DEVELOPMENT OF SUSTAINABLE AQUACULTURE PROJECT

A project implemented by the
WorldFish Center

Funded by the
U.S. Agency for International Development (USAID)
(Cooperative Agreement 388-A-00-00-00068-00)

PROGRESS REPORT
(1 July 2002 - 30 September 2002)

Prepared by

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Project Leader

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INTRODUCTION

The Development of Sustainable Aquaculture Project (DSAP) was authorized by USAID under the Cooperative Agreement # 388-A-00-00-00068-00 on 28 June 2000. This technical progress report covers activities for the three months of the project, 1 July 2002 through 30 September 2002. Financial reporting for the Project is handled separately from the WorldFish Center (previously called ICLARM-The World Fish Center) headquarters in Penang, Malaysia.

The main thrust of the Development of Sustainable Aquaculture Project is to sponsor on-farm aquaculture production demonstrations implemented through co-operating NGO partners. These demonstrations are expected to show farmers and their neighbors the profitability of managed aquaculture systems as small business operations. Both small ponds and integrated rice and fish systems, based on research proven production results, are the target of these demonstrations. The Project also has a research component directed to understanding and exploring additional production options, improving the technology transfer process and monitoring the impact of the adopted aquaculture practices.

This trimester was highlighted by (i) improving technical and financial reporting by partner NGOs, (ii) finalization and approval of the work plans 2002-2003 of the collaborative research with Bangladesh Fisheries Research Institute (BFRI) and (iii) reviewing the concept notes for new research awards.

Details about the support for on-farm demonstrations, research, training and administrative actions are given in the respective sections of this report.

DEMONSTRATIONS AND NGO ACTIVITIES

The identification and specific planning of the aquaculture demonstration effort 2002 was finalized. Currently the Project collaborates with 27 partner NGOs responsible for the implementation of 7,654 new demonstrations and is continuing the technical assistance to 4,845 farmers identified and supported last year. The total number of demonstration farmers receiving technical assistance and advice to improve their skills and subsequently their fish yields during the 2002-2003 aquaculture production season is 12,499 (cf. attachments 1 to 3).

Last year (2001-2002 production cycle) 18 partner NGOs identified 6,608 new farmers organized in 464 Demonstration Farmer Groups (DFG) and of which 13 NGOs continued with the project this year (2002-2003 aquaculture season). Attachment 4 summarizes the current status of the 2001 selected farmers. Finally 4,845 demonstration farmers continued for the second year of extension support, 265 farmers (5.3 %) dropped out of which 106 were replaced in 2002. As explained in the previous report, many NGOs have selected new farmers among interested neighbors of last year's extension effort. However, 1,503 secondary adopters were reported by 10 NGOs. The minor spread-over effect confirms that (i) probably not all the secondary adopters have been reported and (ii) most of the partners did not understand yet one of the basic principles of the demonstrations. This issue was shared with the partner NGOs during the coordination meeting of last August.

The verification of the farmer/household selection was completed during the reporting period. At present 7,654 new demonstration farmers, covering a total surface area of 1,021 hectares for fish culture and organized in 955 Demonstration Farmer Groups (DFG), are receiving extension services (cf. attachment 5). Of this, 6,234 are ponds averaging 0.117 ha each and 1,420 rice/fish paddy fields averaging 0.206 ha each. The percentage of rice/fish culture demonstrations compared to pond culture over the last three years is 15% in 2000, 30% in 2001 and 19% in 2002. The percentage of female demonstrators declined from 42% (2000),

28% (2001) to 19% (2002). This regression seems essentially due to the fact that the percentage of cooperating NGOs who give priority to women beneficiaries is declining despite our effort to select women-focused NGOs. The status of the aquaculture effort in 2002-2003 including details of partner NGOs, new demonstrations and carried-over ones are mentioned in the 2002 NGO directory. This working paper is in the process of final editing.

Overlapping of working areas with other aquaculture development projects emerged as a concern particularly in Faridpur district where the IFAD aquaculture development program has many activities. Moreover farmers are very much attracted to collaborate with the IFAD program because it offers substantial financial advantages. This makes the selection of new farmers in these areas more difficult and time consuming.

Continuous on the job training of NGO staff through frequent field visits, attending partner NGOs' extension meetings, and supporting farmer trainings were the main activities during the reporting period. Currently all partner NGOs have completed the foundation training and the first follow-up training of cooperating farmers. Monthly regional coordination meetings (RCM) with the cooperating NGOs, local GoB representatives, farmers and other stakeholders were organized. The project organized two partner NGO coordination meetings in Dhaka that was attended by most of the cooperating NGOs' senior management staff.

During the reporting period, approximately 25% of demonstrations, both in ponds and rice fields supported by 9 partners were affected by flood especially prawn *ghers* in Jessore and Magura regions but also in some parts of Bogra, Mymensingh as well as Gazipur region. Even if flooding cannot be avoided in flood prone areas of Bangladesh, proper site selection should reduce the risk. Eventual compensation of losses of service charges due to flooding will be decided after total harvest and is conditional upon the submission of a supporting flood damage report by the responsible Research Assistant (extension).

This year all NGOs with exception of Caritas share 20% of the management cost of their program. Caritas who showed resistance to propose a strategy for sustainability of their aquaculture extension program was given a six months reflection period to come up with a comprehensive proposal. For this reason Caritas is not anymore invited to the NGO coordination meetings, progress of program activities is directly discussed with the Fisheries Management Team of Caritas. The project also accepted Caritas' request to evaluate their program by an external consultant hoping that this mission would accelerate the submission of Caritas' sustainability strategy. During the presentation of its findings the consultant, Mr. Michael Roy, concluded that the aquaculture demonstrations are professionally implemented by Caritas with an obvious positive impact on the farmers' household. The consultant also gave some interesting, constructive suggestions for a sustained extension program. The final report of the consultant is scheduled to be submitted in October 2002.

