% had 20 decimal or less land. Average cultivated land was 195 decimal and most of these (155 decimal) was leased-in from others.Around one-fourth of the cage farmer had no homestead land...

One an average 3.4 members of the households of the cage farmers were earning from various sources. Main sources of income of these families were crop or vegetable cultivation, livestock or poultry rearing, aquaculture or other fisheries activities. But their major incomederived from aquaculture or other fisheries activities. On an average annual income of the households was Tk. 117,393 and per capita income was Tk. 26088.

More than 90% of the cage farmers received training on the technology. Average number of training received during last three years was 2.8. All most all had the farmers know about the cage maintenance aspects. Around 80% know the techniques of species selection, 77% knew about the supplementary feed application. However, maintenance of stocking density was known to less than half of the farmers. Around 40% only raise the problem of high mortality rate of fish and 30% identified credit for the capital as their problem

3.6. Hatchery

Depending upon the concentration of fish hatcheries, Barisal and Jessore hubs were selected for the study. As shrimp hatchery is not available in these hubs, so, along with Barisal and Jessore, Coxes Bazar was also included for shrimp hatchery base line information.

Most of the hatcheries of Barisal and Jessore found hatching Rui, Catla, Mrigal, Grass carp, Silver carp and Thai Sorputi. Monosex Tilapia was found hatching at only Jessore. Hatcheries of shrimp were found at Coxes Bazar only. All the hatcheries used broods

stock from other private farm and or from own production sources. But at Jessore all the hatcheries used brood stock from Jamuna and at Barisal broods stock used from government source and natural sources. Hatcheries of Coxes Bazar produce seedling of shrimp and they collect used brood stocks from the natural sources.

On an average permanent employment of 11.2 male was generated by a hatchery. Permanent employment of female was insignificant in number. On an average 80 male daily labor worked per hatchery total and on an average they worked for 104 days. On an average 496 labor days were created for the family male members and 13 for the female members.

On an average cost of fish hatchery was Tk. 1,90,828 and return was Tk. 1,96,611, so gross margin was Tk. 86,783. Average cost of shrimp hatchery was Tk. 28,80,254 and return was Tk.1,27,22,321. Gross margin of shrimp hatchery was Tk. 98, 42,068. Benefit-Cost Ratio of fish and shrimp hatchery was 1.79 and 4.42 respectively.

On an average 5.4 training had been taken by the shrimp hatchery employees in Cox,sBazar and it was 4.6 for Barisal and only 1.8 for Jessore.Some of the technology like Secchi disc reading, stage of maturation of brood fish and shrimp species, water quality management of hatcheries and incubation tanks, stripping of ripen eggs, mixing of eggs and milts feed production and algal culture and application, etc were not kwon to more than 50% of the hatchery operators.

Around 60% of the responses come across constraints of the hatchery operation and those are mentioned shortage of quality broods, climate change and temperature fluctuation, irregular power supply, high cost of larval feed, product marketing, high mortality of shrimp and prawn larvae, social problem (theft, poisoning, multiple ownership), non-availability of credit, etc

3.7. Findings of FGD/Case Studies on Various Issues

The following findings are from FGDs and Case Studies. A total of six FGDs and eight case studies were conducted with the Project and Non-project fish farmers, Hatchery Owners, Middlemen and Other relevant Actors.

Value Chain among Different Actors

There are different actors in the value chain combining different sources including input and output suppliers in fish farming. Supply chain starts from collection of Brood fish and go through fish farmers' level and ends at consumer level. Value Chain actors were categorized mainly into two types: one is at **farming level** and the another one is at **market level**. The first actor at the farming level is the Hatchery Owner who collects brood fish from Open Water (River), BFRI, Fish Farms, and Fish Markets. He produces spawn and supplies to *Patilwala,* Spawn traders of different local and distant markets. In the study areas there are found two types Nursery Owners. The Nursery type-1 collects spawn through *Patilwala or* hatchery and rear spawn for 10-15 days and Nursery type-2 collects fry from nursery type-1 directly or through *Patiwala*. Then Nursery-2 rears it for 30-45 days and makes as fingerling for the fish farmers. Then the fish farmers collect fingerlings from

Nursery-2 directly or through *Patiwala* for culturing various types of fish. Afterwards, it goes to the markets through fish farmers, fishermen or paikars.

There are three types of main intermediaries like, Aratdars/Commission agents, *Paikars*/Wholesalers, Retailers. Intermediaries play important role in the study areas. Aratdars have a prominent role in transferring fish from farmers' level to the wholesalers or retailers. Fish farmers and fishermen are the main actors in supplying fish in the marketing channels. Aratdars call auction in front of the wholesalers/Paikars/Fish farmers and retailers. Usually Aratdars take 3% commission of the total selling amount of money from the farmers/fishermen in Jessore, Barisal, and Khulna (with Mongla) with exception to Faridpur area where they take 5% commission from the farmers/fishermen. On the other hand, Araddars in Dhaka City take 3% commission from the *Paikars* and also 1-2% from the purchasers (Retailers, and so on). Sometimes, farmers are bound to sale their fish without getting fair price for not having sufficient customers, occurring natural calamities, having internal syndicate among the *Aratdars* and *Paikars*. There is no option for the farmers except selling fish in the *arat* at the auction time due to creating confusion in mind, like, uncertainty of preservation facilities and the next days' price, urgent need of money, etc. *Aratdars* also provide credit to the fish farmers/fishermen to run their business well, and borrowers have no option except selling fish to them.

Apart from these actors, there are some important actors at supply level. These actors are suppliers of inputs like, medicine, hormone, fertilizers, feed, lime, etc.

Volume of Sale to Different Actors

Almost 83% of the fish farmers sell their carp fishes to the Paikars through *Aratdars* (Commission agents) and the rest were found to sell locally by themselves (3%). Also they sell to local Beparies or through fishermen and retailers directly which is occupied by 9% and 5% of the total sale respectively.

Value Chain at the Farming Level

Value addition activities in the value chain process starting from producing spawn or PL in the hatchery from brood fish/shrimp and go through a series of consecutive rearing process at different stages and finally appeared as table size fish/shrimp at farmer level. One Kg body weight of brood fish (Rui/Catla) produces 250 gm of spawn at a time. It is found that on an average a total of 46,080 Kg fishes is produced from only 250 gm of spawn. Net value adds were Tk. 250.00 at the hatchery level for producing 250 gm of spawn for a lot/one time , Tk.675.00 at the nursery type-1 for producing 0.8 lac fry, Tk. 36,000.00 at the nursery type-2 for producing 0.64 lac fry, and Tk. 18,43,200.00 for producing 57,600 fish or 46,080 Kg fish at the farming level.

Yearly value adds at farming levels for per decimal of land is found higher (Tk. 1920.00) for the fish farmers followed by the owners of nursery type-1 (Tk. 1746.00) and nursery type-2 (Tk. 1535.00). Net value add of the fish farmer who collect fingerlings from the nursery type-2 is more than that of the fish farmer who collect it from Patilwala.

Value Chain at the Market Level

Value adds per Kg of carp fish at every relevant actor starting from Jessore/Khulna/Bagerhat to Dhaka city varies from Tk. 40.00 to Tk. 43.00/Kg with some

exceptions. *Paikars/*wholesalers get the highest value add of Tk. 43.00/Kg (35%), which is followed by the same amount of value add Tk. 40.00/Kg and the same percentage (32.5%) by fish farmers and retailers. *Paikars* in the local market take 100 gm *dholon* (extra amount of fish) for one Kg fish and *Paikars* get the benefit while selling this fish.

3.8. Recommendations

The following problems/challenges are needed to be taken into consideration by the concerned agencies:

Hatchery:
Shortage of quality broods and lack of knowledge all together has invites the existing fish inbreeding problem of the country resulting low level of production against high investment. In addition to address the aforesaid issue, as the survey indicates, proper attention should also be given to develop human resource in the appropriate areas, ensure continuous power supply during hatching period, control over the cost of hatchery operational inputs and quality control aspects.

Fish Farming: Social attitude towards fish farming is not good in our country, lack of proper extension program and dissemination of new technologies regarding fish culture from GOs and NGOs, underdeveloped fish culture techniques and lack of practical knowledge in fish farming, and Under-developed marketing system.

Seed and Feed Supply: Success of any fish culture venture fully depends upon the quality of seed and feed. Farmers of the country could not reach the target because of unavailability and high cost of these two items. A Considerable portion of the farmers also lacking of awareness about application and role of quality feed in their pond. Implementation of legal instruments and regulatory practices are still in initial stage that urgently need to overcome the quality problems related to fish feed and seed production and marketing.

Marketing of fishes: Transportation system of fish is traditional, Government and local authority does not take initiatives to develop marketing infrastructure, hidden syndication system in controlling market price, no preservation facilities for the farmers and traders.
There is well developed marketing chain system for shrimp in Bangladesh. For fish the marketing system is very weak. The whole system is controlled by a series of syndicate members. As a result, in one end producer farmers cannot derived their benefits upto a desired level and in other end consumers have to pay more. Weak communication network, fish transportation and preservation facilities are also considered as major drawbacks that hindered fish marketing and increases technical loss of commodity.

Overall: Fish and shrimp virus/bacterial diseases are major threats in fish/shrimp farming especially in the southern coastal districts of Bangladesh, intrusion of saline water in coastal freshwater ponds/ghers in southern areas made fish farming impossible, huge amount of other fish seeds and zooplanktons are being destroyed for collecting shrimp PL in the coastal belt which is a threat towards coastal aquatic biodiversity conservation. Natural disasters hamper fish farms ultimately resulting lower production.

Introduction

A Brief Description of the FtF Aquaculture Project

In collaboration with the government's efforts and USAID's FtF initiative, the world fish center has been implementing the FtF Aquaculture project with a view to meet the government and FtF goals to sustainably reduce poverty and hunger since October 2011. The project is one of the largest of its kind in Bangladesh funded by USAID under its FtF goal and covers a 5-year transformative investment in aquaculture focused on 20 southern districts of Barisal, Khulna and Dhaka divisions Beginning October 2011..

The project contributes to achieving the FtF goals through four objectives as follows:

1. ***Dissemination of improved quality fish and shrimp seed***
   Improved quality brood fish have currently been supplied to public and private actors. FtF-Aquaculture is working closely with key public and private actors in hatcheries for 2012 breeding season, and will be further supplemented for 2013-14 season. Together with technical support for fish and shrimp and nursery management, this component will lay the foundations for maintaining high quality seed production into the future. The project will benefit more than 900,000 households though this mechanism, and is expected to generate an associated increase in fish and shrimp production by 36000 and 24000 metric tons respectively over five years. An increase of $240 per year in household income should be realized as a result, improving gradually in increasing number of farm households with the growth of demand for quality stocks by farmers over five years.

2. ***Improving the nutrition and income status of farm households***
   The WorldFish Center, FtF Aquaculture project is partnering with other USAID supported projects to increase household incomes and nutrition for over 20,000 pond-owning households in the first 18 months of project activity. The project aims to extend impacts to a further direct 150,000 household pond owning families over the duration of the project. This outreach will be achieved through partnerships with USAID programs including the Nobo Jibon Multi Year Assistance Program (MYAP) implemented by Save the Children, and the Integrate Protected Area Co-management Project (IPAC) implemented through IRG(?). The project is working directly with MYAP and IPAC's key partners, CODEC and SpeedTrust, to ensure strong connectivity with rural communities, are in discussions with CARE, BRAC and others to help sustain our efforts into the future. WorldFish is focusing on introducing its income enhancing aquaculture technologies, including production of indigenous nutrient dense fish species, into these existing livelihood programs though training, demonstration and communication programs. Nutrition education and promotion of nutritionally rich and income boosting vegetables including Vitamin-A rich orange fleshed sweet potato cultivation will also be part of this component. Household incomes are expected to raise an average of $100 per year, while improved nutrition, as indicated by number of meals containing fish per month, will double.

3. ***Increasing investment, employment and fish production through commercial aquaculture***

   The project is working in the commercial aquaculture area of the southern region to stimulate further investment, employment and increased incomes and productivity. Within the first phase of 18 months, the project will deliver increased production to around 20,000 shrimp farmers and support 5000 entrepreneurs practicing high value commercial fish culture. Conditions for culture of 'new' brackish water commercial aquaculture species that are resilient to the increasing salinity in the southern region associated with water abstraction and climate change will be established.

4. ***Policy and regulatory reform and institutional capacity building to support sustainable aquaculture growth***

   To ensure long term continuity and impact of investments of USAID Feed the Future, the project is work directly with the Government of Bangladesh, particularly with the Department of Fisheries and Bangladesh Fisheries Research Institute. Initial activities will assist with implementing existing policy and regulatory measures in the hatchery and feed acts in order to enhance fish and fish feed quality. This will involve institutional capacity building, including expanding linkages between GOB and India, as well as private sector associations and businesses.

Targets

The project will contribute the following key results (Table 1.01) during the project period. The project will be implemented in three phases. Phase 1 covers 18 months. Targets and results framework is specific for this period. Also presented detail results and targets which will be generated over the five years. It emphasizes on the activities to be implemented within the first phase of 18 months, October 2011 - March 2013. A review will be conducted towards the end of the first phase to assess impacts and support preparation of detail implementation plans for scaling out of impacts during 2013-2016.

Table 1.01: FtF-Aquaculture Key Result: Oct 2011- Sep 2016

Indicators	18 month Target	36 month Target	60 Month Target
Number of households reached	766,922	971,524	1,172,933
Area covered by program (ha)	100,939	148,398	206,550
Increase in fish, shrimp and vegetables production (Mt)	21,726	57,714	105,035
Additional value from fish and shrimp and vegetable production (million US$)	42	147	354
Increase in employment	10,000	50,000	75,000

Objectives of the Baseline Study

The surveys will provide the basis for follow-up surveys including at the end of 2013 as part of the overall impact evaluation. Those findings will then act as a baseline for FtF-A's

second phase of work (2013-2016). Findings from these surveys will also enable FtF-A and the external evaluators to design methods for assessing impact at key points along the way to allow for adaptive management and course adjustments. The objectives of this agreement are to develop and understand:

- The baseline survey shall provide information required to describe qualitatively and quantitatively the indicators of the FtF Aquaculture Project (as provided in Section 2 above) and the project's M&E plan to measure impact of future project interventions. Provide reliable data for advocacy at all levels.

- Inputs link to Production Economics, Output; Cost Benefit Analysis; Knowledge, Attitude and Practice (KAP) of existing farms (shrimp, prawn, tilapia and carp fish); define the outreach households who needs quality seeds from the project indentified service delivery points and indentify control farms as baseline mechanism to track changes periodically.

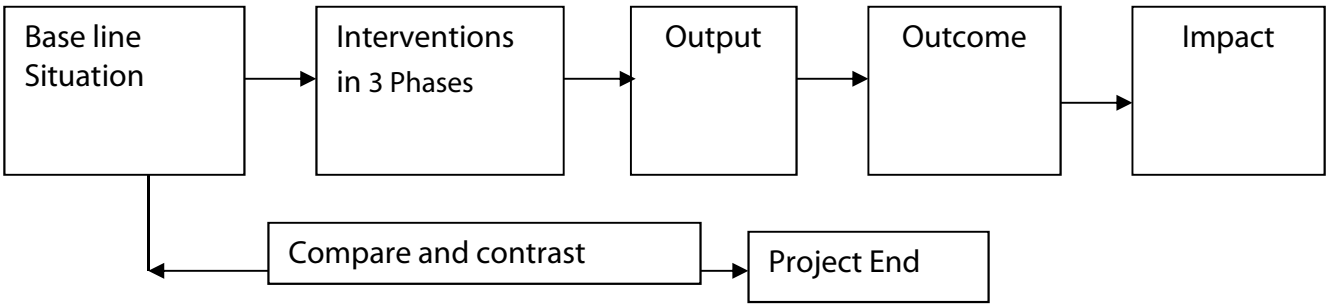
- And recommend performance monitoring tools and system for tracking hatchery and nursery's business growth considering baseline status.

METHODOLOGY

Conceptual Framework

The world fish center, Bangladesh has under taken the FtF Aquaculture project to reduce poverty and hunger by improving fisheries and aquaculture in project areas. The project envisaged to cover 20 districts under 4 hubs in three phases. The duration of 3 phases are: 18 months, 36 months, and 60 months respectively. It is planned to cover 30 upazilas of 10 districts under 4 hubs in the southern part of Bangladesh.

The input → process → output/impact model (Concept) used to develop the study Design is shown as:



A Significant difference between project end and base line level of indicators may be attributed to mainly project intervention.

The Study Design

Following the model as the conceptual framework the study team resorted to using "Before and After Approach" design to capture the difference between baseline and project end Situation of the indicator.

Figure 2: Before and After Approach Design.

Base line Level (P1)	End of 1st phase Level (P2)	End of 2nd phase Level (P3)	End of 3rd phase Level (P4)

The net effect of intervention after 3rd phase = $P_4 - P_1$.

Important Indicators

The TOR specifics a list of indicators among them the poverty prevalence, underweight among children, population under nutrition, fish in take prevalence rate, life skill and livelihood skill indicators are important. Indicators will be worked out in a way that would facilitate monitoring of ongoing project intervention and evaluation of the project after every phase.

Surveys

The study covered the following surveys: 1) Household Aquaculture Survey; 2) Commercial Fish Culture Survey; 3) Commercial Shrimp Culture Survey; 4) Cage Culture Survey; 5) Hatchery Survey; 6) Nursery Survey; and 7) Qualitative Survey.

Sampling Design

Considering time, cost and management constraints the baseline survey used "Three

stage Sampling Design". Upazilas are first stage, Villages are second stage and households are third stage sampling units. At each stage probability sampling was adopted.

Sample Sizes for the survey

Two standard formulas are used. The first one is for the sample size required to capture the changes in the prevalence of poverty or nutrition etc. The formula is:

$$n = D^*[(Z_{2+}Z_3)^2 * P_1(1-P_1)+P_4(1-P_4)]/(P_4-P_1)^2$$

The second one to reduce the coefficient of variation of sample Average compared to coefficient of variable of the variables such as production, project, sale etc. In this case inverse of square root of sample size equal the ratio of CV($\bar{x}$) to cv(x).

CV($\bar{x}$) is 5 percent of CV(x) i.e.,

$$\frac{CV(\bar{x})}{CV(x)} = 0.05 = \frac{5}{100} = \frac{1}{\sqrt{n}} = \frac{1}{20}, \text{ n=400}$$

The sample sizes worked out for different surveys are presented in the Table 3.

Table 3: Sample Size for All the Surveys by Project Groups

#	Name of the survey	Respondents category	Total samples	Method of selection
1	Household Aquaculture Survey	• Has HH pond • FtF Aqua catchment area • Pond size between 5 and 25 decimals	991	**Multistage sample systematic random sampling**
2	Commercial Fish Culture Survey	• Has pond • FtF Aqua catchment area • Pond size between 20 and 100 decimals	401	**Systematic random sampling**
3	Commercial Shrimp Culture Survey	• Has pond • FtF Aqua catchment area • Pond size between 30 and 20 0 decimals	570	**Systematic random sampling**
4	Cage Culture Survey	• Has cage or not • FtF Aqua catchment area	97	**Systematic random sampling**
5	Nursery Survey	• Concrete • Clay made • Pond Based	77	**Systematic random sampling**
6	**Hatchery Survey**	**Fish** • **Carp** • **Tilapia** • **Shrimp**	**37**	**Systematic random sampling**

The baseline sample size would be large enough to capture the difference between baseline, follow-ups and project end situation with statistical significance.

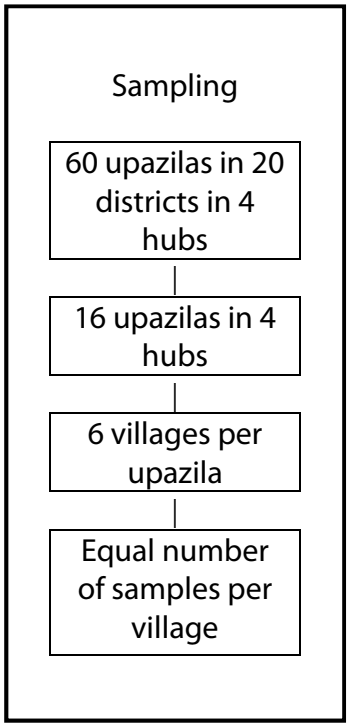
The initial size was taken large enough to ensure effective sample size required for desired precision level and confidence coefficient.

Sample Size for Project Beneficiaries and Non- project Households Meeting the Selection Criteria

As shown in column 5 and 6, the sample size of each survey has been divided into two groups in proportion to the eligible households included in the project and not yet included in the project.

Selection of Samples

A multistage stratified method was used to select the samples in this study. Sixty upazilas in 20 districts in 4 hubs in which FtF operates comprise the universe of the study. FtF had a list of all project fisher in the area from which the overall sampling fraction was determined for each survey. In the first stage 16 upazilas from 4 hubs were selected in proportion to the number of upazilas in each hub to obtain a representation of all the hubs in the sample. Next, the number of samples to be studied for each survey in each selected upazila was determined using the sampling fraction. In the second stage 6 villages from each upazila was selected at random. In the third stage equal number of samples was allocated in each selected village for each survey.



The senior researchers of the study drew the samples of the project households which the enumerator interviewed. The non-project farmers met all the criteria to be selected as project fisher but were not included in the project. The enumerators themselves searched and found the non-project fishers in the village and interviewed them until the required quota was fulfilled. If the required quota was not fulfilled in the sample village they moved to the next nearest village and interviewed to complete the quota.

Formation of the Core Survey Team

The core survey team included a Team Leader, a Field Research Manager, a Data Quality Manager, and two data collection Supervisors. The team leader had high academic training and long working experience in Bangladesh Fisheries sector, and all the members had extensive experience in designing and implementing a variety of surveys that utilized both quantitative and qualitative data collection and all of them served as team leader in previous assignments. The Data Quality Manager had special experience in overseeing data entrant teams and programming with quantitative analysis software. Familiarity with USAID quality standards, technical expertise in agriculture and health (nutrition, and hygiene) and background in research methods and statistics were special considerations in selecting the members for the survey.

Development and Finalization of the Survey Instruments

The survey instruments included seven questionnaires one each for the seven surveys and a field data collection manual. The draft documents prepared by the core research team were jointly reviewed by WFC FtF Aquaculture team and the research team. The questionnaires were tried to be made self explanatory giving explanations, Averageings and instructions to the enumerators underneath each question as far as possible. Once the questionnaires were approved it was translated into Bengali and the Bengali questionnaire was pretested among actual beneficiaries of the survey by two data collection supervisors in a non-sample area to check its efficacy for data collection in this survey. Some sections of it were revised and reframed according to the field experience for more ease and clarity before it was finally accepted for data collection in this study.

Development of the Field Survey Manual

A field survey manual was developed in Bengali 1) summarizing the objectives and implementation mechanisms of the FtF Aquaculture project, 2) explaining the survey approach and methodology, and 3) detailing a question-by-question explanation of the terms and intended Averageings of the questions. The manual was discussed in enumerator training and each enumerator carried a copy of it for reference while collecting data in order to keep uniformity of understanding and homogeneity of data collection across all enumerators.

Orientation and Training of the Enumerators

Field data for this survey were collected by 56 enumerators who had at least bachelor degree and previous experience of collecting quantitative and qualitative data through face to face interview. Initially 120 enumerators were hired through competitive interviews and given three day extensive residential training in Khulna on goals and objectives of the survey, interview techniques, sampling, data collection instruments, monitoring procedures and field data collection using the final questionnaire. Later they were given one day supervised practical test on data collection among actual beneficiaries of the project using the final questionnaire in a non-sample area. After each day debriefing sessions were held and their performance were reviewed by the core survey team and finally the best 56 enumerators were retained for data collection in this survey.

Implementation of the Survey

The enumerators were divided into 8 groups in such a way that one group could complete data collection in one selected village in one day. Data were collected through face-to-face interview and in each case respondent's prior consent was obtained. The enumerators conducted the interviews, probed the responses where necessary, and recorded data taking maximum care for improved data reliability. The field supervisors accompanied the teams during data collection and visited the enumerators as they worked, and were available to all enumerators over phone to provide instant support and advice.

The field supervisors were responsible for drawing the sample and the enumerators interviewed the selected sample. The field supervisors were also responsible for deployment plan that detailed how the field enumerators would cover the sample, the number of interviews each enumerator would complete per day, and other pertinent

details.

The field supervisors were specially coached during the training on how to assign work to the enumerators and how to keep track of their work in order to organise the fieldwork more effectively and efficiently. After the data collection each day, the supervisors and enumerators crosschecked all completed questionnaire of that day, reviewed the performances of the survey, resolved problems if any, and ensured that no pending work was left on data verification for the day. Thereafter, the team planned for the next day.

The data collection was divided into two phases. In the first phase, all the data collection teams were deployed in 6 upazilas in Khulna hub for 2 days. The senior research staff accompanied them in the field to oversee the compliance of the research methodologies, monitor data collection procedures, and to solve any problems. They also checked the completed interviews for internal consistency. After 2 days of data collection the teams returned and assembled in a central place for one day mid-term review and debriefing. There, research methodologies were reiterated, and any problems, weaknesses and experiences were discussed freely and frankly, and deficiencies were removed on individual basis. The teams then moved to their respective data collection zones and completed the rest of the interviews in the second phase.

Quality Control and Internal Validity

Quality control is built in every stage in this survey. The enumerators had previous experience of field data collection through interviews, they were given extensive training and field practice using the survey instruments, the questionnaires were prepared in local language and pretested among actual project beneficiaries for clarity and comprehensiveness, samples were drawn by the senior researchers and the enumerators interviewed the given samples, and interviews were conducted without prior information to anyone and outside influence. Besides, two field supervisors visited the enumerators in the field everyday and were available to them over phone for instant advice and support. Field interviews were checked for consistency by the senior researchers as these were received electronically and sent back to the enumerators for validation through revisit to the respondents in case of any doubtful entry. Each interview took less than fifty minutes to complete, respondents replied freely and spontaneously, and non-response was not a serious issue in this survey. So the quality and validity of data is unlikely to be a major problem in this study.

Data Processing

Data collection and data entry were carried out simultaneously. Double entry procedure was followed for data entry. A customized data entry package was developed with all possible in-built conditional, logical and range check procedures to detect any errors in data entry.

During data entry, a tabulation plan to produce tables was prepared and necessary programs were developed using SPSS to analyze the data.

Qualitative Survey

Qualitative data was gathered through Focus Group Discussion (FGD) from the Project and Non-project fish farmers, Hatchery Owners, Middlemen and other Actors in the value chain at different field level of southern districts.

The first portion will be illustrated on supply and value chain among different actors and the second portion will be on point-wise problems/constraints and suggestions/recommendations
FGDs were conducted in four hubs based on different types of actor in the value chain. In total, number of FGD was seven. Every relevant actor was covered in FGD. Some case studies were also made instead of FGD to understand the value chain fruitfully. FGDs were conducted with 7 to 10 participates of each group. .

Household Characteristics

Nearly two-thirds of the sample households were headed by male (Table 3.01). Average size of the households was 4.6 members which corresponded well with the national average of 4.9 members (BBS, 2011). Most of the farmers (94.3%) were over 25 years of age and had some school education (level of education). The main occupation of the female headed households was housekeeping. Overall, nearly a quarter of the household heads had farming and less than one-fifth had fish culture as the main occupation and three quarters of them some secondary occupation. On the average they had over a decade of involvement in pond fish culture and nearly one-third of them received one or more training in fish cultivation in the last three years of the survey.

Table 3.01: Household Characteristics

Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Average household size	4.8		4.2		4.5		4.8		4.6	
Sex of household head										
Male	336	68.9	78	96.3	225	66.6	74	88.1	713	71.9
Female	152	31.1	3	3.7	113	33.4	10	11.9	278	28.1
Total	488	100	81	100	338	100	84	100	991	100
Age of the farmer (years)										
Less than 25	22	4.5	3	3.7	19	5.6	12	14.3	56	5.7
25-49	324	66.4	40	49.4	202	59.8	48	57.1	614	62.0
50 or more	142	29.1	38	46.9	117	34.6	24	28.6	321	32.4
Total	488	100	81	100	338	100	84	100	991	100
Average		42.5		46.1		42.3		40.9		42.6
Educational level of the farmer (grades completed)										
Illiterate	61	12.5	21	25.9	49	14.5	8	9.5	139	14.0
Primary	160	32.8	16	19.8	127	37.6	14	16.7	317	32.0
Secondary	218	44.7	35	43.2	132	39.1	39	46.4	424	42.8
Higher Secondary	32	6.6	5	6.2	18	5.3	11	13.1	66	6.7
Above HSC	17	3.5	4	4.9	12	3.6	12	14.3	45	4.5
Total	488	100	81	100	338	100	84	100	991	100
Primary occupation of the farmer										
Farming	132	27.0	37	45.7	92	27.2	16	19.0	277	28.0
Housewife	142	29.1	4	4.9	109	32.2	6	7.1	261	26.3
Fish culture	87	17.8	8	9.9	19	5.6	34	40.5	148	14.9
Vendor	32	6.6	11	13.6	21	6.2	9	10.7	73	7.4
Business	26	5.3	3	3.7	31	9.2	12	14.3	72	7.3
Service	21	4.3	6	7.4	22	6.5	4	4.8	53	5.3
Day labor	20	4.1	3	3.7	22	6.5	2	2.4	47	4.7
Handicrafts	8	1.6	2	2.5	10	3.0	0	0.0	20	2.0
Rickshaw driver	8	1.6	4	4.9	6	1.8	0	0.0	18	1.8
Professional	4	0.8	0	0.0	1	0.3	0	0.0	5	0.5
Others	8	1.6	3	3.7	5	1.5	1	1.2	17	1.7
Total	488	100.0	81	100.0	338	100.0	84	100.0	991	100.0

Table 3.01: Household Characteristics										
Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Secondary occupation of the farmer										
Vendor	35	7.2	2	2.5	13	3.8	6	7.1	56	5.7
Day labor	10	2.0	2	2.5	4	1.2	0	0.0	16	1.6
Rickshaw driver	3	0.6	1	1.2	0	0.0	0	0.0	4	0.4
Farming	60	12.3	3	3.7	27	8.0	13	15.5	103	10.4
Handicrafts	5	1.0	0	0.0	1	0.3	0	0.0	6	0.6
Fish culture	210	43.0	51	63.0	208	61.5	38	45.2	507	51.2
Others	6	1.2	2	2.5	15	4.4	2	2.4	25	2.5
None	159	32.6	20	24.7	70	20.7	25	29.8	274	27.6
Total	488	100.0	81	100.0	338	100.0	84	100.0	991	100.0
Average no. of training received	3.9		0.0	.	3.8		2.5		3.7	
Average years involved in fishing	13.8		10.7		9.4		9.9		11.7	

Fish Ponds

The Average number of fish ponds under cultivation per household was 2.0 and some 20% of the households found to cultivate fish in more than 2.0 ponds (Table 3.02). The Average water area cultivated by per household was 0.38 hectare decimals that varied widely from 0.61 in Khulna, 0.19 hectare in Faridpur, 0.09 hectare in Barisal and 0.41 hectare in Jessore. Nearly 10% households leased in and 5% leased out some pond.

Table 3.02: Fish Ponds										
Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
No. of fish ponds cultivated										
1-2	335	68.6	72	88.9	311	92.0	64	78.0	782	79.1
3-4	122	25.0	8	9.9	25	7.4	11	13.4	166	16.8
5 or more	31	6.4	1	1.2	2	0.6	7	8.5	41	4.1
Total	488	100	81	100	338	100	82	100	989	100
Average	2.2		1.5		1.4		2.0		1.9	
Area of fish ponds cultivated (**hectare**)										
Upto 1.00	407	83.4	79	97.5	333	99.4	73	89.0	892	90.5
1.01-300	67	13.7	2	2.5	2	0.6	7	8.5	78	7.9
3.01 and abvoe	14	2.9	0	0.0	0	0.0	2	2.4	16	1.6
Total	488	100	81	100	335	10	82	100	986	100
Average area	0.61		0.19		0.09		0.41		0.38	
Leased in ponds										
No. of Farmers leased in ponds	92	18.9	11	13.6	13	3.8	11	13.1	127	12.8
Average area (hectare.)	1.03		0.43		0.20		1.33		0.92	
Leased out ponds										
No. of Farmers leased out ponds	50	10.2	4	4.9	0	0.0	4	4.8	58	5.9
Average area (hectare	0.57		0.37		-		0.40		0.95	

Cultivable Land

Average area cultivated by per household was 0.43 hectoare varying from 0.70 hectoare in Barisal to 0.43 hectoare in Khulna.

Table3.03: Cultivable Land										
Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Area of land cultivated (hectare)										
Upto 1.00	211	90.6	56	81.2	190	77.2	54	88.5	511	83.9
1.01-300	20	8.6	13	18.8	52	21.1	7	11.5	92	15.1
3.01 and abvoe	2	0.9	0	0.0	4	1.6	0	0.0	6	1.0
Total	233	100	69	100	246	100	61	100	609	100
Average area	0.43		0.65		0.70		0.50		0.57	

Home Gardening

Nearly 97% of the households owned a homestead (Table 3.04). The Average homestead area was 23 decimals and three-fifths of the households had an area of less than 20 decimals.

Over half the households did not cultivate a homestead vegetable garden. Average area cultivated by per household was 7 decimals while most of the farmers cultivated less than 10 decimals.

Homestead Trees

Nearly half of the households owned homestead tree area and one-quarter had over 5 decimals (Table 3.04). The homestead tree area included areas under bamboo, timber and fruit trees. The Average number of homestead trees owned by per household was 12 varying from 8 in Faridpur to 17 in Jessore.

Table 3.04: Home Gardening and Homestead Trees										
Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Area in homestead (dec)										
Less than 20	273	55.9	57	70.4	181	53.6	58	69.0	569	57.4
20-39	133	27.3	13	16.0	99	29.3	14	16.7	259	26.1
40 or more	66	13.5	10	12.3	48	14.2	10	11.9	134	13.5
None	16	3.3	1	1.2	10	3.0	2	2.4	29	2.9
Total	488	100.0	81	100.0	338	100.0	84	100.0	991	100.0
Average area (Dec.)	24.4		18.8		23.6		19.6		23.3	
Area cultivated (decimals)										
Less than 10	204	82.9	18	90.0	202	87.1	20	90.9	444	85.4
10-19	15	6.1	0	0.0	7	3.0	2	9.1	24	4.6
Over 19	27	11.0	2	10.0	23	9.9	0	0.0	52	10.0
Total	246	100.0	20	100.0	232	100.0	22	100.0	520	100.0
Average area (Dec.)	7.4		4.7		7.5		4.2		7.2	
Area under homestead trees (dec)										
Less than 5	82	16.8	20	24.7	79	23.4	9	10.7	190	19.2
5-9	28	5.7	5	6.2	47	13.9	8	9.5	88	8.9
Over 9	48	9.8	7	8.6	95	28.1	19	22.6	169	17.1
None	330	67.6	49	60.5	117	34.6	48	57.1	544	54.9
Total	488	100.0	81	100.0	338	100.0	84	100.0	991	100.0
Average area (Dec.)	9.7		8.0		13.2		17.3		11.9	

Household Income

Earning income from more than one source was common among the households (Table

3.05). On the average a household earned income from 4.4 sources and most of the households earned income from 3 to 6 sources.

Table 3.05: Number of Sources of Household Incomer

No. of sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
1-2	51	10.5	5	6.2	8	2.4	10	12.2	74	7.5
3-4	261	53.5	50	61.7	110	32.5	50	61.0	471	47.6
5-6	146	29.9	23	28.4	177	52.4	20	24.4	366	37.0
7 or more	30	6.1	3	3.7	43	12.7	2	2.4	78	7.9
All	488	100	81	100	338	100	82	100	989	100
Average	4.2		4.0		5.0		3.9		4.4	

Average monthly income of the households was Tk. 12,594 and per capita income was Tk. 2, 923 Aquaculture, crops and vegetables, and business was the most important sources of income of the households. 10-30% of the household income was derived from these sources. Although 70% of the households earned income from livestock and poultry and some 40% earned income from home gardening and homestead trees the share of these sources to total income was very small (Table 3.06)..

Table 3.06: Average Monthly Gross Household Income by Sources

Sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)
Crops and vegetables	51.2	11.4	86.4	25.1	75.4	20.5	75.6	16.8	64.4	15.9
Livestock and poultry	70.1	4.2	42.0	2.4	78.4	3.9	64.6	4.9	70.2	4.0
Home gardening	41.8	1.2	14.8	0.4	50.3	1.3	11.0	0.2	39.9	1.1
Homestead trees	30.9	1.8	22.2	1.7	59.2	2.6	25.6	0.9	39.4	2.0
Aquaculture	91.4	43.1	92.6	23.1	93.8	15.6	93.9	20.0	92.5	30.1
Other fisheries	12.9	2.7	29.6	1.0	22.2	2.5	1.2	0.0	16.5	2.3
Water pump rental	3.9	0.2	6.2	1.0	0.6	0.0	4.9	0.5	3.0	0.2
Power tiller rental	1.8	0.2	4.9	0.8	0.9	0.3	3.7	0.3	1.9	0.2
Fishing net rental	2.7	0.1	2.5	0.3	0.6	0.0	3.7	0.1	2.0	0.1
Labor selling	24.0	5.2	25.9	5.4	22.8	7.9	8.5	1.7	22.4	5.8
Services	12.9	6.9	13.6	9.7	15.7	8.4	20.7	10.4	14.6	7.9
Large lusiness	11.3	6.3	6.2	4.6	15.1	12.9	23.2	25.4	13.1	10.3
Small trade	17.0	4.4	22.2	9.3	14.8	4.8	19.5	3.1	16.9	4.8
Vehicle rental	7.2	2.3	2.5	0.9	6.2	2.5	0.0	0.0	5.9	2.1
Remittance	10.9	4.5	9.9	7.4	23.1	12.6	13.4	11.7	15.2	8.2
Leased out land	14.3	2.1	16.0	4.1	10.7	2.3	8.5	0.9	12.7	2.2
Others	11.7	3.3	6.2	2.8	8.9	2.0	11.0	3.0	10.2	2.8

Ownership and Characteristics of the Selected Pond

Data on ownership pattern reveals that most of the selected ponds were singly owned (85%) by the households; in case of jointly owned and jointly leased ponds the Average number of owners was 3 in both cases (Table 3.07). Most of the ponds had loamy, sandy loamy and clay loam soil. Silt or sandy soils were found relatively rare. Thus the soil chactereristics of the ponds reflects their their productivity.

The Average of total pond area, water surface area and dike area of the ponds was 16 decimal, 12 decimal and 4 decimal, respectively. The Average water depth in the ponds was 5.4 ft in the culture season (May to September) but found to retain water at a depth level that allows to culture fish throughout the year. On the average nearly 30% of the water area was shaded by trees and the Average age of the ponds was 22 years. The stated description of the ponds does not reflect an ideal situation for fish culture in those ponds, because in almost all the cases these rural household ponds were dugged purposively to serve the domestic requirements of the houswhold. However, considering all other factors, like quality of the soil and their productive nature, sub surface and surface water sources, fist growing and short cycle fish species availability and cost and availability of inputs, these household pond resources can be ideally used as a potential source of family nutrition and income generation, as well.

Table 3.07: Characteristics of the Selected Ponds

Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Ownership status										
Singly owned	411	84.2	68	84.0	282	83.4	81	96.4	842	85.0
Jointly owned	66	13.5	9	11.1	53	15.7	3	3.6	131	13.2
Singly leased	10	2.0	3	3.7	3	0.9	0	0.0	16	1.6
Jointly leased	1	0.2	1	1.2	0	0.0	0	0.0	2	0.2
Total	488	100	81	100	338	100	84	100	991	100
Average no. of owners of joined owned pond	2.8		2.9		3.0		3.3		2.9	
Type of soil										
Loamy	88	18.0	22	27.2	50	14.8	20	23.8	180	18.2
Clay	82	16.8	5	6.2	130	38.5	2	2.4	219	22.1
Sandy	30	6.1	4	4.9	3	0.9	5	6.0	42	4.2
Sandy loam	157	32.2	23	28.4	112	33.1	39	46.4	331	33.4
Clay loam	112	23.0	25	30.9	35	10.4	14	16.7	186	18.8
Silt	6	1.2	2	2.5	0	0.0	0	0.0	8	0.8
Silt loam	9	1.8	0	0.0	0	0.0	0	0.0	9	0.9
Others	4	0.8	0	0.0	8	2.4	4	4.8	16	1.6
Total	488	100	81	100	338	100	84	100	991	100
Pond size										
Average pond area (dec)	14.6		18.1		14.8		24.1		15.7	
Average water area (dec)	11.1		11.9		11.0		17.3		11.6	
Average dike area (dec)	3.7		5.4		3.8		6.2		4.1	
Water area shaded by trees (%)	27.1		34.5		29.3		35.5		29.1	
Average water depth in culture season (feet)	5.0		4.6		6.2		4.8		5.4	
No. of months water retains for fish culture	11.4		11.5		11.8		11.4		11.5	
Average age of the pond (yrs)	27.5		17.6		16.3		22.4		22.5	

Input Use and Costs and Returns of Household Aquaculture

Input use and cost and return data were collected for one pond per household. In case of household had more than one pond a randomly selected pond of larger than five decimals was chosen.

In Bangladesh, in all most all cases household ponds in addition to their domestic use, traditionally stocks with various types of fish species particularly to fulfill the family requirement. Under that consideration, over the study area all household also found to involve with fish raising activities from many years ago before conducted this baseline study. Average size of those study ponds under the hubs as recorded were about 12 decimal while the highest size (17.4 decimal) was in Jessor (Table 3.08).

Table 3.08: Household Pond Fish Culture

Items	Khulna	Faridpur	Barisal	Jessore	All regions
Households cultivated (#)	488	81	338	82	989
Total water area in decimal	5355	956	3708	1429	11448
Total water area in hectare	21.68	3.87	15.01	5.79	46.35
Average pond size (dec)	11.0	11.8	11.0	17.4	11.6

Almost all the labors involved in the fish culture were unpaid household labor and over 33% of them were female. Unpaid family labour was shown 22.5 per decimal and paid labour was only 0.43 per decimal. It is mentionable that the estimate of the household labour seems to be too high, because account of household labour was not mentained, they considered number of one member worked for some hour in a day as a man-day. However, for the hired labour they had to pay, so they mentaied it properly (Table 3.9).

Average labor cost was Tk. 150 per labor/day and the average value of fish was 100 Taka per kg in the area which was used in calculating the costs and returns of fish culture throughout the regions. Since labor cost comprised most of the costs the uniform rates will provide better measures of margins which will be directly comparable across the regions.

Table 3.9: Labor Use and Costs in Pond Fish Culture

LLabor type	Khulna	Faridpur	Barisal	Jessore	All regions	%
HH labor						
Male	14	20.4	14	17.8	15	65.70
Female	7.7	11.9	7.9	2.4	7.4	32.41
Total	21.7	32.3	21.9	20.2	22.5	98.55
Hired labor						
Male	0.25	0.18	0.17	0.14	0.27	1.18
Female	0.23	0.19	0.07	0	0.16	0.70
Total	0.48	0.37	0.34	0.24	0.33	1.45
All laborers	22.2	32.67	22.24	20.44	22.83	100.00

Fixed cost items like land, water, structures, operational instruments, machineries and accessories etc for aquaculture are almost same. However their degree of

utilization/operation and quantity may vary from case to case and on the type of culture system. However in the present study, among the durable inputs, 60% of the households found to use spade or sickles, over 50% used harvesting net, 40% used bamboo, wood or rope, and 20% or fewer found to use the other inputs like hapa, tube, drum, etc.

Most of the farmers used lime and nearly 50% of them used inorganic and organic fertilizers for pond preparation. Most of the farmers used supplementary feeds and 40% of them used organic and inorganic fertilizers and lime for post stocking management. Average quantities of inputs used were of negligible quantity. Most of the farmers raised Rui in ponds, nearly 66% raised Katla and silver carp on mixed basis, and 50% raised Thai Sarputi with carps and Tilapia or Niloticaon monoculture basis.

Average cash cost of fish culture was Tk. 464 per decimal (Table 3.10) and average return was Tk. 722 per decimal (Table 3.11). On the average a farmer got gross margin of Tk. 258 per decimal and Tk. 63726 per hectare . Benefit–Cost Ratio was 1.56 (Table-3.11&3.12)

Table 3.10: Costs of Pond Culture

Items	Per Decimal					
	Khulna	Faridpur	Barisal	Jessore	All regions	%
Fixed costs	110	120	100	125	118	25.43
Hired labor	72	56	51	36	50	10.78
Pond preparation	21	24	20	23	23	4.96
Seeding	119	120	115	122	120	25.86
Inputs for stock management	119	121	123	118	121	26.08
Water management	12	11	13	8	12	2.59
Harvesting	10	9	12	11	11	2.37
Selling	8	8	10	10	9	1.94
Cash cost per dec.	471	469	444	453	464	100.00
Cash cost per hectare	116337	115843	109668	111891	114608	

Table 3.11: Outputs of Pond Culture

Outputs	Khulna		Faridpur		Barisal		Jessore		All regions	
	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)
Output per dec	5.2	702	5.3	678	5	625	5.6	728	5.43	722
Output per hect.	1284	173394	1309.1	167466	1235	154375	1383.2	179816	1341	178334

Table 3.12: Financial Returns from Pond Culture

Returns	Khulna	Faridpur	Barisal	Jessore	All regions
	(Tk)	(Tk)	(Tk)	(Tk)	(Tk)
Return per decimal	702	678	625	728	722
Cash cost per decimal	471	469	444	453	464
Gross margin per decimal	231	209	181	275	258
Gross margin per hectare	57057	51623	44707	67925	63726
Benefit-Cost Ratio	1.49	1.44	1.41	1.60	1.56

Nearly 47% of the fish output was consumed in the households and 37% was sold in the market. Technical loss of fish output was found very small Few portion were used for product development like dry fish and gift to the neighbours and others (Table 1.13).

Table 3.13: Disposal of Pond Fish

Disposal	Khulna (% output)	Faridpur (% output)	Barisal (% output)	Jessore (% output)	All regions (% output)
Consumed	54.8	56.7	53.6	48.7	54.0
Sold	32.9	34.9	39.5	46.7	36.6
Gifted	7.9	7.4	3.4	4.3	6.0
Dried	2.4	0.0	3.3	0.0	2.3
Technical loss	2.0	0.9	0.2	0.3	1.2

Sources of Fish Seeds

Traditionally the most common practice of fish seed selling in the rural areas of Bangladesh is done by Patilwala or Faria. Over the period, with the establishment of fish breeding hatcheries and selling network and bringing of diversified high yielding fish species under the breeding program and improved transportation mechanisn, various other distribution channels of fish seed developed in the counry during the last two decades which has been extended upto village level. Even after that still the selling of fish seed for household pond fish culture, Patilwala occupies the highest position. This fact was also found true for the present study areas where they cover 60-90% of household's seed requirements. Other following such sources are private nurseries and then neighbours pond. High dependency of pond owners on Patilwala is because of the multiple involvement of farmers in different business so they cannot effort time and getting their seeds at pond side by the Patilwala, seed may be purchased on credit basis, low price of seed and mortality risk is also low etc.

Selling of seed of Small Indigenous Fishes (SIS) by Patilwala and others are not a common practice in Bangladesh. However, with increasing awareness of people about importance of nutrient dense fish species, few people are now a days collecting and stocking these seeds from wild sources and maintain culture environment for their growth and propagation. Now a days these species are also considered as high priced item. As a result traders are gradually getting interest to invole themselves into its trade. In the study area 44% of fish culturists mentioned Patilwala as a source of SIS seed for their culture ponds.

In case of Galda PL, though there are available GO and NGO hatchery sources in the country, farmers are still found to depend directly on the wild sources (about 50%). This may may because of better growth, breeding response, disease resistance and ess mortality of the wild seed that can ensure profitability. In case of other 31% farmers, they collect Galda PL from Patilwala that generally contains a mixed seed of hatchery and wild sources. Some of the farmer purchase seedlings from village traders or imported, these were very few in number, so these sources were categories as other.

Table 3.14: Sources of Fish Seeds

Sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Rui										

Private nursery	14	3.3	24	29.3	11	3.6	29	36.3	78	8.8
Govt nursery	3	0.7	0	0.0	0	0.0	2	2.5	5	0.6
Patilwala/Faria	388	92.8	39	47.6	277	91.1	25	31.3	729	82.5
Other famer	2	0.5	5	6.1	11	3.6	21	26.3	39	4.4
Hatchery	3	0.7	4	4.9	0	0.0	2	2.5	9	1.0
Own raised	1	0.2	3	3.7	2	0.6	1	1.3	7	0.8
Wild	1	0.2	0	0.0	1	0.3	0	0.0	2	0.2
Others	6	1.4	7	8.5	2	0.7	0	0.0	15	1.7
All	418	100.0	82	100.0	304	100.0	80	100.0	884	100.0
Katla										
Private nursery	7	2.9	25	33.3	11	4.3	20	37.7	63	10.0
Govt nursery	1	0.4	0	0.0	0	0.0	2	3.8	3	0.5
Patilwala/Faria	229	93.9	35	46.7	229	89.1	18	34.0	511	81.2
Other famer	0	0.0	3	4.0	12	4.7	13	24.5	28	4.5
Hatchery	1	0.4	2	2.7	0	0.0	0	0.0	3	0.5
Own raised	0	0.0	3	4.0	3	1.2	0	0.0	6	1.0
Wild	1	0.4	0	0.0	1	0.4	0	0.0	2	0.3
Others	5	2.0	7	9.3	1	0.4	0	0.0	13	2.1
All	244	100.0	75	100.0	257	100.0	53	100.0	629	100.0
Mrigel										
Private nursery	9	5.5	17	27.0	5	4.5	22	37.9	53	13.4
Govt nursery	1	0.6	0	0.0	0	0.0	2	3.4	3	0.8
Patilwala/Faria	150	91.5	31	49.2	97	87.4	18	31.0	296	74.7
Other famer	1	0.6	0	0.0	7	6.3	13	22.4	21	5.3
Hatchery	1	0.6	3	4.8	0	0.0	2	3.4	6	1.5
Own raised	0	0.0	4	6.3	1	0.9	1	1.7	6	1.5
Wild	0	0.0	0	0.0	1	0.9	0	0.0	1	0.3
Others	2	1.2	8	12.7	0	0.0	0	0.0	10	2.5
All	164	100.0	63	100.0	111	100.0	58	100.0	396	100.0
Silver Carp										
Private nursery	6	2.3	21	31.8	9	4.1	19	32.8	55	9.1
Govt nursery	1	0.4	0	0.0	0	0.0	2	3.4	3	0.5
Patilwala/Faria	253	96.9	32	48.5	199	91.3	21	36.2	505	83.7
Other famer	0	0.0	1	1.5	9	4.1	15	25.9	25	4.1
Hatchery	1	0.4	3	4.5	0	0.0	1	1.7	5	0.8
Own raised	0	0.0	3	4.5	1	0.5	0	0.0	4	0.7
Other	0	0.0	6	9.1	0	0.0	0	0.0	6	1.0
All	261	100.0	66	100.0	218	100.0	58	100.0	603	100.0
Grass Carp										
Private nursery	4	3.5	6	18.8	3	5.0	3	21.4	16	7.3
Govt nursery	0	0.0	1	3.1	0	0.0	1	7.1	2	0.9
Patilwala/Faria	106	93.0	16	50.0	56	93.3	5	35.7	183	83.2
Other famer	1	0.9	1	3.1	0	0.0	4	28.6	6	2.7
Hatchery	2	1.8	2	6.3	0	0.0	1	7.1	5	2.3
Own raised	1	0.9	2	6.3	0	0.0	0	0.0	3	1.4
Others	0	0.0	4	12.5	1	1.7	0	0.0	5	2.3
All	114	100.0	32	100.0	60	100.0	14	100.0	220	100.0
Common Carp										
Private nursery	0	0.0	6	33.3	0	0.0	5	38.5	11	20.0
Govt nursery	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00
Patilwala/Faria	16	88.9	10	55.6	6	100.0	2	15.4	34	61.8
Other famer	0	0.0	0	0.0	0	0.0	5	38.5	5	9.1

Hatchery	1	5.6	1	5.6	0	0.0	1	7.7	3	5.5
Own raised	1	5.6	0	0.0	0	0.0	0	0.0	1	1.8
Other	0	0.0	1	5.6	0	0.0	0	0.0	1	1.8
All	18	100.0	18	100.0	6	100.0	13	100.0	55	100.0
Mirror Carp										
Private nursery	3	2.9	3	18.8	4	3.8	10	41.7	20	8.1
Govt nursery	0	0.0	0	0.0	0	0.0	2	8.3	2	0.8
Patilwala/Faria	96	94.1	10	62.5	92	86.8	5	20.8	203	81.9
Other famer	0	0.0	1	6.3	8	7.5	5	20.8	14	5.6
Hatchery	0	0.0	0	0.0	0	0.0	1	4.2	1	0.4
Own raised	1	1.0	2	12.5	0	0.0	1	4.2	4	1.6
Wild	1	1.0	0	0.0	1	0.9	0	0.0	2	0.8
Others	1	1.0	0	0.0	1	0.9	0	0.0	2	0.8
All	102	100.0	16	100.0	106	100.0	24	100.0	248	100.0
Thai Sarputi										
Private nursery	7	2.6	12	26.1	7	4.0	13	40.6	39	7.4
Govt nursery	1	0.4	0	0.0	0	0.0	1	3.1	2	0.4
Patilwala/Faria	262	95.6	24	52.2	160	92.5	11	34.4	457	87.0
Other famer	1	0.4	2	4.3	6	3.5	7	21.9	16	3.0
Hatchery	1	0.4	1	2.2	0	0.0	0	0.0	2	0.4
Own raised	1	0.4	3	6.5	0	0.0	0	0.0	4	0.8
Others	1	0.4	4	8.7	0	0.0	0	0.0	5	1.0
All	274	100.0	46	100.0	173	100.0	32	100.0	525	100.0
Thai Pangas										
Private nursery	2	4.3	1	20.0	5	5.3	1	50.0	9	6.0
Govt nursery	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00
Patilwala/Faria	43	91.5	3	60.0	88	92.6	0	0.0	134	89.9
Other famer	1	2.1	1	20.0	1	1.1	0	0.0	3	2.0
Hatchery	0	0.0	0	0.0	0	0.0	1	50.0	1	0.7
Wild	1	2.1	0	0.0	1	1.1	0	0.0	2	1.3
All	47	100.0	5	100.0	95	100.0	2	100.0	149	100.0
GIFT										
Private nursery	0	0.0	1	20.0	5	12.8	6	85.7	12	20.0
Govt nursery	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00
Patilwala/Faria	8	88.9	2	40.0	31	79.5	0	0.0	41	68.3
Other famer	0	0.0	1	20.0	1	2.6	1	14.3	3	5.0
Own raised	1	11.1	0	0.0	1	2.6	0	0.0	2	3.3
Other	0	0.0	1	20.0	1	2.6	0	0.0	2	3.3
All	9	100.0	5	100.0	39	100.0	7	100.0	60	100.0
Tilapia/Nilotica										
Private nursery	8	2.9	13	28.9	4	2.2	19	30.2	44	7.8
Govt nursery	1	0.4	0	0.0	1	0.5	0	0.0	2	0.4
Patilwala/Faria	204	74.7	23	51.1	154	84.6	25	39.7	406	72.1
Other famer	22	8.1	2	4.4	13	7.1	17	27.0	54	9.6
Hatchery	5	1.8	2	4.4	0	0.0	2	3.2	9	1.6
Own raised	17	6.2	2	4.4	4	2.2	0	0.0	23	4.1
Wild	6	2.2	0	0.0	3	1.6	0	0.0	9	1.6
Others	10	3.7	3	6.7	3	1.6	0	0.0	16	2.8
All	273	100.0	45	100.0	182	100.0	63	100.0	563	100.0
Mola/Dhela/Tengra										
Private nursery	0	0.0	1	50.0	0	0.0	0	0.0	1	6.3
Govt nursery	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00

Patilwala/Faria	0	0.0	0	0.0	0	00.0	0	0.0	0	0.00
Other famer	6	66.7	0	0.0	3	60.0	0	0.0	11	69.3
Own raised	0	0.0	1	50.0	0	0.0	0	0.0	1	6.3
Wild	1	11.1	0	0.0	2	40.0	0	0.0	3	18.8
Other	2	22.2	0	0.0	0	0.0	0	0.0	2	12.5
All	9	100.0	2	100.0	5	100.0	0	0.0	16	100.0
Other white fish										
Private nursery	0	0.0	6	42.9	2	22.2	3	37.5	11	12.6
Govt nursery	2	3.6	0	0.0	0	0.0	0	0.0	2	2.3
Patilwala/Faria	44	78.6	6	42.9	7	77.8	2	25.0	59	67.8
Other famer	1	1.8	1	7.1	0	0.0	2	25.0	4	4.6
Hatchery	0	0.0	0	0.0	0	0.0	1	12.5	1	1.1
Wild	7	12.5	0	0.0	0	0.0	0	0.0	7	8.0
Others	2	3.6	1	7.1	0	0.0	0	0.0	3	3.4
All	56	100.0	14	100.0	9	100.0	8	100.0	87	100.0
Golda PL										
Private nursery	5	3.9	0	0.0	2	6.7	0	0.0	7	4.4
Patilwala/Faria	44	34.1	0	0.0	6	20.0	0	0.0	50	31.3
Other famer	1	0.8	1	100.0	1	3.3	0	0.0	3	1.9
Hatchery	6	4.7	0	0.0	0	0.0	0	0.0	6	3.8
Own raised	5	3.9	0	0.0	0	0.0	0	0.0	5	3.1
Depot	4	3.1	0	0.0	0	0.0	0	0.0	4	2.5
Wild	61	47.3	0	0.0	16	53.3	0	0.0	77	48.1
Other	3	2.3	0	0.0	5	16.7	0	0.0	8	5.0
All	129	100.0	1	100.0	30	100.0	0	0.0	160	100.0

Input Use and Costs and Returns of Dike Vegetable Cultivation

Over the regions a quarter of the households cultivated dike in the year before the survey and average size of the dike was 4 decimal per household (Table 3.15).

