

COMMUNITY DEPENDENCE ON FISH FARMING: STUDY ON ITS ROLE IN UPLIFTING THE SOCIO-ECONOMIC CONDITION OF FISH FARMERS IN SYLHET DISTRICT

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Abstract

An exploratory survey was conducted to investigate farmers dependency on fish farming for their livelihood in three upazilas of Sylhet district namely Kanighat, Gowainghat and Golabgonj from July to December 2013. Sixty fish farmers were interviewed using a semi-structured questionnaire. The study showed that in all farming systems middle aged farmers were found the highest percentage (58.3%). About 55% families of integrated farmers had 6-above members while lowest 35% in semi-intensive farmers. The highest illiterate (40%) was found in extensive farmers and the lowest 15% each in semi-intensive and integrated farmers. About 36.67% of the respondents had tin shed house, 18.33% had kacha, 31.67% had half-building and only 13.33% had building. On an average, 13.33% farmers were used pukka toilets while 20% semi-intensive farmers and 15% integrated farmers used pukka toilet. The lowest 65% extensive farmers used tubewell water while it was observed 90% for semi-intensive farmers. About 55% semi intensive farmers got treatment from upazila health complex while it was only 45% for extensive farmers but a considerable portion depended upon village doctors where highest (40%) extensive farmers. It was revealed that highest percentage 45% of semi-intensive farmers gained training from UFO while only 25% of extensive farmers got training from UFO. It was found that farmers had tremendous scope for harnessing natural resources. No impact of religion was found on farming but electricity played vital role. It was observed that 60% of extensive farmer's primary occupation was agriculture while 20% and 25% semi-intensive and integrated farmer's primary occupation was agriculture, respectively. Self-financed farmers occupied the highest position in all types of farming. Significant difference was found in annual income among the farming systems as highest income (2,65,250 BDT) in semi intensive farming and lowest (95,500 BDT) in extensive farming. Main constraints were inadequate supply of quality fingerlings (26.67%), high production cost (21.67%) and the low quality feed (18.33%). The livelihood outcomes found positive and 76.67% farmers viewed that they have improved their socio-economic conditions. Necessary training on scientific fish culture, establishment of hatchery by GOs and NGOs to ensure quality fingerlings and massive extension work can mitigate the problems of fish culture in the study area.

Keywords: Livelihood, fish farming, socio-economic condition, respondent farmers, Sylhet

Introduction

Aquaculture has become a promising, dynamic and gainful approach to attain self-sufficiency in food sector by promoting food security and also to alleviate poverty in Bangladesh (Ahmed, 2003). It plays a vital role in socio-economic development of rural areas, fulfilling the increasing animal protein demand, creating employment opportunity, alleviating poverty and earning foreign currency. In our country farmers are adopted with different types of farming viz. extensive, semi intensive and integrated and the farming system plays a vital role for uplifting the livelihood conditions of the farmer's community. FAO (2001) describes that a farming system as a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household's livelihoods and constraints and for which similar development strategies and intervention would be appropriate. Ker (1995) denotes

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that depending on the scale of the analysis, a farming system can encompass a few dozens or many millions of households.

"A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future (Carney, 1998). The rural livelihood especially the fish farmer's livelihood is greatly influenced by fish farming. Income-generating opportunities for rural households are most promising in the fisheries sector (DoF, 2006). The fisheries sector is the second largest part-time and full-time employer in rural areas, directly engaging over 60% of the rural population (BBS, 2010).

Sylhet, the north eastern district of Bangladesh is one of the most fascinating and archeologically rich regions in South East Asia. It also fascinates with vast fisheries resources such as *haors*, open water floodplains, rivers, canals etc. Fish farming is not popular in greater Sylhet region due to lack of proper technical knowledge, insufficient supply of fish broods, nonavailability of fish seeds, ignorance of fish farmers, proper marketing channel, reserve of foreign remittance, etc. Information on socio-economic frame work of the fish farmers forms a good base for planning and development of the economically backward sector (Ofuoku et al. 2008). FAO (2001) indicates that over the past 30 years, the FSA (Farming System Approach) has evolved markedly. Essentially the scope of the analysis has gradually expanded, placing increasing emphasis on horizontal and vertical integration, on multiple sources of household's livelihoods and on the role of the community the environment and support services.

