Open Water Fish Farming in Fallow *Beel*: For Food Security & Poverty Alleviation

Background

The *Pataliar beel* (wetlands) which is surrounded by Bhaughannagar, Gowalkhali and Bittipara villages of Shailkupa sub-district under Jhinaidha district used to remain fallow particularly during the rainy season. Once upon a time, the farmers of the surrounding villages cultivated *aman* rice of local varieties namely *Kalomanik*, *Gandhakastor, Murkimala, Kalamucha, Ghuran, Sadakucha* in the higher lands inside the boundary of the *beel*. But, due to sudden excessive rainfall resulting in flash flood during last few years, the cultivation of *aman* rice was almost stopped. Learning about this situation, the staffs of Unnayan Dhara (UD), an NGO, distributed some deep-water *aman* rice seeds of the varieties namely *Jatabaula, Ajaldigha, Boran and Metegaral* in 2009 collected from Pabna region as part of the discussion and decision with the farmers of the Swadhin Krishak Sangathan – SKS (Independent Farmer Organization) of Bhaughannagar village. It is to mention here that UD has been facilitating the formation process of SKS in the area since 2008. However, in that year 07 farmers cultivated deep-water *aman* rice as trial in 10 bighas of land and got good yields. Being inspired from this result almost all farmers cultivated deep-water *aman* rice in the entire *beel* in the next year 2010. But very unfortunately, an early flash flood occurred in that year just after sowing of the seeds leading to total damage of the rice crop.

In that circumstances, the staff of UD motivated the members of SKS for fish culture in the *beel*. It is to mention here that UD staff motivated the farmers for fish culture also in the previous year 2009 which was not possible at that time due to lack of proper initiatives in time. Besides, the most of the lands of the *beel* are owned by the farmers outside of the SKS because the members of the SKS are mainly small, marginal and landless farmers. Moreover, the lands of the *beel* are owned by the farmers of three villages namely Bhaughannagar, Gowalkhali and Bittipara. Besides, no SKS was organized in Bittipara village until that time. Therefore, it was very much difficult task to organize all the farmers of three villages within short time. However, due to hard works of the farmer organizations leaders of Bhaughannagar and Gowalkhali villages it was possible to take the initiatives of fish culture in the Pataliar *beel* during the monsoon of 2010. As most of the farmers involved with fish culture were from outside of the SKS so a separate project implementation committee consisting of 11 members, including five members from SKS was formed according to the suggestions of UD staff, which successfully implemented the fish culture activities.

Study Area

The study has been conducted at Pataliar *Beel*, Bhaughannagar, Gowalkhali and Bittipara villages of Shailkupa sub-district under Jhinaidha district.

Objectives of the Study

Early and excessive rainfall that causes water logging and flash flood during last few years have become a severe problem in the study area specially in cultivating *aman* rice. As a result, the standing crops specially *aman* rice are being damaged and the farmers have to count financial loss in regular basis that discouraged the farmers to cultivate *aman* rice. In order to combat this problem fish culture was initiated in the *beel*. Hence, the objective of the study is analyzing the positive impacts of fish culture in the *beel* in terms of optimum use of natural resources as well as financial benefits of the farmers.

Description of the Activity

The implementation committee of fish culture project initially discussed with the SKS leaders & the landowners, fixed the price of each share of the project at BDT 6,000, and thus managed to sell 64 shares. Bhaughannagar SKS managed to buy 08 shares with its savings of BDT 28,000 and grant from UD BDT 20,000. On the other hand, Gowalkhali SKS managed to buy 04 shares with its savings BDT 14,000 and grant from UD, BDT 10,000. The rest 52 shares were purchased by the landowners. It is to mention here that each member of Bhaughannagar & Gowalkhali SKS deposits BDT 20 and subscribe BDT 02 every fortnightly.

The total area of the *beel* is approximately 3-4 thousand *bighas* where water is available in only 500/600 *bighas* at a depth of 4-5ft for 6-7 months in a year which is suitable for fish culture. Besides, the *beel* is connected in five places with canal & river. So, before releasing fingerlings in the *beel* the openings were closed with bamboo, iron net & thread net in such a way that water can easily passes through but not the fishes or fingerlings to the canal or river. On the other hand, there were seven *Afas* in the *beel,* which were taken lease from their owners by dint of certain amount of money i.e. bigger sized *Afa* for BDT 6,000 each, medium sized for BDT 5,000 each, smaller sized for BDT 4,000 each and the very small sized for BDT 3,000 each.