Almost all the labors used in the gardens were unpaid household labor and nearly three-fifths of the labors were females (Table 3.16). Three-quarters of the households used inorganic fertilizers, two-thirds used manures and one-quarter used pesticides in dike.

Average labor cost was Tk. 150 per Labor Day, average value of dike vegetables, fruits and spices was Tk. 20 per kg and the average values of a dike tree was Tk. 100 in the area which were used in calculating the costs and returns of dike cultivation throughout the regions. Since labor cost comprised most of the costs (Table 3.16), the uniform rates will provide better measures of net margin which will be directly comparable across the regions.

Average cash cost of dike cultivation was Tk. 93 per decimal and gross margin per decimal was Tk. 626 and gross margin per hectare was Tk. 131651 (Table 3.18). On the average a farmer got gross return over cash cost was taka 533. On a average a household got return of Tk. 3,145 over cash cost (Table 3.20).

Nearly three-fifths of the dike vegetables, fruits and spices were consumed in the households, one-third was sold in the market and the rest was distributed to others as

gifts (Table 3.21).

Table 3.15: Dike Cultivation										
Sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	# of farms	% of farms	# of farms	% of farms	# of farms	% of farms	# of farms	% of farms	# of farms	% of farmss
Households cultivated	137	28.1	15	18.5	85	25.1	12	14.6	249	25.2
Average area (dec)	3.9		4.7		4.3		5.9		4.2	

Table 3.16: Labor Use in Dike cultivation										
Labor use per decimal (MD)	Khulna		Faridpur		Barisal		Jessore		All regions	
	# of labor	% of total	# of labor	% of total	# of labor	% of total	# of labor	% of total	# of labor	% of total
HH labor										
Male	10.2	40.5	23.4	60.6	9.3	40.3	2.8	100.0	10.3	43.1
Female	14.5	57.7	15.2	39.4	13.5	58.2	0	0.0	13.2	55.4
Total	24.6	98.1	38.6	100.0	22.8	98.5	2.8	100.0	23.4	98.5
Hired labor										
Male	0.41	1.6	0.0	0.0	0.32	1.4	0.0	0.0	0.32	1.3
Female	0.06	0.2	0.0	0.0	0.02	0.1	0.0	0.0	0.04	0.2
Total	0.47	1.9	0.0	0.0	0.34	1.5	0.0	0.0	0.36	1.5
All labor	25.1	100.0	38.6	100.0	23.1	100.0	2.8	100.0	23.8	100.0

Table 3.17: Fertilizer and Pesticide Use in Dike Cultivation										
Fertilizers and pesticides	Khulna		Faridpur		Barisal		Jessore		All regions	
	# of farms	% of farms	# of farms	% of farms	# of farms	% of farms	# of farms	% of farms	# of farms	% of farms
Inorganic fertilizer	58	42.3	12	80.0	56	65.9	9	75.0	135	54.2
Organic fertilizer	38	27.7	2	13.3	37	43.5	3	25.0	80	32.1

Table 3.18: Costs of Dike Cultivation per Decimal										
Items	Khulna		Faridpur		Barisal		Jessore		All regions	
	Costs (Tk)	% of total	Costs (Tk)	% of total	Costs (Tk)	% of total	Costs (Tk)	% of total	Costs (Tk)	% of total
Household labor	3694	97.08	5789	99.5	3417	97.38	423	92.16	3517	97.42
Hired labor	70	1.84	0	0	51	1.45	0	0.00	54	1.50
Manures	15	0.39	12	0.2	24	0.68	12	5.45	19	0.53
Fertilizers	16	0.42	1	0	13	0.37	11	2.40	13	0.36
Transport cost	10	0.26	17	0.3	4	0.11	0	0.00	7	0.19
Total	3805	100	5819	100	3509	100	446	100	3610	100
Cash Cost	111		30		92		23		93	

Table 3.19: Outputs of Dike Cultivation										
Outputs	Khulna		Faridpur		Barisal		Jessore		All regions	
	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)
Output per hh										
Vegetables	51.6	1032	2.7	53	81.9	1639	0.0	0	56.5	1131
Fruits	33.2	664	1.3	27	29.7	595	1.3	25	28.6	571
Spices	0.4	9	0.0	0	1.3	26	0.0	0	0.7	14

Trees	11.9	1194	33.3	3333	1.2	125	0.0	0	9.0	900
All		2900		3413		2384		25		2616
Output per dec										
Vegetables	13.2	265	0.6	11	19.1	383		0	13.5	271
Fruits	8.5	170	0.3	6	6.9	139	0.2	4	6.8	137
Spices	0.1	2		0	0.3	6		0	0.2	3
Trees	3.1	306	7.0	704	0.3	29		4	2.2	215
Retun per decimal	743		721		557		29		626	

Table 3.20: Financial Returns from Dike Cultivation

Returns	Khulna	Faridpur	Barisal	Jessore	All regions
	(Tk)	(Tk)	(Tk)	(Tk)	(Tk)
Gross Margin per decimal	632	691	465	6	533
Gross Margin per hctare	156104	170677	114855	1482	131651
Return over cash costs per hh	2465	3248	2000	72	3145

Table 3.21: Disposal of Dike Vegetables, Fruits and Spices

Disposal	Khulna (% output)	Faridpur (% output)	Barisal (% output)	Jessore (% output)	All regions (% output)
Consumed	58.6	100.0	57.0	53.3	58.0
Sold	28.4	0.0	35.8	46.7	31.6
Gifted and others	13.0	0.0	7.3	0.0	10.4

Input Use and Costs and Returns of Homestead Vegetable Cultivation

Over the regions two-fifths of the households cultivated home gardens in the year before the survey and the Average size of the gardens was 7 decimal per household (Table 3.22).

Almost all the labors used in the gardens were unpaid household labor and nearly three-fifths of the labors were females (Table 3.23). Three-quarters of the households used inorganic fertilizers, two-thirds used manures and one-quarter used pesticides in home gardening.

The average labor cost was 150 taka per labor day and the average value of vegetables was 20 taka per kg in the area and these rates were used in calculating the costs and returns of home gardening throughout the regions. Since labor cost comprised most of the costs (Table 3.23) and vegetables was the only output of the gardens, the uniform rates will provide better measure of net margins which will be directly comparable across the regions.

The average cash cost of home gardening was 82 taka per decimal (Table 3.24) and the average return was 620 taka per decimal (Table 3.25). On the average a farmer got gross margin per decimal was Tk. 538 and per hectare was Tk. 132886. Average return per family was taka 3712 only (Table 3.26).

Nearly half of the garden outputs were consumed in the households, two-fifths were sold in the market and the rest was distributed to others as gifts (Table 3.27).

Table 3.22: Cultivation of Home Gardens

Sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	# of Hh	% of hh	# of hh	% of hh	# of hh	% of hh	# of hh	% of hh	# of hh	% of hh
Households cultivated	222	45.8	15	18.5	149	44.1	11	13.1	397	40.2
Average area (dec)	8.1		2.9		5.8		4.0		6.9	

Table 3.23: Labor Use in Home Gardening

Labor use per decimal (MD)	Khulna		Faridpur		Barisal		Jessore		All regions	
	# of labor	% of total	# of labor	% of total	# of labor	% of total	# of labor	% of total	# of labor	% of total
HH labor										
Male	6.8	46.0	22.4	54.4	11.4	37.9	5.2	19.1	8.5	41.9
Female	7.8	52.8	18.4	44.8	18.4	61.0	22.0	80.9	11.5	57.0
Total	14.6	98.8	40.8	99.2	29.8	98.9	27.1	100.0	20.0	98.9
Hired labor										
Male	0.2	1.2	0.3	0.8	0.2	0.6	0.0	0.0	0.2	0.9
Female	0.0	0.0	0.0	0.0	0.2	0.5	0.0	0.0	0.1	0.3
Total	0.2	1.2	0.3	0.8	0.3	1.1	0.0	0.0	0.2	1.1
All labor	**14.8**	**100.0**	**41.2**	**100.0**	**30.1**	**100.0**	**27.1**	**100.0**	**20.2**	**100.0**

Table 3.24: Costs of Home Gardening per Decimal

Items	Khulna		Faridpur		Barisal		Jessore		All regions	
	Costs (Tk)	% of total	Costs (Tk)	% of total	Costs (Tk)	% of total	Costs (Tk)	% of total	Costs (Tk)	% of total
Hired labor	27	41.54	51	36.43	51	43.97	29	40.28	34	41.46
Manures	5	7.69	29	20.71	9	7.76	7	9.722	7	8.54
Fertilizers	24	36.92	35	25.00	30	25.86	28	38.89	26	31.71
Pesticides	8	12.31	25	17.86	13	11.21	8	11.11	10	12.20
Others	1	1.54	0	0.00	13	11.21		0	5	6.10
All	65	100.00	140	100.00	116	100.00	72	100	82	100.00

Table 3.25: Outputs of Home Gardening

Outputs	Khulna		Faridpur		Barisal		Jessore		All regions	
	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)	Qty (Kg)	Value (Tk)
Output per hh	214	4276	243	4867	221	4428	118	2364	215	4302
Output per dec	26	527	83	1659	38	764	30	598	31	620

Table 3.26: Financial Returns from Home Gardening

Returns	Khulna	Faridpur	Barisal	Jessore	All regions
	(Tk)	(Tk)	(Tk)	(Tk)	(Tk)
Gross margin per decimal	462	1519	648	526	538

Gross margin per hectare	114114	375193	160056	129922	132886
Return over cash costs per HH	3742	4405	3758	2220	3712

Table 3.27: Disposal of Garden Vegetables

Disposal	Khulna (% output)	Faridpur (% output)	Barisal (% output)	Jessore (% output)	All regions (% output)
Consumed	50.5	54.0	46.9	62.3	49.4
Sold	44.1	35.3	47.0	18.1	44.4
Gifted and others	5.4	10.7	6.0	19.6	6.1

Adoption and Dissemination of Improved Fish Cultivation Technology

Two-thirds to three-quarters of the farmers knew about the improved technologies of liming and weed control for better fish cultivation but a quarter to half of them knew about the other technologies (Table 3.28). Most of the farmers who had the knowledge of testing natural feed adequacy in water, species selection, weed control, liming, growth monitoring and post harvest fish handling practiced the technologies but two-thirds to three-quarters of the farmers who knew of the other technologies practiced them.

In general 'not serious about it' was the major reason for the lack of practice followed by 'inputs not easily available'. 'Lack of enough knowledge' and 'lack of capital' were the other reasons for the lack of practice.

On the average from each farmer a technology was disseminated to 3-4 other farmers across the upazilas.

Table 3.28: Adoption and Dissemination of Improved Pond Fish Culture

Technology	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Testing natural feed adequacy in water										
Knew	230	47.1	32	39.5	146	43.2	43	51.2	451	45.5
Practiced among those who knew	196	81.7	19	54.3	119	81.5	40	93.0	374	80.6
Dissmenated to average no. of farmers	4.0		6.0		3.1		3.5		3.6	
Maintaining fish stock density										
Knew	159	32.6	14	17.3	98	29.0	41	48.8	312	31.5
Practiced among those who knew	127	74.3	8	44.4	72	73.5	33	80.5	240	73.2
Dissmenated to average no. of farmers	4.0		10		2.9		4		3.6	
Species selection										
Knew	252	51.7	27	33.3	179	53.0	48	57.1	506	51.1
Practiced among those who knew average no. of farmers	210	80.5	13	44.8	153	85.5	40	83.3	416	80.5
Dissmenated to average no. of farmers	4.3		4		3.3		4		3.9	
Weed control										
Knew	373	76.6	50	61.7	237	70.1	71	84.5	731	73.8
Practiced among those who knew	349	93.1	38	74.5	224	94.5	71	100.0	682	92.9
Dissmenated to average no. of farmers	4.0		3.7		3.4		4.3		3.9	

Lming										
Knew	346	71.0	48	59.3	202	59.8	62	73.8	658	66.5
Practiced among those who knew	309	88.5	30	58.8	153	75.7	61	98.4	553	83.3
Dissmenated to average no. of farmers	4.7		3.6		3.6		5.0		4.4	
Supplementary feeding										
Knew	210	43.1	37	45.7	170	50.3	57	67.9	474	47.9
Practiced among those who knew	169	77.2	24	61.5	116	67.8	43	75.4	352	72.4
Dissmenated to average no. of farmers	4.5		4.4		3.7		3.7		4.1	
Fish disease management										
Knew	117	24.0	31	38.3	51	15.1	29	34.5	228	23.0
Practiced among those who knew	98	76.6	15	42.9	29	56.9	26	89.7	168	69.1
Dissmenated to average no. of farmers	3.8		4.0		4.2		3.6		3.9	
Health monitoring										
Knew	149	30.7	23	28.4	66	19.5	27	32.1	265	26.8
Practiced among those who knew	129	80.6	10	35.7	47	71.2	25	92.6	211	75.1
Dissmenated to average no. of farmers	3.4		5.0		3.7		3.6		3.5	
Growth monitoring										
Knew	219	45.0	37	45.7	107	31.7	46	54.8	409	41.3
Practiced among those who knew	203	89.4	28	70.0	81	75.0	44	95.7	356	84.6
Dissmenated to average no. of farmers	3.7		4		4.1		4		3.8	
Post-harvest handling										
Knew	155	31.8	29	35.8	136	40.2	45	53.6	365	36.9
Practiced among those who knew	142	85.5	20	60.6	105	77.2	40	88.9	307	80.8
Dissmenated to average no. of farmers	4.2		3.0		4.0		4.9		4.3	
Use of quality seeds										
Knew	265	54.5	24	29.6	186	55.0	47	56.0	522	52.8
Practiced among those who knew	219	80.2	14	53.8	140	75.3	30	63.8	403	75.8
Dissmenated to average no. of farmers	4.9		2.6		4.3		4.0		4.4	
Feed application procedures										
Knew	219	45.0	5	6.2	116	34.3	35	41.7	375	37.9
Practiced among those who knew	179	78.5	3	30.0	74	63.2	30	85.7	286	73.3
Dissmenated to average no. of farmers	4.8		3.0		3.8		3.8		4.3	
Constraints of adoption:										
Inputs not easily available	7	17.1	0	0.0	15	55.6	0	0.0	22	25.3
Lack of capital	7	17.1	0	0.0	1	3.7	0	0.0	8	9.2
Not serious about it	25	61.0	6	37.5	9	33.3	1	33.3	41	47.1
Lack of enough knowledge	5	12.2	6	37.5	2	7.4	2	66.7	15	17.2
Others	2	4.9	4	25.0	0	0.0	0	0.0	6	6.9

Household Decision Making in Fish Culture

Half the times farmers themselves took all the decisions in fish cultivation and nearly one-third to half the times they took the decisions jointly with the other male and female members of the household (Table 3.29). In very few occasions the other male and female members of the household took the decisions independently.

Table 3.29: Household Decision Making in Fish Culture

Decisions	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Planning fish culture										
Farmer him/herself	203	42.1	65	80.2	158	47.4	52	65.0	478	49.0
Other female members	3	0.6	1	1.2	0	0.0	0	0.0	4	0.4
Other male members	26	5.4	0	0.0	6	1.8	3	3.8	35	3.6
Jointly	250	51.9	15	18.5	169	50.8	25	31.3	459	47.0
Selection of species										
Respondent farmer	241	50.3	68	84.0	167	50.6	61	75.3	537	55.3
Other female members	2	0.4	1	1.2	1	0.3	0	0.0	4	0.4
Other male members	32	6.7	0	0.0	7	2.1	4	4.9	43	4.4
Jointly	204	42.6	12	14.8	155	47.0	16	19.8	387	39.9
Fish seed purchase										
Respondent farmer	245	52.5	70	86.4	167	51.1	64	80.0	546	57.2
Other female members	5	1.1	1	1.2	2	0.6	0	0.0	8	0.8
Other male members	41	8.8	0	0.0	7	2.1	5	6.3	53	5.5
Jointly	176	37.7	10	12.3	151	46.2	11	13.8	348	36.4
Feed application										
Respondent farmer	213	46.5	52	65.8	147	44.5	49	61.3	461	48.7
Other female members	10	2.2	2	2.5	2	0.6	2	2.5	16	1.7
Other male members	29	6.3	1	1.3	12	3.6	5	6.3	47	5.0
Jointly	206	45.0	24	30.4	169	51.2	24	30.0	423	44.7
Fertilizer application										
Respondent farmer	196	48.8	60	77.9	138	49.8	49	61.3	443	53.0
Other female members	5	1.2	3	3.9	2	0.7	2	2.5	12	1.4
Other male members	35	8.7	1	1.3	9	3.2	6	7.5	51	6.1
Jointly	166	41.3	13	16.9	128	46.2	23	28.8	330	39.5
Stocking density										
Respondent farmer	239	53.7	64	85.3	153	50.8	62	76.5	518	57.4
Other female members	4	0.9	1	1.3	0	0.0	2	2.5	7	0.8
Other male members	36	8.1	0	0.0	5	1.7	2	2.5	43	4.8
Jointly	166	37.3	10	13.3	143	47.5	15	18.5	334	37.0
Feed preparation										
Respondent farmer	210	45.8	55	70.5	155	48.0	50	62.5	470	50.0
Other female members	8	1.7	2	2.6	2	0.6	2	2.5	14	1.5
Other male members	24	5.2	1	1.3	9	2.8	3	3.8	37	3.9
Jointly	217	47.3	20	25.6	157	48.6	25	31.3	419	44.6
Time to harvest										
Respondent farmer	219	47.7	44	58.7	159	48.6	58	71.6	480	51.0
Other female members	6	1.3	1	1.3	1	0.3	0	0.0	8	0.8
Other male members	26	5.7	1	1.3	11	3.4	3	3.7	41	4.4
Jointly	208	45.3	29	38.7	156	47.7	20	24.7	413	43.8
Dyke cultivation planning										

Respondent farmer	101	43.2	20	80.0	53	47.3	22	59.5	196	48.0
Other female members	10	4.3	1	4.0	3	2.7	2	5.4	16	3.9
Other male members	5	2.1	0	0.0	1	0.9	0	0.0	6	1.5
Jointly	118	50.4	4	16.0	55	49.1	13	35.1	190	46.6
Vegetables selling										
Respondent farmer	125	40.8	17	70.8	63	44.7	25	59.5	230	44.8
Other female members	9	2.9	0	0.0	1	0.7	1	2.4	11	2.1
Other male members	14	4.6	0	0.0	1	0.7	1	2.4	16	3.1
Jointly	158	51.6	7	29.2	76	53.9	15	35.7	256	49.9
Re-investment of income										
Respondent farmer	218	47.9	52	69.3	153	48.1	54	67.5	477	51.4
Other female members	3	0.7	2	2.7	1	0.3	2	2.5	8	0.9
Other male members	21	4.6	0	0.0	4	1.3	4	5.0	29	3.1
Jointly	213	46.8	21	28.0	160	50.3	20	25.0	414	44.6
Distribution of responsibility										
Respondent farmer	182	40.3	33	45.2	150	46.0	49	60.5	414	44.4
Other female members	1	0.2	1	1.4	1	0.3	1	1.2	4	0.4
Other male members	16	3.5	0	0.0	1	0.3	4	4.9	21	2.3
Jointly	253	56.0	39	53.4	174	53.4	27	33.3	493	52.9

Nutritional Status in Pond Aquaculture Households

Household Hunger

Household hunger score was estimated using the three generic questions formulated and validated in the Food and Nutrition Technical Assistance (FANTA) project of Diseases anlobal Health at the USA Agency for International Development. Using this approach almost all the fish farmers had little or no food hunger in the households (3.30).

Table 3.30: Household Hunger

Indicators	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	
How often there was no food to eat of any kind in your house										
Never	461	94.5	73	90.1	328	97.0	78	95.1	940	95.0
Rarely or sometimes	21	4.3	5	6.2	5	1.5	3	3.7	34	3.4
Often	6	1.2	3	3.7	5	1.5	1	1.2	15	1.5
How often did any member of your household go to bed hungry										
Never	467	95.7	76	93.8	321	95.0	78	95.1	942	95.2
Rarely or sometimes	13	2.7	1	1.2	15	4.4	2	2.4	31	3.1
Often	8	1.6	4	4.9	2	0.6	2	2.4	16	1.6
How often did any member of your household spend a full day and night without eating										
Never	478	98.0	75	92.6	330	97.6	80	97.6	963	97.4
Rarely or sometimes	7	1.4	2	2.5	4	1.2	0	0.0	13	1.3
Often	3	0.6	4	4.9	4	1.2	2	2.4	13	1.3
Household hunger status										
Little or no hunger (0-1)	474	97.1	75	92.6	327	96.7	80	97.6	956	96.7
Moderate hunger (2-3)	7	1.4	1	1.2	7	2.1	0	0.0	15	1.5

Severe hunger (4-6)	7	1.4	5	6.2	4	1.2	2	2.4	18	1.8
All	488	100	81	100	338	100	82	100	989	100

Women's Dietary Diversity

The study observed 916 women aged 15-49 years in 991 households across the regions. Most of the women ate grains, roots or tubers, animal protein and fruits and vegetables, some half to two-thirds ate legumes and vitamin A rich dark green leafy vegetables, and a quarter to two-fifths ate the other food groups including eggs, dairy products and other vitamin A rich fruits and vegetables on the day before the survey. Overall, four-fifths of the women ate four or more food mentioned in the following table which is regarded to provide adequate nutritional diversity and their diet was nutritionally adequate. On the other hand diet of some one-fifths of the women was not nutritionally adequate (Table-3.31).

Table 3.31: Dietary Diversity of Women 15-49 Years Old

Food groups	Khulna		Faridpur		Barisal		Jessore		All regions	
	N	%	N	%	N	%	N	%	N	%
Grains, roots and tubers	361	78.3	55	80.9	246	79.6	74	94.9	736	80.3
Legumes	231	50.1	47	69.1	223	72.2	40	51.3	541	59.1
Dairy products	143	31.0	19	27.9	87	28.2	37	47.4	286	31.2
Eggs	165	35.8	26	38.2	125	40.5	33	42.3	349	38.1
Flesh foods and other misc. animal protein	398	86.3	57	83.8	272	88.0	70	89.7	797	87.0
Vitamin A rich dark green leafy vegetables	259	56.2	51	75.0	200	64.7	70	89.7	580	63.3
Other Vitamin A rich vegetables and fruits	183	39.7	38	55.9	122	39.5	28	35.9	371	40.5
Other fruits and vegetables	403	87.4	54	79.4	293	94.8	32	41.0	782	85.4
Average	4.6		5.1		5.1		4.9		4.8	
Distribution										
1-3 groups	95	20.6	7	10.3	47	15.2	8	10.3	157	17.1
4 or more groups	366	79.4	61	89.7	262	84.8	70	89.7	759	82.9
All women	461	100.0	68	100.0	309	100.0	78	100.0	916	100.0

Nutritional Status of Children 6-23 Months Old

Almost all the children were fed colostrums and there were no children which was never breastfed (Table 3.32). Three-fifths of the children were initiated breastfeeding immediately after birth. Nearly half the children were exclusively breastfed for six months but a fifth of them were introduced complementary feeding right after six months. A quarter of those who were given complementary foods right after six months were given solids, semisolids or soft foods and most of them were continued breastfeeding along with complementary feeding. Half the children were fed supplementary foods four times or more in the last 24 hours of the survey and most of them were fed foods from four or more food groups.

Table 3.32: Nutritional status of 6-23 months old children

Indicators	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Fed colostrum to the child	39	100	7	100	34	94.4	8	100	88	97.8

Initiated breastfeeding immediately after birth	22	56.4	4	57.1	23	63.9	4	50.0	53	58.9
Average duration of first initiating breastfeeding (hours)	2.9		16.0		3.3		2.0		3.5	
Never breastfed the child	0		0		0		0		0	
Exclusively breastfed for 6 months	21	37.5	5	100	24	77.4	2	28.6	52	52.5
Average duration of exclusive breastfeeding (months)	3.0		9.2		5.6		4.9		4.2	
Introduced complementary feeding right after 6 months	9	14.5	3	42.9	7	20.6	1	12.5	20	18.0
Average age at introduction of complementary foods (months)	3.1		6.6		5.9		5.8		4.4	
Introduced solid, semi-solid or soft foods right after 6 months	14	22.6	3	42.9	11	33.3	1	12.5	29	26.4
Average age at introduction of solid, semi-solid or soft foods (months)	3.4		7.0		6.1		6.1		4.6	
Continued breastfeeding along with complementary feeding for 12 or more months	32	82.1	7	100	28	77.8	7	87.5	74	82.2
Average number of months continued breastfeeding along with complementary feeding	2.2		.		7.1		2.0		3.1	
Fed supplementary foods 4 times or more in last 24 hours	16	45.7	6	85.7	15	46.9	3	37.5	40	48.8
Average number of times fed supplementary foods in last 24 hours	4.4		4.7		3.8		3.3		4.1	
Breastfed 4 times or more in last 24 hours	100		100		100		100		100	
Average number of times breastfed in last 24 hours	10.7		11.6		11.8		8.5		11.0	
Average number of food groups supplementary foods were fed from in last 24 hours	4.4		4.7		3.8		3.3		4.1	
Fed supplementary foods from 4 or more food groups and 4 or more times in last 24 hours	30	83.3	5	71.4	29	85.3	6	75.0	70	82.4

Children's Dietary Diversity

The study observed 80 children aged 6-23 months in 991 households across the regions. Nearly three-quarters of the children ate grains, roots or tubers and some two-thirds ate fruits and vegetables. Two-fifths ate vitamin A rich vegetables and fruits but fewer ate the other food groups including legumes, dairy products and eggs on the day before the survey. Overall, two-thirds of the children ate four food groups which is regarded to provide adequate nutritional diversity and their diet was nutritionally adequate. On the

other hand diet of over one-third of the children was not nutritionally adequate (Table 3.33).

Table 3.33: Dietary Diversity of Children 6-23 months Old

Food groups	Khulna		Faridpur		Barisal		Jessore		All regions	
	N	%	N	%	N	%	N	%	N	%
Grains, roots and tubers	26	76.5	3	42.9	22	75.9	6	75.0	57	73.1
Legumes and nuts	11	32.4	4	57.1	15	51.7	3	37.5	33	42.3
Dairy products	19	55.9	1	14.3	13	44.8	5	62.5	38	48.7
Eggs	15	44.1	3	42.9	15	51.7	3	37.5	36	46.2
Vitamin A rich vegetables/fruits	20	58.8	3	42.9	18	62.1	4	50.0	45	57.7
Other fruits and vegetables	18	52.9	5	71.4	24	82.8	4	50.0	51	65.4
Distribution										
1-3 groups	17	47.2	3	42.9	7	24.1	3	37.5	30	37.5
4 or more groups	19	52.8	4	57.1	22	75.9	5	62.5	50	62.5
All children	36	100.0	7	100.0	29	100.0	8	100.0	80	100.0

CHAPTER 4: COMMERCIAL FISH CULTURE

Household Characteristics

All most all the sample households (92.5%) were headed by male (Table 3.01). Average size of the households was 4.8 members which corresponded well with the national Average of 4.9 members (BBS, 2010). Most of the farmers were over 25 years of age and average age around 42 years. Only 14% of the farmers had no school education. However, none-educated farmers of Khulna and Faridpur were much higher than Barisal and Jessore.
The main occupation of all most all the female headed households was housekeeping. Overall, nearly one-fifth of the household heads had farming and less than one-fifth had secondary occupation. One-fifth had fish culture as the main occupation and around one-fourth took it as secondary occupation. On the average they had involvement in pond fish culture for around a decade. One-third of them received one or more training in fish cultivation in the last three years of the survey and average number of training received by them was around 4.

Study also showed that on an average the farmers are involved in fish culture for around a decade. About 33% of them received average 4 number of training on fish cultivation in the last three years.

Table 4.01: Household Characteristics

Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Average household size	4.8		4.6		4.6		4.6		4.7	4.8
Sex of household head										
Male	179	94.7	98	97.0	80	84.2	14	87.5	371	92.5
Female	10	5.3	3	3.0	15	15.8	2	12.5	30	7.5
All	189	100.0	101	100.0	95	100.0	16	100.0	401	100.0
Age of the farmer (years)										
Less than 25	18	9.5	5	5.0	5	5.3	2	12.5	30	7.5
25-34	32	16.9	25	24.8	22	23.2	2	12.5	81	20.2
35-44	50	26.5	27	26.7	26	27.4	8	50.0	111	27.7
45-54	47	24.9	24	23.8	20	21.1	3	18.8	94	23.4
55 or above	42	22.2	20	19.8	22	23.2	1	6.3	85	21.2
Less than 25	189	100	101	100	95	100	16	100	401	100

Average	42.8		42.2		43.6		38.3		42.7	42.8
Educational level of the farmer (grades completed)										
None	33	17.5	16	15.8	7	7.4	0	0.0	56	14.0
1-5	50	26.5	25	24.8	19	20.0	5	31.3	99	24.7
6-10	42	22.2	28	27.7	19	20.0	4	25.0	93	23.2
10-12	54	28.6	23	22.8	41	43.2	5	31.3	123	30.7
13 or more	10	5.3	9	8.9	9	9.5	2	12.5	30	7.5
All	189	100	101	100	95	100	16	100	401	100
Primary occupation of the farmer										
House wife	9	4.8	3	2.97	11	11.6	2	13	25	6.2
Service	7	3.7	6	5.9	9	9.5	1	6	23	5.7
Big/medium Business	9	4.8	8	7.9	20	21.1	2	13	39	9.7
Small business	5	2.6	10	9.9	9	9.5	1	6	25	6.2
Day labor	6	3.2	3	3.0	0	0.0	0	0	9	2.2
Rickshaw/Van driver	0	0.0	0	0.0	1	1.1	0	0	1	0.2
Agriculture (Own/share cropper)	39	20.6	19	18.8	26	27.4	1	6	85	21.2
Handicrafts, Carpenter, Mason and other self employed	2	1.1	0	0.0	0	0.0	0	0	2	0.5
Professional (Doctor, engineer, advocate)	0	0.0	3	3.0	0	0.0	0	0	3	0.7
Student	7	3.7	3	3.0	2	2.1	1	6	13	3.2
Retired / Minor child	0	0.0	4	4.0	1	1.1	0	0	5	1.2
Old (Age >60 years)	1	0.5	1	1.0	0	0.0	0	0	2	0.5
Fish Culture	57	30.2	7	6.9	9	9.5	8	50	81	20.2
Others	47	24.9	34	33.7	7	7.4	0	0	88	21.9
All	189	100	101	100	95	100	16	100	401	100

Secondary occupation of the farmer										
House wife	1	0.5	0	0	1	1.1	0	0.0	2	0.5
Service	3	1.6	2	2	0	0.0	0	0.0	5	1.2
Big/medium Business	12	6.3	0	0	1	1.1	0	0.0	13	3.2
Small business	11	5.8	3	3	0	0.0	1	6.3	15	3.7
Day labor	13	6.9	0	0	0	0.0	0	0.0	13	3.2
Rickshaw/Van driver	2	1.1	1	1	0	0.0	0	0.0	3	0.7
Agriculture (Own/share cropper)	37	19.6	19	19	7	7.4	6	37.5	69	17.2
Handicrafts, Carpenter, Mason and other self employed	1	0.5	0	0	1	1.1	0	0.0	2	0.5
Professional (Doctor, engineer, advocate)	0	0.0	1	1	0	0.0	0	0.0	1	0.2
Fish Culture	27	14.3	7	7	50	52.6	7	43.8	91	22.7
Others	32	16.9	46	46	23	24.2	0	0.0	101	25.2
No Subsidiary Occupation	50	26.5	22	22	12	12.6	2	12.5	86	21.4
All	189	100	101	100	95	100	16	100	401	100
Average no. of training received	4.5		3.6		3.4		2.7		3.9	
Average no. of years involve in fishing	11.6		11.1		9.9		8.5		11.0	

Fish Ponds

Average number of fish gher/pond cultivated by per household was 3.2 and some two-third of the households cultivated over 2 ghers/ponds (Table 4.02).Average water area cultivated by per household was 183 decimal (0.74 hectare) and it ranges from 4 decimals to 3000 decimals (12.15 hectare). Average area of gher/pond of Khulna, Faridpur, Barisal and Jessor were 255, 144, 75 and 239 decimal respectively. More than 25% of the farmer leased-in the gher/pond in all the hubs except Barisal and less than 10% leased-out except Khulna.

Table 4.02: Fish Gher/Pond										
Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
No. of fish ponds cultivated										
1-2	111	59.73	73	72.28	77	81.05	7	43.75	268	66.83
3-4	56	29.63	16	15.84	16	16.84	3	18.75	91	22.69

5 or more	22	11.64	12	11.88	2	2.11	6	47.50	42	10.48
Total	189	100	101	100	95	100	16	100	401	100
Average	3.6		3.5		1.9		4.6		3.2	
Area of fish ghers/ponds cultivated (decimals)										
0.00-50.00	30	16.13	30	29.70	43	45.26	2	12.5	105	26.38
50.01-100.00	42	22.58	35	34.65	39	41.05	3	18.75	119	29.90
100.01-150.00	21	11.29	11	10.89	4	4.21	1	6.25	37	9.30
150.01-200.00	37	19.89	5	4.95	3	3.16	3	18.75	48	12.06
200.01-250.00	14	7.53	2	1.98	3	3.16	1	6.25	20	5.03
250.01 and above	42	22.58	18	17.82	3	3.16	6	37.5	69	17.34
Total	186	100	101	100	95	100	16	100	398	100
Average area	254.7		143.7		74.7		238.6		182.9	
Leased in ghers/ponds										
Farmers	60	31.75	34	33.66	8	8.42	4	25.00	106	26.43
Average area	245.3		212.0		66.8		364.0		225.6	
Leased out ghers/ponds										
Farmers	30	15.87	5	4.95	1	1.05	1	6.25	37	9.23
Average area	199.1		39.0		21.0		156.0		171.5	

Cultivable Land

The Average number of field plots cultivated by per household was 4.5 and over half of the households' cultivated 1-2 plots (Table 4.03). Average area cultivated per household was 0.74. It was 0.56, 0.69, 1.03 and 0.68 in Khulna, Faridpur, Barisal and Jessore respectively. Nearly 10% households leased-in and 20% leased cultivable land.

Table4.03: Cultivable Land

Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Average no. of field plot cultivated	2.9		6.8		4.4		3.9		4.5	
Area of land cultivated (decimals)										
0.00-50.00	44	37.93	14	15.56	17	19.77	2	15.38	84	27.54
50.01-100.00	26	22.41	17	18.89	25	29.07	2	15.38	73	23.93
100.01-150.00	13	11.21	16	17.78	9	10.47	2	15.38	30	9.84
150.01-200.00	14	12.07	14	15.56	6	6.98	4	30.77	38	12.46
200.01-250.00	3	2.59	13	14.44	3	3.49	1	7.69	20	6.56
250.01 and above	16	13.79	16	17.78	26	30.23	2	15.38	61	20.00
All Farmers	116	100	90	100	86	100	13	100	305	100
Average area (Hectare)	**0.56**		**0.69**		**1.03**		**0.68**		**0.74**	
Leased in farm land										
Number of farmers	**20**	**10.58**	**7**	**6.93**	**5**	**5.26**	**4**	**25.00**	**38**	**9.48**
Average area (Hectare)	0.70		0.68		0.49		10.61		0.58	
Leased out farm land										
Number of farmers	10	5.25	18	17.82	15	15.79	1	6.25	84	20.94
Average area (Hectare)	0.33		1.00		1.37		0.12		1.07	

Home Gardening

Nearly 90% of the households owned a homestead. Average homestead area was 28 decimals and around half of the households had an area of 20 decimals or less. Over half the households had a homestead vegetable garden. Average number of homestead vegetable plots cultivated

by per household was 1.8 and four in ten households' cultivated one plot. Average area cultivated by per household was 7 decimals while most of the farmers cultivated less than 10 decimals (Table 4.04).

Homestead Trees

Nearly half of the households owned homestead trees. One-quarter had trees over 5 decimals of land and average area of homestead trees was 15 decimal. Homestead tree are bamboo, timber and fruit trees. Average number of homestead trees per household was 12 varying from 8 in Faridpur to 17 in Jessore (Table 4.04).

Table 4.04: Home Gardening and Homestead Trees

Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Area in homestead (decimal)										
00.01-10.00	37	19.6	31	30.7	3	3.2	7	43.75	101	25.2
10.01- 20.00	60	31.7	20	19.8	21	22.1	3	18.75	110	27.4
20.01-30.00	25	13.2	15	14.9	23	24.2	4	25	61	15.2
30.01-40.00	19	10.1	3	3.0	12	12.6	0	0	41	10.2
40.0 -50.00	8	4.2	5	5.0	12	12.6	0	0	23	5.7
50.01and above	21	11.1	15	14.9	12	12.6	2	12.5	45	11.2
No homestead land	19	10.1	12	11.9	12	12.6	0	0	20	5.0
All	189	100.0	101	100.0	95	100.0	16	100	401	100.0
Total having Homestead	*170*	*89.9*	*89*	*88.1*	*83*	*87.4*	*16*	*100*	*381*	*95.0*
Average area in decimal	*26.4*		*24.3*		*34.8*		*19.0*		*27.5*	
Average plot culrivated per hh	1.1		1.0		2.3		1.0		1.4	
Area cultivated (decimals)										
Less than 10	81	68.6	39	86.7	29	46.8	3	75.0	152	66.4
10-19	20	16.9	4	8.9	16	25.8	1	25.0	41	17.9
Over 19	17	14.4	2	4.4	17	27.4	0	0.0	36	15.7
All	118	100	45	100	62	100	4	100	229	100
Average area in decimal	11.9		4.9		15.9		4.5		11.4	11.9
Area under homestead trees (decimals)										
Less than 5	45	23.8	27	26.7	21	22.1	4	25.0	97	24.2
5-9	12	6.3	2	2.0	18	18.9	1	6.3	33	8.2
Over 9	34	18.0	12	11.9	36	37.9	4	25.0	86	21.4
None	98	51.9	60	59.4	20	21.1	7	43.8	185	46.1
All	189	100	101	100	95	100	16	100	401	100
Average area	14.9		8.4		11.9		14.8		12.6	14.9

Household Income

Earning income from more than one source was common among the households. On an average a household earned income from more than 4.7 sources and most of the households earned income from 3 to 6 sources (Table 3.05).

Table 4.05: Number of Sources of Household Incomer										
No. of sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
1-2	10	5.3	7	6.9	2	2.1	1	6.3	20	5.0
3-4	80	42.3	53	52.5	22	23.2	10	62.5	165	41.1
5-6	86	45.5	37	36.6	55	57.9	4	25.0	182	45.4
7 or more	13	6.9	4	4.0	16	16.8	1	6.3	34	8.5
All	189	100	101	100	95	100	16	100	401	100
Average sources of income per hh	4.6		4.2		5.4		4.1		4.7	

The average monthly income of the households was Tk. 4,498 (Table 4.06). Aquaculture was found the major sources of income and it contributed more than 40% of the income which was followed by crops and vegetables (18%), and business (10%). Although more than 70% of the households earned income from livestock and poultry, but its contribution in total income only 4%. Around 50% involved in home gardening, but its share in total income less than 1%.

Table 4.06: Average Monthly Gross Household Income by Sources										
Sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)
Crops and vegetables	73.54	17.00	83.17	17.95	88.42	19.38	81.25	13.41	79.80	17.70
Livestock and poultry	80.42	4.90	52.48	2.99	87.37	3.20	81.25	8.58	75.06	4.14
Home gardening	45.50	1.02	32.67	0.52	49.47	1.30	0.00		41.40	0.89
Homestead trees	52.91	2.08	15.84	0.94	73.68	2.58	37.50	0.62	47.88	1.81
Aquaculture	97.88	46.66	93.07	49.40	96.84	32.19	93.75	51.45	96.26	43.65
Other fisheries	7.94	0.45	36.63	0.78	16.84	1.63	6.25	0.79	17.21	0.90
Pump rental	3.70	0.27	4.95	0.66	1.05	0.03	12.50	0.95	3.74	0.35
Tiller rental	1.06	0.09	1.98	0.16	5.26	0.34	0.00		2.24	0.17
Fishing net rental	1.06	0.01	5.94	0.25	1.05	0.01	18.75	0.56	2.99	0.11
Labor	21.69	3.36	12.87	1.03	7.37	0.83	6.25	0.38	15.46	1.81
Services	13.76	5.53	20.79	8.57	27.37	11.35	6.25	2.38	18.45	7.80
Business	16.40	8.98	12.87	6.86	26.32	13.06	31.25	18.92	18.45	10.20
Small trade	12.17	2.46	13.86	3.14	16.84	2.95	6.25	0.79	13.47	2.68
Vehicle rental	4.23	0.94	1.98	1.04	2.11	0.67	0.00		2.99	0.83
Remittance	4.76	2.28	0.99	0.38	14.74	5.24	0.00		5.99	2.44
Leased out land	16.40	1.30	13.86	1.59	15.79	1.49	12.50	0.79	15.46	1.40
Others	6.88	2.67	14.85	3.73	8.42	3.76	18.75	0.36	9.73	3.12
No. of total household	189		101		95		16		401	
Per capita (Tk.)		3,425		4,892		5,636		7,945		4,498

Characteristics of the Selected Gher/Pond

Input use and cost and return data were collected for one gher/pond per household if a Household had more than one gher/pond a randomly selected.

More than 75% of the ponds were singly owned by the households. Leased of single owned

pond was 8.5% compared to only 1.2% of joint own ponds. In case of jointly owned ponds average number of owners was 3. Most of the ponds had loamy and clay soil or their variations. Silt or sandy soils were relatively rare (Table 4.07).

Average area of gher/pond was around 60 decimals, the Average water area was 50 decimals and the Average dike area was 9 decimals. The Average water depth was 2.7 ft in the culture season but average water retained in the ghers/ponds for fish culture was 4.7 months. On the average nearly 18% of the water area was shaded by trees and the Average age of the ghers/ponds was 10 years.

In case of ownership pattern, it is found that more than 76% of the ponds are owned singly and 14% have joint ownership. Joint owned ponds are higher (24%) in Barisal. Data revealed that leasing-in and leasing-out activities for fish culture are vary limited in the study areas. Only 8.5% farmers leased in ponds singly and 1% farmers jointly laesed (Table (4.07). In case of jointly owned ponds average number of owners was **3**. Most of the ponds had loamy, sandy loamy and clay loam soil. Silt or sandy soils were found relatively rare. Thus the soil chactereristics of the ponds reflects their productive nature.

Average total area of pond was around 55 decimals, the Average water area was 46 decimals and the Average dike area was 9 decimals. The Average water depth of the pond was 3.5 ft. Low average water depth was recorde for Jesssor (2.3 ft) and Khulna (2.7 ft). Probably low depth ponds in these two region is because these ponds were mostly used for pre stocking of fingerlings in the commercial farms. However, water retained in these ponds for fish culture was on an average for 4.7 months. While Faridpur ponds found to retain culture suitable water depth for about 11 months. On the average nearly 18% of the water area of the commercial fish farms was shaded by trees that hinderd light penetration and chemical cycle of the pond water. The Average age of the ponds was 11 years.

Table 4.07: Characteristics of the Selected Ponds

Characteristics	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Ownership status										
Singly owned	155	82.0	73	72.28	66	69.5	12	75.00	306	76.3
Jointly owned	17	9.0	15	14.85	23	24.2	1	6.25	56	14.0
Singly leased	16	8.5	11	10.89	6	6.3	1	6.25	34	8.5
Jointly leased	1	0.5	2	1.98	0	0.0	2	12.50	5	1.2
All	189	100	101	100.	95	100	16	100	401	100
In case jointly owned Average no. of owners										
Type of soil										
Loamy	28	14.8	7	6.9	18	18.9	1	6.3	54	13.5
Clay	42	22.2	0	0.0	34	35.8	3	18.8	79	19.7
Sandy	10	5.3	0	0.0	1	1.1	0	0.0	11	2.7
Sandy loam	32	16.9	65	64.4	28	29.5	8	50.0	133	33.2
Clay loam	66	34.9	29	28.7	10	10.5	3	18.8	108	26.9
Silt	2	1.1	0	0.0	0	0.0	1	6.3	3	0.7
Silt loam	9	4.8	0	0.0	2	2.1	0	0.0	11	2.7
Others	0	0.0	0	0.0	2	2.1	0	0.0	2	0.5
All	189	100	101	100	95	100	16	100	401	100

Area										
Average gher/pond area (dec)	58.2		58.5		44.2		67.0		55.3	
Average water area (dec)	50.2		46.2		35.8		53.2		45.9	
Average dike area (dec)	9.1		13.2		8.9		13.4		10.3	
Water area shaded by trees (%)	18.5		25.9		28.2		24.3		23.7	
Average water depth in culture season (feet)	2.7		4.2		3.7		2.3		3.5	
No. of months water retains for fish culture	4.7		10.9		7.2		6.8		6.9	
Average age of the pond (yrs)	10.1		12.1		11.7		11.1		11.0	

Input Use and Costs and Returns of Household Aquaculture

Over the regions all the households raised fish in the household pond in the years before the survey done. The Average size of pond was found 55.3 decimal (Table 4.08).

Table 4.08: Household Pond Fish Culture

Items	Khulna	Faridpur	Barisal	Jessore	All regions
Households cultivated (#)	189	101	95	16	401
Total water area (dec)	9495	4665	3404	851	18415
Average pond size (dec)	58.2	58.5	44.2	67.0	55.3

Laber investment data shows that a total of 1514 labour day was used for culture one hectare of pond and 1133 hired labors which was 75% of the total labour used (Table 4.10) and the average e

Table 4.9 : Per Hectare Labor Use and Costs in Pond Fish Culture

Labor use	Khulna		Faridpur		Barisal		Jessore		All regions	
	# of labor	**% of total**	**# of labor**	**% of total**	**# of labor**	**% of total**	**# of labor**	**% of total**	**# of labor**	**% of total**
HH labor										
Male	**75**	**5**	**83**	**5**	**71**	**5**	**80**	**5**	**77**	**5**
Female	300	20	330	20	285	20	300	20	304	20
Total	**375**	**25**	**413**	**25**	**356**	**25**	**380**	**26**	**381**	**25**
Hired labor	-	-	-	-	-	-	-	-	-	-
Male	**113**	**8**	**124**	**8**	**107**	**8**	**110**	**7**	**113**	**7**
Female	1013	68	1114	68	962	68	1000	68	1022	68
Total	**1125**	**75**	**1238**	**75**	**1069**	**75**	**1100**	**74**	**1133**	**75**
All laborers	**1500**	**100**	**1650**	**100**	**1425**	**100**	**1480**	**100**	**1514**	**100**
Cost of hired labour (Tk.)	**151875**		**185625**		**160313**		**165000**		**169922**	

Major cost of the commercial fish culture was labour cost and it was Tk. 1,69,950 per hectare which was 57.84 of total cost. Fixed cos twas second highest which was 24.63% of total cost. Fixed cost items for aquaculture are all most common for all the areas. Mostly used durable but minor items are spade/sickle, bamboo, wood and rope, etc. Average fixed cost per hctare was found Tk 72370. Minimum fixed cost was found at Barisal was Tk. 56563 and maximum was Tk. 129181 at Jessore (Tab le-4.11). This variation is likely due to the variation in management practices, culture intensity and input application. Among major items shallow tubewell or water lifting pump was Tk. 7725. Use of pump is minimum in Barisal which is probably due to natural facility that exists in the area due to tidal flow of water through rivers network in different areas.

Commonly used imputs cost items for commercial fish farms are organic fertilizer, inorganic fertilizer, lime, other chemicals (medicines) and other prestocking preparations like drying and plaughing etc. Average cost of pond preparation was Tk. 7825 and average post stockin management cost was Tk. 5773.

Average cost per hectare was Tk. 293844 and return was Tk. 358644. Therefore Gross Margin per hectare was Tk. 64800 and Benefit-Cost Ratio was 1.22 (Table 4.11)..

Table 4.11: Per Hectare Costs of Pond Culture of Commercial Fish						
Items	Per Decimal					
	Khulna	Faridpur	Barisal	Jessore	All regions	%
Fixed costs	60515	100282	56563	129181	72370	24.63
Hired labor	168750	185700	160350	165000	169950	57.84
Pond preparation	14481	9000	8825	8940	7825	2.66
Seeding	17226	18525	17784	19019	18278	6.22
Inputs for stock management	5190	6131	5042	5718	5773	1.96
Water management	8000	7000	7500	8400	7725	1.96
Harvesting	9500	10000	9000	11000	9875	3.36
Selling	5000	3000	3500	4500	4000	1.36
Cash cost per dec.	288662	339638	268564	351758	293844	100.00

Table 4.15: Financial Returns from Pond Culture					
Returns	Khulna	Faridpur	Barisal	Jessore	All regions
	(Tk)	(Tk)	(Tk)	(Tk)	(Tk)
Production per hectare	2836	3140	2870	3526	2964
Return per hectare	354500	405000	332920	412542	358644
Cost per hectare	288662	339638	268564	295796	293844
Gross Marginal per Hectare	65838	65362	64356	116746	64800
Benefit-cost ration	1.23	1.19	1.24	1.39	1.22

Sources of Fish Seed

Patilwala/Faria (fish vendors) was the predominant source of fish seeds distantly followed by private nursery other sources for almost all the fishes. around 20% of the farmers collected katla from the wild source. Other sources of seeds are hatchery, self raised seeds other sources other farmers, etc. A good number of farmers (22%) collected fish seed of Mola/Dhela/Tengra from other farmers (Table-4.21).

For commercial fish culture, like household aquaculture, most farmers preferred to collect fish seed from the Patilwalas. Patilwala/Faria (fish vendors) was the predominant source of fish seeds distantly followed by private nursery and other sources for almost all the fish species. Patilwala found to contribute in more than 60% farms for various carp species except grass carp seed (Table 4.17). Fish seed selling by Patilwala is an age old traditional system of the country. Farmers generally preferred this source because of comparatively low price and pond side delivery of the commodity, so that the owner or farmer can save both money and time.

About 20% of the farmers collected katla seed from various wild sources. Katla wild source

species of the country is very well known for their fast growing nature thatswhy farmer prefer to buy this seed even by spending more price. Other sources of seeds are hatchery, self raised and other farmers pond, etc. A good number of farmers (22%) collected fish seed of Mola/Dhela/Tengra from other farmers pond (Table-4.17).

