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RURAL DEVELOPMENT STUDIES ON THE EXTENSION OF AQUACULTURE TECHNOLOGIES OF FISH PRODUCTION IN BANGLADESH

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ABSTRACT

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Rural development studies were conducted on the extension of aquacultural technologies of fish production in Bangladesh with the objectives of identifying the problems and prospects. The studies covered water body areas of the Eastern and North Eastern Bangladesh where fishing by rural poor was found to be dominant. The results showed that about 45% rural fish ponds made as per recommendations of Local Government, Rural Development and Cooperatives (LGRD&C) Ministry and its Non-Government Organization (NGO) and Microfinance Foundations. It was found that 1-2 acres farm were highest in Netrakona areas. Conversion of lowlands having natural harbour Fisheries to irregular ponds indicated further investment in the system. The skill of the fish farmers should be improved giving modular ICT based training with modern fishery technology using digital presentations. Attention should be given to educated but unemployed rural youth arranging microfinance.

Key words: *rural development, aquaculture technologies, fish extension*

INTRODUCTION

Rural development and Fisheries integrated Farming systems phenomena were not only limited to the fisheries production but also affects the total rural development starting from employment in fish hatchery, nursery, grow-out and fish harvest phases. Using the base year 2005 = 100, the professional productivity index for fisheries sector declines from 109 to 106 by 2010 subsequently (BER-BBS 2011). A recent World Bank report identified the weaknesses of fisheries sector, Bangladesh (Ali *et al.* 1998; and Asaduzzaman *et al.* 2007). These were: lack of sufficient technical capability in fisheries development planning, lack of clear definition and assignment of functional responsibilities for fisheries extension and support services (GO/NGO), lack of female extension service providers, complicated and time wasting procedures in case of water body lease, especially for female applicants, and lack of trained manpower, inadequate career planning and development.

Inadequacy and poor mechanism: Bangladesh is yet to see a substantial improvement in this sector. Especially the Small farmers are facing this (Ahmed and Hossain, 1998; Cunningham 1993).

Some examples are the construction of fishing ports/harbors, fish landing centers and markets, ice and freezing plants, poldered shrimp farming complexes and fish hatcheries. Often overlooked and not readily recognized or understood is that these "hardware" projects do not directly influence and increase fish production per se. It will take time for these "hardware's" indirect influence to exert any impact on fish output. Now that these "hardware" are in place, more attention and effort should be shifted to programs and projects which underpin and directly increase fish output. The carrying capacity of the water column in the ponds can sustain higher production. In the context of potentials and challenges lying ahead for the development of fisheries sector, particularly the aquaculture, and the range of support provided by NATP in meeting those challenges, the present research work was undertaken mainly to assist the concerned agencies by providing some of the important information, currently unavailable, on biotic and abiotic environmental factors affecting pond aquaculture in Bangladesh. With this goal in perspective the present research activities were undertaken with the following specific objectives: to i. know the vital parameters of pond water environment required for aqua-technology adoption, ii. identify the fish production inputs related to the utilization of improved NATP technologies as per profitable species, and iii. prioritize the focal pond fish culture management needs in the community.

MATERIALS AND METHODS

The methods used in the studies were techno-social field investigation selecting variables as per objectives and the procedure as preferably recommended by several workers (Alam and Demaine, 2004; Sharma and Leung, 2003).

Sites sampling – Districts, Mymensingh-Trishal, Sambhuganj, Fulpur, Gouripur. Netrakona- Sadar, Barhatta, Mohanganj, Kendua, Atpara, Khaliajuri. Sunamganj- Sadar, Dharmapasha, Sulla, Dherai, Jamalganj, Tahirpur.

A. Respondent's Identity/Information:

i. Name: ... Gender: ... Age: ... Education: ...
ii. Profession: Fish farm owner, Microfinance Official, Cooperative Member, Local elites
iii. Address: Upazila-...District-..Union/village…
iv. Site character: Urban rural, Suburban rural, Extreme rural

B. Fish farm information:

1. Farm status: i) Big pond ii) Mini Pond iii) Canal iv) Lake
2. Size of the pond: i) >0.5 acre ii) up to 1 acre iii) 1-2 acre iv) <2 acre
3. Nature of the farm: i) Seasonal ii) Perennial iii) Crop mixed
4. Farming strategy: i) Commercial ii) Semi commercial iii) Subsistence level
5. Investment (Tk.- 000): i) > 10 ii) 10-20 iii) 20-50 iv) 50
6. Income from the farming: i) Loss ii) Profit iii) Equal iv) High profit
7. Source of funding: i) Bank ii) NGO (micro) iii) Relatives iv) Sharing
8. Training received on the specific job: i) No ii) > 1 week iii) 1-2 weeks iv) 2 weeks or more
9. Financial assistance received for the purpose: i) No ii) Mortgage Bank iii) Govt agencies iv) Donation
10. Membership: i) Co-op Soc ii) Kaiborto Com iii) Govt ext iv) NGO v) Common Interest Groups (CIG)