Funds for the 3rd quarter were released to all partner NGOs with the exception of Caritas, who had not yet presented the reports of the previous quarter. The release of funds to most of the partners was delayed once again due to late submission of the quarterly financial and technical progress reports. Details of the fund release status are given in the attachment 6

RESEARCH

Impact assessment of adopted aquaculture practices

Year 2000-2001 data: Using the information from 832 pond books of the 2001-2002 aquaculture season (cf. previous report), socio-economic and technology profiling was made. In addition, performance of the technologies in terms of fish production in ponds and rice fields as well as their related economics were estimated. The main results, summarized in

attachment 7, were supplied to USAID for the semi annual review and annual report of the USAID fiscal year 2002. The draft report was submitted for comments and the final version is in progress. The final report will be published as a DSAP working paper from the WorldFish Center, Bangladesh by the end of November 2002.

Year 2001-2002 data: Of the 6608 **pond books** distributed to the farmers of the 2001-2002 program, 4153 or 83% of the expected pond books[1] were effectively received back. In order to analyze the level of adoption of technology and other characteristics of the demonstration, a sample of 776 pond books was randomly selected. The data of these pond books are being verified and entered into the computer. Analysis, draft reporting, validation and final report preparation will require three more months and it is expected that the final report of pond books 2001 will be made available by February 2003.

Year 2001-2002 data: ***Economic Impact Assessment:*** In order to assess the impact of the year 2001 aquaculture demonstrations conducted by farmers under the initiatives of the partner NGOs and to assess the quality of the pond book data, the pond books of some 475 farmers were checked and complementary information was collected by using a simple questionnaire. Collected data are in the process of entry into the computer. In the mean time, partial analysis of the target farmers was completed from which some key information were made available for use by USAID (cf. attachment 8). Entire analysis, draft reporting, validation and final reporting should be completed by February 2003.

Long-term Impact Monitoring (RESTORE): A long-term impact assessment study was commissioned this year, which will be continued until the year 2005. The selected research sites are Bogra, Magura, Mymensingh and Comilla regions. A total of 240 project target farmers (who will participate in the 2003 aquaculture extension program) were selected through rigorous PRAs including wealth-ranking exercises. For this purpose the Research team in collaboration with the concerned partner NGOs conducted a total of 39 PRAs. The complementary questionnaires for the baseline study, scheduled to start in October 2002, were designed.

To improve the quality of this important impact assessment study the concerned project staff received a RESTORE training (cf. previous progress report) and a training in participatory approaches (PRA). The PRA training was organized by the project and conducted/facilitated by PromPT, a local NGO with extensive expertise and experience in PRA training. All the Research Assistants (monitoring) responsible for the field activities of the RESTORE study, and 3 Research Assistants (extension) took part in the 6-day training course (comprising 4 days theory and 2 days fieldwork) held respectively in Dhaka and Gazipur during 9-15 July 2002. The purpose of the training course was to provide basic knowledge and the principles of participatory approaches as well as to acquaint themselves with the most important tools of the PRA "toolbox". By the end of the training course the participants were expected to be able to use participatory approaches and to identify the most appropriate PRA tools for selecting, interacting with and monitoring target households.

Collaborative Research with BFRI

The TAPP for the collaborative research between WorldFish and the BFRI has been approved in March 2002. The identified research programs for collaboration are (i) research related to the development of new aquaculture technologies, (ii) refinement of existing technologies, (iii) farming system research and demonstration, (iv) socioeconomic studies of aquaculture programs, and (v) training program. Work plans for the period of July 2002 to

[1] No returns expected from: one NGO that withdrew from the program, one that suspended its activities and three NGOs that were put on hold (cf. previous progress reports)

June 2003, prepared by BFRI, were finalized and approved. The work plans include the following studies: indigenous catfish culture in mini ponds; brood stock management and minimize inbreeding depression in hatcheries; feasibility study of SIS culture in ponds; low cost agro-based fish feed trial for carp; catfishes, tilapia, freshwater prawn and GIFT culture in seasonal ponds; polyculture of carps; improved carp nursery management; fish culture in seasonal ponds; rice fish culture and integrated chicken-fish culture. A first installment of 1 million Taka (about US$ 17,000) was transferred to BFRI for initiating the collaborative research program. Hence, some of the approved research trials are in the process of implementation.

Research Grants to the Universities

This quarter we received one full proposal "Management of euglenophytes in aquaculture ponds for improving fish production", submitted by Dr. Saleha Khan, Assistant Professor, Department of Fisheries Management, BAU, Mymensingh. This proposal, which was not required to be presented to the selection committee (cf. previous progress report) since this is a continuation of a previous grant, was approved with minor modification. This trial is scheduled to start in November 2002.

In response to our announcement for submission of research awards, the project received 12 research project concept notes. One of these concept notes, dealing with capture fisheries, was handed over to the WorldFish Center implemented Community Based Fisheries Management-2 (CBFM-2) project for consideration. The 11 other concept notes were reviewed by the project and BFRI. Nine concept notes were accepted and returned to the university teachers for the submission of a full research proposal along with the reviewer's comments/suggestions. Two concept notes were refused because the proposed research trials are currently undertaken by BFRI. These concept notes were returned suggesting to present a new concept note regarding a related topic.

In terms of the research grants awarded to the University teachers, a total of 9 grants were awarded to date by the project, 6 studies were completed and 3 are on going. The current status of the different research awards is described briefly below:

Completed research grants:

1. Feasibility of early farming with over-wintered golda *Macrobrachium rosenbergii* juveniles. Dr. Mahmudul Karim, Shrimp specialist, Dhaka. Approved budget: Tk. 235,000. Project tenure: 8 months, 1 October 2000 to 30 May 2001. The final report has been submitted and distributed. Funds disbursed: Tk. 235,500.

