SOCIOECONOMIC AND CULTURAL PROFILE OF FISH FARMERS: A STUDY IN AND AROUND THE LUMDING TOWN, NAGAON DISTRICT OF ASSAM

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ABSTRACT

Livelihood generation through fish culture is an age old practice and especially so in places where fish forms an integral part of both social and cultural life. Fish and rice is staple food for the people of Assam. Assam is gifted with abundant freshwater resources which can generate food and income if utilize to full potential. The study was conducted in Lumding town to identify factors that influence the socio-economic condition of fish farmers, who were involved in culturing various fish species in ponds and how the adoption of modern fish farming technology would help in improving their status. Data were collected from 110 respondents randomly sampled, through questionnaire survey and a structured interview schedule. There are 171 fish ponds in and around Lumding and among fish farmers men outnumbered women. Most of the farmers belonged to scheduled caste (54.5%) and 51% elders were engaged in fish farming. Majority of the fish farmers had their own land and practiced fish farming as primary occupation from many decades. Majority of their family size was large. The study reveals that their income from fish farming was too low (60% earned Rs. 20,000-30,000/year). Most of them were borrowers and took financial help from their friends and relatives. They spent their earnings for basic needs like food and children's education. They had low institutional participation and lack of technical training. Poverty, lack of marketing facilities and lack of technical training are the major hurdles in the path of good income generation for fish farmers. Initiative from Government fisheries department, NGOs and awareness generation are necessary.
Key words: Socio-economic profile, adoption of new farming technology, ponds, technical knowledge

INTRODUCTION

The socio-economic characteristics pertaining to demography means of production and investment, income and expenditure of people living in a particular location strongly influence their response to technological changes and participation in the development schemes. Lack of authentic information on socio-economic condition of the target group is one of the serious impediments in the successful implementation of developmental programmes. In fisheries sector, several micro and macro level socio-economic surveys had been conducted by various agencies and research workers in different regions of our country to study one or the other problem of fish farmer community. However, attempts have not been made to carry out similar studies among inland fish culturists, particularly of Lumding of Assam.

Lumding town is the second biggest town of Nagaon district, Assam. Nagaon district is situated in central part of Assam. It lies between $25°45'$ and $26°45'$ North latitudes & $91°50'$ and $93°20'$ East Latitudes. A large section of the people of Lumding depends on Agriculture, Poultry, and Fishery etc. as their livelihood. There are 171 fish ponds have been constructed and stocked with fish in Lumding and its adjacent area and few of them have not utilized to its full potential.

METHODOLOGY

Sources of data: During collection of data, both primary and secondary sources are considered. Primary data were collected from fish farmers whereas secondary information was procured from fishery offices.

Statistical tools used: For calculation of percentage, mean statistical tool like MS-Excel was used

Socio-economic research variables

Ten variables were identified in socio-domain viz., gender of fish farmer, age, education, landholding, family size, institutional participation and in economic domain, sources of income, income-expenditure pattern etc. were included. A structured interview scheduled was developed incorporating all the queries to accomplish the objectives set

for the study. The collected data were tabulated for statistical analysis.

RESULTS

In the fisheries, socio-economic status of fishermen plays a key role in productive activities. Socio-economic parameters such as gender of fish farmer, age, education, land holding, family size, institutional participation, sources of income, income-expenditure pattern etc. were included. Studies on these variables attempt not only to explain the overall socio-economic conditions of fish farmers, but also to identify the factors constraining the realization of the full potential of the traditional fishery and the appropriate area for Government intervention (Sarma and Irshad Ali 2005).

The study revealed that the farmers in the district operate aquaculture in an easy going manner and they lack the entrepreneurship spirit. Extent of adoption of the recommended practices is summarized below. The farmers of the study area operate aquaculture in old ponds, where production is limited by anaerobic conditions. It is concluded from the study that 88% farmers do not remove silts from the pond bottom, which attribute to poor productivity. Ponds (80%) are generally well impounded and do not allow entry of catchment water in the rainy season.

