PROGRESS REPORT OF "AQUACULTURE TECHNOLOGY TRANSFER THROUGH NGOs AND FEEDBACK TO RESEARCH" PROGRAM FOR THE PERIOD AUGUST 1992 - JUNE 1994

Prepared by :

Dr. M.V. Gupta
Senior Aquaculture Specialist
International Center for Living Aquatic Resources (ICLARM)

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PROGRESS REPORT OF "AQUACULTURE TECHNOLOGY TRANSFER THROUGH NGOs AND FEEDBACK TO RESEARCH" PROGRAM FOR THE PERIOD AUGUST 1992 - JUNE 1994

INTRODUCTION :

The Fisheries Research Institute with the technical assistance of International Center for Living Aquatic Resources Management (ICLARM) has developed low-cost aquaculture practices, through on-station and on-farm research. These studies have shown that farmer's fish productions and incomes could be increased manifold, through appropriate management practices. In early 1992, BARC/FRI/ICLARM project funded by USAID received requests from numerous NGO's and the Association of Development Agencies in Bangladesh (ADAB), for assistance in trainings NGO trainers (extension workers) in aquaculture technologies. At the suggestion of ICLARM, ADAB undertook a survey of NGOs with regard to their manpower training requirements. An analysis of survey results revealed that 52 NGO's requested for training of a total of 553 of their extension workers (431 men and 122 women) as trainers. This was a large number to be trained and to assess the exact needs of NGO's in technology transfer, a meeting was held at Bangladesh Agricultural Research Council (BARC) on 30 March 1992. The meeting was attended by representatives of ADAB, NGO's, USAID, FRI, BARC, DOF and ICLARM Senior Aquaculture Specialist. The meeting recommended undertaking a collaborative program between NGOs and the Government institutions, for transferring the aquaculture technologies developed so far, which can also provide feed-back to researchers, regarding performance of the technologies in different agro-ecosystems and changes needed in technology if any. Based on this recommendation, FRI proposed a project for aquaculture technology transfer through NGOs, which was approved by BARC and USAID with funding from PL-480 to the extent of Tk. 28,83,000 for the period August 1992 - June 1993. Agricultural Research Project-II (Supplement) funded by USAID and implemented by ICLARM provided technical support for implementation of the program. On completion of this first phase which were gave

encouraging results, all the NGOs requested extension of the program and as a result BARC/UsAID approved Tk. 38,20,250 for the second phase during 1994. A brief report of progress under the two phases is given hereunder :

PHASE I : AUGUST 1992 - JUNE 1993

During Phase I of the project, a total of 9 NGOs who had aquaculture operations in different parts of the country were selected representing different agro-ecosystems of Bangladesh. The NGO's selected for implementation of the program are : (i) Bangladesh Rural Advancement Committee (BRAC), (ii) Proshika Manobik Unnayan, (iii) Rangpur Dinajpur Rural Service (RDRS), (iv) Thengamara Mohila Sabuj Sangha (TMSS), (v) Gandhi Ashram Trust, (vi) Jagoroni Chakra, (vii) Unnayan Sangha and (viii) Uttaran (Table 1). CARITAS agreed to coordinate the activities of the last 5 NGOs. ADAB assisted in coordination of all the above NGO's.

Project Implementation

For implementation of the program, 21 thanas, covering 15 districts, where the participating NGOs had their operations and to a certain extent represented different agro-ecosystems of the country, were selected. Details of thanas where the program has been implemented and the NGOs involved in these places, are in Table 1.

The project activities included : (i) training of 25 trainers (extension workers) of NGOs who will be involved with the program; (ii) training of 600 farmers by trained NGO extension workers; (iii) selection of farmers for demonstrations; (iv) demonstration of various aquaculture technologies in 300 ponds : (a) seasonal pond aquaculture in 150 ponds, (b) polyculture of carps in 100 perennial ponds (iii) nursery pond management in 50 ponds; (v) organization of 60 farmers' rallys; and (vi) procurement of training equipment for fisheries training division of Ansar Academy.

Table 1. Details of fish culture demonstrations and training programs undertaken by different NGOs during 1992-93.

Organization	District	Thana	No. of demonstration						No. of farmers trained
			Perennial		Seasonal		Nursery		
			No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	
BRAC	Rangpur	Mithapukur	-	-	39	2.03	-	-	166
	Gaibandha	Palashbari	26	3.30	-	-	-	-	187
	Rajbari	Aladdipur	2	0.32	44	2.39	-	-	154
	Faridpur	Boalmari	24	3.09	-	-	-	-	234
Proshika	Madaripur	Kalkini	22	4.25	-	-	-	-	18
	Brahmanbaria	Sadar	7	1.49	10	4.05	-	-	85
	Barisal	Sadar	11	0.70	7	0.36	-	-	54
	Barisal	Gournadi	11	1.87	2	0.11	-	-	43
RDRS	Lalmonirhat	Kaliganj	6	1.75	-	-	-	-	
	Lalmonirhat	Aditmari	2	0.58	-	-	-	-	54
	Lalmonirhat	Sadar	4	1.51	10	2.04	-	-	
	Lalmonirhat	Hatibandha	2	0.56	-	-	-	-	-
	Thakurgaon/ Panchagar	-	-	-	-	-	-	-	25
Unnayan Sangha	Sherpur	Jhinaigati	5	0.32					12
	Sherpur	Sadar	3	0.20					
	Jamalpur	Melandoh	5	0.30	-	-	3		
Thengramara Mohila Sangha	Bogra	Sadar	5	2.18	8	0.92	3	0.18	32
Jagoroni Chakra	Magura	Mohammadpur	8	1.59	-	-	-	-	64
	Jessore	Monirampur	8	1.46	-	-	-	-	
Uttaran	Satkhira	Tala	8	2.17	7	0.85	1	0.32	72
Gandhi Ashram Trust	Noakhali	Begumganj	2	0.58	-	-	-	-	27
	Noakhali	Chatkhil	4	0.54	-	-	-	-	
Total 8 NGOs	14	19	165	28.76	127	12.7	7	0.5	1,227

The project was approved by BARC and USAID in June 1992, but the funds were released only in August 1992, by which time, it was already late for fish culture operations, especially nursery pond management for fingerlings production. Hence, demonstration of nursery pond management program had to be limited to a few ponds only. A total of 165 perennial ponds with an area of 28.76 ha, 127 seasonal ponds with an area of 12.7 ha and 5 nursery ponds with an area of 0.5 ha were selected by different NGOs for implementation of the program (Table 1).

A Steering Committee comprising of the representatives of FRI, BARC, DOF, ICLARM and ADAB was constituted to oversee the implementation of the program. The Director of DOF instructed District Fishery Officers and Thana Fishery Officers to cooperate and participate in implementation of the program by NGOs.

Some of the NGOs - Proshika, RDRS, TMSS and Uttaran involved landless groups in aquaculture through leasing of 'khas' or private ponds, while the others involved individual farmers who undertook aquaculture in their own ponds or ponds leased by NGOs. In all cases, the beneficiaries of the program were the poorest of the society - the landless farmers, with landholding of less than 0.5 acre (including homestead) and who worked as hired labourers for more than 100 days in a year.

I. Training

As a first step, a training program of 4 days duration was organized to 25 extension workers of implementing NGOs during 27- 30 July 1992.

Participants were introduced to the program by FRI scientists and various fish culture technologies suitable for different aquatic ecosystems, were discussed. Training schedule included both theoretical and practical classes and field visits. The trainees were taken on field visit to ponds where farmers are undertaking carp polyculture in perennial ponds and short-cycle species culture in seasonal ponds, integrated poultry-cum-fish culture and paddy-cum-fish culture. Training manuals and extension pamphlets in english and bengali were produced on

different subjects and distributed to the trainees. An additional 50-100 copies of each of the extension pamphlets were sent to each participating NGO.

Subsequent to initiation of the program, two more workshops were held at FRI, for NGO extension workers in November 1992 and May 1993. In these workshops, progress in implementation of fish culture program was reviewed and problems faced by extension workers and farmers were discussed and solutions were suggested by the researchers. This gave an opportunity for the researchers to understand the field situation in different parts of the country.

Subsequent to the training of NGO extension workers by FRI, these extension workers in turn organized training programs for farmers. The NGO's provided training through formal lectures, workshops, group discussions, pond-side demonstrations, farmers rallies and informal discussions. Subject matter for trainings included all aspects of fish culture. BRAC organized monthly trainings for their group members where they briefed the farmers of various steps involved in fish culture during first training, followed by subsequent trainings during which progress, problems encountered by farmers and ways to solve the problems were discussed. Proshika, RDRS, TMSS, Jagoroni Chakra, Uttaran and Gandhi Ashram organized 3-5 trainings each during the period August 1992 to May 1993. Unnayan Sangha could not organize any formal training. In all, a total of 1,227 farmers have been trained by the project.

