

**DEVELOPMENT OF
SUSTAINABLE AQUACULTURE PROJECT**

**A project implemented by
ICLARM-The World Fish Center**

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


**PROGRESS REPORT
(1 January 2002 - 31 March 2002)**

Prepared by

**Johannes Janssen
Project Leader**

**Ferdous Alam
NGO Coordinator/Researcher**

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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 report covers activities for the three months of the project, 1 January 2002 through 31 March 2002. Financial reporting for the Project is handled separately from ICLARM headquarters in Penang, Malaysia.

The main thrust of the DSAP 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 our activities were concentrated on the partnership with NGOs. The strategy for the implementation of the aquaculture demonstrations was reoriented based on the lessons learnt from the 2001 program and is specifically aiming at improving the sustainability on the level of the household as well as on the level of the NGO.

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

Having evaluated the program of 2001, it was realized that a reorientation of the DSAP strategy for the rest of project period (2002-2005) is necessary. Concepts were developed to give the DSAP a new shape. Significant strategic changes have been made in the DSAP concept. The background work for this change started in November 2001 with an internal evaluation of the DSAP strategy during the visit of the Program Leader, Freshwater Resources Research Program, ICLARM-The World Fish Center. This was completed in December 2001 through the visits of the Project Leader and Field Coordinator/ Researcher to all the partner NGOs involved with the DSAP. The outline and messages of the proposed strategic changes were shared with the NGO executives. The feedback from the executives was subsequently incorporated to improve the concept and make it more practical. The two main pillars of the strategy of the DSAP are the sustainability of the NGOs and farmers. The salient features of the reoriented strategy at the NGO level are: (i) establishing partnership with the NGOs rather than contractorship in order to give NGOs the sense of ownership and the perception that it is their aquaculture program, (ii) giving flexibility within the commonly identified guidelines; allowing them to implement their program according to their own approaches, if appropriate and (iii) establishing transparency, both at the ICLARM-NGO interface and NGO-beneficiaries interface. At the farmer/household level, sustainability is thought to be achieved by (i) being able to give quality technical support, (ii) ensuring the use of participatory approaches for the adoption of selected technologies, (iii) the integration of the promoted aquaculture practices into the other agricultural subsystems of the households and (iv) the spread over effect of the technologies to interested neighbor farmers.

The reoriented strategy of the DSAP for 2002-2005 (cf. Attachment 1) was presented to the concerned staff of the USAID-Bangladesh Mission on 17 January 2002 for their

understanding and approval. Upon receiving verbal approval, the concept then was presented before the partner NGOs and expected partner NGOs in a workshop held at BRAC Center on 22 January 2002. Eighteen partner NGOs were invited to the workshop (15 partners who started the 2001 program and 3 new NGOs who replaced the 3 partner NGOs put on hold due to unacceptable performance). All the partners with exception of BRAC, who confirmed its withdrawal from the aquaculture demonstration program, confirmed their participation for the period 2002-2005. Thus a total of 17 NGOs decided to implement the aquaculture program in 2002 under DSAP support for on-farm demonstrations. As per agreement of the participants of the workshop: (i) the number of new farmers each year to be looked after by each field assistant has been reduced to 50 from 100; (ii) the extension support will be assured for three years and (iii) the partner NGOs will share the program costs (gradually increasing from 20% in 2002 to 80% in 2005). Work plans and budget guidelines were presented to facilitate NGOs in preparation of their work plans and budgets for 2002.

The ICLARM/DSAP has a commitment to implement 7000 demonstrations each year. The project implementation guidelines of 2001 require that each field assistant is to look after 100 farmers. These appeared to be too high as far as quality service is concerned. Quality extension services are a prerequisite for sustainability on both NGO and farmer level. Moreover, it is beyond the capacities of the existing NGOs to produce each year 7000 new demonstrations and to maintain support to those selected in the previous years. This important constraint of the existing NGOs formed the background for selecting further NGOs to ensure the implementation of the required number of demonstrations for the forthcoming years. ICLARM staff (Project Leader, Field Coordinator, Research Associates and the Research Assistants) spent significant time in visiting the expected potential partners to clarify their queries as well as in finalizing the rationale for their selection as new partner NGOs for 2002. In addition, the Research Assistants were sent to the field to collect information about NGOs on a prescribed format to obtain first hand information as basis for preliminary selection (cf. Attachment 2). The DSAP team went through each format carefully to come up with a preliminary selection of 25 NGOs.

A second workshop was then held in the BRAC center on 28 February 2002 for the preliminary selected "new" NGOs to clarify the partnership with ICLARM as well as the DSAP strategy. All the queries and questions were discussed at length. Following the workshop, a set of 10 new partner NGOs were selected who subsequently agreed to implement the aquaculture program from 2002 onwards without grants under DSAP support (cf. Attachment 3). As per agreement of the participants of the workshop, the number of farmers to be looked after by each field assistant has been brought down to 50 instead of 100. This has resulted in a necessary increase in the number of field assistants, which will increase the total number of demonstrations beyond 7000 (cf. attachment 1). This was the main rationale for having a set of partner NGOs willing to demonstrate aquaculture technologies without grants for the cooperating farmers. Also the necessity of demonstration grant appeared to be questionable to the team. Therefore, this gives the Project a unique opportunity to test as to whether demonstration grant money is at all necessary for successful implementation of the demonstration.

It was agreed by all the partner NGOs ("old" and "new") that for 2002 onwards, the new concept will be operational and the NGOs will implement their aquaculture program accordingly. Some new line items of expenditures have been added to the budget on the basis of the feedback from the NGOs. More flexibility is given to the NGOs in terms of implementation of their aquaculture program. The work plans and budgets of 26 NGOs has

been approved, the budget of Caritas is not yet finalized (cf. Attachments 4 and 5). The 2002 program targets the involvement of 27 partner NGOs responsible for the implementation of 7650 new demonstrations of which 5150 with grant (by 17 partners) and 2500 without grant (by 10 partners). Support, particularly group support, to the cooperating "old" farmers (selected in 2001) as well as fellow farmers is included in the approved 2002 work plans. It is foreseen that the number of demonstrations implemented by the 17 NGOs with grant for their beneficiaries will be 7000 for 2003-2005 due to the recruitment of new field assistants next year (2003). NGO staff comprising 28 project coordinators and 153 field assistants (60 "old" and 93 "new") are implementing the 2002 program. The approved budget for 2002 to be taken in charge by DSAP is around 28 million Taka (490,000 US dollars) including 80% of the management cost and the subsidy for the cooperating farmers.

