

**Impact of Fishery Village Program (FVP) under Fourth
Fisheries Project on floodplain aquaculture and
community at Laksham Upazila**



**Fisheries and Marine Resource Technology Discipline
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Fisheries Project on floodplain aquaculture and
community at Laksham Upazila**

A Project Thesis

By

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**Impact of Fishery Village Program (FVP) under Fourth
Fisheries Project on floodplain aquaculture and
community at Laksham Upazila**

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DECLARATION

The results submitted in this project thesis are entirely of the candidate's own investigations and no part of the results has been accepted for any degree, nor it is being concurrently submitted for any degree.

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TO

MY BELOVED PARENTS

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The Author

ABSTRACT

Bangladesh is blessed with large inland depressed water bodies. Most of the inland water resources are flood plains and remain uncultured due to lack of extension, proper management and culture techniques. The training and extension component of Fourth Fisheries Project launched a program titled "Fishery Village Program" during 2000. The studies were conducted on three Fishery Villages of Laksham Upazila during January, 2002 to December, 2002. Objectives of the study were to assess the FVP and its impact on fish culture, floodplain use and community. Different prescribed formats were used in this study. The study revealed that seasonal water bodies can be brought into culture system by a community based management. Production rate was increased from 0.14 Kg/decimal to 3.96 Kg/decimal after the practice of community based management system. Fish production, consumption and income have increased in three Fishery Villages which ensure the positive impact of FVP on the community livelihood. However, land use conflicts and restriction of marginal farmers involvement is a prominent drawback of the project. With the consideration of above mentioned limitations and with further modification the model can be practiced for floodplain aquaculture.



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Chapter One

Introduction

1.1 Flood plains in Bangladesh: The term flood plain is generally applied to low-lying areas which are seasonally flooded by rivers during monsoon and remains submerged for 4-6 months varying from 1 meter to 4 meter. This vast open water bodies or rice canopy provides natural habitats for various aquatic resources including wild fishes and prawns (Das *et al.*, 1990).

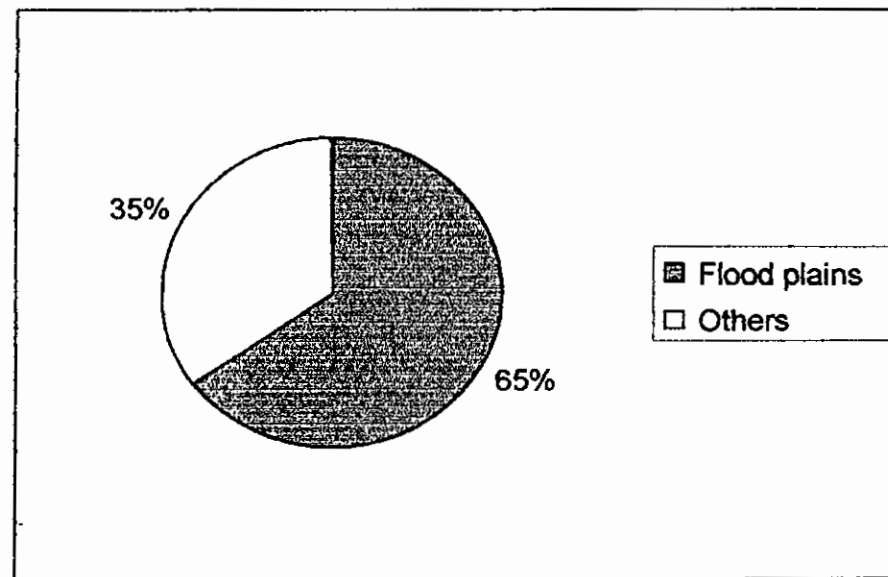


Fig-1: Flood plains under inland water bodies of Bangladesh

Bangladesh has the richest inland fisheries resources of the world being blessed by nature with largest water bodies (Nuruzzaman, 1990). Sixty five percent of total inland water resources are flood plains covering an area of 28, 34,008 hector. About 34 percent of the country's area is under water almost six months each year (BSS, 1996)

1.2 Scope of Seasonal Fish culture in Flood plains: Despite this natural wealth, however, fish stocks in the flood plains have been the declining sharply because of over fishing, indiscriminate use of pesticides in crop productions, and lack of fisheries management and conservation program. This can be offset by the adoption of culture based fisheries technology in flood plains and management (Nuruzzaman, 1993). Aquaculture offers potential for replacing capture fisheries and increased fish production by proper utilization of these water resources. Fish culture in paddy fields is extensive and well developed but in most cases, this

refers to growing fish in shallowly flooded rice growing areas (Tuyen *et al.*, 1991). Deepwater rice area generally rich in phytoplankton, zooplankton and detritus materials. Many of the floating or submerged aquatic weeds are palatable feed for fish species and can reduce feed cost. Rearing of different fish species will open up ways for farmers obtaining additional income and high protein food source (Hazarat *et al.*, 1993)

1.3 Flood plains under Laksham Upazila: Total Area of Laksham Upazila of Comilla District is 42,289 hectors (BSS). Forty four percent of the total area of the Upazila are low lying paddy fields which are seasonally flooded during monsoon and remains submerged for 5-7 months (DOF, Laksham).

