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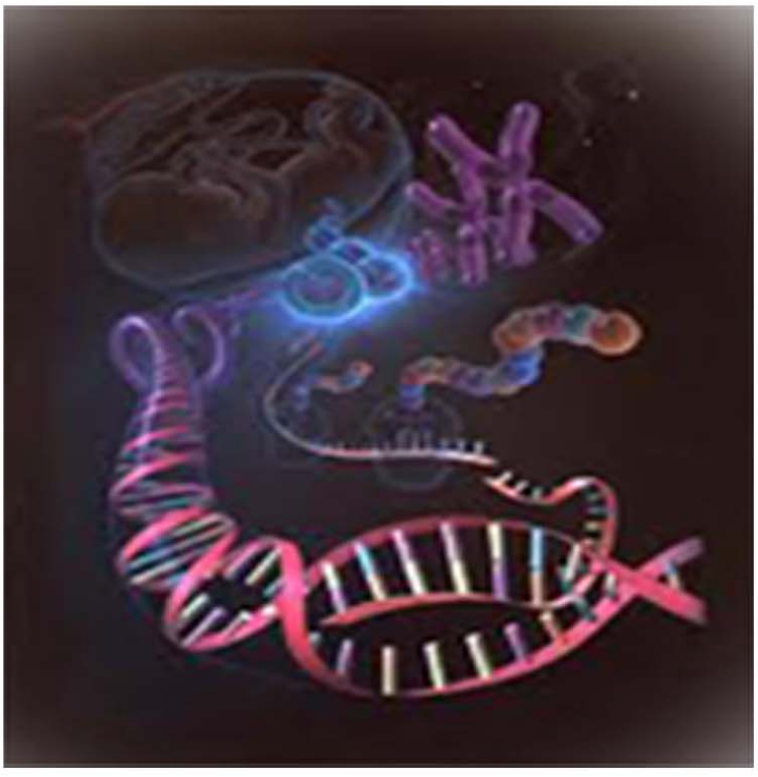

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Research Paper

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

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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/-pa). 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.

Keywords: 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 development schemes. Lack of authentic information on socio-economic condition of the target group is one of the serious impediments in the successful implementation

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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 town 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 ^{0}45' and 26^{0}45' North latitudes and 91^{0}50' and 93^{0}20' East Latitudes. A large section of the people of Lumding depend 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. Some of this is not utilized to its full potential.

METHODOLOGY

Sources of data collection: During collection of data, both primary and secondary sources are considered. Primary data were collected from fish farmers by the researcher. The secondary information was collected 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 *et al.,* 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 wild water.

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 is acidic in reaction, which is major limiting factor. The package of practices recommends application of agricultural lime at 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 (Wetengere, 2009).

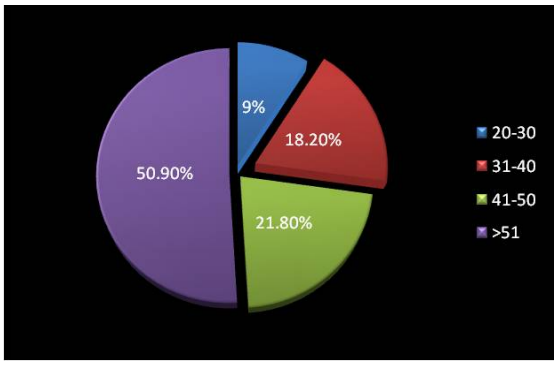
Demographic Profile of Fish Farmer

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 were belong 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 in the Study Area

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%)

Figure 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, 2010), it involves major repairs also. Table 2 reveals that women participation in fish culture practices in Lumding was only 5.4% and male participation is 94.6 %.

Table 2: Gender of the Fish Farmers in the Study Area

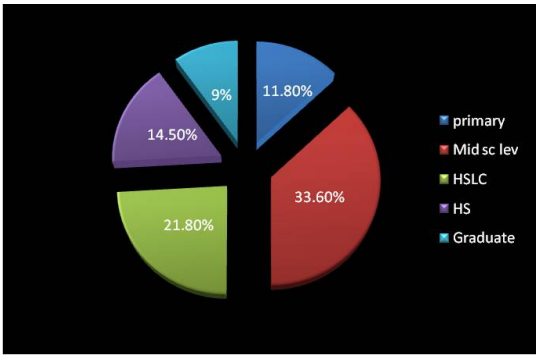
Gender	Percentage of total (N-110)
Male	104 (94.6 %)
Female	6 (5.4 %)

Education: The pond fish culture system is scientific one. Therefore the 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

Table 3: Educational Status of Fish Farmers in the Study Area

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 %)

Figure 2: Educational Status of Fish Farmers



(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 study area, 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. It implies that more number of literate farmers was involved in fish farming practices. It was quite interesting that graduates were also taking interest in fish culture practices.

Family status: In the present study, families were classified into two types as nuclear family and joint family. About 75.5% farmers were lived in joint families and 24.5% in nuclear families. 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 reveals that 24.5% of the respondents of Lumding had small size of family consisting of four members. A majority of respondents, i.e., 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 labor intensive activity hence family size influences the fish production. Present findings is well correspond with Pandey and Upadhayay (2012).

Table 5: Family Size of the Fish Farmers in the Study Area

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 the respondents of Lumding were from Scheduled castes followed by 7.2% of other backward classes and 32.9% were from general castes. The fishing community of Assam, their society and economy has been extensively studied by

Table 6: Caste Status of Fish Farmer in the Study Area

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

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.