2. Improved handling and preservation of golda *Macrobrachium rosenbergii* for producing safe and wholesome product. Drs. Md. Kamal and Md. Nazrul Islam, Department of Fisheries Technology, Bangladesh Agricultural University University (BAU), Mymensingh. Approved budget: Tk. 250,000. Project tenure: one year, 1 April 2001 to 31 March 2002. The authors have submitted the final report. The report was distributed to different institutions/partners (universities, projects, directorates, departments). Funds disbursed: Tk. 250,000.

3. Cost-profit analysis and market testing of value-added product from silver carp and involvement of rural low income people in the production and marketing of value added products. Dr. Nowsad Alam, Department of Fisheries Technology, BAU, Mymensingh. Approved budget: Tk. 250,000. Project tenure: one year, 1 November 2001 to 31 October 2002. The author recently submitted the final report, which will be distributed soonest. Funds disbursed: Tk. 200,000. The last payment has not yet been made.

4. Development of an appropriate technology on *Azolla* based rice-fish farming. Dr. M.H. Mian. Department of Soil Science, Bangladesh Agricultural University (BAU), Mymensingh. Approved budget: Tk. 254,800. Project tenure: one year, 1 April 2001 to 31 March 2002. The research has been completed, but final report not yet submitted. Funds disbursed: Tk. 229,324.

5. Ecology of euglenophytes in aquaculture ponds and their role in fish production. Dr. Saleha Khan, Department of Fisheries Management, Bangladesh Agricultural University (BAU), Mymensingh. Approved budget: Tk. 237,315. Project tenure: one year, 1 June 2001 to 30 May 2002. The final report was submitted and distributed to researchers and policy makers throughout the country for information. From this research project, Dr. Khan will present a poster entitled "Ecology of Euglynophytes in aquaculture ponds and their role in fish production" at the X^{th} international conference on harmful algae organized by the International Society for the Study of Harmful Algae to be held on October 21-25 at St. Pete Beach, Florida, USA. Funds disbursed: Tk. 237,315.

6. Economic Analysis of the sustainability of supplementary feed-based aquaculture. Md. Rais Uddin Mia. Department of Agricultural Finance, Bangladesh Agricultural University (BAU), Mymensingh. Approved budget: Tk. 225,000. Project tenure: one year, 1 August 2001 –31 July 2002. The research has been completed and the preparation of the final report is in progress. Funds disbursed: Tk. 157,274.

On going research grants:

7. Study of inbreeding problems of Thai pangas (*Pangasius sutchi*) in Bangladesh using allozyme electrophoresis. Dr. Md. Mukhlesur Rahman Khan, Department of Fisheries Biology and Genetics, Bangladesh Agricultural University (BAU), Mymensingh. Approved budget: Tk. 250,000. Project tenure: one year, 1 December 2001 - 30 November 2002. The project is running satisfactorily. Funds disbursed: Taka. 190,000.

8. Socio-economic aspects of freshwater prawn (*Macrobrachium rosenbergi*) culture development in Mymensingh. Dr. Nesar Ahmed, Department of Fisheries Management, Bangladesh Agricultural University (BAU), Mymensingh. Approved budget: 126,000. Project tenure: 1 January 2002 – 31 December 2002. The project is running satisfactorily. Funds disbursed: Taka. 113,000.

9. "Management of euglenophytes in aquaculture ponds for improving fish production" Dr. Saleha Khan, Department of Fisheries Management, Bangladesh Agricultural University (BAU), Mymensingh. Tentative budget: Tk. 250,000. Project tenure: one year, 1 November 2002 –31 October 2003.

TRAINING

During the reporting period (June to September 2002) no regular training course was scheduled for partner NGO staff. However, the following training courses were completed: (i) foundation training course of associate partner program, (ii) refresher course No 1 of associate partner program, (iii) GIFT seed production in rice fields and (iv) *imam* training.

The foundation training courses for the last two batches of the 2002 selected associate partner NGOs (cf. previous progress report) were held at the Bangladesh Development Society (BDS) training venue in Barisal. A total of 33 field staff of 14 NGOs participated in the training course.

In the previous progress report we reported the initiation of the associate partner NGO program and the selection of new NGOs in the year 2002. During the reported period the

"non partner" NGOs, who received training in 2001 were invited to join this program. Out of 38 invited NGOs 30 accepted and signed an associate partner contract. Consequently a first follow-up training course on extension methodologies and the basic principles of aquaculture was organized for the extension workers of these partners in two successive batches. The follow-up training of the first batch was held at BFRI in Mymensingh and the second batch at RRC training center in Jessore. A total of 50 field workers from 28 associate partner NGOs participated in the follow-up training, which was in fact the first training for most of them because of the high turnover rate of NGO staff.

Under the associate partner agreement the WorldFish Center will provide training and technical support to the associate partner NGO. The technical support, through the Research Assistant (extension) based at the regional liaison offices, comprises on the job training and regular regional coordination meetings. The regular training support includes a 3-day foundation training and three 2-day follow-up training courses over a period of four years. No financial support for management, farmer training or demonstrations will be provided. However, some training material as training booklets and pond record books etc. may be donated to cooperating housholds.

During this year's aquaculture season the project has initiated a trial on GIFT[2] seed production in boro rice fields following the production systems developed by the North West Fisheries Project, for which 11 partner NGOs volunteered. A 1-day training course for 18 field staff was organized at the WorldFish Center Bangladesh office and facilitated by Dr. Binoy Kumar Barman, Post Doctorate fellow of the University of Stirling, UK. After completion of the training, the partner NGOs organized and conducted a similar training for the 66 selected farmers (6 by each NGO) for this trial. The provision of tilapia fingerlings that was scheduled for this quarter unfortunately had to be postponed due to organizational difficulties.