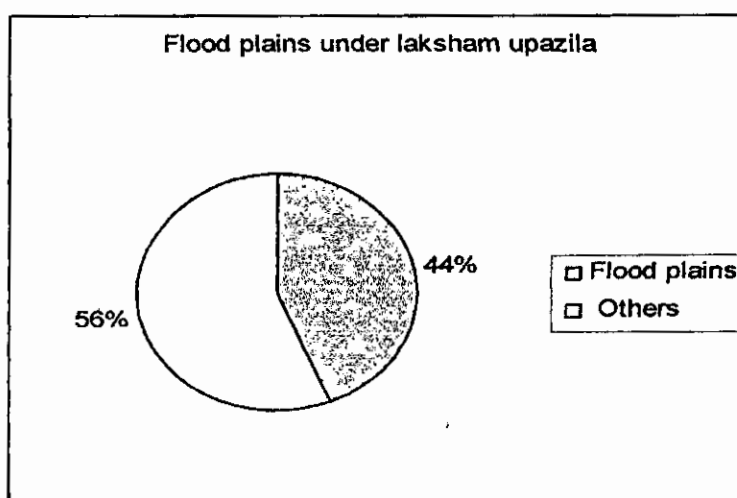


Fig-2: Flood plains under Laksham Upazila

These floodplains are open, semi enclosed or bounded by road infrastructures. Despite tremendous scope for utilization of these resources for culture, most of the floodplains are uncultured due to lack of weak extension, proper management and culture technique. It is possible to grow fish at the rate of 800 kg per acre by seasonal fish culture in flood plains (Mollah, 2001).

1.4 Fourth Fisheries Project: The Fourth Fisheries project (FFP) is the largest fisheries project in Bangladesh. It is being implemented by the Department of Fisheries.

The project aims at increasing fish and shrimp production in Bangladesh and helping alleviate poverty. It was launched in 1999-2000 for duration of five years.

1.5 Fishery Village (FV) Program at Laksham Upazila: Aquaculture extension is a system of educating and training rural people to develop fish farming skills and capabilities so as to increase fish production efficiency every where what ever the water bodies available and there by raise the fish. It is an educational process in which new aquaculture information is disseminated to farmers from the researchers, like any extension workers aqua culture extension is a non-formal education system (Nuruzzaman, 1993). The training and extension component of Fourth Fisheries Project is implementing "Fishery Village Program" . Twenty-five (25) farmers are selected for training from each village. The implementation of this program has started at Laksham Upazila from the year 2000. Upazila team has formed Forty (40) Fishery Villages and one thousand (1000) farmers have already received training by this programme. Out of Forty (40) Fishery Villages, only three (03) Fishery Villages were implemented on seasonal fish culture in flood plains. Twenty- five (25) farmers formed a group in each Fishery Village and worked together in the same water body/floodplain.

1.6 Importance of the study: According to collected literatures and reports, it was found that there was no impact assessment work concerned with the FVP by any external authorities. Moreover, impact assessment will reflect the drawbacks and potentialities of the project which will inform the level of outcomes from the project and will help to sustain project activities.

1.7 Objectives: The following objectives were considered for the present study.

- To know the impact of FVP on fish culture.
- To know the impact of FVP on the use of flood plain.
- To know the impact of FVP on primary stakeholders (Farmers).
- To assess the FVP.

Chapter Two

Methodology

The study was conducted in three Fishery Villages of Laksham Upazila where Forth Fisheries Project (FFP) has completed its training program. These Fishery Villages are Gobindapur, Sateswar and Jaora. All these Flood plains are completely closed system flood plain and regulated by several sluice gates. The area of Gobindapur, Sateswar and Jaora Fishery Villages flood plains are 32.50 acre, 37 acre and 50 acre respectively. All these flood plains are prone to monsoon flooding and remain flooded for periods between four and seven months depending on the severity of flood in different years. During the dry season, however, water of the flood plains shrinks to a negligible amount and most of the dried up land is cultivated with single rice crops. The study was conducted during January, 2002 to December, 2002.

The study considered the Farmer Baseline Survey results (Annex-I). Formats on Impact assessment of Training Program: (Annex-II), (Annex-III), (Annex-IV), (Annex-V) were also in consideration during the study. Collected data by using the above mentioned formats were analyzed and assessed for the key findings of the study.



Chapter Three

Results and Discussion

3.1 Aquaculture management system before Fishery Village program: Previous management system in three selected flood plains was almost same. There was no stocking of the rice fields with fish. Generally these flood plains remain dried from the month of December to March. During monsoon flood water enter into these rice fields and gradually covered the whole area. Wild fish stocked naturally with flooding.

3.2 Present Management System under FVP:

3.2.1 Fourth Fisheries Project: The Fourth Fisheries Project (FFP) is the largest fisheries Project in Bangladesh. It is being implemented by the Department of Fisheries (DOF), Ministry of Fisheries and Livestock. To put it simply, the project aims at increasing fish and shrimp production in Bangladesh and helping alleviate poverty. It was launched in 1999-2000 for duration of five years. The project has four components: Management of open water inland fisheries; Aquaculture extension and training; Shrimp and coastal aquaculture and Biodiversity studies. Among four, aquaculture extension and training (AET) is a major component.

The aquaculture extension and training component of forth fisheries project aims to provident opportunity of sustainable increase of fish production in the country. In two ways; firstly by increasing the area of fish culture and secondly by increasing the productivity through improved water body management. It will also strengthen extension links by which newly research technologies reach farmers and improved management of fisheries at Upazila level through greater co-operation between DOF and the private sector.

The extension approach is based on the village model, called Fishery Village (FV) approach in each fishery village, 25 farmers are trained. The project plans to trained 2, 00,000 farmers in 8 thousand villages in 200 Upazilas in 30 districts over the life of the Project.