Fishes reared under composite culture of carps in Assam are *Catla catla* (Catla), *Cirrhinus mrigala* (Mrigal), *Labeo rohita* (Rohu), *Hypothalmichthys molitrix* (Silver carp), *Ctenopharyngodon idella* (Grass carp) and *Cyprinus carpio* (Common carp). All these species need slightly alkaline water and pH ranging between 6.5-8.0. The soil and water of the study area are acidic in reaction, which is major a limiting factor. The package of practices recommends application of agricultural lime @ 2,100 kg/ha/yr in split doses, but the farmers have not adopted this practice. Majority of the fish farmers (74%) do not apply regularly. Only 2% regularly apply lime following a standard method of recommended dose.

Growth of phytoplankton is essential for sustaining the primary productivity of the pond as the fish yield is the function of primary productivity (Sathiadhas and Pankkar 1988).

Demographic profile of fish farmer

Age: Age is an issue, which can not be approached with cultural preconceptions about what the roles and need of specific age groups might be. Young and middle-aged farmers were aggressive and energetic people who were more willing to adopt new technology than older farmers. Older farmers

were conservative, risk averse and unlikely to try new ideas. Table 1 reveals that in Lumding 44% of the total fish farmers belonged to the middle age group followed by 50% older age groups and 9.1% young age groups.

Table 1. Age distribution of the fish farmers

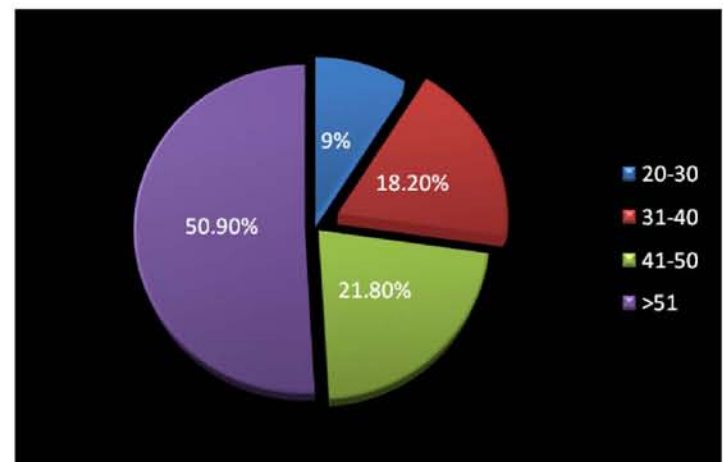| Age groups	Percentage total (N=110)
20-30	10(9%)
31-40	20(18.2%)
41-50	24(21.8%)
51 and above	56 (50.9%)

Fig.1 Age distribution of the fish farmers

Gender : Females are less likely to adopt fish farming than males due to their high workload. They do not have their own land and are not decision makers, as a lot of physical labor is required in pond management (Department of Fisheries, Assam. 2010), it involves major repairs also. Table 2 reveals that women participation in the fish culture practices in Lumding was only 5.4% and of male was 94.6 %.

Table 2. Gender of fish farmer

Gender	Percentage of total (N-110)
Male	104 (94.6 %)
Female	6 (5.4 %)

Education: The pond fish culture system is scientific one and therefore, fish culturists need to gather knowledge on improved fish culture technique. If the farmers have some institutional educational background they can easily understand the system. Literacy rate of pond fish farmers can play a vital role in efficient management and operation as well as in successful production of fish. Education and

farming efficiency are closely related and education generally has a positive effect on farm productivity. An educated farmer is more likely to adopt new technology than an uneducated one (Meena et al. 2002). With regard to the educational level of respondents, it could be observed that 11.8% of the total respondents had attained primary education, 33.6% were below the high school level of education, 21.8 were HSLC passed, 14.5 % were under graduate while 9% were graduates in the study area (Table 3). Since majority of fish farmers were educated up to middle school level and thereby indicating a minimum level of education. However, a small percentage has high level of education suggesting that even literate farmers were attracted to fish farming.

