

DEVELOPMENT OF SUSTAINABLE AQUACULTURE PROJECT

**A project implemented by the
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 July 2001 - 30 September 2001)**

Prepared by

**John H. Grover
Project Leader (Outgoing)**

**Johannes Janssen
Project Leader (Incoming)**

**Aminul Islam
Integrated Aquaculture Consultant**

**Ferdous Alam
NGO Coordinator/Researcher**

**Hasan Chowdhury
Research Associate**

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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 June 2001 through 30 September 2001. 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.

Our activities are generally on schedule as given in the work plan for 2001. We have completed an extensive planning and recruiting process and are now actively implementing the program. Of note is the transition to a new Project Leader, Drs. Johannes Janssen who will assume full responsibilities from Dr. John Grover as of 1 October 2001.

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

DEMONSTRATIONS AND NGO ACTIVITIES

As of the end of the reporting period, seventeen (17) NGOs are implementing DSAP activities in 2001. These NGOs are implementing seventeen (17) different technologies of fish culture. The different major technology groups are polyculture of carp in ponds, raising spawn to fry-fingerlings in paddy fields/ponds, polyculture of carp and golda (= *Macrobrachium* prawns) in paddy fields/ponds, *Azolla*-based fish culture in paddy fields/ponds in red soil areas, nursery management and fish seed production in ponds. The DSAP activity implementation period is December 2000 to November 2001.

A total of 7000 demonstrations were to be implemented through 18 NGOs having signed multiyear Memorandums of Agreement. But in August 2001 one NGO (BRAC) has frozen the implementation of DSAP activities (initially 500 demonstrations) because of disagreement with the DSAP implementation guidelines concerning the opening of project accounts on the level of NGO field staff. BRAC's core staff assures continuation of technical support to the cooperating farmers. Because of faulty stocking, some 200 demonstration ponds of one NGO (ARSHI) were excluded. Thus, demonstrations in about 200 ponds/paddy fields will not be implemented this year. The actual total number of demonstrations implemented this year is 6608 in 68 Upazillas of 27 districts in Bangladesh.

Advance payment to the extent of 50% of the total budget was made in December 2000 to each of the 18 NGOs. Further, a maximum of another 40% of the budgeted money was paid to 8 NGOs upon receiving requests. The names of the NGOs, the status of their finances and demonstrations are given in attachment 1 at the end of this report.

RESEARCH

Impact assessments of adopted aquaculture practices

Some 86 % of the 6248 distributed pond record books for the season 2000/2001 has been returned after completion and checking of the data by the NGO staff. One NGO has not finished data checking. Data from a random sample of 10% of these pond record books are still being entered into a computer database for analysis.

The pond record book format for the season 2001/2002 demonstrations has been further modified to facilitate data collection and to leave the recommendations and harvest information with participating farmers. These newest revised record books have now been distributed to the cooperating NGOs and the NGO field agents have been trained as to how to fill them out and make reports from their respective participating farmers.

We continued working on data from past demonstration efforts and from previous studies. Four working papers have been produced and distributed based on the 1999 demonstrations, farm monitoring work and a pilot study executed by colleagues from ICLARM's Culture Based Fisheries Management project:

1. Fisheries resources and livelihood of the villagers of Chitrapara, W. A. Shah et al. July 2001. 48 pp.
2. Profitability of the farming systems and contribution of small-scale aquaculture in Bangladesh. W. A. Shah et al. July 2001. 37 pp.
3. Pilot study on impacts of sustainable aquaculture project extension through demonstrations. N. Islam et al. July 2001. 40 pp
4. Retail prices of fishes in five regions of Bangladesh. W. A. Shah et al. August 2001. 13 pp.

A work plan for an impact survey with special emphasis on economic aspects has been prepared aiming at measuring profitability, estimating technical efficiency of the technologies, identifying important factors affecting production system/adoption of technologies and assessing the potential for further improvements. The study is limited to carp polyculture systems in both ponds and rice fields. Data collection for this survey is planned to start next quarter and will be finished in the first quarter of 2002.

Water quality management in selected red soil areas

Considering the potential role of ponds in the red soil areas in income generation, food security and employment generation, ICLARM Bangladesh developed a water quality management package for aquaculture in red soil areas based on information available. The impact of the developed water treatment was studied in thirty (30) ponds in five red soil areas during the season 2001/2002.