Support to the NGOs and their 2001 program continued simultaneously with the preparation of the 2002 program. The Research Assistants kept providing support to NGO staff regarding harvest, filling out the pond books, farmer rallies and training. Most farmers had concluded their partial harvests and about 95% of the cooperating farmers have completed their final harvests by the end of March 2002. The information on rallies after December 2001 is still coming in and will be incorporated in the next quarterly report. Likewise, information on the spread-over effect could also not be made available by the partner NGOs. Because of the lack of time, the third follow-up training for most of the NGOs could not be organized. However, some of their staff had already received follow-up training earlier. Since the final harvests of ponds of 2001 continued until mid April, the partner NGOs could not return the filled-out pond books. Necessary instructions have been given to the partner NGOs to return the filled-out pond books by the end of May 2002. Attachment 6 summarizes the status of the on-farm demonstrations of the 2001 effort.

A significant number of new NGOs continue requesting ICLARM to provide training and technical support to their staff to help develop their aquaculture program. It was therefore, very necessary to also select some associate partner or non-contracted NGOs who would be willing to diffuse DSAP technologies using their own staff and at own cost. As part of that necessity DSAP has the capacity to train each year 80-100 extension workers of associate partners NGOs. Such associate-partners would be receiving training and technical support only from ICLARM and in exchange, give us the feedback about their aquaculture program. Selection of the associate partner NGOs for 2002 is in progress.

The demonstration activities of the partner and associate-partner NGOs are scattered in over 30 districts of Bangladesh. To provide better support to the partners, the opening of field liaison offices in 8 districts (Bogra, Rajshahi, Mymensingh, Gazipur, Magura, Jessore, Barisal and Comilla) of Bangladesh is in progress (cf. Attachment 7). Research Assistants will be placed in these liaison offices in order to give support to the NGOs for better implementation of the on-farm demonstrations.

RESEARCH

Impact assessments of adopted aquaculture practices

Entry of data into the computer for 800 randomly selected pond books from a total of 6248 have been completed to generate information on technology profiles of 2000 and to determine the simple economics of practiced technologies. The analysis of the data is in progress. The report on this analysis is expected to be available by July 2002.

The partner NGOs of 2001 have been informed to return the filled-in pond books to ICLARM. A random sample of these pond books will be used to produce information on technology profiles, fish growth and simple economics of fish culture.

In order to assess the impact of the aquaculture demonstrations conducted by farmers in 2001 under the initiatives of the partner NGOs, some 475 farmers are being interviewed by administering the use of a structured questionnaire. About 90 percent of the data collection has been completed. The remaining data collection is expected to be completed by May 2002.

A long-term impact assessment study has been planned to be commissioned and continued until 2005. A draft research proposal has already been developed and discussed with the scientists of the ICLARM headquarters. The research proposal is waiting for finalization. The selected study sites are Bogra, Magura, Mymensingh and Comilla. The ICLARM-developed participatory monitoring, data analysis tool and software **RESTORE** will be applied to determine the impact of Integrated Aquaculture-Agriculture on the livelihoods of the farmers.

Collaborative Research with BFRI

The TAPP for the collaborative research between ICLARM and the BFRI was approved in December 2001. Following the approval of the TAPP, a meeting for identification of research programs (2001-2002) under the USAID/ICLARM/BFRI supported project entitled "Research for Sustainable Aquaculture Development" was held on 8 April 2002 at the BFRI Headquarters in Mymensingh. After detailed discussion on various aspects of the TAPP, some research programs have been finalized for implementation under the project: The research programs to be undertaken are (i) research based demonstration of new aquaculture technologies (indigenous catfish culture in mini pond, brood stock management and minimization of inbreeding depression in hatcheries, feasibility study of SIS culture in ponds, low cost agro-based fish feed trial for carp, catfish, tilapia and freshwater prawn, and GIFT strain culture in seasonal ponds); (ii) refinement of existing technologies (polyculture of carps, improved carp nursery management, fish culture in seasonal ponds, rice-fish culture, integrated chicken-fish culture); (iii) farming system research and demonstration, (iv) socioeconomic studies of aquaculture programs; and (v) training program.

Research Grants to Universities

The DSAP continued to support small research projects by scientist of Universities. A new grant has been awarded making the total number of studies supported by the Project seven. All seven small research projects are now in operation with different sector specialists at the Bangladesh Agricultural University (BAU), Mymensingh. They are as follows:

1. **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 (BAU), Mymensingh. Approved budget: Taka. 250,000. Project tenure: one year, 1 April 2001 – 30 March 2002.

The project has come to an end and the preparation of the final report is in progress. The amount of funds released in two installments was Tk. 200,000. The principal investigators reported that the entire budgeted funds have been exhausted in order to complete the project. All the adjustments were made and all necessary vouchers and documents were submitted to the office of the BAU Research System (BAURES). The remaining portion of the budgeted money of the project will be provided upon receiving the final report.

- 2. 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 –31 October 2002.

The project has been successfully completed achieving all of its targeted objectives. The cost profit analysis and market test in Mymensingh and Chittagong showed an attractive profit margin for fish ball, fish burger, fish stick and fish sausage. Fish burger and fish stick were found to be the most preferred items in terms of taste and price to consumers and profit to the processors. All of the Tk. 200,000 provided to the Principal Investigator was spent and adjustments of these expenditures were submitted to the BAURES, BAU, Mymensingh. Report preparation of the project is in progress and will be submitted soon. Upon receiving the report, the last installment will be released.