Lack of adequate and authentic information on socio-economic conditions of the target populations is one of the serious impediments in the successful implementation of the development program (Ellis, 2000).

Therefore, this work was undertaken to explore the opportunities and constraints for fish farming and livelihood status of fish farmers, as well as the management systems practiced at local levels including the small-scale farmers in Sylhet region considering the following objectives.

- To know the socio-economic conditions and livelihood status of fish farmers in the study area, and
- To find out the influence of farming system on livelihood of fish farmers.

Materials and Methods

The present study was conducted based on community focused field survey where primary data were collected from fish farmers to obtain detailed information on their fish farming system and livelihood status. Three upazilas namely Kanighat, Golabgonj and Goainghat of Sylhet district were selected for the study. Data were collected from 20 extensive farmers, 20 semi-intensive farmers and 20 integrated fish farmers in the study areas. For collecting data both individual and group interviews were applied with different degrees of effectiveness of the farmer's information. The data were collected from July to December 2013. The draft questionnaire was tested by the opinion of 12 fish farmers and much attention was given to any new information which was not designed to be asked but was important and informative to fulfill the objectives. For this research one of the PRA (Participatory Rural Appraisal) tool and Focus Group Discussion (FGD) was conducted where each group size of FGD was 4 to 7 farmers. After collecting the data through questionnaire interviews and FGD, crosscheck interviews were conducted with Upazila Fisheries Officer, Assistant Fisheries Officer, relevant NGO workers, Chairman and Members of the Union councils. Before the tabulation the collected data were scrutinized and summarized carefully. The processed data were transferred to a master sheet from which classified tables were prepared revealing the findings of the study. After data entry, the data were analyzed with computer programs Microsoft Excel and SPSS (Statistical Package for Social Science) 11.5.

Results and Discussion

Livelihood status of fish farmers

DFID distinguishes five categories of assets or capital *viz.* natural, social, human, physical and financial (Carney, 2002). In aquaculture, natural assets include fish species raised, physical capital includes constructed ponds, human

capital includes knowledge of fish culture, financial capital includes income from selling fish and social capital includes the use of pond water for washing, bathing etc. by other community households (Little and Edwards, 2007).

Human capital

Skills, knowledge, ability to labor and good health are considered as human capital that together enables people to pursue their livelihood strategies.

Age structure

In the study area middle age group occupied the highest position (58.33%) followed by old (20%) and young (21.66%) in all farming system (Fig. 1). In case of semi-intensive and integrated farming young age group occupied 30% and 20%, respectively where in extensive farming it was 25%. Mondal *et al.* (2012) stated that most farmers were quite young with an average age estimated at 39 years ranging from 25 to 56. Ali *et al.* (2008) found that most of the fish farmers (50%) belong to age group of 31 to 40 years in Mymensingh district which is related to this present study. The young aged farmers were increasing as they acquainted with modern techniques of fish culture.