II. Demonstrations

Broadly speaking, two types of technologies were suggested by FRI to NGOs, for utilization and increased fish production from seasonal and perennial ponds. These are : (i) culture of tilapia (*Oreochromis niloticus*) and rajputi (*Puntius gonionotus*) in seasonal ponds and (ii) polyculture of carps in perennial ponds.

The farmers could not prepare the ponds exactly as suggested due to delayed implementation of the program. In many cases, farmers prepared their ponds by repeated netting for eradication of predatory and weed fishes. Majority of the ponds were stocked by November 1992.

RDRS, TMSS, Gandhi Ashram, Unnayan Sangha and Jagoroni Chakra could maintain almost suggested stocking densities and species ratios and the rest 3 NGO's used higher stocking densities. Stocking density reached highest (100/decimal) at Barisal (Proshika) and Satkhira (Tala) regions where farmers stocked prawns with carps. Farmers of the most NGO's still believe that stocking of more fingerlings will give higher production. Motivation and demonstration of higher yields from optimally stocked ponds helped in convincing the farmers the need for optimal stocking densities.

The farmers were advised to use rice bran as supplementary feed. However, the farmers used much lower quantities of supplementary feed and fertilizers. This is because, the farmers involved in the project are mostly landless, illiterate farmers with limited resources and were afraid to invest much, without seeing the results for themselves. Inspite of these and several other constraints, farmers obtained fish productions manyfold higher than what they were getting before. For example, farmers of Proshika at Kalkini obtained on an average fish productions of 12.5 kg/decimal (3,125 kg/ha), with a net benefit of Tk. 202/decimal.(Tk.55,000/ha) in 8-10 months rearing. The data collected by Proshika indicated that before the initiation of technology transfer program, contribution to household incomes of these farmers from fish culture amounted to 15%, which increased to 45% after implementation of technology transfer program (Fig.1). BRAC reported that majority of their farmers were new to aquaculture and hence input use was much lower than the suggested. Inspite of this, production from perennial ponds amounted to 2.5 - 3.0 t/ha, which was 3 - 4 times higher than their previous productions. On an average, farmers of TMSS (all women) obtained fish production of 2.68 t/ha, with a net benefit of Tk. 62,525/ha.

III. Farmers Rallies

All the NGOs organized pond-side farmers' rallys to demonstrate the results of modern aquaculture practices to non- participating farmers in the area. Besides, the participating farmers on their own became resource persons in disseminating the knowledge they gained to other farmers in the area and showed the fish productions and benefits they obtained.

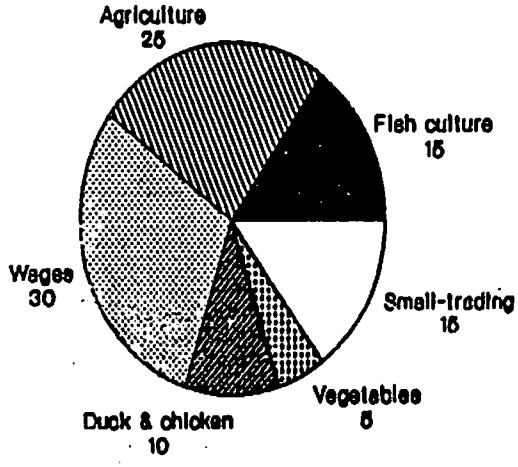

Fig.1a. Contribution (%) to household income of farmers before introduction of aquaculture technologies

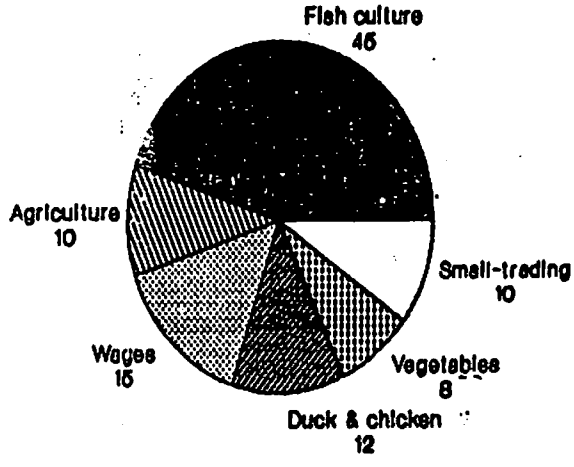

Fig.1b. Contribution (%) to household income of farmers after introduction of aquaculture technologies.

IV. Monthly Meeting

Monthly meetings were held in Dhaka, in order to monitor progress and constraints and provide necessary suggestions for the smooth running of the program. The meetings were attended by the representatives of all co-ordinating agencies and NGO's. Out of 11 meetings, 8 were held in Dhaka and the rest three were held at project demonstration sites at Lalmonirhat (sponsored by RDRS), Brahmanbaria (sponsored by Proshika) and Boalmari, Faridpur (sponsored by BRAC). This gave an opportunity for different NGOs to see how the other NGOs work and for the researchers to understand the real situation in the field. During the meetings, representatives of NGO's briefly mentioned their progress and problems which were then discussed among the participants.

V. Monitoring

A Senior Training Officer was appointed in order to make routine visits to see the fish culture programs of all the participating NGO's and provide guidance. ICLARM Consultants; Member-Director (Fisheries) of BARC and Director and Chief Scientific Officer of FRI visited the project sites from time to time.

Visits were made atleast once a month to each of the NGO's by the above personnel. The visits were really helpful, as it helped in talking to individual fish farmers (group members), discuss their progress and problems and provide necessary suggestions. Such visits were important because a real picture about individual NGO's fish culture programs could be obtained by direct conversation with the farmers.

CONCLUSION

Inspite of the fact that the project has started late in fish culture season, due to delays in approval of project and release of funds and the project has been in operation for only 10 months, much progress was achieved in transferring aquaculture technologies, to the benefit of

a large number of farmers. Farmers increased their fish productions many times as compared to what they were obtaining under traditional methods, where production was almost negligible. RDRS has reported that their farmers have increased their fish productions from 5 kg/decimal (1,250 kg/ha) before project to 10 kg/decimal (2,500 kg/ha) after project. Implementation of the project resulted in the following impact : (i) Training a large number of extension workers as 'Trainers'; (ii) Training of a large number of farmers in low- input, high-yielding aquaculture technologies; (iii) Increased fish production many fold by farmers, as compared to traditional methods they were following, inspite of the use of less than the suggested inputs (in some cases it was only 30-40%). The impact is evident from the fact that pond owners who leased out their ponds to others, are increasing the lease value of the ponds by many times after seeing the productions and benefits. For example, Ms. Saleha Begum of Boalmari, with the assistance of BRAC, leased a 60 decimal (2,400 m^2) pond for Tk. 2,000/year and got a net benefit of over Tk. 8,000 in just 7 months. She has approached the owner to extend the lease of the pond for a further period of 4 years and the pond owner is demanding Tk. 30,000 for 4 years (as against Tk. 8,000 as per previous agreement). BRAC on her behalf has offered Tk. 24,000, but he is not agreeable saying that now he has understood the benefit of aquaculture and he himself can practise and make more profit; (iv) The program gave an opportunity for the participating organizations to understand the technology transfer approaches followed by different NGOs and benefit from it; (vi) The program made a link between NGOs and Government organizations through which NGOs will be able to bring field problems to the notice of researchers; (vii) Over 40% of the ponds in the country are under multiple ownership or under Government control and are unused or under-utilized. NGOs are able to organize landless people into groups and assist them in leasing these ponds for aquaculture benefiting the landless people; (viii) Women are an important target group for these aquaculture activities and they are able to contribute to the incomes and nutrition of their families; (ix) Access to credit is a limiting factor in rural areas. NGOs are able to provide credit to landless and small- holder farmers, without any collateral, enabling resource poor to take benefit of the technologies developed; (x) Theft of fish has been a constraint for aquaculture development in the past. But with group formation, and involvement of large number of people in developmental activities, this social problem has been reduced to a large extent; (xi) The program has begun to provide valuable feedback to FRI on the feasibility

of the technologies in different parts of the country and on problems which should be addressed by research; (xii) The program has shown availability of fingerlings in rural areas is still a constraint and needs to be addressed immediately, if aquaculture is to benefit the rural farmers.

