

# **BUSINESS SERVICE ASSESSMENT**

**Provision for good quality brood fish available in the market**

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*This DRAFT report, prepared by IDE and KATALYST with a view to feeding into the design of BDS market development interventions in the vegetable and pond fishery sectors, provides an overview of the sector and points to interesting avenues for further investigation (service channels, business case for delivery, links to competitiveness, etc.) and intervention design. This assessment report does not reflect KATALYST's current methodology and final conclusions on the sub-sector.*

**Table of Contents**

<b>1. THE PROCESS.....</b>	<b>3</b>
<b>2. DESCRIPTION OF THE SERVICE (PROVISION FOR BETTER QUALITY BROOD FISH AVAILABLE IN MARKET).....</b>	<b>4</b>
<b>3. RELATED SUB-SECTOR CONSTRAINTS .....</b>	<b>4</b>
<b>4. MARKET INFORMATION (SUPPLY AND DEMAND OF THE SERVICE) .....</b>	<b>4</b>
<b>5. CONSTRAINTS AND OPPORTUNITIES .....</b>	<b>10</b>
<b>6. PROVIDERS OF BROOD FISH TO TARGET BY IDE AND KATALYST .....</b>	<b>11</b>
<b>7. POTENTIAL IMPACT (OF IMPROVED BROOD FISH) ON THE RURAL MARKET.....</b>	<b>11</b>
<b>8. ILLUSTRATIVE INTERVENTIONS .....</b>	<b>11</b>
<b>9. CONCLUSIONS.....</b>	<b>12</b>

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**1. The Process**

IDE and KATALYST’s Rural Market Development analysis particularly on Pond Fishery conducted between June and September 2003 pinned down the major constraints besetting the sub-sector. For this analysis, over 70 Pond Fishery and related SMEs were visited and interviewed. A total of 19 (See Box 1.) constraints have been identified, described and catalogued. ....With these constraints, the team sketched out two broad yet possible business services that can address or strengthen the sub-sector.....

The team then filtered the services via a set of four criteria (potential impact that will take place, potential number of beneficiaries of the service, Seasonality and appropriateness for IDE and KATALYST). The objective of this filtering was to identify two initial services to focus on. The selected services were: (a) Provision for good quality brood fish available in the market (b) Provision for good quality, desired size and types of fingerlings available in the market.

**Box 1: Number of Constraints**

<i>Type of Constraints</i>	<i>Number</i>
Input Supply	2
Product Dev. & Process Tech	11
Policy	0
Market Access	2
Operation Environment	2
Organization/Management	1
Finance	1

After a series of deliberations, the team selected the former for the first service assessment exercise.

The team began by developing tools for assessing the demand (Hatchery Owners) and supply (Brood fish suppliers) of better quality brood fish. To gain deeper understanding of the constraints facing suppliers and users of brood fish, the team preferred qualitative over quantitative data capture questions. A sampling frame consisting of fourteen service providers and fourteen service users was planned. The actual business service assessment was carried out from 26 to 27 August, 2003.

The team consolidated its findings from 31 August to 1st September 2003. Then it formulated five underlying constraints, which hinder the smooth run of the service provision. Then it identified several interventions on which IDE and KATALYST can facilitate. The team also has a plan to arrange an FGD to validate the constraints related to the supply and demand of quality brood fish, b) propose initiatives to address these constraints and develop the markets for better quality brood fish.

After the FGD, the team will take a closer look at each proposed intervention in greater detail and select some intervention areas that IDE and KATALYST may seriously consider. To do this, the team will apply the following criteria: (a) extent of its impact (income, employment, etc.) on SMEs, (b) number of SMEs (both directly and indirectly) that will benefit, (c) cost-effectiveness of the intervention, (d) chances of the intervention yielding in sustainable results, (e) IDE and KATALYST’s capacity (including availability of human and financial resources) to implement or manage the intervention, and (f) time needed to complete the intervention.

