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Constraints in fish farming activities as perceived by the fish farmers of RI Bhoi and west Garo Hills districts of Meghalaya

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Abstract

The study was undertaken at Ri Bhoi and West Garo hills districts of Meghalaya during the month of August to October, 2019 to study and identify the constraints pertaining to fish farming and related activities as perceived by the fish farmers of the districts. Data were collected using pre-tested and structured interview schedule from 90 respondents. During the study, it was observed that majority of the respondents belonged to middle aged group. High proportions of the respondents were formally educated up to secondary school (37.78%). Majority of the respondents belonged to nuclear family of size (48.89%). Majority of the fish farmers had medium pond size area (0.07- 0.51 ha). 80 per cent of the fish farmers had up to 5 years of experience in fish farming activities. The study also revealed that the constraints encountered by the fish farmers were high-value cost of technologies; improper storage technique; over specificity/lack of flexibility of the technology with the environment inaccessibility of credit; high cost of inputs; inadequate financial support; excessive cost of labour; non-availability of the technology lack of financial institution; shortage of labourers; inadequate marketing opportunities; poor assistance from the Fish Farmers Development Agencies (FFDA); social beliefs; limited availability of seeds and limited number of publications; extension workers rarely conducts farm and home visit; Unsuccessful implementation of fisheries schemes; absence of policy support; absence of awareness and other developmental programmes from the government; lack of communication on the part of extension workers; lack of need based training programme; illiteracy.

Keywords: Constraints, fish farming, fish farmers, Meghalaya

1. Introduction

Training is very essential for acquiring new skills, attitude and knowledge in the context of improving farmers' skills and farm productivity. Effective training requires a clear picture of how the trainees will execute the information after attending the training; it is also significant in terms of replacing, partially replacing or integrating with the already existing local practices. Training does not mean knowing more but behaving differently. Training is therefore acquisition of the best way of utilizing knowledge and skill and is an integral part of any development activity^[1, 2, 3]. Training needs assessment is one of the major steps to identify the area of farmers' interest and to design and develop curriculum that can be best suited to the existing situation of the farmers. Training need assessment of these farmers is essential to foster meaningful development since their needs constantly changes and timely dissemination of relevant information and skill is critically important¹. Therefore, prior to conducting any training programme, the training institutions should determine who, what, when, where, why and how of training programme^[4, 5, 6].

Training need assessment of the fish farmers of Meghalaya is immensely important due to the fact that fish farming is relatively new in the state and most of the fish farmers are still dependent on traditional way of fish farming practices. Meghalaya, one of the eight North-eastern states of India, is enriched with abundant biodiversity resources; the state is also endowed with plenty of inland fisheries resources *viz.*, rivers, reservoirs, lakes and ponds^[7, 8]. Meghalaya is also known to receive an annual rainfall of 1200 mm which can be utilized for the development of the fisheries sector in the state through proper management and conservation strategies of these resources. Being a hilly region, most of the parts in the state have topography which is unsuitable for fish culture. Moreover, due to the failure of the state to properly and efficiently utilize these resources, the state still lags behind in fish production.

It is estimated that about 30% of the total land area of 22,429 sq. km of Meghalaya lends itself for the development of Fisheries. However, interest in fisheries sector has been increasing in rural areas of the state because of the favourable climatic conditions, availability of abundant land and water resources for fish culture and the changing food preferences of the people [9].

Fish is becoming more and more preferable by the people in the state due to the fact that the people are becoming more aware of the advantages associated with the consumption of fishes preferably to its high protein content. The total fish production of Meghalaya during 2017-18 was 11,961 metric tonnes and the requirement of fish in the state is estimated to be about 27,000 MT per annum in order to meet the nutritional consumption of the country i.e. 11 kg per capita [10]. Hence, there is a gap between demand and supply due to which the state still depends on states like Andhra Pradesh, West Bengal, Assam etc to import fish to the state to meet its requirements. Therefore, understanding the constraints of the fish farmers who are associated with different fish farming activities is significantly important to minimize this gap.