In view of the impact the project has made within a short span of 9-10 months, all the NGOs and farmers involved in the program are happy with the performance of the project and requesting for the extension of the program for one more year, to benefit a larger number of farmers/households in improving their incomes and nutrition.

PHASE II : AUGUST 1993 - JUNE 1994

As a result of the request from the participating NGOs for continuation of the program, in view of the good impact of the program on the incomes of rural households, FRI submitted a request for continuation of the program during 1993-94. Funds to the extent of Tk. 38,20,250 were approved in August 1993, by which time fish culture operations have already started and the farmers have stocked their ponds and it was too late for implementation of the program. In view of this, it was planned to start the program in 1994, starting activities early in the season.

I. Participating NGOs and Areas of Demonstration

The Steering Committee of the project decided to reduce the number of NGOs, as it was difficult with existing manpower, to coordinate and monitor smaller NGOs. In view of this, five NGOs were selected for Phase II. These are : BRAC, Proshika MUK, TMSS, Jagorani Chakra and Banchte Shekha (a women NGO). It was planned to organize 1,000 demonstrations which include fish culture in seasonal ponds, perennial ponds and nursery ponds in 38 Thanas covering 23 districts. The Thanas, where the program is being implemented, are depicted in Fig. 2 and Table 2.

II. Workshop

A two day workshop was organized during 20-21 March 1994 to bring together the Government extension workers (Thana Fishery Officers), NGO extension workers and researchers, to discuss and finalize the technical program for implementation in different parts of the country, taking into consideration the available technologies, the socio-economic condition of target groups, availability of inputs and agroecosystems of the area. A total of 74 persons from FRI, DOF, BARC, BAU, different NGOs, USAID, ADAB and ICLARM, participated in the workshop. During the workshop, aquaculture technology transfer program for different parts of the country was finalized. Proceedings of the workshop are in Annex 1.

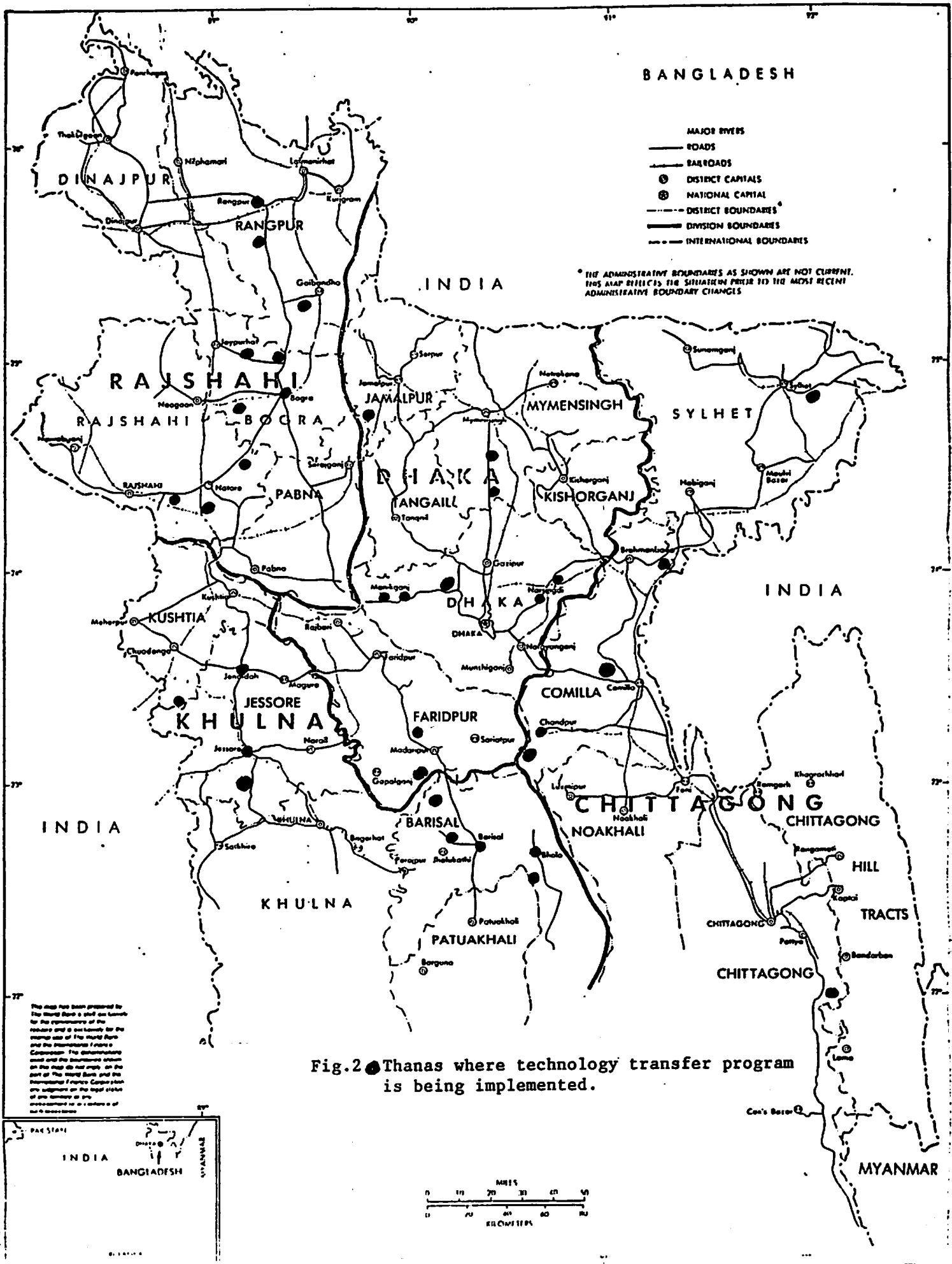

Fig.2 Thanas where technology transfer program is being implemented.

Table 2. Areas where technology transfer through NGOs and feedback to research program undertaken during 1994-'95

Name of NGO	District	Thana
Proshika	Brahmanbaria	Akhaura
	Madaripur	Kalkini
	Faridpur	Bhanga
	Barisal	Sadar Gouripur Ujirpur
	Manikganj	Saturia Geor Manikganj Sadar
	Madaripur	Sadar
	Naogaon	Sadar
	Bogra	Shibganj
	Chittagong	Bashkhali
	Bhola	Sadar Borhanuddin
	Mymensingh	Bhaluka
TMSS	Bogra	Sadar Khalu Nandigram
	Jaipurhat	Kalai

Name of NGO	District	Thana
BRAC	Rangpur	Mithapukur Sadar
	Bogra	Gobindaganj
	Rajshahi	Putia
	Natore	Bonpara
	Jamalpur	Sharishabari
	Sylhet	Golapganj
	Mymensingh	Trishal
	Chandpur	Motlab Sadar
	Comilla	Chandina
	Narshingdi	Sadar
	Dhaka	Dhamrai
	Manikganj	Geor Sadar
Jagorani Chakra	Jessore	Monirampore
	Jhenaidah	Sadar
	Magura	Mohammadpur
Bantche Sheka	Jessore	Sadar Chaugacha Bagerpara

III. Training Programs

Five training programs of six days duration each, were organized and a total of 106 extension workers of participating NGOs were trained at FRI, in different aspects of freshwater aquaculture (Table 3). These trained extension workers in turn organized 79 training programs and trained 1636 farmers in different aspects of pond fish culture. Details of training programs organized by different NGOs and farmers trained, are in Table 4.

Table 3. Details of training of extension workers of the different NGOs as Trainers during 1994.

Name of NGO	No.of extension workers trained
Proshika	46
BRAC	19
TMSS	4
Bantche Shekha	5
Jagorani Chakra	5
Unnoyan Shahajja Sangstha	2
Palli Unnayan	2
Somaj Unnayan Sangstha	8
World Vision	2
Gono Shahajja Sahajja Sangstha	6

Table 4. Farmers training programs organized by different NGOs during 1994 under Aquaculture Technology Transfer Through NGOs and Feedback to Research

Name of NGO	No.of training programs	Duration of each training	Farmers trained		
			Male	Female	Total
BRAC	45	-	108	661	769
Proshika	25	-	430	166	596
TMSS	1	3	3	85	88
Bantche Shekha	3	2	-	90	90
Jagorani Chakra	5	2	34	59	93
Total	79		575	1,061	1,636

IV. Farmers Rallies

Also, to popularize aquaculture and create awareness among rural farmers (besides the farmers participating in the program), a total of 64 Farmers Rallies were organized, in which, a total of 15,860 persons participated. In these rallies, Thana officials actively participated. Details of 'Rallies organized by different NGOs are in Table 5.