3.2.2 Aims of Fishery Village (FV) Program: The Fishery Village (FV) Program aims to increase fish production in two ways; firstly, by expanding the area of water bodies presently under culture. It may be by improving derelict water body, fish culture in rice fields, pen culture, cage culture etc.

Secondly, by increasing productivity through improved management. It may be by increasing the existing production rate in culture able water bodies. For example: If the present production rate is 1–2 Mt/ hac/ year, it should be increased 3 Mt /hac/year production level or above.

3.2.3 Implementation Fishery Village program: Twenty-five (25) interested farmers were selected from a village for each Fishery Village by PRA (Participatory Rural Appraisal). The training was provided in six sessions over two years. It includes three follow up sessions in the second year and is backed by extension lecture. Trainings were provided to selected farmers phase by phase within two years. First year three (03) Technical training (TT) were provided and next year two (02) follow up training were provided.

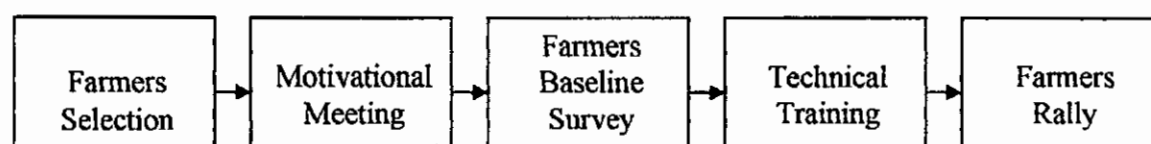


Fig-3: Flowchart of implementation of Fishery Village Program.

A. Farmers selection: Criteria for Farmers selection:

- ❖ Should be pond owner or lessee, or interested to culture in rice fields/flood plains or pen or fish fry trader or fish trader;
- ❖ Should be co-operative;
- ❖ Agree to communicate with extension workers.

B. Motivational training/Meeting: After selection of a fishery Village a motivational training or meeting is arranged in the area/ locality. The aims are:

- ❖ To create an environment for awareness building.
- ❖ To identify the prospect and cultural able area for fish culture by active participation of the stake holders.

- ❖ To select the interested farmers and a leader of the group.
- ❖ To explain the benefits given by FFP team.
- ❖ To explain the necessity of training.
- ❖ Try to involve local leaders, UP members, Mosque Imam, Local elites etc in the program.
- ❖ To explain the success of the FV program with employment, women's participation, nutrition and poverty alleviation of the locality.

C. Base line survey: Farmer's base line survey was conducted by the Upazila team member of the Department of fisheries (DOF), in instructed format, farmer baseline survey questionnaire (Annex-1). The objective of Farmers base line survey was to gather management information on the type and size of water body and type of groups was formed in the fishery village. The findings of the survey will provide a general baseline for future impact of the studies of the project.

D. Training conducted by Upazila team: The training was provided in six sessions over two years. It includes three follow up sessions in the second year and was backed by extension lecture. Trainings were provided to selected farmers phase by phase within two years. First year three (03) Technical training (TT) were provided and next year two (02) follow up training were provided.

Subject of farmers training are: a) Embankment reparation/preparation; b) De weeding; c) Eradication of non-target species; d) Pre stock lime application; e) Pre stock fertilizer application; f) Type of species; g) Post stock fertilizer application; h) Post stock feed application; i) Partial harvesting; j) Re-stocking; k) Final harvesting and l) Problem and risk (Disease, Oxygen shortage, Poaching)

3.2.4 Management and Culture Techniques:

Formation of a Project Implementation Committee (P.I.C): Different committees were formed from twenty-five (25) farmers in each Fishery Village for the

implementation of the project. There was a standing committee; a sale committee and rest of them is member.

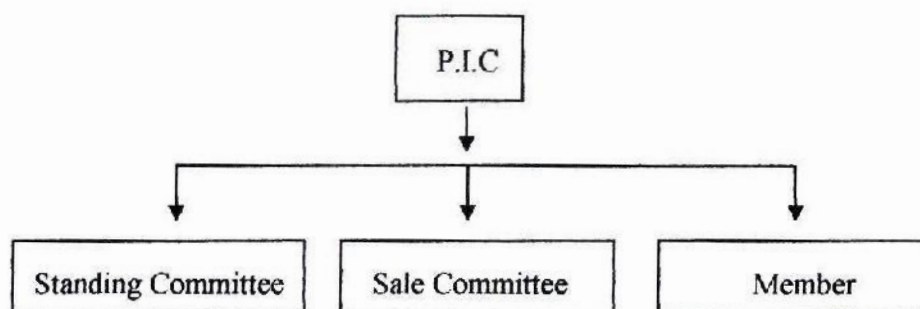


Fig-4: Organogram of a Project Implementation Committee

Project Implementation strategy: There was a joint account in a local bank. Total operational cost was deposited on this account. Each member contributes same amount of money. Owner of land within the project were given lease value. After fish sale all the money was deposited on the account. At last, a general meeting was called and profits were equally divided to the farmers.

Culture Techniques: Flood plains aquaculture normally started during January/February. In dry season embankments preparation/repair, sluice gates, preparation of ditches/ponds within the projects were completed. When rainy season started (April-May) flood water enter into the project and ditches/ponds within the project were filled with water. Fingerlings were introduced to the project. At the recession of floodwater, farmer's started to prepare their rice field for rice cultivation. In a year farmer got only one rice crop from these lands. Finally fishes were harvested from ditches/ponds during December-January.