- 3. Development of an appropriate technology on *Azolla* based rice-fish farming.** Dr. M.H. Mian. Department of Soil Science, BAU, Mymensingh. Approved budget: Tk. 254,800. Project tenure: one year, 1 April 2001 –31 March 2002.

The project has achieved all the targeted objectives. By conducting a number of experiments the project has come to important conclusion on the low cost production of *Azolla*, reduction of the use of chemical fertilizers and costly fish feeds by using *Azolla* in rice-fish and pond production systems. On the basis of positive impacts regarding large size fish production using *Azolla*, initiatives were taken to study the feasibility of quality fry/fingerling rearing in rice field and pond ecosystems with major cultured species in Bangladesh. The detailed report is expected to be submitted in July 2002 following the ongoing boro rice-fish cycle. A tentative workplan with budget for 2002-2003 has also been submitted to the DSAP for further research. Tk. 178,360.00 was advanced in two installments. All budgeted allocations are exhausted and the Principal Investigator has made a request to receive the remaining budget for paying the committed expenditures. The last installment will be paid upon receiving the final report.

- 4. Ecology of euglenophytes in aquaculture ponds and their role in fish production.** Dr. Saleha Khan, Department of Fisheries Management, BAU, Mymensingh. Approved budget: Tk. 237,315. Project tenure: one year, 1 June 2001 –30 May 2002.

To achieve the objectives of the project, two sets of experiments were set up: one in twelve experimental ponds at BAU campus besides the Faculty of Fisheries and the other in rural fish ponds managed differently in Madhupur, Fulpur and Sutiakhali in Mymensingh district. Most of the objectives have been achieved. Eighty percent of the budgeted funds i.e. Tk. 189,852.00 have been provided of which almost all were spent as planned for the research activity. The remaining portion of the budget (the last 20%) will be provided upon receiving the report. The final report is expected to be made available to ICLARM in due time.

- 5. Economic Analysis of the sustainability of supplementary feed-based aquaculture.** Md. Rais Uddin Mia. Department of Agricultural Finance, BAU, Mymensingh. Approved budget: Tk. 225,000. Project tenure: one year, 1 August 2001 –31 July 2002.

This project was awarded initially to Prof. F. Alam of BAU, who subsequently joined ICLARM and therefore, this study was handed over to one of his colleagues at the BAU, Dr. Md. Rais Uddin Mian, who is currently looking after the project. The data collection of the project is completed. Analysis of the data is in progress. Some of the preliminary findings on pangas monoculture were used in a paper presented by Prof. Ferdous Alam at the World Aquaculture Society (WAS) conference in Beijing in April 2002. The overall progress of the project is satisfactory. Tk.101,104 has been used so far. The report is expected to be completed in due time.

6. **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, BAU, Mymensingh. Approved budget: Tk. 250,000. Project tenure: one year, 1 December 2001 - 30 November 2002.

Six ponds have been prepared in the field laboratory of the Faculty of Fisheries, BAU., Mymensingh. *Pangasius sutchi* brood fish and F₁ fingerlings collected from different hatcheries have been stocked. Balanced diet and proper management techniques are being practiced as a rearing parameter of F₁ fingerlings. A systematic study on weight, morphometric and meristic data, sex of brood fish are being studied for which the necessary sample preparation is going on. An electrophoretic study is also going on. The project activities are satisfactory. It is expected to be completed in due date. Taka 190,000 have been released so far whose adjustments are lying with the BAURES, BAU, Mymensingh.

7. **Socio-economic aspects of freshwater prawn (*Macrobrachium rosenbergii*) culture development in Mymensingh.** Dr. Nesar Ahmed, Department of Fisheries Management, BAU., Mymensingh. Approved budget: 126,000. Project tenure: 1 January 2002 – 31 December 2002.

Primary field visits were made and Fulpur, Gouripur and Ishwarganj thanas of Mymensingh district were selected as the study areas. Preparation of a questionnaire has been completed and pre-testing of the same has been made with 10 prawn farmers of the study areas in order to finalize it. The research project has been progressing satisfactorily.

As planned in the 2002 workplan, discussion with the principal investigators are scheduled for the next quarter to identify the best means for the dissemination of the project results, in particular for the first three studies, which were terminated in March 2002.

TRAINING

A workplan for the training program in 2002 was drafted and will be finalized next quarter. This program includes training for staff of partner or contracted NGOs as well as for staff of associate partner or non-contracted NGOs. The training program for partner NGOs' staff consists of one foundation training of 3 days and 2 follow-up training courses of 2-days each in the first year and 4 follow-up training courses during the next 2 years. For the associate partner NGOs' staff we foresee one foundation training and 3 follow-up training courses during a period of three years. The training sessions will be completed by on the spot training from Project field staff. The following table summarizes the 2002 training program:

NGO	Staff	Recruited	No	Training 2002
Partner NGO	Field Assistant	2001	60	Follow-up 3 and 4
	Program Coordinator	2001	13	Follow-up 3 and 4
	Field Assistant	2002	93	Foundation, Follow-up 1 & 2
	Program Coordinator	2002	15	Foundation, Follow-up 1 & 2
Associate Partner	Field staff	2001	76	Follow-up 1 and 2
NGO	Field staff	2002	80	Foundation, Follow-up 1 & 2

We started our training program as per planned schedule from 2nd March 2002 with the Follow-up 3 training course for field staff of Partner NGOs recruited in 2001 and engaged in the implementation of the 2001 aquaculture demonstrations. 56 Field Assistants and 12 Project Coordinators from 16 PNGO participated in this refresher-training course organized in 3 batches at Bogra, Jessore and Mymensingh. The objectives of the training course were to share the reoriented project strategies for 2002-2005 and to emphasize the changes in the extension approach (participatory, integrated agriculture-aquaculture and quality service).