Table 5. Farmers Rallies organized by different NGOs during 1994 under the "Technology Transfer Through NGOs and Feedback to Research" Program.

Name of NGO	No.of rallies	Duration (day)	Farmers rallies		
			Male	Female	Total
BRAC	45	1	4,640	7,240	11,880
Proshika	12	1	-	-	3,500
TMSS	1	1	-	262	262
Bantche Shekha	5	1	-	90	90
Jagorani Chakra	1	1	67	61	128
Total	64				15,860

V. Demonstrations

It was planned to organize 1,000 demonstrations : 400 in perennial ponds, 500 in seasonal ponds and 100 in nursery ponds. The NGOs were informed by BARC and FRI that the funds provided to them can only be utilized before 30 June 1994, as PL 480 funding as of that date comes to an end. As against the target of 1,000 demonstrations, the NGOs could organize only 828 demonstrations (details in Table 6). This is due to : (i) normally pond stocking operations take place during June - August and some farmers could not initiate activities before June 30 due to lack of water in ponds and hence could not be included in the program since funds were not to be spent beyond June 1994 and (ii) delay in release of funds. In addition to the above, demonstrations for integrated rice-fish farming are being organized by Proshika. In all demonstrations, a total of 3,563 farmers of whome 2,029 (56.95%) are women are involved.

VI. Monitoring

To evaluate the performance of the different aquaculture practices, a pond record keeping book has been developed, which includes information on the participating households and input-output data (Annex 2 the books are in bengali; an english translation is also given). These books have been provided to NGOs. For each pond, two books are maintained, one by the farmers and the other by the extension worker.

VII. Remarks

Inspite of the fact that the funding to the program officially came to an end as of 30 June 1994, the program is being continued and monitored. To monitor the program, FRI appointed a Scientific Officer using ICLARM/USAID project funds and posted him in Bogra. Monthly meetings participated by FRI/DOF/NGOs/ADAB/BARC/ICLARM are being held to review the progress of the work and solve problems if any. Also FRI/ICLARM staff are monitoring the activities regularly.

Table 6. No. of fish culture demonstrations organized by different NGOs during 1994 under the "Technology Transfer Through NGOs and Feedback to Research" Program.

Name of NGO	No.of Thanas	Seasonal ponds		Perennial ponds		Nursery ponds		Total ponds		No. of leased ponds	No. of own ponds	Management		No.of farmers participated		Total
		No.	Area (Acre)	No.	Area (Acre)	No.	Area (Acre)	No.	Area (Acre)			Pond under single operator	Ponds under group operators	Male farmers	Female farmers	
BRAC	15	244	29.55	207	58.59	50	11.14	501	99.28	-	-	-	-	53	462	515
Proshika	13	42	48.13	154	197.17	19	5.37	215.	250.67	-	-	-	-	1457	378	1835
TMSS	4	16	2.77	11	4.80	4	1.27	31	8.84	15	16	-	30	-	515	515
Bantche Sheka	3	20	5.115	20	8.58	5	2.64	45	16.33	4	41	16	22	-	635	635
Jagorani Chakra	3	16	3.91	15	9.38	5	1.19	36	14.48	13	23	31	5	30	39	69
Total	38	338	89.475	407	278.52	83	21.61	828	389.6					1540	2029	3569

Annex-1

PROCEEDINGS OF THE WORKSHOP ON "TECHNOLOGY TRANSFER THROUGH NGOS AND FEEDBACK TO RESEARCH"

20-21 MARCH 1994

Organized by FRI/DOF/BARC/ICLARM

The Fisheries Research Institute (FRI) with technical assistance of International Center for Living Aquatic Resources Management (ICLARM) is implementing a program entitled "Technology Transfer Through NGOs and Feedback to Research", in collaboration with the Department of Fisheries (DOF) and Bangladesh Agricultural Research Council (BARC). The program is funded by the United States Agency for International Development (USAID). The program was initiated in 1992 and is being continued during 1994. Five NGOs namely, Proshika Manobik Unnayan Kendra, Bangladesh Rural Advancement Committee (BRAC), Thengamara Mohila Sobuj Sangha (TMSS), Jagoroni Chakra and Banchte Shekha are implementing the program during 1994 in 38 thanas covering 20 districts, representing different agroecological zones of Bangladesh (Appendix-1).

Under the program, during the year 1994-'95, a total of 1000 technology demonstrations - 500 in seasonal ponds, 400 in perennial ponds and 100 in nursery ponds will be organized by the participating NGOs. Four training programs of 6 days duration each will be organized, starting from 4 April 1994 at FRI, for a total of 100 extension workers. The extension workers will be trained as Trainers in different low-cost aquaculture technologies and management practices that would be suitable for implementation by resource poor farmers. The trained extension workers will in turn undertake pond site training of 2000 farmers and organize 100 farmers' rallies.

The main objective of the workshop (program is in Appendix 2) was to bring together the Government extension workers (Thana Fishery Officers) and NGO extension workers from the project area (38 thanas) and researchers of FRI, to discuss and finalize the technical program for implementation in different parts of the country, taking into consideration the available aquaculture technologies, the socio-economic condition of target groups, availability of inputs and agroecosystem of the area. A total of 74 persons from FRI, DOF, BARC, Bangladesh Agricultural University (BAU), different NGOs, USAID, Association of Development Agencies in Bangladesh (ADAB) and ICLARM participated the workshop (list of participants is in Appendix-3).

During the inaugural session, Directors of FRI and DOF, Member-Director (Fisheries), BARC and ICLARM Senior Aquaculture Specialist stressed the need for closer collaboration and linkages between the Government agencies and the NGOs, for development and dissemination of aquaculture technologies that could be integrated into the farming systems and sustained by resource poor rural farmers.

The workshop started with presentation by FRI scientists, of low-cost aquaculture technologies available for seasonal, perennial and nursery ponds and integrated rice-fish farming.

Subsequent to this, NGOs Extension Officers and Thana Fisheries Officers (TFO) from each of the project area, presented in detail the agroclimatic condition of the area, socio-economic conditions of the farmers they are involved with, aquaculture dissemination programs they are presently undertaking and the constraints for aquaculture development that need to be addressed. There were sharp differences of opinion between Government and NGO extension workers, as to who should be the target group for extension of technologies and selection of demonstration ponds. The Government extension workers felt that demonstrations should be organized in ponds of financially sound farmers who could strictly follow the suggested management practices and also suggested that management practices should be more scientific (e.g. farmers to fertilize ponds and adjust fertilization rates based on secchi disc reading, etc.). The NGO extension workers explained that their target group farmers are very poor and illiterate and hence suggested technologies have to be low-cost and simple if they are to be sustained by the resource poor farmers. A Thana Fishery Officer pointed out that under some projects, they (Thana Fishery Officers) have been asked to follow rigidly management practices such as, species for stocking, stocking densities and quality and quality feeds, which the farmers are not accepting and the Government Extension Officers are facing problems. At this juncture, the ICLARM Senior Aquaculture Specialist clarified that the target group under this program are resource poor farmers and in many cases new to aquaculture and hence suggested technologies should be low-cost and simple to adopt. The technologies given should be guidelines only and farmers will follow to the extent possible with their resources. This was appreciated by all present. Some of the constraints for aquaculture development identified by the participants were:

i) Non-availability of appropriate sized fingerlings of required species at times required for stocking the ponds.

ii) Culture of rajputi (*Puntius gonionotus*) has been widely accepted by the farmers in Rajshahi, Dhaka and Khulna divisions. But the supply of fry is unpredictable and uncertain, due to high mortalities in nursery ponds. The extension workers/farmers need knowledge on nursery practices for rajputi.

iii) Farmers are not aware of aquaculture technologies and management practices that could lead to increased productions and hence there is need for more extension services.

iv) Many 'khas' (Government owned) ponds are lying in derelict condition. NGOs are interested to lease these 'khas' ponds for landless/marginal farmer groups. But the present Government policies are not allowing this.

v) Farmers in Rajshahi, Khulna and Barishal Divisions prefer to culture rajputi, while farmers in Chittagong Division have accepted and been culturing tilapia instead of rajputi.

vi) Lack of hands-on training to NGOs field extension workers on different improved aquaculture technologies, which is deterring the dissemination of technologies.

Subsequent to general discussion, characteristics of each of the regions where the program will be implemented was discussed and technical programs that could be suitable for each of the regions was discussed and finalized. While finalizing the program, availability of fingerlings of different species and market demand for different species has been taken into consideration. The technical program agreed by the participants, is in pages 5 to 11.

