AwF-VOSD SMALL SCALE CAGE CULTURE PROJECT FOR RURAL WOMEN IN BANGLADESH

Voluntary Organization for Social Development (VOSD)

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REPORT ON

AwF-VOSD SMALL SCALE CAGE CULTURE PROJECT FOR RURAL WOMEN IN BANGLADESH

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BACKGROUND

Fish culture in cages is not commonly practice in Bangladesh compare to pond fish culture. It is a relatively new technology in Bangladesh though it has successful history in other countries in Asia. In Bangladesh, the first documented attempts on cage culture were conducted at research institutes campuses in mid 70s to 80s. The first serious attempt to introduce cage culture in Bangladesh occurred during 1980s in the Kaptai Lake (Flexi, 1987 In 1991 and 1992, Department of Fisheries (DoF) and Overseas Development Agency (ODA now DFID), supported the Northwest Fisheries Extension Project in cage culture in northwest Bangladesh. The target groups were women. This project initially successful, but failed due to high level of post-stocking fish mortalities.

The first aquaculture development project which was exclusively on cage culture started from 1997 in six regions (Barisal, Comilla, Dhaka, Jessore, Natore and Sylhet) of Bangladesh implemented by CARE. The target groups were the resource poor particularly women who had no owner or access to pond as cages were set in many different water body. The first three years of this project was concerned with introducing cage culture with very limited previous experience. Returns and profits had increased each year since the project inception.

The lesson learned from the cage culture showed an opportunity to poor farmers particularly women. After the successful introduction of small scale cage culture in some areas of Bangladesh, many farmers left their cages from water bodies after the closure of the project in 2002. First it seemed to be a disaster but after analysis, it was reviled that there was no body to support or follow up the program to the beneficiaries from government or NGO level after closure of the project.

A recent initiative of the Voluntary Organization for Social Development (VOSD), with the financial help of Aquaculture without Frontiers (AwF) UK, has been to re-start the effort of small-scale cage culture activities with the aim and devoted to the improvement of the livelihoods of poor women in selected villages. The primary aim of the project is to introduce low input cage culture technology to poor women beneficiaries in two upazilas (Faridganj and Jhalokathi) of Bangladesh. In total, 35 women were selected from the two upazilas. The majority have a pond near their house, most of which are under multiple ownership and used for house hold work as well as fish culture; however, beneficiaries have no previous experience in cage culture technology.

OBJECTIVES

The overall goals of this project were to introduce low-cost cage culture technology to poor women to improve their nutrition status and livelihoods.

To achieve this goal, the specific objectives were below:

- To introduce low input small scale cage culture technology to poor women beneficiaries.

- To aware beneficiaries that small scale cage culture is a profitable option for aquaculture and requires minimum investment.
- To ensure farmers that it is a source of income and may provide protein to family.
- To establish social interaction, like serving guests or neighbours.

Working Methodology

Area Selection

VOSD played the initial step for suitable site selection. After several investigations at various localities, two upazilas, Nalcity and Faridganj were selected from two districts Jhalokathi and Chandpur. The basis of the selection had the following criteria:

- Pond water depth 1.5-2 meters throughout the year
- Large number of ponds availability
- Farmer's interest
- Market demand and good price for fish is evident
- VOSD field office within the area is available for regular monitoring

Group Selection

Thirty five respondents were selected from both areas according to the following criteria:

- The cage culturist must be a woman.
- Each and every woman must have access to a pond.
- Can form a group of minimum 3 per pond
- Each respondent must have enthusiasm to culture fish in cages
- Self literate or at least one member in family can keep records for fish culture
- Each woman may or may not be the member of VOSD.

