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RESEARCH ARTICLE

PRESENT STATUS OF THE FLOODPLAIN AQUACULTURE MANGEMENT PRACTICE OF BEGUMGONJ AND SOCIO-ECONOMIC IMPROVEMENT OF BENEFICIARIES OF BEGUMGONJ, NOAKHALI

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ABSTRACT

The research work was conducted to demonstrate the management strategies of the floodplain area and socio-economic improvement of people for floodplain aquaculture of Begumgonj upazilla situated in Noakhali District of Bangladesh. Data were collected through focus group discussion and interviewing with farmers and committee members of the floodplain (*dogi*) management. The studied floodplain (*dogi*) area (Sonali community based fish culture project) is 12 acre which was brought under floodplain aquaculture project by RFLDC-DANIDA. Almost 90000 fish fingerlings were stocked in floodplain during May-June. Average fish production in the Sonali community based fish culture project were 13% prawn, 50% carp, 4% SIS and 33% large fingerling. Average expenditure of fish culture was BDT 89025.00 and income from floodplain was BDT 141500.00. The results of the present study indicate that community-based fish culture in floodplain is technically feasible, economically profitable, environmentally non-destructive, and socially acceptable. In marketing systems, local agents, whole sellers, local fish traders and retailers may be present as a middleman.

INTRODUCTION

Floodplains can support particularly rich ecosystems, both in quantity and diversity. The yearly fish production in Bangladesh is about 32.61 lakh metric ton from open waterbody in which only floodplain contributes 9.57 lakh metric tons (DoF, 2013). A major feature of the Begumgonj sub-district under Noakhali District is the rice cultivation during the dry season (November to March), but during the rainy season it becomes a vast waterlogged floodplain area (52.42%) which remain from 4 to 6 months. About 60% population of Bangladesh depend on agriculture for their livelihood. In the absence of livelihood opportunities, they usually depend on the fisheries and other resources of the seasonal floodplains. This condition raises the opportunity to produce a crop of stocked fish to meet the demand of poor population and to improve the socio-economic condition aside from the naturally occurring 'wild' species that are traditionally fished. Community-based prawn and fish culture in the floodplains is an excellent opportunity to stimulate income generation, employment and improve the nutritional status of the communities. Increasing of fish production help to generate revenues and influence the development of floodplain aquaculture forward. Therefore, the present study was undertaken to know about the management strategic of floodplain aquaculture and the socio-economic improvement of people from floodplain aquaculture of Begumgonj.

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MATERIALS AND METHODS

The selected area of case study was Sonali community based fish culture project in Begumgonj upazila of Noakhali district in Bangladesh. The period of the data collection was June to September, 2010. Primary data were collected from farmers and associated person and committee members of floodplain aquaculture of Begumgonj upazila through questionnaire survey and crosscheck interview with key informants. Secondary data was collected through quarterly and annual reports available from Upazila Regional Fisheries and Livestock Development Component (RFLDC) Office, District RFLDC Office.

Data Processing and Analysis

After the collection of data, All the data were edited and summarized carefully and recorded. The relevant tables and graphs were prepared in accordance with the objectives of the study for understanding of the data. Microsoft word & the Microsoft Office Excel were used for the data analysis and to prepare the necessary charts, graphs & diagrams. The design of the case study for the present study involved some necessary steps (Fig. 1).

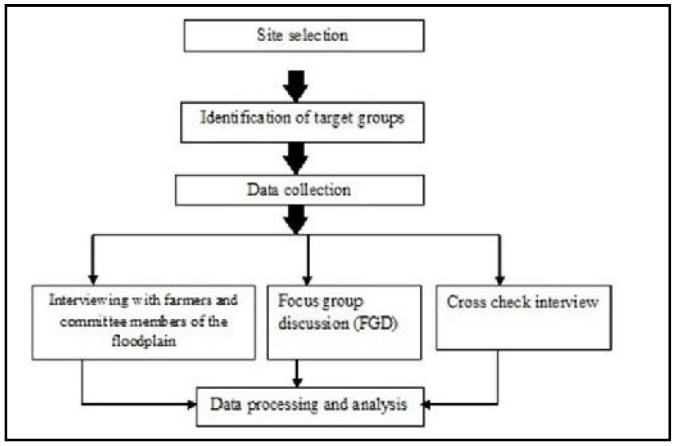

Fig. 1. Methodology followed for the Research

"Fig. 1" At first the study area and target groups were selected and then the questionnaire was designed. Then the data were collected from primary and secondary sources and from these final data was prepared by data processing and analysis. And finally the research project was prepared.