The Senior Aquaculture Specialist of ICLARM briefed participants on the necessity for proper monitoring and evaluation of aquaculture practices undertaken by the farmers under the program, benefits (financial and nutritional) obtained by farmers, constraints in implementation of technology if any, and provide feedback to researchers. In this connection, to monitor, pond book's will be developed in consultation with the NGOs, in which input - output data will be maintained by extension workers and farmers.

The workshop came up with the following additional recommendations :

1. To ensure easy availability of fry/fingerlings, mini carp hatcheries need to be established in the areas under the technology transfer program. Similar to what has been tried by BRAC, fingerling banks may be established to meet the timely need of required size fingerlings;

2. The NGOs will give prior information to FRI about the farmers' training they will be undertaking for suggestions/modifications. FRI will send resource person(s) to help the NGO extension workers/trainers in conducting farmers' training;

3. NGO and DOF extension workers (TFO) and FRI scientists will maintain a strong linkage in implementing the technology transfer program. NGOs will record field-data according to the pond books to be supplied and send these at the end to FRI for analysis as well as to find out the ways and means for further improvement of the technologies;

4. Monthly meetings will be held at different program areas with the participation of concerned persons from FRI, DOF, BARC, ICLARM, NGOs and farmers;

5. Possibility of increasing the number of training officers to be recruited under the program from two to four be explored, for smooth functioning and monitoring of the program. ICLARM is requested to provide financial assistance in this matter. Of the four training officers to recruited, one should be stationed at ICLARM office in Dhaka; one at BRAC training centre/divisional office of DOF in Comilla; one at TMSS office/DFO office in Bogra and one at Jagorani Chakra in Jessore;

6. Special training course on rice-cum-fish farming should be organized for the farmers of Barishal region;

7. A revolving fund should be formed by the NGOs to sustain the program in future on their own;

8. NGOs should be very careful and regular in submitting financial reports to FRI for timely disbursement of fund; and

9. The Government's existing policy for leasing 'khas' ponds (less than 3 acres in area) is hampering the aquaculture development. DOF and FRI may take up the issue with the competent authorities in the Government.

The workshop ended with the comments by the Thana Fishery Officers and representatives of different NGOs, that this was the first time the Government and NGO extension workers could sit together and discuss in depth and agree aquaculture extension approaches and hoped that these dialogues will continue in future.

TECHNICAL PROGRAM SUGGESTED BY THE WORKSHOP FOR DIFFERENT REGIONS

A. RAJSHAHI DIVISION

1. Fish culture in seasonal ponds

Pond preparation :
- Liming - 1.0 kg/decimal
- Fertilization - organic manure - 4 kg/decimal.

Species stocking density (No./decimal*) :

Rajputi	48
Silver carp	6
Mirror carp	6
Total	60

Feeding :
Duck weed, aquatic/terrestrial weeds and
Rice bran @4-5% body weight daily.

Fertilization :
Organic : 4 kg cattle dung/decimal/15 days.
Inorganic : 100 g Urea + 200 g TSP/decimal/15 days.

Disease prevention :
Application of lime in ponds in November @1.0 kg/decimal.

2. Fish culture in perennial ponds

Pond preparation :
- Draining of ponds/application of piscicide
- Liming - 1.0 kg/decimal
- Fertilization :
  i) Organic - 8 kg cattledung/decimal
  ii) Inorganic - 100 g Urea + 100 g TSP/decimal

* decimal = 40 m^2

Species stocking density (No./decimal) :

Silver carp	7
Catla	3
Rohu	5
Mrigal	6
Common carp	1
Grass carp	2
Rajputi	10
Total	34

Feeding :

Rice bran @ 2-3% body weight daily.
Aquatic/terrestrial weeds

Fertilization :

Organic : 4 - 6 kg cattle dung/decimal.
Inorganic : 100 g Urea + 100 g TSP/decimal.
Aquatic/terrestrial weeds

Harvesting : Rajputi in November.

Disease prevention :

Pond liming in November @1.0 k g/decimal.

B. DHAKA DIVISION

1. Fish culture in seasonal ponds

Pond preparation :

- Liming - 1.0 kg/decimal
- Fertilization - organic manure - 4 kg/decimal.

Species stocking density (No./decimal) :

i)	Rajputi	48		ii)	Macrobrachium	15
	Silver carp	6	Or		Silver carp	10
	Mirror carp	6			Rohu	5
	Total	60				30

Feeding :
- Duck weeds, terrestrial/aquatic weeds and
- Rice bran @4-5% body weight daily.

Fertilization :
- Organic : 4 kg cattle dung/decimal/15 days.
- Inorganic : 100 g Urea + 200 g TSP/decimal/15 days.

Disease prevention :
- Pond liming in November @1.0 kg/decimal.

2. Fish culture in perennial ponds

Pond preparation :
- Draining of ponds/application of piscicide
- Liming - 1.0 kg/decimal
- Fertilization :
  i) Organic - 8 kg cattledung/decimal
  ii) Inorganic - 100 g Urea + 100 g TSP/decimal

Species stocking density (No./decimal) :

Shallow ponds		Deeper ponds
Silver carp	7	12
Catla	3	3
Rohu	5	3
Mrigal	6	3
Common carp	1	4
Grass carp	2	3
Rajputi	10	12
Total	34	40

(If Rajputi not available, Macrobrachium will be stocked @7-10/decimal instead of Rajputi).

Feeding :
- Rice bran @2-3% body weight daily.
- Aquatic/terrestrial weeds

Fertilization :
- Organic : 4 - 6 kg cattle dung/decimal.
- Inorganic : 100 g Urea + 100 g TSP/decimal.

Harvesting : Rajputi in November.

Disease prevention :
- Pond liming in November @1.0 kg/decimal.

C. CHITTAGONG DIVISION

1. Fish culture in seasonal ponds

<u>Pond preparation</u> :

- Liming - 1.0 kg/decimal
- Fertilization - organic manure - 4 kg/decimal.

<u>Species stocking density (No./decimal)</u> :

i)	Rajputi	48		ii)	Tilapia	60
	Silver carp	6	Or		Silver carp	6
	Mirror carp	6			Common carp	6
	Total	60				72

Feeding :

- Duck weeds and/or terrestrial/aquatic weeds,
- Rice bran @4-5% body weight daily.

Fertilization :
- Organic : 4 kg cattle dung/decimal/15 days.
- Inorganic : 100 g Urea + 200 g TSP/decimal/15 days.

Disease prevention :
- Pond liming in November @1.0 kg/decimal.

2. Fish culture in perennial ponds

Pond preparation :

- Draining of ponds/application of piscicide
- Liming - 1.0 kg/decimal
- Fertilization :
  i) Organic - 8 kg cattledung/decimal
  ii) Inorganic - 100 g Urea + 100 g TSP/decimal

Species stocking density (No./decimal) :

In general

Silver carp	9
Catla	2
Rohu	6
Mrigal	7
Common carp	2
Grass carp	3
Bighead carp	5
Total	34

For Bashkhali only :

i)	Catla	14	or ii)	Catla	14
	Mrigal	7		Macrobrachium	15
	Common carp	2		Grass carp	3
	Grass carp	3		Rohu	8
	Rohu	8			40
		34			

Feeding :

- Rice bran @2-3% body weight daily.
- Aquatic/terrestrial weeds

Fertilization :

- Organic : 4 - 6 kg cattle dung/decimal.
- Inorganic : 100 g Urea + 100 g TSP/decimal.

Harvesting : Rajputi in November.

Disease prevention :

- Pond liming in November @1.0 kg/decimal.

D. KHULNA AND BARISHAL DIVISION

1. Fish culture in seasonal ponds

Pond preparation :

- Liming - 1.0 kg/decimal
- Fertilization - organic manure - 4 kg/decimal.

Species stocking density (No./decimal) :

i)	Rajputi	48		ii)	Macrobrachium	15
	Silver carp	6	Or		Silver carp	10
	Mirror carp	6			Rohu	5
	Total	60				30

iii)	Rajputi	39
	Silver carp	6
	Macrobrachium	15
	Total	60

Feeding :

- Duck weeds, terrestrial/aquatic weeds and
- Rice bran @4-5% body weight daily.

Fertilization :

- Organic : 4 kg cattle dung/decimal/15 days.
- Inorganic : 100 g Urea + 200 g TSP/decimal/15 days.

Disease prevention :

- Pond liming in November @1.0 kg/decimal.