Table 3. Educational status of fish farmers

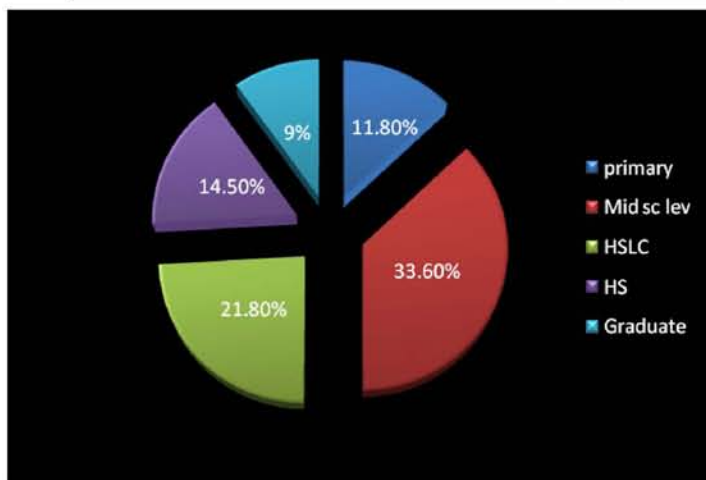| Educational level	Percentage of total (N-110)
No education (Illiterate)	-
Up to primary	13 (11.8 %)
Up to middle school level	37 (33.6 %)
H.S L.C.	24(21.8 %)
H. S.	16(14.5 %)
Graduate	10(9 %)

Fig. 2 Educational status of fish farmers

Family status: In the present study, families were classified into two types as nuclear family and joint family. About 75.5% farmers lived in joint families and the remaining 24.5% in nuclear families (Table 4). Joint family was predominant in the study area which also correspondents well with the findings of Ali et al. (2009) in Mymensingh district. The family size has considerable influence on the income and expenditure of the family.

Table 4. Family status of the fish farmer in the study area

Family Type	Percentage of total (N-110)
Joint Family	82 (74.5%)
Nuclear Family	28 (25.5%)

Family size: The family size of the fish farmers were divided into three categories according to the number of the family members. A critical analysis of the data revealed that 24.5% of the respondents of Lumding had small size of family consisting of four members (Table 5). The majority of respondents (75.5%) had large family size consisting of more than six members. The size of the family has a direct influence on the expenditure and income patterns of the family. As the fish production is a labour intensive activity hence family size influences the fish production. The fishing community of Assam, their society and economy has been extensively studied by Sarma and Ali (2005). They found that the size of the family has direct influences on the expenditure and income patterns of the family and thereby influences on fish production. Pandey and Upadhayay (2012) made similar findings.

Table 5. Family size of the fish farmers

Family size	Percentage of total (N-110)
2-3	11 (10%)
4-5	16 (14.5%)
> 6	83 (75.5%)

Caste status: The caste pattern of the respondents showed that majority (54.5%) of them was from Scheduled castes followed by other backward classes (7.2%) and 32.9% were from general castes (Table 6).

Table 6. Caste status of fish farmer

Castes	Percentage of total (N-110)
Scheduled caste	60 (54.5 %)
Scheduled tribe	--
O.B.C.	8 (7.2 %)
General	42 (38.1%)

Religion: Religion plays a vital role in the social and cultural environment of people in a given area. It acts as a notable constraint and modifies social pattern of people. Hindus were featuring as the absolute majority of the fish farmer in the study area (Table 7). About 96.4% were Hindus while small portions i.e. 5.4 % were Muslims.

Table 7. Religious status of the fish farmers

Religion	Percentage of total (N-110)
Hindus	106 (96.3) %
Muslims	4 (3.6%)

Experience level: Farmers who have acquired knowledge on fish farming were more likely to adopt it than those who had not acquired knowledge. The study revealed that in rural area of Lumding town , 73% of the respondents have medium level of experience followed by 17% of respondents having high level of experience of more than 15 years and 10% had lower level of experience, less than 8 years (Table 8). Our finding agrees with that of of Pandey and Upadhayay (2012).

Table 8. Experience level in fish farming of fish farmers

Level of Experience	Percentage of total (N-110)
High	19 (17 %)
Medium	80(73 %)
Low	11 (10 %)

Source of fish farming experience: Experience in fish farming have positive influence on fish production. In the study area, majority (80%) of the farmers have fish farming experience from their fore fathers, 10% from their friends and the rest (10%) from their relatives (Table 9)..