RESULTS AND DISCUSSION

Implementation of community based floodplain management

Participation, supporting and equity of all are necessary for floodplain culture. So the attempt of community is necessary for combined culture of prawn and fish in floodplain. So implementation of floodplain culture involved some necessary steps (Fig. 2).

Fig. 2. Steps of implementation of floodplain aquaculture

"Fig. 2" The main condition of any development activities is site selection & feasibility studies and then the construction of implementation committee to construct the floodplain management committee. Implementation committee makes agreement with Community Based Organizations to collect large investment for implementation of floodplain aquaculture. Then the budget is prepared and selling of share is the best process of collecting capital.

Culture season and method

In the study area, Fish fries are stocked in May to June and are harvested from floodplain in August to December. Mainly prawn is cultured with Indian major carps (Catla, Rui) and Chinese carps (Common carp, Grass carp, Bighead).

Management of prawn and carp nursery

A) Size of nursery

For best production, a suitable small pond or hole in waterlogged area was used as a nursery pond before stocking the fish fingerling in floodplain. 5-20 and 10-20 decimal is appropriate size of nursery pond for prawn and carp. 3-4 feet is the suitable depth for nursery waterbody.

B) Pre-stocking management

Applying lime, Destroying aquatic insects, Placing Shelter for Prawn were done as pre-stocking management in management of nursery pond. The rocky lime was applied at the rate of 1kg/ decimal. To destroy aquatic insects, diesel or kerosene were spread over water at the rate of 125 ml/ decimal before one day of releasing PL and kerosene was removed from water by dragging net or cloth over the water surface. The sumithion was applied at the rate of 1.5-2ml/ decimal/feet depth of water. Dried bushy bamboo, dried branches of trees etc. was placed as a suitable shelter for week prawn to protect them from cannibalism and predation.

C) Stocking management

The stocking density of prawn was 500-600/decimal and carp fry was 10-15g /decimal in nursery pond. Applying supplementary feed, fertilizers, examination of health of fish and prawn were done as post-stocking management. Juveniles went to the water of floodplain through the connection of nursery floodplain and the grow-out floodplain.

D) Post-stocking management

Supplementary feed

Mainly depend on natural feeds. A small amount of Supplementary feeds were given after the stocking of PL which were prepared in the house from local ingredients (Table 1). The ingredients were oil cake, flour, salt etc. The growth and survival rate of prawn PL and carp fry in nursery pond were examined by dragging the net.

Table 1. The rate of applying of supplementary feeds per decimal

Week	Ingredients	Quantity
1st	Only mustard oil-cake	The quantity is two times of stocking fry
2nd	mustard oil-cake & rice-bran	Three times of stocking fry
3rd	mustard oil-cake & rice-bran	Four times of socking fry
From 4th to the releasing fingerling in grow-out floodplain.	mustard oil-cake & rice-bran	Five times of stocking fry

Management of carp and prawn in grow-out floodplain

Preparation of floodplain is essential for getting good production from floodplain. The pre-stocking management includes repairing dike repairing of pond, eradication of weed, removing predatory and undesired fish, applying lime and fertilizer.

A) Stocking density

Large size fingerlings were stocked by considering the stability of water in floodplain because it was converted into marketing size in 4-6 months. The stocking rate of Prawn, Rui, Sarpunti, Catla/Bighead/Silver Carp, Grass carp and Common Carp were 5:5:5:3:1:1 per decimal in floodplain.