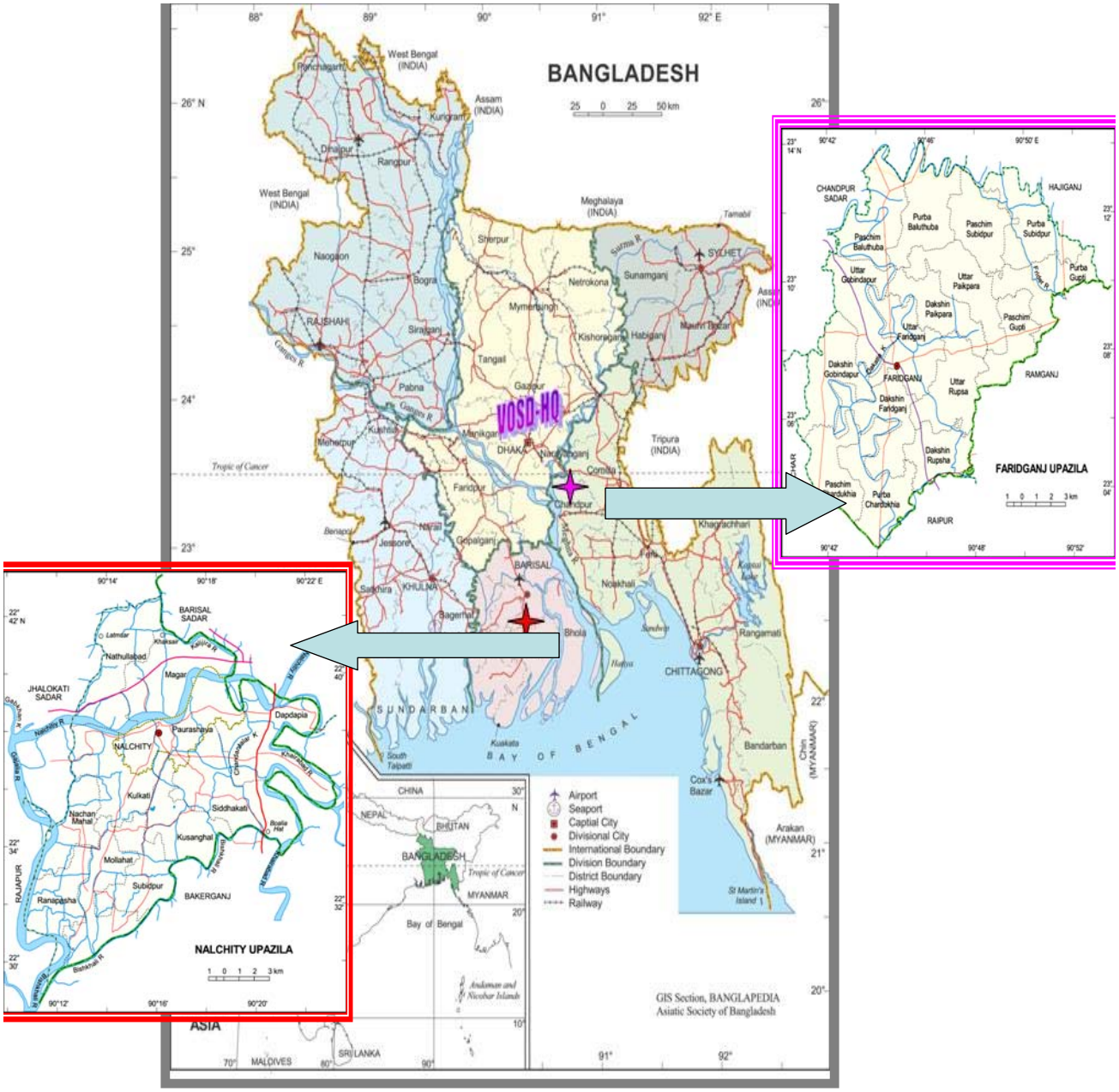


Fig. 1. Map of two cage cultured upazilas Nalcity and Faridganj.

Pond Selection

The ponds were selected for implementing the cage culture practice according to the following criteria:

- Pond must contain 5-6 feet of water
- Pond must be resided at the household.
- No derelict ponds were selected
- Ponds should be more than 6 decimal in size.

VOSD Inputs

A fund from AwF, UK was received on January 2006.

Training Program

- Three days training program were conducted (Technical and Hands on training) in April 2006 for 20 respondents at Nalcity and 15 respondents at Faridganj in front of VOSD office.
- In the technical session, the trained groups were awarded of cages by oral and canvas speech; and made them acquainted with cage construction materials, fish feed and handling and managements of cages.
- Hands on training session, covered the construction of cages. At the end of the session all the respondents were able to make their own cages.
- Hands on training on feed were performed.

Table 1: Materials were used to make 1m³ floating cage in the training.

Cage materials	Quantity
Black polyethylene net (8-13mm mesh)	4.25 meters or 9.5 hands
Bamboos (depend on size and thickness)	12 strips (1m long 3cm wide)
Nylon thread	250gm
Used empty 50 kg fertilizer or cement sack	2
2-5 liter empty oil or water bottles (use as floats)	4
Knife /Daa	1
1" nails	32
Hammer	1
saw	1

Fry Collection and Stocking

After preparation of cages the respondents were placed their cages in water for 10-15 days for softening the nets in water so that harm or scratch to the fish could be avoided. Monosex (*Oreochromis niloticus*) tilapia was used for culture practice. Good quality tilapia fries (length varies in average 2.5-3 inch and 20-25 g in average) were brought from reputed hatchery and transported in oxygenated plastic bags. Fries were stocked in the cages in the early morning. Stocking rate for each cage was 260and fish fry were stocked in June 2006.

Feeding of Fish

Women were trained to prepare hand made mixed feed or dough which containing rice/wheat bran (30%), mustard oil cake (20%), molasses (10%), kitchen wastes (20%) and fish meal (20%) at the rate of 5% of the body weight was served to the fish for three times a day. VOSD field staff supplied the food ingredients monthly. The proximate analysis showed that the feed contain crude protein, 20 to 22%; total fat, 5 to 7% and dietary energy up to 1,493.5 K.Cal/g of feed

Table 2. Feed used for tilapia in cages (quantity of ingredients to prepare one kg of feed)

	Ingredients	Quantity in grams
1.	Rice bran or wheat bran (g)	300
2.	Oil cake (g)	200
3.	Molasses (g)	100
4.	Kitchen waste (g)	200
	Total	1000 g or 1kg.

Sampling

Initial weight of the tilapia was taken at the stocking time. Growth performance and mortality were checked every two weeks. The partial harvest and final harvest weight were collected. No of fish counted to recount the mortality rate.

Production Analysis

Production analysis of cage culture was performed at the end of the final harvesting. Net production, mortality rate, specific growth rate and food conversion ratio were obtained from the following formula.

Net production = Final wt. at the harvesting – Initial wt. at the stocking

$$\text{Mortality rate (\%)} = \frac{\text{No. of fish at stocking} - \text{No. of fish at harvesting}}{\text{No. of fish at stocking}} \times 100$$

$$\text{Specific Growth Rate (SGR) (\%)} = \frac{\ln (W_{t1}) - \ln (W_{t0})}{t} \times 100$$

$$\text{Mortality rate (\%)} = \frac{\text{No. of initial stock} - \text{No. of final harvest}}{\text{No. of initial stock}} \times 100$$

$$\text{Food Conversion Ratio (FCR)} = \frac{\text{Feed given}}{\text{Weight gain of fish}}$$

Economic Analysis

Actual price of cage materials, fish fries and feed were used. The valuation of fish price was done by local market price.