2. Materials and Methods

The present study was conducted during the month of August to October, 2019 in Ri-bhoi district and West Garo hills district of Meghalaya. The two districts were purposively selected based on the prevalence of fish farmers in the districts. Four blocks were purposively selected from the said districts based on the population of fish farmers in the respective blocks: Umling and Umsning from Ri-bhoi district and Rongram and Dadengre from West Garo hills district. Thereafter, eight villages were also purposively selected; two from each block based on the prevalence of fish farmers to attain a total sample size of 90 respondents. Collection of primary data from the selected respondents was carried out after building up good rapport with the respondents through personal interview and home/farm visit using pre-tested structured schedule interview. Based on the situation of the area under fish farming, both primary and secondary data were employed for data collection. After careful examination and taking into consideration all the possible perceived barriers that arise during fish culture, many constraints associated with fish farming were identified which were grouped into six categories *viz.*, (i) constraints related with the technology of fish culture, (ii) constraints related with the economy of fish culture, (iii) administrative constraints, (iv) social constraints, (v) constraints related with the infrastructure of fish culture and (vi) constraints related with extension activities. These were measured using a five point interval scale. These were 'very high', 'high', 'medium', 'low' and 'very low' each given a score of 5, 4, 3, 2 and 1 respectively. Statistical analysis such as weighted mean and ranking was used.

3. Results and Discussion

Adoption of fish farming activities by the respondents is influenced by various socio-economic factors of the fish farmers such as age, education, family type, pond size area, experience in fish farming and annual income of the fish

farmers. Hence, it was felt that these characteristics needs to be studied and the results are provided in the table below.

Table 1: Socio-economic profile of the respondents (n=90)

Sl. No	Characteristics	Frequency (No.)	Percentage (%)
A. Age			
1	Young (Up to 27 years)	11	12.22
2	Middle (28 to 52 years)	64	71.11
3	Old (Above 52 years)	15	16.67
B. Education			
1	Illiterate	19	21.11
2	Primary	22	24.44
3	Secondary	34	37.78
4	Higher secondary	10	11.11
5	Graduate	5	5.56
	Total	90	100
C. Family size			
1	More than 9 members	14	15.56
2	7-9 members	25	27.78
3	4-6 members	44	48.89
4	Up to 3 members	7	7.78
D. Area of the pond (ha)			
1	Small (<0.07 ha)	23	25.56
2	Medium (0.07- 0.51 ha)	55	61.11
3	Large (>0.51 ha)	12	13.33
E. Experience in fish farming (Yrs)			
1	More than 15 years	4	4.44
2	11-15 years	1	1.11
3	6-10 years	13	14.44
4	Up to 5 years	72	80
F. Annual income (Rs.)			
1	Up to 50,000	6	6.67
2	50001 to 1,00,000	29	32.22
3	1,00,001 to 1,50,000	27	30
4	1,50,001 to 2,00,000	14	15.56
5	2,00,001 to 2,50,000	7	7.78
6	2,50,001 to 3,00,000	4	4.44
7	3,00,001 and above	3	3.33

The socio-economic characteristics include age, education, and family size, area of the pond, experience in fish farming and annual income of the fish farmers. It was observed in Table 1. That majority of the respondents belonged to middle aged group (71.11%) and the remaining 16.67 per cent and 12.22 per cent were from old age and young age group respectively. Table 1. Also revealed that majority of the respondents (37.78%) were found to have up to secondary level of education. It was observed that maximum (48.89%) of the fish farmers have a family size between 4-6 members. Majority (80%) of the fish farmers had fish farming experience up to 5 years. The study also showed that a majority of the fish farmers have an annual income between Rs. 50,001 to Rs. 1, 00,000 (32.22%).

As presented in Table 2, the constraints perceived by the fish farmers were grouped into six categories measured using weighted mean. These are (i) constraints related with the technology of fish culture, (ii) constraints related with the economy of fish culture, (iii) administrative constraints, (iv) social constraints, (v) constraints related with the infrastructure of fish culture and (vi) constraints related with extension activities.