Table 4.17: Sources of Fish Seeds

Sources	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Rui										
Private nursery	5	2.8	44	39.3	13	15.1	8	53.3	70	17.9
Govt nursery	0	0.0	0	0.0	0	0.0	1	6.7	1	0.3
Patilwala/Faria	166	92.7	42	37.5	62	72.1	0	0.0	270	68.9
Other famer	3	1.7	19	17.0	7	8.1	5	33.3	34	8.7
Hatchery	3	1.7	4	3.6	4	4.7	0	0.0	11	2.8
Own raised	0	0.0	1	0.9	0	0.0	1	6.7	2	0.5
Depot	1	0.6	0	0.0	0	0.0	0	0.0	1	0.3
Wild	1	0.6	2	1.8	0	0.0	0	0.0	3	0.8
Others	5	2.8	44	39.3	13	15.1	8	53.3	70	17.9
All										
Katla										
Private nursery	5	4.1	40	36.7	12	15.6	6	50.0	63	19.6
Govt nursery	0	0.0	0	0.0	0	0.0	1	8.3	1	0.3
Patilwala/Faria	113	91.9	45	41.3	53	68.8	0	0.0	211	65.7
Other famer	2	1.6	16	14.7	8	10.4	4	33.3	30	9.3
Hatchery	2	1.6	4	3.7	4	5.2	0	0.0	10	3.1
Own raised	1	0.8	4	3.7	0	0.0	1	8.3	6	1.8
Wild	5	4.1	40	36.7	12	15.6	6	50.0	63	19.6
Others	0	0.0	0	0.0	0	0.0	1	8.3	1	0.3
All										
Mrigel										
Private nursery	3	3.3	39	39.4	7	13.2	6	40.0	55	21.4
Govt nursery	1	1.1	0	0.0	0	0.0	1	6.7	2	0.8
Patilwala/Faria	84	93.3	40	40.4	36	67.9	1	6.7	161	62.6
Other famer	0	0.0	13	13.1	6	11.3	5	33.3	24	9.3
Hatchery	1	1.1	4	4.0	3	5.7	0	0.0	8	3.1
Own raised	0	0.0	1	1.0	1	1.9	2	13.3	4	1.6
Wild	1	1.1	2	2.0	0	0.0	0	0.0	3	1.2
Others	3	3.3	39	39.4	7	13.2	6	40.0	55	21.4
All										
Silver Carp										
Private nursery	2	1.8	38	36.9	9	14.5	7	46.7	56	19.2
Govt nursery	0	0.0	0	0.0	0	0.0	1	6.7	1	0.3
Patilwala/Faria	107	95.5	48	46.6	44	71.0	2	13.3	201	68.8
Other famer	0	0.0	9	8.7	4	6.5	4	26.7	17	5.8
Hatchery	2	1.8	5	4.9	4	6.5	0	0.0	11	3.8
Own raised	0	0.0	1	1.0	1	1.6	1	6.7	3	1.0
9=Other	1	0.9	2	1.9	0	0.0	0	0.0	3	1.0
All										
Grass Carp										
Private nursery	2	2.0	25	32.5	2	9.1	3	37.5	32	15.4
Govt nursery	0	0.0	0	0.0	0	0.0	1	12.5	1	0.5

Patilwala/Faria	98	97.0	38	49.4	15	68.2	0	0.0	151	72.6
Other famer	1	1.0	8	10.4	3	13.6	3	37.5	15	7.2
Hatchery	0	0.0	3	3.9	2	9.1	0	0.0	5	2.4
Own raised	0	0.0	1	1.3	0	0.0	1	12.5	2	1.0
Others	0	0.0	2	2.6	0	0.0	0	0.0	2	1.0
All										
Common Carp										
Private nursery	0	0.0	14	32.6	0	0.0	3	50.0	17	29.8
Patilwala/Faria	0	0.0	0	0.0	0	0.0	1	16.7	1	1.8
Other famer	7	100.0	19	44.2	1	100.0	0	0.0	27	47.4
Hatchery	0	0.0	6	14.0	0	0.0	1	16.7	7	12.3
Own raised	0	0.0	3	7.0	0	0.0	1	16.7	4	7.0
Other	0	0.0	1	2.3	0	0.0	0	0.0	1	1.8
All										
Mirror Carp										
Private nursery	3	2.9	17	39.5	5	13.9	5	83.3	30	16.0
Govt nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Patilwala/Faria	98	95.1	19	44.2	25	69.4	0	0.0	142	75.5
Other famer	1	1.0	4	9.3	3	8.3	1	16.7	9	4.8
Hatchery	0	0.0	1	2.3	3	8.3	0	0.0	4	2.1
Own raised	0	0.0	2	4.7	0	0.0	0	0.0	2	1.1
Wild	1	1.0	0	0.0	0	0.0	0	0.0	1	0.5
Others	3	2.9	17	39.5	5	13.9	5	83.3	30	16.0
All										
Thai Sarputi										
Private nursery	2	2.1	28	36.4	7	12.7	5	50.0	42	17.6
Govt nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Patilwala/Faria	94	97.9	41	53.2	46	83.6	1	10.0	182	76.5
Other famer	0	0.0	2	2.6	0	0.0	3	30.0	5	2.1
Hatchery	0	0.0	3	3.9	2	3.6	0	0.0	5	2.1
Own raised	0	0.0	1	1.3	0	0.0	1	10.0	2	0.8
Others	0	0.0	2	2.6	0	0.0	0	0.0	2	0.8
All										
Thai Pangas										
Private nursery	0	0.0	0	0.0	4	12.5	1	33.3	5	11.4
Govt nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Patilwala/Faria	9	100.0	0	0.0	23	71.9	0	0.0	32	72.7
Other famer	0	0.0	0	0.0	3	9.4	1	33.3	4	9.1
Hatchery	0	0.0	0	0.0	2	6.3	1	33.3	3	6.8
Wild										
All										
GIFT										
Private nursery	1	11.1	0	0.0	4	12.1	4	100.0	9	19.6
Govt nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Patilwala/Faria	6	66.7	0	0.0	27	81.8	0	0.0	33	71.7
Other famer	0	0.0	0	0.0	2	6.1	0	0.0	2	4.3
Hatchery	1	11.1	0	0.0	0	0.0	0	0.0	1	2.2
Other	1	11.1	0	0.0	0	0.0	0	0.0	1	2.2
All										
Tilapia/Nilotica										
Private nursery	0	0.0	18	28.6	4	10.8	2	40.0	24	12.0
Govt nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Patilwala/Faria	79	83.2	34	54.0	26	70.3	1	20.0	140	70.0
Other famer	3	3.2	9	14.3	3	8.1	1	20.0	16	8.0
Hatchery	1	1.1	0	0.0	2	5.4	1	20.0	4	2.0
Own raised	5	5.3	2	3.2	2	5.4	0	0.0	9	4.5
Others	7	7.4	0	0.0	0	0.0	0	0.0	7	3.5
Mola/Dhela/Tengra										
Private nursery	0	0.0	1	50.0	0	0.0	0	0.0	1	11.1
Govt nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Patilwala/Faria	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Other famer	2	66.7	1	3.33	3	100.00	0	0.0	2	66.7
Other	1	33.3	0	0.0	0	0.0	0	0.0	0	0.00
All										
Other white fish										
Private nursery	0	0.0	21	38.9	2	22.2	3	75.0	26	28.6
Patilwala/faria	20	83.3	24	44.4	4	44.4	0	0.0	48	52.7
Other famer	0	0.0	5	9.3	0	0.0	0	0.0	5	5.5
Hatchery	0	0.0	1	1.9	2	22.2	0	0.0	3	3.3
Own raised	1	4.2	1	1.9	0	0.0	1	25.0	3	3.3
Wild	2	8.3	0	0.0	1	11.1	0	0.0	3	3.3
Other	1	4.2	2	3.7	0	0.0	0	0.0	3	3.3
Golda PL										
Private nursery	4	4.7	0	0.0	2	9.5	0	0.0	6	5.3
Patilwala/faria	43	50.6	3	42.9	8	38.1	0	0.0	54	47.8
Other famer	2	2.4	0	0.0	4	19.0	0	0.0	6	5.3
Hatchery	9	10.6	1	14.3	0	0.0	0	0.0	10	8.8
Own raised	1	1.2	0	0.0	0	0.0	0	0.0	1	0.9
Depot	5	5.9	2	28.6	0	0.0	0	0.0	7	6.2
Wild	4	4.7	0	0.0	7	33.3	0	0.0	11	9.7
Other	17	20.0	1	14.3	0	0.0	0	0.0	18	15.9
All										

Adoption and Dissemination of Improved Fish Cultivation Technology

Knowledge parameters and practice level of the farmers indicates that most of the farmers (50%) are well acquinted with the natural feed adequacy testing methodin the pond water and majority of them (81%) practice thes technology in field (Table 4.25) .More than 50% of farmers knew about the species selection, weed control, lime application, supplementary feed application, growth monitoring, post harvesting handling and quality seed selection methods wbut ou them only 70-80 practuice the technologies. About 30-40% farmersknew about feed application procedures, fish health monitoring and fish disease monitoring procedure. It is observed that whatever knowledge they had, did not practiced them in field properly. The prime cause of non practicing the technologies as identified was less seriousness of the farmers about the technology application (71%). Other causes were non availability of inputs, capital shortage and lack of enough knowlwdge.

Most of the farmers found had the knowledge of Weed control (84%) and liming (76%). Half of the farmers knew testing natural feed adequacy in water, species selection, supplementary feeding, growth monitoring, post-harvest handling and use of quality seeds.Around 30% knew other technologies practiced them. Most of the farmers who had knowledge they were practicing the technologies.

Major cause of not practicing the technologies was not serious about it. On the average from each farmer a technology was disseminated to 3-4 other farmers across the upazilas.

Table 4.25: Adoption and Dissemination of Improved Pond Fish Culture										
Technology	Khulna		Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%	No.	%
Testing natural feed adequacy in water										
Knew	75	39.7	50	49.5	65	68.4	11	68.8	201	50.1
Practiced among those who knew	59	78.7	36	72.0	57	87.7	11	100.0	163	81.1
Average no. of farmers disseminated to										
Maintaining fish stock density										
Knew	33	17.5	33	32.7	41	43.2	8	50.0	115	28.7
Practiced among those who knew	23	69.7	20	60.6	31	75.6	7	87.5	81	70.4
Average no. of farmers disseminated to										
Species selection										
Knew	79	41.8	56	55.4	63	66.3	12	75.0	210	52.4
Practiced among those who knew	66	83.5	41	73.2	55	87.3	11	91.7	173	82.4
Average no. of farmers disseminated to										
Weed control										
Knew	167	88.4	72	71.3	81	85.3	15	93.8	335	83.5
Practiced among those who knew	154	92.2	62	86.1	77	95.1	15	100.0	308	91.9
Average no. of farmers disseminated to										
Lming										
Knew	132	69.8	79	78.2	78	82.1	14	87.5	303	75.6
Practiced among those who knew	108	81.8	69	87.3	69	88.5	14	100.0	260	85.8
Average no. of farmers disseminated to										
Supplementary feeding										
Knew	75	39.7	53	52.5	68	71.6	12	75.0	208	51.9
Practiced among those who knew	59	78.7	39	73.6	50	73.5	11	91.7	159	76.4
Average no. of farmers disseminated to										
Fish disease management										
Knew	36	19.0	46	45.5	29	30.5	11	68.8	122	30.4
Practiced among those who knew	29	80.6	33	71.7	23	79.3	10	90.9	95	77.9
Average no. of farmers disseminated to										
Health monitoring										
Knew	44	23.3	50	49.5	31	32.6	7	43.8	132	32.9
Practiced among those who knew	35	79.5	37	74.0	25	80.6	6	85.7	103	78.0
Average no. of farmers disseminated to										
Growth monitoring										
Knew	87	46.0	69	68.3	58	61.1	12	75.0	226	56.4
Practiced among those who knew	78	89.7	54	78.3	49	84.5	12	100.0	193	85.4

Average no. of farmers disseminated to										
Post-harvest handling										
Knew	78	41.3	72	71.3	56	58.9	13	81.3	219	54.6
Practiced among those who knew	73	93.6	55	76.4	53	94.6	13	100.0	194	88.6
Average no. of farmers disseminated to										
Use of quality seeds										
Knew	84	44.4	42	41.6	50	52.6	8	50.0	184	45.9
Practiced among those who knew	68	81.0	30	71.4	42	84.0	8	100.0	148	80.4
Average no. of farmers disseminated to										
Feed application procedures										
Knew	65	34.4	33	32.7	36	37.9	12	75.0	146	36.4
Practiced among those who knew	51	78.5	18	54.5	32	88.9	11	91.7	112	76.7
Average no. of farmers disseminated to										
Constraints of adoption:										
Inputs not easily available	0	0.0	0	0.0	5	62.5	0	0.0	5	13.2
Lack of capital	1	6.3	0	0.0	0	0.0	0	0.0	1	2.6
Not serious about it	13	81.3	11	78.6	3	37.5	0	0.0	27	71.1
Lack of enough knowledge	1	6.3	3	21.4	0	0.0	0	0.0	4	10.5
Others	1	6.3	0	0.0	0	0.0	0	0.0	1	2.6

CHAPTER 5: COMMERCIAL SHRIMP CULTURE

Shrimp is one of the commercial fish culture at the costal areas and it is generally cultured in the ghar.. Shrimp culture was found only at Khulna region of the survey areas.

Households Characteristics of the Farmers

All the respondents were farmers and of them 93% were male and 7% were female. Average of the family size was 4.5. Most of the farmers were 25 to 54 years of age, only 7.4% below 25 years and 18.1% above 55years.

Educational level of one-third of the shrimp farmers below primary level, 27% of them passed primary level and 24% had SSC or HSC certificate. Only 12.6% had no education and 5.8% had education more than HSC. So, the educational level of the shrimp farmers better than the national average.

Either main (54.6%) or secondary (35.6%) occupation of most of the shrimp farmers (90%) were fish culture, rest 10% did not take this as their occupation. Second highest occupation of the respondents was agriculture either in their own land or as share cropper. A good number (27%) of shrimp farmers had no secondary occupation.

Out of 570 respondents 230 (40%) received training on shrimp farming during last three years, among them 69% received the training once and 30% twice.

Table 5.01: Household Characteristics		
Characteristics	Number	%
Household Size (No. of members)		
1-3	139	24.4
4-6	383	67.2
7 or more	48	8.4
All	*570*	*100.0*
Average	*4.5*	
Sex of farmer		
Male	530	93.0
Female	40	7.0
All	*570*	*100.0*
Age of farmer		
Less than 25	42	7.4
25-34	136	23.9
35-44	152	26.7
45-54	137	24.0
55 or above	103	18.1
Total	*570*	*100.0*
Average	*41.3*	
Years of schooling of farmer		
No education	72	12.6
Class I-V	173	30.4

Class VI-IX	155	27.2
SSC- HSC	137	24.0
More than HSC	33	5.8
Total	*570*	*100.0*
Primary Occupation of farmer		
Shrimp Culture	311	54.6
Agriculture (Own/share cropper)	84	14.7
Day labor	34	6.0
Small business	30	5.3
Big/medium Business	26	4.6
House wife	23	4.0
Service	16	2.8
Rickshaw/Van driver	14	2.5
Student	14	2.5
Others	13	2.3
Professional (Doctor, engineer, advocate)	2	0.4
Handicrafts, Carpenter, Mason and other self employed	1	0.2
Retired / Minor child	1	0.2
Old (Age >60 years)	1	0.2
Total	*570*	*100.0*
Secondary occupation farmer		
Shrimp Culture	203	35.6
No Subsidiary Occupation	156	27.4
Agriculture (Own/share cropper)	89	15.6
Small business	34	6.0
Day labor	27	4.7
Big/medium Business	23	4.0
Others	18	3.2
House wife	5	0.9
Student	5	0.9
Rickshaw/Van driver	4	0.7
Service	3	0.5
Handicrafts, Carpenter, Mason and other self employed	3	0.5
Total	*570*	*100.0*
Number of training received on shrimp culture during last 3 years		
One	159	69.1
Two	68	29.6
More than two	3	1.3
Total	230	

Shrimp Ghers

The Average number of shrimp ghers cultivated by per household was 2.6 and one-third of the household's cultivated more than 2 ghers (Table 5.02). Average water area of the cultivated gher was 195 decimals. Around 60% leased-in and 50% leased-out their ghers. Average areas of leased-in and leased-out were 173 and 149 decimals respectively. It indicates that the same farmer leased-in and leased-out their ghers for shrimp cultivation.

Table 5.02: Land Ownership - Gher		
Characteristics	No.	%
No. of plot		
1-2	397	69.65
3-4	137	24.03
5 or more	36	6.32
Total	*570*	*100.0*
Average	*2.6*	
Area of gher (decimals)		
0.00-50.00	68	
50.01-100.00	152	
100.01-150.00	104	
150.01-200.00	87	
200.01-250.00	31	
250.01 and above	123	
Total	*565 (570)*	*100*
Average area	**195.3**	
Leased in ghers		
No. of Farmers	345	60.52
Average area (Decimal)	173.1	
Leased out ghers		
No. of Farmers	277	48.60
Average area (Decimal)	**149.2**	

Cultivable Land

Average number of field plots cultivated by a household was 3.6 and over 60% of the households' cultivated more than 2 plots (Table 5.03). Average area cultivated by per household was 105 decimals. Nearly 60% households leased-in and 40% leased-out some cultivable land. Average areas leased-in and leased out were 88 and 109 decimal respectively.

Table 5.03: Cultivated Land		
Characteristics	No.	%
No. of cultivated plot		
1-2	213	37.37
3-4	192	33.68
5 or more	165	28.95
All	570	100.0
Average number of plots	3.6	

Area of cultivated plot (decimals)		
00.01-50.00	35	6.14
50.01-100.00	108	18.95
100.01-150.00	97	17.02
150.01-200.00	87	15.26
200.01-250.00	62	10.88
250.01 -750.00	151	26.49
7.51 and Above	30	5.26
Total	570	100.00
Average area (Decimal)	**254.7**	
Leased in ghers		
Farmers	347	60.88
Average area	**88.2**	
Leased out ghers		
Farmers	227	39.82
Average area	108.7	

Home Gardening

Around 98% of the households own an homestead (Table 5.04). Average homestead area was 14 decimals and it ranges from 1 to 208 decimal.
Over half the households did not cultivate a homestead vegetable garden. The Average number of homestead vegetable plots cultivated by a household was 1.1 and around 40% of the households' cultivated single plot. Average area cultivated by a household was 6.4 decimals while two-third of the farmers cultivated less than 10 decimals of land.

Table 5.04: Home Gardening and Homestead Trees		
Characteristics	No.	%
Area in homestead (decimal)		
1.00	167	29.30
1.01- 5.00	167	29.30
10.01-200.00	119	20.88
20.01-30.00	40	7.02
30.01 and above	64	11.22
No homestead land	13	2.28
Total	570	100.00
Average area (decimal)	14.3	
No. of homestead vegetable plots cultivated		
One	217	38.07
more than one	23	4.04
None	330	57.89
Total	570	100.00
Average (dec)	1.1	
Area cultivated (decimals)		
Less than 10	195	75.58
10-19	43	16.67

more than 19	20	7.75
Total	258	45.26
Average area (decimal)	6.5	
Area under homestead trees (decimal)		
Less than 5	98	17.19
5-9	26	4.56
Over 9	49	8.60
None	397	69.65
All	570	100.00
Average	5.87	

Homestead Trees

Around 70% of the households had not own homestead tree area and only 17% had less than 5 decimals (Table 5.04). The homestead tree area included areas under bamboo, timber and fruit trees. Average number of homestead trees who owned trees was around 6.

Household Income

Earning income from more than one source was common among the households. On the average a household earned income from 4.2 sources and most of the households earned income from 3 to 6 sources (Table 5.05).

Table 5.05: Number of Sources of Household Incomer		
No. of sources	No.	%
1-2	53	9.3
3-4	314	55.1
5-6	171	30.0
7 or more	32	5.6
All	570	100.0
Average	4.2	

Average monthly income of the households was Tk.1, 90,463. All the households either involve in aquaculture or other fisheries. Around 70% of the households involved in crops and vegetables cultivation and more than 70% reared poultry and livestock as their income source. Around one-third of the households did home gardening. Highest income (55%) of these households aquaculture and average income per family was Tk. 1, 09,255. These households are involved in shrimp culture and their major income came from this. Second highest source of income crops and vegetable cultivation and it was only 11.50% (Table 5.06). The above findings indicate that major income of the shrimp farmers come from shrimp culture and income from other sources were small in amount.

Table 5.06: Average Monthly Gross Household Income by Sources					
Sources	Households	%	Income (Tk)	%	Average

Crops and vegetables	395	69.30	12482690	11.50	31602
Livestock and poultry	413	72.46	4020650	3.70	9735
Home gardening	200	35.09	752300	0.69	3762
Homestead trees sold	159	27.89	2215983	2.04	13937
Aquaculture	553	97.02	60418255	55.65	109255
Other fisheries	55	9.65	1559200	1.44	28349
Water pump rental	18	3.16	172000	0.16	9556
Power tiller rental	3	0.53	23900	0.02	7967
Fishing net rental	13	2.28	34800	0.03	2677
Labor selling	142	24.91	4389976	4.04	30915
Services	43	7.54	3851416	3.55	89568
Large business	69	12.11	5053408	4.65	73238
Small trade	97	17.02	4633000	4.27	47763
Vehicle rental	24	4.21	1076000	0.99	44833
Remittance	55	9.65	3899500	3.59	70900
Leased out land	95	16.67	2452822	2.26	25819
Others	45	7.89	1527800	1.41	33951
All households	570	-	108,563,700	100	190463

Characteristics of the Selected Gher

Most of the ghers (85%) were singly owned by the households. Soil characteristics of the majority (65%) of the ghers either sandy loam or clay loam. Others were loamy or clay. A few number of gher found other than these type of soil.

Average gher area was 105 decimals, the Average water area was 89 decimals and the Average dike area was 15.5 decimals. The Average water depth in the ghers was 3.2ft in the culture season but water retained in the gher for fish 8.6 months. Average age of the ghers was 11.6 years.

Table 5.07: Characteristics of the Project Selected Gher

Characteristics	No.	%
Ownership status		
Single owned	486	85.3
Jointly owned	8	1.4
Single leased	75	13.2
Jointly leased	1	0.2
All	570	100
In case jointly owned, Average no. of owners		
Type of soil		
Loamy	79	13.9
Clay	67	11.8
Sandy	20	3.5
Sandy loam	197	34.6

Clay loam	171	30.0
Silt	3	0.5
Silt loam	15	2.6
Others	18	3.2
All	570	100.0
Gher size		
Average gher/gher area (dec)	105.0	
Average water area (dec)	89.1	
Average dike area (dec)	15.5	
Water area shaded by trees (%)	72.1	
Average water depth in culture season (feet)	3.2	
No. of months water retains for fish culture	8.6	
Average age of the gher (yrs)	11.6	

Input Use and Costs and Returns of Shrimp Farming

Total number of sample shrimp farmers was 570. Total areas of the gher including dike was 242.21 hectare and only water surface areas of the gher was 205.70 hecatre. So average water area of gher per household was 89.1 decimal and average dike per household was 15.82 decimal. Gher was used for shrimp culture and the dike was mainly used for vegetable cultivation (Table-5.8).

Table 5.08: Commercial srimp farming		
Items	Deciamal	Hectare
Total water area including dike	59826	242.21
Total water area	50807	205.70
Average gher size	89.1	0.36
Average dike size	15.82	

Among the durable inputs, around 74% of the households used spade or sickles and bamboo/ wood/rope. More than 60% used harvesting net, around 50% had Drum/box/fishing trap and 40% used blue net (Table 5.09).

Almost all the labors (91%) used in the fish culture were unpaid household labor and around 20% were females. Around one thousand labours were required for one hectare of gher cultivation (Table 5.09). The average labor cost was 150 taka per labor. Since labor cost comprised most of the costs, the uniform rates will provide better measures of margins which will be directly comparable across the regions. Average hired labour per hectare used was Tk. 3328 per hectare.

	Table 5.09: Labor Use and Costs in Gher Fish Culture			
Labor use	# of Labor per decimal	Per hectare	% of total	Cost per hectare in Tk.
HH labor				
Male	3.01	744	73.2	35722
Female	0.72	178	17.5	794
Total	3.73	922	90.8	36517

Hired labor				
Male	0.32	79	7.8	3255
Female	0.06	15	1.5	72
Total	0.38	94	9.2	3328
All laborers	**4.11**	**1016**	**100**	**35722**

Most of the farmers used lime and nearly half of them used inorganic and organic fertilizers for gher preparation. Around half of the farmer used organic and inorganic fertilizer. More than 80% used lime and one-fourth used other chemical. Almost all the farmers used supplementary feed and half used inorganic fertilizers and lime for post stocking management. However, only 20% used organic fertilizer.

More than 70% of the farmers cultivated Bagda and Golda. Around 18% cultivated Harina/Chali shrimp and 14% cultivated carp fish in the shrimp gher (Table 3.16).

Table 3.10: Type of Fish Cultivted		
Outputs	# of farms	% of farms
Bagda	414	72.63
Golda	428	75.09
Harina/Chali shrimp	100	17.54
Carp	80	14.04

Most of the cost of shrimp culture as fixed cost (31.82%), labour cost (25.91) and stock management (21.82%). The average cash cost of fish culture was Tk. 54,340 per hectare and average return was Tk. 99,460 per hectare. On the average a farmer got gross margin per hectare from the shrimp culture was Tk. 45120 and Benefit-Cost Ratio 1.83 (Table 5.11 & 5.12).

Table 5.11: Costs of Shrimp Culture			
Items	**Costs per decimal (Tk)**	**Costs per hectare (Tk)**	**%**
Fixed costs	70	17290	31.82
Hired labour	57	14079	25.91
pond preparation	18	4446	8.18
Seeding	8	1976	3.64
Inputs for stock management	48	11856	21.82
Water management	6	1482	2.73
Harvesting	5	1235	2.27
Selling	8	1976	3.64
Cash Cost	220	54340	100.00

Table 3.12: Outputs of Gher Culture		
Outputs	Qty (Kg)	Value (Tk)
Output per dec	0.93	4836
Output per hectare	230	99460
Cost per hectare	-	54340
Gross margin per hectare	-	45120
Benefit-Cost Ratio		1.83

Consumption of Bagda, Golda and Harina/Chali were 5.09%, 9.70% and 17.53% respectively. Amount of sold was around 70%. However, technical loss of Bagda and Golda was around 15% and it was only 1.90% for Harina/Chali. This might be due to export or use of Gold/Bagda by the costly deaprmental shop.

Table 5.13: Percentage Disposal of Gher Fish			
Disposal	**Bagda**	**Golda**	**Harina/Chali**
Consumed	5.09	9.70	17.53
Sold	69.28	71.65	72.85
Gifted	10.23	3.56	7.74
Technical Loss	15.40	15.09	1.90

Total	100	100	100

Sources of Fish Seeds

Sources of Bagda were mainly hatchery, around 20% were collected from natural source and around 90% of Golda were collected from hatchery. However, Harina/Chali were collected from natural sources only.

Adoption and Dissemination of Improved Fish Cultivation Technology

More than 70% of the farmers knew about the improved technologies of liming and weed control for better fish cultivation. Around half of them knew testing natural feed adequacy in water, species selection, supplementary feeding, growth monitoring, use of quality seeds and feed application procedures. Quater of the faremrs knew other technologies. Most of the farmers who knew the technologies practiced them.

In general 'not serious about it' was the major reason for the lack of practice followed by 'inputs not easily available'. 'Lack of enough knowledge' and 'lack of capital' were the other reasons for the lack of practice.

On the average from each farmer a technology was disseminated to 3-4 other farmers across the upazilas.

Table 3.36: Adoption and Dissemination of Improved Gher Fish Culture

Technology	No.	%
Testing natural feed adequacy in water		
Knew		
Practiced among those who knew	286	50.18
Average no. of farmers disseminated to	261	91.26
Maintaining fish stock density		
Knew		
Practiced among those who knew	159	27.89
Average no. of farmers disseminated to	142	89.31
Species selection		
Knew		
Practiced among those who knew	289	50.70
Average no. of farmers disseminated to	274	94.81
Weed control		
Knew		
Practiced among those who knew	502	88.07
Average no. of farmers disseminated to	495	98.61
Lming		
Knew		
Practiced among those who knew	420	73.68
Average no. of farmers disseminated to	397	94.52
Supplementary feeding		
Knew		
Practiced among those who knew	249	43.68
Average no. of farmers disseminated to	212	85.14
Fish disease management		
Knew		

Practiced among those who knew	136	23.86
Average no. of farmers disseminated to	112	82.35
Health monitoring		
Knew		
Practiced among those who knew	173	30.35
Average no. of farmers disseminated to	156	90.17
Growth monitoring		
Knew		
Practiced among those who knew	274	48.07
Average no. of farmers disseminated to	259	94.53
Post-harvest handling		
Knew		
Practiced among those who knew	214	37.54
Average no. of farmers disseminated to	200	93.46
Use of quality seeds		
Knew		
Practiced among those who knew	315	55.26
Average no. of farmers disseminated to	292	92.70
Feed application procedures		
Knew		
Practiced among those who knew	309	54.21
Average no. of farmers disseminated to	262	84.79
Constraints of adoption:		
Inputs not easily available	2	0.35
Lack of capital	1	0.18
Not serious about it	12	2.11
Lack of enough knowledge	5	0.88
Others	7	1.23

CHAPTER 6: NURSERY

Nursery is a very essential for seedlings and fish culture. So in this survey an assessment was made about present nursery available at the survey areas. Mainly nurseries are concentrated to the Khulna hub of the survey areas. Total seventy seven nurseries were survey, among those only 3 were situated at Faridpur hub and rest 74 were at Khulna hub. Most of the nurseries were not well equipped with the facilities need for a nursery. Physical infrastructure like office room, net drying shed, store room, labor shed and guest room were found at 49%, 38%, 32%, 17% and 13% nurseries respectively. Water filtration unit was found in 17% and overhead tank was available in 7% nurseries. A few of them had hatchery jar, air blowing network, laboratory, etc (Table-6.02).

Table : 6.1 – Nursery Complex

Items of nursery complex	Hub					
	Khulna		Faridpur		Total	
	Number	%	Number	%	Number	%
Nursery complex	74	96.1	3	3.9	77	100
Overhead tank	5	6.3	1	33.3	5	6.6
Water filtration unit	15	20.3	0	0.0	13	17.2
Hatching jar	5	6.3	0	0.0	4	5.3
Air blowing network/system	3	4.7	0	0.0	3	4.0
Office room	43	57.8	0	0.0	37	48.9
Guest room	12	15.6	0	0.0	10	13.2
Store room	25	34.4	2	66.7	24	31.7
Net drying shed	34	45.3	0	0.0	29	38.3
Labor shed	15	20.3	0	0.0	13	17.2
Laboratory	2	3.1	0	0.0	2	2.6
Others	2	3.1	0	0.0	2	2.6

A good nursery should well equipped with the modern equipment and machineries along with necessary items. However, most of the surveyed nurseries were found lack of the modern equipments oxygen cylinder, DO meter, PH meter, thermometer, barometer, etc. Some necessary thinks like net, fish weighting balance, hapa, water lifting pump ,etc were available at most of the nurseries . Water testing kits were found around half of them. Transportation facilities like van, boat were found at 20%. It is encouraging solar power system at 27% of the nurseries (Table-6.02).

Table : 6.2– Number of Nursery Owned the Equipment's and Machineries

	Hub					
Equipment and Machineries	Khulna		Faridpur		Total	
	N	%	N	%	N	%
Pipe for water supply to tank	21	28.0	0	0.0	21	27.3
Oxygen cylinder	3	4.0	0	0.0	3	3.9
Fish weighting balance	54	72.0	1	50.0	55	71.4
Net	65	86.7	1	50.0	66	85.7
Hapa	56	74.7	2	100.0	58	75.3
Carrying drum	46	61.3	0	0.0	46	59.7
DO meter	5	6.7	0	0.0	5	6.5
PH meter	4	5.3	0	0.0	4	5.2
Thermometer	4	5.3	0	0.0	4	5.2

Barometer	1	1.3	0	0.0	1	1.3
Shallow/deep tube well	25	33.3	2	100.0	27	35.1
Electric motor	8	10.7	1	50.0	9	11.7
Water lifting pump+pipe	61	81.3	2	100.0	63	81.8
Aerator	6	8.0	0	0.0	6	7.8
Boat	13	17.3	1	50.0	14	18.2
Transport van	16	21.3	1	50.0	17	22.1
Furniture	41	54.7	0	0.0	41	53.2
Water testing kit	2	2.7	0	0.0	2	2.6
Refrigerator	0	0.0	0	0.0	0	0.0
Deep freezer	0	0.0	0	0.0	0	0.0
Computer	4	5.3	0	0.0	4	5.2
Microscope	0	0.0	0	0.0	0	0.0
PCR machine	1	1.3	0	0.0	1	1.3
Water heater	1	1.3	0	0.0	1	1.3
Thermostat	2	2.7	0	0.0	2	2.6
Air cooler/conditioner	4	5.3	0	0.0	4	5.2
Electric fan	18	24.0	0	0.0	18	23.4
Electric generator	3	4.0	0	0.0	3	3.9
Solar Power system	21	28.0	0	0.0	21	27.3
IPS/UPS	1	1.3	0	0.0	1	1.3
Other	7	9.3	1	50.0	8	10.4

An attempt was made to know type of nursing species of fish at the nurseries. Most of the common species of the fish were nursing. More than 60% were found nursing carp type fish like Rui, Catla and Mrigal. Silver carp and Grass carp were found in 52% and 40% nurseries. Thai sorputi was nursed by 41% nurseries. Bagda and Golda shrimp were found nursing by 25% and 11% nurseries respectively (Table-6.3).

Table-6.3: Type of Fish Seed/PL in 2011

	Hub					
Type of fish	Khulna		Faridpur		Total	
	N	%	N	%	N	%
Rui	53	75.7	2	66.7	55	75.3
Catla	45	64.3	3	100.0	48	65.8
Mrigal	42	60.0	3	100.0	45	61.6
Thai Pangus	15	21.4	0	0.0	15	20.5
Grass carp	27	38.6	2	66.7	29	39.7
Silver carp	36	51.4	2	66.7	38	52.1
Monosex Tilapia	14	20.0	0	0.0	14	19.2
GIFT	9	12.9	0	0.0	9	12.3
Shrimp (Bagda)	17	24.3	1	33.3	18	24.7
Shrimp (Golda)	7	10.0	1	33.3	8	11.0
Native Shing	1	1.4	0	0.0	1	1.4
Native Magur	0	0.0	0	0.0	0	0.0
Thai Koi	1	1.4	0	0.0	1	1.4
Thai Sorputi	29	41.4	1	33.3	30	41.1
Other	19	27.1	3	100.0	22	30.1

Total	70	100.0	3	100.0	73	100.0

A number of inputs were used for pond operation of the nurseries. Mostly lime, urea, inorganic fertilizers and cow dung were used. Half had used ready feed purchased from market and around 40% prepared the feed at their own farm or home. Medicine like fish killing agent was used by around 60% and for disease 40%. Seedling and packing cost were incurred by 21% of the nurseries. Around 70% spent money for transportation. Mostly these nurseries did not have their own transport (Table-6.4). Total input cost was taka 19,319,572 for all the 77 nurseries and average cost per nursery was taka 250,904 only (Table-6.05).

Table-6.4: Number of Nurseries Using Different Input Nursing Pond Operational Costs

Operational cost items	Hub					
	Khulna		Faridpur		Total	
	N	%	N	%	N	%
Pond preparation (drying, plaughing, soil purchase, bamboo etc except labor cost)	34	45.9	2	66.7	36	46.8
Input Cost						
Lime	64	86.5	2	66.7	66	85.7
Cow dung	49	66.2	1	33.3	50	64.9
Urea	55	74.3	2	66.7	57	74.0
TSP	53	71.6	1	33.3	54	70.1
MoP	28	37.8	1	33.3	29	37.7
Mustard oilcake	54	73.0	3	100.0	57	74.0
Farm/homemade feed	30	40.5	0	0.0	30	39.0
Industrial/commercial/ready feed	39	52.7	0	0.0	39	50.6
Vitamins and minerals	27	36.5	1	33.3	28	36.4
Reagents/chemicals for water quality test	3	4.1	0	0.0	3	3.9
Medicines for disease control	31	41.9	1	33.3	32	41.6
Fish killing agents (rotenone, tea seed cake etc)	41	55.4	3	100.0	44	57.1
Netting for growth check (in case of hire)	28	37.8	2	66.7	30	39.0
Fuel for water exchange	31	41.9	2	66.7	33	42.9
Fuel for aeration	3	4.1	0	0.0	3	3.9
Other	14	18.9	0	0.0	14	18.2
Seed/PL packing costs (marketing)						
Packing cost (oxygen, jute sac, polybag,box)	16	21.6	0	0.0	16	20.8
Advertising costs (poster/leaflets etc)	10	13.5	0	0.0	10	13.0
Miscellaneous cost	8	10.8	1	33.3	9	11.7
Electricity cost for selected pond	32	43.2	0	0.0	32	41.6
Water treatment cost for selected pond						
Transportation cost (if any)	51	68.9	3	100.0	54	70.1
Total	74	100.0	3	100.0	77	100.0

Table-6.5: : Operational Costs of Nurseries

Nursing Pond Operational Costs (variable costs)	Hub		
	Khulna	Faridpur	Total
Total nursery	74	3	77
Total Cost	19,063,512	256,060	19,319,572
Cost per nursery	257,615	85,353	250,904

Out of 77 nurseries 53 had permanent male labours. Average number of labours who had permanent labour was 2.3 and average labour days were 538 in one year. Only 3 female were found working at 2 nurseries. Average male daily labours were worked for 543 labour days were worked for a year and 18 labour days. Participation of family labour was very low and insignificant in number (Table-6.6)

Table-6.6: Labour use for the Nursery Operation

Labour Type	Hub		
	Khulna	Faridpur	Total
No. of permanent male	50	3	53
	120.0	3.0	123.0
	2.4	1.0	2.3
Permanent male - Total no. of days	50	3	53
	27,550.0	975.0	28,525.0
	551.0	325.0	538.2
No. of permanent female	2	0	2
	3.0	.	3.0
	1.5	.	1.5
Permanent female - Total no. of days	1	0	1
	365.0	.	365.0
	365.0	.	365.0
No. of daily male	47	3	50
	535.0	8.0	543.0
	11.4	2.7	10.9
Daily male - Total no. of days	46	3	49
	2,170.0	316.0	2,486.0
	47.2	105.3	50.7
No. of daily female	3	0	3
	4.0	.	4.0
	1.3	.	1.3
Daily female - Total no. of days	3	0	3
	56.0	.	56.0
	18.7	.	18.7
No. of family male	71	3	74
	102.0	4.0	106.0
	1.4	1.3	1.4
Family male - Total no. of days	71	3	74
	24,285.0	799.0	25,084.0
	342.0	266.3	339.0
No. of family female	15	1	16
	16.0	1.0	17.0
	1.1	1.0	1.1
Family female - Total no. of days	18	1	19

	3,113.0	120.0	3,233.0
	172.9	120.0	170.2

Production of 73 nurseries was informed and all of them sold their product. Average price of production per nursery was taka 644,877.0 and average selling return was taka 596,428. It was informed by 49 nurseries that they consumed their own product and on an average value of the consumption taka 26,995. At the time of survey 30 nurseries reported that they had some unsold product and it was average taka 50,732 per nursery (Table-6.8).

Table-6.8: Production from Nurseries and Its Disposal in 2011

Diposal	Hub		
	Khulna	Faridpur	Total
Production			
Number of nurseries	70	3	73
Production	45,710,323	1,365,695	47,076,018
Average per nursery	653,004.6	455,231.7	644,877.0
Sold			
Number of nurseries	70	3	73
Production	42,516,474	1,022,775	43,539,249
Average per nursery	607,378.2	340,925.0	596,428.1
Consumption			
Number of nurseries	47	2	49
Production	1,322,509	279	1,322,788
Average per nursery	28,138.5	139.5	26,995.7
Unsold			
Number of nurseries	27	3	30
Production	1,416,321	105,636	1,521,957
Average per nursery	52,456.3	35,212.0	50,731.9

An attempt was made to assess the knowledge and real practice of the knowledge at the nursery. It was found that most of the nursery personnel knew High density nursing in earthen ponds and around 60% knew about Nursing in Hapas, one and two stage nursing. Half of them knew Nursing in cemented concrete tanks and 26% knew Nursing of Pangus fry. Practice of the knowledge was found near to the knowledge. It indicates most of the nurseries using their knowledge in practice (Table-6.9). Training is a very strong instrument to increase knowledge and skill for any technical subject. So , it was tried to receiving training by the nursery person. It found that 88 staff of 54 nurseries took training. These persons participated at 202 training course. So on an average 1.6 persons took training and they participated at 3.7 courses (Table-6.10)

Table -6.9: Knowledge and Practice of Improved Fish, Shrimp and Prawn Nursinging technology

	Hub					
Knowledge and practice of technology	Khulna		Faridpur		Total	
	N	%	N	%	N	%
Knowledge						
High density nursing in earthen ponds	63	86.3	3	100.0	66	86.8
Nursing in Hapas	45	61.6	2	66.7	47	61.8
Nursing in cemented concrete tanks	36	49.3	1	33.3	37	48.7
One stage system of nursing	46	63.0	3	100.0	49	64.5
Two stage system of nursing	44	60.3	2	66.7	46	60.5
Prawn larvae nursing in cemented tanks;	6	8.2	0	0.0	6	7.9
Shrimp larvae nursing in cemented tanks;	9	12.3	0	0.0	9	11.8
Nursing of Pangus fry	20	27.4	0	0.0	20	26.3
Nursing of Koi fry	7	9.6	0	0.0	7	9.2
Nursing of native catfish	7	9.6	0	0.0	7	9.2
Practice						
High density nursing in earthen ponds	57	79.2	3	100.0	60	80.0
Nursing in Hapas	40	55.6	2	66.7	42	56.0
Nursing in cemented concrete tanks	31	43.1	1	33.3	32	42.7
One stage system of nursing	46	63.9	3	100.0	49	65.3
Two stage system of nursing	44	61.1	2	66.7	46	61.3
Prawn larvae nursing in cemented tanks;	3	4.2	0	0.0	3	4.0
Shrimp larvae nursing in cemented tanks;	6	8.3	0	0.0	6	8.0
Nursing of Pangus fry	16	22.2	0	0.0	16	21.3
Nursing of Koi fry	5	6.9	0	0.0	5	6.7
Nursing of native catfish	4	5.6	0	0.0	4	5.3

Table-6.10: Staff Received Training On Fish Nursery Management In Last Three Years

Received Training	Hub		
	Khulna	Faridpur	Total
No. of nuseries	54	1	55
No. of staff received training	88	5	93
Average staff received training per nursery	1.6	5.0	1.7
Total number of training received	202	10	212
Average number of training received per nursery	3.7	10.0	3.9

Respondents of the asked what the reason for not practicing the improve nursing. Half of them said that they did not have enough capital and 44% reported they had lack of enough skill. Other responses were input are not easily available and do not belief in

improve technologies (Table-6.11). They were also asked the constraints of operating nurseries. Main reasons mentioned by them were natural climates like heavy rain and draught. Other causes were cost and marketing of the product like high cost of feed, lack of capital and credit facilities (Table-6.12)

Table-6.11: Reasons for not Practicing Improved Fish, Shrimp and Prawn Nursing technology

	Hub			
	Khulna		Total	
	N	%	N	%
Inputs are not freely available	2	12.5	2	12.5
Lack of capital	8	50.0	8	50.0
Don't believe in it	5	31.3	5	31.3
Lack of enough skill	7	43.8	7	43.8
Others	9	56.3	9	56.3

Table-6.12: Types of Problems/Constraints Encounter by the Nurseries

Problems/constraints	Hub					
	Khulna		Faridpur		Total	
	N	%	N	%	N	%
Draught	35	54.7	2	100.0	37	56.1
Heavy rainfall	40	62.5	2	100.0	42	63.6
Insufficient power supply	11	17.2	2	100.0	13	19.7
High cost of nursery feed	39	60.9	2	100.0	41	62.1
Product marketing	18	28.1	1	50.0	19	28.8
Pausing	16	25.0	0	0.0	16	24.2
Less return	16	25.0	0	0.0	16	24.2
Credit problem	32	50.0	1	50.0	33	50.0
Other	2	3.1	0	0.0	2	3.0

It was found the nursery is a very profitable business. Benefit-cost ratio was around two and half, it Averages the return margin 2.5 times of the investment. On an average profit per nursery was Tk. 380225 and Benfit-Cost Ratio 2.44. So if proper support is given in technical and financial matter this business can attract the investor and protein deficiency of the country can be solved. Even foreign currency can be earned by exporting those fishes which has demand in the world market.

Table-6.13: Cost and Return of Nursery operation

Cost/Return	Khulna	Faridpur	Total
Total Cost	16,193,599	616,000	19,319,572
Cost per Nursery	299881	616,000	351265
Total Return	45,710,323	1,365,695	47,076,018
Return per Nursery	846487	1,365,695	855928
Gross margin per Nursery	546606	749,695	380225
Benefit-cost ratio	2.82	2.217	2.44

CHAPTER 7: CAGE FISH CULTURE

Cage fish culture has introduced in Bangladesh in the recent past. Till now it has not been widely used. However, this cultural practice may open the avenue for the poor population who have limited scope to cultivate the fish in pond or gher large water bodies individualy or by group forming. This method can be used open water like river, haor, bill, etc.

Household Characteristics of Farmer of Cage Culture

Data on household characteristics of cage farmers shows that around 62% of them cage farmers were female and rest 38% were male that indicate a So a good participation of female in aquaculture activity was found. Age range of the cage farmers indicates that most of the farmers were between 25 to 44 years of age old and their average family size of these farmers was 4.5. Educational level of the cage farmers were found less compare to than the other fish farmers. Around 30% of them had no education at all and 32% are educated within I-Vupto primary level. As majority of the cage farmers were female, main primary occupation of all the female members were of most of them was identified as housewifery (56%) and 20% male members were agricultural farmers who were mainly male. Secondary occupation of most of the farmers (68%) was found fish culture and around 20% had no secondary occupation (Table 7.1).

Table 7.01: Household Characteristics

Characteristics	Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%
Household size (no. of members)								
1-3	10	27.0	10	18.2	0	0.0	20	20.6
4-6	25	67.6	37	67.3	4	80.0	66	68.0
7 or more	2	5.4	8	14.5	1	20.0	11	11.3
All	37	100.0	55	100.0	5	100.0	97	100.0
Average	4.4		4.6		4.6		4.5	
Sex								
Male	3	8.1	33	60.0	1	20.0	37	38.1
Female	34	91.9	22	40.0	4	80.0	60	61.9
All	37	100.0	55	100.0	5	100.0	97	100.0
Age of the farmer (years)								
Less than 25	7	18.9	4	7.3	1	20.0	12	12.4
25-34	12	32.4	22	40.0	1	20.0	35	36.1
35-44	9	24.3	15	27.3	3	60.0	27	27.8
45-54	6	16.2	8	14.5	0	0.0	14	14.4
55 or above	3	8.1	6	10.9	0	0.0	9	9.3
All	37	100.0	55	100.0	5	100.0	97	100.0
Average	35.1		37.1		34.2		36.2	
Educational level of the farmer (grades completed)								
None	12	32.4	15	27.3	2	40.0	29	29.9
1-5	7	18.9	23	41.8	1	20.0	31	32.0
6-10	8	21.6	10	18.2	2	40.0	20	20.6
10-12	9	24.3	7	12.7	0	0.0	16	16.5
13 or more	1	2.7	0	0.0	0	0.0	1	1.0
All	37	100.0	55	100.0	5	100.0	97	100.0
Primary occupation of the farmer								
House wife	28	75.7	23	41.8	4	80.0	55	56.7
Service	1	2.7	1	1.8	0	0.0	2	2.1

Big/medium Business	0	0.0	1	1.8	0	0.0	1	1.0
Small business	0	0.0	5	9.1	1	20.0	6	6.2
Day labor	2	5.4	1	1.8	0	0.0	3	3.1
Agriculture (Own/share cropper)	0	0.0	20	36.4	0	0.0	20	20.6
Handicrafts, Carpenter, Mason and other self employed	0	0.0	1	1.8	0	0.0	1	1.0
Retired / Minor child	1	2.7	0	0.0	0	0.0	1	1.0
Fish Culture	4	10.8	3	5.5	0	0.0	7	7.2
Others	1	2.7	0	0.0	0	0.0	1	1.0
All	37	100.0	55	100.0	5	100.0	97	100.0
Secondary occupation of the farmer								
House wife	1	2.7	0	0.0	0	0.0	1	1.0
Day labor	1	2.7	4	7.3	0	0.0	5	5.2
Agriculture (Own/share cropper)	2	5.4	0	0.0	0	0.0	2	2.1
Fish Culture	25	67.6	37	67.3	4	80.0	66	68.0
Others	0	0.0	5	9.1	0	0.0	5	5.2
No Subsidiary Occupation	8	21.6	9	16.4	1	20.0	18	18.6
All	37	100.0	55	100.0	5	100.0	97	100.0

Training Received

As cage culture is a new technology, so training on this subject is necessary to practice it. It was found that more than 90% of the cage farmers received training on the technology. Average number of training received during last three years was 2.8. These farmers also received other along with cultivation fish in cage (Table7.2).

Fish culture in cages is a new technology for Bangladesh which is mostly suitable for large open water bodies and running water bodies where normal fish culture is not manageable. Therefore, farmers involve in this activity need to know about new ideas of technology like preparation of cage, materials to be used, site selection, selection of species to be cultures, feed and culture management, maintenance of cages and community based management approaches etc. The present study revealed that more than 90% of the cage farmers received training on various aspects of cage culture technology. Out of them 51% received training for a period of 1-3 days while 33% received training for a period of 7 days or more. About 95% of these cage farmers also received other trainings on fish culture aspects (Table 7.2).

Table-7.2: Training received by HH members on cage farming during last years

	Hub							
Training Received	Faridpur		Barisal		Jessore		Total	
	N	%	N	%	N	%	N	%
Training on cage farming during the last three years								
None	5	13.51	2	3.636	2	40	9	9.28
1-3	30	81.08	19	34.545	0	0	49	50.52
4-6	0	0.00	6	10.909	1	20	7	7.22
7 or above	2	5.41	28	50.909	2	40	32	32.99
Total	37	100.00	55	100.000	5	100	97	100.00
Average training	1.7		3.7		1.5		2.8	
Total training received during last three year								
None	0	0	3	5.45	2	66.7	5	5.15

1-3	34	91.89	43	78.18	0	0	77	79.38
4-6	1	2.70	7	12.73	1	33.3	9	9.28
7 or above	2	5.41	2	3.64	2	0	6	6.19
Total	37	100	55	100.00	5	100	97	100.00

Cultivation Land

Cultivation land is one of the main indicators of the economic condition of the household in the village level. It was found that a large number of the cage farmers (40%) had no cultivable land at all and around 20% had 20 decimal or less land. However, average cultivated land was 195 decimal and most of these (155 decimal) was leased-in (Table-7.3).

Table-7.3: Cultivable Land

	Faridpur		Barisal		Characteristics		All regions	
	No.	%	No.	%	No.	%	No.	%
No. of field plots cultivated								
1-2	18	48.65	26	47.27	2	40.00	46	47.42
3-4	2	5.41	6	10.91	1	20.00	9	9.28
5 or more	0	0.00	3	5.45		0.00	3	3.09
Not Cultivated	17	45.95	20	36.36	2	40.00	39	40.21
All	37	100	55	100	5	100	97	100
Average	1.4		2.5		1.5		2.1	
Area of land cultivated (decimals)								
0.00-50.00	10	27.02	9	16.36	2	40.00	21	21.65
50.01-100.00	3	8.10	13	23.64	1	20.00	17	17.53
100.01-150.00	5	13.51	1	1.82		0.00	6	6.19
150.01-200.00	0	0.00	5	9.09		0.00	5	5.15
200.01 and above	2	5.41	7	12.73		0.00	9	9.28
No cultivable land	17	45.95	20	36.36	2	40.00	39	40.21
All	37	100	55	100	5	100	97	100
Average area	206.7		189.0		184.5		195.4	
Leased in farm land								
Number of farmers	6		13		2		21	
Average area	58.6		188.9		144.5		154.6	
Leased out farm land								
Number of farmers	6		5		0		11	
Average area	1,038		427		0		793	

Homestead Gardening

Around one-fourth of the cage farmer had no homestead land, so scope of gardening very limited. Around 60% did not have chicken garden and area of garden of 80% who cultivated vegetable was less than 10 decimal. More than 60% had no tree at the home stead and 27% had less than 5 trees in their garden (Table-7.4).

Table-7.4: Homestead Land and Gardening

Characteristics	Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%
Area in homestead (decimal)								
00.01-10.00	15	40.54	27	49.09	4	80	46	47.42
10.01- 20.00	7	18.92	12	21.82	0		19	19.59
20.01 and above	2	5.41	6	10.91	0		8	8.25
Total having Homestead	24	64.86	45	81.82	4	80	73	75.26
No homestead land	13	35.14	10	18.18	1	20	24	24.74
All	37	100	55	100	5	100	97	100
Average area	7.4		9.3		1.0		8.5	
No. of homestead vegetable plots cultivated								
One	9	24.32	29	52.73	1	20.00	39	40.21
Over one	0	0.00	0	0.00	0	0.00	0	0.00
None	28	75.68	26	47.27	4	80.00	58	59.79
All	37	100	55	100	5	100	97	100
Average								
Area cultivated (decimals)								
Less than 10	7	77.78	23	79.31	1	100	31	79.49
10 and above	2	22.22	6	20.69	0	0	8	20.51
All	9	100	29	100	1	100	39	100
Average area	6.8		7.6		7.8		7.4	
Area under homestead trees (decimals)								
Less than 5	7	18.92	18	32.73	1	20.00	26	26.80
5-9	1	2.70	5	9.09	0	0.00	6	6.19
9 +	2	5.41	4	7.27		0.00	6	6.19
None	27	72.97	28	50.91	4	80.00	59	60.82
All	37	100	55	100	5	100	97	100
Average area	5.3		7.8		6.8		7.1	

Household Income

One an average 3.4 members of the households of the cage farmers were earning (Table-7.5) and average family size was 4.5. It indicates that most of the family members of the cage farmers earned for their survival. Main sources of income of these families crop or vegetable cultivation, livestock or poultry rearing, aquaculture or other fisheries. However, their major income comes from aquaculture or other fisheries. The above situation shows the vulnerability of the cage farmers. On an average annual income of the households was Taka 117,393 and per capita income was taka 26088 (Table-7.6).

Table-7.5: Income of the Cage Farmers

No. of income sources	Hub							
	Faridpur		Barisal		Jessore		Total	
	N	%	N	%	N	%	N	%
1-2	21	56.8	9	16.4	0	0.0	30	30.9
3-4	11	29.7	23	41.8	5	100.0	39	40.2
5-6	5	13.5	21	38.2	0	0.0	26	26.8

7 or more	0	0.0	2	3.6	0	0.0	2	2.1
Total	37	100.0	55	100.0	5	100.0	97	100.0
No. of earning member	4.0		3.2		3		3.4	

Table-7.6: Sources of Income

Sources	Faridpur		Barisal		Jessore		All regions	
	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)	% of hh	% of income (Tk)
Crops and vegetables	35.1	6.1	67.3	30.7	0.0	0	51.5	17.1
Livestock and poultry	13.5	0.2	81.8	7.2	60.0	4.6	54.6	3.6
Home gardening	18.9	0.4	58.2	4.4	0.0	0.0	40.2	2.2
Homestead trees	8.1	0.1	10.9	0.2	40.0	0.3	11.3	0.2
Aquaculture	32.4	23.5	41.8	5.0	20.0	26.4	37.1	15.2
Other fisheries	62.2	26.1	45.5	12.7	80.0	39.2	53.6	20.6
Pump rental	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tiller rental	0.0	0.0	3.6	0.2	0.0	0.0	2.1	0.1
Fishing net rental	0.0	0.0	0.0	0.0	40.0	0.4	2.1	0.0
Labor	27.0	5.3	30.9	9.6	20.0	19.0	28.9	8.0
Services	10.8	9.2	7.3	7.9	0.0	0.0	8.2	8.1
Business	8.1	6.4	5.5	2.8	0.0	0.0	6.2	4.4
Small trade	8.1	2.0	14.5	5.9	40.0	6.7	13.4	4.0
Vehicle rental	0.0	0.0	9.1	5.6	0.0	0.0	5.2	2.5
Remittance	0.0	0.0	9.1	2.6	20.0	3.5	6.2	1.4
Leased out land	8.1	2.5	1.8	0.2	0.0	0.0	4.1	1.3
Others	27.0	18.2	10.9	4.9	0.0	0.0	16.5	11.2
All households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Per HH average income	151,375		94,867.3		113,720		117,393	
Per capita	34404		20623		24722		26088	

Knowledge and Practice of Cage Culture

All most all had the farmers know the cage maintenance. Around 80% know the techniques of species selection 77% knew about the supplementary feed. However, maintenance of the density of the stack was known to less than half of the farmers (Table7.7).