Net profit (Tk.) = Total sale (Tk.) – Per cycle investment (Tk.)

$$\text{Return on total investment (\%)} = \frac{\text{Net profit (Tk.)}}{\text{Total cost (Tk.}} \times 100$$

Production performance from Small Scale Cage Culture:

Final harvesting was done after 22 weeks of rearing from 35 cages in two upazilas (Nalcity and Faridganj). The better production was observed in cage of owner Nazma Begum cage (43.6kg) at Nalcity (Table3) and Milon Khanam cage (41.13 kg) at Faridganj (Table 4).

After complete harvesting the average production were found to be highest at Nalcity (40.5kg) than Faridganj(37.5 kg). However there is no significant difference in two areas by production($t < 0.05$).Quantity of feed per cage at Nalcity (98kg+15kg kitchen waste=113kg) was more than Faridganj (95kg +11kg kitchen waste=106kg). Mortality rate was low and almost similar at both places.

Table: 3 Final Harvesting at Nalcity, December 2006.

Sl.No.	Name of beneficiaries	No. of stocking fish	Survival fish no.	In. wt (kg)	Final wt (kg)	Total investment Tk.	Unit price Tk.	Total price Tk.
1	Hasina		238	1.3	42.6	1800	70	2986
2	Dilara Afroz		240	1.3	41.1	1800	75	3083
3	Nilufa		237	1.3	38.7	1800	75	2902
4	Sherin		236	1.25	42.5	1900	70	2975
5	Rehana		240	1.3	42.4	1900	70	2968
6	Surya Yasmin		245	1.3	41.5	1700	70	2905
7	Nilufar Begum, Lipi		232	1.3	41	1900	70	2870
8	Poly Akter		240	1.2	42.5	1800	70	2975
9	Rulia Akter		236	1.3	43.1	1750	70	3017
10	Kazol		234	1.3	41.7	1800	70	2919
11	Nargis Begum	260	239	1.35	40.8	1700	70	2856
12	Beauty Akter		236	1.3	39	1700	76	2941
13	Ruma Akter		233	1.3	36.4	1800	80	2912
14	Nazma Begum		237	1.35	43.6	1800	75	3270
15	Eyrin		239	1.3	37.5	1750	75	2520
16	Mahmuda		230	1.25	30.5	1800	75	2287.5
17	Kohinoor		241	1.26	40.7	1725	73	2971.1
18	Rahima		236	1.3	36	1750	75	2700
19	Sufeya Begum		243	1.3	37.7	1800	75	2827.5
20	Rozina Khanam		245	1.36	40.7	1750	75	3052.5
			Avg.		40.5kg		72.95	

Table: 4 Final Harvesting at Faridganj, December 2006.

Sl.No.	Name of beneficiaries	Number of stocking	Survival fish no.	Initial Weight (Kg)	Final Weight (kg)	Total investment Tk.	Unit price Tk. /kg	Total Price Tk.
1	Nazma Begum	260	235	1.1	40.2	1700	72	2894.4
2	Aymon Nahar		233	1.12	39.6	1900		2851.2
3	Monoara Begum		230	1.3	33.5	1800		2412
4	Milon Khanom		237	1.2	41.3	1750		2973.6
5	Dalia Begum		241	1.12	39.5	1800		2844
6	Umme Honey		229	1	32.5	1700		2341.44
7	Suma Akter Ayesa		247	1.25	40.3	1700		3031.2
8	Asura Begum		239	1	38.7	1800		2786.4
9	Rokeya Begum		232	1.35	39.4	1800		2836.8
10	Amena Begum		241	1.3	35.8	1750		2577.6
11	Renu Begum		230	1.35	33.7	1800		2426.4
12	Ayesa Begum		248	1.11	34.6	1725		2491.2
13	Rashida akter		239	1.25	39.8	1750		2865.6
14	Toybun Nessa		243	1.26	37.3	1800		2685.6
15	Nazma		240	1.32	36.5	1750		2626.56
			Avg.		37.51kg			

Table 5: Production data of small-scale cage culture of Tilapia *Oreochromis niloticus* obtained in two upazilas of Bangladesh, 2006.

Sl. No.	Parameters	Upazila	
		Nalcity	Faridganj
1	No. of cage	20	15
2	No. of fish fries	260	260
3	Avg. stocking weight/cage (kg)	1-1.5	1-1.5
4	Avg. no. of fish recovered	237.9	237.6
5	Rearing time (weeks)	22	20
6	Mortality rate (%)	8.5	8.6
7	Feeding rate (%/BW)	3-5	3-5
8	Avg. weight/fish (g) at harvesting	190	185
9	Quantity of feed/cage (kg)(include kitchen waste)	113	106
10	Food Conversion Ratio (FCR) (kg)	2.8	2.8

11	Specific Growth Rate (SGR)	3.5	3.4
12	Avg. net cage production (kg)	40.5	37.5

Economic:

The economical analysis for the culture practices in two upazilas is presented in the Table 6. The average total cost per cage at Nalcity was TK 1780 and Faridganj TK 1748. Labour cost was excluded because the beneficiaries constructed the cages by themselves. It is seen from the Table that the feeding cost is the major cost at both places and it was about 49.4% and 48.5% of the costs incurred respectively at Nalcity and Faridganj. Net profit at both upazilas is nearly similar (TK 1106.4 and TK 1080). Return on total investment at Nalcity was 58.53% and Faridganj 59.07 %.

Table 6. Economics of small-scale cage culture of *Oreochromis niloticus* at two upazilas Nalcity and Faridganj (net profit from one cage at the end of one cycle).

