



# International Journal of Fisheries and Aquatic Studies

ISSN: 2347-5129

IJFAS 2014; 2(1): 01-04

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www.fisheriesjournal.com

Received: 03-07-2014

Accepted: 26-07-2014

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## **Fish Farmers' perceived constraints in transfer of aquaculture technology in Bishnupur district of Manipur, India**

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### **Abstract**

Fish farmers' perception about the constraints in the transfer of aquaculture technologies were studied by surveying 120 farmers in Bishnupur district of Manipur. Data were collected using structured interview schedule with constraints grouped under six areas- technological, social, administrative, economic, infrastructural and extension. The intensity of the constraints was measured using five point continuum. Socioeconomic profile of the farmers reveals that the majority of fish farmers belonged to middle age groups with medium level of education, family size, land holding, experience in fish farming and income. Farmers perceive extension related constraints as a major hurdle in the way of transfer of technology. The study identifies the lack of visits; lack of farmer friendly literature; lack of training and capacity building; inadequate financial support; poor implementation of schemes; high wages and labour cost as some of the constraints.

**Keywords:** Fish farmers, constraints, aquaculture

### **1. Introduction**

Manipur, one of the eight sisters of the North Eastern Region of India, is an isolated hill- girt state stretching between 92 °58 'E to 94 °45 'E longitudes and 23°50'N to 25°42'N latitudes. The growth in State Domestic Product of Manipur is largely dependent on agricultural productions. The state is endowed with fisheries resources of about 56,461.15 ha. water areas in the form of lakes, seasonal and perennial swampy beels, rivers, tanks, ponds, reservoir, low lying paddy field etc. which can be developed on scientific lines of fish culture for production of more fish. So far, 18,600 ha of the water areas have been brought under fish culture operation by the end of 2010-11 <sup>[1]</sup>.

Fish is the main food item of the majority of the people in the State, particularly the Meiteis who are mainly concentrated in the valley. Fish production in Manipur is estimated at 18,000 tons, whereas the state annual consumption is 25,000 tons, having a gap of 7,000 tons/year. The average fish production in Bishnupur district is 1000 tons/ha. only whereas, it is 1500 tons/ha or more in Imphal West district <sup>[2]</sup>. This shows that the fish farmers of Bishnupur district are yet to adopt modern technology in fish culture, although there are some particular progressive farmers. This huge gap is to be met by harnessing the vast fishery resources of State by adopting advanced scientific techniques of fish culture and consolidating the available infrastructures already laid and by introducing new schemes and projects. Now a days pond fish culture has become a popular enterprise to the farmers in the study area. But still this entrepreneurship has some potential barriers which are working behind the growth and development of pond fish culture in Manipur. Without identifying and eliminating those barriers it is difficult to attain the satisfactory growth of this entrepreneurship. Thus, the present study makes an attempt to identify the constraints in aquaculture development and their severity.

### **2. Materials and methods**

The present study was conducted during 2013-14 in purposefully selected district of Bishnupur in Manipur which contributes highest fish production in the fish basket of the State. In addition, the district has a maximum population of fish farmers in the State. Further, out of three Sub-divisions (SD) of the district, one SD namely Nambol was selected

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randomly thereafter, 15 Villages and 8 fish farmers were selected randomly. Thus the sample size comprises 120 respondents. The data was gathered using pre-tested structured interview schedule. After through study of literature and expert consultations 33 constraints grouped under six major areas viz., technological, social, administrative, economic, infrastructural and extension constraints were selected for study. To measure the extent of severity of problem five point interval scale was used. These were very high, high, medium, low, very low and assigned scores were 5, 4, 3, 2, 1 respectively. Appropriate statistical techniques including frequency distribution, percentage and weighted mean were applied to analyzing the primary data

using SPSS-16.

### 3. Results and Discussion

The emergence and development of entrepreneurship is not a spontaneous one, but a dependent phenomenon of economic, social, political, psychological factors often nomenclature as supporting conditions for entrepreneurship development. These conditions may have both positive and negative influences on the emergence of entrepreneurship. Thus, it was felt necessary to study these characteristics and the results have been dealt in the following tables.