The project financed and participated in the pilot Imam (Islamic clerics) training program organized by USAID, Bangladesh. This 2-day program, which is part of the 45-day Imam foundation training organized by the Islamic Foundation, consists of one-day classroom presentations by 4 USAID supported projects followed by one-day field visits (four successive batches of approximately 25 trainees). The project strategy and some basic information on carp polyculture in pond or paddy fields were presented in the classroom session followed by a field visit the next day. The project conducted two successive batches of Imam training at the Imam training centers in Khulna and in Dhaka. A total of 202 Imams from different parts of the country attended the scheduled training program.

ADMINISTRATION

A list of Project personnel as of 30 September 2002 is attached (cf. Attachment 9). As identified by the 2002 work plans and the document "DSAP strategy 2002-2005" (cf. Progress Report Jan.-March 2002), the project has started the process for the recruitment of a Research-Associate (social-scientist) to complete the DSAP team. After interviewing 5 short-listed candidates the position was offered to Mr Md Reazul Karim, who accepted the job proposal and will take up his new assignment on November 1st, 2002. The team of field based Research Assistants (monitoring) was completed on 1st July 2002, when Messrs Saiful Islam, Abu Sayed and Shakil Ahmed Khan resumed duty. The Center has also engaged Ms Hilda Sobita Rozario as receptionist for the Dhaka office, for which 50% will be charged to the project.

[2] WorldFish Center developed Genetically Improved Farmed Tilapia

The project along with one partner NGO "ADI" took part in the American Week organized in Chittagong from 18 to 21 September 2002. The project prepared a multimedia presentation and a panel for display highlighting its purpose, objectives, strategy, working area and main results. ADI prepared another panel showing their aquaculture program, working strategies, activities, working areas and achievements. In addition, an integrated agriculture-aquaculture model was displayed. Different project documents and leaflets were also distributed.

Mr. Jerry Lanier, State Department, Deputy Office Director for South Asia, visited two fish culture demonstrations in Gazipur district supported by PRANTEC. The partner NGO thoroughly presented their aquaculture extension activities supported by the project. Subsequently the farmers explained how they were growing fish and what benefits they received from the collaboration with PRANTEC and the project. Mr. Lanier took keen interest in discussing with the pond and rice-fish farmers.

The usual assortment of meetings, visitors and field visits were attended during the report period. The most important were:

Organized field visits in Khulna (18 July 2002) and in Gazipur (24 July 2002) for the pilot Imam training program;

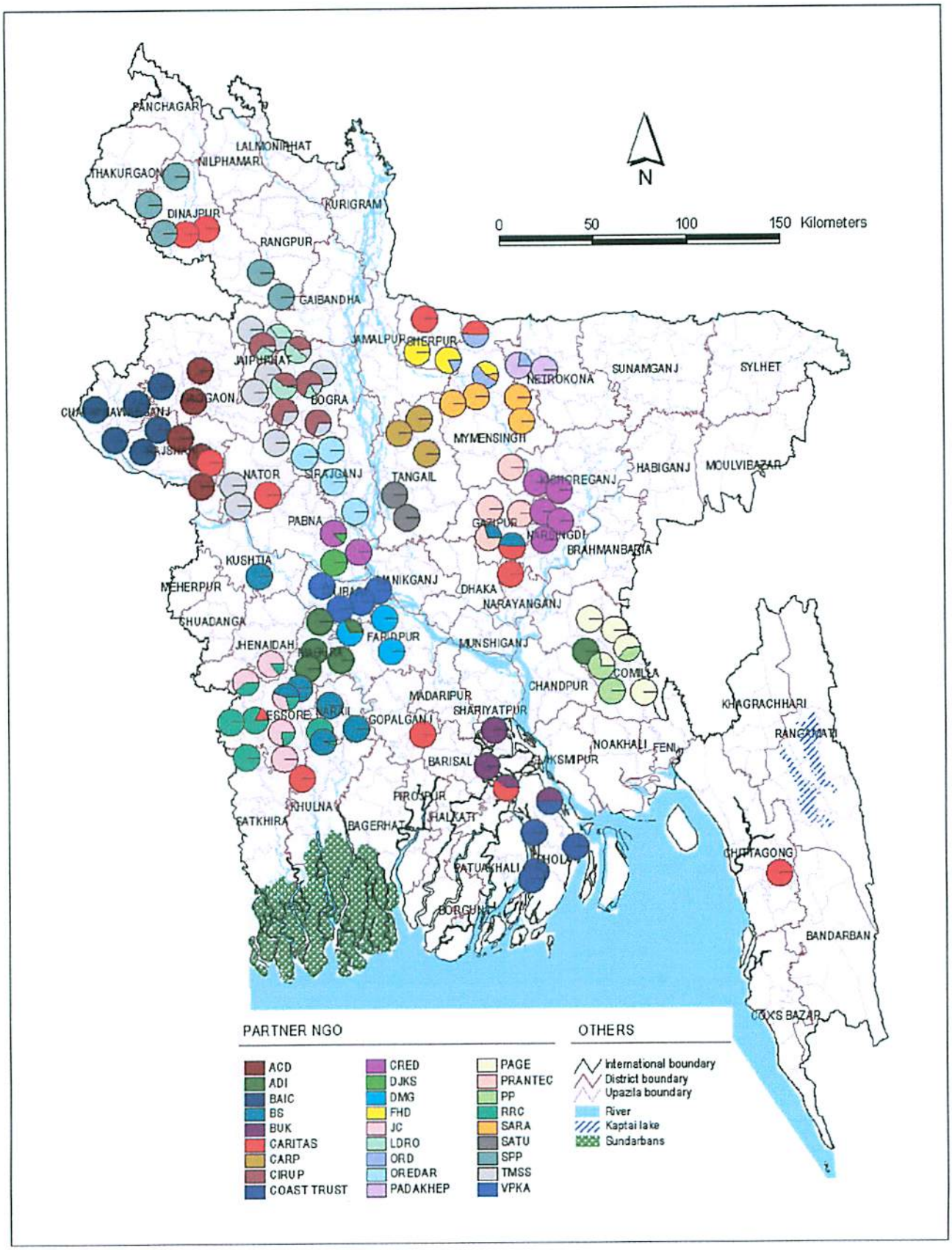
1. Dr. Md. Ferdous Alam, Research Coordinator, participated in the Annual Research Review Workshop of Bangladesh Fisheries Research Institute held on 24 July 2002 in Mymensingh;
2. Mr. Ebbe Schioeler, WorldFish consultant, visited different farmers and their families supported by two partner NGOs in Jessore district on 28-31 July 2002. The consultant documented DSAP success stories to be published in a WorldFish publication scheduled to be launched during the celebration of the Center's 25th anniversary in November 2002
3. Mr. Johannes Janssen, Project Leader, participated in a seminar on "Technology Transfer in Fisheries Sector" organized by the Bangladesh Fisheries Research Institute and held on 17 August 2002 in Mymensingh;
4. Dr. Md. Ferdous Alam, Research Coordinator, presented a keynote paper entitled "Role of fisheries in alleviating poverty in Bangladesh" at the national seminar on "Role of fisheries sector in poverty alleviation" held at BARC farmgate, Dhaka on 20 August 2002;
5. Mr. Johannes Janssen, Project Leader, participated in the annual WorldFish in-house scientific review organized in Penang, Malaysia from 9 to 13 September 2002;
6. Mr. Basilio 'Jiji' Rodriguez, Executive Director, GIFT Foundation International, visited Bangladesh on 20 and 21 September 2002 to investigate the possibilities of supporting BRAC to plan, build and manage an improved germplasm tilapia monosex hatchery which will sustain quality and performance traits of the GIFT fish;
7. Mr. Naseem Aleem participated in a seminar on Aquaculture organized by the USAID supported ATDP-II project and the American Soybean Association on 25th September 2002 at BRAC Inn Center, in Dhaka.