Results of the chemical analyses indicate that the treatment package for aquaculture in red soil areas is effective in improving the water quality for the fish farming. It was further noticed that soil characteristics and the amount of suspended clay particles were different in the different study areas. Therefore, all the inputs recommended for the treatment of ponds in typical red soil areas may not be necessary in all the red soil areas. This means that the farmers need to determine in an empirical way what is the best treatment for their specific

area and soil type. These findings need to be confirmed by the analysis of the production data, which unfortunately are not complete.

Collaborative Research with BFRI

Despite continuing efforts the TAPP for collaborative research work with BFRI is still waiting for approval. The current draft is at present with the Ministry of Planning with the expectation that approval will be forthcoming shortly. Included in this is the recovery of the duties and taxes advanced by ICLARM on the vehicle imported for project use and in service for the past several years.

Research Grants to Universities

Five small research grants are in force with the Bangladesh Agricultural University (BAU) in Mymensingh during the reporting period:

1. Improved handling and preservation of golda *Macrobrachium rosenbergii* for producing safe and wholesome product. Drs. Md. Kamal and Md. Nazrul Islam, BAU Dept. of Fisheries Technology. Tk. 250,000. 1 April 2001 - 30 March 2002.

An acceptable progress report for the work done in April-June was received and release of the second 40% of funding was approved on 20 September. Whole golda put on ice immediately at harvest had "acceptable condition" for 7 days, whereas 4, 8, and 12 hours delay in icing shortened shelf-life to only 3, 2, and 1 days, respectively." The implications of this are that golda need to be put on ice immediately at the pond site when harvested. Processors expecting to meet international export standards need to assure such safe handling.

2. Cost-profit analysis and market testing of value-added product from silver carp. Dr. Nowsad Alam, BAU Dept. of Fisheries Technology. Tk. 250,000. 1 November 2000 -31 October 2001.

A progress report on this work has been received and further financial support released. Results indicate that smaller-sized silver carp, 700-900 g, have fewer lipids in their flesh and give greater volume of minced product than larger fish. Consumer acceptance of products was quite good. "People living in villages adjacent to BAU were willing to spend more money for a product than people from coastal area. The average prices they paid for the fish stick, fish ball and fish sausage were higher than the "production cost" calculated with an average market price for the fresh carp used."

3. Development of an appropriate technology on *Azolla* based rice-fish farming. Dr. M. H. Mian. BAU Dept. of Soil Science. Tk. 254,800. 19 April 2001 - 1 April 2002.

Tentative data from small plot trials after 120 culture days indicates that application of *Azolla* to rice/fish paddies yielded 8.33 kg/40m² fish compared to a control with no *Azolla* of 4.33 kg/40m². The use of 100% requirement of *Azolla* gave a more favorable cost benefit ratio and a higher net income (Tk 229/40m²) than other combinations of *Azolla*, urea fertilizer and supplemental feeds that were tested.

4. Ecology of euglenophytes in aquaculture ponds and their role in fish production. Dr. Saleha Khan, BAU Dept. of Fisheries Management. Tk. 237,315. 1 June 2001 - 30 May 2002.

A progress report covering the first three months of this effort has been received and release of further support has been approved. A pond water quality sampling effort is in progress involving a set of ponds with and without *Euglena* blooms.

5. Economic Analysis of the Sustainability of Supplemental Feed-based Aquaculture. Dr. Ferdous Alam, ICLARM and BAU Dept. of Agricultural Finance. Tk. 225,000 1 August 2001 to 31 July 2002.

Prof. Alam proposed this study in response to our solicitation prior to Prof. Alam joining as a DSAP staff. He has engaged a graduate research assistant to do the fieldwork, which should also be appropriate for a M.S. thesis.

The graduate research assistants at BAU receiving support from small grants from our USAID project funds in the past two years are given in attachment 2.