**Table 1:** Socio-economic profile of the respondents. n =120

Variables	Frequency	Percentage
<b>A. Age</b>		
Young (Up to 35 yrs)	9	7.50
Middle (36-50 yrs)	78	65.00
Old (Above 50 yrs)	33	27.50
<b>B. Education</b>		
Illiterate	-	-
Up to class V	15	12.51
Class VI to XII	83	69.16
Above class XII	22	18.33
<b>C. Caste</b>		
General	99	82.50
O.B.C	17	14.16
S.C	-	-
S.T	4	3.34
<b>D. Family size</b>		
Small (1 to 5 members)	29	24.16
Medium( 6 to 10 members)	83	96.17
Large ( Above 10 members )	8	6.67
<b>E. Land holding</b>		
Small (< 1 ha)	52	43.34
Medium (1 to 2 ha)	56	46.66
Large (> 2 ha)	12	10.00
<b>F. Experience in farming</b>		
Low (Up to 3 years)	15	18.34
Medium (4 to 10 years)	83	69.16
High (Above 10 years)	22	12.50
<b>G. Annual income</b>		
Low (< 1.5 lakh)	27	22.50
Medium (1.5 to 5 lakh)	79	65.84
High (> 5 lakh )	14	11.66

The socio-personal characteristics included age, education, social participation, land holding and income of the farmers. It is reflected from the Table 1 that the majority of the fish farmers were in middle age (65%) and old age (27.50%) groups, only 7.5 per cent of them belonged to younger age group. All the respondents were found to be literate. However, the majority (69.16%) of them had education up to twelfth standard, whereas, as the per provisional data of population census 2011 the male literacy rate in Manipur was 86.06 per cent. The results further indicate that 82.50 per cent of fish farmers were from general category. The maximum (46.66%) of fish farmers had medium size (1-2 ha) of land holding followed by small (43.34%) and large (10%). The earnings of the fish farmers of study area showed that, 65.84 per cent and 22.50 per cent of the fish farmers were found in medium and low income category, respectively. These results

indicate that a large segment of fish farmers of the study area belonged to middle age groups with medium level of education, family size, land holding, experience in fish farming and income.

The constraints perceived by the fish farmers were broadly categorized into six categories viz. technological, economic, administrative, social, infrastructural and extension constraints and prioritized based on their intensity/weighted score and presented in Table 2. It is evident that extension constraints were emerged as main barrier in transfer of aquaculture technologies with mean score 4.06 and ranked I as perceived by the fish farmers in the study area. Whereas, administrative constraints stood II rank with mean score 3.58, and economic constraints as III rank with mean score 3.39. Technological constraints, infrastructural constraints and social constraints were ranked IV, V and VI with mean score 3.12, 3.11 and

2.42 respectively. According to the report of the 2nd Administrative Reform Commission Manipur is currently the most insurgency ridden state. It is reported that militant organizations are virtually running a parallel government in many districts in the state and they are able to influence the decision of the state government in awarding contracts, supply orders and appointments in government service. Similarly, the virtual extortion racket run by various militant groups at a number of points, collection of protection money from business and salaried classes have

been extensively documented (2nd ARC, 7th Report, P.151). This may be one of the reasons of restricted mobility of development officials and effective implementation of development schemes. Limited staff, rigid organization, poor capacity, a top-down linear culture, weak links of the research system (particularly KVKs), and limited reach to farmers may be other reasons for poor performance of the public extension system<sup>[3]</sup>.

**Table 2:** Ranking of major constraints.

	Major areas	Mean Score	Rank
a)	Technological constraints	3.12	IV
b)	Economic constraints	3.39	III
c)	Administrative constraints	3.58	II
d)	Social constraints	2.42	VI
e)	Infrastructural constraints	3.11	V
f)	Extension constraints	4.06	I