Table-1: The quantities and prices of fingerlings released in the *beel* in 2010 according to the species of fishes are presented in the table below.

Name of Fish variety	Price/KG	Quantity KG	Total price
Rui	120	676	81120
Katla	130	212	27560
Mrigel	120	119	14280
Bighead	80	131	10480
Mirror carp	150	660	99000
Japani Puti	140	28	3920
Silver carp	75	60	4500
Black carp	180	80	14440
Grass carp	200	367	73400
Total		**2333**	**328700**

It is seen from the above table that a total 2333 kg of fingerlings were released in the *beel* at a cost of BDT 328,700. It is mentionable that the size of the fingerlings of the species namely Rui, Katla, Mrigel, Bighead, Mirror carp, Silver carp, Black carp, Grass carp were more than 4 inches while the size of Japani puti were 1.5-2.0 inches. Bigger sized fingerlings were released so that the predator fishes cannot hunt them and the fishes become bigger size within the short period of 6-7 months when there is water in the *beel*. The fingerlings were collected from Barobazar Hatchery in Jessore through the local fingerlings traders.

The cost of production of fishes was very low in fact, there was no much cost other than the cost of fingerlings because no artificial feeds were used in fish culture. There was some cost for guarding the fishes from stealing. During initial two months, the shareholders themselves guarded the fishes by turn on voluntary basis. After that four paid guard were engaged at a wage of BDT 100 each per night. Four small houses were also built with bamboo and straw for the guards in four sides of the *beel*.

In order to assess the production of the fish some fishes were caught at early October. Then from the early November catching and selling of fishes was started that continued up to end of January. The local fishermen were engaged for catching and selling of fishes. According to the farmers the production of Bighead (weight 3 to 4 kg each) and Silver carp (weight 2 to 2.5 kg each) were very

good. On the other hand, the production of other fishes such as Rui, Katla & Mrigel (weight 1 to 1.5 kg each), Mirror carp (weight 1.5 to 2 kg each), Black carp & Grass carp (weight 2 to 2.7 kg each) and Japani puti (weight 0.5 kg each) were also good. The fishes were sold to the local fishermen at the rate of 85 BDT/kg for Bighead & Silver carp while the other fishes at the rate of 95 BDT/kg. The following table shows the income-expenditure and net profit of the project:

Table-2: Expenditure, income and net profit from fish culture in 2010.

Expenditure (BDT)	Expenditure (BDT)	Income (BDT)	Total Income (BDT)
Fingerlings	328,700	Fishes sold 13400 kgs	1,236,320
Guard & others	35,000	Fishes of Afa sold	60,000
Afa lease	30,000	**Total**	**1,296,320**
Total	**393,700**		
Net profit (1,296,320-393,700)= BDT **902,620**			

The figures presented in the table shows that the total expenditure of the project was BDT 393,700 while the total income was BDT 1,296,320 and the net profit was BDT 902,620, which is about 229%. On the other hand, each shareholder got return of BDT 20,255 with a net profit of BDT 14,103 by investing only BDT 6,000. It is to mention here that the Bhaughannagar and Gowalkhali SKS purchased 12 shares with an amount of BDT 72,000 and got return of BDT 243,060 with a net profit of BDT 171,060.

There were also various kinds of natural fishes, which were not caught during catching fishes so that those get more time to grow and gather in the *Afas* because at the end of the season the demand of those fishes become higher and the prices also go higher. After finishing of the catching cultivated fishes the seven *Afas* were sold for BDT 60,000 which were purchased by 10 farmers. Later on the farmers caught the fishes of *Afas* by bailing out water three times and got huge amount of natural indigenous fishes of various species namely Taki, Shing, Tengra, Bine, Bele, Puti, Khalisha, Kai, Mola, Shoal, Magur and to name a few. According to the opinion of local people such amount of natural fishes were never seen over last several decades. As reason behind this the local people told that every year catching of these fishes is started just at the beginning of the hatching period, which was not possible last year due to fish culture. According to the data from the farmers who purchased the *Afas* they could sell the fishes for an amount of approximately BDT 120,000 after huge amount of family consumption and distributing among the relatives. They also told that there are still good quantity of fishes under the mud of *Afas* which will be multiplied in the next year. They also told that many species of indigenous fishes such as Royna, Pabda, Sarputi, Chela, Gajar are already disappeared from the area.