TRAINING

During the reporting period a number of training workshops were organized under our on-going project activities. The foundation training for 7000 demonstration farmers were initiated by 18 Partner NGOs from May-June 2001 and 17 NGOs had successfully completed that training for over 6500 farmers by July 2001. The remaining partner NGO (BRAC) started training with only one batch of 18 farmers but did not continue and finally withdrew from the program. The reason for this was that this NGO didn't agree to open project accounts on the level of their staff as required by the implementation guidelines. The partner NGOs who started their technology demonstration program on time already started the first follow-up training for cooperating farmers in early August 2001. Already 7 NGOs have completed the first follow-up training and others are in process. These training programs, organized by the partner NGOs, were conducted with the support from ICLARM staff, in particular from the research assistants.

The 3-day follow-up training courses on "Monitoring and evaluation of technology transfer program and procedure of technical information collection for research data base" was conducted for NGO field staff from 24 July to 11 August 2001 at BRAC Technical Training Center and Hatchery Complex, Sherpur, Bogra. Seventy-one (71) field assistants and fifteen (15) project coordinators participated in the training. Along with the pre-scheduled training content, open discussions were held in a participatory manner on the operational aspects of the project. Recommendations regarding the problems identified in the field were developed and suggestions for different technical, financial and managerial aspects of DSAP implementations were also made.

A workshop on the "Identification of research issues for DSAP" was conducted on 23 July 2001 at the same training venue with participation of the project coordinators and ICLARM DSAP staff as a part of the pre-study assignment for the Ph.D. research of Mr. Golam Faruque. A set of recommendations was formulated out of this participatory workshop.

Considering the continuous request from non-contracted NGOs for training *support and* evaluating the positive impact of last year's training program, we have called for nominations

this year from interested NGOs. Up to July 2001, in response to our advertisement, 157 new NGOs have responded and sent 298 nominations for aquaculture training. All the applications were screened out in August and a database regarding the basic information of nominated staff was prepared. Based on the academic and professional background of the nominated field staff and their organizational involvement in aquaculture, 240 NGO professional staff members were finally selected for 5 different aquaculture courses. The course on integrated rice-fish farming has been conducted for 61 staff members of 6 NGOs in September 2001. The other four courses are scheduled for the 4th quarter 2001. We continue receiving regularly applications for the 2002 non-contracted NGO training program.

Another 15 officers from 7 partner NGOs received a 5-day special training course on integrated rice-cum-fish/prawn farming. These NGOs are already involved in rice-fish farming as partner organizations of the IFAD funded "Agricultural Diversification and Intensification Program (ADIP)", executed by the Dept. of Agricultural Extension. Recently ADIP requested the DSAP to train 42 NGO officers from 22 partner NGOs and 22 DAE officers working under 22 Project Upazillas of four districts in the Dhaka division. We have planned to train them under the non-contracted NGO training program in 2001 and to study their follow-up activities regarding technology transfer.

On the request of Bangladesh Krishi Bank (BKB), ICLARM-DSAP organized a coordination meeting with leading prawn farmers, 23 NGO representatives and BKB officials held at GTI, BAU, Mymensingh on the evening of 22 September. About 60 participants attended the meeting including General Manager BKB, Deputy General Manager, Assistant General Manager of BKB Dhaka region and some Bank Managers and concerned officers of BKB under Mymensingh District. Prof. Ferdous Alam and Hasan A. Chowdhury participated in the meeting as representatives from ICLARM. The problems and prospects of prawn farming in the greater Mymensingh area and the involvement of ICLARM, NGOs and BKB for successful enterprise development were the main topics of discussions. In conclusion, a set of decisions and recommendations were formulated.

A weeklong training program for the 16 Project Officers under DANIDA assisted Patuakhali-Barguna Aquaculture Extension Project was organized jointly by GTI and DANIDA/DoF at GTI, BAU, Mymensingh, from 22-29 July 2001. Hasan A. Chowdhury, Training Coordinator of ICLARM contributed on 27 July 2001 a full day technical session on modern rice-fish farming as an invited resource person. A field visit was organized the next day to show DSAP rice-fish/prawn demonstrations in Phulpur Upazilla, Mymensingh.

Bangladesh Aquaculture Development Forum (BADF), Gopalganj Branch, an association of NGOs involved in aquaculture activities, organized a workshop at Gopalganj on 2 September 2001 where Md. Abul Kashem, research assistant, attended as representative from ICLARM and explained the DSAP activities. Twenty-four participants from 14 local NGOs and representatives from DoF, BADC, CARE, FTEP attended the workshop and they all requested for ICLARM's assistance to promote aquaculture activities in the concerned area.