### 2. Description of the Service (Provision for Better Quality Brood Fish available in Market)

The development and growth of pond fishery greatly depends on the provision and use of quality brood fish by the hatcheries. The effect of good or bad quality brood fish lasts in the entire fishery sub-sector value chain. Poor quality brood fish (immature or inbred) results in poor quality spawns, which ultimately implies to high mortality rate, less growth at hatchery, nursery and farmers' level. Again uses of inbred brood fishes leads to the production of such spawn whose ultimate growth is very poor.

This service assessment report deals with quality brood fish, which is very important for the entire pond fishery sub-sector value chain

The provision of quality brood fish requires: (a) selection and collection of the appropriate brood fish (b) appropriate management of brood fish rearing by the hatchery owners (c) awareness of not using inbred and immature brood fish for breeding.

#### Box 4: The Objectives of the Focus Group Discussion

- ✓ Validate constraints related to the supply and demand of quality brood fish
- ✓ Propose initiatives to address these constraints and develop the markets for better quality brood fish.

### 3. Related Sub-sector Constraints

Unavailability of quality brood fish (size, weight and age) forces the hatchery owners to go for inbred system, using immature/expire brood fish which leads to poor quality spawns resulting in less growth and high mortality rate of fingerlings/fish at nursery and farmers' level.

### 4. Market Information (Supply and Demand of the Service)

#### 4.1. The Brood Fish Supplier

The hatchery owners are currently collecting or using brood fish from two sources described below:

**Own collection:** Here the hatchery owners use a portion of the spawns produced in their own hatcheries (about 70%) and also those collected from rivers (about 30%) and then he rears them for producing brood fish. About 55% of their total brood fish requirement is fulfilled by the supply from rearing by themselves.

**Fish Farmers:** The hatchery owners purchase table fish from fish farmers for using as brood fish. This is usually happens when they cannot meet up their demand from their own source. About 45% of their total brood fish requirement is fulfilled by the supply from fish farmers.

The table1 shows the number of present suppliers of brood fish in three districts of greater Faridpur:

**Table: 1**

## Pond Fishery - Brood Fish

Thana wise supplier	District	Total Supplier
Sadar- 07 Modhukhali -15 Boalmari - 08	Faridpur	30
Baliakandi - 06 Sadar - 04 Goalanda - 03	Rajbari	13
Kotalipara - 05	Gopalganj	05

### Brood Banks:

Two Brood Banks (Govt.), one in Gopalgonj and another in Court Chandpur in Jhenaidah, are in the process of production of brood fish, which will start supplying brood fish in the market from 2004.

The primary goal of the Brood Bank is to supply and sell quality Brood Fish.

Their activities include:

- Spawn and fingerling collection from river
- Spawn production
- Brood fish rearing

It is important to mention here that there is no private brood bank in greater Faridpur supplying brood fish.

## 4.2. Market Size and Penetration

The number of Hatchery operating in greater Faridpur is fifteen of which fourteen have been interviewed. Out of these fifteen hatcheries two are run by government and the rest are by individual ownership. The hatcheries are dependent on their own source of brood fish for breeding; the rest of demand is fulfilled by the supply of other fish farmer's supply, which is basically table fish. About forty-eight numbers of such brood fish suppliers have been identified. Since no hatchery is found in Shariotpur and Madaripur, such brood fish supplier is not found their either.

## 4.3 The Demand-Side: The Brood Fish Users

Although a huge demand has been found for good quality brood fish, no brood fish supplier (exclusively or as major concern) is identified. The reason behind this is lack of initiatives in supplier level because of several causes, which are described later as constraints.