Table 2: Ranking of major constraints as perceived by the respondents (n=90)

SI. No	Constraints	Weighted mean score	Rank
1.	Constraints related with the technology of fish culture	4.17	III
2.	Constraints related with the economy of fish culture	4.84	I
3.	Administrative constraints	1.60	V
4.	Social constraints	2.76	IV
5.	Constraints related with the infrastructure of fish culture	4.74	II
6.	Constraints related with extension activities.	1.58	VI

It was observed from the table 2 that constraints related with the economy of fish culture (4.84, I) poses the main challenge as perceived by the fish farmers in the study area. This was followed by constraints related with the infrastructure of fish culture (4.74, II); constraints related with the technology of fish culture (4.17, III); social constraints (2.76, IV), administrative constraints (1.60, V) and constraints related with extension activities (1.58, VI). As fish farming is a relatively new practice in the study area, the fish farmers

found it difficult to manage the economy related issues with the practice. Moreover, fish farmers faced difficulties to obtain and procure the necessary inputs such as fish seed, fish feed, fertilizer etc. They also expressed their difficulties in obtaining farm machineries and equipments such as pumps and aerators due to the lack of stores and suppliers which could provide them the farm machineries and tools. Therefore, many of the farmers procure these tools and products from other states.

Table 3: Ranking of the items of constraints as perceived by the fish farmers

SI. No	Ranking of constraints related with the technology of fish culture	Weighted mean score	Rank
1.	High-value cost of technologies	3.97	I
2.	Complexity of the technology/technique	2.60	III
3.	Over specificity/lack of flexibility of the technology with the environment	2.60	III
4.	Improper storage technique	2.23	IV
5.	Non-availability of the technology	2.67	II
SI. No	Ranking of constraints related with the economy of fish culture		
1.	Inadequate financial support	4.40	III
2.	Inaccessibility of credit	4.74	II
3.	Excessive cost of labour	3.45	IV
4.	High cost of inputs	4.78	I
5.	Inadequate marketing opportunities	1.43	V
SI. No	Ranking of constraints related with the administrative constraints as perceived by the farmers		
1.	Unsuccessful implementation of fisheries schemes	1.84	IV
2.	Absence of policy support	2.34	II
3.	Poor assistance from the FFDA	3.31	I
4.	Lack of support from the fisheries department	1.70	V
5.	Absence of awareness and other developmental programmes from the government	1.86	III
SI. No	Ranking of constraints related with the social constraints as perceived by the farmers		
1.	Poisoning and pilfering of the farmers ponds and fishes	2.31	II
2.	Social beliefs	2.92	I
3.	Absence of family/peers encouragement	1.57	V
4.	Shortage of family labour	1.67	IV
5.	illiteracy	1.69	III
6.	Insurgency	1.31	VI
SI. No	Ranking of constraints related with the infrastructure of fish culture		
1.	Lack of financial institution	3.94	II
2.	Seeds are not available/limited	4.81	I
3.	Shortage of labourers	3.04	III
4.	Problems of drainage facilities, shortage of water supply	1.72	IV
5.	Lack of transport facilities	1.67	V
6.	Absence of storage facilities	1.60	VI
SI. No	Constraints related with extension activities		
1.	Extension workers rarely conducts farm and home visit	2.36	II
2.	Limited to no farm publications	2.80	I
3.	Extension workers are hesitant towards helping the farmers	2.26	III
4.	Lack of communication on the part of extension workers	1.53	V
5.	Lack of need based training programme	1.81	IV