Activities	January to December											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Embankment/Sluice gate preparation												
Ditches within the project Preparation												
Fingerling introduction												
Tilling/ De weeding												
Lime application												
Fertilizer application												
Supplementary feed application												
Partial harvest												
Final harvest												

Fig-5: Time Frame and activities chart of flood plain aquaculture

A. Project preparation or reparation: Firstly, wild fishes or non-target species were captured from ditches/ponds situated within the project. Then lime (CaCO_3) was applied at the rate of 0.5 Kg. to 1 Kg per decimal. Before introduction of fingerlings, fertilizers were applied. Urea and TSP were applied at the rate of 20-30 Kg per acre and 15-20 Kg per acre respectively. After harvesting of rice crop, lands within the project were tilled with power tiller or tractor. At this stage, weeds are collected and gathered in one place. Later these weeds were used as composed manure.

B. Introduction of Fingerlings: Normally large size fingerlings (4"-6") that were hatched last year in hatchery and nursed for 6 months were introduced into the projects. For one acre (100 decimal) of water body the size, amount, percentage, of fingerlings were give below:



Table -1: size and stocking density of fingerlings in flood plain aquaculture

SL no	Species (Local Name)	Number	Percentage	Size (cm)
1.	Silver carp	400	20%	12-15
2.	Catla	100	5%	12-15
3.	Big head	200	10%	12-15
4.	Rui	300	15%	12-15
5.	Mrigal	200	10%	12-15
6.	Gania	100	5%	12-15
7.	Carpio	200	10%	12-15
8.	Grass Carp	200	10%	12-15
9.	Thai puti	300	15%	08-10
	Total	2000	100%	

A. Post Stock Management:

Lime application: In a production cycle, lime was applied three or four times at the rate of 40-50 Kg. per acre.

Fertilizer application: In a production cycle fertilizer was applied in 3-4 phases. Urea 40-50 Kg/ acre, TSP 20-25 Kg. /acre. 10-12 mond / acre.

Supplementary feed application: Though natural foods were available in flood plains, supplementary feeds were necessary to increase to fish production. In flood plains aquaculture wild fish couldn't be controlled. Wild fish come with floodwater and grow with target species. So, total density of fish was high in this culture system. For this reason, supplementary feed application was a must to ensure better growth of target species. 50% of total production depends on natural foods and the rest 50% depends on application of supplementary feeds. Oil cake and rice bran were used as supplementary feeds at the ratio of 1:2. Supplementary feeds were applied 3-4 days in a week.

Netting: First netting was conducted after a month of stocking for close observation (health, body weight, disease, growth) of the fishes. During this netting a large amount of wild fishes were harvested and sold to market.

Harvesting: A large amount of non-target species such as Mola, Chanda, Puti, Tengra, Darkina, Chingri were available in the project. These fish competed with target species. During the month of July-September, wild fishes were harvested phase by phase. During wild fishes harvesting, there was a partial harvest of silver carp, Thai Puti, Big head. As a result, density of fishes reduces and existing fish grow rapidly. The time of final harvest was December-January. All the sluice gates were kept open to discharge water and fishes in the project were sheltered/gathered in the ditches or ponds within the project. Fish was finally harvested from these ditches or ponds by dragnets or cast nets.

Marketing: Normally harvesting was conducted everyday at 3 PM to 10 PM. Harvested fish was brought to the landing center near to the project. Here fishes were sorted into sizes and species. Sorted fishes are sold to local market or near by whole sales market by fish sales committee.

3.3 Comparative study of two management system: Total area of flood plains in three Fishery Villages was 119.50 acre or 48.38 hectares. Before Fishery Villages program, all these water bodies were semi open system flood plains. For four (04) months to seven (07) months, these rice-fields were under water and filled with dense weeds during monsoon. Local people only captured resident/wild fishes from these flood plains.

Table-2: Comparison between past management and present management.

SL	Criteria	Past Management System	Present Management System
1.	Type of fishery	Capture fishery	Culture fishery
2.	Area under culture system	Nil (Uncultured)	119.50 acre or 48.38 hac
3.	Total catches (wild fishes)	1640 Kg or 1.64 ton	3745 Kg or 3.745 ton
4.	Total catches (Exotic carps)	Nil	46.747 ton
5.	Production rate (Kg/decem)	0.14	3.96

From baseline survey (Annex-1) of three fishery villages it is revealed that catches from three flood plains were 800 Kg, 450 Kg and 390 Kg. Total catches were 1640 Kg. or 1.640 tons. Average catch per unit area was 0.14 Kg. per decimal. After motivation, group formation and training, farmer's first time have bought these flood plains into culture system.

Table-3: Consolidated base line production information in floodplains.

SLNo	Name of fishery village	Area (Decemal)	Production (Kg)			Production Rate
			Wild	Cultured	Total	
1	Govindapur	3250	390	-	390	0.12
2	Sateswar	3700	450	-	450	0.13
3	Jaora	5000	800	-	800	0.16
Total:		11,950	1640	-	1640	0.14

From Impact assessment format of training program (Annex-IV), it is found that fish production in three flood plains is 18.122 ton, 15.725 ton and 12.9 ton. Total fish production is 46.747 ton and average production per unit area is 3.96 Kg. per decimal. Total increase in fish Production in three selected flood plains is 45.107 ton.

Table -4: Consolidated production information after culture system.