Sl. No.	Parameters	Upzilla	
		Nalcity	**Faridganj**
1	**Costs**		
	Cage materials	400	400
	Fingerlings (@ Tk. 2.0)	500	500
	Feed costs (Tk.)	880	848
	Total costs	1780	1748
2	**Benefits**		
	Gross sale (Tk.) (@ Tk. 72)	2822.4	2780.6
3	**Profitability**		
	Net Profit (Tk.)	1042	1032.6
	Return on total investment (%)	58.5	59.1
	Feeding costs (%)	49.4	48.5

(1US$= BDT 70)

The profitability of cage culture at Nalcity and Faridganj can be summarized by the following:

1. Net profit from 1st cycle Tk. 1042 and 1032.64 (including all inputs).
2. The opportunity for net profit from 2nd cycle Tk. 1442.4 and TK1432.64 (Taka 400 excluded as no costs for cage materials).

Social Interaction:

As cage culture is found to be the extra income source of rural women besides other household income activities. Information on how they spent money earned from selling fish from cages and area wise fish consumption patterns are summarized in the Table 7. It was evident from both areas that most cage culturist partially consumed fish harvested from the cages, and earned additional income by selling fish locally. A substantial proportion of the women spent the money for their personal purpose in both areas (Nalcity 25% and Fariganj 53%).

Table 7. List of Social Interactions among the cage farmers

Use of fishes and the sell out money	Nalcity (n=20)	Faridganj (n=15)
Fresh fish:		
Family consumption of fish	100% (20)	100 %(15)
Guest entertainment with fish	30% (6)	46% (7)
Fish sold out money:		
Additional contribution to family	100% (20)	100% (15)
Money spent for husband/children wares, shoes, etc.	60% (12)	66.67% (10)
Money spent for herself (Cosmetics, dress, shoes etc.)	25% (5)	53.33% (8)

From the table 7, it can be observed that though the monitory contribution of cage culture to the overall family income is not significant but it created opportunities of social interactions that enhanced harmony among the farmers.

Dissemination of the Technology:

1. Two Booklets one is **"Easy Methods for fish Culture in Small Cages**" **(Annex-1)** and "**Small Scale Tilapia Culture in Cages"(Annex- 2)** have been developed and published in Bangla language as an outcome of the project, which is helpful for cage culture interested farmers in Bangladesh.

The booklet has been distributed to different Fisheries Department, NGOs, Universities Fisheries projects and interested farmers.

2. Cage culture activities were made available to the local people of Nalcity and Faridganj areas as it was a new fish culture technology to the people. Not only women, interested non-participants men were found to be curious and came to see how to build the cages during training sessions.

3. News on activities of cage culture at Nalcity was published in two daily bengali news papers (National news paper Somokal (Annex-3), and local news paper The Daily Dakkhinanchal (Annex-4) in August and September 2006.

4. Some cage culture beneficiaries were visited by neighbours from other villages who come to find out about this new technology. They curious wanted to know how to build the cages, what things require to make cage, what were suitable species to grow, what to feed the fish etc. The cage culture trained beneficiaries tried to explain their experience to all.

5. One workshop was done at VOSD Faridganj office with relevant people from GoB, NGOs, farmers, VOSD officials, VOSD Executive Director and Fisheries advisor from Dhaka University. The achieved results of the project were discussed in the workshop.

6. A visit was done by Dr. M. C. Nandeesha (Photograph at Annex-6) from central agricultural university Tripura, India and Josey Joseph from DoN Bosco India. The technology will be used in another AwF funded project operated by the St. Xavier's vocational Training Centre in Bishramganj in Tripura State..

Positive approach of Cage Fish Culture Technology for Rural Women

Some positive approach found from the project:

- Ensure Involvement of rural women
- Get extra benefit from cage fish culture
- Supplementation of family nutrition
- Small size cages, easy to handle by women.
- Best use of multiple ownership water bodies where no fish cultured due to conflict arises.
- Required low financial and labour inputs
- Dissemination of the information and peoples interests

Sustainability of Cage Culture Technology

Some key issues to sustain cage culture in an area:

- Water availability in the locality throughout the year
- Correct species selection (e.g. tilapia) and seed source availability
- Beside farmed feed use of household wastes minimize the feeding costs of farmers
- The use of more than one cage per individual may improve the returns and investment to the beneficiaries.
- Farmers can form groups so that continuous guard to reduce poaching threats
- Cage culture is suitable in ownership conflicts area like multi-ownership pond for its sustainability (Minimum ,TK 60/Kg is valuable)
- Proper price of fish is also important for sustainability
- NGO's and banks can offer low interest credit which is potential for sustainability of cage culture technology.

Constrains anticipated:

- Lack of funding and Support – NGOs or Govt.
- Lack of management support to implement new technology
- Social Barrier – Farmers preference on traditional technologies acceptance rather than new technologies
- Non-availability of fish seeds in the off seasons in remote places.
- Lack of knowledge regarding scientific fish culture and its economic viability
- Not getting proper price in the locality due the interference of fish traders and wholesalers.
- Water level reduction in winter season in some areas
- Poaching

Achievement from first cycle:

- Self employment has been created for women.
- Low cost small scale cage fish culture technology has been introduced and established.
- Opportunities for additional income, financial support to family and decision making by women has increased.
- Awareness on cage culture technology has been developed among the beneficiaries and community people.
- Social interactions: Entertainment to guests with fish

- Resource utilization: Proper utilization of fallow water bodies.

- Increasing family fish consumption as well as protein intake have been accomplished.
- Two booklets on small scale caged fish culture has been published.

Second culture cycle:

With satisfactory performance made from first cycle, all beneficiaries are like to stock tilapia in their cages again in both areas. As water level of the ponds are reducing due to winter and non-breeding seasons for tilapia's fries, the second cycle should be started in March 2007. Some women want to increase the number of cage during second cycle. That would encourage as that will give more return to the beneficiaries.