Table 7: Religious Status of the Fish Farmers in the Study Area

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

Religious status: 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. About 96.4% were Hindus while small portions, i.e., 5.4 % were Muslims.

Table 8: Experience Level in Fish Farming of the Fish Farmers in the Study Area

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

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. The present findings well correspond with the study of Pandey and Upadhayay (2012).

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

Table 9: Source of Fish Farming Experience in the Study Areas (n=110)

Experience	
Fore father	80%
DoF	–
Neighbours/friend	10%
Relatives	10%
NGOs	–

Training: Training is an effective tool of transfer of technology. It is essential for adoption 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% which was more or less similar to the findings of Goswami *et al*. (2002).

Table 10: Fish Culture Training Details of Fish Farmers in the Study Area

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

Area and depth of ponds (ha) in the surveyed area: The pond area and water depth are the important determinant of fish productivity as it provides living space for fishes. In the present study, it was found that the average pond size in the study area was found to be 0.15 ha but a few were larger in size ranging 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 m. According to DoF (2010) the average depth of ponds Assam should be 1.5 m and the average depth in Bangladesh (Pravakar *et al.,* 2013) is between 2 and 5 m, which well correspond 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 owned by the participating farmers: In the study area, majorities (90%) of the pond were perennial and only 10% were seasonal. The water level in the perennial ponds declined significantly during dry season and became unsuitable for fish culture. Some of the farmer filled their ponds up to 2-3 ft level by pumping water from the nearly dig 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
Perrenial	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. Pandey and Upadhayay (2012) found the multiple ownership of pond in Tripura which was higher than 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

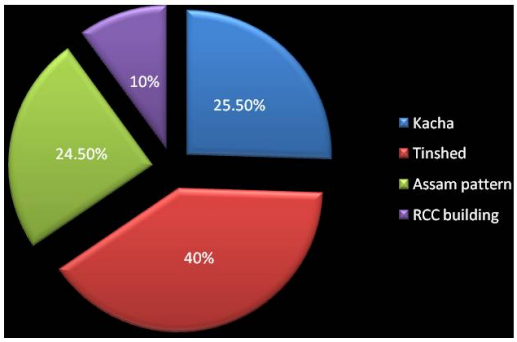
Ownership	Percentage of total (N-110)
Single	106 (96.3%)
Multiple	4 (3.6%)

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 Kacha, whereas 40% were living in tinshed, 24.5% in Assam pattern houses and 10%

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%)

Figure 3: Housing Pattern of Fish Farmers



were living in RCC building houses. This reflects the poor living condition of the people in the study area.

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. In the study area 90% of the fish farmers were used own dig well and only 10% of the farmers used neighbor's well for collecting 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: Health facilities of the fish farmer were poor and it was found that when health problem occurs initially the farmers (10%) takes the advice from village doctor and 40% farmers takes medicine from Homeopathic Doctor of the area. If the problem become severe than most of them (40%) move to District hospital, 5.4% move to Railway Hospital and rest 4.5% to private MBBS doctor. Ali *et al.* (2008) found that 46% of the farmers received health service from village doctors, 18% from upazila healthcomplex, 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 Area

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 Doctor(Private)	5 (4.5%)

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

Table 17: Status of Electricity Facilities of the Fish Farmers in the Study Area

Electric Facilities	Percentage of total (N-110)
Yes	100
No	–

Sanitary facilities: Due to the initiative taken by the Lumding Municipal Board and DRM, Lumding, all 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.

Table 18: 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: At about 50% of the respondents stated that they mainly used LPG cylinder as fuel and rest 50% used wood as fuel.

Table 19: Cooking Fuels

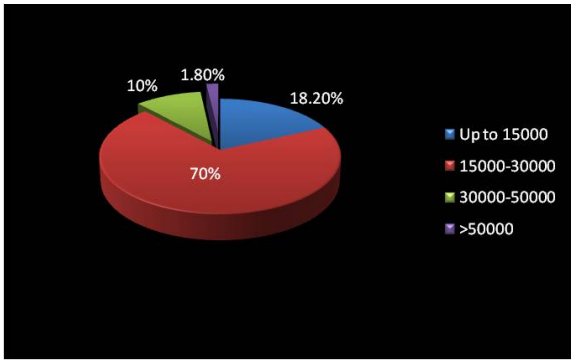
Cooking Fuel	Percentage of total (N-110)
LPG cylinder	50
Wood	50
Cow dung	–

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 20). The highest percentage (70%) fish farmers earned Rs. 15,000/- to Rs. 30,000/-. This low level of income reflects in 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 20: 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%)

Figure 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 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. Expenditure pattern shows that about 70% of the income of the respondents of Lumding was spent on their food alone. The clothing was found to be the next major item for expenditure point of view among the respondents.

Table 21: 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. 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 22: 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 23: Bank Loan Received by Farmers for Farming in the Study Area

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

Social participation: The social participation is essentially important for sociocultural 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%). Farmers participated in social institutions like club, school, co-operatives and village welfare organizations.

Table 24: 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 socioeconomic 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. Schemes sponsored by various agencies. Studies on these variables 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 a

family size and age, caste, social participation, educational status, experience in fish farming, income-expenditure pattern, etc., are represented in Tables 1 to 24.

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 20 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 rising sector in Assam but it has some strong barriers those 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 that may only encourage more farmers on fish farming.

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