Table-7.7: Knowledge and Practice of Cage Fish Culture

Technology	Faridpur		Barisal		Jessore		All regions	
	No.	%	No.	%	No.	%	No.	%
Maintaining fish stock density								
Knew	10	27.0	29	52.7	5	100.0	44	45.4
Practiced among those who knew	9	90.0	27	93.1	5	100.0	41	93.2
Average no. of farmers disseminated to								
Species selection								
Knew	20	54.1	54	98.2	5	100.0	79	81.4

Practiced among those who knew	14	70.0	54	100.0	5	100.0	73	92.4
Average no. of farmers disseminated to								
Cage maintenance								
Knew	37	100.0	54	98.2	5	100.0	96	99.0
Practiced among those who knew	30	81.1	54	100.0	5	100.0	89	92.7
Average no. of farmers disseminated to								
Supplementary feeding								
Knew	18	48.6	53	96.4	4	80.0	75	77.3
Practiced among those who knew	14	77.8	52	98.1	4	100.0	70	93.3
Average no. of farmers disseminated to								
Fish disease management								
Knew	14	37.8	31	56.4	4	80.0	49	50.5
Practiced among those who knew	10	71.4	31	100.0	4	100.0	45	91.8
Average no. of farmers disseminated to								
Health monitoring								
Knew	14	37.8	43	78.2	5	100.0	62	63.9
Practiced among those who knew	10	71.4	42	97.7	5	100.0	57	91.9
Average no. of farmers disseminated to								

Problem and Constraints

The problems of cage fish culture were so highlighted by the farmers. Around 40% only raise the problem of high mortality rate of fish and 30% identified credit for the capital as their problem. However, the farmers started the cage culture recently, so they might not across the problems (Table-7.8).

Table-7.8: Problems and Constraints

Problems			Hub			
			Faridpur	Barisal	Jessore	Total
High mortality of fish	Less	%	48.6	10.9	20.0	25.8
	Moderate	%	2.7	1.8	20.0	3.1
	High	%	32.4	0.0	0.0	12.4
	None	%	16.2	87.3	60.0	58.8
High mortality of fish - Measures taken to overcome problem	Keep safe from infection sources	%	54.8	28.6	0.0	47.5
	Better management of water quality	%	83.9	14.3	0.0	67.5
	Consultation with expert	%	45.2	71.4	0.0	47.5
	Use of medicine/antibiotics	%	6.5	42.9	0.0	12.5
	Others	%	0.0	0.0	100.0	5.0
Social problem	Less	%	10.8	0.0	0.0	4.1
	Moderate	%	10.8	0.0	0.0	4.1

	High	%	54.1	0.0	0.0	20.6
	None	%	24.3	100.0	100.0	71.1
Social problem - Measures taken to overcome problem	Increased security guard	%	60.7	0.0	0.0	60.7
	Awareness campaign	%	89.3	0.0	0.0	89.3
Credit problem	Less	%	32.4	0.0	0.0	12.4
	Moderate	%	2.7	5.5	0.0	4.1
	High	%	32.4	0.0	0.0	12.4
	None	%	32.4	94.5	100.0	71.1
Credit problem - Measures taken to overcome problem	Easy access to association/cooperatives	%	96.0	66.7	0.0	92.9
	Loan taken from Bank	%	24.0	66.7	0.0	28.6
Natural calamities	Less	%	10.8	0.0	0.0	4.1
	High	%	2.7	0.0	0.0	1.0
	None	%	86.5	100.0	100.0	94.8
Financial problems	Less	%	16.2	0.0	20.0	7.2
	Moderate	%	0.0	1.8	20.0	2.1
	High	%	10.8	0.0	0.0	4.1
	None	%	73.0	98.2	60.0	86.6
High input cost	Less	%	2.7	0.0	0.0	1.0
	Moderate	%	5.4	3.6	0.0	4.1
	High	%	2.7	1.8	0.0	2.1
	None	%	89.2	94.5	100.0	92.8
Water pollution	Less	%	8.1	0.0	0.0	3.1
	moderate	%	0.0	3.6	20.0	3.1
	None	%	91.9	96.4	80.0	93.8
Total			37	55	5	97

Chapter 8: Hatchery

Hatchery is the main source of quality seedling of fish culture. Shrimp cultivation is mainly dependent on the hatchery. Mainly hatcheries are available at Barisal and Jessore hub of the survey area. However, hatchery of the shrimp is not available at the survey areas. So, Barisal and Jessore along with Coxes Bazar to cover shrimp hatchery.

Hatcheries are considered as the main source of germ plasm of fish and shrimp/prawn. Previously farmers were fully dependent on wild seed for fish culture. However after the development of fish breeding technologyin in early 60's, later the technology gradually spreaded over the country and now providing more than 70% of the national fish seed requirement. But various malpractices at hatchery level over the period invites problems like genetic erosion and inbreeding etc those drastically reduces the production potential of the sub sector.

In case of shrimp seed, upto 90's, wild source was the only way to get PLs for culture in the ghers of the country, where the harvest size was about 600 crore PL per year which was a great threat against biodiversity conservation for the respective aquatic environment. Because collectors used to destroy 116- 140 other aquatic lives for the collection of single PL. However, establishment of shrimp hatcheries and their production activity opened the door of new avenues particularly to increase national earning through frozen shrimp export. At present 55 shrimp hatcheries of the country satisfying more than 65% seed requirements of the shrimp farmers.

Type of Broods Stock

Most of the hatcheries of Barisal and Jessore found hatching Rui, Catla, Mrigal, Grass carp, Silver carp and Thai Sorputi. Monosex Tilapia was found hatching at only Jessore. Hatcheries of shrimp was found at Coxes Bazar only (Table-8.1).

Survey findings on fish and shrimp hatchery reflect that all most all fish hatcheries are operating in the Barisal and Jessor. Intensity and volume of breeding activity is much higher in Jesssor hatcheries than Barisal. This is worthwhile to mention that historically Jessor is well known for fish seed production in the region and occupies the leading position both in hatcghery quantinty, volume of production and seed trade in the country. However the major breeding species are common and these are Rui, Catla, Mrigal, Grass carp, Silver carp and Thai Sorputi. GIFT strain and Monosex Tilapia are bred in Jessor hatcheries only. The brood stock size of different species in the Jessor is found much higher than Barisal.(Table 8.1).

In case shrimp hatcheries, the only species bred is Bagda (*P.monodon*). Hatchery owners have to fully depend on wild brood of the species, bacuse this can not be raised upto a egg bearing mature brood in captive condition.Under the study, shrimp hatchery survey was conducted in seven operational hatcheries at Cox'sBazar area.

Table-8.1: Number of Hatcheries Type of Broods Stock for Hatchery

Type of broods	Zone							
	Barisal		Coxs Bazar		Jessore		Total	
	N	%	N	%	N	%	N	%
Rui	4	80.00	0	0	20	80.00	24	64.86
Catla	3	60.00	0	0	19	76.00	22	59.46
Mrigal	3	60.00	0	0	20	80.00	23	62.16
Thai Pangus	0	0.00	0	0	10	40.00	10	27.03
Grass carp	3	60.00	0	0	19	76.00	22	59.46
Silver carp	3	60.00	0	0	19	76.00	22	59.46
Monosex Tilapia	0	0.00	0	0	1	4.00	1	2.70
GIFT	1	20.00	0	0	1	4.00	2	5.41
Shrimp (Bagda)	0	0.00	7	100	0	0.00	7	18.92
Prawn (Golda)	1	20.00	0	0	1	4.00	2	5.41
Native Shing	0	0.00	0	0	2	8.00	2	5.41
Native Magur	0	0.00	0	0	2	8.00	2	5.41
Thai Koi	0	0.00	0	0	1	4.00	1	2.70
Thai Sorputi	3	60.00	0	0	20	80.00	23	62.16
Other	4	80.00	0	0	20	80.00	24	64.86
Total	5	100	7	100	25	100.00	37	100.00

Sources of Brood Stocks

All the hatcheries collect brood stock from Private far and Own production. However, At Jessore all the hatcheries collect brood stock from Jamuna river and Barisal from government source and natural sources. However, hatcheries of Coxes Bazar produce seedling of shrimp, so they collect brood stocks from the natural sources (Table8.2).

Sources of brood fish/shrimp used in the carp and shrimp hatcheries are presented in Table 8.2. It is clear from the survey findings that hatcheries of different survey locations used broods from all most all the available souces of the country at a time. Because of the recent fish inbreed problem in the carp hatcheries of the country, producers became aware about the importance of quality brood use in the hatchery for better breeding and business successs. As a followup activity few are collecting selected species directly from the wild sources for their purity and good breeding performances, few are stocking and raising broods using quality germplasm and few became serious about maintain the breeding line at hatchery level. The present study revealed that Jessor hatcheries are highly dependent on wild natural sources. Both Barisal and Jessor also used government farms and other private farms as a good source of broods.

However, for mother shrimp, hatchery owners have to fully depended on deep sea originated wild sources, because Bagda brood can not be raised in captive condition Therefore, it appeared that 86% of shrimp hatcheries in Cpx,sBazar area used broods from natural source while rest 4% is Galda species those can be raised by farmers own or may be procured from other natural or culture sources.

Table-8.2: Sources of Brood Stock of Hatcheries in 2011

Sources	Zone							
	Barisal		Coxs Bazar		Jessore		Total	
	N	%	N	%	N	%	N	%
Halda	4	80.00	0	0	8	32.00	12	32.43
Jamuna	0	0.00	0	0	25	100.00	25	67.57
Brahmaputra	0	0.00	0	0	3	12.00	3	8.11
Government farm	5	100.00	0	0	18	72.00	23	62.16
Private farm	5	100.00	0	0	25	100.00	30	81.08
Own	5	100.00	0	0	25	100.00	30	81.08
Natural	5	100.00	6	85.7	10	40.00	21	56.76
Other wild sources	5	100.00	0	0	3	12.00	8	21.62
Others	5	100.00	0	0	17	68.00	22	59.46
Total	5	100.00	7	100	25	100	37	100.00

Cost of Hatchery

Cost of hatcheries included both the fixed cost and operational cost.

Fixed Cost

Fixed cost mainly included the cost of hatchery complex and equipment cost. It was found 1,55,90,522 taka per hatchery (Table-3). Major fixed cost was cost of build-up the hatchery complex. Only around 15% for the equipment (Table-4). Average fixed cost at Barisal, Cox,s Bazar and Jessore were Taka 73,65,080, 6,07,21,086 and 45,99,053 respectively. It indicates that cost of shrimp hatchery is much more higher than the other hatcheries.

Table-8.3: Cost of Fixed Items of Hatchery Complex

Items of cost		Zone			
		Barisal	Coxs Bazar	Jessore	Total
Total Number of Hatcheries		5	7	25	37
Cost of Hatchery complex	Total	28,386,500	370,582,000	93,434,568	492,403,068
	Average	5677300	52940285.71	3737382.72	13308191
Equipment Cost	Total	8,438,900	54,465,600	21,541,750	84,446,250
	Average	1,687,780	7,780,800	861,670	2,282,331
Total fixed cost	Total	36,825,400	425,047,600	114,976,318	576,849,318
	Average	7365080	60721086	4599053	15590522

Table-8.4: Percentage of Fixed Costs of Hatchery

Items of cost	Zone			
	Barisal	Coxs Bazar	Jessore	Total
Cost of Hatchery Complex	77.08	87.19	81.26	85.36
Equipment Cost	22.92	12.81	18.74	14.64
Total fixed cost	100	100	100	100

Operational Cost

Brood stock collection and rearing management is one of the important operation of hatching. This cost in case of shrimp is much more higher than other fish. Because collection of mother shrimp is involved with hiring of deep sep trawl vessel and other cruise cost. It was found intotal Taka 12,425,571 for shrimp at Cox's Bazar. This were Tk 662,875 and Tk. 2,043,616 at Barisal and Jessore respectively (Table-5).

Other operational cost were brood pond operation, hatchery operation, spawn packing and marketing and other miscellaneous cost. On an average operational cost of shrimp was Tk. 20,161,775. Cost of other two locations Barisal and Jessore were Tk. 2,034,140 and Tk, 1,260,699 respectively (Table-6). Wide variation of operational costs between the hatcheries of two areas are particularly due to hatchery size, intensity of operation and efficiency of the hatchery. Generally Jessor hatcheries are considered as more organized productive hatcheries where involvement of costs are much higher with better return.

Table -8.5: Costs Brood Stock Retained

Brood stock retained cost	Zone			
	Barisal	Coxs Bazar	Jessore	Total
Number	5	7	25	37
Total	3,314,375	86,979,000	51,090,407	141,383,782
Average	662,875	12,425,571	2,043,616	3,821,183

Table-8.6: Hatchery Operational Costs in Taka

Items of Cost		Zone			
		Barisal	Coxs Bazar	Jessore	Total
Total Number of Hatcheries		5	7	25	37
Brood pond operations cost	Total	8,459,800	18,514,425	22,931,895	49,906,120
	Average	1,691,960	2,644,918	917,276	1,348,814
Hatchery operation costs	Total	1,177,900	44,244,001	7,169,410	52,591,311
	Average	235,580	6,320,572	286,776	1,421,387
Spawn packaging costs (marketing	Total	242,000	22,774,000	1,547,760	24,563,760
	Average	48,400	3,253,429	61,910	663,885
Miscellaneous costs	Total	166,000	55,600,000	1,721,900	57,487,900
	Average	33,200	7,942,857	68,876	1,553,727
Total Operational Costs	Total	10,170,700	141,132,426	31,517,465	182,820,591
	Average	2,034,140	20,161,775	1,260,699	4,941,097

Table-8.7: Percentage Operational Costs of Hatchery

Items of Cost	Zone-wise % of cost			
Items of Expenditures	Barisal	Coxs Bazar	Jessore	Total
Operational Costs of Hatchery (variable costs)	50.31	50.00	48.57	49.76
Brood pond operations cost	41.85	6.56	35.34	13.58
Hatchery operation costs	5.83	15.67	11.05	14.32
Spawn packaging costs (marketing	1.20	8.07	2.39	6.69
Miscellaneous costs	0.82	19.70	2.65	15.65
Total	100.00	100.00	100.00	100.00

Return

Return of hatcheries comes from two sources- value of the sale of brood fish and spwan. Average sale of broods of shrimp at Coxes Bazar was taka 1,413,393. It was at Barisal and Jessore were 142785 and 399629 respectively. Return of spwan of was taka 87,642,857 per shrimp hatchery and taka 1346,450 and 19,629,218 at the Barisal and Jessore. It was found that return of shrimp hatchery of Coxes Bazar was much higher than other two areas. However, hatchery of Barisal incurred loss. Sample size the Barisal was only 5, Sample of Jessore was 25, so finding of this hub is more rliable. Return of shrimp hatchery was taka 87,795,551 and benefit cost ratio was 4.42. Gross profit of the hatcheries of Jessore was 3,148,399 and Benefit-cost ratio was 3.5 (Table-8.8, 8.9 & 8.10).

Table-8.8: Value of broods sold in 2011 in Taka

	Region			
	Barisal	Coxs Bazar	Jessore	Total
Number of hatchery	5	7	25	37
Total value	713,925	9,893,750	4,178,594	14,786,269
Average value per hatcery	142,785	1,413,393	167,144	399,629

Table-8.9: Production and Sales of Fish Spwan in 2011

Value of fish spwan/PL	Zone			
	Barisal	Coxs Bazar	Jessore	Total
Number of hatchery	5	7	25	37
Total	6,732,250	613,500,000	106,048,840	726,281,090
Average	1,346,450.	87,642,857.	4,241,953.	19,629,218

Table-8.10: Benefit Cost of the Hatchery

Benefit and cost	Barisal	Jessore	Fish Hatchery	Shrimp (Coxes Bazar
Number of Hachery	5	25	30	7
Gross return	1,489,235	4,409,098	5,898,333	89,056,250
Gross return per hachery	297,847	176,364	196,611	12,722,321
Total Cost	2,034,140	1,260,699	3,294,839	20,161,775
Cost per hachery	406,828	50,428	109,828	2,880,254
Gross margin per hactery			86783	9,842,068
Benefit-cost ratio			1.79	4.42

Labour Use

Labour use one of the important issues for employment generation of any business. On an average permanent employment of 11.2 male was generated by a hatchery. Permanent employment of female was insignificant in number. On an average 80 male daily labourer worked per hatchery total and on an average they worked for 104 days. Female daily labour was also insignificants in number. On an average 496 labour days were created for the family male members and 13 for the female members (Table-8.11)

Table-8.11: Use of Labour for Hatchery Operation

Type of Labour Used		Zone			
		Barisal	Coxs Bazar	Jessore	Total
Number of hatvheries		5	7	25	37
No. of permanent male	Total	19	255	141	415
	Average	3.8	36.4	5.6	11.2
No. of days of Permanent male	Total	4,808	3,330	79,072	87,210
	Average	961.6	475.7	3,162.9	2,357.0
No. of permanent female	Total	1.0	0.0	0.0	1.0
	Average	0.2	0.0	0.0	0.0
No. of days of Permanent female	Total	360	0.0	0.0	360
	Average	72.	0.0	0.0	9.7
No. of male daily labourer	Total	14	2,080	880	2,974
	Average	2.8	297.1	35.2	80.4
Total no. of days of daily male labour	Total	342	600	2,938	3,880
	Average	68.4	85.7	117.5	104.9
No. of daily female labour	Total	0.0	2	5	7
	Average	0.0	0.3	0.2	0.2
Total no. of days of daily female labour	Total	0.0	20	120	140
	Average	0.0	2.9	4.8	3.8
No. of family male labour	Total	8	7	38	53
	Average	1.6	1.0	1.5	1.4
Total no. of days family male labour	Total	2,905	1,966	13,470	18,341
	Average	581.0	280.9	538.8	495.7
No. of family female labour	Total	0.0	0.0	3.0	3.0
	Average	0.0	0.0	0.1	0.1
Total no. of days family female labour	Total	0.0	0.0	488	488
	Average	0.0	0.0	19.5	13.2

Knowledge and Practice

Overall knowledge on improve technology of the farmers was good. However, some of the technology like secchi disc reading, stage of maturation of brood fish and shrimp species, Water quality management of hatching and incubation tanks, stripping of ripen eggs, mixing of eggs and milts, Live feed production and algal culture and application, etc were not kwon to more than 50% of the hatchery operators. So this should take into consideration to improve their skill. A relationship between the knowledge is obvious and that has been also reflected in the practice (Table-8.13). However, it was reported by the respondents that personnel of all the hatchery had received training. On an average 5.4 training had been taken by the shrimp hatchery employees and it was 4.6 for Barisal and only 1.8 for Jessore (Table-8.14).

Table-8.13: Knowledge of Improved Fish, Shrimp and Prawn Hatching

Knowledge on Nursing technology	Zone							
	Barisal		Coxs Bazar		Jessore		Total	
	N	%	N	%	N	%	N	%
Brood stocking density	4	80.0	0	0.0	19	79.2	23	76.7
Water depth	5	100	1	100	19	79.2	25	83.3
Water exchange before hatching	2	40.0	0	0.0	17	70.8	19	63.3
Protein percentage in feed	3	60.0	0	0.0	19	79.2	22	73.3
Feed application rate (pre spawning)	3	60.0	0	0.0	20	83.3	23	76.7
Feed application rate (after spawning)	2	40.0	0	0.0	15	62.5	17	56.7
Secchi disc reading	1	20.0	0	0.0	11	45.8	12	40.0
Sampling and health monitoring	3	60.0	1	100	19	79.2	23	76.7
Ratio of M:F brood used during spawning	4	80.0	0	0.0	20	83.3	24	80.0
Presence of aeration device in brood pond	3	60.0	0	0.0	15	62.5	18	60.0
Average number of time each brood is spawned per season	4	80.0	0	0.0	20	83.3	24	80.0
Hybrid produced illegally	0	0.0	0	0.0	7	29.2	7	23.3
Pond for conditioning spent brood fish	2	40.0	0	0.0	17	70.8	19	63.3
Stage of maturation of brood fish and shrimp species	0	0.0	0	0.0	11	45.8	11	36.7
Quality brood of fish,shrimp and prawn selection	3	60.0	1	100.0	14	58.3	18	60.0
Water quality management of hatching and incubation tanks	2	40.0	1	100.0	10	41.7	13	43.3
Dose détermination and application of induction agents	2	40.0	0	0.0	16	66.7	18	60.0
Stripping of ripen eggs	3	60.0	0	0.0	10	41.7	13	43.3
Mixing of eggs and milts	2	40.0	0	0.0	9	37.5	11	36.7
Health care of induced and spent fish	3	60.0	0	0.0	20	83.3	23	76.7
Use of antibiotics/medicines	4	80.0	0	0.0	18	75.0	22	73.3
Growth and survivality Monitoring of spawn/larvae	4	80.0	1	100.0	17	70.8	22	73.3
Live feed production and algal culture and application	1	20.0	0	0.0	6	25.0	7	23.3

Table-8.14: Practice of Improved Fish, Shrimp and Prawn Hatching

Practice of Nursing technology	Zone							
	Barisal		Coxs Bazar		Jessore		Total	
	N	%	N	%	N	%	N	%
Brood stocking density	2	50.0	0	0.0	12	63.2	14	60.9
Water depth	2	50.0	0	0.0	14	73.7	16	69.6
Water exchange before hatching	2	50.0	0	0.0	12	63.2	14	60.9
Protein percentage in feed	2	50.0	0	0.0	13	68.4	15	65.2
Feed application rate (pre spawning)	2	50.0	0	0.0	13	68.4	15	65.2
Feed application rate (after spawning)	2	50.0	0	0.0	11	57.9	13	56.5
Secchi disc reading	1	25.0	0	0.0	11	57.9	12	52.2
Sampling and health monitoring	1	25.0	0	0.0	10	52.6	11	47.8
Ratio of M:F brood used during spawning	3	75.0	0	0.0	16	84.2	19	82.6
Presence of aeration device in brood pond	1	25.0	0	0.0	9	47.4	10	43.5
Average number of time each brood is spawned per season	2	50.0	0	0.0	10	52.6	12	52.2
Hybrid produced illegally	0	0.0	0	0.0	7	36.8	7	30.4
Pond for conditioning spent brood fish	1	25.0	0	0.0	7	36.8	8	34.8
Stage of maturation of brood fish and shrimp species	0	0.0	0	0.0	6	31.6	6	26.1
Quality brood of fish,shrimp and prawn selection	0	0.0	0	0.0	4	21.1	4	17.4
Water quality management of hatching and incubation tanks	0	0.0	0	0.0	3	15.8	3	13.0
Dose détermination and application of induction agents	0	0.0	0	0.0	8	42.1	8	34.8
Stripping of ripen eggs	1	25.0	0	0.0	7	36.8	8	34.8
Mixing of eggs and milts	0	0.0	0	0.0	6	31.6	6	26.1
Health care of induced and spent fish	1	25.0	0	0.0	8	42.1	9	39.1
Use of antibiotics/medicines	2	50.0	0	0.0	8	42.1	10	43.5
Growth and survivality Monitoring of spawn/larvae	2	50.0	0	0.0	6	31.6	8	34.8
Live feed production and algal culture and application	0	0.0	0	0.0	4	21.1	4	17.4

Table-8.14: Hatchery staff received training on fish Hatchery management in last three years

Received training	Zone			
	Barisal	Coxs Bazar	Jessore	Total
Number of hatchery	5	7	25	37
Training received on hatchery	23	38	46	107
Average	4.6	5.4	1.8	2.9
Total training received	76	24	307	407
Average	15.2	3.4	12.3	11.0

Constraints

Around 60% of the responses comes as constraints of the hatchery operation and those are mentioned in table-8.15

Table -8.15: Problems/constraints Facing by Hatcheries

	Zone							
Problems/constraints	Barisal		Coxs Bazar		Jessore		Total	
	N	%	N	%	N	%	N	%
Shortage of quality broods	3	100.0	7	100.0	17	85.0	27	90.0
Climate change and temperature fluctuation	3	100.0	6	85.7	14	70.0	23	76.7
Irregular power supply	1	33.3	7	100.0	18	90.0	26	86.7
High cost of larval feed	2	66.7	6	85.7	17	85.0	25	83.3
Product marketing	1	33.3	2	28.6	4	20.0	7	23.3
High mortality of shrimp and prawn larvae	0	0.0	7	100.0	0	0.0	7	23.3
Social problem (theft, poisoning, multiple ownership)	1	33.3	0	0.0	8	40.0	9	30.0
Credit problem	3	100.0	1	14.3	8	40.0	12	40.0

CHAPTER 9: QUALITATIVE STUDY

This section deals with the views which were gathered through Focus Group Discussion (FGD) from the Project and Non-project fish farmers, Hatchery Owners, Middlemen, Other Actors in the value chain at different field level of southern districts.

The first portion will be illustrated on **supply and value chain among different actors** and the second portion will be on **point-wise problems/constraints and suggestions/recommendations**.

1. Supply and Value Chain among Different Actors

This section illustrates supply and value chain among different actors. The following diagram (Figure-1) shows complete supply chain combining different sources including input and output suppliers in fish farming. Supply chain starts from collection of Brood fish and go through fish farmers' level and ends at consumer level. Besides, transformation and value addition of spawn produced from one Kg Brood Fish at various stages will be presented.

Value Chain Actors

Value Chain actors can be categorized mainly into two types: one is at **farming level** and the another one one is at **market level**. Fish farmers and Fishermen are also found at both of the levels.

1.1 Actors at the Farming Levels:

The first actor at the farming level is the Hatchery Owner who collects brood fish from Open Water (River), BFRI, Fish Farms, and Fish Markets. He produces spawn and supplies to *Patilwala,* Spawn traders of different local and distant markets. In the study areas there are found two types Nursery Owners. The Nursery type-1 collects spawn through *Patilwala or* hatchery and rear spawn for 10-15 days and again Nursery type-2 collects fry from nursery type-1 directly or through *Patiwala*. Then Nursery-2 rears it for 30-45 days and makes as fingerling for the fish farmers. Then the fish farmers collect fingerlings from Nursery-2 directly or through *Patiwala* for culturing various types of fish. Afterwards, it goes to the markets through fish farmers, fishermen or paikars.

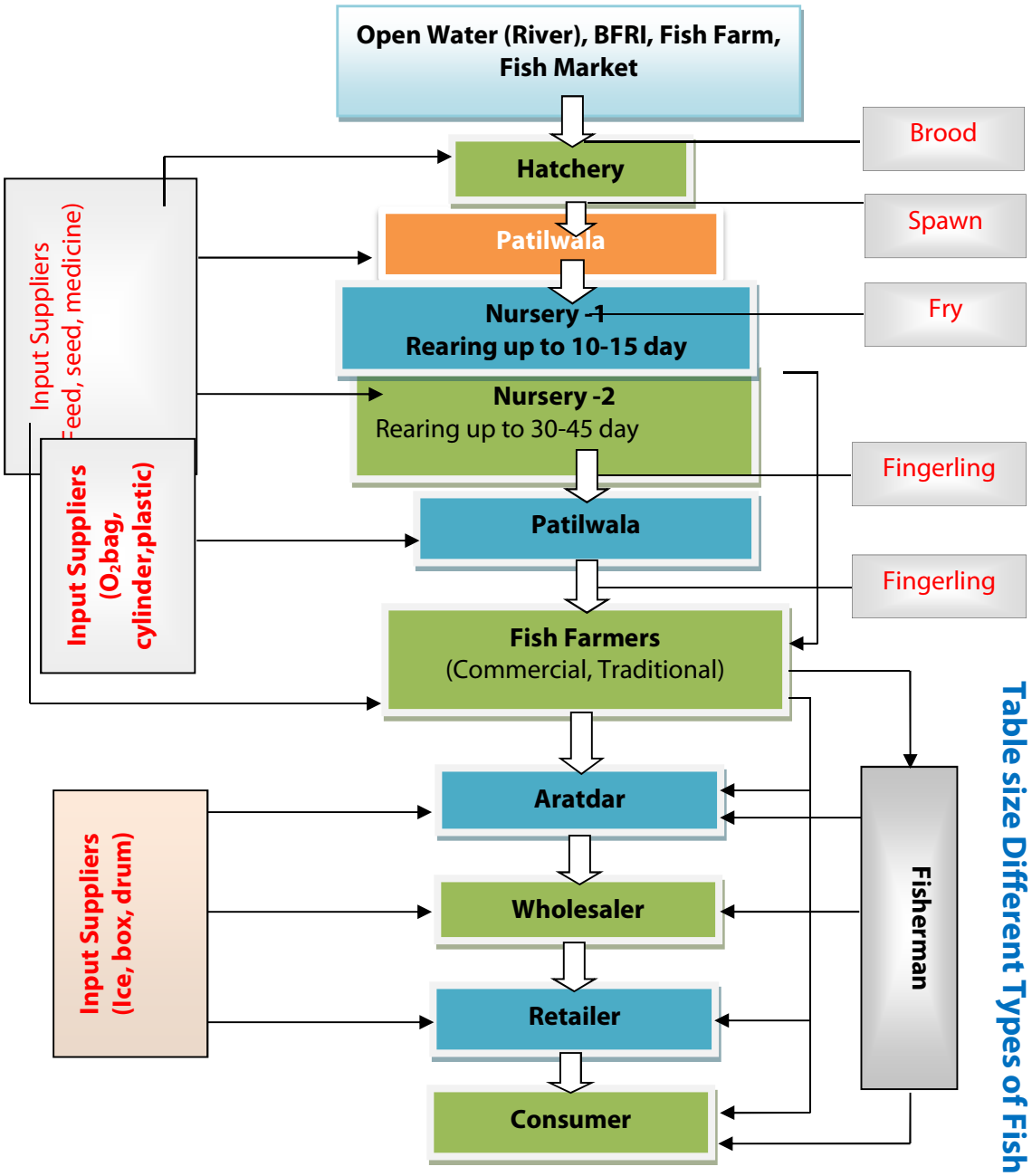
1.2 Actors in the Value Chain at the Fish Market levels:

There are three types of main actors who works as intermediaries like, aratdars/commission agents, *Paikars*/Wholesalers, Retailers.

Intermediaries play important role in the study areas. Here, we see that Aratdars have a prominent role in transferring fish from farmers' level to the wholesalers or retailers. Fish farmers and fishermen are the main actors in supplying fish in the marketing channels. FGD/Case Studies and Alam et. al (2012) suggest that there are two types of *aratdars*:

Aratdar-1 (in cases where distance between production and consumption point is very low) who collects fish from local wholesalers, fish farmers or directly from local fishermen and sell it to *Paikers* and Retailers. *Aratdar- 2* generally operates in large cities or trading zones and receives large volume of fish from the *paikers* (wholesalers) coming from small towns/Upazilas.

Figure-1: Supply Chain among Different Actors



Aratdars call auction in front of the wholesalers/Paikars/Fish farmers and retailers and the highest bidder based on the call from various parties get the fish in consent with the sellers (farmers and so on). Usually Aratdars take 3% commission of the total selling amount of money from the farmers/fishermen in Jessore, Barisal, and Khulna (with Mongla) with exception to Faridpur area where they take 5% commission from the farmers/fishermen. They don't take any commission from the *Paikars* from the distant markets. On the other hand, Araddars in Dhaka City take 3% commission from the *Paikars* and also 1-2% from the purchasers (Retailers, and so on). So, it's clear that amount of commission varies from place to place.

In some cases, farmers are bound to sale their fish without getting fair price for not having sufficient customers, occurring natural calamities, having internal syndicate among the *Aratdars* and *Paikars*. Apart from these, some farmers complains that there is no option except selling fish in the *arat* at the auction time due to creating confusion in mind, like, uncertainty of preservation facilities and the next days' price, urgent need of money, etc.

Aratdars also provide credit to the fish farmers/fishermen to run their business well, in this case also farmers who takes credit from them have no option except selling of fish to them. So, *Aratdars and paikars* are playing key role in the fish marketing channel.

Retailers collect fish through *Paikars or Aratdars*. Then at the end level there are consumers who collect fish from the Retailers or from the fish farmers directly.

Apart from the two levels, there are **some important actors at supply level.** These actors are suppliers of inputs like, medicine, hormone, fertilizers, feed, lime, etc. In case of feed, some own-made and commercial feeds are applied at the farming level.

1.3 Volume of Sale

It is found that 83% of Fish Farmers sell their carp fishes to the Paikars through *Aratdars* (Commission Agents) and the rest were found to sell locally by themselves (3%). Apart from this, they sell to local beparies or through fishermen and retailers directly which is occupied by 9% and 5% of the total sale respectively (Figure-2). Actually they prefer *Aratdars* because of selling in the large volume at a time.

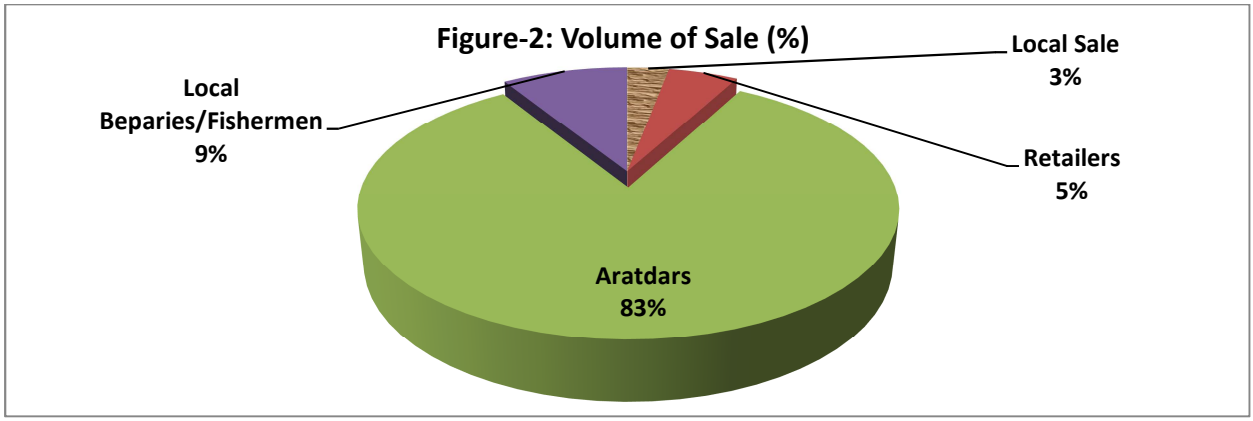
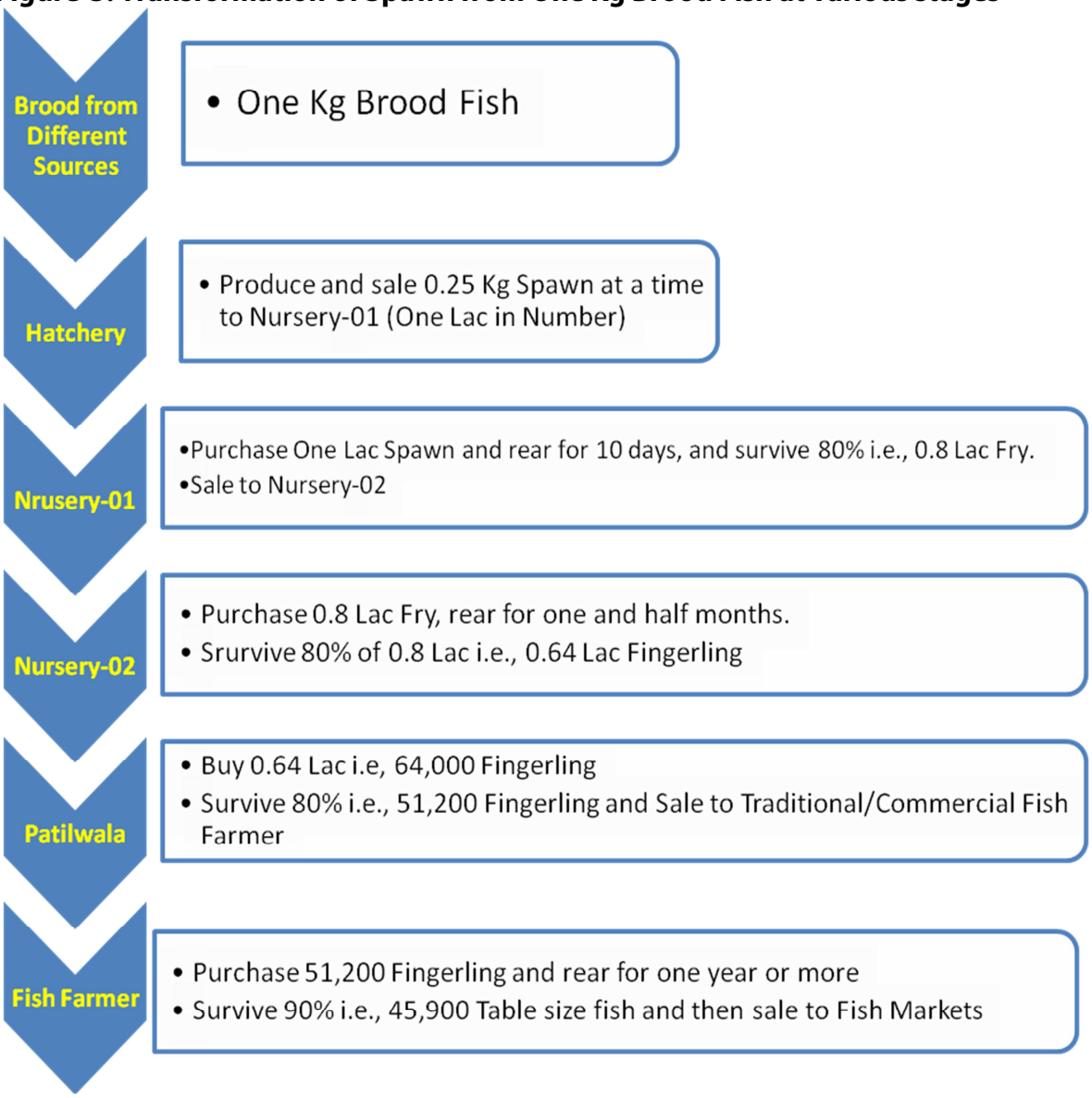


Figure-2: Volume of Sale (%)
Local Sale
3%
Local
Beparies/Fishermen
9%
Retailers
5%
Aratdars
83%

1.4 Value Chain of Spawn produced from One Kg Brood Fish up to marketing of Table Size Carp fish at different stages

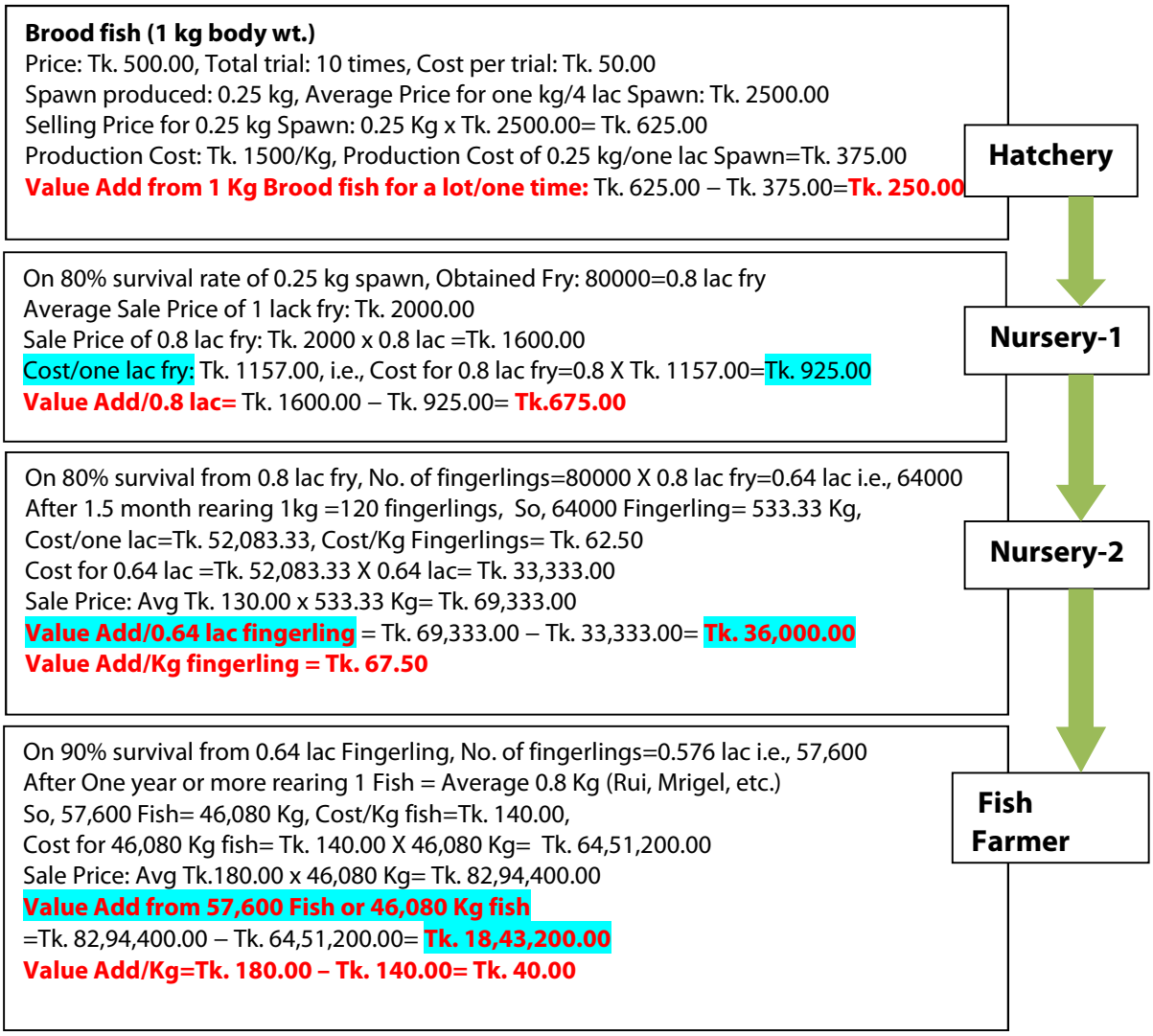
This section shows how value add works in the value chain starting from producing spawn in the Hatchery from one kg Brood fish and go through consecutive rearing process at different stages and finally appeared as table size fish at farmer level. It is found that one Kg Brood fish produces 250 gm of spawn at a time.
Survival rate of spawn, fingerling and matured fish varies at every stage which is shown below (Figure-3):

Figure-3: Transformation of Spawn from One Kg Brood Fish at various stages



The detailed value adds of the product is calculated starting from one Kg Brood fish and ending at the produce of the fish farmers which are given below:

Figure-4: Value Adds in the Value Chain from Hatchery to Fish Farmer



Generally, *Patilwala* purchases fingerlings from Nursery-02 and then supplies to Fish Farmers. But there is also observed that some farmers also purchase fingerling directly from Nursery-02. So their net return is higher compared to those farmers who take fingerlings from Patilwala. In this case, survival rate of fingerlings is also found higher.

It is found that net value adds were Tk. 250.00 from hatchery for producing 250 gm of Spawn for a lot/one time , Tk.675.00 from Nursery type-1 for producing 0.8 lac fry, Tk. 36,000.00 from Nursery type-2 for producing 0.64 lac fry, and Tk. 18,43,200.00 for producing 57,600 Fish or 46,080 Kg fish.

On the other hand, it can be pointed out that on an average a total of 46,080 Kg fishes is produced from only 250 gm of Spawn which is produced from one Kg body weight of fish at the hatchery. These calculations were made considering all the mortality rates at every stage. So, production can be more if we can reduce the mortality rate and supply the quality seeds and other inputs at the farming level.

1.5 Yearly Value Adds at Farming Levels

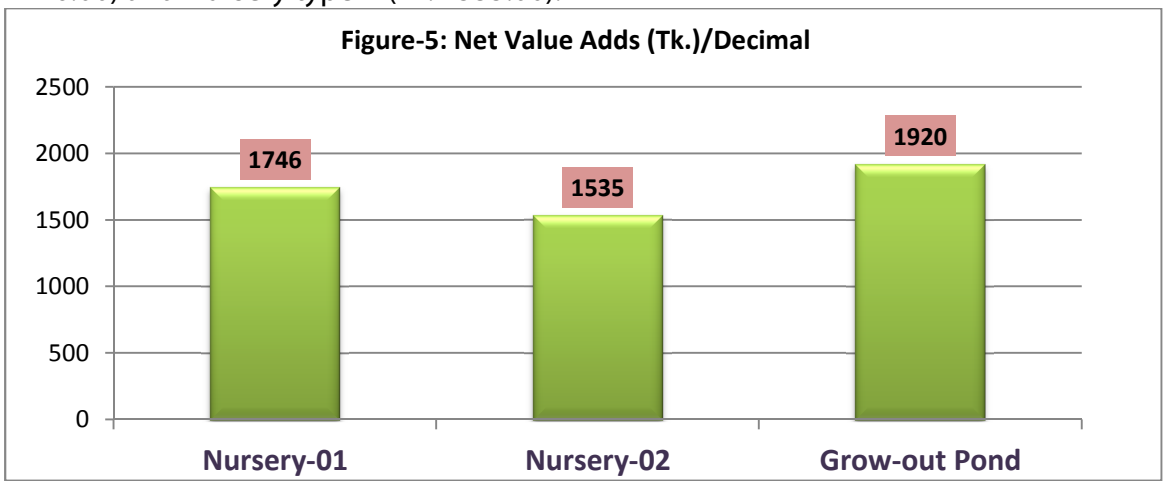
If Value adds are calculated on yearly basis, the following results were found:

Yearly Value adds per decimal of pond at different stages of the value chain are calculated starting from the Nursery Owners to the Grow-out pond fish farmers (Table-1).

Table 1: Value Adds Per Decimal of Land in the Value Chain

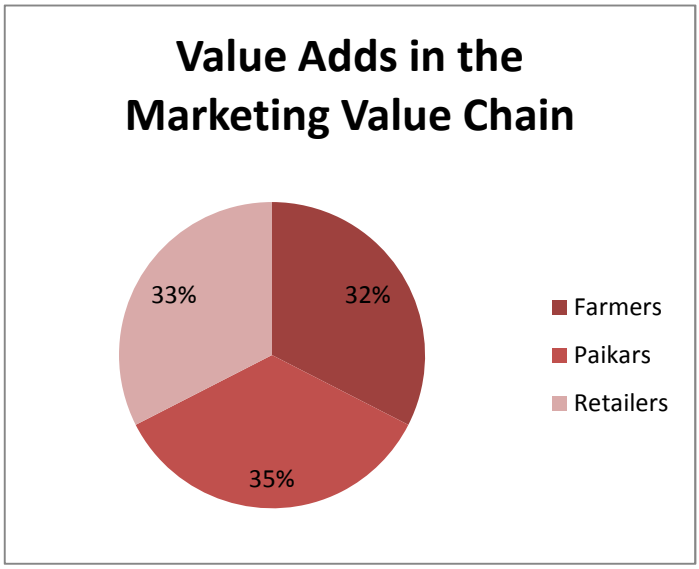
Types of Fish Farming	Sale (Tk.)/Decimal	Total Cost (Tk.)/ Decimal	Net Value Add (Tk.)/Decimal/Year
Nursery-01 (10-15 days)	616.00/lot X 6 Lots= Tk. 3696.00	325.00/lot X 6 Lots= Tk. 1950.00	1746.00
Nursery-02 (1.5-2 months)	985.00/lot X 3 Lots= Tk. 2955.00	473.48/lot X 3 Lots= Tk. 1420.44	1535.00
Grow-out Pond (1-1.5 Years) (Fish Farmer level)	8640.00	6720.00	1920.00

Figure-5 indicates that yearly value adds at farming levels for per decimal of land is found higher (Tk. 1920.00) in case of fish farmers followed by the Owners of Nursery type-1 (Tk. 1746.00) and Nursery type-2 (Tk. 1535.00).



1.6 Value Chain at the Market Level

In the value chain, fish farmers sell carp fish, especially Rui/Catla @Tk. 180.00/Kg and it reaches to @Tk. 270.00/Kg for the consumers at the market . Value adds are calculated based on fish marketing from Jessore/Khulna/Bagerhat to Dhaka city. It is found that value adds per Kg of carp fish at every relevant actor varies from Tk. 40.00 to Tk. 43.00/Kg. There is also regional variation in this regard. Actually, farmers receive Tk. 162.00 instead of Tk. 180.00 for selling one Kg fish. Because, *Paikars* in the local market



take 100 gm *dholon* (extra amount of fish) for one Kg fish and pay for only 900 gm of fish. *Paikars* directly come to Jessore/Khulna/Bagherhat and then take fish directly to Dhaka or other distant markets. *Paikars/*Wholesalers get the highest value add of Tk. 43.00/Kg (35%), which is followed by the same amount of value add Tk. 40.00/Kg occupied by the same percentages (32.5%) of Fish Farmers and Retailers (Figure-6 & 7). Aratdars in the local market take 3-5% commission from the framers on the total price of the fish sold and *Aratdars* in Dhaka city take 3% commission from the *Paikars* and 1-2% commission from retailers and other customers. Calculation is shown in the Table-2. Value adds of the retailer is more in the large cities compared to that of local towns/Upazila Bazar.

Figure-6: Shares of Value Add among different marketing actors.

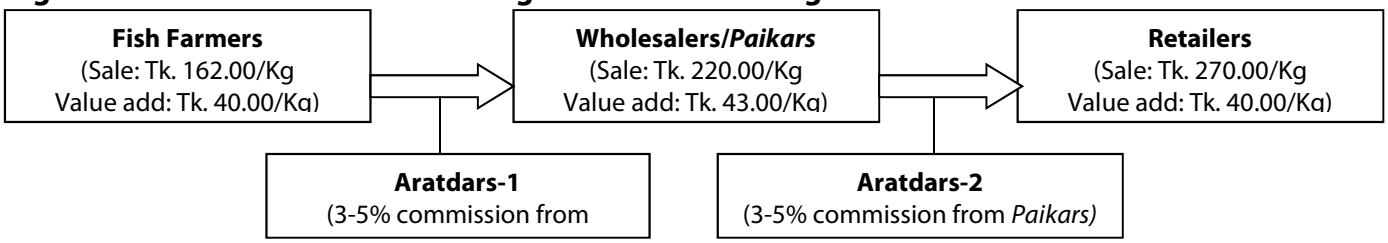


Table-2: Value Adds of Paikars in Selling to Different Markets

Sl No.	Market Destination	Cost (Tk.)/ Drum*	Transports and Other cost/Kg (A+B)	Purchase Price (900 gm)	Total Cost (Tk/Kg)	Sale (Tk./Kg)	Value Add (Tk./Kg)
1	Khulna/Jessore/ Bagerhat to Dhaka	1700.00-1800.00	15.00	162	177.00	220.00	43.00
2	Khulna/Jessore/ Bagerhat to Sylhet	2100.00-2200.00	16.00	162	178.00	225.00	47.00
3	Khulna/Jessore/ Bagerhat to Chittagong	2100.00-2200.00	17.00	162	179.00	230.00	51.00

*Each Drum contains 200-250 Kg. Transportation cost for 1000 Kg fish to Dhaka reaches to Tk. 15000.00 including costs of truck rent Tk. 12,500.00, labour, personal drum and other costs. So, Transportation cost/Kg to Dhaka = Tk. 15.00. Each aratdar transacts 1.5 to 3.00 mtons of fish everyday with the *Paikars and farmers.* Paikars get extra price for 100 gm fish which is taken as Dholon from the Farmers.

Problems/Constraints and Suggestions/Recommendations on Various Issues

This section deals with the views which were gathered through Focus Group Discussions (FGD) and Case Studies from the Project and Non-project fish farmers, hatchery owners, middlemen, other actors in the value chain at different field level of southern districts (Appendix-A). The issues on inputs supplies and distribution, quality of inputs, marketing, cost/profit, problems/challenges and possible suggestions/ recommendations made by different actors for improvement of the fish sub-sector are presented below:

2.1 Hatchery

Problems/Constraints:

- Shortage of quality brood in nature,
- Shortage of quality brood from fish farms,
- Inbreeding is a serious problem in the hatcheries resulting production of low quality seeds,
- Interruption of power supply causes a great loss in hatchery,
- High price of larval feed,
- Lack of sanitary knowledge among workers,
- Lack of proper training for workers,
- Collecting spawn from immature brood fish, and
- Other quality control problem.

Suggestions/recommendation:

- High quality broods should be conserved in natural sources
- Awareness should be raised against the negative impacts of inbreeding.
- Uninterrupted power supply should be ensured in the hatchery during their operation.
- Sanitary and hygiene condition in Hatchery should be maintained.
- Selective breeding good quality seeds should be produced.
- Low quality seed breeders should be taken under training and other supportive programmes, and
- Law enforcement is needed for those who are not be involved in quality seed production.

2.2 Fish Farming

Problems/Constraints:

- 'Fish culture might be a business' is not realized by most of the farmers. They just believe that fish is for household consumption.

- Social attitude towards fish farming is not good in our country. So entrepreneurs become discouraged.
- Lack of proper extension program and dissemination of new technologies regarding fish culture from GOs and NGOs.
- Underdeveloped fish culture techniques and lack of practical knowledge in fish farming
    - Farmers cannot recognize/identify healthy spawn/fingerling,
    - Lack of feeding knowledge
    - Farmers are not aware of the benefits of netting, pond preparation, feeding properly, nursing, etc.
- Lack of credit facilities for marginal farmers, and
- Under-developed marketing.

Suggestions/recommendation:

- Training should be arranged for fish farmers to enrich practical knowledge and make awareness towards fish farming,
- NGOs should come forward to make the farmers aware and enrich practical knowledge in association with government programs,
- Lots of programmes should be undertaken to change social attitude towards fish farming,
- Provision of credit for fish farmers should be introduced more without or at low interest with agreeable grace period,
- Environment friendly new technology should be developed for sustainable aquaculture, and
- Quality seed supply should be ensured through attempts undertaken by GOs and NGOs.

2.3 Seed and Feed Supply

Problems/Constraints:

- Poor quality seeds cause loss in business which discourages farmers in further investment in their pond,
- Feed price is very high and thus marginal farmers can't afford to buy feed.
- Lack of demand of quality feed among existing farmers because of having less awareness,
- Feed laws are not actually implemented in our country, so low quality seeds have now occupied the market which is deleterious for fisheries business,
- Farmers don't get quality feed easily, and
- Some farmers do not want to use formulated feed in their pond due to high cost.

Suggestions/recommendation:

- Fish culture with high quality inputs should be demonstrated for creating public awareness. High production from such culture system will provoke the farmers to initiate their activities,
- Provision of good quality seed should be ensured first to have a better production,
- Price of all inputs should be kept reasonable,
- Provision of credit for farming should be introduced more without or at low interest, and
- Feed laws should be implemented forcefully for the feed entrepreneurs to maintain the quality.