SL. No	Name of Fishery Village	Area (Decem)	Production (Kg)			Production Rate
			Wild	Cultured	Total	
1	Govindapur	3,250	900	12,000	12,900	3.97
2	Sateswar	3,700	1,295	14,430	15,725	4.25
3	Jaora	5,000	1,,50	16,572	18,122	3.62
Total:		11,950	3,745	43,002	46,747	3.96

Present investigation reveals that utilization of flood plains for seasonal fish culture offer good scope for increasing fish production. It is clear that there is a scope for horizontal and vertical increase in fish production through seasonal fish culture in flood plains.

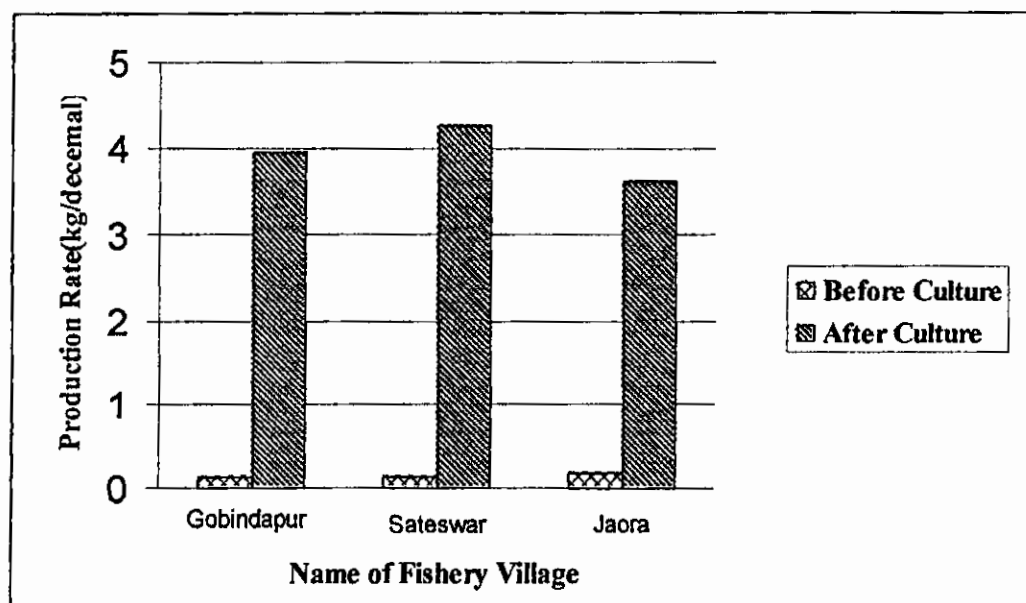


Fig-6: Comparative fish production rate before and after culture system

Production of wild fishes: It is evident that seasonal fish culture in flood plains has a positive impact on wild/ resident fishes. In seasonal fish culture in floodplains, resident/wild fishes can not avoid fully. During monsoon fertilized eggs or fish species of these wild fishes enter into flood plains through sluice gates or nets and grow with exotic carps. As fishing was restricted in three selected flood plains for four (04) to seven (07) months, resident/ wild fishes get considerable amount of time to grow there. These fishes are harvested with exotic fishes at the end of the culture season. Table-2 shows that before selection for FV program, total wild/residents fish captured from this three flood plains was 1640 Kg, but Table-3 shows that, after culture with exotic fish in floodplains total 3,745 Kg resident fish was harvested from the same water body. So, it is clear that production of resident/wild fish has increased with the exotic fish.

Cost Benefit Analysis:

All the information related to culture was stored time to time in farmer's record books. Expenditure and sale data are collected from record books which are given below:

Table-5: Expenditure in flood plain aquaculture

Sl no	Item	Cost / Expenditure in flood plain (Tk)		
		Govindapur	Sateswar	Jaora
1	Embankment Preparation	12,000/=	18,000/=	30,000/=
2.	Lease value	20,000/=	33,600/=	37,500/=
3	Fingerling	80,000/=	1,12,500/=	1,00,000/=
4	Lime	2,400/=	5,000/=	3,000/=
5	De-weeding	10,000/=	8,500/=	12,300/=
5	Supplementary feed	None	17,000/=	20,000/=
6	Guard	18,000/=	12,000/=	18,000/=
7	Netting	15,000/=	8,000/=	5,000/=
8	Others	5,000/=	6,000/=	5,000/=
Total		1,74,400/=	2,20,600/=	2,30,000/=

Table-6: Sale and consumption value of harvested fish

SL No	Name of flood plain	Harvested fish (Kg)			Total sale (Tk)
		Wild	Cultured	Total	
1	Govindapur	900	12,000	12,900	4,63,200 /=
2	Sateswar	1,295	14,430	15,725	6,70,810/=
3	Jaora	1,550	16,572	18,122	7,32,630/=
Total		3,745	43,002	46,747	18,66,640/=

Net Profit: Though total investment in seasonal fish culture in flood plains was high, it was profitable. It was community-based management and individual contribution for each member in a group is reasonable. Table 7 shows that total expenditure for culture in three (03) Fishery Villages were 6, 25,800 (Six lac twenty five and eight hundred)

Taka and total sale and consumption value was 18, 66, 640 (Eighteen lac sixty six thousand and six hundred forty) taka. Net profit from these flood plains aquaculture was 12, 40, 840 (twelve lac forty thousand eight hundred forty) taka. This profit has come only after five (05) to seven (07) months of culture duration.