Under the constraints related with the technology of fish culture (Table 3.), high-value cost of technologies emerged as the main problems to fish culture (3.97, I). This was followed by non-availability of the technology (2.67, II); complexity of the technology/technique (2.60, III); over specificity/lack of flexibility of the technology with the environment (2.60, III). Improper storage technique scored the least (2.23, IV); the

reason for this might be due to the fact that the fish farmers sell the fishes immediately after harvesting. Hence, they bother least about storing their produce. Under the domain of "economy of fish culture", high cost of inputs (4.78, I) stood as the major barrier for the fish farmers in fish culture. This was followed by inaccessibility of credit (4.74, II) and inadequate financial institution (4.40, III) whereas excessive

labour cost (3.45, IV) and inadequate marketing opportunities (1.43, V) were the least perceived constraints. Majority of the respondents felt that poor assistance from the FFDA (3.31, I) is the major barrier under administrative constraints. This was followed by absence of policy support (2.34, II); absence of awareness/developmental programmes (1.86, III) and unsuccessful implementation of fisheries schemes from the government (1.84, IV). Lack of support from the fisheries department was the least perceived constraints by the fish farmers (1.70, V).

Under social constraints, majority of the fish farmers perceived social beliefs (2.92, I) as a major problem. The reason might be due to the social stigma associated with agriculture and allied activities wherein they are considered to be an inferior profession. Fish farmers also faced criticism from their family, friends and neighbour for engaging in fish farming activities because of their notion that fish farming is less profitable as compared to other agricultural activities. Moreover, majority of the fish farmers keep their ponds on lease for the people to carry out angling in the water body. Fish farming is comparatively new in the state and the fish farmers have very less or little knowledge on different advances of fish farming practices which makes them skeptical on adopting fish farming activities. This is followed by poisoning and pilfering of the fishes (2.31, II); illiteracy (1.69, III); shortage of family labour (1.67, IV); absence of family/peers encouragement (1.51, V) and insurgency (1.31, VI). In infrastructural constraints, lack of fish seeds availability (4.81, I) is the major problem that the fish farmers faced, Production of fish seeds is very meager in the state due to which the fish farmers have to incur extra cost for buying fish seeds from other states. This is followed by lack of financial institution (3.94, II) which is in line with the findings of the study conducted by Hijam in 2014^[11]. This is followed by constraints pertaining to shortage of labourers (3.04, III); problems of drainage facilities, shortage of water supply (1.72, IV). Lack of transport facilities (1.67, V) and absence of storage facilities (1.60, VI) poses the least perceived constraints of the fish farmers.

Under the constraints related with different extension activities, majority of the fish farmers perceived that there is limited number of farm publications (2.80, I) being published; this was followed by rare farm and home visits by the extension workers (2.36, II); extension workers being hesitant towards helping the fish farmers (2.26, III), lack of need based training programme (1.81, IV) and lack of communication (1.53, V) on the part of extension workers poses the least problems to the fish farmers. These findings revealed the major gap in establishing convergence between the fish farmers and the extension professionals. Apart from developing different extension publications, it is very also important to give emphasis on producing these publications in different regional languages for the farmers to get most from it. Moreover, the low frequency of farm and home visits by the extension workers may be due to several factors; excessive engagement of the extension personnel in other official task being one of them. Similar finding has been reported by Sajina in 2019^[12] wherein she revealed that due to several official tasks and assignments, extension personnel were not able to conduct regular field based activities. Extension system also suffers from the problem of low outreach due to lack of sufficient staff and low operational budgets which restrict the extension personnel from visiting farmers' fields^[13, 14].

4. Conclusion

As revealed in the present study, training is very essential for inculcating need-based skills and knowledge to the fish farmers for effectively practicing scientific method of fish farming techniques. However, inadequacy of training programmes poses as a threat which could hinder the development of fisheries sector in the state. In fact, different training programmes are being organized by the Department of Fisheries and other relevant organizations but these training programmes are generally conducted without assessing and addressing the fish farmers' actual needs and problems. In this regard, assessment of training need and understanding the different constraints associated with fish farming activities are the prerequisites prior to conducting any programmes for the fish farmers. Linkage and convergence between different stakeholders of fisheries also needs to be strengthened to effectively enhance the skills and efficiency of these fish farmers. Moreover, the extension personnel also needs to be trained about the recent advances in fish farming techniques; they also need to be made well acquainted with the different Information Communication Tools, e-initiatives and services which are implemented by the government.

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