Table 9. Source of fish farming experience (n=110)

Experience	
Forefather	80%
DoF	------
Neighbours /friend	10%
Relatives	10%
NGOs	------

Training: Training is an effective tool of transfer of fish farming technology scientifically (Wetengere 2008). Training is a planned process to modify attitude, knowledge or skill behavior through a learning experience to achieve effective performance in an activity or range of activities and education is an activities which aim at developing the knowledge, skills and moral values (Smith 1992). Even though training programmes are being organized in Nagaon district by Fish Farmers Development Agencies and other organizations, the

fish farmers were not willing to participate for fear of wage loss, waste of time and lack of incentives (Mahendra Kumar 1996). Majority of farmers did not receive any training for fish culture practices. The percentage of trained farmers was very less (only 1.8%, Table 10) which was more or less similar to the findings of Goswami et al. (2002).

Table 10. Fish culture training details of fish farmers

Training	Percentage of total (N-110)
Trained	2 (1.8%)
Non-trained	108(98.1 %)

Area and depth of ponds (ha)
The pond area and water depth are the important determinant of fish productivity as it provides living space for fishes. In the present study, average pond size in the study area was found to be 0.15 ha but a few were larger in size ranging from 1-5 ha in the study area. This is clear indicative of smaller size of pond available with the farmers of Lumding. Khan (1986) stated that fish culture efficiency varied with the size of ponds. The average depth of pond in the study area was found 3.2 meter (Table 11) which was higher than the recommended depth of 1.5m for ponds Assam (Department of Fisheries 2010). The average depth of ponds in Bangladesh (Pravakar et al. 2013) is between 2 and 5 meter, which correspond well with the present study.

Table 11. Area of ponds (ha) in the surveyed area

Range (ha)	Percentage of total (N-110)
0.001-0.009	11 (10%)
0.01-0.09	19 (17%)
0.1-1.0	66 (60%)
1-5	10 (9%)
Small varying size	2 (1.8%)

Type of pond: In the study area, majorities (90%) of the ponds were perennial and only 10% were seasonal (Table 12). The water level in the perennial ponds declined significantly during dry season and became unsuitable for fish culture. Some of the farmers filled their ponds up to 2-3ft level by pumping water from the nearly dug well/ river. Seasonal ponds became totally unsuitable for fish culture. Ali et al. (2008) found 46% of the ponds were seasonal and 54% ponds were perennial in Rajshahi district.

Table 12. Type of pond owned by the participating farmers:

Type of pond	Percentage of total (N-110)
Seasonal	20
Perennial	80

Pond ownership: Many management decisions related to fish farming are influenced by the type of ownership involved. In the study area, it was found that majority (96.3%) of the ponds were under single ownership whereas only 3.6% under multiple ownership(Table 13). Pandey and Upadhayay (2012) found higher percentage of multiple ownership of pond in Tripura in comparison to the present study. Hossain et al. (2002) reported that multiple pond ownership was a major constrains for pond aquaculture.

Table 13. Ownership of the ponds in the study area

Ownership	Percentage of total (N-110)
Single	106 (96.3%)
Multiple	4 (3.6%)

Housing pattern: Housing pattern is one of the most important indicators used to assess the economic well- being of any community. During the survey, attempts were made to find out the condition of living house of the farmer. On an average 25.5% of the respondents of Lumding were living in earthen house (Kacha), 40% under tin shed, 24.5% in Assam pattern houses and 10% in RCC building houses (Table 14). This reflects the poor living condition of the people in the study area.

Table 14. Housing pattern of fish farmers

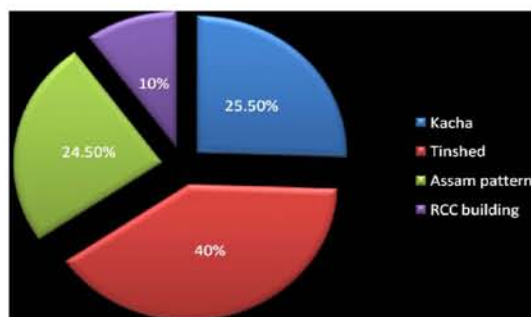| Housing Condition	Percentage of total (N-110)
Kacha	28 (25.5%)
Tinshed	44 (40%)
Assam pattern houses	27 (24.5%)
RCC building houses	11(10%)

Fig.3 Housing pattern of fish farmers

Drinking water facilities: The provision of clean and safe drinking water is considered to be the most valued element in the society. The study showed that100% of the fish farmers used well water for drinking purposes (Table 15). In the study area 90% of the fish farmers own dug wells and only 10% used neighbor's well for drinking water. It indicates a positive sign for health facilities in the study area.