Table-7: Percent of profit from floodplain aquaculture in three fishery village.

Sl.No	Flood plain	Expenditure (Tk)	Sale (Tk)	Profit (Tk)	Percent of profit
1	Govindapur	1,74,400/=	4,63,200/=	2,88,800/=	165.6
2	Sateswar	2,20,600/=	6,70,810/=	4,50,210/=	204
3	Jaora	2,30,800/=	7,32,630/=	5,01,830/=	217
Total		6,25,800/=	18,66,640/=	12,40,840/=	198

3.4 Impact on stake holders: Aquaculture extension is traditionally considered as an integral part of the fishery discipline. It is a system of educating and training rural people to develop fish farming skills and capabilities so as to increase fish production efficiency every where whatever the water bodies available and thereby raise the fish (Nuruzzaman,1993). Twenty five (25) farmers were selected for training from each village. The training was provided in six sessions over two years. In each Fishery Village selected for flood plains aquaculture, twenty five (25) farmers formed a group and worked together on the same flood plains. By this way, seventy-five (75) farmers have received training on seasonal fish culture in flood plains by three (03) Fishery Villages. Farmers have understood the instructions of fish culture and in many cases fully applied. Training has changed the attitudes and skills of the selected farmers. As a result, after training program, fish production, amount of fish consumption, income from fish sale, investment in fish culture, time given by the farmer for fish culture and savings have increased remarkably in each group selected for Fishery Villages program. (Annex-III).

Secondary Adoption/Technology Transfer: Out of seventy-five (75) trained farmers in three (03) Fishery Villages, 38 farmers have given instructions related to fish culture to eighty-four (84) non trained farmers (Annex-III). The non- trained farmers have shown interest for fish culture in flood plains. By this way, now aquaculture information

will disseminate to farmers and more such unutilized water bodies will come under culture system. It will help the rural people to improve their desperate poverty through augmenting fish production.

3.5 Relationship between co-management and community based management with FVP.

FVP is implementing under the training and extension component of Fourth Fisheries Project. The extension approach is based on the village model, called fishery village approach. In each fishery village, 25 farmers were selected and trained. The aim of FVP was horizontal and vertical increase in fish production. It will also improve management of fisheries at Upazila level through greater co-operation between DOF and private sector.

Co-management: Co-management can be defined as an arrangement where responsibility for resource management is shared between the government and user groups.

Community based management: Community based management can be defined as the decisions about fisheries management in a particular area, are made at the local level by the community using the fishery, with no clear role for government.

Conditions for community based management:

The following are considered to be the most important conditions for community based management-

1. Fishery should have clearly defined boundaries;
2. User community should be clearly defined;
3. Motivation and organization should be needed for fishers;
4. There should be good coordination between govt. and community;
5. There should have provisions of financial recourses;
6. Membership should be clearly defined;
7. Leadership should be developed;
8. Benefits of participation should exceed investment cost;

Relationship between co-management and FVP: In FVP 25 interested farmers were selected from a village using Participatory Rural Appraisal (PRA) tools. They were provided with technical training on fish culture over the two years program. No financial support was given to the farmers in FVP. There was no responsibility for resource management between the government and farmers. FFP Upazila team (UFO, EO, AFO and FA) motivate the selected farmers to utilize their water resources and provide farmers with technical training to increase fish production. According to Sen and Nielsen (1996), there is no relation ship between FVP management and Co-management system.

Relationship between community based management and FVP:

Clearly defined boundaries: In FVP 25 farmers worked together on the same water body/ floodplain for fish culture. The areas of floodplains were not too large but boundaries were clearly defined, both physical and ecological. Floodplains were easily managed and monitored by the group members.

User community: Farmers, who lived close to floodplains, were selected for FVP. Farmer's selection was also done in terms of social and economic criteria. Young farmers and who wanted to invest money were mainly selected for floodplain aquaculture.

Motivation and organization: In FVP, communities surrounding each floodplain were motivated and organized for seasonal fish culture in floodplains. A motivation meeting was conducted before implementation of FVP where local elites, mosque imam, local leaders, UP Members, land owner and farmers were participated. Interested persons were selected from this meeting for FVP.

Coordination between govt. and community: Farmers were provided with training over the 2 years program. There was a good coordination between Govt. (FFP Upazila Team) and Fishery Village farmer. Leaders from each Fishery village attended a quarterly meeting organized by Upazila fishery office. They discussed matters related to management and culture. Upazila team members regularly visited fishery village flood plains.

Provisions of financial recourses: Sufficient and timely funding was available to continue the program. Every farmer contributed same amount of money and deposited on a joint account of a local bank for operational cost.

Membership: Membership in FVP was clearly defined. 25 farmers were involved in each FVP. Numbers of farmers were not too large. It helped in communication and decision making.

Leadership: Leadership was developed in FVP. Local leaders were directly or indirectly involved in this program. They motivated other people to follow floodplain culture and direction for management process.

Benefits of participation exceed cost: Benefit of participation exceeded cost of investment in each fishery village. Results of the study shows that net percentage of profit from three floodplains are 165%, 204% and 217%. Farmer's expectations fulfilled by this management system.

3.6 SWOT Analysis of Fishery Village (FV) Program

STRENGTH

1. The Fishery Village Program (FVP) is a Government based Project in Bangladesh.
2. For increasing fish production and shrimp production, the Department of Fisheries (DOF) has designed a project having cost of 2,602.36 million taka.
3. There are four regional offices of the project at Khulna, Barisal, Rajshahi, and Comilla.
4. There was project co ordination director, project director, senior assistant director, assistant director, upazila fishery officer; extension officer. 211 extension officers were recruited at Upazila level to enhance the implementation of FVP.
5. 1000(One thousand) farmers were selected under 40 Fishery Village at Upazila level.