During the reporting period, we also participated in some training and workshops organized by other institutions. A week-long training program was organized for 28 Program Officers of PBAEP implemented by DoF/DANIDA. The course was jointly organized by DANIDA and GTI, BAU, in Mymensingh from 9-16 February 2002. Mr. Hasan A. Chowdhury, Research Associate Training contributed one full day as facilitator and resource person in the sessions on integrated rice-fish/freshwater prawn farming.

ADMINISTRATION

A list of the Project personnel as of 31 March 2002 is attached (cf. Attachment 8). The contract of Prof. A. Islam, who was recruited as senior aquaculture consultant was terminated 31 January 2002. One important achievement of his dedicated work is that presently, some 20 technologies have been proven to be feasible, affordable and acceptable for resource poor household in rural areas. At present there is a need for the Project to concentrate its efforts on the dissemination of the identified technologies using participatory (bottom-up) approaches and the feed back on technical issues and aquaculture research will be ensured by our partner BFRI. As identified by the 2002 workplan, the project has started the process of recruiting a field coordinator, a research-associate social-scientist, two research assistants for extension, 8 research assistants for monitoring and a computer operator.

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

1. Mr Hasan Chowdhury, Research Associate training, participated in a national workshop on Agricultural Extension Policy organized by Bangladesh Agricultural Extension Society (BAES) held in Mymensingh on 26-28 January 2002;
2. Dr. Ferdous Alam, Field Coordinator, Dr. Khondker Murshed-e-Jahan, Research Associate, impact assessment and Mr. Johannes Janssen, Project Leader, participated in the retreat of the ICLARM Freshwater Resources Research Program in Penang, Malaysia on 31 January – 2 February 2002. The main objective of the retreat was to revisit the FRRP strategic research program and to prepare a logframe for the program;

3. Mr. Johannes Janssen, Project Leader, participated in a workshop on Genetic Status of Improvement Strategies for Exotic Carps for low input Aquaculture in Asia, organized by BFRI and DFID in Dhaka on 12-14 February 2002;
4. Organized for the US Embassy, Bangladesh a half-day field visit of project realizations for important leaders of the Muslim community of Bangladesh in Gazipur (Gazipur District) on 13 February 2002;
5. Mr. Johannes Janssen, Project Leader and Dr. Khondker Murshed-e-Jahan, Research Associate, impact assessment, participated in the presentation and discussion on the DFID supported CARE-Cages evaluation report in Dhaka on 13 March;

ATTACHMENTS

- Attachment 1 DSAP strategy 2002-2005.
- Attachment 2 Questionnaire: NGO profile.
- Attachment 3 Selection of “new” partner NGOs for DSAP 2002 program.
- Attachment 4 Partner NGOs for DSAP 2002 program.
- Attachment 5 NGO Cooperators, status of 2002 on-farm demos as of 31 March 2002
- Attachment 6 NGO Cooperators, status of 2001 on-farm demos as of 31 March 2002.
- Attachment 7 Geographical distribution of field liaison offices.
- Attachment 8 USAID-funded staff list as of 31 March 2002.

ATTACHMENT 1 DSAP strategy 2002-2005

1. 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. The rationale for the project recognizes the importance of fish in the economy of Bangladesh and the potential of aquaculture to significantly contribute to the overall fish supply.

The main thrust of the DSAP is to sponsor on-farm demonstrations through co-operating NGO partners, aiming at the realization of the following two objectives:

On the level of the households

- To increase the fish production of small-scale rural farmers and to improve the households incomes and livelihood of these resource limited people;

On the level of the NGOs

- To build up capacity that will enable the cooperating NGO partners to maintain and, if possible, to extend their aquaculture support programs even in the absence of external support.

Concerning the introduction of appropriate aquaculture practices the Cooperative Agreement (CA) identifies ICLARM's commitment to implement 7,000 new pond/plot demonstrations each year using improved low-input fish farming technologies (cf. CA page 21). By the end of the project approximately 35,000 ponds representing micro enterprises will have been guided to demonstrate improved production systems (cf. CA page 16).

The Cooperative Agreement also gives the following general guidelines for the implementation of the aquaculture demonstrations:

- Implementation of the demonstrations through the NGO community;
- Selection of cooperating demonstration farmers among low-income people;
- Use of participatory approaches in setting up the demonstrations;
- In the first year farmers will receive a subsidy (ca US\$ 35 in kind);
- Organization of farm-day rallies by the partner NGOs permitting initial cooperators to share their experiences with neighbors.

2. DSAP STRATEGY 2001

The strategy developed to implement the 7,000 demonstrations is based on the established principle that one field assistant (FA) is responsible for the implementation of 100 new demonstrations each year. These cooperating farmers, who are organized in 5-8 demonstration farmer groups of the same geographical location and the same technology, will receive foundation training and follow up training for a period of 5 years. For each 5 field assistants the NGO is authorized to employ a project coordinator (PC) responsible for supervising and assisting their field assistants. 70 field assistants should be hired in the first, second and fifth year of the Project. The yearly maximum number of demonstrations for one NGO is fixed at 500. Table 1 shows the new demonstrations and the responsibilities of the different field assistants for the implementation of the demonstrations for an identified geographical area of one NGO.

Table 1. Strategy 2001: Number of new demonstrations and responsible extension worker

Year	2001	2002	2003	2004	2005
2001	100, FA 1 st yr	100, FA 1 st yr	100, FA 1 st yr	100, FA 1 st yr	100, FA 1 st yr
2002		100, FA 2 nd yr	100, FA 1 st yr	100, FA 1 st yr	100, FA 1 st yr
2003			100, FA 2 nd yr	100, FA 1 st yr	100, FA 1 st yr
2004				100, FA 2 nd yr	100, FA 2 nd yr
2005					100, FA 5 th yr

Encircled: yearly workload of each FA

This strategy allows 7,000 demonstrations each year with a total of 35,000 at termination of the project as well as the training of 210 field assistant and 16 project coordinators. The most important inconveniences of this approach are (i) the hand over from one field assistant to a colleague in the second year of the new cooperators of 2002 and 2003 and (ii) the situation after 2005 for the field assistant recruited in the first year is not very clear (competition with project coordinators). The advantage of this strategy is the 5-year technical assistance for each group, however the content for the four years of the follow up training is not specified. Even if the group approach is considered the most effective tool for sustainable aquaculture practices, farmers should receive individual assistance twice monthly during the first year.