ATTACHMENTS

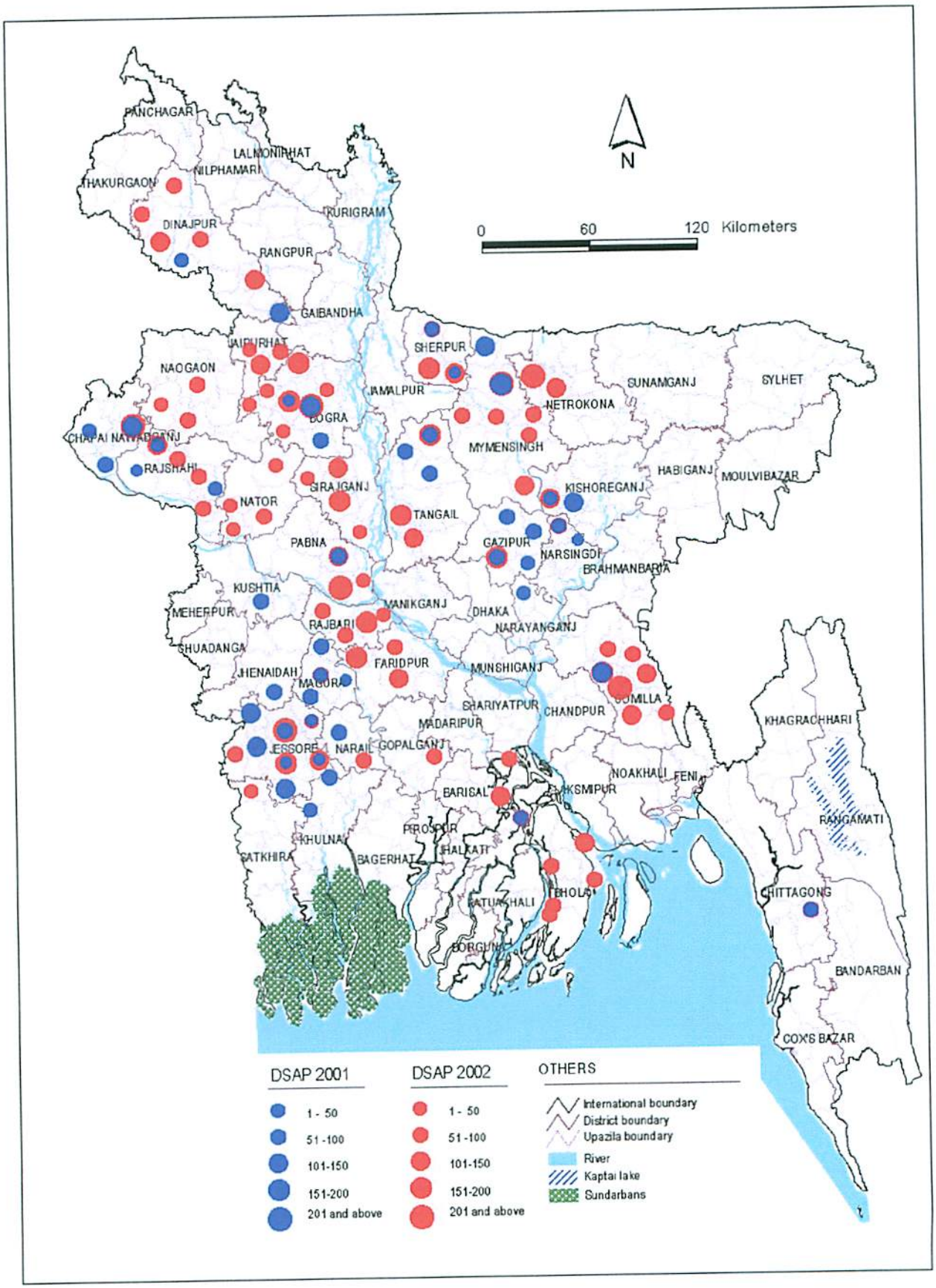
Attachment 1 Status of 2001 selected demonstration farmers in 2002