2.4 Marketing of fishes

Problems/Constraints:

- Poor communication system between fish farms and distant markets,
- Transportation system of fish is traditional,
- Infrastructure of fish market is very poor. Water logging and unhygienic environment in the market,
- Government and local authority does not take initiatives to develop marketing infrastructure,
- There is hidden syndication system in controlling market price. Fish markets are occupied by the middlemen. They regulate the whole marketing system,
- If one farmer takes fish directly to the aradars, it is very difficult for him going without selling according to his own choice, and
- Farmers have no preservation facilities.

Suggestions/recommendation:

- Good communication system through road, railway and waterway should be availed.
- Infrastructure development and favourable environment should be created in the markets. Government/local authority should visit the market regularly,
- Transportation system should be developed by giving technical support,
- Entrepreneurs' support is needed for the farmers. Fish Farmers' cooperatives can be formed and strengthened,
- Number of intermediaries can be the reduced in the marketing channels, and
- Storage system should be provided to the farmers and traders as well.

2.5 Overall

Problems/Constraints:

- Fish and shrimp virus is a major threat in fish farming especially in the southern districts in Bangladesh,
- Intrusion of saline water in coastal ponds/ghers in southern areas made fish farming impossible,
- In coastal belt huge amount of other fish seeds are being wasted to collect shrimp PL. It is a threat for fish biodiversity, and
- Natural disasters hamper fish farms ultimately resulting lower production.

Suggestions/recommendation:

- Intrusion of saline water in household areas must be prevented to save the domestic environment,
- Adequate hygiene and sanitary measures should be undertaken to prevent outbreak of viral diseases,
- Water pollution should be minimized by enforcing the water laws, and
- New development policy should be assimilated to improve the overall Fisheries sector.

APPENDIX-A

A1: Case Study of a Fish Hatchery Owner

Alhaz Feroz Khan and Alhaz Anisur Rahman Mukul are the owners of Maa Fatima Matshya Hatchery. The hatchery is situated in Vaturia village under Chachra Union of Jessore Sadar Upazila. The interview was conducted with **Mr. Alhaz Feroz Khan**. He is the President of District Hatchery Owners Association. He initiated Fishery business in 1979 with Mr. Saifuzzaman Maju. Mr. Feroz Khan alone invested Tk. 940 only. Later, he continued his business with new share-holder Mr. Alhaz Anisur Rahman Mukul. However, they started the Hatchery business in 1990 and worked hard to establish the business. After passing a long way, they are now established businessmen and owner of a renowned Hatchery. Artificial breeding of *Pangasius suchi* was first done in their hatchery.

Hatchery complex description:
The Hatchery complex is equipped with necessary instruments and materials.

- Total Land area of the hatchery: 17 acre (8 ponds)
- Incubation tank.
- Hatching jar.
- Store room: 1 room adjacent to hatchery complex
- 1 Labor shed, 1 office room and one net drying shed
- Overhead Tank (1): Use to reserve water. World Fish Centre has built it to purify and to de-carbonize the water.
- Oxygen cylinder: These are served to seed customers
- P^H meter, DO meter, thermometer, electric motor, water lifting pump + pipe, aerator, boat etc are available.

Name of fish species commonly breed:
Rui, Catla, Mrigal, Silver Carp, Minor Carp, Grass Carp, Bighead Carp, Pangus etc.

Source of Brood Fish: They collect brood-fish from Bangladesh Fisheries Research Institute (BFRI), different fish farms and sometimes from natural water bodies. They use same brood fish in breeding purpose for 3 years and then sell it to market.

No. of spawn produced from each fish:

Fish Species	Fecundity /kg body weight
Rui	1 lac
Catla	1 lac
Mrigal	1 lac
Puti	3 lac
Silver Carp	1.25 lac
Bighead Carp	1.25 lac

Feeding system:

- ✓ Homemade feed: Rice bran, wheat bran, egg yolk, oil cake, etc.
- ✓ Balanced diet: Mega feed, ACI, Quality feed, etc.

Technical Support:

World Fish Centre is giving technical support to this hatchery. A new hormone Avoli suggested by World Fish Centre (WFC) expert results in high breeding performance and less price compared to PG. Previously Avolin was imported from India.

CO_2 problem was a great barrier in hatching of eggs which is mitigated by using over head tank advised by WFC.

Cost, Selling and Value Add for producing one Kg of Spawn:

A total of Tk. 1400-1500 is required to produce 1 kg spawn. Price of spawn varies from season to season. Average selling price of one kg spawn is Tk. 2000.00 where it rises to Tk. 5000.00/Kg spawn during peak season. So, values add/Kg spawn varies from on an average Tk. 500 to Tk 1000.

Employment Opportunity and Skills of Manpower:

In total, 11 Permanent persons have been working for netting, harvesting and breeding activities. Apart from this, additional labors are recruited in this hatchery. A total of 5000 working man-days is created in this hatchery. So, it has been contributing a lot to create employment opportunities for the people in this area.

Out of 11 permanent workers 3 are trained and skilled. They received training from various NGOs including world fish centre. Their skill is continuously upgrading through working in the hatchery.

Buyers:

The main customers of this hatchery are from following districts Barisal, Bhola, Patuakhali, Faridpur, Bagerhat, Mymensingh, Nilphamari, Madaripur, Sariatpur, Sylhet. Majority of the customers are nursery owners. Some are Patilwala also from the local areas.

Profit- Loss:

- Profit gained by 90-100% in the years 2007-2010 compared to previous years.
- Incurred loss by 60% in the year 2011.
- Gained profit by 100-120% in the year 2012.

Problems:

- Lack of sanitary knowledge among workers
- Underdeveloped fish culture technique in Bangladesh
- Feed laws are not actually implemented in our country
- Farmers don't search quality seed
- High price of larval feed
- Shortage of quality brood
- Interruption in power supply
- Lack of proper training for workers.

Suggestions:

- Raise awareness among hatchery owners and workers in maintenance of hygiene and demerits of inbreeding,
- Invent new breeding technique,
- Arrange in-country/outside exposure visits for the entrepreneurs,

- Implement Hatchery and Feed laws forcefully, and monitoring the activities of feed companies in every district by the concerned authority and representative from the hatchery owners and Fish farmers,

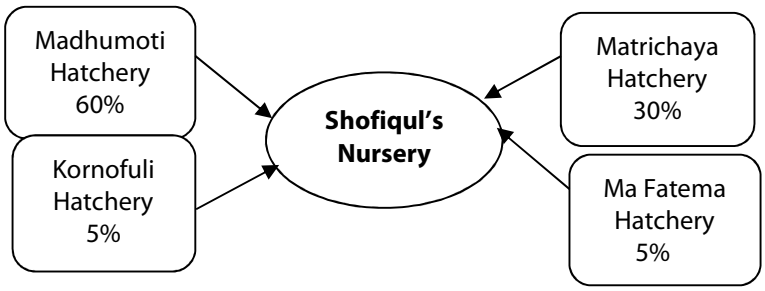
A2: Case study of a Nursery owner

Md. Shafiqul Islam is a good entrepreneur and successful fish nursery businessmen under Bablatola village of Jessor Sadar Upazila. He has 15 years experience in rearing spawn and fingerling. He owns a total of 6 ponds, out of them 3 ponds are of his own and another 3 are leased in.

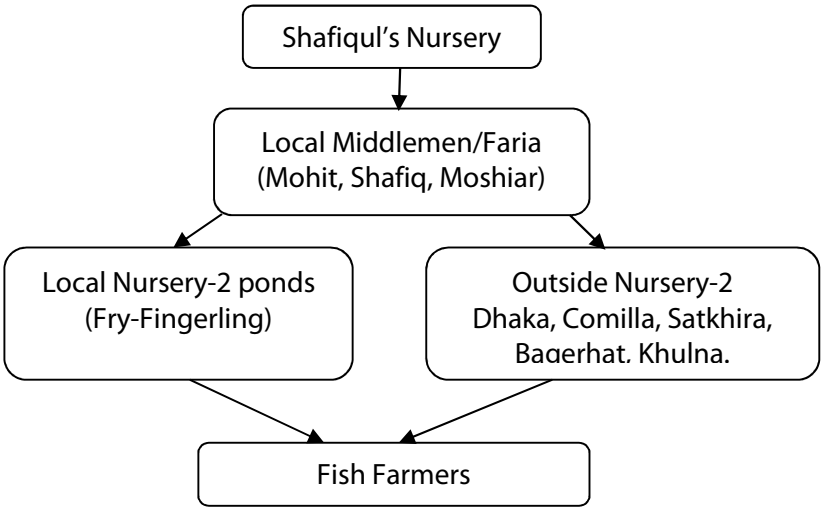
Among 6 ponds he uses 5 ponds as nursery and another one as grow-out pond. He usually rears spawn up to fry stage. The duration of rearing is 10-12 days. This phase can be called as nursery-1. He uses to rear various **species** like Rui, Catla, Tilapia, Mrigal, Puti, Silver carp, Grass Carp etc.

Ownership Pattern and Sizes of Pond		
Pond size	Ownership	No. of pond
130	Lease in	1
100	Own	1
120	Lease in	1
50	Own	1
36	Lease in	1
40	own	1

Source of Spawn: Mr. Shafiq collects spawn from local hatcheries of Jessor. The shares of collection according to hatcheries are given bellow. The dominant share i.e., 60% is occupied by Madhumati Hatchey in Jessore.



Distribution Channel from Nursery type-1:



Value Add Analysis of Nursery Type-01:

Cost is calculated for rearing spawn in 50 decimal of pond. Item-wise expenditure is given in the Table at the right side:

Item-wise expenditure		
Sl.No.	**Types of Expenditure**	**Cost (Tk.)**
1.	**Diesel**	**800.00**
2.	**Lime**	**600.00**
3.	**Geolite**	**400.00**
4.	**Water**	**400.00**
5.	**Oil Cake**	**450.00**
6.	**Sumithion**	**300.00**
7.	**Aeration**	**200.00**
8.	**Labor**	**2500.00**
9.	**Netting**	**600.00**
Total		**6250.00**

Total cost includes for purchasing of spawn and rearing it in the pond. In total, it becomes Tk. 16250.00 (Tk. 6250.00 for rearing + Tk. 10000.00 for 4 Kg spawn).

While purchasing, 1 Kg spawn contains 4 lac spawn. After rearing of spawn for 10-15 days it is called fry. The survival rate of fry is 80%.

Selling price of 1 kg fry is on an average Tk. 2000.00.

So, Gross Return from 4 kg spawn (14 lac) =14 lac X Tk. 2200.00 = Tk. 30800.00.

Value Add = Tk. 30800.00 – Tk. 16250.00 = Tk. 14550.00

Net benefit from per Kg spawn/lot = Tk. 14550.00/4 Kg = Tk. 3637.50

This is the output from one lot. During the period from Boishakh to Ashwin Mr. Shafiq can produce spawn for 6 lots. So, his **Value Add/year** = Tk. 14550.00 X 6 lots = **Tk. 87,300.00.**

Value Add Analysis of Nursery Type-02:

Apart from the Nursery-01 he produces fingerling in Nursery-02. He rears fry in 132 decimal (4 Bigha) pond where he stocks 1.5 lac fry and produces a total of 1000 kg fingerling. The details of cost and benefit are given below:

Total cost in Nursery-2

Sl. No.	Item	Amount/ Number	Cost (Tk.)
1.	TSP	4 Bag	4600.00
2.	Urea	2 Bag	2000.00
3.	Cow-dung	10 Barrel	2500.00
4.	Oil Cake	3 Bag	5100.00
5.	MP	1 Bag	750.00
6.	Lime	4 Bag	1600.00
7.	Fry	1.5 Lac	5000.00
8.	Feed		15000.00
9.	Labor		10000.00
10.	Pond lease in rent	132 Decimal	10000.00
11.	Carrying		1000.00
12.	Miscellaneous		4950.00
Total cost			62500.00

On 80% survival from 1.5 lac fry i.e., No. of fingerlings =1.2 lac ie.,120,000

After 1.5 month rearing 1kg fingerling =120 fingerlings. So, 120,000 Fingerling= 1000 Kg

Cost for 120,000 Fingerling= Tk. 62,500.00, Sale Price: Avg Tk. 130.00 x 1000 Kg= Tk. 130,000.00

Net Value Add/1.2 lac fingerling = Tk. 130,000.00 – Tk. 62,500.00= **Tk. 67500.00** (from 132 decimal land)

Cost/one lac fingerling=Tk. 52,083.33, Cost/Kg Fingerlings= Tk. 62.50,

Net Value Add/Kg fingerling = Tk. 67.50

A3: Case study of a Patilwala

Tipu Boiragi is a member of *Patiwala* Group. He is from Chor Icha, Sayestabad, Barisal Sadar Upazila. Mr. Boiragi has been working for last 10 years as a pona/fingerling supplier to the farmer level. He uses to buy fingerlings from nursery type-02 and sales these to fish farmers.

He commonly sales the following fish species:

Rui, Catla, Mrigal, Silver carp, Bighead carp, Mirror Carp, Tilapia, Puti, etc.

Sources of Pona:

- Kagasura nursery- 60%
- Lakutia nursery- 20%
- Chormonai – 10%
- Mamun Talukdar nursery (Sayestaganj)-8%
- Jorjhoratola -2%

All these nursery purchase spawn from Jessore area, rear them for 2 weeks and sell to Patilwala and farmers.

Size of Pona:

- Larger sizes are between 120-150 piece per Kg
- Medium and small are between 200-300 piece per Kg

Average daily sell:

Actually he takes order of pona from fish farmers in local areas and buy required amount of fingerling from nursery and then supply these to fish farmers. In the peak season (April-October), he sells higher amount of fingerlings than that of the rest seasons of the year.

Income:

- Cost: He buys 1kg fingerling at Tk. 150.00 - Tk. 180.00. He rents a van for which he has to pay Tk. 300.00 daily. He brings 15-20 Kg fingerling a day. So, transportation and other costs amounts to Tk. 15-20/Kg.
- Sell: Selling price of per kg fingerling is 200-220 taka.
- Value Add: Avg. Tk. 210- (Tk. 150 + Tk. 15)= Tk. 45.00/Kg.

Problems:

- Financial problem to run the business,
- Low demand of seed in this area,
- farmers don't place demand in time.

A4: Case Study of a Tilapia Commercial Fish Farmer

Md. Tariqul Islam (Roni) is a successful commercial Tilapia fish farmer of Bhaturia village under Chachra Union of Jessor sadar Upazila. He has 198 decimal pond area sharing with his brothers. He has 19 decimal own pond which is used in commercial fish farming. Average depth of pond is 4 feet. He is a selected commercial fish farmer of FtF Aquaculture Project. Out of 19 decimal pond, the area of the pond for culture is 15 decimal without dike area. He has 5 years experience of fish culture. Mainly he cultures Tilapia along with a small amount of Silver carp and Mirror carp.

He prepared the pond with technical help of WFC. The following procedure was followed by Mr. Roni in preparation of the pond:

- Pond renovation: Old pond was renovated before stocking seed.
- Dewatering and watering were done.
- Liming: A total of 15 kg lime was applied in the pond.
- Fertilizer: About 3 kg Urea and TSP, and 240 kg cow-dung were applied.
- Fencing by Net: The pond was encircled with nylon net to protect entering of crab, frog, snake and others.

Stocking and Post Stocking Management

The fishes mentioned at the right side were stocked in 15 decimal pond.

Floating feeds were applied like, C. P. and Mega feed. Lime was applied in the pond in maintaining the quality of water. Timsen was applied to keep out insects from pond water.

Stocking Density		
Fish species	**Number (piece)**	**Weight (kg)**
Mono sex Tilapia	3000	13
Silver Carp	80	6
Mirror Carp	40	4

Cost and Value Add of Production:

Cost for producing fish=Tk. 32,668.00, Selling Price= Tk. 44,250.00, So, Value Add from 409 kg fish cultivation=

Tk. 44,250.00 - Tk. 32,668.00= Tk. Tk. 11,582.00.

Net Return/Kg = Tk. 28.32

Items of Expenditure	Cost (Tk.)
Pond Preparation	2405.00
Seed	6780.00
Feed, Medicine, Water, etc	22667.00
Marketing	816.00
Total	32668.00

Problems:

- Lack of financial support in adopting modern culture system
- Lack of technical support

Selling of fishes			
Types of Fish	**Amount (kg)**	**Price /kg**	**Price (Tk.)**
Tilapia	373	110	41030.00
Silver carp	26	80	2080.00
Mirror carp	10	114	1140.00
Total			**44250.00**

Comments:

Last year Mr. Roni earned an amount of Tk. 20000.00, but this year the opportunity has been created with the help of World Fish Centre to earn at least Tk. 34746.00 (Tk. 11,582.00 X 3 times). Through this initiative by WFC other fish farmers surrounding the area are coming forward to know about the culture procedure and other matters.

A5: FGD with Commercial/Traditional Fish Farming

FGD was conducted with Commercial and traditional fish farmers in Char Icha Village under Sayestabad Union of Barisal Sadar Upazila. A total of 12 persons attended the FGD. Out of them four were commercial fish farmers and the rest were Traditional fish farmers. According to them, previously 7-8% household were involved in fish culture, but now it has been increased to 60-70%.

Information on fish culture:

Maximum ponds are self-owned. It is found that 50.8% ponds are small. The rest are medium and a few are large ponds. No leasing system was found among the interviewed farmers. Farmers usually culture Rui, Catla, Mrigal, Silver Carp, Grass Carp, Tilapia, Pangus, Bighead Carp etc.

Sizes and Numbers of Ponds			
Types of Pond	Size (decimal)	Number	%
Large	50	8	6.7
Medium	20-30	50	42.5
Small	10-15	60	50.8
Total		118	100

Pond Preparation:

Half of the commercial farmers used to prepare their pond before stocking fish seed. Some farmers were found to prepare their land partially (e.g., liming and manuring). Per decimal cost was Tk. 200-300. Traditional farmers don't prepare their pond. They have also lacking of knowledge on pond preparation.

Problems:

- Water depth of ponds is high
- No drainage facility
- Have no interest in fish culture
- Fears in getting loss in fish culture
- Lack of awareness
- Water pollution
- Form gas in the water

Fingarling (*Pona*):

- Source: 80% from Patilwala, 20% from Nursery (Aziz, Kashipur nursery, Kagasura Nurseries are major sources of fingerling in this area).
- Quality: Moderate, Mortality rate of fingerling is low.
- Mixed Fingerling are sold by the Patilwala, so it's difficult to distinguish different species,
- Stocking Density: 80-100 fingerling per decimal or about 0.8 kg/decimal
- Price/kg fingerling: Rui, Mrigal= Tk.200, Silver carp= Tk. 150-170.

Feeding:

- Ready-made: 33% (4-5 persons) use ready-made feed. They use the feed of different companies like Aftab feed, Mega feed and Quality feed.
- Most of them use home-made feed like, Rice bran, rice polish, wheat bran, oil cake, kitchen wastes, etc.

- Cost of feed: Tk. 65/kg fish.

Fertilizer:

- Urea, TSP, MP and cow-dung are applied in fish pond. These are available in local markets.

Fish Sale and Net Return/Kg:

Name of fish	Rearing period	Production and Other Cost (Tk/Kg)	Sale (Tk./Kg)	Profit (Tk./Kg)
Rui	1-1.5 years	150	200	50
Catla	1-1.5 years	150	200	50
Silver Carp	1 year	70	100	30
Mirror Carp	1 year	65	100	45
Grass Carp	1 year	70	110	40
Tilapia	3-4 months	70	100	30
Pangus	6 months	70	100	30

Marketing system of fish:

Fish are graded according size and species. These are carried to local (Sayestabad and Taltola) and Upazila market/District Market by Rickshaw van. Farmers sell the fish through the intervention of Aratdars. Aratdars take 3 % commission of the sale amount from farmers. Some of the farmers sell his fish daily in the local market directly.

Over-all Problems:

- Lack of knowledge about fish culture
- Lack of financial supports
- Lack of technical support
- Lack of quality seed and feed
- Lack of awareness in using seed, feed and medicine.

Suggestions by the farmers:

- Training program should be arranged on fish culture for growing knowledge.
- Government and NGOs should come forward to provide financial support.
- World Fish Centre provides advantages to a few farmers. Enrolment in the programme of WFC should be increased.
- WFC can supply good quality seed,
- Provision of good quality feed should be ensured.

The list of The FGD participants from Char Icha Village, Sayestabad Union, Barisal Sadar Upazila**:**

Mr. Md. Kamal Hossain	Md. Babul Khan	Md. Hanif
Md. Fazlul Haque	Md. Khalilur Rahman	Md. Ripon Sharif
Md. Tareque	Md. Jahid Hasan	Md. Selim Reza
Md. Robiul Haque	Md. Sumpn Miah	Md. Sohel

A6: Case Study with a Fish Aratdar

Md. Mahbub Alam is a fish trader. He has a fish Arat at Mongla Bazar in Bagerhat. He is newer in this business. He has started this business early of the current year. The name of his shop is M/S Akota Fish. He is doing well in his business. He starts his daily transaction at 6 AM and it continues up-to 6 in the evening.

He deals in the following major species: Rui, Catla, Mrigal, Silver carp, Tilapia, Coral, Parsey, Puti, Gulsha Tengra, etc.

About 1.5-2 tones of fish are transacted everyday on an average.

Source of Fish:

- Farmers carry their fish to depot area. They usually harvest their fish from gher on the basis of market demand as they are previously informed by depot owners.
- Farmers from all unions bring their fish in depot. Maximum fish comes from Chila Union.

Buyers:

Khulna, Bagerhat are rich in fish. Buyers from different districts come here. Mostly buyers of Dhaka, Barisal, Sylhet, Chittagong regions are found. They inform their demand of fish to depot owners and depot owners manage the required amount of fish from farmers.

Transaction system:

- Here depot holders act as intermediaries. The fish are auctioned in the presence of fish farmers and buyers. Who call the highest price at which farmers willing to sell, get the fish.
- Depot holders charge 3% commission from fish farmers and do not take any charge from buyers. Buyers pay price of 900 gm fish for 1 kg .

Transportation System:

- Fish are transported in steel box, plastic box and plastic drums. Tracks are mainly used to carry fish. Enough ice is used with fish in case of long distance. About 200-250 kg fish can be transported in a single drum.

Transportation cost:

It varies depending on the distance and system used. To transport a drum of fish it cuts following costs-

- Mongla to Dhaka= 1700-1800 Taka/drum
- Mongla to Sylhet= 2100-2200 Taka/drum
- Mongla to Chittagpng= 2100-2200 Taka/drum

Satisfaction:

Farmers, depot owners and buyers are satisfied with the marketing system that is being practiced here. Each of them carries his business without having any chaotic condition.

Fish storage system: Depot holders preserve additional fish in ice in their store house and sell these fish in the next day. This opportunity is availed by the farmers.

Problems:

- Small traders lack financial support
- Sometimes buyers do not pay depot owners which they lent
- Poor communication system with distant markets.

A7: Case study with a Retailer

Mr. Abdul Halim is a retailer from Mongla Fish Market, Mongla, Bagerhat.

Daily sale of fish and profit:

Daily Sell of fish depends on price of fish. When supply is abundant and price is low then sell is usually high and vice versa. Average daily sell is about 40-50 kg per day. Mr. Halim uses to sale different types of fishes. The local people are his customers. The species-wise price list is given below:

Types of Fish	Purchasing rate/Kg	Selling Price/Kg	Gross Profit/Kg
Rui	190	210	20
Calta	180	200	20
Mrigal	140	160	20
Tilapia	90	110	20
Nilotica	110	120	10
Golda	180	200	20

Deducting all the daily costs including food, market toll, ice etc Mr. Halim earns Tk. 300-400 daily. He earns about Tk.10-20/Kg depending on bargaining with customers.

Source of fish purchased:

- Local Mongla Bazar Arat
- Collect fish from farmers ponds
- Fishermen

Level of satisfaction: He is satisfied with his daily income and the price of fish.

Facility of fish preservation: Ice box and ice are available in the study area. As the source of fishes is nearly located fish ponds, icing is not required. But if remain unsold, these are preserved in ice and sold in the next days.

Association:

In the market fish sellers have an association of 163 members. They work altogether for their development. They deposit money every month in an enterprise and share the benefit among themselves.

Problems:

- Infrastructure of fish market is very poor. Water logging is the main problem in the market.
- Lack of proper drainage facility
- Lack of shed over the market
- Government authority does not visit the market
- Poor communication system

Suggestions:

- ✓ Renovation and reconstruction of the market infrastructure
- ✓ Availing proper drainage system
- ✓ Government authority should visit the market condition regularly
- ✓ Transportation system should be developed

A8: Case Study with a Input Supplier

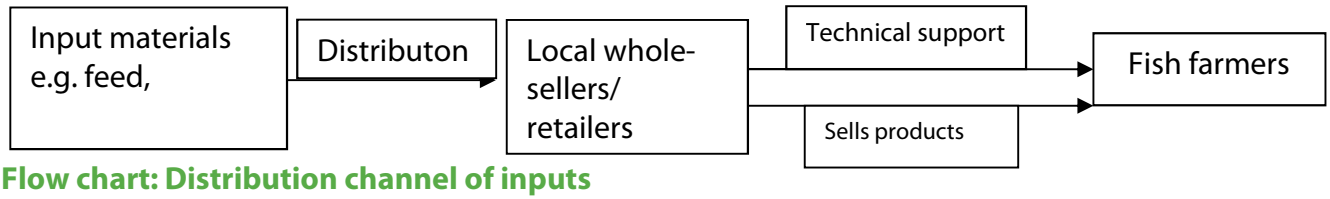
Mr. Md. Selim Miah is a Input Supplier. His shop's name is M/S Janata Enterprise situated at Mongla Bazar, Bagerhat. He started his business in 1997. In 2007 he got the dealership of Sunny Feed in Mongla, Bagerhat. He attended several types of training courses on using different inputs for crops cultivation and fish culture. He has been running business with his own investment.

Mr. Salim's business Products:

- Agricultural inputs, e.g; seed, fertilizers, insecticides, pesticides.
- Aquaculture products, e.g; feed, fertilizer, medicine, vitamins, geolytte, gas tablet, oxygen tablet, etc.

Input supply channel:

Distributors of Different Company supply input products to his shop. Farmers from surrounding villages under six Unions of Mongla Upazila purchase aquacultural inputs from this shop. Apart from selling, Mr. Salim gives them technical supports to solve the problems concerning fish culture.



Flow chart: Distribution channel of inputs

Selling figure:

- About 50 farmers come every day on an average
- Every day he sells 500 kg feed of sunny feed company, which occupies 50% of total sale of feed.
- Mega feed, ACI feed are also sold in small amount.

Business status:

The business is now in downward condition after the occurrence of Sidr and Aila. Average profit decreased by 20% due to damage occurred by these calamities in the ponds and Ghers.

Awareness status:

As a result of different interventions taken by NGOs, now-a-days the knowledge on fish farming is increasing. Farmers are now becoming interested to apply different inputs in fish culture. Especially Mr. Salim needs improved training for advising the farmers on using inputs.

Comments:

Framers don't get full support from GOs and NGOs. So as an Input supplier Mr. Selim is helping fish farmers to enrich their practical knowledge and advising the farmers in using different inputs. So these types of suppliers should be taken under training program.

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Appendix-1

Part A: Definitions and Measurements

Early initiation of breastfeeding

Definition: Proportion of children born in the last 24 months who were put to the breast within one hour of birth.

Measurement:

Children born in the last 24 months who were put to the breast within one hour of birth

_____

Children born in the last 24 months

Exclusive breastfeeding under 6 months

Definition: Proportion of infants 0–5 months of age who are fed exclusively with breast milk.

Measurement:

Infants 0–5 months of age who received only breast milk during the previous day

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Infants 0–5 months of age

Continued breastfeeding at 1 year

Definition: Proportion of children 12–15 months of age who are fed breast milk.

Measurement:

Children 12–15 months of age who received breast milk during the previous day

_____

Children 12–15 months of age

Introduction of solid, semi-solid or soft foods

Definition: Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.

Measurement:

Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day

_____

Infants 6–8 months of age

Minimum dietary diversity

Definition: Proportion of children 6–23 months of age who receive foods from 4 or more food groups.

Measurement:

Children 6–23 months of age who received foods from ≥4 food groups during the previous day

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Children 6–23 months of

Minimum meal frequency

Definition: Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more.

Measurement:

Breastfed children 6–23 months of age who received solid, semi-solid or soft foods the minimum number of times or more during the previous day

_____

Breastfed children 6–23 months of age

and

Non-breastfed children 6–23 months of age who received solid, semi-solid or soft foods or milk feeds the

minimum number of times or more during the previous day

Non-breastfed children 6–23 months of age

Minimum is defined as: 2 times for breastfed infants 6–8 months; 3 times for breastfed children 9–23 months and 4 times for non-breastfed children 6–23 months

Minimum acceptable diet

Definition: Proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk).

Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day

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Breastfed children 6–23 months of age

and

Non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day

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Non-breastfed children 6–23 months of age

Consumption of iron-rich or iron-fortified foods

Definition: Proportion of children 6–23 months of age who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

Measurement:

Children 6–23 months of age who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was fortified in the home with a product that included iron during the previous day

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Children 6–23 months of age

Children ever breastfed

Definition: Proportion of children born in the last 24 months who were ever breastfed.

Measurement:

Children born in the last 24 months who were ever breastfed

Children born in the last 24 months

Continued breastfeeding at 2 years

Definition: Proportion of children 20–23 months of age who are fed breast milk.

Measurement:

Children 20–23 months of age who received breast milk during the previous day

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Children 20–23 months of age

Age-appropriate breastfeeding

Definition: Proportion of children 0–23 months of age who are appropriately breastfed.

Measurement:

Infants 0–5 months of age who received only breast milk during the previous day

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Infants 0–5 months of age

and

Children 6–23 months of age who received breast milk, as well as solid, semi-solid or soft foods, during the previous day

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Children 6–23 months of age

Predominant breastfeeding under 6 months

Definition: Proportion of infants 0–5 months of age who are predominantly breastfed.
Measurement:
Infants 0–5 months of age who received breast milk as the predominant source of nourishment during the previous day

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Infants 0–5 months of age

Median Duration of breastfeeding

Definition: Median duration of breastfeeding among children 0–35 months of age.
Measurement: The age in months when 50% of children 0–35 months did not receive breast milk during the previous day.

Bottle feeding

Definition: Proportion of children 0–23 months of age who are fed with a bottle.
Measurement:
Children 0–23 months of age who were fed with a bottle during the previous day

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Children 0–23 months of age

Milk feeding frequency for non-breastfed children

Definition: Proportion of non-breastfed children 6–23 months of age who receive at least 2 milk feedings.
Measurement:
Non-breastfed children 6–23 months of age who received at least 2 milk feedings during the previous day

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Non-breastfed children 6–23 months of age

Gross margin

Definition: Gross margin is the difference between the total value of production and the cash cost of production. Attention was focused on accounting for cash costs that represented at least 5% of total cash costs. Capital investments and depreciation was not included in cash costs. Unpaid, family labor was not valued and included in costs.
Calculation:
Average price = value of sales divided by quantity of sales
Gross revenue = average price x total production
Net revenue = gross revenue - purchased input cost
Gross margin (per ha, per animal, per pond area, per crate) = net revenue divided by area planted/in production (for crops, ponds), by animals (for milk, eggs); by crates (marine aquaculture)

Appendix-2

(Instruments for Data Collection)

গোপনীয়

শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে

ওয়ার্ল্ডফিস সেন্টার বাংলাদেশ
এফটিএফ এ্যাকুয়াকালচার প্রজেক্ট

বেইজলাইন জরিপ ২০১২

খানায় মৎস্য চাষ প্রশ্নপত্র

জরিপ পরিচালনায়

ডাটা ম্যানেজমেন্ট এইড

ইউএসএআইডি'র অর্থায়নে বাংলাদেশ সরকারের সহায়তায় ওয়ার্ল্ডফিস সেন্টার পরিচালিত
এফটিএফ এ্যাকুয়াকালচার প্রজেক্টের সহযোগীতায় পরিচালিত

জরিপে অংশগ্রহনের সম্মতিপত্র

ফিড দ্যা ফিউচার ওয়াল্ড ফিস সেন্টার পরিচালিত ইউএসএআইডি'র অর্থায়নে ও বাংলাদেশ সরকারের সহযোগিতায় একটি প্রকল্প। এটি ৫(পাচ) বছরের জন্য হস্তান্তর যোগ্য প্রকল্প যা কিনা বাংলাদেশের ঢাকা, খুলনা ও বরিশাল বিভাগের দক্ষিনাঞ্চলের ২০টি জেলায় বাস্তবায়ন হচ্ছে। প্রকল্পটি টেকসই ক্ষুধা ও দারিদ্রতা নিরসনে ফিড দ্যা ফিউচার এর উদ্দেশ্য বাস্তবায়নে কাজ করছে।

যে সকল এলাকায় প্রকল্পের কাজ পরিচালিত হবে সে সকল এলাকার উপর ডাটা ম্যানেজমেন্ট এইড এর মাধ্যমে একটি বেইজলাইন জরিপ পরিচালনা করছে।
এই জরিপের মাধ্যমে এফটিএফ মাছ চাষের প্রচলিত কৌশল ভালভাবে অবগত হয়ে বর্তমান ও ভবিষ্যতের কর্ম কৌশল নির্ধারণ করতে সাহায্য করবে।

আপনার নাম ও দেয়া সকল তথ্য সর্ম্পুন গোপনীয় রাখা হবে এবং শুধুমাত্র গবেষনার কাজে ব্যবহৃত হবে।

আপনার অংশ গ্রহন সম্পূর্ণ ইচ্ছাকৃত। উত্তর দেয়া না দেয়া সম্পুর্ন আপনার ইচ্ছা। তবুও আমরা আশা করি আপনি এই জরিপে অংশ গ্রহন করবেন কারণ আপনার মন্তব্য এই জরিপের জন্য খুবই গুরুত্বপূর্ণ ।

এখন আপনি জরিপ সম্মন্ধে যে কোন প্রশ্ন করতে পারেন।

আমি কি এখন আপনাকে প্রশ্ন করা শুরু করতে পারি ?
হ্যাঁ = 1
না = 2

সাক্ষাতকার গ্রহণকারী

Module A: Identification of the Sample

SI NO	Farmer's ID খামারির পরিচিতি	Name	Code
A1	Name of farmer খামারির নাম		
A2	Father's/husband 's name পিতা/স্বামীর নাম		
A3	Name of household head খানা প্রধানের নাম		
A4	District		
A5	Upazila		
A6	Union		
A7	Ward ওয়ার্ড		
A8	Village		
A9	Household number খানা নাম্বার		
A10	Are you a selected farmer of the FtF Aquaculture Project? আপনি কি FtF একুয়াকালচার প্রকল্পের একজন সদস্য? (1=yes ; 2=no) (1= , 2=)		
A11	Date of interview তথ্য সংগ্রহের		
A12	Interviewer সাক্ষাতকার গ্রহণকারীর নাম		
A13	Name of Supervisor সুপারভাইজারের নাম		

Module B: Household Member Profile (খানার সদস্যদের তথ্যঃ)

Sl no. ক্রমিক নং	Relationship with farmer খামারির সাথে সম্পর্ক	Sex (M / F/T) লিঙ্গ পুঃ/ মঃ/হিঃ	Age বয়স		Years of schooling কোন শ্রেনি পর্যন্ত পড়াশুনা করেছেন/ করছেন	Main occupation প্রধান পেশা	Subsidiary occupation অন্য পেশা
			Year বছর	Month মাস			
1. Farmer খামারি							
2							
3							
4							
5							
6							
7							

Codes: Relationship		Codes: Occupation
1. Husband 2. Wife 3. Son 4. Daughter 5. Father 6. Mother 7. Brother 8. Sister 9. Mother-in-law 10. Father-in law 11. Son-in-law 12. Daughter-in-law 13. Grand son 14. Grand daughter 15. Others	১= স্বামী ২= স্ত্রী ৩= পুত্র ৪= কন্যা ৫= বাবা ৬=মা ৭= ভাই ৮= বোন ৯= শাশুড়ি ১০= শ্বশুর ১১= জামাতা ১২= পুত্রবধূ ১৩= নাতি ১৪= নাতনি ১৫= অন্যান্য	1. House wife গৃহিণী 2. Service চাকুরী 3. Big/medium Business মাঝারী/ বড় ব্যবসা 4. Small business ছোট ব্যবসা 5. Day labor দিন মজুর 6. Rickshaw/Van driver রিক্সা/ ভ্যান চালক 7. Agriculture (Own/share cropper) কৃষি (নিজ/ বর্গা) 8. Handicrafts, Carpenter, Mason and other self employed কারুশিল্পী, কাঠমিস্ত্রি, রাজমিস্ত্রি এবং অন্যান্য স্বকর্ম 9. Professional (Doctor, engineer, advocate) পেশাজীবী (ডাক্তার, ইঞ্জিনিয়ার,আইনজীবী) 10. Student ছাত্র 11. Unemployed বেকার 12. Retired / Minor child অবসর প্রাপ্ত/ ছোট শিশু 13. Old (Age >60 years) বৃদ্ধ(৬০ বছরের উপরে) 14. Fish culture মাছ চাষ 15. Others (specify) অন্যান্য(উল্লেখ করুন)

B1	Did you receive any training on fish culture during the last three years? (1=yes ; 2=no) আপনি গত ৩ বছরে মাছ চাষের উপর কোন প্রশিক্ষণ পেয়েছেন কি? (1=হ্যাঁ, 2=না)	
B2	If yes, what is the total number of training you received in last three years?	…… No ..... টি

Module C: Land Ownership (জমির মালিকানা)

SI NO	Land type জমির ধরন	Cultivated last year (2011) গত বছরে (২০১১) চাষকৃত			Leased/mortgage out (decimal) ইজারা/ বন্ধক দেয়া (শতাংশ)
		No. of plots মোট কত খণ্ড	Total cultivated (decimal) মোট চাষকৃত (শতাংশ)	Leased/mortgage in (dec) ইজারা / বন্ধক নেয়া (শতাংশ)	
		A	B	C	D
C1	All *ghers*/ponds সকল ঘেড়/পুকুর				
C2	Cultivable land চাষযোগ্য জমি (field crops and vegetable) (শষ্য ও তরকারী)				
C3	Homestead area (without pond) বসতবাড়ির জায়গা (পুকুর ব্যতীত)				
C4	Homestead vegetables/fruits garden বাড়ির আঙ্গিনায় সব্জী/ফলের বাগান				
C5	Bamboo/timber trees garden বাঁশ/ কাঠ জাতীয় গাছের বাগান				
C6	Others (specify) অন্যান্য (উল্লেখ করুন)				

Module D: Annual Household Income (খানার বাৎসরিক আয়)

SI NO	**Source of income** আয়ের উৎস	**Gross income (Tk/year)** মোট আয় (টাকা/বৎসর)
D1	Field Crops and vegetables মাঠে উৎপাদিত শষ্য ও সব্জী	
D2	Livestock and poultry (meat, milk, egg) পশু ও হাঁস মুরগী (মাংস, দুধ,ডিম)	
D3	Homestead gardening (vegetables) বাড়ীর আঙ্গিনায় সব্জি	
D4	Homestead forest , trees, flowering বাড়ির আঙ্গিনায় গাছ ও ফুলফলাদি	
D5	Aquaculture (shrimp and fish produced) মৎস্য চাষ (চিংড়ি ও মাছ উৎপাদন)	
D6	Other fisheries(Fish business, harvesting from river and canal) অন্যান্য মাছ (মাছ ব্যবসা, নদী ও খাল থেকে আহরন)	
D7	Water pump rented out পানির মেশিন ভাড়া বাবদ	
D8	Power tiller and/or plough renting পাওয়ার টিলার এবং লাঙ্গল ভাড়া বাবদ	
D9	Fishing net renting মাছের জাল ভাড়া বাবদ	
D10	Labor selling (farmer himself & household members) শ্রম বিক্রয় (কৃষক নিজে বা পরিবারের সদস্যরা)	
D11	Services (Govt. and private job of farmer himself & household members) চাকুরী (সরকারী/বেসরকারি চাকুরী, কৃষক নিজে বা পরিবারের সদস্যরা)	
D12	Business (medium and large scale) ব্যাবসা (মধ্যম এবং বড়)	
D13	Small trading / small grocery shop ছোট ব্যাবসা / ছোট মুদির দোকান	
D14	Tempo/van/rickshaw /motorcycle renting টেম্পু, ভ্যান/রিক্সা/মোটর সাইকেল ভাড়া বাবদ	
D15	Remittance (in country and abroad) রেমিটেন্স (দেশের ভিতর/বিদেশ থেকে)	
D16	Land leased and/or mortgage out জমি ইজারা এবং বন্ধক থেকে	
D17	Others (Please specify) অন্যান্য (উল্লেখ করুন)	

Module E: Description of Selected/Specific Pond and Cultural Practices (নির্বাচিত/নির্ধারিত পুকুরের এবং চাষাবাদের বিবরন)

Q #	Questions প্রশ্ন	Response উত্তর
E1	Total project/specific pond area (water+dike) (dec) (HH pond size 5 to 20 dec) প্রজেক্টের বা নিদিষ্ট পুকুরের আয়তন (পানি+পাড়) (শতাংশ)	
E2	Water surface area of project/specific pond (dec) প্রজেক্টের বা নিদিষ্ট পুকুরের পানির আয়তন (শতাংশ)	
E3	Dike area of project/specific pond(decimal) প্রজেক্টের বা নিদিষ্ট পুকুরের পাড়ের আয়তন (শতাংশ)	
E4	Water surface area of the pond shaded by trees (%) পুকুরের পানির কত অংশ গাছের ছায়া দ্বারা আবৃত (%)	
E5	Ownership status of the pond (1=single ; 2=joint ; 3=singly leased; 4=jointly leased) পুকুরের মালিকানা: 1=নিজে ; 2=যৌথ ; 3=একক ইজারা; 4=যৌথ ইজারা)	
E6	If multiple ownership, please mention the number of owners যৌথ মালিকানা হলে কতজন?	
E7	Average water depth of the pond in culture season(feet) চাষ মৌসুমে গড়ে পুকুরের পানির গভীরতা কত থাকে (ফিট)	
E8	No. of months water retains for fish culture in the pond? মাছ চাষের জন্য পুকুরে কতমাস পানি থাকে?	
E9	How many years have you been involved in fish farming? কত বছর যাবৎ মাছচাষ করছেন?	
E10	How many years ago was the pond dag,/prepared? পুকুরটি কত বৎসর আগে খনন করা হয়েছিল?	
E11	Soil type of the pond (1=Loamy, 2=Clay, 3=Sandy, 4= Sandy loam, 5=Clay loam, 6=Silty, 7=Silty loam, 8=others (specify) পুকুরের মাটির ধরন (1=দোআশ, 2=কাঁদা, 3=বালি, 4=বেলে দোআঁশ, 5=এটেল দোআঁশ, 6=পলি, 7= পলি দোআঁশ, 8=অন্যান্য (উল্লেখ করুন)	

Model F: Investment in Fish Culture in 2011

F1. Fixed Cost in the Selected/Specific Pond

২০১১ সালে নির্বাচিত/নির্ধারিত পুকুরে মূলধন বিনিয়োগ খরচ

SI NO	**Items** ধরন	**No.** নং	**Total value/cost (Tk)** মোট মুল্য/খরচ (টাকা)	**Economic life (year)** কার্যকাল (বছর)	**% used for the pond/*gher*** পুকুরের বা ঘেরের কাজে কত অংশ ব্যবহার হয় (%)
		A	B	C	D
F1.1	*Pond* lease value পুকুরের ইজারা মুল্য				
F1.2	Bamboo/wood/rope বাঁশ/কাঠ/দড়ি				
F1.3	Shallow tubewell/pump শ্যালো টিউবওয়েল/পাম্প				
F1.4	Spade/sickle etc, কোদাল/কাঁচি/দা ইত্যাদি				
F1.5	Drum/box/fishing trap ড্রাম/বক্স/মাছ ধরার ফাঁদ				
F1.6	Boat/tube নৌকা/টিউব				
F1.7	Net (harvesting) জাল (মাছ ধরার জন্য)				
F1.8	Blue net (Hapa and fence) ব্লুনেট (হাপা এবং বেড়া)				
F1.9	Others অন্যান্য (উল্লেখ করুন)				

F2: Pre-Stocking/Pre-Seedling Pond Preparation and Input Costs in 2011

2011 সালে পোনা মজুদপূর্ব পুকুর প্রস্তুতকরন ও উপকরণ খরচ

SI NO	Input ব্যবহার সামগ্রী	For fish or prawn মাছ অথবা গলদা চিংড়ি	
		Quantity পরিমান	Total cost (Tk) মোট মুল্য(টাকা)
		A	**B**
	Organic Fertilizer জৈব সার		
F2.1	Cow dung ***(kg)*** গোবর (কেজি)		
F2.2	Goat dung ***(kg)*** ছাগলের বিষ্ঠা (কেজি)		
F2.3	Compost ***(kg)*** কমপোস্ট (কেজি)		
F2.4	Other (specify) ***(kg)*** অন্যান্য(কেজি)		
F2.5	Total ***Organic Fertilizer*** মোট		
	Inorganic Fertilizer অজৈব সার		
F2.6	Urea ***(kg)*** ইউরিয়া (কেজি)		
F2.7	TSP ***(kg)*** টি,এস,পি (কেজি)		
F2.8	MoP ***(kg)*** এমপি (কেজি)		
F2.9	Total মোট		
	Lime (kg) চুন (কেজি)		
F2.10	Quick lime ***(kg)*** কুইক লাইম (কেজি)		
F2.11	Slaked lime ***(kg)*** স্লাকড লাইম (কেজি)		
F2.12	Lime stone ***(kg)*** পাথর চুন (কেজি)		
F2.13	Gypsum ***(kg)*** জিপসাম (কেজি)		
F2.14	Dolomite ***(kg)*** ডলোমাইট (কেজি)		
F2.15	Total মোট		
	Others Chemicals Use অন্যান্য রাসায়নিক দ্রব্য ব্যবহার		
F2.16	Rotenone (g) রোটেনন (গ্রাম)		
F2.17	Phostoxin (g) ফসটক্সিন (গ্রাম)		
F2.18	Sumithion (ml) সুমিথিয়ন(গ্রাম)		
F2.19	Thiodin (ml) থায়োডিন (গ্রাম)		
F2.20	Bleaching (kg) ব্লিচিং পাউডার (কেজি)		
F2.21	Dipterax (g) ডিপটারেক্স (গ্রাম)		
F2.22	Others (g/ml) অন্যান্য (গ্রাম/ মিলিলিটার)		
F2.23	Total মোট		
	Other Inputs অন্যান্য সামগ্রী		
F2.24	Rent cost for plaughing/power tiller পাওয়ার টিলার/লাঙ্গল ভাড়া		
F2.25	Total মোট		

F3: Stocking/seedling Costs in 2011 (২০১১ সালে পোনা মজুদ খরচ)

SI NO	**Species** প্রজাতী	**Nos** সংখ্যা	**Kg** কেজি	**Total cost (Tk)** মোট মূল্য (টাকা)	**Source*** উৎস
F3.1	Rui রুই				
F3.2	Catla কাতলা				
F3.3	Mrigel মৃগেল				
F3.4	Silver carp সিলভার কার্প				
F3.5	Grass carp গ্রাস কার্প				
F3.6	Common carp কমন কার্প				
F3.7	Mirror carp মিরর কার্প				
F3.8	Thai Shorputi রাজপুটি				
F3.9	Thai Pangas থাই পাঙ্গাশ				
F3.10	GIFT গিফট				
F3.11	Tilapia/Nilotica তেলাপিয়া				
F3.12	Mola/Dhela/Tengra মলা/ডেলা/টেংরা				
F3.13	Other white fish seed অন্ন্যান্য সাদা মাছের পোনা				
F3.14	Golda PL গলদার পোনা				
F3.15	Vegetables/spices seed in dyke পুকুর পাড়ে সব্জি/মসল্লা বীজ				

Source*(1=Private nursery, 2=Govt nursery, 3=patilwala/faria, 4=other famer, 5=hatchery, 6=own raised, 7= depot, 8=Wild, 9=Others)

উৎসঃ 1=ব্যক্তিমালিকানাধীন নার্সারি, 2=সরকারি নার্সারি, 3=পাতিলওয়ালা/ফরিয়া, 4=অন্যখামারি, 5=হাচারি, 6=নিজের, 7=ডিপো, 8=মুক্ত জলাশয় 9= অন্যান্য (উল্লেখ করুন)

F4: Dike Cultivation and Post Stocking Management Costs in 2011 (2011 সালে পুকুরপাড়ে চাষ ও মজুদ পরবর্তী ব্যবস্থাপনা ব্যয়)

SI NO	**Input** উপকরণ সমুহ	For fish or prawn মাছ অথবা গলদা চিংড়ি চাষের জন্য		For dike vegetables পুকুর পাড়ে সব্জি চাষের জন্য
		Quantity পরিমাণ	Cost (Tk) মূল্য (টাকা)	Cost (Tk) মূল্য (টাকা)
	Organic Fertiliser: জৈব সার			
F4.1	Cow dung ***(kg)*** গোবর			
F4.2	Poultry Droppings ***(kg)***			
F4.3	Goat dung ***(kg)*** ছাগলের বিষ্ঠা			
F4.3	Compost ***(kg)*** কমপোস্ট			
F4.4	Others অন্যান্য উল্লেখ করুণ			
F4.5	Total মোট			
	Inorganic Fertiliser: জৈব সার			
F4.6	Urea ***(kg)*** ইউরিয়া (কেজি)			
F4.7	TSP ***(kg)*** টি,এস,পি (কেজি)			
F4.8	MoP ***(kg)*** এম পি (কেজি)			
F4.9	DAP (kg) ডি এ পি (কেজি)			
F4.10	Zink (Kg) জিঙ্ক (কেজি)			
F4.11	Others অন্যান্য উল্লেখ করুণ			
F4.12	Total মোট			
	Supplementary feed:সম্পুরক খাবার			
F4.13	Rice-bran ***(kg)*** চালের ভুষি			
F4.14	Wheat-bran ***(kg)*** গমের ভুষি (কেজি)			
F4.15	Oil-cake ***(kg)*** খৈল (কেজি)			
F4.16	Duckweed ***(kg)*** *ডাক উইড* (কেজি)			
F4.16	Green vegetable ***(kg)*** সবুজ শাক সব্জি			
F4.17	Fish meal ***(kg)*** মৎস্য চূর্ণ			
F4.18	Animal blood ***(kg)*** পশুর রক্ত			
F4.19	Snail meat ***(kg)*** শামুকের মাংস			
F4.20	Commercial feed ***(kg)*** বাণিজ্যিক খাবার			
F4.21	Total মোট			
	Lime (kg) চুন			
F4.22	Quick lime (kg) কুইক লাইম			
F4.23	Lime stone ***(kg)*** পাথর চুন			
F4.24	Slaked lime ***(kg)*** স্লাক লাইম			
F4.25	Gypsum ***(kg)*** জিপসাম			
F4.26	Dolomite ***(kg)*** ডলমাইট(কেজি)			
F4.27	Total মোট			
F4.28	Water exchange and management cost (Tk) পানি পরিবর্তন ও ব্যাবস্থাপনা খরচ(টাকা)			
F4.29	Harvesting cost (hired net, contract out or dewatering cost) (Tk)			

SI NO	**Input** উপকরণ সমুহ	For fish or prawn মাছ অথবা গলদা চিংড়ি চাষের জন্য		For dike vegetables পুকুর পাড়ে সব্জি চাষের জন্য
		Quantity পরিমাণ	Cost (Tk) মূল্য (টাকা)	Cost (Tk) মূল্য (টাকা)
	মাছ আহরনের খরচ (জাল ভাড়া, চুক্তি, পানি সেচ বাবদ, শ্রমিক খরচ)			
F4.30	**Selling cost** (Transport, labor, toll, tax etc) বিক্রয় ব্যয় (যানবাহান,মজুদ,টোল,ট্যাক্স)			

F5 :Labor Cost for Fish Culture and Dyke Vegetables Production (2011)

মৎস্য চাষ ও পুকুর পাড়ে কৃষি কাজে ব্যবহৃত শ্রমিক বিবরণ ও ব্যয়

Purpose of use ব্যবহারের উদ্দেশ্য	Labor type মজুর ধরন	No. of labor মজুদের সংখ্যা	Total no. of days worked মোট কতদিন কাজ করেছে	Average No. of hours worked per day গড়ে প্রতিদিন কত ঘন্টা কাজ করেছে	Wage (Tk/day/person) মজুরী (টাকা/দিন/জন)		
					Cash নগদ		Food/kind খাদ্য
					Daily দিন	Monthly মাস	
Fish/prawm culture মাছ/চিংড়ি চাষ	Permanent male স্থায়ী পুরুষ কর্মী						
	1						
	2						
	3						
	Permanent female স্থায়ী মহিলা কর্মী						
	1						
	Daily male পুরুষ দিন মজুর						
	Daily female মহিলা দিন মজুর						
	Family male পারিবারিক পুরুষ						
	1						
	2						
	3						
	4						
	Family female পারিবারিক মহিলা						
	1						
	2						
	3						
	4						
Vegetables in dike পাড়ে সব্জি চাষ	Permanent male স্থায়ী পুরুষ কর্মী						
	Permanent female স্থায়ী মহিলা কর্মী						
	Daily male পুরুষ দিন মজুর						
	Daily female মহিলা দিন মজুর						
	Family male পারিবারিক পুরুষ						
	Family female পারিবারিক মহিলা						

Module G: Production from the HH Pond and Its Disposal in 2011

2011 সালে পুকুর থেকে প্রাপ্ত উৎপাদন ও ব্যবহার

SI NO	Output উৎপাদন	Production (Kg) উৎপাদন (কেজি)						Total value of product (Tk) মোট মূল্য (টাকা)
		Total মোট	Consumed খাবার	Sold বিক্রি	Gifted উপহার	Dried শুকানো	Technical lost টেকনিক্যাল লস	
G1	Golda গলদা							
G2	Rui রুই							
G3	Catla কাতলা							
G4	Mrigal মৃগেল							
G5	Silver carp সিলভার কার্প							
G6	Grass carp গ্রাস কার্প							
G7	Common carp কমন কার্প							
G8	Mirror carp মিরর কার্প							
G9	Thai Shorputi থাই সরপুঁটি							
G10	Thai Pangus থাই পাঙ্গাশ							
G11	GIFT গিফট							
G12	Tilapia/Nilotica তেলাপিয়া/নাইলোটিকা							
G13	Mola/Dhela/Tengra মলা/ডেলা/টেংরা							
G14	Dike vegetables পুকুর পারের শাক সব্জি							
G15	Dike fruits পাড়ের ফল							
G16	Dike spices পাড়ের মশল্লা							
G17	Other white fish species অন্যান্য সাদা মাছের প্রজাতি							
G18	Dike trees and others অন্যান্য (পাড়ের গাছ)							

Module H: Cost and Returns of Homestead Vegetables Production in 2011

2011 সালে বাড়ীর আঙ্গিনায় সব্জি উৎপাদন ব্যয় ও আয়

SI NO	**Cost items** ব্যয়ের খাত	**Quantity** পরিমাণ	**Total Value (Tk)** মোট মূল্য(টাকা)
H1	Area of land under vegetables (dec) সব্জী চাষকৃত জমির পরিমান (শতক)		
H2	Plaughing লাঙ্গল দিয়ে চাষ		
H3	Vegetable seed/sapling সব্জিবীজ / চারা		
H4	Total no. of days worked by family male (day/year) পারিবারের পুরুষরা মোট কতদিন কাজ করেছে (দিন/বছর)		
H5	Average hours worked by family male (hours/day) গড়ে পারিবারের পুরুষরা কত ঘন্টা কাজ করেছে (ঘন্টা/দিন)		
H6	Total no. of days worked by family female (day/year) পারিবারের মহিলারা মোট কতদিন কাজ করেছে (দিন/বছর)		
H7	Average hours worked by family female (hours/day) গড়ে পারিবারের মহিলারা কতঘন্টা কাজ করেছে (ঘন্টা/দিন)		
H8	Total days worked by hired male (day/year) গড়ে পুরুষ মজুর মোট কত দিন কাজ করেছে (দিন/বছর)		
H9	Total days worked by hired female (day/year) গড়ে মহিলা দিন মজুর মোট কত দিন কাজ করেছে (দিন/বছর)		
H10	Urea ইউরিয়া (সাদা সার) (কেজি)		
H11	TSP টি এস পি (ফসফেট সার) (কেজি)		
H12	DAP (kg) ডি এ পি (কেজি)		
H13	Ash (Kg) ছাই (কেজি)		
H14	Cow dung (kg) গোবর (কেজি)		
H15	Pesticide বালাইনাশক		
H16	Other cost (if any) অন্যান্য (যদি থাকে)		
	Output উৎপাদন		
H17	Total production (Kg) মোট উৎপাদন (কেজি)		
H18	Total consumed (Kg) মোট খাওয়া (কেজি)		
H19	Total sold (Kg) মোট বিক্রি (কেজি)		
H20	Total gifted and others (Kg) উপহার হিসাবে দেয়া ও মোট অন্যান্য (কেজি)		

Module I: Involvement of HH Members in Decision Taking for Individual Activities in Fish Culture (Tick the appropriate answer/s)

2011 সালে বসতবাড়ীর আঙ্গিনায় পুকুরের মাছ চাষ পরিচালনায় সিদ্ধান্ত গ্রহনে পরিবারের ভুমিকা

SI NO	**Activities**	**Who decides** কে সিদ্ধান্ত নেন			
		Respondent farmer খামারি নিজে	**Other female members** অন্যান্য মহিলা সদস্য	**other male members** অন্যান্য পুরুষ সদস্য	**Jointly** যৌথ ভাবে
I1	Planning for fish culture মাছ চাষের পরিকল্পনা				
I2	Selection of species প্রজাতি নির্বাচন				
I3	Fish or shrimp seed purchase মাছ বা চিংড়ির পোনা ক্রয়				
I4	Feed application into pond or ghers পুকুরে মাছের খাবার প্রদান				
I5	Fertilizer application into pond or ghers পুকুরে সার প্রয়োগ				
I6	Decision in fish or shrimp stocking density মাছের মজুদ ঘনত্বের সিদ্ধান্ত				
I7	Fish or shrimp feed preparation মাছের খাদ্য প্রদান				
I8	Decision in when fish/shrimp is harvested মাছ আহরনে সিদ্ধান্ত				
I9	Dyke cultivation planning পাড়ে সবজি চাষের পরিকল্পনা				
I10	Vegetables selling and consumption সবজি বিক্রয় ও খাওয়া				
I11	Re-investment planning of earned money মাছ চাষে পুনঃবিনিয়োগ				
I12	Distribution of management responsibility কাজের বন্টন				

Module J: Household Hunger Scale （খানার হাঙ্গার স্কেল）

Q #	Question for last 4 weeks or 30 days গত ৪ সপ্তাহের বা ৩০ দিনের মধ্যে	Response (0=never, 1=rarely or sometimes, 2=often) উত্তর （0=কখন না, 1=হঠাৎ কখনও,2= প্রায়ই）
J1	How often there was no food to eat of any kind in your house বাড়িতে খাবার ছিল না এমন কত ঘন ঘন হয়েছে?	
J2	How often did any member of your household go to bed hungry পরিবারের কোন সদস্য না খেয়ে ঘুমাতে গেছে এমন কত ঘন ঘন হয়েছে?	
J3	How often did any member of your household spend a full day and night without eating পরিবারের কোন সদস্য দিনে ও রাত্রে না খেয়ে থেকেছে এমন কত ঘন ঘন হয়েছে?	