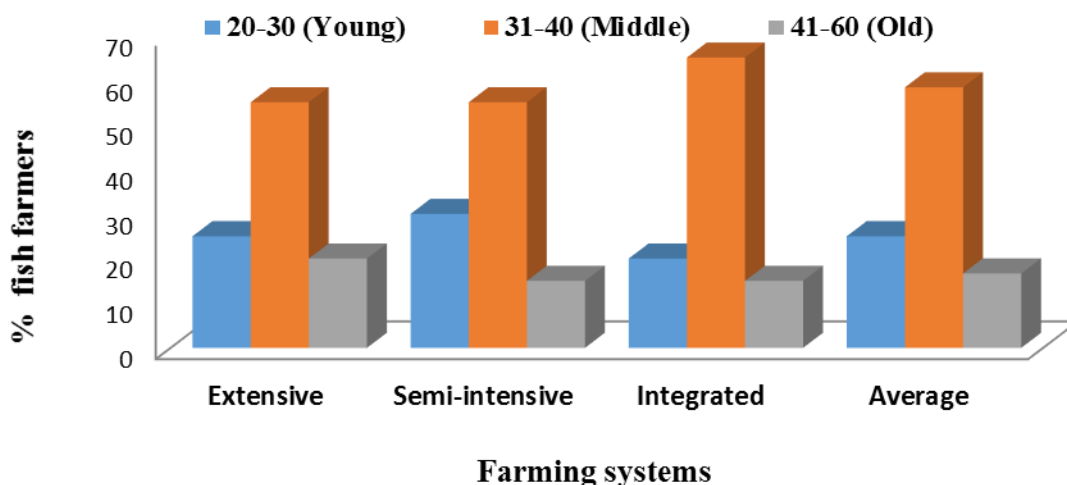


Fig. 1. Age structure of fish farmers

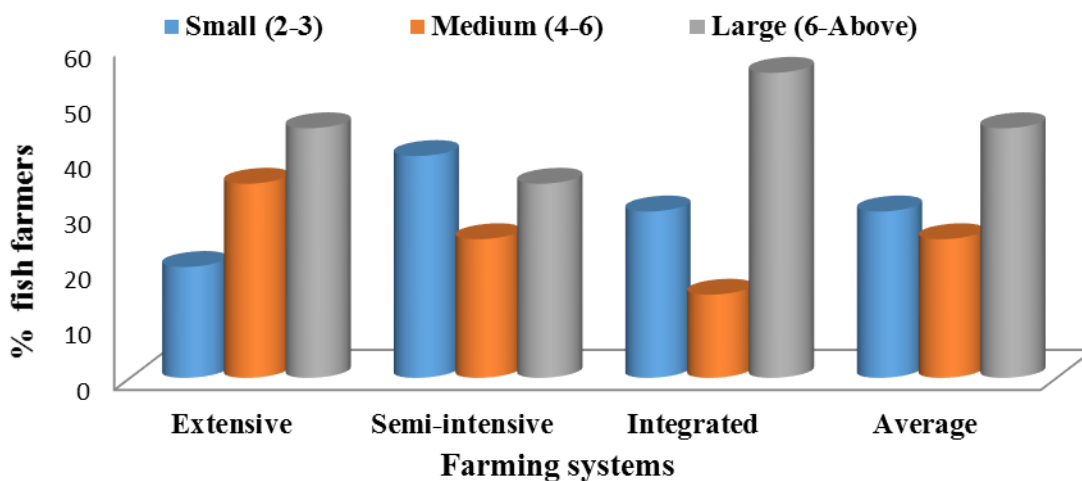


Fig. 2. Family size of fish farmers

Family size

It was revealed that the highest percentage (45%) of family consists of 6-above members and 30%, 25% family consists of 2-3, 4-5 members, respectively. In case of integrated farmers 55% family had 6-above members while lowest in semi-intensive farmers 35% (Fig. 2). Tanzeena *et al.* (2007), Ali *et al.* (2008) and Rejwan *et al.* (2012) found 4.56 of average family members, 52% family belonged 4-5 members and 45% family belonged 4-5 members, respectively which are similar to this study.

Level of education

About 45% of the interviewed extensive farmers were illiterate and lowest (15%) illiterate farmers were found in semi-intensive and integrated farmers. It's a matter of hope that graduate people were involved in fish farming where 10% and 15% for semi-intensive and extensive farmers respectively (Table 1). Study showed that 25% extensive and 30% integrated farmers educated up to primary level while the highest 35% occupied semi-intensive farmers. Tanjeena *et al.* (2007) found majority (14.4%) of the fish farmers were educated up to primary level followed by secondary level (8.9%) and higher secondary or above (6.7%). Quddus *et al.* (1998) reported that there were no illiterate pond owners at Demra area of Dhaka.

Table 1. Level of education of fish farmers

Level of education	Extensive farmer (%)	Semi-intensive farmer (%)	Integrated farmer (%)	Average (%)
Illiterate	40	15	15	23.33
Can sign	15	5	10	10
Can read	5	5	5	5
Primary	25	35	30	30
Secondary	15	15	10	13.33
Higher secondary	0	15	15	10
Bachelor	0	10	15	8.33

Religious status

In the study area the percentage of the Muslim and the Hindu farmers were 85% and 15%, respectively while highest percentage 90% of Muslim farmers was found in extensive farming. It can be noted that there was no impact of religion on farming systems. Tanjeena *et al.* (2006) were found 90% Muslim farmers and 10% Hindu farmers at Mohanpur upazila of Rajshahi district, which is related to this study.

Physical capitals

Transport, road, market, electricity, water supply, sanitary and health facilities are the physical capital of fish farming that enable people to pursue their livelihood strategies (Mondal *et al.* 2012).