Conclusions

- It is hoped that tilapia culture in cages is an appropriate aquaculture technology for rural women in Bangladesh.
- Low-input cage aquaculture offers a profitable option for rural women along with other activities such as homestead gardening, poultry and goat rearing, as an additional part of their households income.
- Cage culture enhances the status of women in the communities
- Cage culture technology has the future for significant contribution to fish production in Bangladesh, especially in the communities where livelihoods and nutritional status is a major problem.
- Finally, it can be said that cage culture required least investment; bank and NGO's can offer low interest micro-credit or loan for the cage culturists.

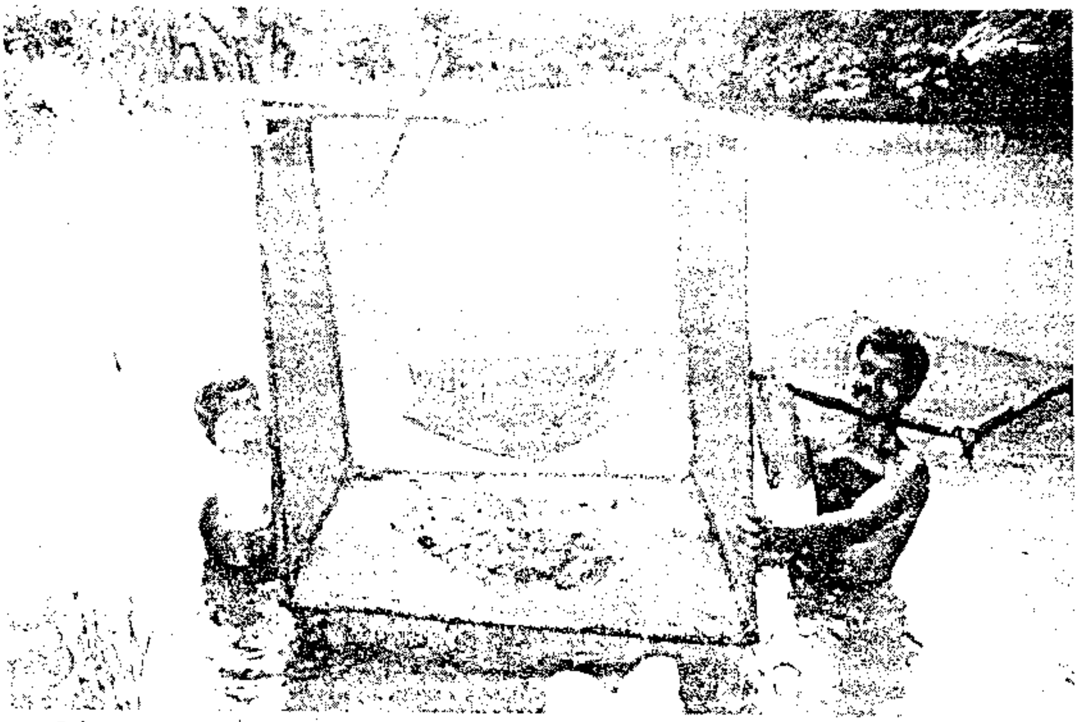
Annex -1. Easy Methods for Fish Culture in Small Cages (In Bengali), Published in 2006).

Annex- 2. Small Scale Tilapia Culture in Cages (In Bengali), Published in 2007.

Annex -3. SOMOKAL (A National Bengali Daily 06 August 2006)

১৬ । সমকাল

সমকাল রোববার ২২ শ্রাবণ ১৪১৩, ৬ আগস্ট ২০০৬



এভাবেই খাঁচায় মাছ চাষ হয় —সমকাল

খাঁচায় মাছ চাষ

জিয়াউল হাসান পলাশ

পরিত্যক্ত জলাশয় এবং পুকুরে খাঁচায় মাছ চাষ [illegible] সম্ভাবনা রয়েছে। দক্ষিণাঞ্চলে পরীক্ষামূলকভাবে [illegible] এ প্রযুক্তির কাজ শুরু করেছে। এর আগে ২০০৫ সালে এ প্রযুক্তির মাধ্যমে চাঁদপুর জেলায় ব্যাপক সফলতা পাওয়া গেছে। তাই দক্ষিণাঞ্চলের [illegible] জেলার নলছিটি উপজেলায় [illegible] এসোসিয়েশন ফর সোস্যাল ডেভেলপমেন্ট। এ প্রযুক্তির পরীক্ষামূলক [illegible] শুরু করেছে, যা দেখে ব্যাপক সাড়া পড়েছে এলাকাবাসীর মধ্যে। নলছিটি [illegible] কার্যালয়ে এ সম্পর্কে জানতে ও প্রকল্প দেখতে ভিড় জমাচ্ছে প্রতিদিন এলাকার [illegible]। তবে এ প্রকল্পে সফলতা পেলেই অনেক আগ্রহীদের খাঁচা উৎপাদন ও সরবরাহ করবে বলে জানা গেছে। ইতিমধ্যেই এক মাস অতিবাহিত খাঁচার মাছ [illegible] সন্তোষজনক [illegible]।

ঢাকা বিশ্ববিদ্যালয়ের মৎস্য বিশেষজ্ঞ ড. নিয়ামুল নাসের [illegible] সহায়তায় [illegible] খাঁচায় মাছ চাষের প্রযুক্তি আবিষ্কার করে, [illegible] ১২টি [illegible] খাঁচা [illegible] চারদিকে চারটি প্লাস্টিকের [illegible] একটি খাঁচার মধ্যে ২৫০টি [illegible]। সঠিকভাবে খাবার দিলে [illegible] মাস পর এ মাছ খাওয়া বা বিক্রির উপযোগী হবে।