C. Research Questions:

1. What is the quantitative status of related female fish farmer/entrepreneur?

(a) Fisheries farm owner **female:** i) < 10% ii) 10-20% iii) 20-30% iv) 30-40% v) >40%
(b) Fisheries Entrepreneur **female:** i) < 10% ii) 10-20% iii) 20-30% iv) 30-40% v) >40%
(c) Fisheries rural processor **female:** i) < 10% ii) 10-20% iii) 20-30% iv) 30-40% v) >40%

2. What is the quantitative status of direct and active male fish farmer/entrepreneur?

(a) Fisheries farm owner **male:** i) < 10% ii) 10-20% iii) 20-30% iv) 30-40% v) >40%
(b) Fisheries Entrepreneur **male:** i) < 10% ii) 10-20% iii) 20-30% iv) 30-40% v) >40%
(c) Fisheries rural processor **male:** i) < 10% ii) 10-20% iii) 20-30% iv) 30-40% v) >40%

3. What is the main problem from the Microfinance operation? No direct legal security from the govt., Unsecured market price, Lack of modern and competitive efficiency, Higher risks of loss, No insurance.

4. What is the main problem from the friend circle? Lack of dignity, Less income, Negative interaction with relatives, Disadvantaged time schedule, Others

5. What is the main problem relating infrastructure? Non-co-operation from inter-departments, Negative interaction with elites, Lack of road, Unsuitable microfinance investment sector, Lack of communication

RESULTS AND DISCUSSION

The results obtained from the studies conducted here are briefly mentioned. The results after analysis are mentioned both in tabular and graphical forms. The results are arranged as per objectively set headings and sub-headings.

Farm Information

The results obtained as farm information during the studies are sequentially presented. The presentations are made both in tabular and graphical formats. The study results of the sites are depicted in the Table 1 and Fig. 1 to Fig. 5.

Table 1. Percent of seasonal and commercial fish pond of 1-2 acre

Category	Mymensingh	Netrakona	Sunamganj	Mean
Fish farm owners	71	78	46	65.0
Microfinance Officials	62	72	35	56.3
Cooperative Members	48	66	27	47.0
Local elites	53	61	22	45.3
Mean	58.5	69.3	32.5	53.4

The results (Table 1 and Figs. 1-5) show that 1-2 acres farm (minimum commercial size. (Bagi 1981), were highest Netrakona or greater Mymensingh as for communities involved fish farm owners scored highest, followed by Microfinance Officials.

Fig. 1. Only 32.5% respondents of Sunamganj areas told that size of pond is within 1- 2acres. Conversion of lowlands having natural harbour fisheries to irregular ponds indicating further investment in the system. The size ponds were smaller in the Sunamganj haors as it require more investment converting lowlands to regular ponds.

Fig. 2. About 62% of the basin ponds are in the way of converting to homestead system. Homestead self employment in the Sunamganj Dherai haor with Fisheries establishment transforming to pond system.

Fig. 3. Intensive business endeavors, 63% as mean of greater Mymensingh told in favour of 1-2 acres as commercial size with fisheries establishment in the Bhaluka Trishal belt showing high investment and employment by rural communities Shambhuganj.

Fig. 4. Modern organized cluster and nursery ponds with Fisheries establishment developing at Shambhuganj medium highland Shambhuganj.

Fig. 5. Developing cluster ponds with Fisheries establishment at Mymensingh medium low lands creating more investment and employment.

Professional response on the Fish Farm establishment

The results obtained on the Professional response on the fish farm establishment are given here in Figs. 6, 7, and 8. The results showed that the farm owners were more concerned with the production systems, while the social elites were least active, which clearly denote the less interest of the profession as a livelihood carrier.

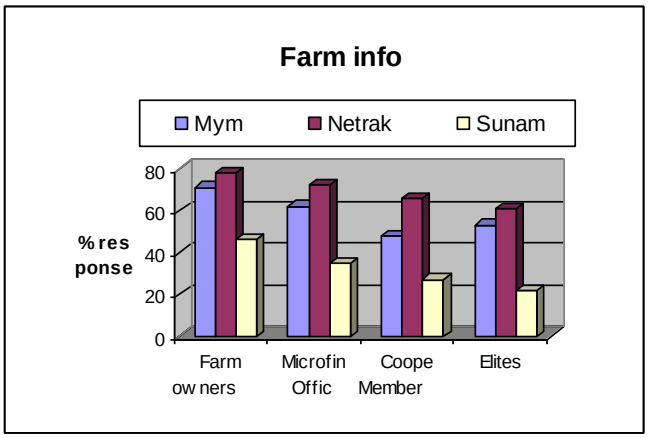

Fig. 6. District based fish farm distribution (1-2 acres)

The findings as per district show that (Fig. 6 and Fig. 7) Netrakona was dominant in this profession involving all elites, cooperative members and microfinance officials. I t was found to e 43% as group.