Module K: Nutritional status of 6-23 months old children

K1.1	Do you have any children aged 6-23 months in your household? (1=yes ; 2=no) আপনার খানায় ৬-২৩ মাস বয়সি কোন শিশু আছে কি? (1=হ্যাঁ, 2=না)	
If no please skip this section. যদি না হয় তাহলে L মডিউলে যান		
K1.2	If yes, What is the age of the child: _____ months হ্যাঁ হলে, শিশুর বয়স..... মাস.....	
	what is the Sex: (1=M,2=F) _____ লিঙ্গ （1=পু, 2=ম）	

(Pleases ask these questions to the mother of the child) (দয়াকরে শিশুর মাকে প্রশ্ন করুন)

Q #	Questions প্রশ্ন	Response
K1	Did you feed colostrum to the child? বাচ্চাকে শাল দুধ খাইয়েছিলেন কি?	1=yes হ্যাঁ 2=no না 3=don't remember মনে নাই
K2	When did you first initiate breast feeding the child? বাচ্চাকে কখন প্রথম মায়ের দুধ দিয়েছিলেন?	1=immediately after birth জন্মের পরপরই 2=after ____hours of birth জন্মের..... ঘন্টা পর 3=never কখননা 4=don't remember মনে নাই
K3	How long did you exclusively breastfed the child? (ORS, vitamins, minerals and medicine as prescribed by doctors are allowed in EBF) কত মাস পর্যন্ত এই শিশুটিকে শুধু মাত্র বুকের দুধ খাইয়েছেন? (ডাক্তারের পরামর্শে ওআরএস, ভিটামিন ও ঔষধ খাওয়ানো শুধু মাত্র বুকের দুধ খাওয়ানো হিসাবে বিবেচিত হবে)	1.Up to _____ months ১= .....মাস বয়স পর্যন্ত 2.Still exclusively breast feeding ২= এখনও শুধু মাত্র বুকের দুধ খায়
K4	When did you first introduce complementary feeding to the child? মায়ের দুধের পাশাপাশি কখন বাড়তি খাবার দেয়া শুরু করেছেন?	1=at _____months ১= .....মাস বয়স থেকে 2=still not introduced এখনও দেওয়া শুরু করিনাই
K5	When did you first introduce solid, semi-solid or soft food to the child? কত মাস বয়সে বাচ্চাকে প্রথম শক্ত ও নরম খাবার দেয়া শুরু করেছেন?	1=at _____months ১= .....মাস বয়স থেকে 2=still not introduced এখনও দেওয়া শুরও করিনাই
K6	How long did you continue breast feeding along with complimentary feeding to the child? আলগা খাবারের পাশাপাশি কতদিন বাচ্চাকে মায়ের দুধ খাইয়েছেন ?	1=up to _____months ১= ..... মাস পর্যন্ত 2=still continuing breast feeding ২= এখনও বুকের দুধ খাচ্ছে
K7	How many times did you feed supplementary foods to the child in last 24 hours? গত ২৪ ঘন্টায় বাচ্চাকে কতবার সম্পুরক খাবার খাইয়েছেন? (সংখ্যা লিখুন)	.....বার
K8	How many times did you breastfeed the child in last 24 hours? গত ২৪ ঘন্টায় বাচ্চাকে কতবার মায়ের দুধ খাইয়েছেন? (সংখ্যা লিখুন)	.....বার

	Group	***Foods Eaten by the Child in the Last 24 Hours:*** শিশুটি গত ২৪ ঘন্টায় কি খাবার খেয়েছে	Response

K9	1	Cereals খাদ্য শস্য (e.g. rice, bread, wheat, wheat bread, rice flakes, puffed rice, barley, wheat grain, popcorn) (1=yes ; 2=no) দানা জাতীয় শস্য যেমন চাউল, রুটি, গম, আটার রুটি ভাতের জাউ, র্বালি, গমের গুড়া, খই? (১=হ্যাঁ, ২=না)	
K10	1	Roots and tubers (e.g. white potatoes, white yams or other foods made from roots and tubers) (1=yes ; 2=no) (যে কোন ধরনের সাদা আলু, গাছ আলু অথবা মাটির নীচের সব্জি দিয়ে তৈরী খাদ্য) (১=হ্যাঁ, ২=না)	
K11	2	Legumes and nuts (e.g. bengal gram, black gram, dal, lentil, khesari, mung bean) (1=yes ; 2=no) যেকোন ধরনের ডাল যেমন -মাসকলাই, মাটিকলাই, মশুর, খেসারী, মুগ? (১=হ্যাঁ, ২=না)	
K12	4	Meat (e.g. beef, mutton, poultry, lamb, pork, liver and other organ meat) (1=yes ; 2=no) মাংস জাতীয় খাবার যেমন, কলিজা, গরুর মাংস, হাঁস-মুরগী, ভেড়া, শুকর ইত্যাদি? (১=হ্যাঁ, ২=না)	
K13	4	Fish (e.g. fresh or dried fish or shellfish) (1=yes ; 2=no) কোন তাজামাছ বা শুঁটকী মাছ অথবা খোলসযুক্ত জলজপ্রাণী যেমন-শামুক, ঝিনুক, চিংড়ি ইত্যাদি । (১=হ্যাঁ, ২=না)	
K14	4	Small indigenous fish (mola, dela, kaski, etc) (1=yes; 2=no) দেশীয় ছোট মাছ (মলা,ডেলা,কাসকি)১= হাঁ ২= না	
K15	5	Eggs (1=yes ; 2=no) ডিম (১=হ্যাঁ, ২=না)	
K16	3	Milk or milk products (e.g. cow milk, buffalo milk, goat milk, yogurt, curd, cheese) (1=yes ; 2=no) দুধ অথবা দুধ দিয়ে তৈরী খাবার যেমন, গরুর দুধ, মহিষের দুধ, ছাগলের দুধ, দই, ছানা, পনির? (১=হ্যাঁ, ২=না)	
K17	6	Yellow and orange vegetables (e.g. pumpkins, carrots, squash, orange flesh sweet potato or vegetables that are yellow or orange inside) (1=yes ; 2=no) কুমড়া, গাজর, ধুন্দুল, মিষ্টি আলু বা শাকসব্জী যাহা ভিতরে হলুদ বা কমলা রংয়ের? (১=হ্যাঁ, ২=না)	
K18	6	Dark green leafy vegetables (e.g. ipomoea, amaranth, spinach, parwar sag, drumstick leaves) (1=yes ; 2=no) যেকোন ধরনের গাঢ় সবুজ পাতা জাতীয় সব্জী যেমন - কলমীশাক, ডাটাশাক, পালং শাক, পারওয়ার শাক, সজনেডাটা শাক? (১=হ্যাঁ, ২=না)	

K19	7	Other vegetables (e.g. cucumber, radish, pepper, string beans, cabbage, cauliflower, radish, onion) (1=yes ; 2=no) অন্যান্য সব্জী যেমন, শশা, মূলা, মিষ্টি মরিচ, বাঁধা কপি, স্ট্রীং বিন, ফুল কপি, পিয়াজ? (১=হ্যাঁ, ২=না)	
K20	6	Vitamin A rich fruits (e.g. ripe papaya, mango or other fruits that are yellow or orange inside) (1=yes ; 2=no) পাকা পেঁপে, আম অথবা এ ধরনের ফল যার ভেতরটা হলুদ অথবা কমলা? (১=হ্যাঁ, ২=না)	
K21	7	Other fruits (e.g. banana, sithphal, grapefruit, apple, orange, jackfruit, jambura fruit, plums, melon, tomato, date, lemon) (1=yes ; 2=no) অন্যান্য ফল যেমন, কলা, পেঁপে, পিচফল, আঙ্গুর, আপেল, কমলা, কাঁঠাল, তাল, তরমুজ, টমেটো, খেজুর, লেবু ইত্যাদি? (১=হ্যাঁ, ২=না)	
K22		Any foods prepared using fat, e.g. oil, butter, dalda, ghee (1=yes ; 2=no) চর্বিদ্বারা তৈরী খাবার, যেমন-তেল, মাখন, ডালডা অথবা ঘি? (১=হ্যাঁ, ২=না)	
K23		Any sugar or honey (1=yes ; 2=no) চিনি বা মধু ১= হাঁ ২= না	

Module L: Women's Dietary Diversity মহিলাদের খাদ্য বৈচিত্রতা
(For women aged 15-49 years)

Q #		Question	Response
L1		Is there a woman aged 15-49 years in the household? (1=yes ; 2=no >> skip to Module L) এই খানায় 15-49 বছর বয়সি কোন মহিলা আছে কি? (1= হ্যাঁ, 2=না) যদি না হয় তবে M মডিউলে যান	
L2		If yes, what is her name? (if there are more than one such woman, select one randomly and enter her name) যদি হাঁ হয়, তার নাম কি?	
L3		***Foods Eaten by the Woman in the Last 24 Hours:*** ***(make sure that this question is answered by the women herself, not by anyone on her behalf)*** মহিলা গত ২৪ ঘন্টায় কি খাবার খেয়েছে (মহিলা নিজে প্রশ্নের উত্তর দিবেন তার পক্ষে অন্যকেও নয়)	
L4	***1***	***Cereals(e.g. rice, bread, wheat, wheat bread, rice flakes, puffed rice, barley, wheat grain, popcorn)(1=yes ; 2=no)*** দানা জাতীয় শস্য যেমন চাউল, রুটি, গম, আটার রুটি ভাতের জাউ, র্বালি, গমের গুড়া, খই?	
L5	***1***	***Roots and tubers (e.g. white potatoes, white yams or other foods made from roots and tubers)*** ***(1=yes ; 2=no)*** য কোন ধরনের সাদা আলু, গাছ আলু অথবা মাটির নীচের সব্জি দিয়ে তৈরী খাদ্য ?	
L6	***2***	***Legumes and nuts*** ***(e.g. bengal gram, black gram, dal, lentil, khesari, mung bean)*** ***(1=yes ; 2=no)*** যেকোন ধরনের ডাল যেমন -মাসকলাই, মাটিকলাই, মশুর, খেসারী, মুগ?	

		(১=হ্যাঁ, ২=না)	
L7	***4***	***Meat*** ***(e.g. beef, mutton, poultry, lamb, pork, liver and other organ meat)*** ***(1=yes ; 2=no)*** মাংস জাতীয় খাবার যেমন, কলিজা, গরুর মাংস, হাঁস-মুরগী, ভেড়া, শুকর ইত্যাদি? (১=হ্যাঁ, ২=না)	
L8	***4***	***Fish (e.g. fresh or dried fish or shellfish)*** ***(1=yes ; 2=no)*** কোন তাজামাছ বা শুঁটকী মাছ অথবা খোলসযুক্ত জলজপ্রাণী যেমন-শামুক, ঝিনুক, চিংড়ি ইত্যাদি । (১=হ্যাঁ, ২=না)	
L9	***4***	Small indigenous fish (mola, dela, kaski, etc) (1=yes; 2=no) দেশীয় ছোট মাছ (মলা,ডেলা,কাসকি)১= হাঁ ২= না	
L10	***5***	***Eggs(1=yes ; 2=no)*** ডিম? (১=হ্যাঁ, ২=না)	
L11	***3***	***Milk or milk products*** ***(e.g. cow milk, buffalo milk, goat milk, yogurt, curd, cheese)*** ***(1=yes ; 2=no)*** দুধ অথবা দুধ দিয়ে তৈরী খাবার যেমন, গরুর দুধ, মহিষের দুধ, ছাগলের দুধ, দই, ছানা, পনির? (১=হ্যাঁ, ২=না)	
L12	***6***	Yellow and orange vegetables (e.g. pumpkins, carrots, squash, orange flesh sweet potato or vegetables that are yellow or orange inside) (1=yes ; 2=no) (! " ,# ,$ % & ' ( ) ১= হাঁ ২= না	
L13	***6***	Dark green leafy vegetables (e.g. ipomoea, amaranth, spinach, parwar sag, drumstick leaves) (1=yes ; 2=no) যেকোন ধরনের গাঢ় সবুজ পাতা জাতীয় সব্জী যেমন - কলমীশাক, ডাটাশাক, পালং শাক, পারওয়ার শাক, সজনেডাটা শাক? (১=হ্যাঁ, ২=না)	
L14	***7***	Other vegetables (e.g. cucumber, radish, pepper, string beans, cabbage, cauliflower, radish, onion) (1=yes ; 2=no) অন্যান্য সব্জী যেমন, শশা, মূলা, মিষ্টি মরিচ, বাঁধা কপি, স্ট্রীং বিন, ফুল কপি, পিয়াজ? (১=হ্যাঁ, ২=না)	
L15	***6***	Vitamin A rich fruits (e.g. ripe papaya, mango or other fruits that are yellow or orange inside) (1=yes ; 2=no) পাকা পেঁপে, আম অথবা এ ধরনের ফল যার ভেতরটা হলুদ অথবা কমলা? (১=হ্যাঁ, ২=না)	
L16	***7***	Other fruits (e.g. banana, sithphal, grapefruit, apple, orange, jackfruit, jambura fruit, plums, melon, tomato, date, lemon) (1=yes ; 2=no) অন্যান্য ফল যেমন, কলা, পেঁপে, পিচফল, আঙ্গুর, আপেল, কমলা, কাঁঠাল, তাল, তরমুজ, টমেটো, খেজুর, লেবু ইত্যাদি? (১=হ্যাঁ, ২=না)	
L17		Any foods prepared using fat, e.g. oil, butter, dalda, ghee (1=yes ; 2=no) চর্বিদ্বারা তৈরী খাবার, যেমন-তেল, মাখন, ডালডা অথবা ঘি? (১=হ্যাঁ, ২=না)	
L18		Any sugar or honey (1=yes ; 2=no) চিনি বা মধু ১= হাঁ ২= না	

Module M: Information on Consumption and Sources of fish use in the household

M1:. List the Fish Species You Consumed in the Last 3 Days and Amount of Each Fish Consumed

গত ৩ দিনে আপনার পরিবারের কি কি মাছ কত পরিমানে খেয়েছেন?

Species consumed প্রজাতির নাম									Total (kg)
Quantity consumed (Kg) খাওয়ার পরিমান (কেজি)									

M2: List the Source of the Fish Your HH Consumed in the Last 3 Days and Quantity From Each Source

গত ৩ দিনে পরিবারের সদস্যরা যে সকল মাছ খেয়েছেন এর উৎস ভিত্তিক পরিমান সম্পর্কে তথ্যাদি?

Fish source মাছের উৎস	Own Ponds নিজের পুকুর	Purchased from market বাজার থেকে ক্রয়কৃত	Self caught (from own rice field) নিজের ধান ক্ষেত থেকে সংগৃহীত	Self-caught (from open water body) মুক্ত জলাশয় থেকে নিজের দ্বারা আহরিত	Gift from friend or relative বন্ধু বা আত্মীয় স্বজনের কাছ থেকে পাওয়া	Other (specify) অন্যান্য (উল্লেখ করুন)	Total (kg) মোট (কেজি)
Quantity consumed (Kg) খাওয়ার পরিমান (কেজি)							

Module N: Knowledge Attitude and Practice of Improved Fish Cultivation Technology

Q #	Improved fish cultivation management technology উন্নত প্রযুক্তিতে মাছ চাষে ব্যবস্থাপনা	Standard practice	Knowledge (1=know; 2=don't know) জ্ঞান (১=জানি, ২=জানিনা)	Practice (1=practiced 2=didn't practice) ব্যবহারের মাত্রা	If knows, reasons for non-practice[1] (multiple reasons apply) যদি জানে তবে অনুশীলন না করার কারন	No. of other farmers used this technologies learnt from you আপনার কাছ থেকে শিখে আর কত জন এই প্রযুক্তি ব্যবহার করেন
N1	Testing natural food adequacy in water পানির রং পরীক্ষা করে খাবারের পর্যাপ্ততা নির্ণয়	Required				
N2	Maintaining stock density মজুদের ঘনত্ব বজায় রাখা	40-70 fingerling per decimal				
N3	Species selection সঠিক প্রজাতি নির্বাচন করা	required				
N4	Weed control আগাছা নিয়ন্ত্রণ	Required				
N5	Liming চুন দেওয়া	0.5 to 1.5 kg per dec				
N6	Providing supplementary feed সম্পূরক খাবার দেওয়া	Required based on sampling				
N7	Employing fish disease management মাছের রোগ ব্যবস্থাপনা	Required				
N8	Health monitoring **# & * +**	Required				
N9	Growth monitoring মাছের বৃদ্ধি পর্যবেক্ষণ	Required				
N10	Post harvest handling আহরনোত্তর পরিচর্যা	Required				
N11	Use quality seeds উন্নত পোনা ব্যবহার	required				
N12	Followed feeding application procedures (feeding time, frequency feeding etc) খাদ্য প্রয়োগ পদ্ধতি অনুসরন	Required				

[1]Code : 1=inputs not easily available; 2=lack of capital; 3=not serious about it; 4=lack of enough technical knowledge; 5= lack of consensus among multiple owners; 6=others (specify)
১=উপকরণ সহজ লভ্য নয়, ২= পুজির অভাব, ৩= এই বিষয়ে আন্তরিক নয়, ৪= পর্যাপ্ত কারিগরি জ্ঞানের অভাব ৫= মালিকদের মধ্যে মত অনৈক্য ৬= অন্যান্য(উল্লেখ করুন)

Module O: Problems and Constraints সমস্যা ও প্রতিবন্ধকতা

SI NO	Problems সমস্যা	Intensity (1=Less, 2=moderate,	Measures taken to overcome problem

		3=High, 4=None) মাত্রা (১=কম, ২=মধ্যম, ৩=উচ্চ, ৪=নাই)	সমস্যা উত্তরনে কি ব্যবস্থা নেওয়া হয়েছে
O1	Short of quality seed মান সম্মত মাছের পোনার অপর্যাপ্ততা		
O2	Social problem (theft, poisoning, multiple ownership) সামাজিক সমস্যা (চুরি, বিষ প্রয়োগ, যৌথ মালিকানা)		1= Increased security guard পাহারাদের সংখ্যা বৃদ্ধি 2= Awareness campaign সচেতনতা বৃদ্ধি করণ 3= 4=
O3	Credit problem ঋণ সম্পর্কিত সমস্যা		1= Easy access to association/cooperatives সমবায় / সংগঠনের প্রাপ্ত সুবিধা ভোগ 2= 3=
O4	Natural calamities প্রাকৃতিক দুর্যোগ		
O5	Financial problems অর্থনৈতিক সমস্যা		
O6	High input cost উপকরনের উচ্চ মূল্য		
O7	Water pollution (gas, bloom, bottom slug) পানির দূষণ (গ্যাস, ব্লুম, তলার কাদা)		

গোপনীয়

শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে

ওয়ার্ল্ডফিস সেন্টার বাংলাদেশ
এফটিএফ এ্যাকুয়াকালচার প্রজেক্ট

বেইজলাইন জরিপ ২০১২

বাণিজ্যিক চিংড়ি চাষ প্রশ্নপত্র

জরিপ পরিচালনায়

ডাটা ম্যানেজমেন্ট এইড

ইউএসএআইডি'র অর্থায়নে বাংলাদেশ সরকারের সহায়তায় ওয়ার্ল্ডফিস সেন্টার পরিচালিত
এফটিএফ এ্যাকুয়াকালচার প্রজেক্টের সহযোগীতায় পরিচালিত

জরিপে অংশগ্রহনের সম্মতিপত্র

ফিড দ্যা ফিউচার ওয়াল্ড ফিস সেন্টার পরিচালিত ইউএসএআইডি'র অর্থায়নে ও বাংলাদেশ সরকারের সহযোগিতায় একটি প্রকল্প। এটি ৫(পাচ) বছরের জন্য হস্তান্তর যোগ্য প্রকল্প যা কিনা বাংলাদেশের ঢাকা, খুলনা ও বরিশাল বিভাগের দক্ষিনাঞ্চলের ২০টি জেলায় বাস্তবায়ন হচ্ছে। প্রকল্পটি টেকসই ক্ষুধা ও দারিদ্রতা নিরসনে ফিড দ্যা ফিউচার এর উদ্দেশ্য বাস্তবায়নে কাজ করছে।

যে সকল এলাকায় প্রকল্পের কাজ পরিচালিত হবে সে সকল এলাকার উপর ডাটা ম্যানেজমেন্ট এইড এর মাধ্যমে একটি বেইজলাইন জরিপ পরিচালনা করছে।
এই জরিপের মাধ্যমে এফটিএফ মাছ চাষের প্রচলিত কৌশল ভালভাবে অবগত হয়ে বর্তমান ও ভবিষ্যতের কর্ম কৌশল নির্ধারণ করতে সাহায্য করবে।

আপনার নাম ও দেয়া সকল তথ্য সর্ম্পুন গোপনীয় রাখা হবে এবং শুধুমাত্র গবেষনার কাজে ব্যবহৃত হবে।

আপনার অংশ গ্রহন সম্পূর্ণ ইচ্ছাকৃত। উত্তর দেয়া না দেয়া সম্পুর্ন আপনার ইচ্ছা। তবুও আমরা আশা করি আপনি এই জরিপে অংশ গ্রহন করবেন কারণ আপনার মন্তব্য এই জরিপের জন্য খুবই গুরুত্বপূর্ণ ।

এখন আপনি জরিপ সম্মন্ধে যে কোন প্রশ্ন করতে পারেন।

আমি কি এখন আপনাকে প্রশ্ন করা শুরু করতে পারি ?
হ্যাঁ = 1
না = 2

সাক্ষাতকার গ্রহণকারী

Module A: Identification of the Sample

SI NO	Farmer's ID খামারির পরিচিতি	Name	Code
A1	Name of farmer খামারির নাম		
A2	Father's/husband 's name পিতা/স্বামীর নাম		
A3	Name of household head খানা প্রধানের নাম		
A4	District		
A5	Upazila		
A6	Union		
A7	Ward ওয়ার্ড		
A8	Village		
A9	Household number খানা নাম্বার		
A10	Are you a selected farmer of the FtF Aquaculture Project? আপনি কি FtF একুয়াকালচার প্রকল্পের একজন সদস্য? (1=yes ; 2=no) (1= , 2=)		
A11	Date of interview তথ্য সংগ্রহের		
A12	Interviewer সাক্ষাতকার গ্রহণকারীর নাম		
A13	Name of Supervisor সুপারভাইজারের নাম		

Module B: Household Member Profile পরিবারের সদস্যদের তথ্য

Sl no. ক্রমিক নং	Relationship with farmer খামারির সাথে সম্পর্ক	Sex (M / F/T) লিঙ্গ পুঃ/ মঃ/হিঃ	Age বয়স		Years of schooling কোন শ্রেনি পর্যন্ত পড়াশুনা করেছেন/ করছেন	Main occupation প্রধান পেশা	Subsidiary occupation অন্য পেশা
			Year বছর	Month মাস			
1.Farmer খামারি							
2							
3							
4							
5							
6							
7							

Codes: Relationship	Codes: Occupation
1. Husband 2. Wife 3. Son 4. Daughter 5. Father 6. Mother 7. Brother 8. Sister 9. Mother-in-law 10. Father-in law 11. Son-in-law 12. Daughter-in-law 13. Grand son 14. Grand daughter 15. Others	1. House wife গৃহিণী 2. Service চাকুরী 3. Big/medium Business মাঝারী/ বড় ব্যবসা 4. Small business ছোট ব্যবসা 5. Day labor দিন মজুর 6. Rickshaw/Van driver রিক্সা/ ভ্যান চালক 7. Agriculture (Own/share cropper) কৃষি (নিজ/ বর্গা) 8. Handicrafts, Carpenter, Mason and other self employed কারুশিল্পী, কাঠমিস্ত্রি, রাজমিস্ত্রি এবং অন্যান্য স্বকর্ম 9. Professional (Doctor, engineer, advocate) পেশাজীবী (ডাক্তার, ইঞ্জিনিয়ার,আইনজীবী) 10. Student ছাত্র 11. Unemployed বেকার 12. Retired / Minor child অবসর প্রাপ্ত/ ছোট শিশু 13. Old (Age >60 years) বৃদ্ধ(৬০ বছরের উপরে) 14. Fish culture মাছ চাষ 15. Others (specify) অন্যান্য(উল্লেখ করুন)

B1	**How many people of the gher received training on shrimp culture management in last 3 years……no.** গত ৩ বছরে আপনার পরিবারের কতজন সদস্য ঘের ব্যবস্থাপনার উপর প্রশিক্ষণ গ্রহন করেছেন? .....জন	……..No ……..জন
B2	**What is the total no. of training they received** তারা মোট কতটি প্রশিক্ষন গ্রহন করেছেন? ..... টি	…… No ..... টি

B3: Land ownership জমির মালিকানা

SI NO	Land type জমির ধরন	Cultivated last year (2011) গত বছরের চাষ কৃত ভুমি			Leased/mortgage out (decimal) ইজারা দেওয়া জমি (শতাংশ)
		No. of plots কয়টি	Total cultivated (decimal)	Leased/mortgage in (dec) ইজারা নেওয়া জমি	

		প্লট	মোট চাষকৃত(শতাংশ)	(শতাংশ)	
B3.1	All *ghers*/ponds ঘের/পুকুর				
B3.2	Cultivable land (crop/vegetable) চাষকৃত জমি (শস্য, তরকারি)				
B3.3	Homestead area (without pond) বসত ভিটার জমির পরিমান (পুকুর ব্যতীত)				
B3.4	Homestead vegetables/fruits বাড়ির আঙ্গিনায় সব্জি/ফল বাগান				
B3.5	Bamboo/wood garden বাঁশঝাড়/ গাছ				
B3.6	Others (specify) অন্যান্য (উল্লেখ করুন)				

Module C: Annual Household Income খানার বাৎসরিক আয়

Sl.No	Source of income আয়ের উৎস	Gross income (Tk/year) মোট আয় (টাকা/বৎসর)
C.1	Field Crops and vegetables মাঠে উৎপাদিত শষ্য ও সব্জী	
C.2	Livestock and poultry (meat, milk, egg) পশু ও হাঁস মুরগী (মাংস, দুধ,ডিম)	
C.3	Homestead gardening (vegetables) বাড়ীর আঙ্গিনায় সব্জি	
C.4	Homestead forest , trees, flowering বাড়ির আঙ্গিনায় গাছ ও ফুলফলাদি	
C.5	Aquaculture (shrimp and fish produced) মৎস্য চাষ (চিংড়ি ও মাছ উৎপাদন)	
C.6	Other fisheries (Fish business, harvesting from river and canal) অন্যান্য মাছ (মাছ ব্যবসা, নদী ও খাল থেকে আহরন)	
C.7	Water pump rented out পানির মেশিন ভাড়া বাবদ	
C.8	Power tiller and/or plough renting পাওয়ার টিলার এবং লাঙ্গল ভাড়া বাবদ	
C.9	Fishing net renting মাছের জাল ভাড়া বাবদ	
C.10	Labor selling (farmer himself & household members) শ্রম বিক্রয় (কৃষক নিজে বা পরিবারের সদস্যরা)	
C.11	Services (Govt. and private job of farmer himself & household members) চাকুরী(সরকারী/বেসরকারি চাকুরী, কৃষক নিজে বা পরিবারের সদস্যরা)	
C.12	Business (medium and large scale) ব্যাবসা (মধ্যম এবং বড়)	
C.13	Small trading / small grocery shop ছোট ব্যাবসা / ছোট মুদির দোকান	
C.14	Tempo/van/rickshaw /motorcycle renting টেম্পু, ভ্যান/রিক্সা/মোটর সাইকেল ভাড়া বাবদ	
C.15	Remittance (in country and abroad) রেমিটেন্স (দেশের ভিতর/বিদেশ থেকে)	
C.16	Land leased and/or mortgage out জমি ইজারা এবং বন্ধক থেকে	
C.17	Others (Please specify) অন্যান্য (উল্লেখ করুন)	

Module D: Description of Gher and Cultural Practices ঘের ও ঘেরে চিংড়ি চাষের ও পদ্ধতির বিবরণ

Q #	Questions	Response
D1	Total area (water+dike) of the gher (dec) (Commercial shrimp gher 30 to 200 dec) নির্বাচিত পুকুরের পাড় ও পানি সহ মোট জমির পরিমান (শতাংশে) (বাণিজ্যিক পুকুরের মাপ ৩০ থেকে ২০০ শতাংশ)	
D2	Total water surface area of the gher (dec) ঘেরের কত জল আয়তন এলাকায় মাছ চাষ করেছেন? (শতাংশে)	
D3	Total dike area of the gher (dec) ঘেরের পাড়ের মোট আয়তন (শতাংশ)	
D4	Area of rice plot in gher (dec) ঘেরে ধান চাষের জমির আয়তন (শতাংশ)	
D5	Ownership status of the gher (1=single ; 2=joint ; 3=singly leased; 4=jointly leased) পুকুর/ ঘেরের মালিকানা সত্ব ১=একক, ২= যৌথ, ৩= একক ইজারা, ৪= যৌথ ইজারা,	
D6	If multiple ownership, please mention the number of owners যদি একাধিক মালিকানা হয় তবে অনুগ্রহ করে মোট মালিকের সংখ্যা বলুন	
D7	Yearly average water depth of the gher in culture season (feet) চিংড়ি চাষকৃত ঘেরে বছরে গড়ে পানির গভীরতা কতটুকু থাকে (ফিট)?	
D8	No. of months water retains for shrimp culture in the gher ঘেরে চিংড়ি চাষের জন্য কত মাস পানি সংরক্ষণ করা হয়	
D9	How many years have you been involve in shrimp farming? আপনি কত বছর যাবত চিংড়ি খামারের সাথে জড়িত আছেন?	
D10	How many years ago was the gher prepared? আপনি কত বছর আগে এই ঘের তৈরি করেছেন?	
D11	Soil type of the pond (1=Loamy, 2=Clay, 3=Sandy, 4= Sandy loam, 5=Clay loam, 6=Silty, 7=Silty loam, 8=others (specify) পুকুরের মাটির ধরন (1=দোআশ, 2=কাঁদা, 3=বালি, 4=বেলে দোআঁশ, 5=এটেল দোআঁশ, 6=পলি, 7= পলি দোআঁশ, 8=অন্যান্য (উল্লেখ করুন)	

Module E:

E 1: Investment Costs in Gher in 2011

2o11 সালে নির্ধারিত ঘের তৈরিতে বিনিয়োগের পরিমাণ

SI NO	**Items** সামগ্রী	**No.** নাম্বার	**Total value/cost (Tk)** মোট মূল্য	**Economic life (year)** আয়ুস্কাল (বছর)
E1.1	*Gher* lease value ঘের লীজ			
E1.2	Bamboo/wood/rope বাঁশ/ কাঠ /দড়ি			
E1.3	Shallow tubewell/pump শ্যালটিউবওয়েল/পাম্প			
E1.4	Spade/Sickle etc, কোদাল/দা,কাস্তে			
E1.5	Drum/box/fishing trap ড্রাম/ বাক্স/ মাছ ধরার ফাঁত			
E1.6	Boat/tube নৌকা/টিউব			

E1.7	Net (harvesting) মাছ ধরার জাল			
E1.8	Blue net (Hapa and fence) নীল জাল(হাপা ও বেড়ার জন্য)			
E1.9	*Gher* house ঘেরের ঘর			
E1.10	Aerator এরিএটর			
E1.11	Others অন্যান্য (উল্লেখ করুন)			

E 2: Pre-Stocking/Pre-Seedling Activity and Input Costs for Gher Preparation in 2011

2011 সালে পোনা মজুদপূর্ব পুকুর প্রস্তুতি খরচ

SI NO	Input উপকরন	For shrimp চিংড়ি		For rice plot in gher ঘেরে ধান চাষ	
		Amount পরিমাণ	Total cost (Tk) মোট খরচ (টাকা)	Amount পরিমাণ	Total cost (Tk) মোট খরচ (টাকা)
	Organic Fertilizer				
E2.1	Cow dung ***(kg)*** গোবর				
E2.2	Poultry droppings ***(kg)*** হাঁস মুরগির বিসটা				
E2.3	Goat dung ***(kg)*** ছাগলের বিসটা				
E2.4	Compost ***(kg)*** কমপোস্ট সার				
E2.5	Other (specify) ***(kg)*** অন্যান্য (উল্লেখ করুন)				
E2.6	**Total** মোট				
	Inorganic Fertilizer অজৈব সার				
E2.7	Urea ***(kg)*** ইউরিয়া সার				
E2.8	TSP ***(kg)*** টি এস পি সার				
E2.9	MoP ***(kg)*** এম পি সার				
E2.10	**Total** মোট				
	Lime (kg) চুন				
E2.11	Quick lime ***(kg)*** কুইক লাইম				
E2.12	Slaked lime ***(kg)*** স্লাক লাইম				
E2.13	Lime stone ***(kg)*** চুনা পাথর				
E2.14	Gypsum ***(kg)*** জিপসাম				
E2.15	Dolomite ***(kg)*** ডলমাইট				
E2.16	**Total** মোট				
	Others Chemicals Use অন্যান্য রাসায়নিক দ্রব্য ব্যবহার				
E2.17	Rotenone (g) রোটেনন (গ্রাম)				
E2.18	Phostoxin (g) ফসটক্সিন (গ্রাম)				
E2.19	Sumithion (ml) সুমিথিয়ন(গ্রাম)				
E2.20	Thiodin (ml) থায়োডিন (গ্রাম)				
E2.21	Bleaching (kg) ব্লিচিং পাউডার (কেজি)				
E2.22	Dipterax (g) ডিপটারেক্স (গ্রাম)				
E2.23	Others (g/ml) অন্যান্য (গ্রাম/ মিলিলিটার)				
E2.24	**Total মোট**				
	Other Inputs অন্যান্য				
E2.25	Rent cost for ploughing/power tiller পাওয়ার টিলার/লাঙ্গলের ভাড়া বাবদ খরচ				
E2.26	Other Inputs অন্যান্য				
E2.27	Total মোট				

E 3: Stocking/Seedling Costs in 2011 (২০১১ সালে পোনা মজুদের খরচ)

SI NO	Species প্রজাতির নাম	Nos সংখ্যা	Kg কেজি	Total cost (Tk)	Source* উৎস

				মোট মূল্য (টাকা)	
E3.1	Golda PL গলদা				
E3.2	Bagda PL বাগদা				
E3.3	Harina/Chali seed হারিনা/চালির পোনা				
E3.4	Other white fish seed অন্যান্য সাদা মাছের পোনা				
E3.5	Rice seedling in Gher (market value) ধানের চারা				
E3.6	Vegetables/spices seed in dike ঘেরের পাড়ে চাষের জন্য সব্জি/ মশল্লার বীজ				

Source*(1=Private nursery, 2=Govt nursery, 3=patilwala/faria, 4=other famer, 5=hatchery, 6=own raised, 7=shrimp depot, 8=Wild, 9=Others**)** উৎস ঃ ১=ব্যক্তিগত নারসারি,২=সরকারি নার্সারি, ৩=পাতিলওয়ালা/ফরিয়া,৪=অন্য খামারি,৫=হাচারি,৬=নিজের,৭=চিংড়ি ডিপো, ৮=মুক্ত জলাশয় ৯= অন্যান্য (উল্লেখ করুন)

E 4: Post Stocking/Seedling Activities and Costs in 2011 (২০১১ সালে মজুদ পরবর্তী কর্মকাণ্ড ও খরচ)

SI NO	Input উপকরন	For shrimp চিংড়ির জন্য		Rice plot in gher ঘেরে ধানের চাষ		For dike vegetables পুকুর পাড়ের সব্জির জন্য
		Quantity পরিমাণ	Cost (Tk) মুল্য (টাকা)	Quantity পরিমাণ	Cost (Tk) মুল্য (টাকা)	Cost (Tk) মুল্য (টাকা)
	Organic Fertilizer জৈব সার					
E4.1	Cow dung *(kg)* গোবর (কেজি)					
E4.2	Goat dung *(kg)* ছাগলের বিসটা (কেজি)					
E4.3	Compost*(kg)*কমপোস্ট (কেজি)					
E4.4	Other Inputs অন্যান্য উল্লেখ করুণ					
E4.5	Total মোট					
	Inorganic Fertilizer অজৈব সার					
E4.6	Urea *(kg)* ইউরিয়া সার (কেজি)					
E4.7	TSP *(kg)* টি এস পি সার (কেজি)					
E4.8	MoP *(kg)* এম পি সার (কেজি)					
E4.9	DAP (kg) ডি এ পি (কেজি)					
E4.10	Zink (Kg) জিংক (কেজি)					
E4.11	Other Inputs অন্যান্য উল্লেখ করুণ					
E4.12	Total মোট					
	Supplementary feed সম্পূরক খাবার					
E4.13	Rice-bran *(kg)* চালের ভুষি (কেজি)					
E4.14	Wheat-bran *(kg)* গমের ভুষি (কেজি)					
E4.15	Oil-cake *(kg)* সরিষার খইল (কেজি)					

SI NO	Input উপকরন	For shrimp চিংড়ির জন্য		Rice plot in gher ঘেরে ধানের চাষ		For dike vegetables পুকুর পাড়ের সব্জির জন্য
		Quantity পরিমাণ	Cost (Tk) মুল্য (টাকা)	Quantity পরিমাণ	Cost (Tk) মুল্য (টাকা)	Cost (Tk) মুল্য (টাকা)
E4.16	Duckweed *(kg)* ডাক উইদ (কেজি)					
E4.17	Green vegetable *(kg)* সবুজ শাক সব্জি (কেজি)					
E4.18	Fish meal *(kg)* মৎস্য চূর্ণ (কেজি)					
E4.19	Animal blood *(kg)* পশুর রক্ত (কেজি)					
E4.20	Snail meat *(kg)* শামুকের মাংস (কেজি)					
E4.21	Commercial feed *(kg)* বাণিজ্যিক খাদ্য (কেজি)					
E4.22	Other Inputs অন্যান্য					
E4.23	Total মোট					
	Lime (kg) চুন (কেজি)					
E4.24	Quick lime (kg) কুইক লাইম (কেজি)					
E4.25	Lime stone *(kg)* চুনা পাথর (কেজি)					
E4.26	Slaked lime *(kg)* স্লাক লাইম (কেজি)					
E4.27	Gypsum *(kg)* জিপ সাম (কেজি)					
E4.28	Dolomite *(kg)* ডলোমাইট (কেজি)					
E4.29	Total মোট					
E4.30	Water exchange and management cost (Tk) পানি পরিবর্তন এবং ব্যবস্থাপনা খরচ					
E4.31	Harvesting cost (hired net, contract out or dewatering cost) (Tk) আহরণ খরচ(জাল ভাড়া, চুক্তি, পানি নিষ্কাশন)					
E4.32	Selling cost Transport, labor, toll, tax etc বিক্রয়মূল্য (যানবাহন,দিনমজুর,টোল,খাজনা)					

E 5 :Labor Cost for Shrimp Culture and Dike Vegetables Production (2011)

2011 সালে ঘেরে চিংড়ি চাষ এবং ও পাড়ে উৎপাদিত শাক সব্জির জন্য মজুর খরচ

Purpose of use ব্যবহারের	Labor type কর্মীর ধরণ	No. of labor	Total no. of days worked	Average No. of hours worked per	Wage (Tk/day/person) মুজুরি (টাকা/ দিন/ জন)	
					Cash নগদ	Food/kind

উদ্দেশ্য		কর্মীর সংখ্যা	মোট কতদিন কাজ করেছে (সব কর্মীর জন্য)	day প্রতিদিন কত ঘন্টা কাজ করেছে	Daily দিন	Monthly মাস	খাবার
Shrimp and prawn culture চিংড়ি চাষ	Permanent male স্থায়ী পুরুষ কর্মী						
	1						
	2						
	3						
	Permanent female স্থায়ী মহিলা কর্মী						
	1						
	Daily male দিন মজুর পুরুষ						
	Daily female দিন মজুর মহিলা						
	Family male পারিবারিক পুরুষ কর্মী						
	1						
	2						
	3						
	4						
	Family female পারিবারিক মহিলা কর্মী						
	1						
	2						
	3						
	4						
Rice in gher ঘেরে ধান চাষ	Permanent male স্থায়ী পুরুষ কর্মী						
	Permanent female স্থায়ী মহিলা কর্মী						
	Daily male দিন মজুর পুরুষ						
	Daily female দিন মজুর মহিলা						
	Family male পারিবারিক পুরুষ কর্মী						
	Family female পারিবারিক মহিলা কর্মী						
Vegetables in dike পুকুর পাড়ে সব্জি চাষ	Permanent male স্থায়ী পুরুষ কর্মী						
	Permanent female স্থায়ী মহিলা কর্মী						
	Daily male দিন মজুর পুরুষ						
	Daily female দিন মজুর মহিলা						
	Family male						

Purpose of use ব্যবহারের উদ্দেশ্য	Labor type কর্মীর ধরণ	No. of labor কর্মীর সংখ্যা	Total no. of days worked মোট কতদিন কাজ করেছে (সব কর্মীর জন্য)	Average No. of hours worked per day প্রতিদিন কত ঘন্টা কাজ করেছে	Wage (Tk/day/person) মুজুরি (টাকা/ দিন/ জন)		
					Cash নগদ		Food/kind খাবার
					Daily দিন	Monthly মাস	
	পারিবারিক পুরুষ কর্মী						
	Family female পারিবারিক মহিলা কর্মী						

Module F: Production of the gher and Its Uses in 2011

2011 সালে ঘেরে থেকে উৎপাদন এবং তার ব্যবহার

SI NO	Output	Production (Kg) উৎপাদন (কেজি)						Total value of product (Tk) মোট উৎপাদিত মূল্য (টাকা)
		Total মোট	Consumed খাবার	Sold বিক্রি	Gifted উপহার	Dried শুকানো	Technical loss কারিগরি ক্ষতি	
F1	*Bagda* বাগদা							
F2	*Golda* গলদা							
F3	*Harina /chali* shrimp হারিনা/ চালি চিংড়ি							
F4	Crab (*Kakra)* কাঁকড়া							
F5	Rice চাল							
F6	Dike vegetables পুকুর পাড়ে সব্জি							
F7	Dyke fruits পুকুর পাড়ে ফল							
F8	Dyke spices পুকুর পাড়ে মসল্লা							
F9	Other white fish species অন্যান্য সাদা মাছ							
F10	Others (dike trees) অন্যান্য							

Module G:Cost and Returns of gher dyke vegetables production in 2011

2011 সালে ঘেরের পারে শাক সব্জি উৎপাদনে খরচ এবং তা থেকে আয়

SI NO	Expenditure Items	Quantity পরিমাণ	Value (Tk) মূল্য (টাকা)
G1	Area of land under vegetables (dec) শাক সব্জি উৎপাদনে জমির পরিমাণ (শতাংশ)		
G2	Plaughing চাশাবাদে		
G3	Vegetable seed/sapling শাক সব্জির চারা/ বীজ		
G4	Total no. of days worked by family male (day/year) পারিবারের পুরুষরা মোট কতদিন কাজ করেছে (দিন/বছর)		
G5	Average hours worked by family male (hours/day) গড়ে পারিবারের পুরুষরা কত ঘন্টা কাজ করেছে (ঘন্টা/দিন)		
G6	Total no. of days worked by family female (day/year) পারিবারের মহিলারা মোট কতদিন কাজ করেছে (দিন/বছর)		
G7	Average hours worked by family female (hours/day) গড়ে পারিবারের মহিলারা কতঘন্টা কাজ করেছে (ঘন্টা/দিন)		
G8	Total days worked by hired male (day/year) গড়ে পুরুষ মজুর মোট কত দিন কাজ করেছে (দিন/বছর)		
G9	Total days worked by hired female (day/year) গড়ে মহিলা দিন মজুর মোট কত দিন কাজ করেছে (দিন/বছর)		
G10	Urea (kg) ইউরিয়া সার (কেজি)		
G11	TSP (kg) টি এস পি (কেজি)		
G12	DAP (kg) ড্যাপ (কেজি)		
G12	Ash (Kg) ছাই (কেজি)		
G13	Cowdung (kg) গোবর (কেজি)		
G14	Pesticide কীটনাশক		
G15	Other cost (if any) অন্যান্য খরজ (যদি থাকে)		
	Income items:		
G16	Total production (Kg) মোট উৎপাদন (কেজি)		
G17	Total consumed (Kg) মোট খাবার (কেজি)		
G18	Total sold (Kg) মোট বিক্রি (কেজি)		
G19	Total gifted and others (Kg) মোট উপহার (কেজি)		

Module H: Information on Fish Consumption and Sources পরিবারের মাছের উৎস ও খাদ্য গ্রহণের তথ্য

H 1:. List the Fish Species Consumed in the Last 3 Days and Amount of Each Fish Consumed

গত **3** দিনে আপনার পরিবারে কি কি মাছ কি পরিমান খেয়েছে?