একটি খাঁচা তৈরিতে [illegible] খরচ বাবদ খরচ হবে [illegible] হাজার ৫০০ টাকা। চার মাসে একটি তেলাপিয়ার গড় ওজন হবে ২৫০ থেকে ৩০০ গ্রাম। একই সময় একটি খাঁচায় [illegible] ২৫০ গ্রাম করে ৭৫ কেজি। এক কেজি মাছের [illegible] ৬০ টাকা হলে [illegible] কেজি মাছের দাম হবে ৪ হাজার ৫০০ টাকা। [illegible] লাভ আসে ৩ হাজার টাকা। এভাবে [illegible] বাড়ির পার্শ্ববর্তী পরিত্যক্ত [illegible] নলছিটি শাখা ম্যানেজার [illegible] এ খাঁচায় মাছ চাষে সফলতা [illegible] সহযোগিতা করলে [illegible] বেকার ও [illegible]।

Annex- 4. The Daily Dakkhinanchal (A Local Bengali Daily
07 August and 06 September 2006)

দৈনিক THE DAILY DAKKHINANCHAL
দক্ষিণাঞ্চল
(The first and most widely circulated Independent Bengali Daily from Southern Bangladesh)
net রেজিঃ নং-কে এন ২০৩-২১ বর্ষ, ২৮৬ সংখ্যা বরিশাল, বুধবার, ২২ ভাদ্র ১৪১৩, ১২ শাবান ১৪২৭, ৬ সেপ্টে

খাঁচায় মাছ চাষ

নলছিটি প্রতিনিধি

পরিত্যক্ত জলাশয় এবং খাঁচায় মাছ চাষ প্রকল্পের উজ্জল সম্ভাবনা রয়েছে। সরেজমিনে দেখা গিয়াছে বেসরকারি সংস্থা ভল্যান্টারী অর্গানাইজেশন ফর সোসাল ডেভেলপমেন্ট ভোসড নলছিটি উপজেলায় খাঁচায় মাছ চাষ প্রযুক্তি শুরু করেছে। যা দেখে ব্যাপক সাড়া পড়েছে এলাকাবাসীর মধ্যে, নলছিটি ভোসড কার্যালয়ে এ সম্পর্কে জানতে ও প্রকল্প দেখতে ভীড় জমাচ্ছে এলাকার জনসাধারণ। ইতোমধ্যেই ৪৫ দিন অতিবাহিত খাঁচার মাছ দেখে সফলতার উজ্জল সম্ভাবনার কথা জানিয়েছে ভোসড কর্তৃপক্ষ।

ঢাকা বিশ্ববিদ্যালয়ের মৎস্য বিশেষজ্ঞ প্রফেসর ডঃ নিয়ামুল নাছের এবং মোসাম্মত তামান্না খাতুনের তত্ত্বাবধানে উক্ত খাঁচায় মাছ পরিচালিত হচ্ছে। প্রকল্পটির বাস্তবায়নে সহযোগিতা করছেন এ ডব্লিউএফইউকে। আড়াই হাত লম্বা বাঁশের ১২টি চেরা দিয়ে তৈরি খাঁচা জাল দিয়ে ঢেকে দিলেই খাঁচা তৈরি হয়। খাঁচার মধ্যে থাকে মাছের খাবার ট্রে। খাঁচাটিকে পানিতে ভাসমান অবস্থায় রাখতে খাঁচার চারিদিকে চারটি প্লাস্টিকের খালি বোতল দিতে হবে। নির্দিষ্ট সময় একটি খাঁচার মধ্যে ২৫০টি হাইব্রিড তেলাপিয়ার পোনা পালন করা যাবে। সঠিকভাবে খাদ্য দিলে ৩-৪ মাস পরে এই মাছগুলি খাবার বা বিক্রির উপযোগী হবে। একটি খাঁচার চার মাসের জন্য মাছের খাবার বাবদ খরচ হয় ১৫০০শ' টাকা। চার মাসে একটি তেলাপিয়ার গড় ওজন হবে ২৫০-৩০০ গ্রাম। একই সময় একটি খাঁচায় বিক্রিত মাছের পরিমাণ দাঁড়াবে ৭৫ কেজি। প্রতি কেজি মাছের দাম ৬০ টাকা হলে, ৭৫ কেজি মাছের দাম দাঁড়াবে ৪৫০০ টাকা। খরচ বাদে খাঁচা প্রতি লাভ আসে তিন হাজার টাকা। এভাবে বেকার যুবক, যুবতীরা অনায়াসেই তাদের বাড়ির পার্শ্ববর্তী পরিত্যক্ত ডোবা নালা বা খালে খাঁচায় মাছ চাষ করে পেতে পারে স্বল্প পুঁজিতে নতুন আয়ের উৎস্য।

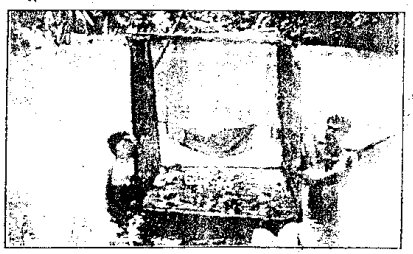
এ বিষয়ে মাঠ পর্যায়ে প্রকল্পটির ব্যবস্থাপনায় মিঃ প্রণব কুমার মজুমদার ও মিঃ ছালাউদ্দিন লিটন জানান, উপজেলার উৎসাহিত বেকার জনসাধারণের মধ্যে প্রকল্পটি ব্যাপকভাবে চালু করার পরিকল্পনা রয়েছে।