WEAKNESS

1. Lack of manpower and sufficient fund.
2. Only training is provided to farmer but no other inputs.
3. As it is a donor fund project, fund release procedures are very difficult.
4. As funds are released at the end of financial year, farmer's trainings are provided within short time. As a result, qualitative training is not possible.
5. Training materials are not available (Flip chart, Audio visual, white board, leaf let).
6. Poor farmers are not generally included in fishery village program as the project seems optimistic.

OPPURTUNITIES

1. We have skill and well experienced manpower at Upazila level such as UFO, AFO, and FA who are the member of Upazila Team.
2. About 34% of country s area under water almost 5-7 months each year during monsoon. these floodplains offer good scope for seasonal fish culture
3. Different research activities can be done by FMRT Discipline of Khulna University, Chittagong University, and B.F.R.I.
4. Government, many donor agencies and N.G.Os are interested to work on seasonal fish culture in flood plains.

THREAT

- 1 .Due to lack of fund, the program may not run further.
2. Land use conflict may hamper the program. Some landowners within flood plain are not agreeing to allow their land for flood plain aquaculture for personal interest. During monsoon, they prefer fishing in flood plain than culture. Sometimes they demand higher lease value
3. Industrial pollution, pesticides, sedimentation, over fishing may destroy floodplain ecology and fish habitats.
4. Migration of wild fish may hamper by this projects.

Analyze the results:

How strength is employed: One thousand farmers were trained under 40 Fishery Villages at Upazila level. Trained farmers can motivate and disseminate culture technology to other farmers of the area. Upazila Team (UFO, EO, AFO, and FA) can continue this program by taking more model Fishery Villages in different areas of the Upazila.

Weakness overcome: More manpower (EO, AFO, and FA) should be recruited at Upazila level. Funding, especially, timely and sustained funding should be needed for sustainability of FVP. Farmers should provide with financial supports (grants, low interest loan). Funds should be released at the beginning of the financial year (July/august). Fund release procedure should be complicated. Available and quality training materials (Flipchart, audio visual, white board, leaf let) should be provided for each technical program. Poor farmers should be motivated and selected for FVP. It will help in poverty alleviation.

Maximization of opportunities: Skilled and well experience manpower at Upazila level may continue such fishery village programme. Further aim may be inconsideration by FBP. Research can be conducted on problem and prospect of flood plain aquaculture in Bangladesh. Government and donor agencies can allocate more funds for sustainability of FVP. FVP requires financial resources to support the process. As flood plain aquaculture is profitable, local private and commercial banks can invest there. Local NGO can take initiative to run the similar projects.

Avoidance of threats: Continuous allocation of funds should be ensured for smooth functioning of the programme. Government and donor agencies should take the responsibility of funding. Some flood plain should be treated as sanctuaries so that migration of wild fishes may not hamper by this programme. Fishing may be prohibited in such flood plain. Local leaders, Gram sharker should motivate landowners who are not agree to use their lands for culture. Such type of farmers may be involved in this culture system. Motivation and implementation of laws by government may protect environmental pollution and over fishing in flood plain.

Chapter Four

Recommendations

Following recommendations should be considered for seasonal fish culture in floodplains:

GO:

1. Upazila administration, Local government, Gram sarkar, political elites can play a vital role in motivating the local people to bring these seasonal water bodies under culture system.
2. More Technical qualitative training on floodplains aquaculture is necessary so that technology could be transferred rapidly to the farmer.
3. The existing extension activities may be strengthened to meet the growing demands of the technology transfer and new extension facilities be created where ever they are not available at present.
4. Government should take environment enhancing measures such as establishment of sanctuaries within floodplains, de silting of canals within floodplains for better movement of water and fish and simple fish passes around obstructing roads and irrigation structures.
5. Sizeable and robust fingerlings are necessary in floodplain stocking, So Government should take necessary steps in providing good fingerling.
6. Government should prepare a land use policy in this context

NGOs:

1. NGOs should come forward and provide the farmers with financial and technical support.
2. Despite a profitable culture system, it needs much financial Support. Local commercial and private banks might be the possible sources for investment.

Community:

1. Land Use Conflicts is the main problem in seasonal fish culture in flood plains. So it should be community-based management. Land owner, Land less; poor, rich, every farmer should be involved in this culture system. Local Government and local elites should come forward in solving such conflicts.
2. Half of our population is women. Women can be involved and participated in this culture system. It will help their participation in development, income generation, poverty alleviation etc.
3. Local Youths have to involve in this culture system. It will solve unemployment problem and prevent exodus to urban cities. On the other, hand social crimes committed by the youths in the locality will reduce remarkably.

Research:

1. Cautious and scrupulous study should be conducted before such flood plain stocking to find out competition and interaction between resident and stocked species.
2. Research should be conducted on floodplain ecology, Fish behavior, habitats etc.

Media:

Electronic and print media should take positive role in motivating people for maximum utilization of this unutilized seasonal water bodies for aquaculture and to achieve the maximum production and sustainability.