Table 2 shows the fifteen hatcheries identified in greater Faridpur:

**Table: 2**

District	Thana wise Hatchery	Total Hatchery
Faridpur	Faridpur - 02 Modhukhali - 05 Boalmari - 01	08
Rajbari	Baliakandi - 03 Sadar - 01 Goalanda - 02	06

Gopalganj	Kotalipara - 01	01
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### 4.3.1. Satisfaction

Since brood fish is used from two different sources described earlier, the satisfaction also differs in those two contexts. It is found that satisfaction is comparatively higher in case of own brood fish; this is due to the reason that themselves bring up those brood fishes and they looked after them considering the fact that they are going to be used as brood fish. But those brood fishes, which are bought from the farmers, are reared up not for the purpose to sell as brood fish rather as table fish. The following comparative features will delineate the overall satisfaction.

**Own Brood fish** - satisfaction is comparatively higher but still the hatchery owners feel that this is less than what they need. The features are:

- Spawn Production 80-90%
- Low mortality rate - 15%-20%
- Growth - near required level
- Appropriate age, physical factors and weight criteria are not met in 50-60% cases
- Transport over large distances is minimized.
- Hatchery owners are able to maintain quality as they rear the Brood fish from their own ponds

**Brood fish purchased and collected** from external sources - Satisfaction is very low. The features are:

- Reduced production (50-60%)
- High mortality rate- 30%-40%
- Low growth
- Genetic complications, e.g., inbreeding
- Inadequate Supply - only 60% available
- Problems with transport and conveyance
- Immature fish
- Low weight

The comparative picture shows that hatchery owners are to some extent satisfied by using their own brood fish, but since the entire demand is not met by their own reserve (limited pond, cost involvement, time involvement), they depend on other sources. It is important to mention here that the hatchery owners buy the table fish from the farmers to use as brood fish with 10% higher price than that which could be sold in the market as table fish. Again the hatchery owners are still ready to pay more if they get the right quality brood fish according to their demand.

**4.3.2. Awareness**

<b>Demand Side (Hatchery owners)</b>	<b>Supply Side (Brood fish suppliers)</b>
<ul style="list-style-type: none"> <li>70% Hatchery owners aware about quality Brood fish.</li> <li>They use 40-50% quality Brood fish, which is collected from the hatchery owner's own pond, and the rest collected from farmers pond and fish market are considered as non-quality brood fish.</li> </ul>	<ul style="list-style-type: none"> <li>Awareness level is very low owing to the fact that there is no actual Brood fish supplier in the greater Faridpur area. Hatchery owners use table fish cultivated by farmers as Brood fish.</li> <li>80% Farmers are not aware about the market demand for Brood fish</li> <li>Weak linkages with Hatchery owners due to irregular and erratic contact between brood fish suppliers and hatchery owners and the lack of a smooth and unhindered linking system.</li> </ul>

**4.3.3 Usage and Transactions:**

Table 3 shows the percentage of brood fish that hatchery owners use from different sources:

**Table 3:**

<b>Source</b>	<b>Ruhi</b>	<b>Katala</b>	<b>Mrigel</b>	<b>Silver Carp</b>	<b>Grass Carp/Common Carp</b>
<b>Own</b>	70%	70%	50%	35%	20%
<b>River</b>	-	-	-	-	-
<b>Table Fish</b>	30%	30%	50%	65%	80%

Table 4 shows brood fish use according to quantity, % share, average cost and total cost in the market as well as average use of brood fish by individual hatcheries/ year.

**Table: 4**

<b>Name of Pond</b>	<b>Average use</b>	<b>Total Use</b>	<b>% Share</b>	<b>Rate (avg.)/kg</b>	<b>Total Tk</b>
Ruhi	514 kg	7640 kg (191 mon)	33%	100	764000
Katala	280 kg	4280 kg (107 mon)	18%	100	428000
Silver Carp	202 kg	6160 kg (154 mon)	26%	75	462000
Grass Carp/Common Carp	405 kg	2240 kg (56 mon)	10%	65	145600
<b>Total</b>		<b>23360 kg (584 mon)</b>			<b>1997200</b>

Table 5 shows the price of the brood fish at which the hatchery owners are buying from the suppliers and actual price of the same weight fish at which it is supposed to be sold if it were brought up for the purpose of producing as brood fish. The price difference is due to the reason that the fishes sold as brood fish are not reared up as brood fish rather as table fish. The second column implies that hatchery owners themselves know that better quality brood fish would cost more and they have a good understanding on its price.