Table 15. Drinking water facilities

Sources of drinking water	Percentage of total (N-110)
Own dig well	83(75.5%)
Supply water	---
Neighbour's well	27 (24.5%)

Health service: When health problem occurs, initially the farmers (10%) take village doctor advice and 40% took medicines from Homeopathic Doctor of the area. When problem become severe, most of them (40%) move to District hospital, 5.4% move to Railway Hospital and rest 4.5% to private MBBS doctor (Table 16). It is evident that access to health facilities of the fish farmer was poor. Ali et al. (2008) found that 46% of the farmers received health service from village doctors, 18% from upazila health complex, 14% from district hospital and 20% from MBBS doctors in Bangladesh which was almost similar with the present study.

Table 16. Health service received by the fish farmers in the surveyed are

Health services	Percentage of total (N-110)
Village doctor (Kobiraj)	11(10%)
Homeopathic Doctor	44(40%)
Railway Hospital	6 (5.4%)
District Hospital	44(40%)
MBBS Doctors (Private)	5 (4.5%)

Electricity facilities: It was found that 100% of the surveyed farmers have electricity facilities. Since Assam State Electricity Board services were very poor, and so, during load shedding they used Kerosene lamps, candle and occasionally they hired generators.

Sanitary facilities: Due to the initiative taken by the Lumding Municipal Board and DRM, Lumding, most of the farmers of the study area had higher access to good

sanitation. The present study revealed that the sanitary conditions of the fish farmers were relatively satisfactory only in the pucca houses (Table 17).

Table 17. Use of sanitary facilities by the fish farmers in the study area

Sanitary facilities	Percentage of total (N-110)
Katcha	Nil
Semi-pucca	Nil
Pucca	100

Cooking fuels: About 50% of the respondents stated that they mainly used LPG cylinder as fuel and rest 50% used wood as fuel (Table 18).

Table 18. Cooking fuels

Cooking Fuel	Percentage of total (N-110)
LPG cylinder	50
Wood	50
Cow dung	--

Annual income: In general, employment and income are the twin decisive factors mostly used for determining the living standard of any community or region. Equitable distribution of income further enhances the social harmony among different sections of population. Analysis of income levels of the fish farmer families revealed that annual income of fish farmer were varied from Rs. 15,000/- to Rs.100,000/. The selected fish farmers were grouped into five categories based on the level of their income (Table 19). The highest percentage (70%) of fish farmers earned Rs. 15,000/- Rs. 30,000/-. This low level of income reflects their poor economic condition, which was not sufficient to maintain their normal livelihood. They cannot afford much for fish culture activities. The present findings of annual income of fish farmers correspond well with the findings of Goswami et al. (2002) and Rahman et al. (2012).

Table 19. Annual Income level of the fish farmers

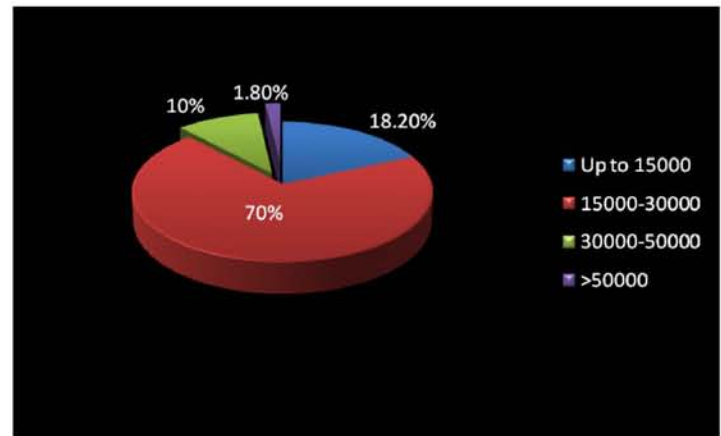| Income level (Rs)/yr	n=110
up to 15,000	20 (18.2%)
15,000 to 30,000	77 (70%)
30,000 to 50,000	11 (10%)
Above 50,000	2 (1.8%)

Fig. 4 Annual Income level of the fish farmers

Expenditure Pattern: Most of the fish farmer belongs to the low incoming group and found difficult to maintain their requirements from their earnings. A perusal of expenditure pattern shows that about 70% of the income of the farmers was spent on their food alone. The clothing was found to be the next major item for expenditure point of view among the farmers (Table 20).