B) Post-stocking management

Fertilizing after stocking

Cow-dung, urea and TSP are necessary for production of natural feed. Compost is one of the effective fertilizers and produced by decomposition of parts of plant (leaves, straw) and animal (faces, urine) which is initiated by earthworm and microorganisms.

Harvesting and marketing

Harvesting of fish was started after 3 months of stocking fish. The selling of Small indigenous species which were found with cultured species is also profitable because they have good market demand. Local CBO can give different harvesting materials such as seine net, insulated rickshaw van etc. In marketing systems, local agents, whole sellers, local fish traders and retailers may be present as a middleman (Fig. 3).

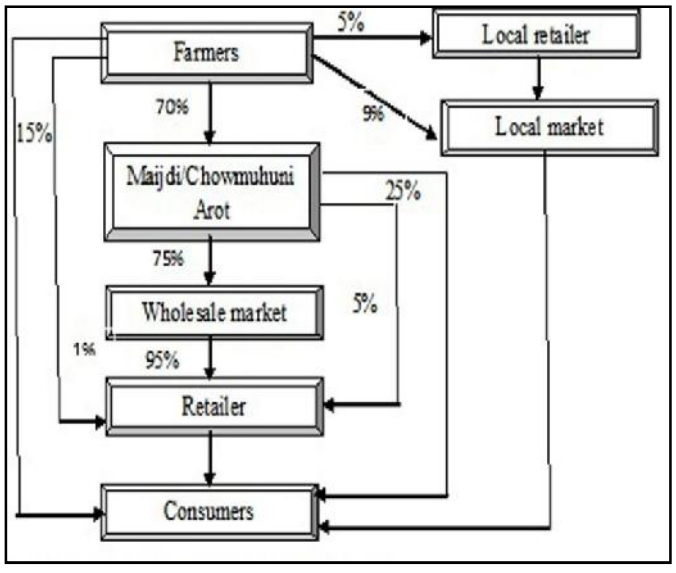

Fig. 3. Fish marketing channel in the study area

"Fig. 3" Farmers sold 15% of fishes directly to the consumers at the bank of waterbody and 9%, 1% and 5% to the local market, retailer and local retailer respectively. And rest 70% of fishes was sold to the Maijdi/Chowmuhuni arotdar. From Maijdi/Chowmuhuni arotdar, 75% and 5% of fishes were sold to the wholesaler and retailer respectively and rest 25% directly to the consumers. Retailer bought fishes from the wholesaler and sold to the consumers.

Fish production

From the present study, it was found that the percentage of production of the Sonali community based fish culture project was 50% carp, 33% large fingerling, 13% prawn and 4% SIS (Fig. 4). 2.5, 2.25, 0.9 and 0.15 kg were the maximum weight of Grass carp, Big head, Rui and Prawn respectively. Catla and Common carp had same maximum weight (1kg) (Fig. 5).

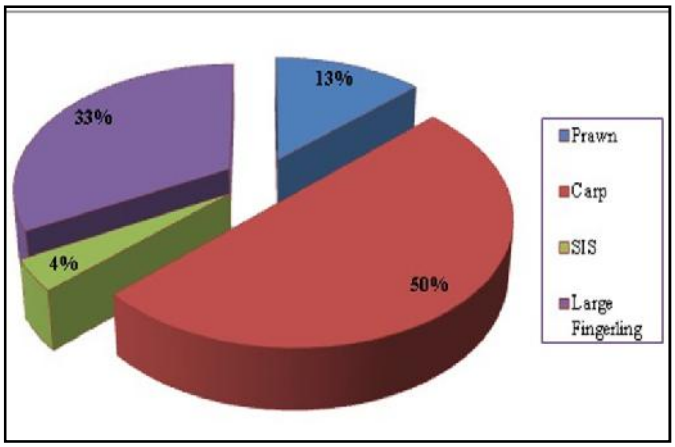

Fig. 4. Average fish production in the floodplain

"Fig. 4" 50% carp, 33% large fingerling, 13% prawn and 4% SIS were produced in Sonali community based fish culture project that year. Some large fingerlings were sold but mainly these fingerlings were stocked for next culture. These large fingerlings were stocked in one pond in highest density which is called overwintering and these fingerlings are called overwintered fingerlings.