The subsidy to the new farmers is given in kind (fingerlings and pond nutrient inputs/water enrichment materials); this grant should be paid back without interest to create a revolving fund managed by the beneficiaries. The grant money, which corresponds to 60-100 Taka/dec) represents on average more or less 50 % of the inputs or direct costs of the demonstrations. This illustrates that what is a modest amount of money (US\$ 35) for development workers, is an important amount for the small holders.

The NGOs will collect a modest service charge (fee for provided services) per decimal of pond/plot for a production cycle (10 Taka/dec) to minimize the operations cost and to make their aquaculture extension programs sustainable.

3. DSAP STRATEGY 2002-2005

After individual discussions with all the NGO partners, and with the members of ICLARM's DSAP team we propose to emphasize:

On the level of the households

- the quality of the technical support in particular during the first year;
- the use of participatory approaches for the dissemination of the selected technologies;
- the integration of the promoted aquaculture practices into the other agricultural subsystems of the household;
- the spread over effect of the technologies to interested neighbor farmers.

This approach is also required for the use of RESTORE, the software program developed by ICLARM to monitor the impact of the adoption of the technologies and their integration on small-scale farm households.

On the level of the NGO

- the elaboration of a partnership: the project should support the development and implementation of the NGO's aquaculture support programs;
- flexibility within the commonly identified guidelines; allowing NGOs to implement their program according their own approaches, and;
- transparency: both at the ICLARM-NGO interface as well as at the NGO-Beneficiaries interface.

This approach that gives more responsibility to the NGOs also gives them more operational latitude. Consequently this approach also requires a closer monitoring system of NGO program and finance.

To accommodate and to ensure the above we propose to reduce the number of new demonstrations to 50¹ per FA each year and to reduce the period of technical and financial support to 3 years (cf. Table 2). Each year 70 new field assistants and 12 new project coordinators are recruited and trained. The first year emphasis is on the technical aspect through individual and group participatory methods. In the second and third year the financial management and organizational aspects are emphasized through a group approach.

Table 2. Strategy 2002-2005: Extension approach for each field assistant

Year	2001	2002	2003	2004	2005
2001	100				
2002		50			
2003			50		
2004				50	
2005					50

Yearly workload of FA is encircled

Table 3 represents the number of trained extension workers and the expected number of new demonstrations for each year. It indicates that the number of new demonstrations gradually increases from 7,000 (2001) to 11,500 (2004) and the total number of new demonstrations at the end of the project is around 47,000. The total number of NGO staff trained is approximately 230 (200 field assistants and 30 project coordinators).

Table 3. Number of new demonstrations

Year	New FA	Total FA	New	Total demos
2001	70	70	100	7.000
2002	80	150	50 ¹	7.500
2003	40	190	50 ¹	9.500
2004	40	230	50 ¹	11.500
2005	-	230	50 ¹	11.500
Total				47.000

¹ Initially ICLARM proposed 30, 50 is the number of new demonstrations agreed upon by ICLARM and the partners NGOs during the evaluation workshop held on 22 January 2002

To ascertain the sustainability of the extension programs we propose that the partner NGOs take over gradually the management cost of these programs according to the following schedule: 25% in 2002; 50% in 2003; 75% in 2004 and 100% in 2005. This proposal has been discussed with our partners most of whom accept and agree with this concept that will avoid an abrupt take over at termination of the project in 2006. This approach also strengthens the organizations and reduces the risks of discontinuing their programs of dissemination of aquaculture technologies. Some of them through, in particular the local NGOs have expressed their concern to assure sufficient income to finance their aquaculture program. An alternative schedule² 20% (2002) - 40% (2003) - 60% (2004) - 80% (2005) could be applied for these NGOs. The NGO workshop scheduled for 22 January is aiming at sharing experiences and ideas for income generating activities/approaches such as service charges for provided extension services; credit/saving and marketing functions; seed supplies...

The same workshop will evaluate the 2001 experiences with the management of the subsidy/revolving fund and seek for refinement of the actual system. According to the experiences and the differences between approaches of partner NGOs two or three selected approaches could be retained for implementation and monitoring of their impact to identify an appropriate solution for each NGO. An effective farmer-to-farmer spread of the technologies as a result of a sustainable integrated participatory approach will have an important impact on the service charges and the sustainability of the aquaculture programs. It is of ICLARM's concern to promote farmer friendly systems that are acceptable to the NGO community.

During the last mid-annual review the DSAP reported an additional 5000 new demonstrations that were implemented by non-contracted NGOs (termed here 'associate partners') who staff received foundation training from the project in 2000. No further subsidies were given. As foreseen in the CA we will develop the training program for these associate partner-NGOs. We propose to train each year 80 staff (foundation and follow up training) of these NGOs and to assure some technical assistance for the implementation of their aquaculture extension programs. The demonstrations of the associate partner NGOs will be included in the impact assessment of the demonstrations allowing for the evaluation of the efficiency/sustainability of the contracted partner NGO approach (technical and financial support) as well as the associate partner NGO approach (technical support only).

Table 4. Number of new demonstrations of non-contracted Associate-Partner NGO

Year	New FA	Total FA	New	Total demos
2001	80	80	20	1,600
2002	80	160	20	3,200
2003	80	240	20	4,800
2004	80	320	20	6,400
2005	80	400	20	8,000
Total				24,000

² The alternative schedule has been adopted by the evaluation workshop held on 22 January 2002

Table 5. Number of new demonstrations of non-contracted Associate Partner NGO

Year	Partner NGOs		Associate-Partner NGOs		Total
	Total FA	Total demos	Total FA	Total demos	
2001	70	7,000	80	1,600	8,600
2002	150	7,500	160	3,200	10,700
2003	190	9,500	240	4,800	14,300
2004	230	11,500	320	6,400	17,900
2005	230	11,500	400	8,000	19,500
Total	230	47,000	400	24,000	71,000

4. BUDGET

The yearly estimations for the cost of the implementation of de demonstrations (budget line item 2) as indicated in the cooperative agreement and of the above-mentioned strategy are represented in table 4.