দৈনিক দক্ষিণাঞ্চল-৪
বরিশাল ❑ সোমবার ❑২৩ শ্রাবণ ১৪১৩ ❑ ৭ আগস্ট ২০০৬

খাঁচায় মাছ চাষ: নতুন কর্মসংস্থান সৃষ্টির উজ্জল সম্ভাবনা

❑ মুঃ মনিরুজ্জামান মনির

আধুনিক প্রযুক্তির এ যুগে খাঁচায় মাছ চাষ এক নতুন আবিষ্কার। ভলান্টারি অর্গানাইজেশন ফর সোসাল ডেভেলপমেন্ট (ভোসড) এই নতুন প্রযুক্তির উদ্ভাবন করেছে। ভোসড ২০০৫ সনে পরীক্ষামূলক এই প্রযুক্তির মাধ্যমে চাঁদপুর জেলার কয়েকটি উপজেলায় ব্যাপক সফলতা পেয়েছে যার প্রেক্ষিতে এই প্রযুক্তিটি নলছিটিতে পরীক্ষামূলক শুরু করা হয়েছে। ভোসড নলছিটি উপজেলা শাখা প্রাথমিক পর্যায়ে পরীক্ষামূলক ২০টি খাঁচার মাধ্যমে মৎস চাষ প্রকল্প চালু করেছে। ব্যাপক সাড়া পড়েছে খাঁচায় মাছ চাষের। প্রতিদিন নলছিটি উপজেলার বিভিন্ন এলাকা থেকে খাঁচায় মাছ চাষ আগ্রহী ভিড় জমাচ্ছে ভোসড কার্যালয়ে। কিন্তু ভোসড কর্তৃপক্ষ পরীক্ষামূলক এই প্রকল্পে সফলতা পাওয়ার পরই ব্যাপকভাবে খাঁচা উৎপাদন ও সরবরাহ করবে বলে সবাইকে ফিরিয়ে দিচ্ছে। উপজেলার বিভিন্ন এলাকার জলাশয়ে ভাসমান খাঁচা দেখতে ভিড় জমাচ্ছে কৌতূহলী জনতা। ভোসড নলছিটি শাখা এই



নতুন প্রকল্পটি শুরু করেছে জুন মাসের মাঝামাঝি সময়ে। ইতিমধ্যে এক মাস অতিবাহিত হয়েছে। এই এক মাসের খাঁচার মাছ দেখে বলা যাচ্ছে সফলতার উজ্জ্বল সম্ভাবনা রয়েছে।

ঢাকা বিশ্ববিদ্যালয় প্রাণী বিদ্যা বিভাগের মৎস্য বিশেষজ্ঞ ডঃ নিয়ামুল নাসেরের কারিগরি সহায়তায় ভোসড খাঁচায় মৎস চাষ প্রযুক্তি আবিষ্কার করেন। অল্প খরচ ও স্বল্প সময়ে খাঁচা তৈরি করা যায়। আড়াই হাত (৫.৫) লম্বা বাঁশের ১২টি চেরা দিয়ে খাঁচার কাঠামো তৈরি করা হয়। খাঁচার কাঠামোর চারদিকে জাল দিয়ে ঢেকে দিলেই খাঁচা তৈরি হয়ে যায়। খাঁচার মধ্যে মোটা পলিথিন জাতীয় বস্ত্র দিয়ে মাছের খাদ্য দেয়ার ট্রে তৈরি করে দিতে হবে। খাঁচাটিকে পানিতে ভাসমান অবস্থান রাখার জন্য খাঁচার চারপাশে চারটি ভাসমান বস্তু দিতে হয়। নির্দিষ্ট সময়ে একটি খাঁচার মধ্যে হাইব্রিড জাতীয় ২৫০ থেকে ৩০০টি তেলাপিয়ার পোনা পালন করা যাবে। প্রতিদিন খাঁচার মধ্যে সকাল ও বিকালে খাদ্য দিতে হবে। তিন থেকে চার মাস মেয়াদকালে খাঁচার মাছ বিক্রয় বা খাবার উপযোগী হয়। একটি খাঁচা তৈরি, ২৫০ থেকে ৩০০টি মাছের পোনা ও চার মাসের খাবার বাবদ প্রতিটি খাঁচায় খরচ হতে পারে ১২০০ থেকে ১৫০০ টাকা। এই সময় এক একটি তেলাপিয়ার গড় ওজন হবে ২০০ থেকে ৩০০ গ্রাম। সে হিসেবে চার মাস পর একটি খাঁচায় গড়ে ৩০০ পিচ মাছের ওজন ২৫০ গ্রাম করে ৭৫ কেজিতে দাঁড়ায়। এক কেজি মাছের দাম ৫০ টাকা করে হলেও ৩৭৫০ টাকা হবে। খরচ বাদ দিয়ে একটি খাঁচায় লাভের পরিমাণ দাঁড়ায় ২২৫০ টাকা। একজন বেকার যুবক যুবতী কিংবা গ্রামের মধ্যবিত্ত ও নিম্ন পরিবারের মহিলারাও পুকুর, ডোবা, খাল ও বিলে খাঁচায় মাছ চাষের মাধ্যমে নতুন আয়ের পথ পেতে পারেন। ৩ থেকে ৪ হাত গভীরতার যে কোন জলাশয়ে অন্যান্য মাছ চাষের সাথে খাঁচায় মাছ চাষ করা যেতে পারে। ভোসড নলছিটি শাখার ম্যানেজার মোঃ সালাউদ্দিন লিটন জানিয়েছেন, নলছিটিতে পরীক্ষামূলক ভাবে মাছ চাষএ সফলতা পাওয়ার পরেই ভোসড এর পক্ষ থেকে ব্যাপক ভাবে প্রকল্পটি চালু করা হবে।

Annex -5. CASE STUDY - FARIDGANJ

Name : Monoara Begum (38 yrs)
Husband's Name : Kazi Nazrul Islam
Occupation : Housewife
Village : Horne Durgapur (Bhuyan Bari)
Union : 14 No. Faridganj Dakshin
Upazilla : Faridganj
District : Chandpur

She has 2 sons and 1 daughter. Her husband is a wager. He can not afford his family with his limited income. But his inspiration gives her more strength. That's why she is looking for an income generating source in their locality. When she heard about cage fish culture technology from VOSD, at first she was not so much interested as it was a new technique in that area. But when VOSD staffs explain her about cage fish culture can be done in any water body and spend little time for management. Then she agreed to do this cage culture in her multi-ownership pond. After that she became a group member for cage fish culture.