Housing condition

It was found that majority (36.67%) of the respondents had tin shed house, 18.33% had kacha, 31.67% had half-building and only 13.33% had building (Table 2). Highest percentage (35%) of kacha house was found in case of extensive farmers while semi-intensive and integrated was 10% each. Pijush *et al.* (2013) reported that 70% house of fish farmers was made of tin-shed, 20% half building and 10% building of Shahrasti upazila of Chandpur district. Shariful (2011) reported that 80% of housing structures were tin shed, while 15% were kacha, 5% were half-building at Moulvibazar district.

Drinking water facilities

Among the interviewed farmers 75% of the farmers used tube well water, 10% river water, 15% pond water. About 90% of semi-intensive and integrated farmers used tubewell water as drinking water while it was only 65% for extensive farmers (Table 2). Ali *et al.* (2008) found that about 88% used own tube well and 12% used neighbors tubewell water at Bagmara upazilla under Rajshahi district.

Table 2. Housing, drinking water and healthcare facilities of fish farmers

Category of house of fish farmers				
Category of house	Extensive farmer (%)	Semi-intensive farmer (%)	Integrated farmer (%)	Average (%)
Kacha	35	10	10	18.33
Tinshed	40	35	35	36.67
Half-building	15	40	40	31.67
Building	10	15	15	13.33
Total	100	100	100	100
Drinking water facilities of the farmers				
Tubewell	65	80	80	75
River	15	10	5	10
Pond	20	10	15	15
Total	100	100	100	100
Health centre/ Medical facilities of fish farmers				
Village doctor	40	30.0	35	33.3
Upazila health complex	45	55.0	50.0	50.0
District hospital	10	15.0	10.0	11.7
Do not get treatment	5		5.0	5.0
Total	100	100	100	100.0

Sanitary facilities

The Sanitary facilities of farmers were taken into consideration and it was observed that on average 13.33% farmers were used pukka toilet while 20% semi-intensive farmers and 15% integrated farmers used pukka toilet and extensive farmers used the highest percent (35%) of kacha toilet (Fig. 3).

Ali *et al.* (2008) found that 62.5% of the farmers had semi-pucca, 25% had kacha and 12.5% had pukka toilet in Mymensingh district. Rahman *et al.* (2012) found about 95% kacha, 3% semi-pucca and 2% pukka at fisher’s community of nijhum dhip of Noakhali district.

Health Centre/ Medical facilities

The study revealed that 55% of semi-intensive farmers got treatment from upazila health complex while it was 45% and 50% for extensive and integrated farmers, respectively (Table 2). Highest percentage (40%) of extensive farmers depends on village doctor for regular treatment while it was 30% and 35% for semi-intensive and integrated farmers, respectively. Alam (2006) found that only 42% of the farmers in the Mithapukur upazila under Rangpur district got the treatment from upazila health complex while the rest 58% depend on village doctor and others.