Table 6. Estimated DSAP/USAID expenditures (in US \$) for the grants to NGOs and beneficiaries (line item 2A)

Line item	FY 2001	FY2002	FY 2003	FY 2004	FY 2005	Total
Approved budget	325,000	360,000	400,000	420,000	400,000	1,905,000
Option 1 ¹	180,000	360,000	440,000	430,000	430,000	1,840,000
Option 2 ²	180,000	370,000	470,000	500,000	550,000	2,070,000
100% paid by	180,000	420,000	620,000	780,000	1,020,000	3,020,000

¹ DSAP's part of the management costs: 75-50-25-0 % (2002-2005). ² idem: 80-60-40-20 % (2002-2005).

5 STAFFING

During the last decade ICLARM, supported by USAID, has concentrated its activities on the development of aquaculture technology packages suitable for poor, marginal rural households and which can be easily adopted by them. Some 20 technologies have been developed and are, at present, transferred to small holders. This concentration on technical issues is confirmed by the dominance of fisheries biologists specialized in aquaculture in the DSAP team. At present 8 fisheries specialist are employed: a senior aquaculture scientist/project leader, an aquaculture extension/training specialist (research associate) and 6 aquaculture scientists (research assistants). The project has also engaged a senior economist, two economists (1 research associate and 1 research assistant) and 1 research assistant for GIS.

One of the major principles of technology transfer through participatory approaches is the complementarity of a multi-disciplinary team. For our project this means that if we want to cover the above-mentioned disciplines in a balanced and target-oriented manner, we need to recruit specialists with the missing skills. The project suggests therefor recruiting a senior sociologist with extensive experience in participatory extension and a mid-level farming system specialist. An alternative option could be the engagement of a fisheries specialist with extensive experiences in participatory approaches and two mid-level scientists, one sociologist and one farming system specialist.

ATTACHMENT 2 Questionnaire: NGO Profile

1. NGO Name:

2. Contact Address: (Head Quarter)	Bangladesh:
3. Working area (Regions)	

4. Overall Program Scale

Items	Description
Annual Budget (TK)	
Number of staffs	
Mission and approaches to development	

5. Yearly budget allocation

Year	Aquaculture Budget (TK)	Total Development Budget (TK)
1991		
1992		
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		
2001		

6. Mode of operation in aquaculture

Mode of fund operation	Types of disbursement	Research (TK)	Development (TK)
Own fund	Grant		
	Loan		
GOB fund (Grant)	Grant		
	Loan		
Donor fund (Grant)	Grant		
	Loan		
Donor fund (Loan)	Grant		
	Loan		
GOB (Loan)	Grant		
	Loan		

7. Type of aquaculture funding

Aquaculture Type	Total Funding (TK)	Types of products
Fresh water		
Brackish water		
Marine		

8. Scale of operations in aquaculture

Activities	Answer
Number of districts covered	
Number of staff trained	
Number of staff involved	
Value of infrastructure developed (TK)	
✓ Hatchery	
✓ Training center	
✓ Pond complex	
✓ Others (specify)	

9. Participants/beneficiaries information in aquaculture

Activities	Answer
Number of Participants / beneficiaries	Male:
	Female:
Level of poverty	<input type="radio"/> Very poor <input type="radio"/> Poor <input type="radio"/> Landless <input type="radio"/> Destitute <input type="radio"/> Others (specify)
Access arrangements to water resources for aquaculture	

10. Technology promoted and their key features in aquaculture

Technology	Key features

11. Performance (success/failure) of the aquaculture project with reference to impacts on poor and food security

Comments	List of reports

12. Others (e.g. major problems, current strategy, and changes in strategy over the years, expectation and future plan)

ATTACHMENT 3 Selection of New NGOs for DSAP 2002 program

Sl. No	Region	NGO	Status of partnership		remarks
			P-2002	AP-NGO	
1.	Mymensingh	Padakhep SARA POPI SAFE	✓ ✓	✓ ✓	Replacement of ARSHI P-NGO 2003?
2.	Bogra	LDRO OREDAR NDP SSKS	✓ ✓	✓ ✓	Recruited TMSS staff ³ In Sirajgonj In Sirajgonj
3.	Rajshahi	DJKS PCD BCSUS ACD PARTNER	✓ ✓	✓ ✓ ✓	In Pabna In Pabna In Pabna, P-NGO 2003? In Rajshahi In Rajshahi
4.	Magura	VPKA DMG SDC DNP	✓ ✓	✓ ✓	In Rajbari In Faridpur In Faridpur In Faridpur
5.	Barisal	BDS COAST BUK SMKK SUS	✓ ✓	✓ ✓	In Bhola In Barisal In Barisal In Jhalkathi
6.	Comilla	Page GKK AID Comilla SHEBA PP	✓ ✓	✓ ✓ ✓	In Comilla In B. Baria, P-NGO 2003? In Comilla, P-NGO 2003? In Comilla, P-NGO 2003? In Comilla
7.	Gazipur	SATU	✓		Replacement of RASDO
Total			13	15	