Sl. #	NGO	New in 2002		Carried over of 2001		Total in 2002	
		DFG	Demos	DFG	Demos	DFG	Demos
01	ACD	35	250			35	250
02	ADI	50	350	32	496	82	846
03	BAIC	41	350	35	431	76	781
04	BS	40	350	34	498	74	848
05	BUK	29	250			29	250
06	CARITAS	17	401	43	600	60	1001
07	CARP	35	250	20	300	55	550
08	CIRUP	35	250	21	300	56	550
09	COAST TRUST	29	250			29	250
10	CRED	49	350	32	435	81	785
11	DJKS	35	253			35	253
12	DMG	32	250			32	250
13	FHD	35	250	15	203	50	453
14	JC	35	350	30	500	65	850
15	LDRO	29	250			29	250
16	ORD	35	250	23	282	58	532
17	OREDAR	29	250			29	250
18	PADAKHEP	35	250			35	250
19	PAGE	35	250			35	250
20	PRANTEC	33	250	20	304	53	554
21	PP	34	250			34	250
22	RRC	46	350	20	300	66	650
23	SARA	35	250			35	250
24	SATU	32	250			32	250
25	SPP	39	300	22	196	61	496
26	TMSS	51	350			51	350
27	VPKA	25	250			25	250
Total =	**27**	**955**	**7,654**	**348**	**4,845**	**1303**	**12,499**

Attachment 2 **Geographical distribution of aquaculture demonstrations supported by WorldFish-NGO extension effort 2002 (NGO wise)**



Attachment 3 **Geographical distribution of aquaculture demonstrations supported by WorldFish-NGO aquaculture extension effort 2002 (number wise)**



Attachment 4 Status of 2001 selected demonstration farmers in 2002

Sl #	NGO	2001 Demonstrations				Replacement (5)	Total (4+5)	Remarks
		Initiated (1)	Dropped out (2)	Discontinued (3)	Carried over (4=1-2-3)			
01	ADI	500	4		496		496	
02	ARSHI	292		292	0		0	Put on hold
03	BAIC	500	69		431		431	
04	BS	503	14		489	9	498	
05	BRAC	311		311	0		0	discontinued
06	CARITAS	600			600		600	
07	CARP	300	61		239	61	300	
08	CIRUP	300	3		297	3	300	
09	CRED	500	70		430	5	435	
10	DSS	201		201	0		0	Put on hold
11	FHD	203			203		203	
12	JC	500			500		500	
13	ORD	294	12		282		282	
14	PRANTEC	304	28		276	28	304	
15	RASDO	300		300	0		0	Put on hold
16	RRC	300			300		300	
17	SPP	200	4		196		196	
18	TMSS	500		500	0		0	discontinued
Total		**6,608**	**265**	**1,604**	**4,739**	**106**	**4,845**	

Attachment 5 Status of new demonstration farmers in 2002

Sl. No	NGO	Working area		Demos (No)	DFG (No)	Demo area (dec)	Technology group adopted (No)	Technology group codes
		District (No)	Thana (No)					
01	ACD	2	5	250	35	9,965	1	16
02	ADI	3	5	350	50	12,595	4	11, 16, 03, 02
03	BAIC	3	4	350	41	8,380	1	16
04	BS	5	7	350	40	9,397	6	16, 11, 17, 04, 03, 02
05	BUK	2	4	250	29	8,429	4	11, 16, 03, 02
06	CARITAS	9	9	401	17	9,272	4	11, 16, 03, 17
07	CARP	1	3	250	35	10,884	3	11, 16, 03
08	CIRUP	2	6	250	35	6,587	2	16 ,03
09	COAST	1	5	250	29	10,056	3	11, 16, 03
10	CRED	3	5	350	49	9,581	4	11, 02, 16, 03
11	DJKS	1	2	253	35	9,264	3	11, 16, 03
12	DMG	1	3	250	32	12,712	2	16, 03
13	FHD	1	2	250	35	7,836	4	11, 02, 16, 03
14	JC	1	4	350	35	17,082	2	04, 16
15	LDRO	2	5	250	29	7,154	3	11, 16, 03
16	ORD	2	4	250	35	8,312	4	11, 02, 16, 03
17	OREDER	1	4	250	29	9,530	3	11, 16, 03
18	PADAKHAP	1	2	250	35	6,761	3	11, 16, 03
19	PAGE	1	5	250	35	9,059	3	11, 16, 03
20	PRANTEC	2	3	250	33	5,857	4	11, 02, 16, 03
21	PP	1	3	250	34	10,425	4	11, 16, 03, 17,04
22	RRC	4	9	350	46	10510	3	11, 16, 03
23	SARA	1	5	250	35	9,589	4	11, 02, 16, 03
24	SATU	1	2	250	32	5,033	2	16, 03
25	SPP	1	5	300	39	12,600	3	16, 02, 03
26	TMSS	3	14	350	51	8,520	3	11, 16, 03
27	VPKA	1	4	250	25	6,886	2	16, 03
Total		**31**	**105**	**7,654**	**955**	**252,276**	**6**	**02, 03, 04, 11, 16, 17**

Attachment 6 NGO cooperators, status of 2002 on-farm demonstrations as of 30 September 2002