**Table: 5**

<b>Rate of Present Brood fish Tk/kg</b>	<b>Actual rate of quality Brood fish</b>
Ruhi = 80 -120	Ruhi = 150 - 200
Katala = 80 - 120	Katala = 150 - 200
Silver Carp = 60 -80	Silver Carp = 80 - 100
Mrigel = 60 -80	Mrigel = 100 - 120
Grass Carp/Common Carp = 60- 80	Grass Carp/Common Carp = 100 - 120

### **Mode of sales/ Transaction:**

- Cash
- Cash + Credit

About 70% Brood fish is sold in cash. The rest 30% is in cash-credit mode. Among this 30%, about 60% is paid on cash and the rest is in credit. Credit of 1 week to three months could be typical arrangements agreed upon. Alternatively, this could also extend to longer period; sometimes after the spawns produced are sold.

### **4.4 The Supply-Side: The Brood Fish Suppliers**

As described earlier the brood fish suppliers are basically the fish farmers who cultivate fish for the purpose of producing table fish. While producing in such way a number of big fishes remain in pond, which are collected by the hatchery owners. Quality Brood fish is not available. The supply of large fish is also quite erratic at best. 40-50% of quality Brood fish are being used presently.

#### **4.4.1 Seasonality**

For about half a year the hatcheries produce spawns and sell. So the purchase of brood fish is also biased by this seasonality factor. The following features could be mentioned here.

- Brood fish purchase period for rearing purposes: January - March
- Brood fish purchase for egg collection: March - May
- Spawn production period in hatchery: February to July
- Spawn collection period from river: June - July

#### **4.4.2 Relationships**

There is an ongoing relationship between the demand and supply side in most of the cases. It is found that the hatchery owners purchase brood fish from those farmers who used to collect spawns from them because they have their own nursery also. About 60%-70% of brood fish is collected from these type farmers. So when the farmers come to buy spawns the hatchery owners ask whether they have any big/ brood fish for sale. For fulfilling the rest of demand i.e. about 30%-40%, the hatchery owners search for farmers who are little bit larger and have

a better quantity of production. Then they go for it and purchase. In both the cases the demand side carries the transportation cost. Since both kinds of supply sides have not taken the brood fish selling as their major concern, services such as guarantee, after-sales service, transport and technical assistance are not provided.

**4.4.3 Users, Trends and Marketing**

The brood fish suppliers that are catering the hatcheries are still not considering brood fish cultivating as their main concern. They cultivate for producing table fish, after harvesting several times (2/3) the big fishes remained in the pond are sold as brood fish. The hatchery owners purchase those from them. Proactive marketing is not practiced. The farmers (having nursery) go to the hatchery for spawns and then the hatchery owners ask whether they have any big/brood fish. The supply chain is quite irregular as the hatchery owners collect fish for the purpose of brood from farmers at different locations and during different seasons of the year.

Table 6 shows the present trend of what type of brood fish the hatchery owners are using and a comparative picture of their requirements.

**Table: 6**

Criteria	Standard					Current practice					
Type	Ruhi	Katala	Mrigel	Silver	Grass/Common carp	Ruhi	Katala	Mrigel	Silver	Grass/Common carp	
Age	2-3 years	4-5 years	2-3 years	2-3 years	2-4 years	1-2 years	3-4 years	1-2 years	1-2 years	1-3 years	
Physical Factors	Energetic Physical fitness Healthy (disease free) Spotless Strong Shining Maintenance of appropriate density: 75 to 100 fish in the appropriate age and weight (150-160 kg) are reared per 33 decimals of pond area					Reduced energy levels Strength levels are below requirements 70% of the fish are spotless 200 to 300 fish are reared per 33 decimals of pond area; size, age and weight are not adhered to at all.					
Weight (kg)	1.5+	3+	2+	1.5+	3+	2+	1.5+	3+	2+	1.5+	3+

**4.4.4 Capacity**

It is found that 48 suppliers are supplying about 45% total requirement of brood fish to the hatcheries Faridpur. Table 7 shows the number of brood fish suppliers in greater Faridpur at different thana levels.