ATTACHMENT 4 Partner NGOs of DSAP 2002 program

Sl. No	NGO	old FA	new FA	Total FA	PC	Demos	Remarks
1	ADI	5	2	7	1	350	
2	BAIC	4	3	7	1	350	
3	Padakhep	1	4	5	1	250	FA Rasdo, new PC
4	BS	5	2	7	1	350	
5	CARITAS	8	0	8	2	400	1 new PC
6	CARP	3	2	5	1	250	
7	CIRUP	3	2	5	1	250	
8	CRED	5	2	7	1	350	
9	FHD	2	3	5	1	250	new PC
10	JC	5	2	7	1	350	
11	ORD	5	0	5	1	250	2 FA, 1 PC ARSCHI
12	PRANTEC	3	2	5	1	250	
13	SATU	1	4	5	1	250	1 FA, 1PC RASDO
14	RRC	3	4	7	1	350	
15	SPP	2	4	6	1	300	new PC
16	TMSS	2	5	7	1	350	new PC
17	LDRO	3	2	5	1	250	2 FA from TMSS
<i>Sub total-I</i>		<i>60</i>	<i>43</i>	<i>103</i>	<i>18</i>	<i>5150</i>	
18	OREDAR (Sirajgonj)	-	5	5	1	250	new PC
19	SARA (Mymensingh)	-	5	5	1	250	new PC
20	VPKA (Magura)	-	5	5	1	250	new PC
21	DMG (Magura)	-	5	5	1	250	new PC
22	PAGE (Comilla)	-	5	5	1	250	new PC
23	PP (Comilla)	-	5	5	1	250	new PC
24	ACD (Rajshahi)	-	5	5	1	250	new PC
25	DJKS (Rajshahi)	-	5	5	1	250	new PC
26	COAST (Barisal)	-	5	5	1	250	new PC
27	BUK (Barisal)	-	5	5	1	250	new PC
<i>Sub total-II</i>		<i>0</i>	<i>50</i>	<i>50</i>	<i>10</i>	<i>2500</i>	
Grand total		60	93	153	28	7650	

Partner NGOs of 2001 put on hold

Sl. No	NGO	FA	PC	Remarks
1	ARSHI	3	1	2 FA + 1 PC to ORD; farmers with ARSHI project accounts not closed
2	DSS	2	-	2 FA not released; farmers to RRC project accounts not closed
3	RASDO	3	1	1FA to Padakhep, 1 FA + PC to SATO, 1 FA left farmers with RASDO; project accounts closed

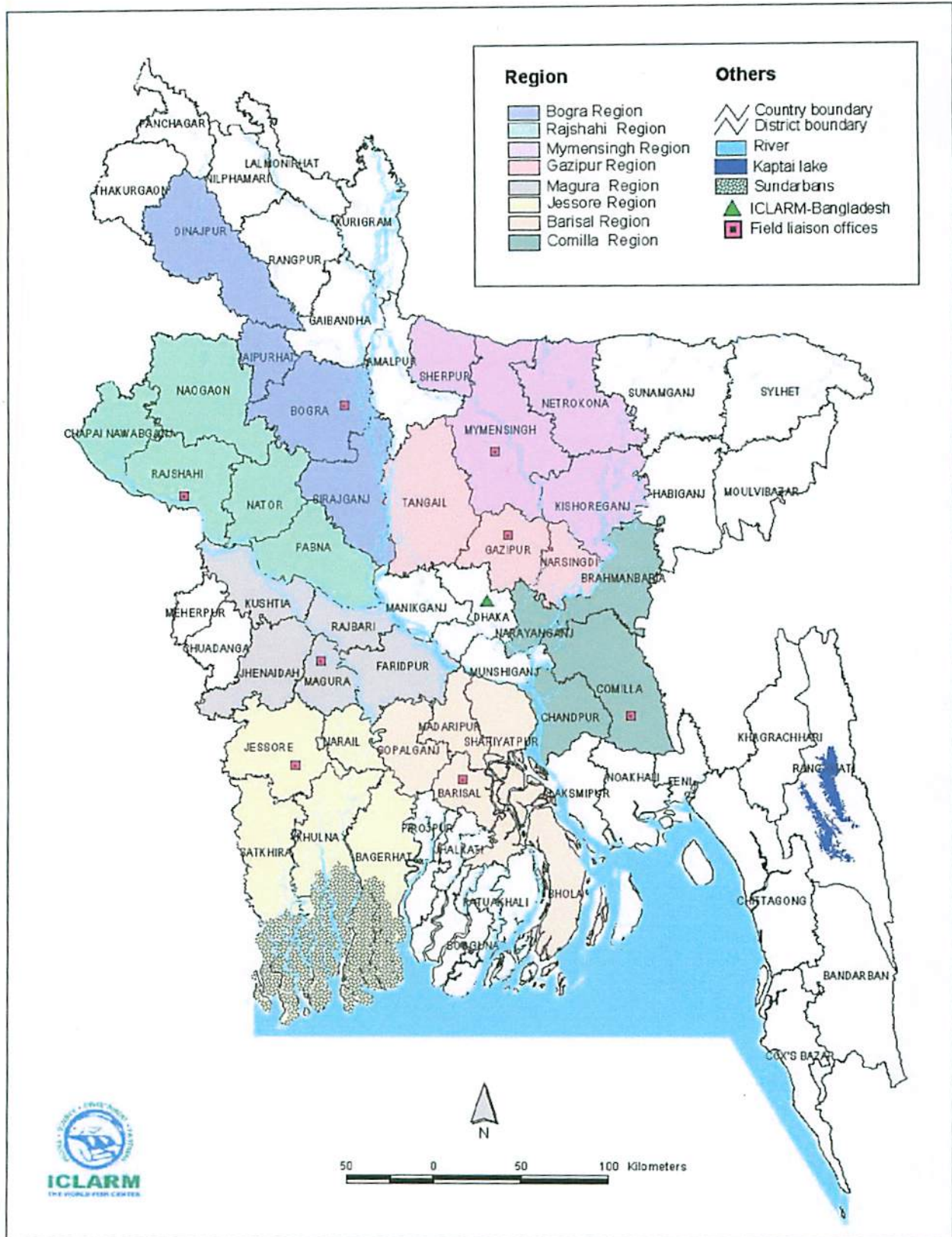
Sl. No.	NGO	initial No pond/plot	Revised	Total budget		installment				remaining budget
				initial	revised	Q-1	Q-2	Q-3	Q-4	
1	ACD	250		581,570			174,471	232,628	174,471	407,099
2	ADI	350		1,382,875		204,800	590,719	450,719	136,638	1,178,075
3	BAIC	350		1,448,890		192,320	607,223	467,223	182,125	1,256,570
4	BS	350		1,389,400		207,200	592,350	452,350	137,500	1,182,200
5	BUK	250		459,940			183,976	137,982	137,982	275,964
6	CARITAS	400		2,000,000		350,000	780,000	620,000	250,000	1,650,000
7	CARP	250		1,010,687		135,000	427,672	327,672	120,344	875,687
8	CIRUP	250		1,149,000		194,700	462,250	362,250	129,800	954,300
9	COAST	250		681,446			204,434	272,578	204,434	477,012
10	CRED	350		1,381,843		204,550	590,461	450,461	136,372	1,177,293
11	DJKS	250		605,160			181,548	242,064	181,548	423,612
12	DMG	250		639,225			191,768	255,690	191,768	447,458
13	FHD	250		1,098,275		192,940	449,569	349,569	106,198	905,335
14	JC	350		1,364,830		170,008	586,208	446,208	162,407	1,194,822
15	LDRO	250		1,060,250		151,300	440,063	340,063	128,825	908,950
16	ORD	250		1,137,650		250,000	459,413	359,413	68,825	887,650
17	OREDAR	250		563,688			169,106	225,475	169,106	394,582
18	Padakhep	250		1,265,225		191,306	491,306	391,306	191,307	1,073,919
19	PAGE	250		591,570			177,471	236,628	177,471	414,099
20	PP	250		537,330			158,949	211,932	158,949	370,881
21	PRANTEC	250		1,098,635		171,128	449,659	349,659	128,190	927,507
22	RRC	350		1,361,986		213,900	585,497	445,497	117,093	1,148,086
23	SARA	250		591,210			177,363	236,484	177,363	413,847
24	SATO	250		1,169,848		167,462	467,462	367,462	167,462	1,002,386
25	SPP	300		1,235,796		190,740	518,949	398,949	127,158	1,045,056
26	TMSS	350		1,705,300		(445,660) ¹	671,325	531,325	52,650	1,255,300
27	VPKA	250		586,260			175,878	234,504	175,878	410,382
Total (No/Tk)		7,650		27652229		3,187,354	10,673,903	9,371,619	4,419,353	22,667,661
Total (US\$)				481,746		55,529	185,957	163,269	76,992	394,907