Table 20. Expenditure Pattern (% of earnings) of fish farmer households

Item	% of Expenditure
Food	70
Clothing	15
Education	5
Medical	7
Entertainment	2
Others	1

Savings: It was found form the survey that 70% of the respondent had savings. The farmers could save some money from agriculture, fish culture, business, services and from other activities (Table 21). Savings were used for many purposes such as children's education, healthcare, loan payment, agriculture inputs, housing, clothes, livestock and poultry rearing, lease out of lands, food purchase for own consumption etc. However the rest 30% could not save due to poor resources and household expenses.

Table 21. Savings by farmers in the study area

Savings	Percentage of total (N-110)
Yes	77 (70%)
No	33 (30%)

Bank Loan or finance: From the study area it was found that no any farmers have received bank loan for farming (Table 22).

Table 22. Bank Loan received by farmers for farming

Loan received	Percentage of total (N-110)
yes	Nil
No	100%

Social participation: The social participation is essentially important for socio-cultural development and discussion on many issues including fish production and marketing. The majority of fish farmer (78%) selected for the study had medium level of social participation (Table 24). However, only small segment (12%) of fish farming community had higher level of social participation and this was followed by lower (10%) (Table 23). Farmers participated in social institutions like club, school, co-operatives and village welfare organizations.

Table 23. Social participation level of fish farmer

Level of Social participation	Percentage of total (N-110)
High	12%
Medium	78%
Low	10%

DISCUSSION

This study was undertaken with a view to know the socio-economic characteristics of the pond fish culturists and their significance in pond fish production and their cultural profile of life.

The result of the study indicate that level of education, size of land holding, annual family income from fish culture etc. were important factors affecting the utilization of pond fish farming. In fisheries sector, socio-economic status of fisher folk/Fish farmers plays a key role in productive activities. Socio-economic parameters such as family size, age structure, education, social participation, income, and experience in aquaculture, size and nature of ownership of pond influence fish production. The pond area is an important factor because all management measures are planned considering the size of ponds in schemes sponsored by various agencies. Studies on these variables were attempted not only to explain the overall socio-economic conditions of the fish farmers, but also identified the factors inhibiting the realisation of the full

potential of traditional fishery and the appropriate area for government intervention (Sathiadhas and Panikkar 1988). The interactions of personnel, psychological and situational factors always influence strategies and adoption of the scientific fish farming by fish farmers. Hence, preparing socioeconomic profile of the respondents is important to establish and explain the possible relationships among different socio-economic variables. Characteristics representing the personal and socio-economic attributes like family size and age, caste, social participation, educational status, experience in fish farming, income-expenditure pattern etc. are represented in Table 1-23.

Fish pond requires a considerable amount of investment for modern fish culture practices. The investment is necessary for the preparation of pond annually before stocking of fingerlings and also for purchase of inputs. From the Table 19 it was clearly indicated that most of the pond owner earn very little so it is difficult to save a certain portion of their income for investment in the pond after meeting necessary family expenses. According to the supplied data it was found the per acre production, gross return and net return follow a definite trends. Higher income group produced higher production as they had their savings to invest for pond fish production. Mahabubullah (1983) showed that family income has significant positive relationship with investment in ponds.

Considering the different observations during the present study, Lumding was found to be potential area for fish culture. In conclusion it can be said that, farmers should be given facilities on training program and input availabilities. They should also be provided with credit facilities, motivated to utilize all types of water bodies for fish culture as well as integrated culture should be adopted. The fish farmers should be given amenities for education so that they can be well aware of their problems and prime rights. All the water resources should be utilized for fish culture to get maximum production by using suitable technology. More hatcheries should be established, so that farmers can get quality seeds easily.