She got three days (technical and hands-on- training) training and other inputs (cage materials, tilapia fries and food) in May, 2006 from VOSD (by the supporting of AwF). From the training, she learned cage culture activities.

Poultry and duckery wastes are a good fertilizer and form some kind of food in water which is useful for cage fish growth. She stocked 260-monosex tilapia fries in her cage in July, 2006 and feeding thrice a day. Besides supplied feed, she also used kitchen wastes, vegetables, spinaches, etc. for cage fishes as food as she learned from the training.

Local peoples around the area show their interest for fish culture in cages as it is a new technology, profitable and need low cost inputs. Monoara Begum wants to do the next cycle, but there is problem to get fish fries in that area, because there is no hatchery around the village to purchase fries.

As the growth of all fishes in her cage was not same, she harvested big sized fishes after 4 months of rearing and got 23.2 kg tilapia of this, she sold 20 kg @ Tk. 70 and consumed 3.2 kg for her family. Till now she got Tk. 1624.00 from cage fish and she thinks that cage fish culture is a profitable income generating activities for women.

CASE STUDY – NALCITY

Name: Ruma akter
Age : 27
Village: Siddha kathi.
Nalcity, Jhalakathi.

Ruma Akter a landless rural women lives in the village Siddha Kathi under Nalcity upzilla of Jhalakathi district. She is a newly married and her husband is a tea seller at Dhaka. She heard about cage culture from VOSD employee Kohinoor Begum. Then she showed her interest. So family suffers much to live a decent living Ruma has to live her father's house because of her husband's bad condition. Ruma wants to be self-dependent. She took three days training from VOSD on cage culture and is using her grand father's pond to cage culture. As she does not need the whole pond for this activity she said it is a good fish culture technology for the woman who have no pond but can use others pond. VOSD provided (with support of AwF) to her cage materials fish feed and fries. She has one cage and she stocked tilapia's fries in June 2006.

Ruma soaked oil cake overnight in water, and then mixed with rice bran/wheat bran, molasses and some fish meal. She mixed the ingredients together to dough and made in to ball and feed fishes each morning and in the afternoon each day. One month after stocking she also began providing kitchen waste vegetable, spinach etc. as fish feed with mixed other supplemental feed.

Often Ruma is visited by neighbours from other villages who come to find out about this technology, want to know how she built the cage, what things require to make cage, what are suitable species to grow, what to feed the fish etc. Ruma tries to explain her experience to all.

Partial harvesting was done from her cage. Average weight of her fish was 150-200g each. She said she sold 16 kg fishes and approximately 4 kg fish has eaten during Eid and Ramadan festival.

Ruma is very happy to do cage culture and found new income path. This income will not satisfy all her needs but will be helpful in marinating her poor family. She wants to increase the number of cages in future.

CASE STUDY – NALCITY

Name: Sufia Begum
Age : 42
Village : Siddha kathi
Upzilla- Nalcity
District- Jhalakathi.

Sufia Begum, a house wife in the village of Siddhakathi under Nalcity upazila of Jhalakathi district, where She has four sons and three daughters, though two sons and two daughters have already got married and have left home. Her husband is a farmer and a little land for cultivation. Her two sons works as a day labor in a factory at Dhaka. Most of the household income comes from her husband's day wage and her sons. All of these incomes are not enough to support her family.

Sufia is a member of the NGO; VOSD which introduced her to the concept of cage culture, the NGO provided (by support of AwF) her training and other inputs for cage culture. She started tilapia culture in cage in July 2006 in her own pond. She stocked 2 inches 260 tilapia fries in her $1m^3$ cage. She fed the fishes a ball feed containing rice bran, wheat bran, mustard cake and kitchen wastes and continued this culture for 4 months. She fed her fishes thrice a day. After 4 months rearing, she partially harvested cage fishes in November 2006 at the rate of Tk. 70 per Kg. Totally she sold approximately 19 kg tilapia fish and consumed 4-5 kg for guest entertains. As VOSD provided all cost input on free so she got all profit from one cage. She spent the money to buy poultry for rearing to get egg for family nutrition.

Sufia Begum has planed to continue the cage culture and increase the number as two to three cages are easily manageable as part of her household activities.

Annex – 6. Photograph of project visit (Dr. M.C. Nandeesha from Central Agricultural University ,India)

Annex-7. Expenditure Statement

Sl.	Activities	BDT

No.		
1	a. Three days training on cage culture for 35 rural women (for food)	10,500
	b. Conveyance for 35 farmers	10,500
	c. Local trainer honorarium	6,000
	d. Training materials	3,675
	e. Tilapia fries for 35 cages	17,850
	f. One day follow up training: Food + Conveyance for 35 farmers	7,000
	g. Pond preparation (Lime, fertilizers, etc.) for 15 ponds	8,280
2	Input materials (net, bamboo split and others) for 35 cages	15,400
3	Fish feed	36,260
4	Cage culture training manual (Easy Methods for Fish Culture in Small Cages, 800 pcs.) and documentation	52,000
5	Fish Culture Manual (Small Scale Tilapia Culture in Cage, 500 pcs.)	30,000
6	Documentation, Reporting and Photography	1,750
7	Emergency Pond Treatment	3,800
8	Travel cost, Food and Accommodation for field supervisor	17,360
9	Local seminar and workshop	22,238
10	Audit fees	3,000
	Bank charge and other commission	1,425
	Total (Two lakhs forty thousand eight hundreds and thirteen)	**247,038**
	Total AwF Contribution	**176,886**
	Total VOSD Contribution	**70,152**
		(IUS$= BDT 70)