During the reporting period, ICLARM's Director General Dr. Meryl J. Williams visited Bangladesh from 23-30 September 2001 when she made a field visit to DSAP demonstration areas in Bogra and Mymensingh.

A special training workshop on Applications of RESTORE Field Tools and Software for Integrated Aquaculture-Agriculture Development was conducted in ICLARM Dhaka office on 3-5 September by three staff from ICLARM headquarters, Dr. Mark Prein, MsTeresita

Lopez and Ferdinand Paraguas. Eight (8) participants from ICLARM-DSAP, two (2) from Caritas, one (1) from Danida, one (1) from BFRI and one (1) from BAU attended the course (cf. Attachment 3)

ADMINISTRATION

A list of the Project personnel as of 30 September 2001 is attached (cf. attachment 4). Johannes Janssen joined the DSAP as the incoming Project Leader on 1 September to overlap with departing Prof. John Grover who is expected to leave Dhaka in mid October. Active recruitment is in progress for an office manager (25% support by DSAP) and a GIS specialist (50% support by DSAP) and a third driver. ICLARM has signed a purchase order for a reconditioned 15-passenger van that will be available to support our training efforts. The Project has also contributed to the purchase of furniture and office equipment needed to furnish our new office location.

The usual assortment of meetings, visitors and field visits were attended to during the report period. Interesting among these was a visit by Stephen Hilton and two consultants of the Conrad M. Hilton Foundation along with ICLARM Director General Meryl J. Williams in consultation with officials of the Grameen Motsho Foundation 24-28 July. The visits and meetings explored possible opportunities and collaboration for further aquaculture development support, for which there has been some follow up exchange that will likely engage ICLARM/Bangladesh in preparing a background paper on possible aquaculture development efforts for the Hilton Foundation.

Prof. John Grover and Prof. Aminul Islam were active participants in the International Workshop on the Role of Self-recruiting Species in Rural Livelihoods held in Dhaka on 23 August. Professor Islam also gave special service to BAU Faculty of Fisheries in conducting practical examinations in ichthyology spanning 4 days in August. He also served on an expert panel for Khulna University dealing with faculty advancement.

Both Prof. John Grover and Johannes Janssen were able to attend the annual ICLARM in-house scientific review held in the new headquarters facilities in Penang, Malaysia, 10-14 September. This proved to be a valuable time in which experiences were exchanged and operations with the central administration could be coordinated.

ATTACHMENTS

- Attachment 1. NGO Cooperators, status of demos implementation and finance.
- Attachment 2. BAU graduate student research assistance supported under small research grants.
- Attachment 3. Participants of the RESTORE training workshop, Dhaka, 3-5 Sept. 2001.
- Attachment 4. USAID-funded staff list as of 30 September 2001.
- Attachment 5. Geographical distribution of year 2001 demonstration effort.

Attachment 1. NGO COOPERATORS, STATUS OF DEMOS IMPLEMENTATION AND FINANCE as of 30 Sept. 2001

NGO	No of planned ponds/plots		Total budget		1st installment	2nd installment			remaining
	initial	revised	initial	revised	(50%) to CPMC ¹	to CPMC ¹	to UPMC ²	total	budget
ADI	500	500	1,500,000	1,504,052	750,000	60,000	552,845	612,845	141,207
ARSHI	500	292	1,500,000	859,133	750,000	0	60,000	60,000	49,133
BAIC	500	500	1,500,000	1,417,055	750,000	54,619	512,203	566,822	100,233
BS	500	503	1,500,000	1,500,044	750,000	29,830	462,143	491,973	258,071
BRAC	500	311	1,500,000	750,000	750,000			0	0
CARP	300	300	900,000	900,212	450,000	0	360,000	360,000	90,212
CIRUP	300	300	900,000	900,000	450,000			0	450,000
CARITAS	600	600	2,207,329	2,207,329	750,000			1,236,596	220,733
CRED	500	500	1,500,000	1,500,000	750,000	120,000	480,000	600,000	150,000
DSS	200	201	600,000	599,995	300,000			0	299,995
ORD+FHD	500	497	1,500,000	1,495,909	555,201	50,493	549,507	600,000	340,708
JC	500	500	1,500,000	1,500,000	750,000	50,416	549,584	600,000	150,000
PRANTEC	300	304	900,000	900,000	450,000	0	303,801	303,801	146,199
RRC	300	300	900,000	900,000	450,000	28,075	331,925	360,000	90,000
RASDO	300	300	900,000	900,000	450,000			0	450,000
SPP	200	200	600,000	600,000	300,000		251,586	251,586	48,414
TMSS	500	500	1,500,000	750,000	750,000				0
Total (Taka)	7,000	6,608	21,407,329	19,183,729	10,155,201	393,433	4,413,594	6,043,623	2,984,905
Total (US\$)			378,891	339,535	179,738	6,963	78,117	106,967	52,830