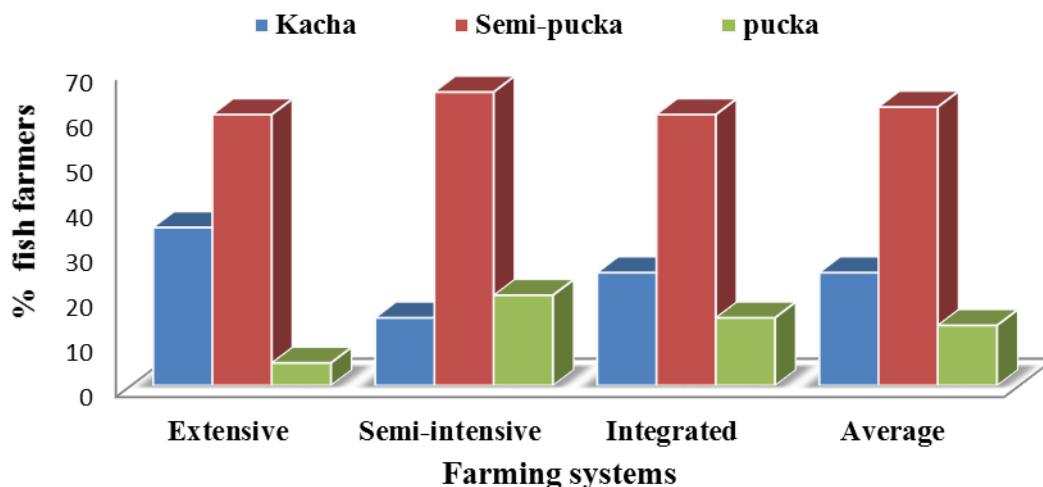


Fig. 3. Sanitary facilities of the fish farmers

Electricity facilities

The studied area was not taken under full electricity and extensive farmers enjoyed lowest (45%) electricity facilities while highest 75% of semi-intensive farmers used electricity. Shariful (2011) stated that about 79% farmers had electricity at Srimongal upazila under Moulvibazar district which is similar to this study. Mondal *et al.* (2012) found that electricity supply was limited despite the delay of the rural electrification board and only 29% of farmers had electricity.

Fish marketing system

From the survey it was found that 51.67% farmers sold their product into local market and 18.33% sold in urban market. About 60% of extensive farmers sold their product into local market while the percentage of semi-intensive and integrated farmers was 45% and 50%, respectively. Only 25% semi-intensive farmers sold fish in urban market while it was 10% and 20% for extensive and semi-intensive farmers, respectively. However the choosing of market depends on the total catch, transportation facilities, price of fish, demand of fish etc. Mondal *et al.* (2012) found 80% harvested fishes were sold in district market of Mymensingh and 20% sold in the local market of Fulpur upazila.

Social capitals

Acquired experience/ training

According to the survey it was revealed that highest percentage 45% of semi-intensive farmers gained training from UFO while only 25% extensive farmers gained training from UFO. A major portion (50%) of extensive farmers gained knowledge of fish farming from friends and neighbors while it was 20% and 30% for semi-intensive and integrated farmers respectively (Table 3). Some NGOs give technical and financial support for fish culture and it was 20%, 30%, 25% of extensive, semi-intensive and integrated farmers, respectively from NGOs. Pijush *et al.* (2013) reported that only 34% farmers received necessary training. Ali *et al.* (2008) found that 60% farmers got technical assistance, 22% farmers from others (self-study), while 8% and 10% from Department of Fisheries and NGOs, respectively. Similar result was found by Zaman (2006) and Hossain *et al.* (1992).

Table 3. Acquired experience/ training of fish farmers

Category	Extensive farmer (%)	Semi-intensive farmer (%)	Integrated farmer (%)	Average (%)
NGO	20	30	25	25
UFO	25	45	35	35
Neighbors and friends	50	20	30	33.33
Others	5	5	10	6.67
Total	100	100	100	100

Natural capitals

In the study areas almost all farmers have own houses and dependent on natural environment for water. Presence of canal, ponds and existence of floodplains in the vicinity of the study area offer tremendous scope for harnessing natural resources for sustainable livelihood management of the fish farmers and fishing community.

Financial capitals

Source of income

In the study area most of the farmers were involved with more than one occupation to earn their livelihood.

Primary and Secondary occupation

In the study area it was found that 60% of extensive farmer's primary occupation was agriculture while it was 20% and 25% for semi-intensive and integrated farmers. Beside primary occupation 40% of the semi-intensive farmers considered fish culture as their secondary occupation while it was 45% for integrated farmers. Tanjeena *et al.* (2006) found that agriculture was the main occupation of 51.1% and aquaculture was the main occupation of 18.9% farmers. Saha (2004) reported that 41% pond owners were related to agriculture and 9% to fish culture as their main occupation which is little bit deviation from this study.

Table 4: Different occupational level of fish farmers.

Occupations	Extensive farmer (%)		Semi-intensive farmer (%)		Integrated farmer (%)		Average (%)	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Agriculture	60	35	20	45	25	40	35	40
Fish culture	30	60	55	35	50	45	45	46.67
Business	5	5	10	0	10	10	6.67	5
Service	5	0	5	10	10	5	3.33	5
Migrant Worker	0	0	10	10	5	0	5	3.33
Total	100	100	100	100	100	100	100	100

Source of fund

In the present study it was found that 68.33% farmers used their own money and 11.67% farmers received loan from bank and 20% from self and NGOs. Rather than self-funding it was observed that 15%, 20% and 25% extensive, semi-intensive and integrated farmers, respectively took loan from NGOs (Fig. 4). Similar result was found by Pijush *et al.* (2013) where 80% farmers used their own money, 8% farmers received loan from bank and 12% fish farmers received loan from other sources like different NGOs.