**Table: 7**

<b>District</b>	<b>Thana wise supplier</b>	<b>Total Supplier</b>
Faridpur	Sadar - 07 Modhukhali -15 Boalmari - 08	30
Rajbari	Baliakandi - 06 Sadar - 04 Goalanda - 03	13
Gopalganj	Kotalipara - 05	05

Table 7 shows the supply volume of fourteen interviewed brood fish suppliers according to different types of fish.

**Table: 7**

<b>Type</b>	<b>Quantity</b>	<b>Rate</b>	<b>Total (Tk)</b>
Ruhi	1320 kg	100	132000
Katala	400 kg	100	40000
Mrigel	400 kg	75	30000
Silver Carp	1600 kg	65	104000
Grass Carp/Common Carp	1600 kg	65	104000

#### **4.5 Conclusions on the Brood Fish Market**

Irrespective of size and production volume the hatchery owners have high awareness of the need for quality brood fish. However, the current usage is still very low compared to what it should be. Hence, the satisfaction level is very low. Meanwhile the brood fish suppliers have relatively low perception and knowledge of the existing potentials of good quality brood fish. They still are not taking brood fish production and selling as their major concern rather doing table fish production knowing its definite market and profitability. Moreover, this also prevented them from improving their awareness of technical options that eventually postponed or delayed their investments in rearing brood fish properly.

#### **5. Constraints and Opportunities**

With the Business Service Assessment survey, the IDE and KATALYST team identified five main constraints that hinder the provision of good quality brood fish. These have to be presented, discussed and validated by the FGD participants. The validation process will be consisted of four steps: (a) validation of business service constraint, (b) validation of constraints to the provision of the business service, (c) parameters for the formulation of interventions, and (d) formulation of interventions (e.g., what the participants and the IDE and KATALYST can do to resolve the constraint). The five constraints are:

1. Lake of knowledge of the brood fish cultivators about the rearing procedure technique leads in low quality brood fish, which produce weak generations next.
2. Lack of awareness of the hatchery owners about the spawn which are collected for producing brood fish leads them use inbred ones, spawn from immature fish etc. which ultimately produces non quality brood fish.

3. Lack of finance of the farmer leads regenerate their running capital by selling small fish for which they don't go for long time brood fish production
4. Lack of security for fish cultivation the farmer not go for producing brood fish which takes longer time (3-5 years)
5. Absence of any entity producing/selling good quality brood fish exclusively in the market leads the hatchery owners buy /use normal fish as brood fish.

### 6. Providers of Brood Fish to Target by IDE and KATALYST

### 7. Potential Impact (of improved brood fish) on the rural market

By improving the quality of brood fish, the pond fisheries sub-sector is expected to: (a) achieve higher quality fingerlings, (b) reduce mortality rate of fingerlings, (c) increase growth, and (d) upgrade the technical skills of the workers. Directly, the brood fish can increase the volume of products exported or delivered for the high-end consumers, and assist low end producers to access or penetrate the higher-end markets. Both can reduce their production costs and wastes thereby increasing the sub-sector's competitiveness.

### 8. Illustrative Interventions

After the service assessment still we are on process for arranging a FGD to validate what we have found in the field. But from our field experience and our team meeting we have summed up the following potential interventions where IDE and KATALYST facilitation may be needed:

**Constraint 1: Lack of knowledge of the brood fish cultivators about the rearing procedure techniques leads to low quality brood fish, which produce week generations next.**

#### Proposed Facilitation Activities:

- Arrange training program on brood fish cultivation method for the farmers
- Arrange visit program for the brood fish cultivators to show the model brood bank
- Establish linkage between the brood fish cultivators and the experts on this context for the access of information.