2. Fish culture in perennial ponds

Pond preparation :

- Draining of ponds/application of piscicide
- Liming - 1.0 kg/decimal
- Fertilization :
  i) Organic - 8 kg cattledung/decimal
  ii) Inorganic - 100 g Urea + 100 g TSP/decimal

Species stocking density (No./decimal) :

	Shallow ponds	Deeper ponds
Silver carp	7	12
Catla	3	3
Rohu	5	3
Mrigal	6	3
Common carp	1	4
Grass carp	2	3
Rajputi	10	12
Total	34	40

(If Rajputi not available, Macrobrachium will be stocked @7-10/decimal instead of Rajputi).

Feeding :

- Rice bran @2-3% body weight daily.
- Aquatic/terrestrial weeds

Fertilization :

- Organic : 4 - 6 kg cattle dung/decimal.
- Inorganic : 100 g Urea + 100 g TSP/decimal.

Harvesting : Rajputi in November.

Disease prevention :

- Pond liming in November @1.0 kg/decimal.

Appendix-1

AREAS WHERE TECHNOLOGY TRANSFER THROUGH NGOs AND FEEDBACK TO RESEARCH PROGRAM WILL BE UNDERTAKEN DURING 1994-'95

FRI/DOF/BARC/ICLARM/USAID PROJECT

District	Thana
Brahmanbaria	Akhaura
Faridpur	Kalkini Bhanga
Barisal	Barishal Sadar Gournadi Ujirpur
Bogra	Shibganj Bogra Sadar Khahalu Nandigram Gobindaganj
Jaipurhat	Kalai
Chittagong	Bashkhali
Bhola	Bhola Sadar Borhanuddin
Mymensingh	Bhaluka Trishal
Rangpur	Mithapukur Rangpur Sadar
Rajshahi	Putia
Natore	Bonpara

Jamalpur	Sharishabari
Sylhet	Golapganj
Chandpur	Chandpur Sadar Motlab
Comilla	Chandina
Narsingdi	Narsingdi Sadar Shibpur
Dhaka	Dhamrai
Manikganj	Gheor Manikganj Sadar
Jessore	Monirampur Jessore Sadar Chaugacha
Jhenaidah	Jhenaidah Sadar
Manikganj	Saturia
Madaripur	Sadar
Naogaon	Sadar

Appendix-2

WORKSHOP ON
TECHNOLOGY TRANSFER THROUGH NGOs AND FEEDBACK TO RESEARCH
20-21 MARCH 1994

JOINTLY ORGANIZED BY FRI/DOF/BARC/ICLARM

VENUE : FRI AUDITORIUM

PROGRAM

Date/Time	Events	
20 March 1994		
90.00 - 10.00	Registration Inaugural Session Chairman :	Dr. M.A. Mazid Director, FRI
	Welcome address :	Dr. M.G. Hussain, CSO (cc), FRI
	Theme of workshop :	Dr. M.V. Gupta Senior Aquaculture Specialist ICLARM
	Speech by special Guests:	Dr. A.K.M. Nuruzzaman Member-Director (Fisheries) BARC
		Prof. Dr. Somen Dewan BAU, Mymensingh
		Mr. Kevin Mullaly, USAID
	Speech by Chief Guest :	Mr. A.K. Ataur Rahman Director, DOF
	Speech by the Chairman :	Dr. M.A. Mazid Director, FRI
	Vote of thanks :	Dr. M.J. Alam Senior Scientific Officer, FRI

TECHNICAL SESSION-I

Chairman : Mr. A.K. Ataur Rahman
Director, DOF

Rapporteurs : Mr. Muhammad Zaher
Senior Scientific Officer, FRI

Mr. Md. Yahia Mahmood
Scientific Officer, FRI

11.15 - 12.45 **Technologies for dissemination under the project**

11.15 - 11.25 Fish culture in perennial ponds
Mr. Md. Shahab Uddin, Senior Scientific Officer, FRI

11.25 - 11.35 Fish culture in seasonal ponds
Mr. A.H.M. Kohinoor, Scientific Officer, FRI

11.35 - 11.45 Integrated rice-fish farming
Mr. Md. Aminur Rahman, Scientific Officer, FRI

11.45 - 11.55 Nursery pond management
Mr. Md. Shahab Uddin, Senior Scientific Officer, FRI

11.55 - 12.15 Monitoring and evaluation procedures
Dr. M.V. Gupta, Senior Aquaculture Specialist
ICLARM

12.15 - 12.45 General discussion

12.45 - 13.45 LUNCH

TECHNICAL SESSION II

Chairman : Dr. A.K.M. Nuruzzaman
Member-Director (Fisheries), BARC

Rapporteurs : Mr.Md. Shahabu Uddin
Senior Scientific Officer, FRI

Mr. Shaymal Chandra Mahata
Scientific Officer, FRI

13.45 - 17.00 **Presentation and discussion of program by region**
Dr. M.G. Hussain, CSO (cc), FRI

21 March 1994

TECHNICAL SESSION III

Chairman : Dr. M.A. Mazid
Director, FRI

Rapporteurs : Mr. Md. Shahab Uddin, SSO, FRI
Mr. Shaymal Chandra Mahata, SO, FRI

09.30 - 12.45 **Presentation and discussion of program by region**
Dr. M.G. Hussain, CSO (cc), FRI

12.45 - 13.45 LUNCH

TECHNICAL SESSION IV

Chairman : Dr. M.A. Mazid
Director, FRI

Rapporteurs : Mr. Muhammad Zaher
Senior Scientific Officer, FRI

Mr. Md. Shahab Uddin
Senior Scientific Officer, FRI

13.45 - 14.15 **Adoption of recommendations**
Dr. M.V. Gupta, Senior Aquaculture Specialist, ICLARM

14.15 - 16.00 Discussion and finalization of program

16.00 - 16.30 Concluding remarks by the Chairman and closing ceremony

Appendix-3

LIST OF PARTICIPANTS

Non-Government Organizations (NGO)

1. Md. Mokarram Hossain, Sector Specialist (Fisheries) BRAC
2. Md. Tofazzal Hossain, P.O (Fisheries), BRAC.
3. Md. Enamul Haque Anwar, P.O (Fisheries), BRAC.
4. Shahjahan, P.O (Fisheries), BRAC.
5. Md. Abdur Rahman, P.O (Fisheries), BRAC.
6. Md. Asad Ali, P.O (Fisheries), BRAC.
7. Subhas Chandra Ghose, P.O (Fisheries), BRAC.
8. A.K.M. Fouhad Kabir, P.O (Fisheries), BRAC.
9. Ashoke Kumar Das, P.O (Fisheries), BRAC.
10. Md. Fazlul Huq, P.P.C. Proshika
11. Md. Abdur Rahman, P.C.(Fisheries), Proshika.
12. Swapan Kumar Das, Associate Program Coordinator, Proshika.
13. Md. Altaf Hossain, Associate Program Coordinator, Proshika
14. S.M. Bakhtiar Firoz. D.W. Proshika.
15. Paritosh Kumar Sarker, J.P.O (Fisheries), Proshika.
16. Sk. Ali Afzal, J.P.O.Ag., Proshika.
17. Mohoshinuzzaman (HENA), Area Coordinator, Proshika.
18 Md. Golam Mostofa, FTW, Proshika.
19. M.A. Razzou, FTV
20. H.M. Edris, F.F., TMSS.
21. Md. Ataur Rahman, Fisheries Officer, TMSS.
22. Md. Badrul Alam, Trainer (Fisheries), Jagorani Chakra.
23.. Francisco Noble, IVS Fisheries Advisor, ADAB.

Department of Fisheries

24. Mr. A.K. Ataur Rahman, Director
25. Md. Mosharraf Hossain, Thana Fisheries Officer, Baraigram, Natore.
26. Md. Shafiul Alam, Thana Fisheries Officer, Kalliani, Madaripur.
27. Md. Saidur Rahman, Thana Fisheries Officer, Shibgonj, Bogra.
28. Md. Azizur Rahman Sardar, Thana Fisheries Officer, Rangpur Sadar, Rangpur.
29. Md. Anwarul Haq, Thana Fisheries Officer, Gournadi, Barisal.
30. Md. Rafiqul Islam, Thana Fisheries Officer, Dhamrai, Dhaka.
31. Md. Abdul galie, Thana Fisheries Officer, Akhama, B. Baria.
32. A.N.M. Taher Noon, Thana Fisheries Officer, Banskhali, Chittagong.
33. Md. Shahidul Islam, Thana Fisheries Officer, Jessore Sadar.