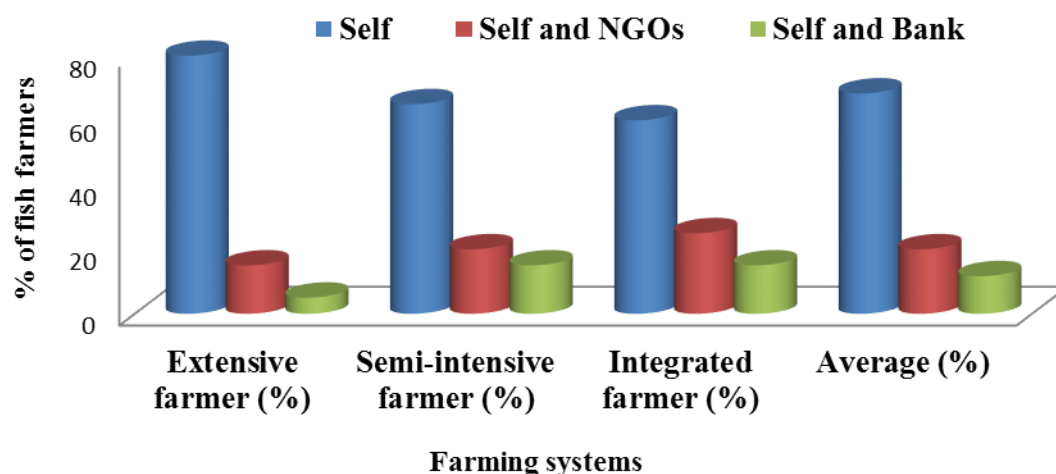


Fig. 4. Source of fund of fish farmers

Annual income

Significant difference was found in annual income among the farming systems as highest income (2,65,250) in semi intensive farming and lowest (95,500) in extensive farming (Table 5). Reason behind the highest income in semi-intensive farming as the highest input such as appropriate feeding and fertilization were done in this type of farming. Pijush *et al.* (2013) found that annual income of fish farmers varied from 24000 to 10000 BDT which is not similar to the present study.

Table 5. Annual incomes of the fish farmers

Annual Income	Extensive farmer (%)	Semi-intensive farmer (%)	Integrated farmer (%)	Average (%)
Income	95500±20074.85 ^b	265250.4±111458.91 ^a	214300±97332.36 ^a	191683.5±111019.24

Constraints of production

The highest percentage (35%) farmers stated inadequate supply of quality fingerlings was the main problem of integrated farmers while 15% extensive and 30% semi-intensive farmers stated this problem. Thirty percent extensive farmer stated lack of operational capital as their main problem. Hossain (2006) and Rahman (2003) reported that lack of money and higher production costs were the main problem. Mondal *et al.* (2012) found that the main constraint of aquaculture was lack of operational capital in Mymensingh district.

Livelihood outcomes and socio-economic condition

In the study area 76.67% people stated that they were benefited by fish farming and only 23.33% failed due to lack of proper technical knowledge, operational capital, disease problem etc. Among all the farming system found in the study area semi-intensive farming considered the best farming. Need technical support and financial assistance for converting the farmers to intensive farming. Ahmed S A, Quamruzzaman K M, Halim G M A and Rashid M A. 2008. Summer hybrid tomato variety and production technology (in Bengali). Olericulture Division, HRC, BARI, Gazipur. 16p.

Table 6. Key constraints of fish production

Key constraints	Extensive farmer (%)	Semi-intensive farmer (%)	Integrated farmer (%)	Average (%)
Lack of operational capital	30	10	10	16.67
High production costs	20	25	20	21.67
Inadequate supply of quality fingerlings	15	30	35	26.67
Poor feed quality	5	25	25	18.33
Inadequate technical knowledge	25	5	5	11.67
Fish disease	5	5	5	5
Total	100	100	100	100

Table 7. Status of socio-economic condition

Improved socio-economic conditions	Extensive farmer (%)	Semi-intensive farmer (%)	Integrated farmer (%)	Average (%)
No	35	15	20	23.33
Yes	65	85	80	76.67

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