Sl. No.	NGO	pond/plot #	Total budget		Installment				remarks
			initial	revised	Q-1	Q-2	Q-3	Q-4	
1	ACD	250	581,570			174,471	146,817	260,282	
2	ADI	350	1,382,875		204,800	521,004	439,909	217,162	
3	BAIC	350	1,448,890		192,320	569,845	579,156	107,569	
4	BS	350	1,389,400		207,200	481,436	391,533	309,231	
5	BUK	250	459,940			183,976	80,480	195,484	
6	CARITAS	400	2,390,681			1,195,341	717,670	477,670	
7	CARP	250	1,010,687		135,000	387,353	352,187	136,147	
8	CIRUP	250	1,149,000		194,700	370,925	165,047	418,328	
9	COAST trust	250	681,446			204,434	165,654	311,358	
10	CRED	350	1,381,843		204,550	515,054	430,072	232,167	
11	DJKS	250	605,160			181,548	179,900	243,712	
12	DMG	250	639,225			191,768	191,768	255,690	
13	FHD	250	1,098,275		192,940	367,522	251,116	286,697	
14	JC	350	1,364,830		170,008	563,270	406,998	224,554	
15	LDRO	250	1,060,250		151,300	438,155	286,327	184,468	
16	ORD	250	1,137,650		250,000	411,219	280,982	195,449	
17	OREDAR	250	563,688			169,106	199,138	195,444	
18	Padakhep	250	1,265,225		191,306	361,900	323,535	388,484	
19	PAGE	250	591,570			177,471	102,748	311,351	
20	PP	250	537,330	529,830		161,199	145,046	231,085	
21	PRANTEC	250	1,098,635		171,128	444,008	318,654	164,845	
22	RRC	350	1,361,986		213,900	516,585	496,212	135,289	
23	SARA	250	591,210			177,363	116,293	297,554	
24	SATO	250	1,169,848		167,462	377,743	295,848	328,795	
25	SPP	300	1,235,796	1,242,547	190,740	393,797	342,922	308,337	
26	TMSS	350	1,259,640				910,562	349,078	
27	VPKA	250	586,260			175,878	133,176	277,206	
Total (No/Taka)		**7,650**	**28,042,910**		**2,837,354**	**9,712,371**	**8,449,750**	**7,043,435**	
Total (US$)			**488,552**		**49,431**	**169,205**	**147,208**	**122,708**	

Attachment 7 Analysis Pond book 2000 (April 2000 -March 2001)

	fish pond	paddy field[1]	total/*average*
Demonstrations (No)	5,322	926	6,248
Demonstrations (%)	85.2	14.8	100.0
Male farmers (%)	56.4	66.2	*57.9*
Female farmers (%)	43.7	33.8	*42.2*
Stratified random sample[2]	604	228	832
No of technologies	9	7	16
General			
Average pond/plot size (dec)	24.3	37.8	*26.3*
Average pond/plot size (ha)	0.098	0.153	*0.106*
Production period (days)	148	138	*147*
Survival rate (%)	56	80	*60*
Yield (mt/ha/crop)	2.73	2.27	*2.66*
Survival rate			
Yield (mt/ha/crop)	2.78	1.52	*2.60*
Yield (kg/dec/crop)	11.1	9.2	*10.8*
Production (mt/ha/yr)	6.74	5.99	*6.62*
Production (g/m2/day)	1.85	1.64	*1.82*
Financial analysis (per crop)			
Variable cost (Tk/plot)	4,083	5,970	*4,362*
Gross revenue (Tk/plot)	11,196	20,300	*12,546*
Gross margin (Tk/plot)	7,113	14,331	*8,183*
Variable cost (Tk/ha)	41,500	39,009	*41,131*
Gross revenue (Tk/ha)	113,805	132,651	*116,598*
Gross margin (Tk/ha)	72,305	93,642	*75,467*
Value of financial resources raised (million US$)	0.38	0.10	0.47
Benefit cost ratio[3]	1.74	2.40	*1.84*
Impact			
Total pond/plot area (ha)	519	141	660
Total produced fish/shrimps (mt)	1,418	318	1,737
Total production auto-consumed (mt)	213	48	261
Total production marketed (mt)	1,206	271	1,476
Sales price (US$/kg)	0.72	1.01	*0.76*
Sales value (million US$)	1.02		
Value annual sales (million US$)	0.87	0.27	1.14
participating households (no)	7,238	1,259	8,497
Family size	5.92	5.75	*5.89*
Direct beneficiaires (No)	42,848	7,241	50,090
Job equivalent[2]	1,064	185	1,250
Increased fish/shrimp produced (mt/ha/crop)	1.39	1.24	
Increased fish/shrimp produced (%)	103	121	
Increased revenu (Tk/crop)	6,756	13,950	

Attachment 7 Analysis Pond book 2000 (April 2000 -March 2001) (continued)

Increased revenu (%)	152	220	
Increased total production fish/shrimp (mt)	721	174	895
Sales growth (million US$)	0.52	0.18	0.70
Baseline information (1999) before extension support			
Aquaculture experience (yr)	4.4	3.6	
Produced fish/shrimp (mt/ha/crop)	1.34	1.03	
Income from fish (Tk/yr)	4,440	6,350	
On-farm income (Tk/yr)	25,798	30,598	
Off-farm income (Tk/yr)	14,592	11,723	
Total income (Tk/yr)	42,321	40,390	
Some other results			
Single ownership	84	89	*85*
Multi ownership	12	6	*11*
Leased	4	5	*4*
Water retention			
Perenial	66	25	
Seasonal >9 months	16	23	
Seasonal 6-9 months	15	45	
Seasonal <6 months	3	7	
Stocking			
No/ha	11,612	9,908	
No/dec	47	40	
Kg/dec	?	?	
Kg/ha	?	?	
Varaible cost (%)			
Fingerlings	32	27	
Hired labor	21	26	
Fertilizer	22	25	
Feed	20	20	
Other	5	1	
Varaible cost (Tk)			
Fingerlings	1,306	1,612	*1,352*
Hired labor	857	1,552	*960*
Fertilizer	898	1,492	*986*
Feed	817	1,194	*872*
Other	204	60	*183*