Chapter Five

Conclusion

Seasonal fish culture in floodplain (i.e. FVP) is a community based management which might be accepted as a reference model for seasonal fish culture in floodplain areas of Laksham Upazila. It can be disseminated by NGOs and DOF which will ultimately bring these unutilized open water resources into culture system and increase fish production, income opportunities, women's participation in fish culture, nutrition, employment and poverty alleviation. However, a suitable ending strategy is required to sustain the model in the floodplain areas.

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Appendix

Baseline survey format

Annex-I

Division: District : Upzila : Union- Village : Date :

SL. No.	Farmers Name	Father's Name	Age	HH Size	Occupation (Code)	education (Code)	Gross Annual cash Income (Tk) (Code)	Crop land Code	Total Pond Nos.	Selected water body only				Previous training (Y/N)	Type of culture planned
										Flood Prone (Y/N)	Water body type (S/P)	Water body ownership and total area (decimal)	Last Year total prodn. (kg)		
1												Owned	shared		
2															
3															
4															
5															
6															
7															
8															
9															
10															
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22															
23															
24															
25															

Education Code:		Occupation Code		Income code		Crop land	
1. Illiterate	5. Second	1. Agriculture	7. Day labour	1. > 5,000	6. 30,000-50,000	0. None	
2. Can read only	6. Higher Second	2. Fish farmer	8. Skilled tradesman	2. 5,000-10,000	7. 50,000-75,000	1. < 50 decimal	
3. Can keep accounts only	7. Above Higher Secondary	3. Fisherman	9. Housewife	3. 10,000-15,000	8. 75,000 +	2. 50+ decimal	
4. Primary		4. Businessman	10. Student	4. 15,000-20,000			
		5. Service	11. others	5. 20,000-30,000			
		6. Small trader					

Impact assessment format of Training Program.

Project Name: FFP, Division-, District....., Upazila-
 Union : Fishery village : Village No..... Total No of
 Trained farmer: 25

Different stages of fish culture technique:

SL No.	Instructed stage in Fish culture	Farmer has understood and fully applied	Farmer has understood and partially applied	Farmer has understood but not applied	Farmer has not understood and not applied also	Not applicable for farmer
A	B	C	D	E	F	G
1	Embankment reparation					
2	De weeding					
3	Eradication of non target species					
4	Pre-stock lime application					
5	Pre-stock fertilizer application					
6	Type of species					
7	Density of species					
8	Post-stock fertilizer application					
9	Post-stock feed application					
10	Partial harvesting					
11	Re- stocking					
12	Final harvesting					
13	Problems and risks (Disease, Oxygen shortage, poaching.					



Impact assessment format of Training Program.

Impact Indicator:

Sl. No.	Success Index	Number of Farmer			Remarks
		Increased	Not Changed	Decreased	
A	B	C	D	E	F
1	Fish Production				
2	Amount of fish consumption				
3	Income from fish sale				
4	Investment in fish culture				
5	Area of water bodies for fish culture extension				
6	Time given by farmer for fish culture (own/family)				
7	Savings				

Subject	Instructions given by trained farmer (Number)	Instructions received by no-trained farmer (Number)
How many non - trained farmers have come to you for instructions		

Have trained farmers form a group

Yes

No

Code of Type of water body : 1. Perennial pond, 2. Seasonal pond, 3. Rice field/flood plains, 4. Ditch/canal, 5. Cage, 6. Pen

[illegible]

Key Issues:

[illegible]

Photographs at a glance on FVP & Flood Plain Aquaculture



Plate- 1: Motivational meeting organized by FVP Upazila team.



Plate-2: Technical training organized by FVP Upazila team.



Plate-3: Flood plains
during monsoon.



Plate -4: Floodplain
during culture season.



Plate-5: Harvested fish at landing center



Plate-6: Harvested fishes are sorted

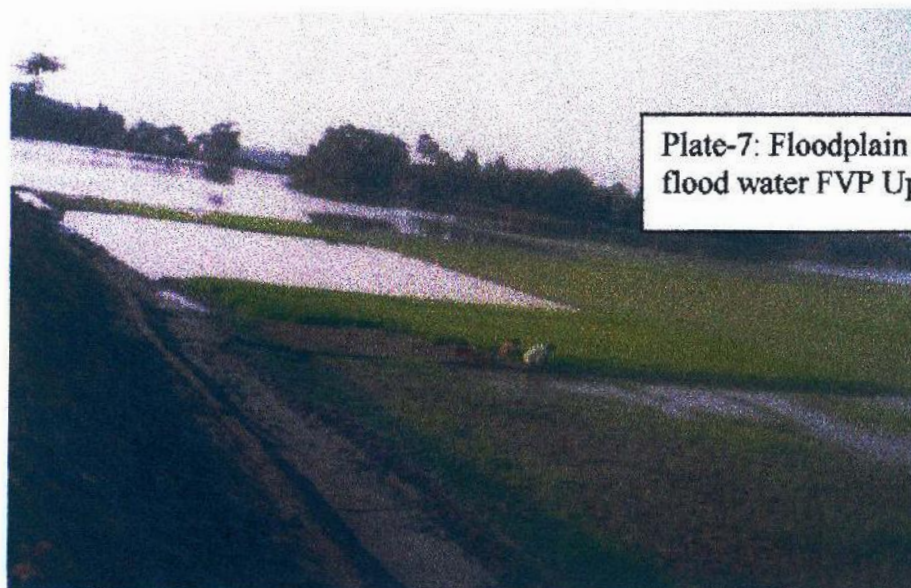


Plate-7: Floodplain at the recession of flood water FVP Upazila team.