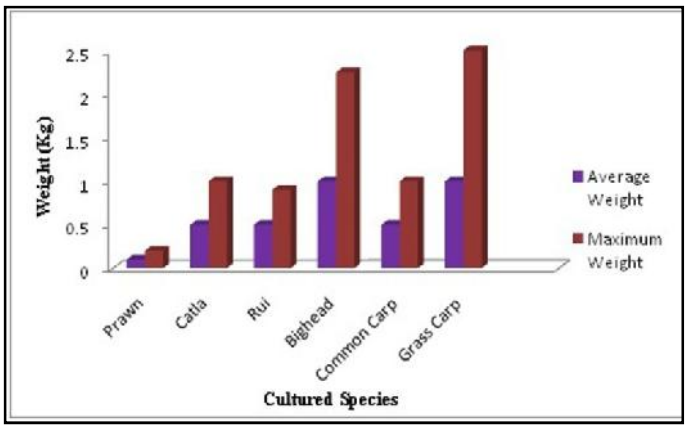

Fig. 5. Weight of produced fish species in the floodplain

"Fig. 5" The average weight of produced Prawn, Catla, Rui, Bighead, Common Carp and Grass Carp in floodplain were 0.1 ,0.5, 0.5, 1, 0.5 and 1kg respectively. The maximum weight of produced Prawn, Catla, Rui, Bighead, Common Carp and Grass Carp in floodplain were 0.2, 1, 0.9, 2.25, 1 and 2.5kg respectively.

Production cost

From the present study, it was found that the production cost of floodplain culture including the cost of pond/land lease, dike repair, land plaguing, lime & fertilizer, carp fingerling, prawn PL, feed, de-weeding, fish marketing and other cost (Fig. 6).

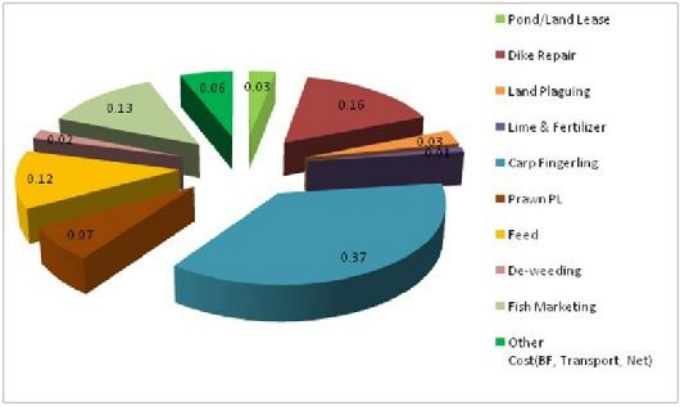

Fig. 6. Average expenditure of fish culture in floodplain

"Fig. 6" Among all production cost, the highest amount of money was spent for carp fingerling (37%) and then dike repair (16%). 13%, 12%, 7%, 6%, 3%, 3%, 2% and 1% of production cost were spent for fish marketing, feed, Prawn PL, other cost (Transport, Net), pond/land lease, land plaguing, de-weeding and lime and fertilizer.

Return from fish harvest

From the present study, it was found that earnings from fish culture in floodplain were BDT 141500.00.

Net profit

It was found that net profit from floodplain aquaculture was BDT 11791.67 which was economical profitable.

Share and distribution of profit

All members of the floodplain group must be united because different quantity of land in floodplain was owned by different people. To bring the unity between different members of floodplain, some steps are taken-

1) The share of floodplain was sold between all members of the floodplain group. One can buy more than one share according to their capability of spending money. Generally one can buy highest 3 share. The price of share and highest bidding amount were determined by floodplain management committee. The profit was distributed proportionally between the shareholders according to the amount of share.
2) Poor and landless communities whose were lived around the floodplain, had opportunity to participate in this type of culture as labor.