The economic profitability of fish farming is more in comparison to cultivating rice or any other crops, thus farmers considered on converting their rice fields into pond. The study reported that though fish farming is a raising sector in Assam but it has some strong barriers which are hindering its growth. The income from fish farming is very important. The present study explored the factors that can influence income from

fish farming. These factors need to be addressed properly to make fish farming more profitable.

References

Ali, M.H., M.D. Hossain, A.N.G.M. Hasan and M.A. Bashar. 2008. Assessment of livelihood status of the fish farmers in some selected areas of Baghmara Upazilla under Rajshahi district. J. Bangladesh Agil. Univ. 6 (2): 367-374.

Ali, H., M.A.K. Azad, M. Anisuzzaman, M.M.R. Chowdhury, M.Hoque and M.I. Sharful. 2009. Livelihood status of the fish farmers in some selected areas of TarakandaUpazila of Mymensingh district. J. Agrofor. Environ. 3(2): 85-89.

Department of Fisheries, Assam. 2010. Fish seed production of Assam.

Edwards, P and H. Demaine. 1997. Rural Aquaculture: Overview and Framework for Country Reviews. RAP Publication 1997/36, RAP/FAO, Bangkok.

Goswami, M., R. Sathiadhas, U.C. Goswami and S.N. Ojha. 2002. Socio-economic dimensions of fish farming in Assam. Journal of the Indian Fisheries Association 29: 103-110.

Hossain, M.A., M.A.R. Khan and M.A. Mannan. 2002. Present status of pond fishery in Dhamaihat Upazila, Naogoan. Univ. J. Zool. Rajshahi. Univ. 21: 79-80.

K. Mahendra Kumar. 1996. Communication Behavior of Fish Farmers in Tamil Nadu. Ph.D Thesis, CIFE, Mumbai

Khan, M.S. 1986. Socio-economic factors in the development of fisheries. Bangladesh J. Agril. Econ. 10(2): 43-47.

Meena, S.B., T.N.Kirway, N.M. Lema and A.J.Nalitolela. 2002. Farming System Approach to Technology Development and Dissemination. A Teaching Manual and Tutors' Guide for Training at Certificate and Diploma Levels. Color Print Ltd. Ministry of Agriculture and Food Security, Dares Salaam, pp. 228.

Pandey, D.K. and Upadhayay 2012. Socio-economic profile of fish farmers of an adopted model aquaculture village: Kulubari, West Tripura. Indian Research Journal of Extension Education, Special Issue, 2: 55-58.

Pravakar, P., B. P.Sarkar, M. Rahman and M.B. Hossain. 2013. Present Status of Fish Farming and Livelihood of fish farmers in Shahrasti Upazila of Chandpur district, Bangladdesh. American-Eurasian Journal Agric. and Environ. Sci. 13(3): 391-397.

Rahman, M., M.F. Tazim, S.C. Dey, A.K.M.S. Azamand and M.R. Islam. 2012. Alternative livelihood options of fishermen of NijhumDwip under HatiyaUpazila of Noakhali district, Bangladesh. Asian J. Rural Dev. 2(2): 24-31.

Sarma, C. and N.M. Irshad Ali. 2005. A Fishing Community of Assam. Their Society and Economy. J. Hum. Ecol. 17(3): 205-209.

Smith, A. 1992. Training and Development in Australia. Sydney, Butterworth, pp. 279.

Sathiadhas, R. and K.K. P. Pankkar. 1988. Socioeconomics of small scale fishermen with emphasis on costs and earnings of traditional fishing units along Trivandrum coasts, Kerala-A case study. Seafood Export J. 20(2): 21-36.

Sugunan V.V. and M. Sinha. 2001. Sustainable capture and culture based fisheries in freshwaters of India. In: Sustainable Indian fisheries, T. J. Pandian (Ed.). National Academy of Agricultural Sciencs, New Delhi, 43-70.

Wetengere, K. 2009. Socio-economic factors critical for adoption of fish farming technology: The case of selected villages in Eastern Tanzania. International Journal of Fisheries and Aquaculture 1 (3) : 28-37.