¹ CPMC = Central Project Management Committee, Accounts on this level are managed by Executive Director and Project Coordinator

² UPMC = Unit Project Management Committee, Accounts on this level are managed by Project Coordinator and Field Assistant

**ATTACHMENT 2. BAU GRADUATE STUDENT RESEARCH ASSISTANCE
SUPPORTED UNDER SMALL RESEARCH GRANTS**

Grant title: Silver Carp Value Added Project (year 2000)

Md. Ferdous Ali, M.S., Thesis title: Thermal gelatin properties of surimi prepared from silver carp.

Md. Abul Kalam Azad, M.S., Thesis title: Manufacture of some value-added products (fish sausage, fish burger and fish sticks) from silver carp.

Publication: Nowsad, AKM. A., M. F. Ali, A. K. Azad, M. I. Hossain and N. A. Khan. Thermal gelatin properties and washing and frozen storage effects of surimi prepared from silver carp. *J. Aquatic Food Product Technology*. Manuscript submitted 2001.

Grant title: Food habits and breeding aspects of three species of Mastacembelidae (year 2000)

Md. Shaeb Ali PK, M.S.,

Grant title: Biology and culture potential of dhela (year 2000)

Md. Ashraful Alam, special problem

Grant title: Improved handling and preservation of *Macrobrachium rosenbergii* (year 2000-2001)

Md. Kamruzzam, special project

Chowdhury Tanvir Ahasan, M. S., Theses title: Post-mortem of small indigenous fish species (SIS) under various storage conditions (writing stage)

Dilip Kumer Chowdhury, M. S., Thesis title: Prevalence of bacteria of public health significance in cultured freshwater prawn. (on-going)

Grant title: Applications of *Azolla* to aquaculture (year 2000-1)

Md. Khairul Islam, M.S.

Grant title: Sustainability of supplementary feed-based aquacultures in Bangladesh (2001)

Md. Obaidur Rahman, M.S., (in progress)

Grant title: Cost-profit and market testing of value added products from silver carp (year 2001)

Md. Kamruzzaman, M.S. and special project (below)

Abul Basar Muhammad Shahidul Hoque, M. S.

Grant title: Ecology of Eugelophytes in aquaculture ponds (year 2001)

Md. Mahabubur Rahman, M. S.

B. M. Zahidul Islam, M.S.

ATTACHMENT 3. LIST OF PARTICIPANTS OF THE RESTORE TRAINING WORKSHOP, 3-5 SEPT. 2001

ICLARM

Prof. M. Aminul Islam
Prof. Md. Ferdous Alam
Hasan Ahmed Chowdhury
Dr. Khondker Mushed-e-Jahan
Khandokar M. Shameem Kamal
Ms. Manuara Azim
Golam Faruque
Mohammed Mokhlesur Rahman

CARITAS Bangladesh

K. M. Narul Islam
Phanindra Sangma

DANIDA/Noakhali Aquaculture Extension Project

Francisco U. Noble

Bangladesh Fisheries Research Institute (BFRI)

M. Enamul Hoq

Bangladesh Agricultural University (BAU)

Md. Rais Uddin Mian

ATTACHMENT 4. USAID-FUNDED STAFF LIST AS OF 30 SEPTEMBER 2001

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

Attachment 5 Geographical distribution of year 2001 demonstration effort (NGO-wise)