Socio-economic status of the people

The impact of floodplain aquaculture in Sonali Community based fish culture project and its social and economic profitability on local people were described by giving emphases on age structure, religion, educational status, family size, household status, health facilities, sanitary facilities, sources of drinking water, income level. For this study, a total of 50 peoples were selected for interviewing.

Occupational status

It was found that the main occupation of most of the people (40%) was agriculture and others occupation were fishing (24%), small trading (16%), services (6%), Daily labor (8%) and others (6%). In Tangail district area full time fishermen were 84% of which 24% had subsidiary occupation and 81% were found fishing throughout the year (Ahmed, 1994).

Age structure

From the present study, it was found that age group of fishermen varied from 15 to 65 years where the highest (50%) was 15-30 years, lowest (20%) was 31-50 years and the remaining 30% was 51-65 years of age. Similar results were found in the Tangail district (Islam *et al.*, 2012). In Mymensingh district, most of the fish farmers (50%) belonged to age group of 31-40 years (Ali *et al.*, 2009).

Family type

From the present study, it was observed that most of the fishermen (60%) lived in nuclear families and rest (40%) in joint family. In the Tangail district, 60% fishermen families were jointed and rest were nuclear (Islam *et al.*, 2012).

Religion status

Out of 50 fishermen, Muslim (70%) was the most dominant group and Hindus represent 30%. Ali et al. found that 77.78% fishermen were Muslim and 22.22% fishermen were Hindus in the Mymensingh region. In Gazipur district 68% Muslims and 32% Hindus (Karim, 2004). In coastal area of Bangladesh, 66.7% and 43.3% Muslims and Hindus were found respectively (Haque, 1993).

Educational status

Most of the fishermen were illiterate (52%). About 25% and 15% fishermen completed primary and secondary level of education. Only 8% fishermen could sign only. In Bangladesh, most of the fishermen are illiterate and few have primary level of education and literacy rate among fishing communities always far less than that of other areas (Rahman, 1994).

Annual Income

Annual incomes of fishermen varied from BDT 16000 to 50000. The selected fishermen were categorized into three groups based on the level of annual income. It was observed that about 60%, 30% and 10% of fishermen had annual income in the range of BDT 16000 to 30000, BDT 30000-40000 and BDT 40000-50000 respectively.

Housing condition

Generally the housing condition of people indicates the social condition of people. From the present study, it was found that

45% fishermen had tinshed house, 25% households were half building, 20% households were earthen or made of straw components and 10% were building.

Sanitation and drinking water facilities

Generally awareness of health is increased with the improvement of social and economic condition. The sanitary condition of the study area was good. It was found that 50% toilets were semi-concrete, 28% were concrete, 17% were earthen and 6% had no sanitary facilities. Most of the fishermen (75%) used tube well, 15% used pond and 10% used beel for drinking purposes.

Livelihood outcomes

From the present study, it was found that 80% of the interviewed people improved their socio-economic condition through floodplain aquaculture project and 20% of the people could not improve their condition.

Table 2. Problems faced by the fish farmers in the study areas

Problems	Sonali CBFM Project
Non availability of fish fry	30%
Fish disease	16%
late coming of rainy season	7%
social dissimilarity	24%
Lack of credit source	7%
Low product cost	6%
Poor technical knowledge	5%
Lack of money	8%

Problems faced by the fish farmers

In the present study, it was found that a number of problems were reported by farmers including poor technical knowledge, fish disease etc. (Table 2).

Conclusion

The sustainability of waterlogged areas especially the rice-based farming systems-is important both from ecological and economic point of view. The maximum waterlogged area lies in Begumganj thana as compared to other parts of the greater Noakhali. Floodplain prawn/fish culture may be undertaken for overall economic upliftment of the local community by properly utilizing the vast untapped waterlogged areas in this region.

Government organizations, other NGOs, donors, voluntary organizations and community-based organizations should come forward to gear up their efforts for the promotion of aquaculture activities in the waterlogged area in order to improve the socio-economic status of people.

Acknowledgement

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