Impacts

A total of 172 members (86 male & 86 female) of the Bhaughannagar and Gowalkhali SKS who are small, marginal and landless farmers have become economically benefited from the fish culture. The money has been added to their deposits, which they have been reinvested in different income generating projects like cow, goat & poultry rearing. Not only the farmers but also the local fishermen and fingerlings traders have become directly benefited from the fish culture.

The fishes of the *beel* were sold at a rate of BDT 120 to 150 per kg in the local markets that indicate that the fishermen made very good profit out of the fishes without investing any money because they paid money after selling the fishes. It is to mention here that the local people could buy the fishes at wholesale rate i.e. BDT 85-95 per kg which is much lower than the market price. As a result, the people of surrounding villages irrespective of poor & rich consumed significant amount of fishes.

Apart from the surrounding villages, many people from far places also purchased the fishes at wholesale price though their relatives in the surrounding villages not only for low prices but also for unique taste of the fishes mainly because no artificial feeds were used for fish culture.

It is obvious that the supply of fishes in the area is increased due to the project. During fish harvesting period, everyday about 10 mounds of fishes were supplied and sold in the nearby markets and people showed eagerness to buy these fishes rather than other fishes in the markets. Poor families also could afford buying these fishes due to low price compared to the fishes sold in the markets. According to the villagers, since these fishes are tasty and fresh, they even shared the fishes with their relatives at nearby villages, which strengthened their relationship. The surrounding people of Pataliar *beel* got such an opportunity of sending fresh fishes to the relatives after many days which was a regular practice once upon a time when the fishes of this *beel* was famous in this area.

On the other hand, since the project is profitable, landowners showing eagerness to buy more shares of the project. There is also a negative impact of it that the members of the SKS who are the real initiators of fish culture are under threat of not getting expected numbers of shares in next year because they do not have much land in the *beel* as they are mainly small, marginal & landless farmers. It is interesting that, being profitable last year, one of the big land owners of the *beel* has decided for fish culture with his own initiative and he has already built a boundary with bricks surrounding his land.

Being inspired from the result of this project the SKSs of nearby villages have already decided for fish culture in the *beels* of their villages. For instance, the SKS of nearby Putimary and Ashannagar villages have decided for fish culture in their local Paingar *beel* and Muchra *beel* respectively from the year 2011.

Future plan

It is realized by the farmers that because of having no skill & experiences the expenditure was little higher in the first year. Therefore, they are expecting to cut off some expenses leading to increase of their profit. They have planned to purchase a small boat for guarding the fishes, which will also reduce their cost. Besides, last year they did not release sufficient amount of fingerlings due mainly to lack of experience, which will be doubled this year and expected to get more production and profit. Besides, the number of shares will be increased this year because more landowners are showing keen interest to purchase shares. Moreover, in the last year, no payment was made to the landowners who remained outside of the project but this year they are claiming fare for their lands. So, it is decided to pay lump sum money as fare for their lands.

On the other hand, this year they have planned to cultivate rice and fish together. So, they have decided not to release any fingerlings of grass carp fish because grass carp feed on the rice plants. They also feels need of training for better management of the project and they have already demanded the training from UD.

Conclusion

Bangladesh has uncountable number of *beels* throughout the country, which are flooded during the rainy season and remain fallow. Once upon a time, there were huge of natural fishes available in the *beels*. The farmers also cultivated deep-water *aman* rice in the *beels*. But, due to change in cropping pattern and use of excessive agrochemicals the availability of natural fishes have drastically been reduced. The presented case shows that the availability of fishes can be increased significantly by fish culture in the *beel* without using any artificial feeds (like wheat, maize etc. which are food for human being) as fish culture in the ponds that is happening throughout the country. Thus, the supply of protein can be increased significantly along with ensuring financial benefits of the poor people leading to their food security and poverty alleviation.