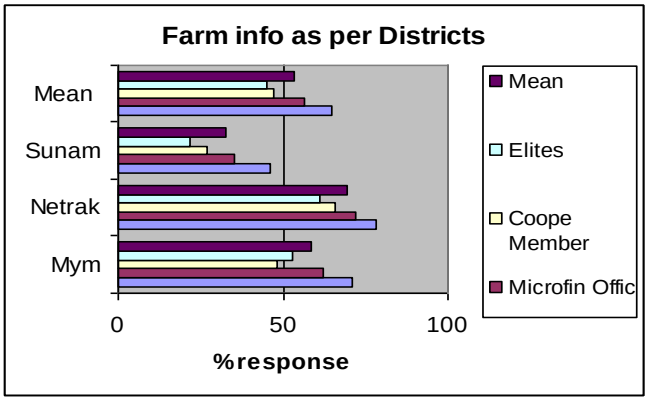

Fig. 7. Farm info as per districts responded by groups

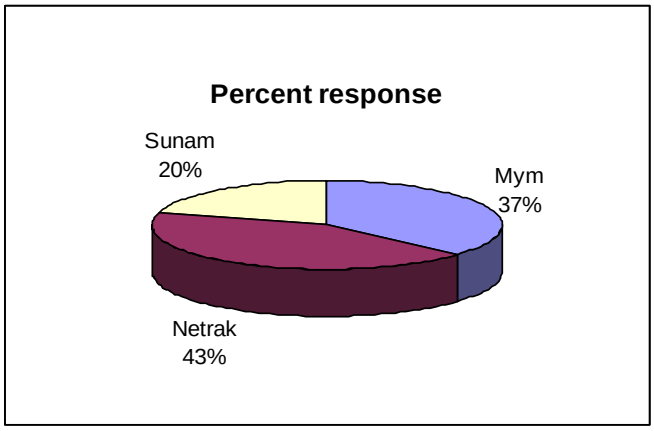

Fig. 8. Percent distribution of fish farms/ pond (1-2 acres)

Fish farm employment based investment

The results obtained on fish farm employment based investment and employment based entrepreneurs Table 2 and Table 3 shows that highest response was found for investment in Mohanganj being 54% results indicates that the business is still profitable. The employment was found to be highest in Sunamganj and Netrakona 58.6% followed by Mymensingh and sector was small business and fish farmer (Entrepreneur). The scope for female was in the range of 19-29%. The grand mean for the system was only about 40% which indicate less care by the nation. Similar result trends were apprehended by related workers (Uddin 2002; Bingham 1989) but it deteriorated further more which must be taken in to account for fisheries systems enhancement nationally.

Table 2. Investment analysis by entrepreneurs

	Trishal Mymensingh	Mohanganj Netrakona	Dharmapasha Sunamganj	Mean
Investment: 20-50 thousand	81	73	66	73.3
Income: Profit and Equal	64	65	53	60.6
Finance: Relatives	29	46	47	43.3
Membership: Kaiborto Community	13	31	26	23.3
Mean	46.9	53.8	48.0	48.9

Table 3. Employment based entrepreneurs

	Farm owner	Entrepreneurs	Aratder	Processor	Retailer	Mean
Mymensingh Male	64	65	53	29	46	51.4
Mymensingh Female	21	27	7	31	11	19.4
Netrakona Male	57	72	81	48	32	58.0
Netrakona Female	13	31	9	43	14	22.0
Sunamganj Male	81	73	66	37	36	58.6
Sunamganj Female	38	41	12	21	32	28.8
Mean	45.7	51.5	38.0	34.8	28.5	39.7

CONCLUSION

It may be concluded from findings of the present studies that the conversion of lowlands having natural harbour Fisheries to irregular ponds indicating further investment in the system. Homestead self employment in the Sunamganj Dherai haor with Fisheries establishment transforming to pond system which was enhanced by microfinance. Attention should be given to educated but unemployed rural youth. Awareness among the fish farmer and enlist them categorically, should be raised. Microfinance with easy terms and conditions should be arranged, simultaneously with skill and social training. Cordial relation with the fish farmer by supervision, regular follow-up, guidance and good manners should be arranged. Some center where the fish farmer can get together, ask and receive their technological needs, suggestion and means should be established. The constraints of fisheries development as well as rural development should be removed. Women participation in this sector by establishing gender relations through courtyard training and women professional rights should be established.

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