Black= approved budget/disbursed; red= projected expenditures;

ATTACHMENT 6 NGO Cooperators, status of 2001 on-farm demonstration as of 31 March 2002

NGO	No of planned ponds/plots		Total budget		1st installment	2nd installment	3rd installment	4th installment	Remaining budget
	initial	revised	initial	revised					
ADI	500	500	1,500,000	1,531,875	750,000	612,845			169,030
ARSHI	500	292	1,500,000	1,016,398	750,000	60,000	130,975		75,423
BAIC	500	500	1,500,000	1,520,541	750,000	566,822	64,464		139,255
BS	500	503	1,500,000	1,531,875	750,000	491,973	108,027	181875	0
BRAC	500	311	1,500,000	194106	194,106	0			0
CARP	300	300	900,000	923,337	450,000	360,000	35,475		77,862
CIRUP	300	300	900,000	889,600	450,000	0	360,757		78,843
CARITAS	600	600	2,207,329	2,018,956	750,000	1,236,596	32,360		0
CRED	500	500	1,500,000	1,531,875	750,000	600,000	138,125		43,750
DSS	200	201	600,000	608,750	300,000	0			308,750
ORD+FHD	500	497	1,500,000	1,517,710	751,000	600,000	107,123	57193	2,394
JC	500	500	1,500,000	1,493,051	750,000	600,000	144,902		-1,851
PRANTEC	300	304	900,000	923,125	450,000	303,801	33500	56,290	79,534
RRC	300	300	900,000	923,125	450,000	360,000	105,563		7,562
RASDO	300	300	900,000	923,125	450,000	0			473,125
SPP	200	200	600,000	608,750	300,000	251,586	57,164		0
TMSS	500	500	1,500,000	311,419	750,000	0			-438,581
Total (Taka)	7,000	6,608	21,407,329	18,467,616	9,795,106	6,043,623	1,318,435	295,358	1,015,094
Total (US\$)			378,891	326,860	173,365	106,967	23,335	5,228	17,966

ATTACHMENT 7. Geographical distribution of field liaison offices



ATTACHMENT 8 USAID-funded staff list as of 31 March 2002

No	Name of Staff	Position	Date Employed
1	Drs. Johannes Janssen	Senior Aquaculture Scientist/ Project Leader	01 September 01
2	Prof. Aminul Islam	Senior Aquaculture Consultant	01 March 99
3	Prof. Md. Ferdous Alam	NGO Coordinator/Researcher	01 July 01
4	Hasan Ahmmed Chowdhury	Research Associate	15 December 99
5	Dr. Khondker Murshed-e-Jahan	Research Associate/Fellow	24 January 01
6	Kh. M Shameem Kamal	Research Assistant	01 July 99
7	Manuara Azim	Research Assistant	01 July 99
8	Mohammad Abdul Latif Siddique	Research Assistant	11 March 01
9	Md. Jahirul Hoque	Research Assistant	11 March 01
10	Mohammed Mokhlesur Rahman	Research Assistant	11 March 01
11	Bijan Mazumder	Research Assistant	11 March 01
12	Md. Mamunor Rashid	Research Assistant	20 May 01
13	Md. Abul Kashem	Research Assistant	20 May 01
14	Bijoy Bhushan Debnath	Administrative Officer	01 May 90
15	Khan Golam Rasul	Accounts Officer	01 June 96
16	Md. Billal Hossain	Data Entry Operator	01 August 99
17	Md. Abdur Razzak	Driver	01 May 89
18	Md. Dulal	Driver	01 May 99
19	Md. Nazrul Islam	Driver	01 October 01
20	Tapan Chandra Sarker	Messenger	01 July 93
21	Md. Idris Ali	Messenger	01 June 98
22	Md. Abdul Wahab	Messenger	01 September 98
23	Md. Mahade Hasan Babul	Messenger	01 July 01