Species consumed প্রজাতির নাম									Total মোট
Quantity consumed (Kg) পরিমাণ (কেজি)									

H 2: List the Source of the Fish Your HH Consumed in the Last 3 Days and Quantity From Each Source

গত তিন দিনে আপনার খানার সদস্যরা যে সকল মাছ খেয়েছেন তার উৎস ও পরিমাণ সম্পর্কে বলুন

Fish source মাছের উৎস	Own Ponds নিজস্ব ঘের থেকে	Purchased in market বাজার থেকে ক্রয় করা	Self caught (from own rice field) নিজস্ব ধান খেত থেকে ধরা	Self-caught (from open water body) মুক্ত জলাশয় থেকে ধরা	Gift from friend or relative বন্ধু বান্ধব অথবা আত্মীয় স্বজন থেকে পাওয়া	Other (specify) অন্যান্য (উল্লেখ করুন)	Total মোট
Quantity consumed (Kg)							

Module I: Knowledge Attitude and Practice of Improved Fish Cultivation Technology in 2011

২০১১ সালে চিংড়ি চাষে উন্নত ব্যবস্থাপনা প্রযুক্তি বিষয়ক ও প্রয়োগ বিষয়ক তথ্যাদি

Q #	Improved shrimp cultivation management technology উন্নত প্রযুক্তিতে চিংড়ি চাষে ব্যবস্থাপনা	Standard practice সুপারিশকৃত মাত্রা	Knowledge (1=know 2=don't know) জ্ঞান (১=জানি, ২=জানিনা)	Practice ব্যবহারের মাত্রা	If know, reasons for non-practice[3] যদি জানে তবে অনুশীলন না করার কারন	No. of other farms used this technologies learnt from you আপনার কাছ থেকে শিখে আর কতগুলো ফার্ম এই প্রযুক্তি ব্যবহার করেন
I1	Testing natural food adequacy in water পানির রং পরীক্ষা করে খাবারের পর্যাপ্ততা নির্ণয়	Required				
I2	Maintaining stock density মজুদের ঘনত্ব বজায় রাখা	100-200 PL per decimal				
I3	Species selection সঠিক প্রজাতি নির্বাচন করা	required				
I4	Weed control আগাছা দমন দমন	Required				
I5	Liming চুন দেওয়া	0.5 to 1.5 kg per dec				
I6	Providing supplementary feed সম্পুরক খাদ্য সরবরাহ	Required based on sampling				
I7	Employing fish disease management	Required				

Q #	Improved shrimp cultivation management technology উন্নত প্রযুক্তিতে চিংড়ি চাষে ব্যবস্থাপনা	Standard practice সুপারিশকৃত মাত্রা	Knowledge (1=know 2=don't know) জ্ঞান (১=জানি, ২=জানিনা)	Practice ব্যবহারের মাত্রা	If know, reasons for non-practice[3] যদি জানে তবে অনুশীলন না করার কারন	No. of other farms used this technologies learnt from you আপনার কাছ থেকে শিখে আর কতগুলো ফার্ম এই প্রযুক্তি ব্যবহার করেন
	মাছের রোগ ব্যবস্থাপনা					
I8	Health monitoring রোগ পর্যবেক্ষণ	Required				
I9	Growth monitoring বৃদ্ধি পর্যবেক্ষণ	Required				
I10	Post harvest handling আহরনত্তোর পরিচর্যা	Required				
I11	Use quality seeds উন্নত পোনা ব্যবহার	required				
I12	Followed feeding application procedures (feeding time, frequency feeding etc) খাওয়ানোর নিয়মকানুন মেনেছে (খাওয়ানোর সময় এবং বার)	Required				
I13	Dike vegetables practice পুকুরপাড়ে সব্জি চাষ	Required				

[1]Code : 1=inputs not easily available; 2=lack of capital; 3=not serious about it; 4=lack of enough technical knowledge; 5= lack of consensus among multiple owners; 6=others (specify)

Module J: Problems and Constraints সমস্যা ও প্রতিবন্ধকতা (শুধু উত্তরদাতার জন্য প্রযোজ্য)

SI NO	Problems/ Constraints সমস্যা ও প্রতিবন্ধকতা	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম,2=মধ্যম, 3=উচ্চ, 4=কিছুই না)	Measures taken to overcome problem সমস্যা উত্তরনে কি ব্যবস্থা নেওয়া হয়েছে
J1	Short of quality seed মান সম্মত প্রজনন ক্ষম মাছের অপর্যাপ্ততা		
J2	Social problem (theft, poisoning, multiple ownership) সামাজিক সমস্যা (চোর, বিষ প্রয়োগ, যৌথ মালিকানা)		1= Increased security guard 1= পাহারাদের সংখ্যা বৃদ্ধি 2= Awareness campaign 2= সচেতনতা বৃদ্ধি করণ 3= 4=
J3	Credit problem ঋণ সম্পর্কিত সমস্যা		1= Easy access to association/cooperatives 1= সমবায় / সংগঠনের প্রাপ্ত সুবিধা ভোগ 2= 3=
J4	White spot syndrome virus সাদা দাগ ভাইরাস (মাছের রোগ)		1=Improved culture environment 1=চাষের পরিবেশ উন্নত করা 2=Improved culture management practices 2=চাষ ব্যবস্থাপনা উন্নত করা 3=Use of disease free quality seed 3=রোগমুক্ত উন্নত মানের পোনা ব্যবহার 4=Increased consciousness to avoid contamination 4=সংক্রামন পরিহারে সচেতন তা বৃদ্ধি করা 5= 6=
J5	Natural calamities প্রাকৃতিক দুর্যোগ		1= 2= 3=
J6	Financial problems অর্থনৈতিক সমস্যা		1= 2= 3= 4=
J7	High input cost খাদ্যের উচ্চ মূল্য		1= 2=

SI NO	Problems/ Constraints সমস্যা ও প্রতিবন্ধকতা	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম,2=মধ্যম, 3=উচ্চ, 4=কিছুই না)	Measures taken to overcome problem সমস্যা উত্তরনে কি ব্যবস্থা নেওয়া হয়েছে
			3= 4=
J8	Water pollution (gas, bloom, bottom slug) পানির দূষণ (গ্যাস, ব্লুম, তলার কাদা)		1=Adjusted feeding 1=খাবার নিয়ন্তন 2= water exchange practiced 2= পানি বদল অনুশীলন 3=Avoid pollution sources 3=দুষন উৎস পরিত্যাগ 4=
J9	Technical loss (soft shell) টেকনিক্যাল লস		1=Ensured nutrient presence 1= পুষ্টি নিশ্চিতকরণ 2=Application of lime 2= চুন প্রয়োগ 3=Proper water exchange practiced 3= পানি বদল অনুশীলন 4=

গোপনীয়

শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে

ওয়ার্ল্ডফিস সেন্টার বাংলাদেশ
এফটিএফ এ্যাকুয়াকালচার প্রজেক্ট

বেইজলাইন জরিপ ২০১২

বাণিজ্যিক মৎস্য চাষ প্রশ্নপত্র

জরিপ পরিচালনায়

ডাটা ম্যানেজমেন্ট এইড

ইউএসএআইডি'র অর্থায়নে বাংলাদেশ সরকারের সহায়তায় ওয়ার্ল্ডফিস সেন্টার পরিচালিত
এফটিএফ এ্যাকুয়াকালচার প্রজেক্টের সহযোগীতায় পরিচালিত

জরিপে অংশগ্রহনের সম্মতিপত্র

ফিড দ্যা ফিউচার ওয়াল্ড ফিস সেন্টার পরিচালিত ইউএসএআইডি'র অর্থায়নে ও বাংলাদেশ সরকারের সহযোগিতায় একটি প্রকল্প। এটি ৫(পাচ) বছরের জন্য হস্তান্তর যোগ্য প্রকল্প যা কিনা বাংলাদেশের ঢাকা, খুলনা ও বরিশাল বিভাগের দক্ষিনাঞ্চলের ২০টি জেলায় বাস্তবায়ন হচ্ছে। প্রকল্পটি টেকসই ক্ষুধা ও দারিদ্রতা নিরসনে ফিড দ্যা ফিউচার এর উদ্দেশ্য বাস্তবায়নে কাজ করছে।

যে সকল এলাকায় প্রকল্পের কাজ পরিচালিত হবে সে সকল এলাকার উপর ডাটা ম্যানেজমেন্ট এইড এর মাধ্যমে একটি বেইজলাইন জরিপ পরিচালনা করছে।
এই জরিপের মাধ্যমে এফটিএফ মাছ চাষের প্রচলিত কৌশল ভালভাবে অবগত হয়ে বর্তমান ও ভবিষ্যতের কর্ম কৌশল নির্ধারণ করতে সাহায্য করবে।

আপনার নাম ও দেয়া সকল তথ্য সর্ম্পুন গোপনীয় রাখা হবে এবং শুধুমাত্র গবেষনার কাজে ব্যবহৃত হবে।

আপনার অংশ গ্রহন সম্পূর্ণ ইচ্ছাকৃত। উত্তর দেয়া না দেয়া সম্পুর্ন আপনার ইচ্ছা। তবুও আমরা আশা করি আপনি এই জরিপে অংশ গ্রহন করবেন কারণ আপনার মন্তব্য এই জরিপের জন্য খুবই গুরুত্বপূর্ণ ।

এখন আপনি জরিপ সম্মন্ধে যে কোন প্রশ্ন করতে পারেন।

আমি কি এখন আপনাকে প্রশ্ন করা শুরু করতে পারি ?
হ্যাঁ = 1
না = 2

সাক্ষাতকার গ্রহণকারী

Module A: Identification of the Sample

SI NO	Farmer's ID খামারির পরিচিতি	Name	Code
A1	Name of farmer খামারির নাম		
A2	Father's/husband 's name পিতা/স্বামীর নাম		
A3	Name of household head খানা প্রধানের নাম		
A4	District		
A5	Upazila		
A6	Union		
A7	Ward ওয়ার্ড		
A8	Village		
A9	Household number খানা নাম্বার		
A10	Are you a selected farmer of the FtF Aquaculture Project? আপনি কি FtF একুয়াকালচার প্রকল্পের একজন সদস্য? (1=yes ; 2=no) (1= , 2=)		
A11	Date of interview তথ্য সংগ্রহের		
A12	Interviewer সাক্ষাতকার গ্রহণকারীর নাম		
A13	Name of Supervisor সুপারভাইজারের নাম		

Module B: Household Member Profile পরিবারের সদস্যদের তথ্য

Sl no. ক্রমিক নং	Relationship with farmer খামারির সাথে সম্পর্ক	Sex (M / F/T) লিঙ্গ পুঃ/ মঃ/হিঃ	Age বয়স		Years of schooling কোন শ্রেনি পর্যন্ত পড়াশুনা করেছেন/ করছেন	Main occupation প্রধান পেশা	Subsidiary occupation অন্য পেশা
			Year বছর	Month মাস			
2. Farmer খামারি							
2							
3							
4							
5							
6							
7							

Codes: Relationship		Codes: Occupation
16. Husband 17. Wife 18. Son 19. Daughter 20. Father 21. Mother 22. Brother 23. Sister 24. Mother-in-law 25. Father-in law 26. Son-in-law 27. Daughter-in-law 28. Grand son 29. Grand daughter 30. Others	১= স্বামী ২= স্ত্রী ৩= পুত্র ৪= কন্যা ৫= বাবা ৬=মা ৭= ভাই ৮= বোন ৯= শাশুড়ি ১০= শ্বশুর ১১= জামাতা ১২= পুত্রবধূ ১৩= নাতি ১৪= নাতনি ১৫= অন্যান্য	16. House wife গৃহিণী 17. Service চাকুরী 18. Big/medium Business মাঝারী/ বড় ব্যবসা 19. Small business ছোট ব্যবসা 20. Day labor দিন মজুর 21. Rickshaw/Van driver রিক্সা/ ভ্যান চালক 22. Agriculture (Own/share cropper) কৃষি (নিজ/ বর্গা) 23. Handicrafts, Carpenter, Mason and other self employed কারুশিল্পী, কাঠমিস্ত্রি, রাজমিস্ত্রি এবং অন্যান্য স্বকর্ম 24. Professional (Doctor, engineer, advocate) পেশাজীবী (ডাক্তার, ইঞ্জিনিয়ার,আইনজীবী) 25. Student ছাত্র 26. Unemployed বেকার 27. Retired / Minor child অবসর প্রাপ্ত/ ছোট শিশু 28. Old (Age >60 years) বৃদ্ধ(৬০ বছরের উপরে) 29. Others (specify) অন্যান্য(উল্লেখ করুন) 30. Fish culture

B1	Did any of your farm receive any training on fish culture during the last three years? (1=yes ; 2=no) আপনার খামারের কোন সদস্য গত ৩ বছরে মাছ চাষের উপর কোন প্রশিক্ষণ পেয়েছেন কি? (1=হ্যাঁ , 2=না)	
B2	If yes, What is the total number of training received within that period যদি হ্যাঁ হয় তবে গত ৩ বছরের মধ্যে কতটি প্রশিক্ষণ নিয়েছেন?	…… No ..... টি

Land ownership জমির মালিকানা

Sl No	Land type জমির ধরন	Cultivated last year (2011) গত বছরের চাষ কৃত জমি			Leased/mortgage out (decimal) ইজারা দেওয়া জমি (শতাংশ)
		No. of plots কয়টি প্লট	Total cultivated (decimal) মোট চাষকৃত (শতাংশ)	Leased/mortgage in (dec) ইজারা নেওয়া জমি (শতাংশ)	
B3	All *ghers*/ponds ঘের/পুকুর				
B4	Cultivable land (crop/vegetable) চাষকৃত জমি (শস্য, তরকারি)				
B5	Homestead area (without pond) বসত ভিটার জমির পরিমান				
B6	Homestead vegetables/fruits বাড়ির আঙ্গিনায় সব্জি/ফল বাগান				
B7	Bamboo/wood garden বাঁশঝাড়/ গাছ				
B8	Others (specify) অন্যান্য (উল্লেখ করুন)				

Module C: **Annual Household Income** খানার বাৎসরিক আয়

Sl.No	**Source of income** আয়ের উৎস	**Gross income (Tk/year)** মোট আয় (টাকা/বৎসর)
C1	Field Crops and vegetables মাঠে উৎপাদিত শষ্য ও সব্জী	
C2	Livestock and poultry (meat, milk, egg) পশু ও হাঁস মুরগী (মাংস, দুধ,ডিম)	
C3	Homestead gardening (vegetables) বাড়ীর আঙ্গিনায় সব্জি	
C4	Homestead forest , trees, flowering বাড়ির আঙ্গিনায় গাছ ও ফুলফলাদি	
C5	Aquaculture (shrimp and fish produced) মৎস্য চাষ (চিংড়ি ও মাছ উৎপাদন)	
C6	Other fisheries(Fish business,harvesting from river and canal) অন্যান্য মাছ (মাছ ব্যবসা, নদী ও খাল থেকে আহরন)	
C7	Water pump rented out পানির মেশিন ভাড়া বাবদ	
C8	Power tiller and/or plough renting পাওয়ার টিলার এবং লাঙ্গল ভাড়া বাবদ	
C9	Fishing net renting মাছের জাল ভাড়া বাবদ	
C10	Labor selling (farmer himself & household members) শ্রম বিক্রয় (কৃষক নিজে বা পরিবারের সদস্যরা)	
C11	Services (Govt. and private job of farmer himself & household members) চাকুরী(সরকারী/বেসরকারি চাকুরী, কৃষক নিজে বা পরিবারের সদস্যরা)	
C12	Business (medium and large scale) ব্যাবসা (মধ্যম এবং বড়)	
C13	Small trading / small grocery shop ছোট ব্যাবসা / ছোট মুদির দোকান	
C14	Tempo/van/rickshaw /motorcycle renting টেম্পু, ভ্যান/রিক্সা/মোটর সাইকেল ভাড়া বাবদ	
C15	Remittance (in country and abroad) রেমিটেঞ্চ (দেশের ভিতর/বিদেশ থেকে)	
C16	Land leased and/or mortgage out জমি ইজারা এবং বন্ধক থেকে	
C17	Others (Please specify) অন্যান্য (উল্লেখ করুন)	

Module D: Description of Ponds and Cultural Practices

মাছ চাষের পুকুরের ও পদ্ধতির বিবরণ

Q #	Questions প্রশ্ন	Response উত্তর
D1	Total project/specific pond area (water+dike) (dec) (HH pond size 5 to 20 dec) প্রজেক্টের বা নিদিষ্ট পুকুরের আয়তন (পানি+পাড়) (শতাংশ)	
D2	Water surface area of project/specific pond (dec) প্রজেক্টের বা নিদিষ্ট পুকুরের পানির আয়তন (শতাংশ)	
D3	Dike area of project/specific pond(decimal) প্রজেক্টের বা নিদিষ্ট পুকুরের পাড়ের আয়তন (শতাংশ)	
D4	Water surface area of the pond shaded by trees (%) পুকুরের পানির কত অংশ গাছের ছায়া দ্বারা আবৃত (%)	
D5	Ownership status of the pond (1=single ; 2=joint ; 3=singly leased; 4=jointly leased) পুকুরের মালিকানা: 1=নিজে ; 2=যৌথ ; 3=একক ইজারা; 4=যৌথ ইজারা	
D6	If multiple ownership, please mention the number of owners যৌথ মালিকানা হলে কতজন?	
D7	Average water depth of the pond in culture season(feet) চাষ মৌসুমে গড়ে পুকুরের পানির গভীরতা কত থাকে (ফিট)	
D8	No. of months water retains for fish culture in the pond? মাছ চাষের জন্য পুকুরে কতমাস পানি থাকে?	
D9	How many years have you been involved in fish farming? কত বছর যাবৎ মাছচাষ করছেন?	
D10	How many years ago was the pond dag,/prepared? পুকুরটি কত বৎসর আগে খনন করা হয়েছিল?	
D11	Soil type of the pond (1=Loamy, 2=Clay, 3=Sandy, 4= Sandy loam, 5=Clay loam, 6=Silty, 7=Silty loam, 8=others (specify) পুকুরের মাটির ধরন (1=দোআশ, 2=কাঁদা, 3=বালি, 4=বেলে দোআঁশ, 5=এটেল দোআঁশ, 6=পলি, 7= পলি দোআঁশ, 8=অন্যান্য (উল্লেখ করুন)	

Module E: Fixed Cost in the Pond

2011 সালে নির্ধারিত পুকুরে মূলধন বিনিয়োগ খরচ

	Items ধরন	**No.** নং	**Total value/cost (Tk)** মোট মুল্য/খরচ (টাকা)	**Economic life (year)** কার্যকাল (বছর)	**% used for the pond/*gher*** পুকুরের বা ঘেরের কাজে কত অংশ ব্যবহার হয় (%)
		A	B	C	D
E1	*Pond* lease value পুকুরের ইজারা মুল্য				
E2	Bamboo/wood/rope বাঁশ/কাঠ/দড়ি				
E3	Shallow tubewell/pump শ্যালো টিউবওয়েল/পাম্প				
E4	Spade/sickle etc, কোদাল/কাঁচি/দা ইত্যাদি				
E5	Drum/box/fishing trap ড্রাম/বক্স/মাছ ধরার ফাঁদ				
E6	Boat/tube নৌকা/টিউব				
E7	Net (harvesting) জাল (মাছ ধরার জন্য)				
E8	Blue net (Hapa and fence) ব্লুনেট (হাপা এবং বেড়া)				
E9	Others অন্যান্য (উল্লেখ করুন)				

Module F: Pre-Stocking/Pre-Seedling Pond Preparation and Input Costs in 2011
2011 সালে পোনা মজুদপূর্ব পুকুর প্রস্তুতকরন ও উপকরণ খরচ

Q	Input ব্যবহার সামগ্রী	For fish or prawn মাছ অথবা গলদা চিংড়ি	
		Quantity পরিমান	Total cost (Tk) মোট মুল্য(টাকা)
		A	**B**
	Organic Fertilizer জৈব সার		
F1	Cow dung ***(kg)*** গোবর (কেজি)		
F2	Goat dung ***(kg)*** ছাগলের বিষ্ঠা (কেজি)		
F3	Compost ***(kg)*** কমপোস্ট (কেজি)		
F4	Other (specify) ***(kg)*** অন্যান্য(কেজি)		
F5	Total ***Organic Fertilizer*** মোট		
	Inorganic Fertilizer অজৈব সার		
F6	Urea ***(kg)*** ইউরিয়া (কেজি)		
F7	TSP ***(kg)*** টি,এস,পি (কেজি)		
F8	MoP ***(kg)*** এমপি (কেজি)		
F9	Total মোট		
	Lime (kg) চুন (কেজি)		
F10	Quick lime ***(kg)*** কুইক লাইম (কেজি)		
F11	Slaked lime ***(kg)*** স্লাকড লাইম (কেজি)		
F12	Lime stone ***(kg)*** পাথর চুন (কেজি)		
F13	Gypsum ***(kg)*** জিপসাম (কেজি)		
F14	Dolomite ***(kg)*** ডলোমাইট (কেজি)		
F15	Total মোট		
	Others Chemicals Use অন্যান্য রাসায়নিক দ্রব্য ব্যবহার		
F16	Rotenone (g) রোটেনন (গ্রাম)		
F17	Phostoxin (g) ফসটক্সিন (গ্রাম)		
F18	Sumithion (ml) সুমিথিয়ন(গ্রাম)		
F19	Thiodin (ml) থায়োডিন (গ্রাম)		
F20	Bleaching (kg) ব্লিচিং পাউডার (কেজি)		
F21	Dipterax (g) ডিপটারেক্স (গ্রাম)		
F22	Others (g/ml) অন্যান্য (গ্রাম/ মিলিলিটার)		
F23	Total মোট		
	Other Inputs অন্যান্য সামগ্রী		
F24	Rent cost for plaughing/power tiller পাওয়ার টিলার/লাঙ্গল ভাড়া		
F25	Total মোট		

Module G:Stocking/seedling Costs in 2011 (2011 সালে পোনা মজুদ খরচ)

SINo	**Species** প্রজাতী	**Nos**	**Kg**	**Total cost**	**Source***

		সংখ্যা	কেজি	**(Tk)** মোট মূল্য (টাকা)	উৎস
G1	Rui রুই				
G2	Catla কাতলা				
G3	Mrigel মৃগেল				
G4	Silver carp সিলভার কার্প				
G5	Grass carp গ্রাস কার্প				
G6	Common carp কমন কার্প				
G7	Mirror carp মিরর কার্প				
G8	Thai Shorputi রাজপুটি				
G9	Thai Pangas থাই পাঙ্গাশ				
G10	GIFT গিফট				
G11	Tilapia/Nilotica তেলাপিয়া				
G12	Mola/Dhela/Tengra মলা/ডেলা/টেংরা				
G13	Other white fish seed অন্যান্য সাদা মাছের পোনা				
G14	Golda PL গলদার পোনা				
G15	Vegetables/spices seed in dyke পুকুর পাড়ে সব্জি/মসল্লা বীজ				

Source*(1=Private nursery, 2=Govt nursery, 3=patilwala/faria, 4=other famer, 5=hatchery, 6=own raised, 7= depot, 8=Wild, 9=Others)

উৎসঃ 1=ব্যক্তিমালিকানাধীন নার্সারি, 2=সরকারি নার্সারি, 3=পাতিলওয়ালা/ফরিয়া, 4=অন্যথামারি, 5=হ্যাচারী, 6=নিজের, 7=ডিপো, 8=মুক্ত জলাশয় 9= অন্যান্য (উল্লেখ করুন)

Module H: Dike Cultivation and Post Stocking Management Costs in 2011

(2011 সালে পুকুরপাড়ে চাষ ও মজুদ পরবর্তী ব্যবস্থাপনা ব্যয়)

SI No	**Input** উপকরণ সমূহ	For fish or prawn মাছ অথবা গলদা চিংড়ি চাষের জন্য		For dike vegetables পুকুর পাড়ে সব্জি চাষের জন্য
		Quantity পরিমাণ	Cost (Tk) মূল্য (টাকা)	Cost (Tk) মূল্য (টাকা)
	Organic Fertiliser: জৈব সার			
H1	Cow dung ***(kg)*** গোবর			
H2	Poultry Droppings ***(kg)*** হাঁস-মুরগীর বিষ্ঠা			
H3	Goat dung ***(kg)*** ছাগলের বিষ্ঠা			
H4	Compost ***(kg)*** কমপোস্ট			
H5	Others (g/ml) অন্যান্য (গ্রাম/ মিলিলিটার)			
H6	Total মোট			

SI No	Input উপকরণ সমূহ	For fish or prawn মাছ অথবা গলদা চিংড়ি চাষের জন্য		For dike vegetables পুকুর পাড়ে সব্জি চাষের জন্য
		Quantity পরিমাণ	Cost (Tk) মূল্য (টাকা)	Cost (Tk) মূল্য (টাকা)
	Inorganic Fertiliser: জৈব সার			
H7	Urea ***(kg)*** ইউরিয়া (কেজি)			
H8	TSP ***(kg)*** টি,এস,পি (কেজি)			
H9	MoP ***(kg)*** এম পি (কেজি)			
H10	DAP (kg) ডি এ পি (কেজি)			
H11	Zink (Kg) জিঙ্ক (কেজি)			
H12	Others অন্যান্য উল্লেখ করুণ			
H13	Total মোট			
	Supplementary feed:সম্পুরক খাবার			
H14	Rice-bran ***(kg)*** চালের ভুষি			
H15	Wheat-bran ***(kg)*** গমের ভুষি (কেজি)			
H16	Oil-cake ***(kg)*** খৈল (কেজি)			
H17	Duckweed ***(kg)*** *ডাক উইড* (কেজি)			
H18	Green vegetable ***(kg)*** সবুজ শাক সব্জি			
H19	Fish meal ***(kg)*** মৎস্য চূর্ণ			
H20	Animal blood ***(kg)*** পশুর রক্ত			
H21	Snail meat ***(kg)*** শামুকের মাংস			
H22	Commercial feed ***(kg)*** বাণিজ্যিক খাবার			
H23	Others অন্যান্য উল্লেখ করুণ			
H24	Total মোট			
	Lime (kg) চুন			
H25	Quick lime (kg) কুইক লাইম			
H26	Lime stone ***(kg)*** পাথর চুন			
H27	Slaked lime ***(kg)*** স্লাক লাইম			
H28	Gypsum ***(kg)*** জিপসাম			
H29	Dolomite ***(kg)*** ডলমাইট (কেজি)			
H30	Others অন্যান্য			
H31	Total মোট			
H32	Water exchange and management cost (Tk) পানি পরিবর্তন ও ব্যাবস্থাপনা খরচ (টাকা)			
H33	Harvesting cost (hired net, contract out or dewatering cost) (Tk) মাছ আহরনের খরচ (জাল ভাড়া, চুক্তি, পানি সেচ বাবদ, শ্রমিক খরচ)			
H34	Selling cost (Transport, labor, toll, tax etc) বিক্রয় ব্যয় (যানবাহান,মজুদ,টোল,ট্যাক্স)			

Module I: Labor Cost for Fish Culture and Dyke Vegetables Production (2011)

২০১১ সালে মৎস্য চাষ ও পুকুর পাড়ে কৃষি কাজে ব্যবহৃত শ্রমিক বিবরণ ও ব্যয়

Purpose of use ব্যবহারের উদ্দেশ্য	Labor type কর্মীর ধরণ	No. of labor কর্মীর সংখ্যা	Total no. of days worked মোট কতদিন কাজ করেছে (সব কর্মীর জন্য)	Average No. of hours worked per day প্রতিদিন কত ঘন্টা কাজ করেছে	Wage (Tk/day/person) মুজুরি (টাকা/ দিন/ জন)		
					Cash নগদ		Food/kind খাবার
					Daily দিন	Monthly মাস	
Fish culture মাছ চাষে	Permanent male স্থায়ী পুরুষ কর্মী						
	1						
	2						
	3						
	Permanent female স্থায়ী মহিলা কর্মী						
	1						
	Daily male দিন মজুর পুরুষ						
	Daily female দিন মজুর মহিলা						
	Family male পারিবারিক পুরুষ কর্মী						
	1						
	2						
	3						
	4						
	Family female পারিবারিক মহিলা কর্মী						
	1						
	2						

	3						
	4						
Vegetables in dike পুকুর পাড়ে সব্জি চাষ	Permanent male স্থায়ী পুরুষ কর্মী						
	Permanent female স্থায়ী মহিলা কর্মী						
	Daily male দিন মজুর পুরুষ						
	Daily female দিন মজুর মহিলা						
	Family male পারিবারিক পুরুষ কর্মী						
	Family female পারিবারিক মহিলা কর্মী						

Module J: Production from the Commercial Fish Pond and Its Disposal in 2011

2011 সালে পুকুর থেকে প্রাপ্ত উৎপাদন ও ব্যবহার

SI No	Output উৎপাদন	Production (Kg) উৎপাদন (কেজি)						Total value of product (Tk) মোট মূল্য (টাকা)
		Total মোট	Consumed খাবার	Sold বিক্রি	Gifted উপহার	Dried শুকানো	Technical lost টেকনিক্যাল লস	
J1	Golda গলদা							
J2	Rui রুই							
J3	Catla কাতলা							
J4	Mrigal মৃগেল							
J5	Silver carp সিলভার কার্প							
J6	Grass carp গ্রাস কার্প							
J7	Common carp কমন কার্প							
J8	Mirror carp মিরর কার্প							
J9	Thai Shorputi থাই সরপুঁটি							
J10	Thai Pangus থাই পাঙ্গাশ							
J11	GIFT গিফট							
J12	Tilapia/Nilotica তেলাপিয়া/নাইলোটিকা							
J13	Mola/Dhela/Tengra মলা/ডেলা/টেংরা							
J14	Dike vegetables পুকুর পারের শাক সব্জি							
J15	Dike fruits পাড়ের ফল							
J16	Dike spices পাড়ের মশল্লা							
J17	Other white fish species অন্যান্য সাদা মাছের প্রজাতি							
J18	Dike trees and others অন্যান্য (পাড়ের গাছ)							

Module K: Cost and Returns of DikeVegetables Production in 2011

2011 সালে সব্জি উৎপাদন ব্যয় ও আয়

SI No	Cost items ব্যয়ের খাত	Quantity পরিমাণ	Total Value (Tk) মোট
K1	Area of land under vegetables (dec) সব্জী চাষকৃত জমির পরিমান (শতক)		
K2	Plaughing লাঙ্গল দিয়ে চাষ		
K3	Vegetable seed/sapling সব্জিবীজ / চারা		
K4	Total no. of days worked by family male (day/year) পারিবারের পুরুষরা মোট কতদিন কাজ করেছে (দিন/বছর)		
K5	Average hours worked by family male (hours/day) গড়ে পারিবারের পুরুষরা কত ঘন্টা কাজ করেছে (ঘন্টা/দিন)		
K6	Total no. of days worked by family female (day/year) পারিবারের মহিলারা মোট কতদিন কাজ করেছে (দিন/বছর)		
K7	Average hours worked by family female (hours/day) গড়ে পারিবারের মহিলারা কতঘন্টা কাজ করেছে (ঘন্টা/দিন)		
K8	Total days worked by hired male (day/year) গড়ে পুরুষ মজুর মোট কত দিন কাজ করেছে (দিন/বছর)		
K9	Total days worked by hired female (day/year) গড়ে মহিলা দিন মজুর মোট কত দিন কাজ করেছে (দিন/বছর)		
K10	Urea ইউরিয়া (সাদা সার) (কেজি)		
K11	TSP টি এস পি (ফসফেট সার) (কেজি)		
K12	DAP (kg) ডি এ পি (কেজি)		
K13	Ash (Kg) ছাই (কেজি)		
K14	Cow dung (kg) গোবর (কেজি)		
K15	Pesticide বালাইনাশক		
K16	Other cost (if any) অন্যান্য (যদি থাকে)		
	Output উৎপাদন		
K17	Total production (Kg) মোট উৎপাদন (কেজি)		
K18	Total consumed (Kg) মোট খাওয়া (কেজি)		
K19	Total sold (Kg) মোট বিক্রি (কেজি)		
K20	Total gifted and others (Kg) মোট উপহার হিসাবে দেয়া ও অন্যান্য (কেজি)		

Module L: Information on Consumption and Sources of fish use in the Household

L1: List the Fish Species Consumed in the Last 3 Days and Amount of Each Fish Consumed
গত ৩ দিনে আপনার পরিবারের কি কি মাছ কত পরিমানে খেয়েছেন?

Species consumed প্রজাতির নাম									Total (kg)
Quantity consumed (Kg) খাওয়ার পরিমান (কেজি)									

L2: List the Source of the Fish Your HH Consumed in the Last 3 Days and Quantity From Each Source
গত ৩ দিনে পরিবারের সদস্যরা যে সকল মাছ খেয়েছেন এর উৎস ভিত্তিক পরিমান সম্পর্কে তথ্যাদি?

Fish source মাছের উৎস	Own Ponds নিজের পুকুর	Purchased from market বাজার থেকে ক্রয়কৃত	Self caught (from own rice field) নিজের ধান ক্ষেত থেকে সংগৃহীত	Self-caught (from open water body) মুক্ত জলাশয় থেকে নিজের দ্বারা আহরিত	Gift from friend or relative বন্ধু বা আত্মীয় স্বজনের কাছ থেকে পাওয়া	Other (specify) অন্যান্য (উল্লেখ করুন)	Total (kg) মোট (কেজি)
Quantity consumed (Kg) খাওয়ার পরিমান (কেজি)							

Module M: Knowledge Attitude and Practice of Improved Fish Cultivation Technology
This module measures the number of farmers who have applied new technologies as a result of USG assistance

মাছ চাষে উন্নত ব্যবস্থাপনা প্রযুক্তি বিষয়ক ও প্রয়োগ বিষয়ক তথ্যাদি

Q #	Improved fish cultivation management technology উন্নত প্রযুক্তিতে মাছ চাষে ব্যবস্থাপনা	Standard practice	Knowledge (1=know; 2=don't know) জ্ঞান (১=জানি, ২=জানিনা)	Practice (1=practiced 2=didn't practice) ব্যবহারের মাত্রা	If knows, reasons for non-practice[1] (multiple reasons apply) যদি জানে তবে অনুশীলন না করার কারন	No. of other farmers used this technologies learnt from you আপনার কাছ থেকে শিখে আর কত জন এই প্রযুক্তি ব্যবহার করেন
M1	Testing natural food adequacy in water পানির রং পরীক্ষা করে খাবারের পর্যাপ্ততা নির্ণয়	Required				
M2	Maintaining stock density মজুদের ঘনত্ব বজায় রাখা	40-70 fingerling per decimal				
M3	Species selection সঠিক প্রজাতি নির্বাচন করা	required				
M4	Weed control আগাছা নিয়ন্ত্রণ	Required				
M5	Liming চুন দেওয়া	0.5 to 1.5 kg per dec				
M6	Providing supplementary feed সম্পূরক খাবার দেওয়া	Required based on sampling				
M7	Employing fish disease management মাছের রোগ ব্যবস্থাপনা	Required				
M8	Health monitoring **# & * +**	Required				
M9	Growth monitoring মাছের বৃদ্ধি পর্যবেক্ষণ	Required				
M10	Post harvest handling আহরনোত্তর পরিচর্যা	Required				
M11	Use quality seeds উন্নত পোনা ব্যবহার	required				
M12	Followed feeding application procedures (feeding	Required				

	time, frequency feeding etc) খাদ্য প্রয়োগ পদ্ধতি অনুসরন (????)					

[1]Code : 1=inputs not easily available; 2=lack of capital; 3=not serious about it; 4=lack of enough technical knowledge; 5= lack of consensus among multiple owners; 6=others (specify)

1=উপকরণ সহজ লভ্য নয়, 2= পুজির অভাব, 3= এই বিষয়ে আন্তরিক নয়, 4= পর্যাপ্ত কারিগরি জ্ঞানের অভাব 5= মালিকদের মধ্যে মত অনৈক্য 6= অন্যান্য(উল্লেখ করুন)

Module N: Problems and Constraints

সমস্যা ও প্রতিবন্ধকতা

SI No	Problems/Constraints সমস্যা ও প্রতিবন্ধকতা	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম, 2=মধ্যম, 3=উচ্চ, 4=নাই)	Measures taken to overcome problem সমস্যা উত্তরনে কি ব্যবস্থা নেওয়া হয়েছে
N1	Short of quality seed মান সম্মত মাছের পোনার অপর্যাপ্ততা		
N2	Social problem (theft, poisoning, multiple ownership) সামাজিক সমস্যা (চুরি, বিষ প্রয়োগ, যৌথ মালিকানা)		1= Increased security guard পাহারাদের সংখ্যা বৃদ্ধি 2= Awareness campaign সচেতনতা বৃদ্ধি করণ 3=
N3	Credit problem ঋণ সম্পর্কিত সমস্যা		1= Easy access to association/cooperatives সমবায় / সংগঠনের প্রাপ্ত সুবিধা ভোগ 2= 3=
N4	Natural calamities প্রাকৃতিক দুর্যোগ		
N5	Financial problems অর্থনৈতিক সমস্যা		
N6	High input cost উপকরনের উচ্চ মূল্য		
N7	Water pollution (gas, bloom, bottom slug) পানির দূষণ (গ্যাস, ব্লুম, তলার কাদা)		

গোপনীয়

শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে

ওয়ার্ল্ডফিস সেন্টার বাংলাদেশ
এফটিএফ এ্যাকুয়াকালচার প্রজেক্ট

বেইজলাইন জরিপ ২০১২

নার্সারি মৎস্য / চিংড়ি চাষ প্রশ্নপত্র

জরিপ পরিচালনায়

ডাটা ম্যানেজমেন্ট এইড

ইউএসএআইডি'র অর্থায়নে বাংলাদেশ সরকারের সহায়তায় ওয়ার্ল্ডফিস সেন্টার পরিচালিত
এফটিএফ এ্যাকুয়াকালচার প্রজেক্টের সহযোগীতায় পরিচালিত

জরিপে অংশগ্রহনের সম্মতিপত্র

ফিড দ্যা ফিউচার ওয়াল্ড ফিস সেন্টার পরিচালিত ইউএসএআইডি'র অর্থায়নে ও বাংলাদেশ সরকারের সহযোগিতায় একটি প্রকল্প। এটি ৫(পাচ) বছরের জন্য হস্তান্তর যোগ্য প্রকল্প যা কিনা বাংলাদেশের ঢাকা, খুলনা ও বরিশাল বিভাগের দক্ষিনাঞ্চলের ২০টি জেলায় বাস্তবায়ন হচ্ছে। প্রকল্পটি টেকসই ক্ষুধা ও দারিদ্রতা নিরসনে ফিড দ্যা ফিউচার এর উদ্দেশ্য বাস্তবায়নে কাজ করছে।

যে সকল এলাকায় প্রকল্পের কাজ পরিচালিত হবে সে সকল এলাকার উপর ডাটা ম্যানেজমেন্ট এইড এর মাধ্যমে একটি বেইজলাইন জরিপ পরিচালনা করছে।
এই জরিপের মাধ্যমে এফটিএফ মাছ চাষের প্রচলিত কৌশল ভালভাবে অবগত হয়ে বর্তমান ও ভবিষ্যতের কর্ম কৌশল নির্ধারণ করতে সাহায্য করবে।

আপনার নাম ও দেয়া সকল তথ্য সর্ম্পুন গোপনীয় রাখা হবে এবং শুধুমাত্র গবেষনার কাজে ব্যবহৃত হবে।

আপনার অংশ গ্রহন সম্পূর্ণ ইচ্ছাকৃত। উত্তর দেয়া না দেয়া সম্পুর্ন আপনার ইচ্ছা। তবুও আমরা আশা করি আপনি এই জরিপে অংশ গ্রহন করবেন কারণ আপনার মন্তব্য এই জরিপের জন্য খুবই গুরুত্বপূর্ণ ।

এখন আপনি জরিপ সম্মন্ধে যে কোন প্রশ্ন করতে পারেন।

আমি কি এখন আপনাকে প্রশ্ন করা শুরু করতে পারি ?
হ্যাঁ = 1
না = 2

সাক্ষাতকার গ্রহণকারী

Module A: Identification

SI No	Identification পরিচিতি	Name	Code
A1	Nursery name নার্সারির নাম		
A2	License issue year লাইসেন্স ইস্যুর বছর		
A3	owners name নার্সারির মালিকের নাম		
A4	Other owners name 1 অংশীদারের নাম-		
A5	Other owners name 2 অংশীদারের নাম-		
A6	District জেলা		
A7	Upazilla উপজেলা		
A8	Union ইউনিয়ন		
A9	Village গ্রাম		
A10	Para পারা		
A11	Mouza মৌজা		
A12	Phone # of Nursery owner নার্সারির মালিকের ফোন নাম্বার		
A13	Phone # of contact person যোগাযোগকারীর ফোন নাম্বার		
A14	Data collection Date তথ্য গ্রহণের তারিখ		
A15	Interviewer সাক্ষাতগ্রহণকারীর নাম		
A16	Name of Supervisor সুপারভাইজারের নাম		

Module B:

B.1: Details of Nursery Complex নার্সারির কমপ্লেক্সের বিবরন

SI No	Description of complex নার্সারির কমপ্লেক্সের বিবরন	Number/quantity (সংখ্যা) /পরিমাপ	Year of construction তৈরির বছর	Cost of construction (Tk.) তৈরির মূল্য	Economic life (years) আয়ুস্কাল (বছর)
B1.1	Total area of the Nursery complex (dec.) নার্সারি কমপ্লেক্সের মোট আয়তন (শতাংশ)				
B1.2	Overhead tank ওভারহেড ট্যাঙ্ক				
B1.3	Water filtration unit পানি পরিশোধত ইউনিট				
B1.4	Hatching jar হাচিং জার				
B1.5	Air blowing network/system বায়ু প্রবাহের সিস্টেম				
B1.6	Office room অফিস রুম				
B1.7	Guest room অতিথি কক্ষ				
B1.8	Store room ভাণ্ডার				
B1.9	Net drying shed জাল শুকানোর শেড				
B1.10	Labor shed শ্রমিক শেড				
B1.11	Laboratory পরিক্ষাগার				
B1.12	Other অন্যান্য উল্লেখ করুণ				

B.2. Information on Nursery Equipment's and Machineries (Durable: Economic life is more than one year) নার্সারির যন্ত্রপাতি ও সরঞ্জামাদির বিবরন (১ বৎসরের বেশী আয়ুষ্কাল)

SI No	Equipment's / Machineries যন্ত্রপাতি ও সরঞ্জামাদি	Purchase Value (TK) ক্রয় মূল্য	Economic life (years) আয়ুস্কাল (বছর)
B2.1	Pipe for water supply to tank ট্যাঙ্ক এ পানি সরবরাহ পাইপ		
B2.2	Oxygen cylinder অক্সিজেন সিলিন্ডার		
B2.3	Fish weighting balance মাছের ওজন যন্ত্র		
B2.4	Net জাল		
B2.5	Hapa হাপা		
B2.6	Carrying drum পরিবহণ ড্রাম		
B2.7	DO meter অক্সিজেন (ডিও) মিটার		
B2.8	PH meter পি এইচ মিটার		
B2.9	Thermometer থারমোমিটার		
B2.10	Barometer ব্যারোমিটার		
B2.11	Shallow/deep tube well অগভীর/গভীর নলকূপ		
B2.12	Electric motor বৈদ্যুতিক মটর		
B2.13	Water lifting pump+pipe পানি তোলার পাম্প ও পাইপ		
B2.14	Aerator এ্যারেটর		
B2.15	Boat নৌকা		
B2.16	Transport van ভ্যান পরিবহণ		
B2.17	Furniture আসবাবপত্র		
B2.18	Water testing kit পানি পরীক্ষার কিট		
B2.19	Refrigerator রেফ্রিজারেটর		
B2.20	Deep freezer ডিপ ফ্রিজ		
B2.21	Computer কম্পিউটার		
B2.22	Microscope মাইক্রোস্কোপ		
B2.23	PCR machine পি সি আর মেশিন		
B2.24	Water heater ওয়াটার হিটার		
B2.25	Thermostat থারমোষ্টাট		
B2.26	Air cooler/conditioner এয়ার কুলার/কন্ডিশনার		
B2.27	Electric fan বৈদ্যুতিক ফ্যান		
B2.28	Electric generator জেনারেটর		
B2.29	Solar Power system সৌর বিদ্যুৎ ব্যবস্থা		
B2.30	IPS/UPS আই পি এস/ ইউপিএস		

B2.31	Other অন্যান্য উল্লেখ করুণ		

Module C: Information About Ponds Use, in the Nursery (nursing pond, water settling/reservoir) নার্সারি কার্যক্রমে ব্যবহৃত পুকুর সমূহ (যেমন পানি পরিশোধন পুকুর, নার্সিং পুকুর) সংক্রান্তি তথ্যাদি

Pond # পুকুর	**Area (dec)** পরিমান (শতাংশ)	**Ownership status (1= own; 2 = leased)** মালিকানার ধরন (1= নিজে, 2=ইজারা)	**When constructed/Leased (year)** তৈরী/ইজারা নেবার বৎসর	**Construction/Leased Cost (Tk.)** তৈরীর খরচ (টাকা)	**Purpose of use** ব্যবহারের উদ্দেশ্য
P1					
P2					
P3					
P4					
P5					
P6					
P7					
P8					
P9					
P10					
P11					
P12					

Module D: Income & Expenditure for all pond in 2011 সকল পুকুরের আয় ও ব্যয়ের হিসাব

D 1. Information about Nursing species and Costs Involvement

মাছের পোনার প্রজাতি ও পরিচর্যার ব্যায় সম্পর্কিত তথ্য

SI No	**species** প্রজাতির নাম	**Total Weight (kg)** মোট ওজন (কেজি) (সাদা মাছের জন্য)	**Number** সংখ্যা (শুধু চিংড়ি মাছের জন্য)	**Value (Tk)** মুল্য (টাকা)
D1.1	Rui রুই			
D1.2	Catla কাতলা			
D1.3	Mrigal মৃগেল			
D1.4	Thai Pangus থাই পাঙ্গাশ			
D1.5	Grass carp গ্রাস কার্প			
D1.6	Silver carp সিলভার কার্প			
D1.7	Monosex Tilapia মনোসেক্স তেলাপিয়া			
D1.8	GIFT গিফট			
D1.9	Shrimp (Bagda) বাগদা			
D1.10	Prawn (Golda) গলদা			
D1.11	Native Shing দেশীয় শিং			
D1.12	Native Magur দেশীয় মাগুর			
D1.13	Thai Koi থাই কৈ			
D1.14	Thai Sorpunti রাজপুটি			
D1.15	Other অন্যান্য উল্লেখ করুণ			

D 2. Nursing Pond Operational Costs (variable costs) During Last Year (2011)
নার্সিং পুকুর এর পরিচালন ব্যায় (২০১১ সালের)

SI No	Cost items খরচের উপকরণ	No. সংখ্যা	Kg কেজি	Total (Tk) মোট টাকা
D2.1	Pond preparation (drying, plaughing, soil purchase, bamboo etc except labor cost) পুকুর প্রস্তুতকরন (দিনমজুর খরচ ছাড়া অন্যান্য খরচ)			
	Input Cost			
D2.2	Lime চুন			
D2.3	Cow dung গোবর			
D2.4	Urea ইউরিয়া সার (সাদা সার)			
D2.5	TSP টি এস পি সার (কালো সার)			
D2.6	MoP এম পি সার (লাল সার)			
D2.7	Mustard oilcake সরিষার খৈল			
D2.8	Farm/homemade feed নিজস্ব তৈরি মাছের খাবার			
D2.9	Industrial/commercial/ready feed বানিজ্যিক ভাবে তৈরি মাছের খাবার			
D2.10	Vitamins and minerals ভিটামিন ও খনিজ			
D2.11	Reagents/chemicals for water quality test পানির মান পরীক্ষার জন্য রিএজেন্ট / ক্যামিক্যালস			
D2.12	Medicines for disease control রোগ প্রতিরোধের জন্য ঔষধাদি			
D2.13	Fish killing agents (rotenone, tea seed cake etc) মাছ মারার ঔষধ (চা বীজ খৈল, রটেনেন)			
D2.14	Netting for growth check (in case of hire) মাছের বৃদ্ধি পর্যবেক্ষণের জন্য জাল (জাল ভাড়া করলে)			
D2.15	Fuel for water exchange পানি পরিবর্তনের জন্য জ্বালানী			
D2.16	Fuel for aeration এরিটরের এর জন্য জ্বালানী			
D2.17	Other অন্যান্য উল্লেখ করুণ			
	Seed/PL packing costs (marketing) প্যাকিং খরচ (বাজারজাতকরণ)			
D2.18	Packing cost (oxygen, jute sac, polybag,box) প্যাকিং খরচ (পলি বাগ, চটের ছালা, অক্সিজেন,বক্স)			
D2.19	Advertising costs (poster/leaflets etc) প্রচার খরচ (পোস্টার, লিপলেট)			
	Miscellaneous cost বিবিধ খরচ			
D2.20	Electricity cost for selected pond নির্বাচিত পুকুরের জন্য বিদ্যুৎ খরচ			
D2.21	Water treatment cost for selected pond নির্বাচিত পুকুরের পানি পরিশোধন খরচ			
D2.22	Transportation cost (if any) পরিবহণ খরচ (যদি থাকে)			

D 3: Labor Costs in Last Year (2011) 2011 সালে কর্মীর বেতনাদি

Labor type কর্মীর ধরণ	No. of labor কর্মীর সংখ্যা	Total no. of days worked (for all labor) সব কর্মীর মোট কতদিন কাজ করেছে	Average No. of hours worked per day গড়ে প্রতিদিন কত ঘন্টা কাজ করেছে	Wage (Tk/day/person) মুজুরি (টাকা/ দিন/ জন)		
				Cash নগদ		Food/kind খাবার
				Daily দিন	Monthly মাস	
Permanent male স্থায়ী পুরুষ কর্মী						
1						
2						
3						
4						
5						
Permanent female স্থায়ী মহিলা কর্মী						
1						
2						
Daily male দিন মজুর পুরুষ						
Daily female দিন মজুর মহিলা						
Family male পারিবারিক পুরুষ কর্মী						
1						
2						
3						
4						
Family female পারিবারিক মহিলা কর্মী						
1						
2						
3						
4						

Module E: Production and Sales of Fish Seed/PL in 2011

মাছের পোনা ও চিংড়ি পোস্ট লার্ভা এর উৎপাদন ও বিক্রয় বিবরন

SI No	Type of seed/PL প্রজাতী	No./kg সংখ্যা/কেজি	Production উৎপাদন			Total value (Tk) মোট মূল্য	Price variation মুল্যের ব্যবধান (Tk/kg or Tk/1000PL টাকা/কেজি ও টাকা/১০০০ পি এল	
			Sold বিক্রিত	Self use নিজে ব্যবহারকৃত	Unsold অবিক্রিত		Max.rate সর্বোচ্চ দাম	Min.rate সর্বোনিম্ন দাম
			1	2	3	4=(1+2+3)*মূল্য		
E1	Rui রুই							
E2	Catla কাতলা							
E3	Mrigal মৃগেল							
E4	Thai Pangus থাই পাঙ্গাশ							
E5	Grass carp গ্রাস কার্প							
E6	Silver carp সিলভার কার্প							
E7	Monose x Tilapia মনোসেক্স তেলাপিয়া							
E8	GIFT গিফট							
E9	Shrimp (Bagda) বাগদা							
E10	Prawn (Golda) গলদা							
E11	Native Shing দেশীয় শিং							
E1	Native							

2	Magur দেশীয় মাগুর							
E13	Thai Koi থাই কৈ							
E14	Thai Sorputi রাজপুটি							
E15	Other অন্যান্য উল্লেখ করুণ							

F1.Area coverage of seed/PL distribution by the nursery in 2011

নার্সারি থেকে উৎপাদিত ও বিতরনকৃত মাছ ও চিংড়ির পোনার বাজারজাত জেলা ও বিতরনের মাধ্যম সমূহ

Name of District জেলার নাম	Seed purchased by মাছ ও চিংড়ির পোনা ক্রয়কারী		
	No. of nurseries নার্সারির সংখ্যা	No.of patilwala পাতিলওয়ালার সংখ্যা	No.of farmars খামারির সংখ্যা

Module F: Knowledge Attitude and Practice of Improved Fish, Shrimp and Prawn Nursinging technology মাছ ও চিংড়ির উন্নত ব্যবস্থাপনা পদ্ধতি ও প্রয়োগ বিষয়ক তথ্যাদি

SI No	Tecdhnology পদ্ধতি	Knowledge (1=know 2=don't know) জ্ঞান (1=জানি, 2=জানিনা)	Practice ব্যবহারের মাত্রা	If know, reasons for non-practice[3] যদি জানে তবে অনুশীলন না করার কারন
F1	High density nursing in earthen ponds পুকুরে অধিক ঘনত্বে পোনা লালন পালন			
F2	Nursing in Hapas হাপায় পোনা লালন পালন			
F3	Nursing in cemented concrete tanks পাক্কা ট্যাঙ্ক এ পোনা লালন পালন			
F4	One stage system of nursing এক ধাপ পরিচর্যা পদ্ধতি			
F5	Two stage system of nursing দুই ধাপ পরিচর্যা পদ্ধতি			
F6	Prawn larvae nursing in cemented tanks; পাক্কা ট্যাঙ্ক এ গলদা লার্ভার পরিচর্যা			
F7	Shrimp larvae nursing in cemented tanks; পাক্কা ট্যাঙ্ক এ বাগদা লার্ভার পরিচর্যা			
F8	Nursing of Pangus fry পাঙাশ পোনার পরিচর্যা			
F9	Nursing of Koi fry কৈ মাছের পোনার পরিচর্যা			
F10	Nursing of native catfish দেশিয় শিং মাগুর এর পরিচর্যা			

[1]Code : 1=Know ; 2=Don't know ১= জানি, ২= জানিনা

[2]Code : 1=Practice ; 2=Don't practice ১=প্রয়োগ করে, ২= প্রয়োগ করে না

[3]Code : 1=Inputs are not freely available ; 2=Lack of capital ; 3=Don't believe in it ; 4=Lack of enough skill ; 5=Others (specify)
1= সামগ্রী সহজ লভ্য নয় 2=মুলধন এর অভাব, 3= বিশ্বাস নেই, 4= দক্ষতার অভাব, 5= অন্যান্য

F11	How many staffs of your nursery received training on fish nursery management in last three years? গত ৩ বছরে আপনার নার্সারির কতজন সদস্য নার্সারি ব্যবস্থাপনার উপর প্রশিক্ষণ গ্রহন করেছেন? ..... জন	
F12	What is the total number of training they received? তারা মোট কতটি প্রশিক্ষন গ্রহন করেছেন?	…… No ..... টি

Module G: Problems/Constraints সমস্যা ও প্রতিবন্ধকতা

SI No	Problems/Constraints **সমস্যা প্রতিবন্ধকতা**	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম, 2=মধ্যম, 3=উচ্চ, 4=কোনটিই না)	Measures taken to overcome problem সমস্যা উত্তরনে গৃহীত ব্যবস্থা
G1	Draught খরা		
G2	Heavy rainfall অতি বৃষ্টি		
G3	Insufficient power supply অপর্যাপ্ততা বিদ্যুৎ সরবরাহ		
G4	High cost of nursery feed খাদ্যের উচ্চ মূল্য		
G5	Product marketing বাজার জাতকরণ		
G6	Pausing চুরি করে নিয়ে যাওয়া		
G7	Less return সল্প আয়		
G8	Credit problem ঋণের সল্পতা		
G9	Other অন্যান্য উল্লেখ করুণ		

গোপনীয়

শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে

ওয়ার্ল্ডফিস সেন্টার বাংলাদেশ
এফটিএফ এ্যাকুয়াকালচার প্রজেক্ট

বেইজলাইন জরিপ ২০১২

হ্যাচারি প্রশ্নপত্র

জরিপ পরিচালনায়

ডাটা ম্যানেজমেন্ট এইড

ইউএসএআইডি'র অর্থায়নে বাংলাদেশ সরকারের সহায়তায় ওয়ার্ল্ডফিস সেন্টার পরিচালিত
এফটিএফ এ্যাকুয়াকালচার প্রজেক্টের সহযোগীতায় পরিচালিত

জরিপে অংশগ্রহনের সম্মতিপত্র

ফিড দ্যা ফিউচার ওয়াল্ড ফিস সেন্টার পরিচালিত ইউএসএআইডি'র অর্থায়নে ও বাংলাদেশ সরকারের সহযোগিতায় একটি প্রকল্প। এটি ৫(পাচ) বছরের জন্য হস্তান্তর যোগ্য প্রকল্প যা কিনা বাংলাদেশের ঢাকা, খুলনা ও বরিশাল বিভাগের দক্ষিনাঞ্চলের ২০টি জেলায় বাস্তবায়ন হচ্ছে। প্রকল্পটি টেকসই ক্ষুধা ও দারিদ্রতা নিরসনে ফিড দ্যা ফিউচার এর উদ্দেশ্য বাস্তবায়নে কাজ করছে।

যে সকল এলাকায় প্রকল্পের কাজ পরিচালিত হবে সে সকল এলাকার উপর ডাটা ম্যানেজমেন্ট এইড এর মাধ্যমে একটি বেইজলাইন জরিপ পরিচালনা করছে।

এই জরিপের মাধ্যমে এফটিএফ মাছ চাষের প্রচলিত কৌশল ভালভাবে অবগত হয়ে বর্তমান ও ভবিষ্যতের কর্ম কৌশল নির্ধারণ করতে সাহায্য করবে।

আপনার নাম ও দেয়া সকল তথ্য সর্ম্পুন গোপনীয় রাখা হবে এবং শুধুমাত্র গবেষনার কাজে ব্যবহৃত হবে।

আপনার অংশ গ্রহন সম্পূর্ণ ইচ্ছাকৃত। উত্তর দেয়া না দেয়া সম্পুর্ন আপনার ইচ্ছা। তবুও আমরা আশা করি আপনি এই জরিপে অংশ গ্রহন করবেন কারণ আপনার মন্তব্য এই জরিপের জন্য খুবই গুরুত্বপূর্ণ ।

এখন আপনি জরিপ সম্মন্ধে যে কোন প্রশ্ন করতে পারেন।

আমি কি এখন আপনাকে প্রশ্ন করা শুরু করতে পারি ?
হ্যাঁ = 1
না = 2

সাক্ষাতকার গ্রহণকারী

Module A: Identification

A.1 Hatchery name হ্যাচারীর নাম	
A.2 year of license issue লাইসেন্স ইস্যুর বছর	
A.3 owners name হ্যাচারীর মালিকের নাম	
A.4 Other owners name 1 অংশীদারের নাম-১	
A.5 Other owners name 2 অংশীদারের নাম- ২	
A.6 District জেলা	
A.7 Upazilla উপজেলা	
A.8 Union ইউনিয়ন	
A.9 Village গ্রাম	
A.10 Para পারা	
A.11 Mouza মৌজা	
A.12 Phone # of hatchery owner হ্যাচারীর মালিকের ফোন নাম্বার	
A.13 Phone # of contact person **যোগাযোগকারীর ফোন নাম্বার**	
A.14 Data collection Date তথ্য গ্রহণের তারিখ	
A.15 Interviewer সাক্ষাত গ্রহণকারীর নাম	
A.16 Name of Supervisor সুপারভাইজারের নাম	

Module B:

B.1: Hatchery Complex Descriptions and costs হ্যাচারীর কমপ্লেক্সের বিবরন ও ব্যয়

SI No	Description of items হ্যাচারীর কমপ্লেক্সের বিবরন	Number (সংখ্যা)	When constructed (year) তৈরির বছর	Cost of construction/value (Tk.) তৈরির মূল্য (টাকা)	**Economic life (years) আয়ুস্কাল (বছর)**
B1.1	Total land area of the hatchery (dec.) হ্যাচারির মোট জমির আয়তন (শতাংশ)				
B1.2	value of instrument/facilities in hatchery complex Bangla???				
B1.3	Incubation tank ইঙ্কুবেসন ট্যাঙ্ক				
B1.4	Hatching tank হেচিং ট্যাঙ্ক				
B1.5	Larvae rearing tank রেনু লালন পালন ট্যাঙ্ক				
B1.6	Algae culture tank এলজি কালচার ট্যাঙ্ক				
B1.7	Overhead tank ওভারহেড ট্যাঙ্ক				
B1.8	Water filtration tank পানি পরিশোধন ট্যাঙ্ক				
B1.9	Hatching jar/bottle হেচিং জার/ বোতল				
B1.10	Air blowing network/system বায়ু প্রবাহের সিস্টেম				
B1.11	Office room অফিস রুম				
B1.12	Guest room অতিথি কক্ষ				
B1.13	Spawn distribution center রেনু বিতরন কেন্দ্র				
B1.14	Store room ভাণ্ডার				
B1.15	Net drying shed জাল শুকানোর শেড				
B1.16	Labor shed শ্রমিক শেড				
B1.17	Laboratory পরিক্ষাগার				
B1.18	Others অন্যান্য উল্লেখ করুন				

B.2. Information on Hatchery Equipment's and Machineries (Durable: Economic life is more than one year) হ্যাচারীর যন্ত্রপাতি ও সরঞ্জামাদি যা ১ বৎসরের বেশী টিকে