[1] mainlt alternate rice cum fish culture

[2] 10% per technology with a minimum of 30

[3] Gross margin/variable cost

Attachment 8 Analysis 2001 survey (April 2001 -March 2002)

	fish pond	paddy field[1]	total/*average*
Demonstrations (No)	4,596	2,012	6,608
Demonstrations (%)	69.6	30.4	100.0
Male farmers (%)	65.0	87.0	*71.7*
Female farmers (%)	35.0	13.0	*28.3*
Stratified random sample[2]	150	39	189
No of technologies	9	7	16
General			
Average pond/plot size (dec)	22.0	44.0	*28.7*
Average pond/plot size (ha)	0.089	0.178	*0.116*
Production period (days)	203	133	*182*
Stocking (no/dec)	43	46	*44*
Stocking (kg/dec)	0.69	0.52	*0.64*
Survival rate (%)	-	-	
Yield (mt/ha/crop)	2.78	1.52	*2.40*
Yield (kg/dec/crop)	11.3	6.1	*9.7*
Production (mt/ha/yr)	5.01	4.16	*4.75*
Production (g/m2/day)	1.37	1.14	*1.30*
Financial analysis (per crop)			
Variable cost (Tk/plot)	2,842	3,501	*3,043*
Gross revenue (Tk/plot)	9,408	9,621	*9,473*
Gross margin (Tk/plot)	6,565	6,120	*6,430*
Variable cost (Tk/ha)	31,913	19,653	*28,180*
Gross revenue (Tk/ha)	105,623	54,011	*89,908*
Gross margin (Tk/ha)	73,710	34,358	*61,728*
Value of financial resources raised (million US$)	0.23	0.12	0.35
Benefit cost ratio[3]	2.31	1.75	*2.14*
Impact			
Total pond/plot area (ha)	406	356	762
Total produced fish/shrimps (mt)	1,131	539	1,669
Total production auto-consumed (mt)	170	81	250
Total production marketed (mt)	961	458	1,419
Sales price (US$/kg)	0.66	0.92	*0.74*
Value annual sales (million US$)	0.63	0.42	1.05
Participating households (no)	6,251	2,736	8,987
Family size	6.26	5.38	*5.99*
Direct beneficiaires (No)	39,129	14,721	53,850
Job equivalent[2]	919	402	1,322
Increased fish/shrimp produced (mt/ha/crop)	1.74		
Increased fish/shrimp produced (%)	165		

Attachment 8 Analysis 2001 survey (April 2001 -March 2002) (continued)

	fish pond	paddy field[1]	total/*average*
Increased revenu (Tk/crop)	78,526		
Increased revenu (%)	290		
Increased total production fish/shrimp (mt)	705		705
Sales growth (million US$)	0.46		0.46
Control group without extension support			
produced fish/shrimp (mt/ha/crop)	1.05		
Variable cost (Tk/ha)	27,097		
Gross revenue (Tk/ha)	36,771		
Gross margin (Tk/ha)	9,674	0	
Some other results			
single ownership	85	89	*86*
multi ownership	14	6	*12*
leased	1	5	*2*
Varaible cost (%)			
fingerlings	32		
hired labor	20		
organic fertilizer	8		
inorganicfertilizer	20		
feed	13		
other	7		

[1] mainly alternate rice cum fish culture [2]

[3] Gross margin/variable cost

Attachment 9 USAID-funded staff list as of 30 September 2002

No	Name of Staff	Position	Date Employed
1	Drs. Johannes Janssen	Senior Aq. Scientist/Project Leader	01 September 01
2	Prof. Md. Ferdous Alam	Research Coordinator	01 July 01
3	Naseem Aleeem	Field Coordinator IAA	01 June 02
4	Hasan Ahmmed Chowdhury	Research Associate	15 December 99
5	Dr. Khondker Murshed-e-Jahan[3]	Research Associate/Fellow	24 January 01
6	Kh. M Shameem Kamal	Research Assistant	01 July 99
7	Ms Manuara Azim	Research Assistant	01 July 99
8	Mohammad Abdul Latif Siddique	Extension Officer	11 March 01
9	Md. Jahirul Hoque	Research Assistant	11 March 01
10	Mohammed Mokhlesur Rahman	Research Assistant	11 March 01
11	Bijan Mazumder	Extension Officer	11 March 01
12	Md. Mamunor Rashid	Research Assistant	20 May 01
13	Md. Abul Kashem	Extension Officer	20 May 01
14	Md Nazim Uddin	Extension Officer	29 May 02
15	Md Abdur Razzaque	Extension Officer	29 May 02
16	Syed Arifuzzaman	Extension Officer	29 May 02
17	Mir Mostaque Ahamed	Extension Officer	29 May 02
18	Md. Asadul Hoque	Extension Officer	23 June 02
19	Md. Khabirul Hasan	Research Assistant	9 June 02
20	Ms Chamon Ara Begum	Research Assistant	9 June 02
21	Saiful Islam	Research Assistant	1 July 02
22	Abu Sayed	Research Assistant	1 July 02
23	Md. Shakil Ahmed Khan	Research Assistant	1 July 02
24	Reza Md Ali Kareem[4]	Office manager	10 Feb. 02
25	Bijoy Bhushan Debnath	Administrative Officer	01 May 90
26	Khan Golam Rasul	Accounts Officer	01 June 96
27	Md. Billal Hossain	Data Entry Operator	01 August 99
28	Ms Maksuda Khanam	Data Entry Operator	01 May 02
29	Ms Hilda Sobita Rozaria[5]	Receptionist	10 July 02
30	Md. Abdur Razzak	Driver	01 May 89
31	Md. Dulal	Driver	01 May 99
32	Md. Nazrul Islam	Driver	01 October 01
33	Tapan Chandra Sarker	Messenger	01 July 93
34	Md. Idris Ali[5]	Messenger	01 June 98
35	Md. Abdul Wahab[5]	Messenger	01 September 98
36	Md. Mahade Hasan Babul[5]	Messenger	01 July 01

[3] Costs shared DSAP (80%), PRIAP (fish 2020) (20%)
[4] Costs shared by ICLARM HQ (50%); CBFM (25%) and DSAP (25%)
[5] Costs shared by CBFM (50%) and DSAP (50%)