**Constraint 2: Lack of awareness of the hatchery owners about the spawn which are collected for producing brood fish leads them use inbreed ones, spawn from immature fish etc. which ultimately produces non quality brood fish.**

#### Proposed Facilitation Activities:

- Awareness campaign for the hatchery owners for not to use inbreed and immature brood fish for spawn.
- Arrange visit program for the hatchery owners to show the model hatchery

#### Box 5: IDE and KATALYST's Interventions Selection Criteria

- ✓ Extent of its impact (income, employment, etc.) on SMEs,
- ✓ Number of SMEs (both directly and indirectly) that will benefit
- ✓ Cost-effectiveness of the intervention
- ✓ Chances of the intervention yielding in sustainable results
- ✓ IDE and KATALYST's capacity (including availability of human and financial resources) to implement or manage the intervention
- ✓ Time needed to complete the intervention.

**Constraint 3: Lack of finance of the farmers leads regenerate their running capital by selling small fish for which they don't go for long time brood fish production.**

**Proposed Facilitation Activities:**

- Establish linkages with the financial institutions to have loans
- Arrange training for the interested entrepreneurs on banking procedures for obtaining bank loan
- Identify potential investor in brood fish farming

**Constraint 4: Lack of security for fish cultivation the farmer not go for producing brood fish, which takes longer time (3-5 years)**

**Proposed Facilitation Activities:**

- Explore and identify security service
- Establish linkages with the security service providers

**Constraint 5: Absence of any entity producing/selling good quality brood fish exclusively in the market leads the hatchery owners buy /use normal fish as brood fish.**

**Proposed Facilitation Activities:**

- Identify and develop a hatchery owner for producing and supplying quality brood fish.

## **9. Conclusions**

The team has identified four areas of possible interventions that could be verified in the validation workshop:

- Establish brood bank;
- Provide training on brood fish cultivation methods;
- Create a spawn/ breeding awareness campaign; and
- Links cultivators to both experts and financial institutions.

**Respondent List for Business Service Assessment**

<b>No.</b>	<b>Name</b>	<b>Type</b>
1	Akram Hossain (Agrogami Mothsho Khamar)	Hatchery Owner
2	Ali Haider (Al-Amin Mothsho Hatchery)	Hatchery Owner
3	Atikur Rahman	Hatchery Owner
4	Mr.Shahjahan	Government Hatchery (Rajbari)
5	Ms. Nibedita	Government Hatchery (Faridpur)
6	Rajanath Sarker (Gopinath Hatchery)	Hatchery Owner
7	Md. Ali	Hatchery Owner
8	Abu Bakkar Mollah	Hatchery Owner
9	Motahar Hossain Sarder	Hatchery Owner
10	Liakot Mollah	Hatchery Owner
11	Mamun (Maa Hatchery)	Hatchery Owner
12	Rafikul Islam	Hatchery Owner
13	Fazlul Hoque	Hatchery Owner
14	Abdus Salam Sorder Hobi	Government Hatchery (Jessore)
15	Kabul Hossain	Brood Fish Supplier
16	Mosharrof Hossain	Brood Fish Supplier
17	Ananda Halder	Brood Fish Supplier
18	Munshi Ragib Ahsan	Brood Fish Supplier
19	Reazul Karim	Brood Fish Supplier
20	Latifur Rahman	Brood Fish Supplier
21	Abdul Motalab	Brood Fish Supplier
22	Ranjit Sarker	Brood Fish Supplier
23	Motiar Rahman	Brood Fish Supplier
24	Abdul Mannan Gazi	Brood Fish Supplier
25	Romzan Bishwas	Brood Fish Supplier
26	Karim Mollah	Brood Fish Supplier
27	Tamiz Uddin Sheikh	Brood Fish Supplier
28	Mizanur Rahman	Brood Fish Supplier