34. Nusjer Chandra Das, Thana Fisheries Officer,, Kahalo, Bogra.
35. Ranjit Kumar Paul, Thana Fisheries Officer,, Sharishabari, Jamalpur
36. Mrs. Zazma Begum, Thana Fisheries Officer,, Chandina, Comilla.
37. Md. Mojibor Rahman, Thana Fisheries Officer, Trishal, Mymensingh.
38. A.S.M. Roshedul Haque, Thana Fisheries Officer, Bogra Sadar, Bogra.
39. Syed Sazzad Zahir, Thana Fisheries Officer, Monirampur, Jessore.
40. Timir Baran Mondal, Thana Fisheries Officer, Jhenaidah Sadar, Jhenaidah.
41. Md. Sharaf Uddin, Thana Fisheries Officer, Bhaluka, Mymensingh.
42. Azizul Haque, Thana Fisheries Officer, Wasinpure, Barisal.
43. Md. Motaher Hossain, Thana Fisheries Officer,, Chandpur Sadar, Chandpur.
44. Abdur Rashid Dhali, Thana Fisheries Officer, Narsingdi Sadar, Narsingdi.
45. Md. Rafiqul Islam, Thana Fisheries Officer, Nandigree, Bogra.

Fisheries Research Institute, Mymensingh

46. Dr. M.A. Mazid, Director.
47. Shah Md. Ershaduzzaman, Additional Director.
48. Dr. M.G. Hussain, Chief Scientific Officer.
49. Md. Abdur Rahman, Deputy Director.
50. Dr. M.J. Alam, Senior Scientific Officer.
51. Md. Abul Hossain, Senior Scientific Officer.
52. Md. Shahab Uddin, Senior Scientific Officer.
53. M.A. Zaher, Senior Scientific Officer.
54. Md. Zahirul Haque, Senior Scientific Officer.
55. Md. Aminur Rahman, Scientific Officer.
56 Yahia Mahmud, Scientific Officer.
57. Mohosena Begum Tanu, Scientific Officer.
58. A.H.M. Kohinoor, Scientific Officer.
59. Shayamal Chandra Mahata, Scientific Officer.
60. Goutam Buddha Das, Scientific Officer.
61. Masud Hossain Khan, Scientific Officer.
62. Md. Anwarul Islam, Scientific Officer.
63. M. Nurullah, Scientific Officer.
64. Md. Younus Mia, Scientific Officer.
65. Md. Kamruzzaman, Administrative Officer.
66. Durin Akhtar Jahan, Scientific Officer.

Bangladesh Agricultural Research Council (BARC)

67. Dr. A.K.M. Nuruzzaman, Member-Director(Fisheries), BARC.

Bangladesh Agricultural University

68. Prof. Dr. Manwar Ahmed, Director, BAURES.
69. Prof. Dr. Somen Dewan, Professor, Department of Fisheries.
70. Dr. Gias Uddin Ahmed, Asosciate Professor, Department of Fisheries and Limnology.

Food and Agriculture Organization (FAO)

71. Dr. Esmail Aghasadeh, Socio-economics Consultant.

United States Agency for International Development (USAID)

72. Mr. Latifur Rahman, Program Specialist.

International Center for Living Aquatic Resources Management (ICLARM)

73. Dr. M.V. Gupta, Senior Aquaculture Specialist
74. Dr. Eric Worby, Post-Doctoral Fellow.

পুকুরে মাছ চাষঃ উপকরণ ও উৎপাদন সংক্রান্ত তথ্য

১. চাষীর পরিচিতি ঃ

চাষীর নাম ঃ _____

গ্রাম/মৌজা ঃ _____

ইউনিয়ন ঃ _____ থানা ঃ _____

অঞ্চল ঃ _____

২. পুকুর / ডোবার তথ্য ঃ

পুকুর / ডোবার নম্বর ঃ _____

(খালি রাখুন)

জলাশয়ের পাড় সহ আয়তন (শতাংশ) ঃ _____

জলাশয়ের পাড় ছাড়া আয়তন (শতাংশ) ঃ _____

নূন্যতম ২/৩ ফুট পানি থাকার সময় (মাস) ঃ _____

৩. চাষীর অবস্থা ঃ (√ চিহ্ন ব্যবহার করুন)

ক) একক মালিক চাষী ☐

খ) যৌথ মালিক চাষী ☐

গ) একক লীজ চাষী ☐

ঘ) যৌথ লীজ চাষী ☐

৪. যৌথ ভাবে পরিচালিত হলে চাষীর সংখ্যা ঃ _____

৫. মূখ্য চাষীর পেশা ঃ _____

(চাষী, দিন মজুর, ক্ষুদ্র ব্যবসায়ী, বেতনভূক কর্মচারী, ছাত্র, দক্ষ শ্রমিক, গৃহস্থালী, অন্যান্য)

৬. মুখ্য চাষী মহিলা হলে স্বামীর পেশা ঃ _____

৭. মুখ্য চাষীর শিক্ষাগত মান ঃ _____

(নিরক্ষর, লিখতে পড়তে পারে, প্রাইমারী লেভেল পর্যন্ত, ৬ষ্ঠ থেকে ১০ম শ্রেণী পর্যন্ত এস.এস.সি এবং তদুর্দ্ধে)

৮. পরিবারের সদস্য সংখ্যা ঃ

মহিলা _____ পুরুষ _____ শিশু (১২ বৎসরের নীচে) _____

৯. মূখ্য চাষীর মোট জমির পরিমান (একর / শতাংশ) ঃ _____

১০. জলাশয়ের ধরন ঃ _____

(খনন কৃত, প্রাকৃতিকভাবে সৃষ্ট, রাস্তা পার্শ্বস্থ ইত্যাদি)

১১. জলাশয় খননের উদ্দেশ্য ঃ _____

(মাছ চাষ, গৃহ নির্মাণ, গোসল, ধোয়া মোছা, রাস্তা নির্মাণ অন্যান্য)

১২. পুকুর যদি লীজ নেওয়া হয়, কত বৎসরের জন্য ঃ _____

১৩. পুকুরটি কোন বৎসরে লীজ নেয়া হয়েছে ঃ _____

১৪. লীজের অর্থ মূল্য (টাকা / বছরের সংখ্যা) ঃ _____

১৫. ১৯৯৩-৯৪ সালে পুকুরটিতে মাছ চাষ হয়েছে? _____

১৬. উত্তর হ্যাঁ হলে কত বৎসর ধরে হচ্ছে? _____

১৭. উত্তর না হলে চাষ না হওয়ার কারণ ঃ _____

১৮. কি ধরনের মাছ চাষ করা হয়েছে? (√ চিহ্ন ব্যবহার করুন)

কাতলা	☐
রুই	☐
বিগহেড	☐
মৃগেল	☐
কমন কার্প / মিরর কার্প	☐
রাজপুটি	☐
সিলভার কার্প	☐
তেলা পিয়া	☐
গ্রাসকাপ	☐
চিংড়ি	☐
অন্যান্য (উল্লেখ করতে হবে)	☐ _____

১৯. গত মৌসুমে প্রাপ্ত মৎস্য উৎপাদন (কেজি)? _____

২০. উৎপাদিত মৎস্য বন্টন (কেজি) ঃ বিক্রয় _____ ভোগ _____ বিলি _____

বিভিন্ন উৎস থেকে পরিবারের বাৎসরিক আয় ঃ

১. খামার উৎস থেকে বাৎসরিক আয় ঃ

শস্য ঃ

ধান এবং অন্যান্য খাদ্য শস্য ঃ _____

ডাল এবং শাক সব্জী ঃ _____

ফলমূল ঃ _____

গৃহপালিত পশুপাখীঃ

গৃহপালিত পশু ঃ _____

হাঁস-মুরগী ঃ _____

মাছ ঃ _____

জমি (লীজ এবং বর্গা থেকে)ঃ _____

পশুশ্রম ঃ _____

পশু পাখীর বর্গা ঃ _____

অন্যান্য (উল্লেখ্য করতে হবে) ঃ _____

২. খামার বহির্ভূত উৎস থেকে পারিবারিক মোট আয় ঃ

মুজুরী শ্রম ঃ _____

ক্ষুদ্র ব্যবসা ঃ _____

কুটির শিল্প ঃ _____

অন্যান্য ঃ _____

মোট ঃ _____

উপকরণ ও ব্যায়ের হিসাব

১. পুকুর প্রস্তুতি ঃ

বিষয়	তারিখ	শ্রম দিবসের সংখ্যা		মোট ব্যয় (টাকা)
		নিজ	ভাড়া	
পাড় সংস্কার				
আগাছা পরিস্কার				
পুকুর শুকানো				
বিষ প্রয়োগ				
জাল টানা				