**Table 3:** Ranking of items of constraints as perceived by the fish farmers. n=120

A.	Technological constraints	Mean Score	Rank
a)	High cost technologies.	3.19	IV
b)	Complexity of the information	3.26	III
c)	Technology not suited with existing environment	3.34	II
d)	Lack of location specific technologies	3.43	I
e)	Lack of storage technique	2.36	V
<b>B.</b>	<b>Economic constraints</b>		
a)	Lack of financial support	4.35	II
b)	Non availability of credit	4.37	I
c)	High wages & labour cost	4.08	III
d)	High cost of inputs	3.45	IV
e)	Insufficient marketing facilities	2.00	VI
f)	Inappropriate use of available resources	2.08	V
<b>C.</b>	<b>Administrative constraints</b>		
a)	Poor implementation of fisheries development scheme	4.41	I
b)	Lack of policy support	4.30	III
c)	Poor approach of FFDA.	4.32	II
d)	Inadequate extension contact	4.23	IV
e)	Lack of need based program for any organization	4.21	V
<b>D.</b>	<b>Social constraints</b>		
a)	Poaching & poisoning	2.27	II
b)	Social norms and beliefs	2.24	III
c)	Lack of family encouragement	2.05	V
d)	Inadequate family labour	3.78	I
e)	Illiteracy	2.14	IV
f)	Insurgency	2.05	V
<b>E.</b>	<b>Infrastructural constraints</b>		
a)	Inadequate financial institution	4.23	I
b)	Non-availability of seeds	2.36	IV
c)	Shortage of labour	3.87	III
d)	Lack of storage facilities	2.22	V
e)	Lack of water management, scarcity of water & drainage during flood	3.93	II
f)	Poor transportation facilities	2.02	VI
<b>F.</b>	<b>Extension constraints</b>		
a)	Lack farm and home visit by the extension workers.	4.13	I
b)	Lack of farm publication	4.13	I
c)	Lack of mass media exposure	4.13	I
d)	Ineffective communication	3.88	III
e)	Lack of need based training program	4.03	II

The data in Table 3 reveals that among technological constraints, 'lack of location specific technologies'

emerged as main barrier in transfer of aquaculture technologies with mean score 3.43 and ranked I whereas,

'adaptability of the technologies' stood II rank with mean score 3.34, and 'complexity of the technology' as III rank with mean score 3.26. 'High cost technologies' and 'lack of post-harvest technologies' were ranked IV and V with score 3.19 and 2.36 respectively. These findings are in line as reported by earlier researchers [4, 5]. Among economic constraints, 'non-availability of credit', 'lack of financial support' and 'high wages and labour cost' perceived as major problems and were ranked I, II and III respectively. The higher cost of input, improper utilization of resources (MS 2.08), and non-availability of marketing facilities (MS 2.00) were ranked as IV, V and VI, respectively. Due to non-availability of credit facilities, the farmers were not able to adopt new technologies, which ultimately affect the productivity [6, 7, 8, 5].

In the category of administrative constraints, poor implementation of various fisheries development schemes stood rank I with mean score 4.41 followed by poor approach of fish farmer development agencies (MS 4.32, II) and lack of policy support (MS 4.30, III) were perceived as important constraints. The other constraints were inadequate extension contact (MS.4.23, IV), lack of need based program (MS 4.21, V) as expressed by the fish farmers. Inadequate family labour (MS 3.78, I), poaching and poisoning (MS 2.27, II) and social norms and beliefs (MS 2.24, III) were the significant problems faced by the fish farmers under social constraints. Others constraints identified were illiteracy (MS 2.14, IV), insurgency (MS 2.05, V) and lack of family encouragement (MS 2.05, VI). The reasons for inadequate family labour in fish culture activities might be due small or medium family size and involvement of the members in non-farm activities. The migration of labour to the urban area may also attribute to shortage of labour. These results are in line with the findings of earlier researchers [9, 10, 11]. Under the infrastructural constraints, inadequate financial institution (MS 4.23, I) was the main problem reported by the fish farmers. Others constraints were lack of water management (MS 3.93, II), shortage of labour (MS 3.87, II), non-availability of quality fish seed (MS 2.36, III), lack of storage facilities (MS 2.22, IV) and transportation (MS 2.02, V). In past studies non-availability of quality fish seed and high cost of inorganic fertilizers were the major constraints in fish production have also been identified [12]. With regard to extension constrains it is evident from table 25 that the fish farmers encountered major problems with extension communication methods viz. farm & home visit by the extension workers, farm publications, mass media exposure and each of them stood rank I with mean score 4.13. Lack of need-based training programme (MS 4.03) and ineffective communication (MS 3.88) ranked 2<sup>nd</sup> and 3<sup>rd</sup> respectively.

The present study on barriers to aquaculture development identified six groups of constraints. Severe among them are lack of training and capacity building; inadequate financial support; poor implementation of schemes; high wages and labour cost. Government and other stakeholders would have adopted a concerted approach to remove the barriers. Financial institutions, marketing agencies, research institutions also have their role to play. An enabling policy environment with regard to technological, infrastructural, financial and marketing support would certainly attract and encourage young entrepreneurs to start aquaculture venture.

#### 4. Acknowledgements

The authors are thankful to the Program Coordinator; Krishi Vigyan Kendra (KVK) and the extension functionaries of the Department of Fisheries, Govt. of Manipur working in the study area/district for wholehearted cooperation rendered in preparation of interview schedule as well as assistance provided during data collection.

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