SI No	Equipment's / Machineries যন্ত্রপাতি ও সরঞ্জামাদি	Purchase Value (TK) ক্রয় মূল্য	Economic life (years) আয়ুস্কাল (বছর)
B2.1	Pipe for water supply to tank ট্যাঙ্ক এ পানি সরবরাহ পাইপ		
B2.2	Oxygen cylinder অক্সিজেন সিলিন্ডার		
B2.3	Hormone weighing balance হরমোন মাপার যন্ত্র		
B2.4	Fish weighting balance মাছে মাপার যন্ত্র		
B2.5	Net জাল		
B2.6	Hapa হাপা		
B2.7	Carrying drum পরিবহণ ড্রাম		
B2.8	DO meter অক্সিজেন (ডিও) মিটার		
B2.9	PH meter পি এইচ মিটার		
B2.10	Thermometer থারমোমিটার		
B2.11	Barometer ব্যারোমিটার		
B2.12	Shallow/deep tube well অগভীর/গভীর নলকূপ		
B2.13	Electric motor ইলেকট্রিক মটর		
B2.14	Water lifting pump+pipe পানি উত্তোলন পাম্প ও পাইপ		
B2.15	Aerator এ্যারেটর		
B2.16	Boat নৌকা		
B2.17	Transport van ভ্যান গাড়ি		
B2.18	Furniture আসবাবপত্র		
B2.19	Water testing kit পানি পরীক্ষার কিট		
B2.20	Refrezerator রেফ্রিজারেটর		
B2.21	Deep freezer ডিপ ফ্রিজ		
B2.22	Computer কম্পিউটার		
B2.23	Microscope মাইক্রোস্কোপ		
B2.24	PCR machine পি সি আর মেশিন		
B2.25	Water heater ওয়াটার হিটার		
B2.26	Thermostat থারমোষ্টাট		
B2.27	Air cooler/conditioner এয়ার কুলার/কন্ডিশনার		
B2.28	Electric fan ফ্যান		

B2.29	Electric generator জেনারেটর		
B2.30	Solar Power system সৌর বিদ্যুৎ ব্যবস্থা		
B2.31	IPS/UPS আই পি এস/ ইউপিএস		
B2.32	Nursing tank নার্সিং ট্যাংক		
B2.33	Others অন্যান্য উল্লেখ করুন		

B.3:. . Information about ponds used for hatchery operation (brood rearing, water settling/reservoir, temporary nursing pond) হ্যাচারীর পুকুর সম্বন্ধীয় (পরিপক্ক মাছ পরিচর্যা, পানি পরিশোধন ও অস্থায়ী নার্সিং পুকুর)

Pond # পুকুর	Area (Dec) পরিমান (শতাংশ)	Ownership status (1= own; 2 = leased) মালিকানার ধরন (1= নিজে,2=ইজারা)	When constructed/ leased (year) তৈরীর/লিজের বৎসর	Construction cost /leased cost (Tk.) তৈরীর/লিজ নেওয়া বাবদ খরচ (টাকা)	Purpose of use (**1**=brood rearing,**2**=reservoir,**3**=nursery) ব্যবহারের উদ্দেশ্য (1=মা মাছ পালন, 2=পানি মজুদ পুকুর, 3=নার্সারি)
P1					
P2					
P3					
P4					
P5					
P6					
P7					
P8					
P9					
P10					
P11					
P12					

Module C: Information About Brood Stock Source of Species Used in Hatchery

হ্যাচারিতে ব্যবহৃত পরিপক্ক মাছের মজুদ বিবরন ও উৎস সম্বন্ধীয় তথ্যাদি
Information on brood stock retained from last year (2011)

২০১১ সালের পরিপক্ক মাছের বিবরন ও উৎস সম্বন্ধে তথ্য

SI No	Brood species name প্রজাতির নাম	Number সংখ্যা		Total Weight (kg) মোট ওজন (কেজি)		Value (Tk) মুল্য (টাকা)	Source (Halda, Jamuna, Brahmaputra, other wild source ,Govt farm, private farm, own, unknown) উৎস (1=হালদা, 2=যমুনা, 3=ব্রহ্মপুত্র,4=সরকারি ফার্ম,5=বেসরকারি ফার্ম, 6=নিজ, 7=অজানা,8=প্রাকৃতিক,9=অন্যান্য প্রাকৃতিক উৎস, 10=অন্যান্য (উল্লেখ করুণ)
		M পুং	F ম	M পুং	F ম		
C1	Rui রুই						
C2	Catla কাতলা						
C3	Mrigal মৃগেল						
C4	Thai Pangus থাই পাঙ্গাশ						
C5	Grass carp গ্রাস কার্প						
C6	Silver carp সিলভার কার্প						
C7	Monosex Tilapia মনোসেক্স তেলাপিয়া						
C8	GIFT গিফট						
C9	Shrimp (Bagda) বাগদা						
C10	Prawn (Golda) গলদা						
C11	Native Shing দেশীয় শিং						
C12	Native Magur দেশীয় মাগুর						
C13	Thai Koi থাই কৈ						
C14	Thai Sorputi রাজপুটি						
C15	Others অন্যান্য উল্লেখ করুন						

Module D:
D 1: Operational Costs of the hatchery (variable costs) During Last Year (2011)

২০১১ সালের হ্যাচারি পরিচালনা ব্যয়

SI No	Cost items সামগ্রী সমূহ	No./Kg সংখ্যা/ কেজি	Total cost(Tk) মোট টাকা
	Brood pond operation পরিপক্ক মাছের পুকুর পরিচালনা		
D1.1	Pond preparation (eg.drying, ploughing, soil purchase, bamboo ,other cost except labor cost) পুকুর প্রস্তুতকরন ব্যয় (যেমনঃ শুকানো,পুকুরের তলা চাষ দেওয়া, মাটি কেনা, বাঁশ ও অন্যান্য খরচ, দিনমজুর খরচ ছাড়া)		
D1.2	Lime চুন		
D1.3	Cow dung গোবর		
D1.4	Urea ইউরিয়া সার		
D1.5	TSP টি এস পি সার		
D1.6	MoP এম পি সার		
D1.7	Mustard oilcake সরিষার খৈল		
D1.8	Farm/homemade feed নিজে তৈরি মাছের খাবার		
D1.9	Industrial/commercial/ready feed বানিজ্যিক মাছের খাবার/রেডি ফিড		
D1.10	Vitamins and minerals ভিটামিন ও খনিজ ঔষধ		
D1.11	Reagents/chemicals for water quality test পানির মান পরীক্ষার জন্য রিএজেন্ট /ক্যামিকেলস		
D1.12	Medicines for disease control রোগ প্রতিরোধের জন্য ঔষধ		
D1.13	Fish killing agents (rotenone, tea seed cake etc) মাছ মারার ঔষধ (চা বীজ খৈল, রটেনন)		
D1.14	Netting for growth monitoring (in case of hire) মাছের বৃদ্ধি পর্যবেক্ষণের জন্য জাল টানা (জাল ভাড়া বাবদ)		
D1.15	Fuel for water exchange পানি পরিবর্তনের জন্য জ্বালানী		
D1.16	Fuel for aeration এরেটরের চালানোর জন্য জ্বালানী		
D1.17	Others অন্যান্য উল্লেখ করুন		
	Hatching operation প্রজনন পরিচালনা ব্যয়		
D1.18	Hormone/inducing agents cost হরমোন/ ইনডিওচিং এজেন্ট বাবদ খরচ		
D1.19	Chemicals (Methyl blue, bleaching, salt, formalin etc) ক্যামিকেল (মিথাইল ব্লু, ব্লিচিং, লবন, ফরমালিন)		
D1.20	Medicine (vitamin, antibiotic, etc.) ঔষধ (ভিটামিন, এনটিবাওটিক)		
D1.21	Tank washing powder ট্যাঙ্ক পরিস্কার করার পাউডার		
D1.22	Feeding for spawn/larvae রেনু/ লার্ভার খাদ্য		
D1.23	Clothing কাপড় চোপড়		

D1.24	Bag for brood transfer পরিপক্ক মাছ স্থানান্তর এর ব্যাগ		
D1.25	Fuel for water pumping পানি পাম্পিং এর জন্য জ্বালানী		
D1.26	Algae species এলজি প্রজাতি		
D1.27	Brine solution ব্রাইন সলুসন		
D1.28	*Artemia* cysts আরটিমিয়া সিশট		
D1.29	Others (injecting materials, globes, distilled water etc) অন্যান্য খরচ (সিরিঞ্জ, গ্লভস, ডিসটিল ওয়াটার)		
	Spawn packing costs (marketing) রেণু প্যাকিং খরচ (বাজারজাতকরণ)		
D1.30	Packing cost (oxygen, jute sac, polybag) প্যাকিং খরচ (পলি বাগ, চটের ছালা, অক্সিজেন, ককসিট বক্স)		
D1.31	Advertising costs (poster/leaflets etc) প্রচার খরচ (পোস্টার, লিপলেট)		
	Miscellaneous cost অন্যান্য খরচ		
D1.32	Electricity cost for selected pond পুকুরের জন্য বিদ্যুৎ খরচ		
D1.33	Water treatment cost for selected pond নির্বাচিত পুকুরের পানি পরিশোধন খরচ		
D1.34	Transportation cost (if any) পরিবহণ খরচ (যদি থাকে)		

D 2: Labor Costs in Last Year (2011) ২০১১ সালে শ্রমিক/কর্মীর বেতনাদি

Labor type কর্মীর ধরণ	No. of labor কর্মীর সংখ্যা	Total no. of days worked (for all labor) মোট কতদিন কাজ করেছে (সব কর্মীর জন্য)	Average No. of hours worked per day গড়ে প্রতিদিন কত ঘন্টা কাজ করেছে	Wage (Tk/day/person) মুজুরি (টাকা/ দিন/ জন)		
				Cash নগদ		Food/kind খাবার
				Daily দিন	Monthly মাস	
Permanent male স্থায়ী পুরুষ কর্মী						
1						
2						
3						
4						
5						
Permanent female স্থায়ী মহিলা কর্মী						
1						
2						
Daily male দিন মজুর পুরুষ						
Daily female দিন মজুর মহিলা						
Family male পারিবারিক পুরুষ কর্মী						
1						
2						
3						
4						
Family female পারিবারিক মহিলা কর্মী						
1						
2						
3						
4						

Module E: No. of Broods Hatched and Sold During Last Year (2011)
পরিপক্ক প্রজননকৃত মাছের সংখ্যা ও বিক্রি সংক্রান্ত তথ্য

SI No	Species প্রজাতী	No.of brood hatched ডিম সংগ্রহ করা হয়েছে কতগুলো ব্রুড মাছ থেকে (সংখ্যা)	No. of brood fish sold প্রজনন ক্ষম বিক্রি করা ব্রুড মাছের সংখ্যা	No. of spent fish sold/consumed ডিম সংগ্রহের পর বিক্রি করা ব্রুড মাছের সংখ্যা	Total value of sold/consumed brood fish (Tk) বিক্রি/ খাওয়া থেকে প্রাপ্ত মোট মুল্য
		1	2	3	4=(2+3)* মূল্য
E1	Rui রুই				
E2	Catla কাতলা				
E3	Mrigal মৃগেল				
E4	Thai Pangus থাই পাঙ্গাশ				
E5	Grass carp গ্রাস কার্প				
E6	Silver carp সিলভার কার্প				
E7	Monosex Tilapia মনোসেক্স তেলাপিয়া				
E8	GIFT গিফট				
E9	Shrimp (Bagda) বাগদা				
E10	Prawn (Golda) গলদা				
E11	Native Shing দেশীয় শিং				
E12	Native Magur দেশীয় মাগুর				
E13	Thai Koi থাই কৈ				
E14	Thai Sorputi রাজপুটি				
E15	Others অন্যান্য উল্লেখ করুন				

Module F: Production and Sales of Fish Spawn/PL in 2011
মাছের রেণু ও চিংড়ির পোস্ট লার্ভার উৎপাদন ও বিক্রয় বিবরন

SI No	Type of spawn/PL প্রজাতী	No./kg সংখ্যা/ কেজি	Production (kg) উৎপাদন (কেজি)			Total value (Tk মোট টাকা)	Price variation মুল্যের ব্যবধান (Tk/kg and Tk/1000PL টাকা/কেজি ও টাকা/১০০০ পি এল	
			Sold বিক্রি	Self use নিজে ব্যবহার	Unsold অবিক্রিত		Max সর্বোচ্চ দাম	Min সর্বোনিম্ন দাম
			1	2	3	4=(1+2+3)*মূল্য		
F1	Rui রুই							
F2	Catla কাতলা							
F3	Mrigal মৃগেল							
F4	Thai Pangus থাই পাঙ্গাশ							
F5	Grass carp গ্রাস কার্প							
F6	Silver carp সিলভার কার্প							
F7	Monosex Tilapia মনোসেক্স তেলাপিয়া							
F8	GIFT গিফট							
F9	Shrimp (Bagda) বাগদা							
F10	Prawn (Golda) গলদা							
F11	Native Shing দেশীয় শিং							
F12	Native Magur দেশীয় মাগুর							
F13	Thai Koi থাই কৈ							
F14	Thai Sorputi রাজপুটি							
F15	Others অন্যান্য উল্লেখ করুন							

F1.Area coverage of spawn**/PL distribution by the hatchery**

২০১১ সালে হ্যাঁচারি থেকে উৎপাদিত ও বিতরনকৃত রেনু ও লার্ভার বাজারজাত এলাকা ও বিতরনের মাধ্যম

Name of District জেলার নাম	Seed purchased by রেনু/ লার্ভা ক্রয়কারী		
	No. of nurseries নার্সারির সংখ্যা	No.of patilwala পাতিলওয়ালার সংখ্যা	No.of farmars খামারির সংখ্যা

Module G: Knowledge Attitude and Practice of Improved Fish,Shrimp and Prawn Hatching Technology মাছ ও চিংড়ির উন্নত হ্যাচারী ব্যবস্থাপনা পদ্ধতি ও প্রয়োগ বিষয়ক তথ্যাদি

SI No	Technologies (in case of major carps) পদ্ধতি কার্প জাতীয় মাছের জন্য)	Standard practice সুপারিশকৃত মাত্রা	Knowledge (1=know 2=don't know) জ্ঞান (1=জানি, 2=জানিনা)	Practice ব্যবহারের মাত্রা	If know, reasons for non-practice[3] যদি জানে তবে অনুশীলন না করার কারন	No. of other farms used this technologies learnt from you আপনার কাছ থেকে শিখে আর কতগুলো ফার্ম এই পদ্ধতি ব্যবহার করেন
G1	Brood stocking density পরিপক্ক মাছের মজুদের ঘনত্ব	12 kg/dec				
G2	Water depth পানির গভীরতা	6-10 feet				
G3	Water exchange before hatching প্রজনন এর পূর্বে পুকুরের	15-20%				
G4	Protein percentage in feed খাবারের প্রোটিনের শতকরা অংশ	25-28%				
G5	Feed application rate (pre spawning) খাবার প্রয়োগের হার	2% of bodyweight				

SI No	Technologies (in case of major carps) পদ্ধতি কার্প জাতীয় মাছের জন্য)	Standard practice সুপারিশকৃত মাত্রা	Knowledge (1=know 2=don't know) জ্ঞান (1=জানি, 2=জানিনা)	Practice ব্যবহারের মাত্রা	If know, reasons for non-practice[3] যদি জানে তবে অনুশীলন না করার কারন	No. of other farms used this technologies learnt from you আপনার কাছ থেকে শিখে আর কতগুলো ফার্ম এই পদ্ধতি ব্যবহার করেন
	(প্রজনন পূর্ব)					
G6	Feed application rate (after spawning) খাবার প্রয়োগের হার (প্রজননের পর)	2-2.5% of BW				
G7	Secchi disc reading সেকি ডিস্ক রিডিং	30cm				
G8	Sampling and health monitoring নমুনায়ন ও স্বাস্থ্য পর্যবেক্ষণ	Monthly				
G9	Ratio of M:F brood used during spawning পুরুষ ও স্ত্রী পরিপক্ক মাছের ব্যবহার এর আনুপাতিক হার	1M :2F				
G10	Presence of aeration device in brood pond ব্রুড মাছের পুকুরে অক্সিজেন সঞ্চালন ব্যবস্থা	Required				
G11	Average number of time each brood is spawned per season প্রতি মৌসুমে পরিপক্ক মাছের প্রজননের গড় সংখ্যা	1-2 times				
G12	Hybrid produced illegally যথাযথ পদ্ধতি অনুসরন না করে হাইব্রিড মাছের উৎপাদন (ইনব্রিডিং)	Not recommended				
G13	Pond for conditioning spent brood fish? প্রজনন কৃত মাছের পরিচর্যার জন্য আলাদা পুকুর	Required				

SI No	Technologies (in case of major carps) পদ্ধতি কার্প জাতীয় মাছের জন্য)	Standard practice সুপারিশকৃত মাত্রা	Knowledge (1=know 2=don't know) জ্ঞান (1=জানি, 2=জানিনা)	Practice ব্যবহারের মাত্রা	If know, reasons for non-practice[3] যদি জানে তবে অনুশীলন না করার কারন	No. of other farms used this technologies learnt from you আপনার কাছ থেকে শিখে আর কতগুলো ফার্ম এই পদ্ধতি ব্যবহার করেন
G14	Stage of maturation of brood fish and shrimp species প্রজনন যোগ্য মাছের এবং চিংড়ির পরিপক্কতার পর্যায় যাচাই	Required				
G15	Quality brood of fish,shrimp and prawn selection প্রজননক্ষম মাছের / চিংড়ির গুনগত মান যাচাই	Required				
G16	Water quality management of hatching and incubation tanks হাচিং ও ইঙ্কুবেসন ট্যাঙ্ক এর পানির গুনগত মান ব্যবস্থাপনা	Required				
G17	Dose détermination and application of induction agents হরমোন বা ইনডিওসিং এজেন্ট এর মাত্রা নির্ধারণ	Required				
G18	Stripping of ripen eggs স্টিপিং পদ্ধতিতে ডিম সংগ্রহ	Required				
G19	Mixing of eggs and milts ডিম ও বীর্য এর সংমিশ্রণ	Required				
G20	Health care of induced and spent fish প্রজননকৃত ও প্রজননাধীন মাছের স্বাস্থ্য পরিচর্যা	Required				
G21	Use of antibiotics/medicines অ্যান্টিবাইওটিক/ ঔষধের ব্যবহার	Required				

SI No	Technologies (in case of major carps) পদ্ধতি কার্প জাতীয় মাছের জন্য)	Standard practice সুপারিশকৃত মাত্রা	Knowledge (1=know 2=don't know) জ্ঞান (1=জানি, 2=জানিনা)	Practice ব্যবহারের মাত্রা	If know, reasons for non-practice[3] যদি জানে তবে অনুশীলন না করার কারন	No. of other farms used this technologies learnt from you আপনার কাছ থেকে শিখে আর কতগুলো ফার্ম এই পদ্ধতি ব্যবহার করেন
G22	Growth and survivality Monitoring of spawn/larvae রেনু/ লার্ভার বৃদ্ধি ও বেচে থাকার হার পর্যবেক্ষণ	Requied				
G23	Live feed production and algal culture and application. আলগী ও জীবন্ত খাদ্য (আরটিমা) উৎপাদন ও প্রয়োগ	Required				
G25	How many staffs of your hatchery received training on fish hatchery management in last three years?.....no. গত ৩ বছরে আপনার হ্যাচারির কতজন সদস্য হ্যাচারির ব্যবস্থাপনার উপর প্রশিক্ষণ গ্রহন করেছেন?					
G26	What is the total number of training they received?.....no. তারা মোট কতটি প্রশিক্ষন গ্রহন করেছেন? ..... টি					…… No ..... টি

Module H: Problems/Constraints
সমস্যা ও প্রতিবন্ধকতা

SI No	Problems/Constraints সমস্যা ও প্রতিবন্ধক	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম,2=মধ্যম, 3=উচ্চ, 4= নাই)	Measures taken to overcome problem সমস্যা উত্তরনে গৃহীত ব্যবস্থা নেওয়া হয়েছে
H1	Shortage of quality broods মান সম্মত ব্রুড মাছের অপর্যাপ্ততা		1= wild source search প্রাকৃতিক উৎসের সন্ধান 2= govt brood banks search সরকারী ব্রুড ব্যাংক অনুসন্ধান 3= private source বেসরকারি উৎস 4= go to research center গবেষণা কেন্দ্র থেকে সংগ্রহ 5= 6= 7=
H2	Climate change and temperature fluctuation জলবায়ু পরিবর্তন ও তাপমাত্রার প্রভাব		1= Inhouse maturation of short cycle fish under control condition 1= দ্রুত বর্ধন শীল স্বল্প মেয়াদী মাছের নিয়ন্ত্রিত পদ্ধতিতে পরিপক্ক করন 2= Technology used for early and timely maturation of fish and prawn species 2= চিংড়ি ও মাছের আগাম পরিপক্ক করন প্রযুক্তির ব্যবহার 3= 4=
H3	Irregular power supply অনিয়মিত বিদ্যুৎ সরবরাহ		1= Used generator 1= জেনারেটর ব্যবহার 2=Used solar energy 2= সৌর বিদ্যুতের ব্যবহার 3=
H4	High cost of larval feed লার্ভার খাদ্যের উচ্চ মূল্য		1= Use local ingredients for feed preparation 1= খাদ্য তৈরিতে স্থানীয় উপকরণের ব্যবহার 2= Low cost fish meal for commercial farm feed production 2= স্বল্প মূল্যের ফিশ ফিড মিল ব্যবহারে গুনগত মানের খাদ্য তৈরি করা

SI No	Problems/Constraints সমস্যা ও প্রতিবন্ধক	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম,2=মধ্যম, 3=উচ্চ, 4= নাই)	Measures taken to overcome problem সমস্যা উত্তরনে গৃহীত ব্যবস্থা নেওয়া হয়েছে
			3= Borrowed money 3= টাকা ধার করা 4= Purchase in credit 4= বাকিতে খাদ্য কেনা 5= 6=
H5	Product marketing বাজার জাত করণ		1=Advertising 1=প্রচার কার্যক্রম 2=Sales in credit 2=বাকিতে বিক্রি 3= used commission/sales agents 3=কমিশন / বিক্রি এজেন্ট এর মাধ্যমে 4= Help from association 4=সংগঠনের সহায়তা 5= 6=
H6	High mortality of shrimp and prawn larvae গলদা ও বাগদার পোনার উচ্চ মৃত্যুহার		1=Keep safe from infection sources 1=সংক্রামক উৎস থেকে নিরাপদ রাখা 2=Better management of water quality 2=পানির অধিকতর উন্নত ব্যবস্থাপনা 3= Health maintenance of brood 3= পরিপক্ক চিংড়ির স্বাস্থ্য ব্যবস্থাপনা 4= Consultation with expert 4= বিশেষজ্ঞদের পরামর্শ নেওয়া 5= Use of medicine/antibiotics 5= প্রয়োজনীয় ঔষধের ব্যবহার 6= 7=
H7	Social problem (theft, poisoning, multiple ownership) সামাজিক সমস্যা (চোর, বিষ প্রয়োগ, যৌথ মালিকানা)		1= Increased security guard 1= পাহারাদের সংখ্যা বৃদ্ধি 2= Awareness campaign 2= সচেতনতা বৃদ্ধি করণ 3=
H8	Credit problem ঋণের সমস্যা		1= Easy access to association/cooperatives 1= সমবায় / সংগঠনের প্রাপ্ত সুবিধা

SI No	Problems/Constraints সমস্যা ও প্রতিবন্ধক	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম,2=মধ্যম, 3=উচ্চ, 4= নাই)	Measures taken to overcome problem সমস্যা উত্তরনে গৃহীত ব্যবস্থা নেওয়া হয়েছে
			ভোগ 2= 3=

গোপনীয়

শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে

ওয়ার্ল্ডফিস সেন্টার বাংলাদেশ
এফটিএফ এ্যাকুয়াকালচার প্রজেক্ট

বেইজলাইন জরিপ ২০১২

খাঁচায় মৎস্য চাষ প্রশ্নপত্র

জরিপ পরিচালনায়

ডাটা ম্যানেজমেন্ট এইড

ইউএসএআইডি'র অর্থায়নে বাংলাদেশ সরকারের সহায়তায় ওয়ার্ল্ডফিস সেন্টার পরিচালিত
এফটিএফ এ্যাকুয়াকালচার প্রজেক্টের সহযোগীতায় পরিচালিত

জরিপে অংশগ্রহনের সম্মতিপত্র

ফিড দ্যা ফিউচার ওয়াল্ড ফিস সেন্টার পরিচালিত ইউএসএআইডি'র অর্থায়নে ও বাংলাদেশ সরকারের সহযোগিতায় একটি প্রকল্প। এটি ৫(পাচ) বছরের জন্য হস্তান্তর যোগ্য প্রকল্প যা কিনা বাংলাদেশের ঢাকা, খুলনা ও বরিশাল বিভাগের দক্ষিনাঞ্চলের ২০টি জেলায় বাস্তবায়ন হচ্ছে। প্রকল্পটি টেকসই ক্ষুধা ও দারিদ্রতা নিরসনে ফিড দ্যা ফিউচার এর উদ্দেশ্য বাস্তবায়নে কাজ করছে।

যে সকল এলাকায় প্রকল্পের কাজ পরিচালিত হবে সে সকল এলাকার উপর ডাটা ম্যানেজমেন্ট এইড এর মাধ্যমে একটি বেইজলাইন জরিপ পরিচালনা করছে।

এই জরিপের মাধ্যমে এফটিএফ মাছ চাষের প্রচলিত কৌশল ভালভাবে অবগত হয়ে বর্তমান ও ভবিষ্যতের কর্ম কৌশল নির্ধারণ করতে সাহায্য করবে।

আপনার নাম ও দেয়া সকল তথ্য সর্ম্পুন গোপনীয় রাখা হবে এবং শুধুমাত্র গবেষনার কাজে ব্যবহৃত হবে।

আপনার অংশ গ্রহন সম্পূর্ণ ইচ্ছাকৃত। উত্তর দেয়া না দেয়া সম্পুর্ন আপনার ইচ্ছা। তবুও আমরা আশা করি আপনি এই জরিপে অংশ গ্রহন করবেন কারণ আপনার মন্তব্য এই জরিপের জন্য খুবই গুরুত্বপূর্ণ ।

এখন আপনি জরিপ সম্মন্ধে যে কোন প্রশ্ন করতে পারেন।

আমি কি এখন আপনাকে প্রশ্ন করা শুরু করতে পারি ?
হ্যাঁ = 1
না = 2

সাক্ষাতকার গ্রহণকারী

Module A: Identification of the Sample

SI NO	**Area** ID সাক্ষাত দাতার পরিচিতি	**Name** নাম	**Code** কোড
A1	Name of farmer খামারির নাম		
A2	Father's/husbands's name খামারির পিতার/স্বামীর নাম		
A3	Name of household head খানা প্রধানের নাম		
A4	District জেলা		
A5	Upazila উপজেলা		
A6	Union ইউনিয়ন		
A7	Village গ্রাম		
A8	Farmer's household number খামারির খানা নাম্বার		
A9	Date তারিখ		
A10	Interviewer সাক্ষাত গ্রহণকারীর নাম		
A11	Name of Supervisor সুপারভাইজারের নাম		

A12	Are you a selected farmer of the FtF Aquaculture Project? (1=yes ; 2=no) আপনি কি FtF প্রকল্পের একজন নির্বাচিত মৎস্য চাষি? (1=হ্যাঁ , 2=না)	
A13	How many years of experience do you have in fish farming? মাছ চাষে আপনার কত দিনের অভিজ্ঞতা আছে?	…… years ..... বছর
A14	How many years of experience do you have in cage fish farming? খাঁচায় মাছ চাষে আপনার কত দিনের অভিজ্ঞতা আছে?	…… years ..... বছর
A15	If you had experience in cage fish culture, which institution or organization arranged for it? খাঁচায় মাছ চাষ করে থাকলে কোন প্রতিষ্ঠান বা সংস্থা এর ব্যবস্থা করে দিয়েছিল?	1.Enter name _____ 1.নাম লিখুন_____ 2.Independently

Module B: Household Socioeconomic Status (2011)

পারিবারিক আর্থ সামাজিক অবস্থা

B1: Household Member Profile

পরিবারের সদস্যদের তথ্য

Sl # and name ক্রমিক নং ও নাম	Relationship with farmer খামারির সাথে সম্পর্ক	Sex (M / F/T) লিঙ্গ পুঃ/মঃ/হিঃ	Age বয়স		Years of schooling কোন শ্রেনি পর্যন্ত পড়াশুনা করেছেন/ করছেন	Main occupation প্রধান পেশা	Subsidiary occupation অন্য পেশা
			Year বছর	Month মাস			
1.Farmer খামারি							
2							
3							
4							
5							
6							
7							

Codes: Relationship		Codes: Occupation
31. Husband 32. Wife 33. Son 34. Daughter 35. Father 36. Mother 37. Brother 38. Sister 39. Mother-in-law 40. Father-in law 41. Son-in-law 42. Daughter-in-law 43. Grand son 44. Grand daughter 45. Others	১= স্বামী ২= স্ত্রী ৩= পুত্র ৪= কন্যা ৫= বাবা ৬=মা ৭= ভাই ৮= বোন ৯= শাশুড়ি ১০= শ্বশুর ১১= জামাতা ১২= পুত্রবধূ ১৩= নাতি ১৪= নাতনি ১৫= অন্যান্য	31. House wife গৃহিণী 32. Service চাকুরী 33. Big/medium Business মাঝারী/ বড় ব্যবসা 34. Small business ছোট ব্যবসা 35. Day labor দিন মজুর 36. Rickshaw/Van driver রিক্সা/ ভ্যান চালক 37. Agriculture (Own/share cropper) কৃষি (নিজ/ বর্গা) 38. Handicrafts, Carpenter, Mason and other self employed কারুশিল্পী, কাঠমিস্ত্রি, রাজমিস্ত্রি এবং অন্যান্য স্বকর্ম 39. Professional (Doctor, engineer, advocate) পেশাজীবী (ডাক্তার, ইঞ্জিনিয়ার,আইনজীবী) 40. Student ছাত্র 41. Unemployed বেকার 42. Retired / Minor child অবসর প্রাপ্ত/ ছোট শিশু 43. Old (Age >60 years) বৃদ্ধ(৬০ বছরের উপরে) 44. Others (specify) অন্যান্য(উল্লেখ করুন)

B2: Land Ownership in 2011

2011 সালে জমির মালিকানা সত্ব

SI NO	Land type জমির ধরন	Cultivated last year গত বছরে আবাদকৃত			Leased out (decimal) ইজারা দেওয়া (শতাংশ)
		No. of plots কয়টি প্লট বা খণ্ড	Cultivated (dec) চাষকৃত(শতাংশ)	Leased in (dec) ইজারা নেওয়া (শতাংশ)	
B2.1	All *ghers*/ponds ঘের/পুকুর				
B2.3	Cultivated land (field crops/vegetables etc) চাষকৃত জমি (মাঠ শস্য, তরকারি ইত্যাদি)				
B2.3	Homestead area বসতবাড়ি এলাকা				

B2.4	Homestead vegetables/fruits বসতবাড়ি আঙ্গিনায় সব্জি/ফল বাগান				
B2.5	Bamboo/wooden garden বাঁশঝাড়/ কাঠ জাতীয় বৃক্ষ				
B2.6	Others অন্যান্য				

B 3: Annual Household Income (2011)
বার্ষিক পারিবারিক আয়

	Source of income আয়ের উৎস	**Gross income (Tk/year)** মোট আয় (টাকা/বৎসর)
B3.1	Field Crops and vegetables মাঠে উৎপাদিত শষ্য ও সব্জী	
B3.2	Livestock and poultry (meat, milk, egg) পশু ও হাঁস মুরগী (মাংস, দুধ,ডিম)	
B3.3	Homestead gardening (vegetables) বাড়ীর আঙ্গিনায় সব্জি	
B3.4	Homestead forest , trees, flowering বাড়ির আঙ্গিনায় গাছ ও ফুলফলাদি	
B3.5	Aquaculture (shrimp and fish produced) মৎস্য চাষ (চিংড়ি ও মাছ উৎপাদন)	
B3.6	Other fisheries(Fish business, harvesting from river and canal) অন্যান্য মাছ (মাছ ব্যবসা, নদী ও খাল থেকে আহরন)	
B3.7	Water pump rented out পানির মেশিন ভাড়া বাবদ	
B3.8	Power tiller and/or plough renting পাওয়ার টিলার এবং লাঙ্গল ভাড়া বাবদ	
B3.9	Fishing net renting মাছের জাল ভাড়া বাবদ	
B3.10	Labor selling (farmer himself & household members) শ্রম বিক্রয় (কৃষক নিজে বা পরিবারের সদস্যরা)	
B3.11	Services (Govt. and private job of farmer himself & household members) চাকুরী(সরকারী/বেসরকারি চাকুরী, কৃষক নিজে বা পরিবারের সদস্যরা)	
B3.12	Business (medium and large scale) ব্যাবসা (মধ্যম এবং বড়)	
B3.13	Small trading / small grocery shop ছোট ব্যাবসা / ছোট মুদির দোকান	
B3.14	Tempo/van/rickshaw /motorcycle renting টেম্পু, ভ্যান/রিক্সা/মোটর সাইকেল ভাড়া বাবদ	
B3.15	Remittance (in country and abroad) রেমিটেন্স (দেশের ভিতর/বিদেশ থেকে)	
B3.16	Land leased and/or mortgage out জমি ইজারা এবং বন্ধক থেকে	
B3.17	Others (Please specify) অন্যান্য (উল্লেখ করুন)	

Module C: Description of Cages and Cultural Practices (2011)

খাঁচার বর্ণনা ও খাচায় মাছ চাষ সম্পর্কিত তথ্যাদি (প্রকল্পের খামারিদের জন্য প্রযোজ্য নয়)

Q #	Questions	Response
C1	How many cages did you operated last year? গত বছর কতগুলো খাঁচায় মাছ চাষ করেছেন?	No._____
C2	Ownership status of cages (1=single ; 2=joint খাঁচার মালিকানা সত্ব (1=একক, 2= যৌথ,)	
C3	What was the water body used for cage aquaculture? (1=large open water; 2=running water; 3=closed water body) (multiple response apply) কোন ধরনের জলাশয় খাঁচায় মাছ চাষ করেছেন? 1=উন্মুক্ত জালাশায় 2=চলমান জালাশয় 3=বদ্ধ জালাশায়	

C4	Total water area covered by the cages (enter in decimals) কত জল আয়তন এলাকায় খাঁচায় মাছ চাষ করেছেন? (ডেসিম্যাল এ লিখুন)	
C5	What are the materials used for your cage preparation (1=GI pipe, nylon net and plastic drum (type 1cage); 2=PVC pipe, cotton net, metallic drum (type 2 cage); 3=bamboo poles, nylon/cotton net, plastic drum (type 3 cage); 4=bamboo poles, nylon/cotton net, metallic drum (type 4 cage) খাঁচা তৈরিতে কি ধরনের সামগ্রী ব্যবহৃত হয়েছে? 1=জি আই পাইপ, নাইলন নেট ও প্লাস্টিক ড্রাম, 2=পি ভি সি পাইপ, সুতি জাল, ধাতুর ড্রাম, 3=বাশের খুঁটি, নাইলন বা শুতির জাল, প্লাস্টিক ড্রাম , 4=বাশের খুঁটি, নাইলন বা শুতির জাল, ধাতুর ড্রাম	
C6	Species used in case fish culture (1=Tilapia (monosex and GIFT); 2=Rajpunti,3= Carps (Indian major carps and exotic carps); 4=Thai pangus (Pungus from Thailand) (multiple response apply) খাঁচায় কোন কোন প্রজাতির চাষ করা হয়েছে? 1=তিলাপিয়া (মনসেক্স ও গিফট), 2=রাজপুটি 3=কার্প (দেশী / বিদেশী), 4=থাই পাঙ্গাশ (একাধিক উত্তর হতে পারে)	
C7	What is the fish Stocking density generally followed by you in cage culture (# of fingerlings per cage খাঁচায় মজুদ ঘনত্ব (# পোনা প্রাতি খাঁচায়)	
C8	What type of fish feed did you use? (1=floating; 2=semi floating; 3=sinking; 4=mixed spreader (mixture of rice bran, wheat bran, mustard oil cake, fish meal produced locally by farmers)) (multiple response apply) কি ধরনের মৎস্য খাদ্য ব্যবহার করেছেন? (1=ভাসমান, 2=আধা ভাসমান, 3=দুবন্ত, 4=মিস্র ছিটানো (কুঁড়া, খৈল, মৎস্য চূর্ণ ইত্যাদি)	
C9	What yield did you receive? (kg per year) খাঁচা প্রতি বছরে উৎপাদন কত (কেজি) ?	

Module D: Fixed Costs of Cage in 2011

খাঁচা তৈরিতে মূলধন খরচ

SI NO	Items সামগ্রী	Total present value/cost (Tk)	Economic Life (year)
D1	Bamboo/wood/rope বাঁশ/ কাঠ /দড়ি		
D2	Nylon net/Cotton net নাইলন জাল/সুতার জাল		
D3	Floating drum(metallic or plastic) ভাসমান ড্রাম (প্লাস্টিক বা ধাতব নির্মিত)		
D4	Metal frame ধাতব নির্মিত কাঠামো		
D5	Others (Please specify) অন্যান্য (উল্লেখ করুন)		

Module E: Input Use and Cash Operating Costs of Fish Cultivation in 2011

উপকরণের ব্যবহার ও খাঁচায় মাছ চাষ পরিচালনা ব্যয়

Q#	Questions	Quantity	Rate Tk/unit	Value Tk
E1	Cage repairing and maintenance (e.g. GI pipe, bamboo pole, nylon net, floats, feeding tray etc) (Tk) খাঁচা মেরামত এবং রক্ষণাবেক্ষণ (জি আই পাইপ,বাঁশের খুটি,জাল,ফ্লটস,খাবার ট্রে ইত্যাদি)			
E2	Feed (e.g. floating, semi-floating sinking and mixed) (kg) খাবার (1=ভাসমান, 2=আধা ভাসমান, 3=দুবন্ত, 4=মিস্র)			
E3	Chemicals/reagents (for water quality test) (kg) পানির গুনাগুন পরিক্ষার জন্য কেমিক্যালস/ রিএজেন্ট			
E4	Mono Sex Tilapia seed			

	মনো সেক্স তেলাপিয়ার পোনা			
E5	GIFT seed গিফট তেলাপিয়ার পোনা			
E6	Rajputi seed রাজপুঁটি পোনা			
E7	Medicine (for disease control) (kg) রোগ নিয়ন্ত্রণের জন্য ঔষধাদি			
E8	Number of times harvested আহরণের সংখ্যা			
E9	Others (specify) (Tk) অন্যান্য (উল্লেখ করুন)			
E10	Where did you buy the fish seed from? 1=private hatchery; 2=government hatchery; 3= private nursery; 4=government nursery; 5=patilwala; 6=vendor; 7=local market; 8=others (specify). আপনি কোথা থেকে মাছের পোনা ক্রয় করেন? 1=ব্যক্তি মালিকানাধীন হ্যাচারী,2=সরকারি হ্যাচারী,3=পাতিলওয়ালা, 4=ফড়িয়া,5=স্থানীয় বাজার,6= অন্যান্য			

Module F: Labor Costs in Last Year (2011)

শ্রমিকের খরচ (2011 সালের)

Labor type শ্রমিকের ধরণ	No. of labor শ্রমিকের সংখ্যা	Total no. of days worked (for all labor) মোট কর্ম দিবস (সকল শ্রমিকের জন্য)	Average No. of hours worked per day প্রতিদিন গড়ে কত ঘন্টা কাজ	Wage (Tk/day/person) মজুরি (টাকা/দিন/জন)		
				Cash নগদ		Food/kind খাদ্য/জিনিস
				Daily দৈনিক	Monthly মাসিক	
Permanent male স্থায়ী শ্রমিক পুরুষ						
1						
2						
3						
4						
5						
Permanent female স্থায়ী শ্রমিক মহিলা						
1						
2						
Daily male দৈনিক হারে পুরুষ						
Daily female দৈনিক হারে মহিলা						
Family male পরিবারের পুরুষ						
1						
2						
3						
4						
Family female পরিবারের মহিলা						
1						
2						
3						
4						

Module G: Production and Disposal of Fish

মাছ উৎপাদন,বিক্রয়/ব্যবহারের তথ্য

Q #	Questions	Quantity	Rate (Tk/kg)	Value Tk
G1	***Telapia:*** ***(monosexTilapia and GIFT)*** মনোসেক্স তেলাপিয়া ও গিফট			
G1.1	**Total Harvested** （kg） মোট আহরণ (কেজি)			
G1.2	Consumed （kg）খেয়েছেন （কেজি）			
G1.3	Sold বিক্রিত （কেজি） (kg)			
G1.4	Gifted (kg) দান/ উপহার （কেজি）			
G1.5	Processed (e.g. dried) (kg) প্রক্রিয়াজাতকৃত （কেজি）			
G1.6	Technical loss[1] (kg) টেকনিক্যাল লস （কেজি）			
G2	***Others:*** ***(e.g. punti, pungus, singh and magur)*** অন্যান্য মাছ (পুঁটি, পাঙ্গাশ, শিং এবং মাগুর）			
G2.1	**Total Harvested (kg)** মোট আহরণ (কেজি)			
G2.2	Consumed (kg) খেয়েছেন （কেজি）			
G2.3	Sold (kg) বিক্রিত （কেজি）			
G2.4	Processed (e.g. dried) (kg) প্রক্রিয়াজাতকৃত （কেজি）			
G2.5	Technical loss[1] টেকনিক্যাল লস （কেজি） (kg)			
G3	Reasons for technical loss (multiple reasons apply) 1= Damaged or lost due to improper harvesting or post harvest handling and transportation; 2=lack of preservation facilities; 3=degraded seed quality; 4=Others (specify) কারিগরি ক্ষতির কারন (1= যথাযথ ভাবে আহরণোত্ত পরিচর্যা, 2=সংরক্ষন ব্যবস্থার অভাব 3=নিম্নমানের পোনা ব্যবহার করা, 4=অন্যান্য）			
G4	Where do you sell your fish outputs? 1=consumers; 2=middlemen; 3=arat; 4=government service centers; 5= processers; 6=others (specify) উৎপাদিত মাছ কোথায় বিক্রি করেন? (1=গ্রাহকের নিকট, 2=মধ্যসত্বভোগী, 3=আড়ত, 4=সরকারী সার্ভিস কেন্দ্র, 5= প্রক্রিয়াজাতকারী, 6=অন্যান্য)			

Module H:

H 1: Fish and Other Food Commodity Consumed by Your HH Member in Last 3 Days

পরিবারে গত তিন দিনে মাছসহ অন্যান্য খাদ্য গ্রহণের বিবরণ

SI NO	Food items খাদ্য তালিকা	Number of days consumed (in last 3 days)	Total number of meals in last 3 days গত তিন দিনে কত বার	Quantity consumed in last 3 days গত তিন দিনে মোট কি

		গত তিন দিনের মধ্যে কত দিন খেয়েছেন	খেয়েছেন	পরিমান খেয়েছেন
H1.1	Cereals খাদ্য শস্য			Kg কেজি
H1.2	Small fish ছোট মাছ			Kg কেজি
H1.3	Big fish বড় মাছ			Kg কেজি
H1.4	Meat মাংস			Kg কেজি
H1.5	Egg ডিম			No সংখ্যা
H1.6	Pulses ডাল			Kg কেজি
H1.7	Milk দুধ			Litre লিটার
H1.8	Fruits ফল			Kg কেজি
H1.9	Vegetables শাকসবজি			Kg কেজি

H 2: List the Fish Species You Consumed in the Last 3 Days Amount of Each Fish Consumed

গত তিন দিনে আপনার পরিবারের কি কি মাছ কত পরিমানে খেয়েছেন

Species consumed প্রজাতির নাম									Total মোট
Quantity consumed (Kg) খাওয়ার পরিমান (কেজি)									

H 3: List the Source of the Fish Your HH Consumed in the Last 3 Days and Quantity From Each Source

গত তিন দিনে আপনার পরিবারে যে সকল মাছ খাওয়া হয়েছে তার উৎস ও পরিমান

Fish source মাছের উৎস	Own Ponds নিজের পুকুর	Purchased in market বাজার থেকে ক্রয়	Self caught (from own rice field) নিজের ধান ক্ষেত থেকে আহরিত	Self-caught (from open water body) মুক্ত জলাশয় থেকে নিজের দ্বারা আহরিত	Gift from friend or relative বন্ধু বা আত্মীয় স্বজনের কাছ থেকে পাওয়া	Other (specify) অন্যান্য (উল্লেখ করুন)	Total মোট
Quantity consumed (Kg) খাওয়ার পরিমান (কেজি)							

Module I: Knowledge Attitude and Practice of Improved Cage Cultivation Technology
খাচায় মাছ চাষে উন্নত ব্যবস্থাপনা পদ্ধতি সমূহ ও এর প্রয়োগ বিষয়ক তথ্যাদি

Q #	Improved cage cultivation technology খাঁচায় মাছ চাষের উন্নত প্রযুক্তি	Standard recommended সুপারিশকৃত মাত্রা	Knowledge (1=know 2=don't know) জ্ঞান (১=জানে,২=জানেনা)	Practice (1=practiced 2=didn't practice) অনুশীলন	If knows, reasons for non-practice[1] (multiple reasons apply) যদি জানে তবে অনুশীলন না করার কারন কি	No. of other farmers used this technologies learnt from you আপনার কাছ থেকে শিখে আর কতগুলো ফার্ম এই প্রযুক্তি ব্যবহার করেন
I1	Maintaining stock density **, -**	120-150 fingerlings/sqm				
I2	Species selection **. /**	short cycle fast growing				
I3	Cage maintenance খাঁচা রক্ষনাবেক্ষণ	Net cleaning, repairing,				
I4	Providing supplementary feed **0 1 . #**	Recommended				
I5	Employing fish disease management **2 # 3**	Recommended				
I6	Health monitoring **# & * +**	Recommended				

A12	Did you receive training on cage fish culture in last three years? (1=yes ; 2=no) গত ৩ বছরে আপনি খাচায় মাছ চাষের উপর প্রশিক্ষণ গ্রহন করেছেন কি? (1=হ্যাঁ , 2=না)	

A13	What is the total number of training you received?মাছ চাষে আপনার আপনি মোট কতটি প্রশিক্ষন গ্রহন করেছেন?	…… No ..... টি

Module J: Problem and Constraints

সমস্যা ও প্রতিবন্ধকতা

SI NO	Problems/ Constraints সমস্যা/ প্রতিবন্ধকতা	Intensity (1=Less, 2=moderate, 3=High, 4=None) মাত্রা (1=কম,2=মধ্যম, 3=উচ্চ, 4=নাই)	Measures taken to overcome problem সমস্যা উত্তরনে কি ব্যবস্থা নেওয়া হয়েছে
J1	High mortality of fish মাছের উচ্চ মৃত্যুহার		1=Keep safe from infection sources 1=সংক্রামক উৎস থেকে নিরাপদ রাখা 2=Better management of water quality 2=পানির অধিকতর উন্নত ব্যবস্থাপনা 3= Consultation with expert 3= বিশেষজ্ঞদের পরামর্শ নেওয়া 4= Use of medicine/antibiotics 4= প্রয়োজনীয় ঔষধের ব্যবহার 5= 6=
J2	Social problem (theft, poisoning, multiple ownership) সামাজিক সমস্যা (চোর, বিষ প্রয়োগ, যৌথ মালিকানা)		1= Increased security guard 1= পাহারাদের সংখ্যা বৃদ্ধি 2= Awareness campaign 2= সচেতনতা বৃদ্ধি করণ 3=
J3	Credit problem ঋণ সম্পর্কিত সমস্যা		1= Easy access to association/cooperatives 1= সমবায় / সংগঠনের প্রাপ্ত সুবিধা ভোগ 2= Loan taken from Bank 2= ব্যাংক থেকে ঋণ গ্রহন 3=
J4	Natural calamities প্রাকৃতিক দুর্যোগ		
J5	Financial problems অর্থনৈতিক সমস্যা		
J6	High input cost উপকরনের উচ্চ মূল্য		
J7	Water pollution (gas, bloom, bottom slug) পানির দূষণ (গ্যাস, ব্লুম, তলার কাদা)		

গোপনীয়

শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে

ওয়ার্ল্ডফিস সেন্টার বাংলাদেশ
এফটিএফ এ্যাকুয়াকালচার প্রজেক্ট

বেইজলাইন জরিপ ২০১২

Guildeline for FGDs

জরিপ পরিচালনায়

ডাটা ম্যানেজমেন্ট এইড

ইউএসএআইডি'র অর্থায়নে বাংলাদেশ সরকারের সহায়তায় ওয়ার্ল্ডফিস সেন্টার পরিচালিত
এফটিএফ এ্যাকুয়াকালচার প্রজেক্টের সহযোগীতায় পরিচালিত

FGD Guidelines for Aquaculture Farmer and Commercial Fish Farmer

Fish Cultured

- Pond preparation for fish culture
- Total Area of pond/s and production /unit
- Name of fish species
- Sources of fish seed
- Feed and fertilizer application
- Stocking density/decimal
- Duration of culture

Input Use

- Identification of input used for fish production
- Sources, percent of different inputs from different source, quality, price, cost per unit, problems, recommendations, etc.
    - Fish seed (Spawn, Fry and Fingerling)
    - Prawn or Galda PL(post larvae)
    - Feed
    - Fertilizer
    - Medicine
    - Liming
    - Others

- Source of financing (own, bank, NGO, Mahajan, etc. problems, suggestions)
- Harvesting (cost per unit)
- Grading (size, quality, varieties of fish, cost per unit)
- Processing (drying and others, cost per unit)
- Packaging (types, cost per unit)
- Seed (hatchery act) and feed policy issues

Marketing

- Markets (farmgate, local fisherman, local hats and bazaars, wholesale market, etc.) and actors-wise sale
- Average selling price obtained
- Satisfaction

Marketing Cost (markets and actors-wise per unit)

- Transportation (types, cost per unit)
- Load-unloading
- Market toll per unit
- Aratdar Commission
- Personal cost
- Others
- Pricing (pricing methods, who determines and how, level of satisfaction by the fish farmers and other Intermediaries)

Returns

- Employment Generation such as skilled, unskilled, family, hired (man-days, cost)
- Gross Return
- Gross Cost per Unit
- Net Value Addition
- Support for Technology Development
- Practice of Technology Development
- If not practicing, reasons.
- Over-all Problems and Constraints
- Recommendations and Suggestion

FGD with Fish Traders

- Types of fish purchased
- Average purchase of fish per day (% of amount from different sources, price, quality, problems and suggestions
- Average unit price of different fish
- Source of financing (own, bank, NGO, Mahajan, etc.)
- Cost of grading, packaging, processing, etc.
- Labour requirement (man-days and cost)
- Volume of sale per day
- Average sale price (fish-wise)
- Pricing (pricing methods, who determines and how, level of satisfaction by them and other Intermediaries)
- Satisfaction at the price of fish.
- Gross return per unit
- Gross cost per unit
- Value added per unit
- Number of farmers covered
- Supports for technology development
- Practice of technology development
- Modern packaging, processing, preservation, etc.
- If not practicing, reasons
- Facilities of preservation in the study area
- Over-all problems and constraints
- Recommendations and suggestion

FGD with Shrimp Farmers

- Coverage in the study areas
- Types of shrimp and prawn(Bagda or Golda)
- Culture practices, mono culture or poly culture or mixed with white fish
- Stocking density per unit area
- Duration of culture, starting and ending
- Crops per year
- Sources of seed and % from different sources (wild, hatchery raised, traders)
- Stage of stocking (post larvae, Juvenile)

Seed

- sources, % of seed amount from different sources, price of seed, quality,
- Problems with seed and suggestion
- Price of feed
- Other inputs used in shrimp culture: name, sources, ingredients, quality, price, problems and suggestions, etc.
- Production per decimal
- Grading (types: size, quality, variety-wise, cost per unit)
- Processing (types, cost perunit)
- Production cost per unit
- Sales (different markets, buyers-wise, price per unit)
- Satisfaction level
- Net value added
- Number of farmers and others benefitted from shrimp farming
- Over-all problems
- Suggestions

Feed Supply

- Sources of feed and % from different sources
- Types of feed, ready made commercial or home made pilets or mixture
- Name of company (in case of commercial ready feed)
- Ingredients of feed

Seed and Feed Policy

- Seed and feed policy and act issues

FGD with Carp Hatchery Owners

- Number of hatchery in this area
- Area of carp hatchery
- Name of fish/shrimp seed produced
- Sources of brood fish/mother species
- Number of brood fish ponds available
- Number of nursery ponds available
- Breeding activities done by whom? (self, appointed technician, others.)
- Employment generation (creation of man-days)
- Number of farmers and others associated
- Inputs used (sources, price, amount required, availability, quality, problems, etc.)
- Annual production capacity (Kg) of the hatchery
- Name of fish species breeding of which takes place in your hatchery(This item is same as sl 3)
- Production cost of seed/PL per Kg or per thousand

Seed and Feed Policy

- Seed and feed policy and act issues
- Production cost of seed/PL per Kg/1000
- Marketing (markets, buyers-wise, etc.)
- Market information (types and sources)
- Volume of sale per day, average sale price (fish-wise) and satisfaction
- Marketing cos per /unit
- Financing source

Sale

- Different markets, buyers-wise (nursery owners, fry traders, commission agents),
- Price/unit
- Satisfaction level

- Gross return per unit
- Net value added
- Support for technology development (fisheries officers, NGO personnel, others)
- Practice of technology development
- If not practicing, reasons
- Over-all problems
- Suggestions
- Market size and demand by species
- Major selling areas (district and upazila etc.)

FGD with Carp Nursery Owners

- Total area of carp nursery
- No. of pond in the study area
- Name and duration of fish species reared/nursed

Inputs used

- Fish seed (spawn), feed, etc.
- Sources, price, amount required,
- Availability, quality, problems, etc.
- Other inputs used (Feed, fertilizers, medicines)
- Financing (different sources, types, rates and procedures of payment and repayment, etc.)
- Production (size of fingerlings, Kg per decimal)
- Production cost of one kg of fingerlings (Tk by species)
- Volume of sale per day (Species-wise)

Seed and Feed Policy

- Seed and feed policy and act issues
- Marketing (areas, types of customers, etc.)
- Market information (types and sources)
- Average sale price (fish-wise)
- Gross return per uunit
- Value added per unit
- Pricing (pricing methods, who determines and how, level of satisfaction by the fish farmers and other intermediaries)
- Support for technology development (fisheries officers, NGO personnel, others)
- Practice of technology development
- If not practicing, reasons….
- Over-all problems/Constraints
- Recommendations/Suggestion
- Market size and demand by species
- Major selling areas (districts and upazila etc.)

Contact Details:

WorldFish Center

Bangladesh and South Asia Office
House 22B, Road 7, Block – F, Banani, Dhaka 1213, Bangladesh,
Tel: + (880-2) 881 3250, 881 4624 and 881 7300,
Fax: + (880-2) 8811151,
www.worldfishcenter.org

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