২. পোনা মজুদ

মোট পোনার সংখ্যা ঃ _____ মোট মূল্য (টাকা) ঃ _____

তারিখ	প্রজাতি	সংখ্যা	আকার (সে.মি.)	গড় ওজন (গ্রাম)	ব্যয় (টাকা)

৩. সার এবং আনুসঙ্গীক উপকরণ ঃ

তারিখ	চুন		ইউরিয়া		টি. এস. পি		গোবর			কম্পোষ্ট		অন্যান্য		
	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	বিষয়	পরিমাণ (কেজি)	মূল্য (টাকা)
							নিজস্ব	ক্রয়						

৩. সার এবং আনুসঙ্গীক উপকরণ ঃ

তারিখ	চুন		ইউরিয়া		টি. এস. পি		গোবর			কম্পোষ্ট		অন্যান্য		
	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	বিষয়	পরিমাণ (কেজি)	মূল্য (টাকা)
							নিজস্ব	ক্রয়						

৪. খাদ্য ঃ

তারিখ	চালের কুড়া			খৈল			গমের ভূষি			ঘাস/ক্ষুদিপানা			অন্যান্য		
	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	বিষয়	পরিমাণ (কেজি)	মূল্য (টাকা)
	নিজস্ব	ক্রয়		নিজস্ব	ক্রয়		নিজস্ব	ক্রয়		নিজস্ব	ক্রয়				

৪. খাদ্য ঃ

তারিখ	চালের কুড়া			খৈল			গমের ভূষি			ঘাস/ক্ষুদিপানা			অন্যান্য		
	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	পরিমাণ (কেজি)		মূল্য (টাকা)	বিষয়	পরিমাণ (কেজি)	মূল্য (টাকা)
	নিজস্ব	ক্রয়		নিজস্ব	ক্রয়		নিজস্ব	ক্রয়		নিজস্ব	ক্রয়				

৪. খাদ্য ঃ

তারিখ	চালের কুড়া			খৈল			গমের ভূষি			ঘাস/ক্ষুদিপানা			অন্যান্য		
	পরিমাণ (কেজি)		মূল্য	পরিমাণ (কেজি)		মূল্য	পরিমাণ (কেজি)		মূল্য	পরিমাণ (কেজি)		মূল্য	বিষয়	পরিমাণ	মূল্য
	নিজস্ব	ক্রয়	(টাকা)	নিজস্ব	ক্রয়	(টাকা)	নিজস্ব	ক্রয়	(টাকা)	নিজস্ব	ক্রয়	(টাকা)		(কেজি)	(টাকা)

উৎপাদন বন্টন এবং আয়ের হিসাব

তারিখ	আহরণকৃত মাছ		মোট	বিক্রয়			নিজস্ব ভোগ		বিলি		
	প্রজাতি	সংখ্যা	ওজন (কেজি)	সংখ্যা	ওজন (কেজি)	মোট আয় (টাকা	সংখ্যা	ওজন (কেজি)	সংখ্যা	ওজন (কেজি)	অংশীদারের অংশ:কেজি)
মোট											

মোট আহরণকৃত মাছ (কেজি) ঃ _____

৫. মাছ ধরার খরচ ঃ

নগদ ব্যয় (টাকা) ঃ _____

দ্রব্যে পরিশোধ (কেজি) ঃ _____

৬. পরিবহন ব্যয় (সকল উপকরণের জন্যে)

তারিখ	বিষয়	ব্যয় (টাকা)

৭. মোট ব্যয় (টাকা) ঃ _____

৮. মন্তব্য ঃ

মাসিক নমুনা সংগ্রহের উপাত্ত

তারিখ	গড় ওজন (গ্রাম)										
	কাতলা	সিলভার	রুই	গ্রাস	মৃগেল	কমন/মিরর কার্প	রাজপুটি	তেলাপিয়া	চিংড়ি	বিগহেড	অন্যান্য

Annex-2

ENGLISH VERSION OF RECORD KEEPING BOOK

FISH CULTURE IN PONDS : INPUT - OUTPUT RECORDS

1. Identification of the operator :

   Name of the operator : _____
   Village/Mauza : _____ Union : _____
   Thana : _____ Region : _____

2. Information on pond/ditch :

   Pond/Ditch No. : _____

   Area of the waterbody with dikes : _____

   Area of the waterbody without dikes : _____

   Minimum 2-3' water retention period (months) : _____

3. Operator/farmer status :

   a) Single owner operator |__|
   b) Joint owner operator |__|
   c) Single lease operator |__|
   d) Joint lease opertator |__|

4. If jointly operated, number of operators : _____

5. Occupation of the principal operator : _____
   (Farmer; Daily labour; Petty trading;
   Salaried job; Student; Skilled labour;
   House keeping and Others)

6. In case of woman operator, occupation
   of husband : _____

7. Education of the principal operator : _____
   (Illiterate; Can read and write;
   Upto primary; Class VI-class X-4;
   SSC & above-5)

8. No. of family member : Women ____ Men ____ Children (below 12 years) _____

9. Land owned by the principal operating : _____
household (acres/decimal)

10. Type of waterbody : _____
(excavated, natural depression,
roadside, others)

11. Purpose for which pond/ditch was dug ? : _____
(fish culture, house building, bathing,
washing, road construction, others)

12. If the pond was leased in, for how many years : _____

13. Which year the pond was leased : _____

14. Lease value (Tk./no. of years) : _____

15. Was the pond under fish culture during 1993-94 ? : _____

16. If answer to above is yes, for how many years ? : _____

17. If not, why pond was not under culture : _____

18. What did farmers culture ? : _____

Catla	|__|
Rohu	|__|
Mrigal	|__|
Silver carp	|__|
Grass carp	|__|
Common/mirror carp	|__|
Bighead	|__|
Rajputi	|__|
Tilapia	|__|
Prawn	|__|
Others (specify)	|__|

19. How much fish production was obtained
during last season (kg) ? _____

20. How was it utilized (kg) : Sold _____ Consumed _____ Given away _____

Annual Household Income from different sources

1. Annual income from farm sources :

   - Crops :
     Rice and other cereal crops : _____
     Pulses and vegetables : _____
     Fruits : _____

   - Livestock :
     Animal : _____
     Poultry birds : _____

   - Fish : _____

   - Land (leased out and share crop) : _____

   - Bullock labour : _____

   - Livestock sharing : _____

   - Others (specify) : _____

2. Annual income from non-farm sources :

   Wage labour : _____
   Trading : _____
   Handicrafts : _____
   Others : _____
   Total : _____

INPUT AND COST ACCOUNTS

1. Pond preparation :

Item	Date	No. of mandays		Total cost (Tk)
		Self	Hired	
Dike repairing Weed Clearing Dewatering Fish poison Netting				

2. Stocking :

Fingerlings (No.) : _____ Price (Tk.) : _____

Species	No.	Size (cm)	Average weight (g)	Cost (Tk.)
Catla				
Rohu				
Mrigal				
Silver carp				
Bighead				
Grass carp				
Common/mirror carp				
Rajputi				
Tilapia				
Prawn				
Total				

3. Fertilizer and related inputs

Date	Lime		Urea		TSP		Cattle manure			Compost		Others		
	Quantity (kg)	Price (Tk)	Quantity (kg)	Price (Tk)	Quantity (kg)	Price (Tk)	Quantity (kg)		Price (Tk)	Quantity (kg)	Price (Tk)	Item	Quantity (kg)	Price (Tk)
							Own	Purchased						

4. Feed

Date	Rice bran			Oil cake			Wheat bran			Grass/duckweed			Others		
	Quantity (kg)		Price (Tk)	Quantity (kg)		Price (Tk)	Quantity (kg)		Price (Tk)	Quantity (Tk)		Price (Tk)	Item	Quantity (kg)	Price (Tk)
	Own	Purchased		Own	Purchased		Own	Purchased		Own	Purchased				

5. Cost of harvesting :

Cash cost (Tk) : _____

Kind payment (kg) : _____

6. Carrying Cost (for all inputs)

Date	Item	Cost (Tk)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. Total Cost (Tk) : _____

8. Remarks :

PRODUCTION, DISPOSAL AND INCOME ACCOUNTS

Date	Harvested fish		Total weight (kg)	Sale		Self consumption		Given away		Share of harvested (kg)
	Species	No.		Weight (kg)	Total revenue (Tk)	No.	Weight (kg)	No.	Weight (kg)	
Total										

Total fish harvest (kg) : _____