Indian Journal of Extension Education
Vol. 53, No. 4, 2017 (144-147)

Extent of Knowledge of Fish farmers about Scientific Fish Culture Practices in North 24 Parganas of West Bengal, India

B. Goswami[1], S.B. Mukhopadhyay[2] and S.S. Dana[3]

ABSTRACT

The study was conducted in North 24 Parganas district of West Bengal. It was found that majority of the fish farmers (50.8%) had the medium level of knowledge regarding scientific fish culture practices. The highest extent of knowledge was observed in the names of some aquatic weeds (95.83%), and lowest was observed in the minimum depth of water required for fish culture and the time gap required between manure application and stocking of fish seed (26.67%). The path analysis indicated that innovative proneness was the most potent variable in effecting the knowledge of fish farmers positively.

Keywords: Scientific Fish Culture, Knowledge, Fish Farmer.

INTRODUCTION

Fish has long been an important source food for people all over the world. The importance of fish as a source of high quality, balanced and easily digestible proteins is well understood. The fish production of the country has increased from 0.75 million tons in 1950 to over 6.4 million tons at present, an over 8 fold increased. At the same time the share of inland fisheries has gone up from 29 per cent to over 50 per cent. Aquaculture in India is seen as an attractive option for enhancing fish production at a stage. Where there has been stagnation of growth from open water fisheries. Fresh water aquaculture continuously contributing a giant share over 95% of the total aquaculture production in terms of quantity. This has increased the national average productivity from the ponds and tanks to a present level of 2200 kg/ha, an over 2 folds growth in the last two decades (Sagrangi and Jena, 2005). A host of technology over the years have largely contributed to such growth in the sector.

West Bengal has been playing a significant role in fish culture since time immemorial. West Bengal possesses vast inland aquatic resources. The present fish production is about 11.7 lakh tons but there is a scope to increase the production level. Low fish production of the State can be attributed to several reasons. However knowledge of the fish farmers on scientific fish culture is the single largest factor responsible for low fish production.

Knowledge about scientific fish culture plays a very important role in the adoption of scientific fish culture. Knowledge as a component of the behaviour of an individual. To improve the adoption of scientific fish culture under village condition it is necessary to know the knowledge of fish farmer so that knowledge could be used effectively with an appropriate economic viability.

Keeping these facts in view the present investigation was desirable with following objectives –

1. To measure the extent of knowledge on scientific fish culture practices.
2. To find out the direct and indirect effect of selected independent variables on knowledge.

METHODOLOGY

The present study was carried out using *ex post facto* research design during 2005-06 in the purposively selected Dakshin Dinajpur District of West Bengal. A combination of purposive and systematic random sampling procedures

[1]Subject Matter Specialist (Fisheries Science), Dakshin Dinajpur Krishi Vigyan Kendra, Uttar Banga Krishi Viswavidyalaya, Majhian, Patiram, D. Dinajpur-733133, W.B., [2]Former Professor, Dept. of Agril. Extension, Agril Economics & Agril. Statistics, Palli Siksha Bhavana, Sriniketan, Viswa-Bharati,W.B., [3]Professor, Department of Fishery Extension, Faculty of Fishery Sciences, West Bengal University of Animal & Fishery Sciences, Chakgaria, Kolkata W.B., e-mail: bisug2003@gmail.com

was employed. The District was purposively selected as it has vast and diverse inland fishery resources ideally suited for taking up scientific fish culture. Among the eight development blocks, four blocks namely, Amdanga, Hasnabad, Habra-I and Habra-II were selected for the study in the consideration of the preponderance of fish farmers among the population. In the four selected blocks, three villages from each were selected by simple random sampling technique, total twelve villages served as the representing unit for the study. A list of fish farmers were prepared in the selected villages. The fish farmers in the selected villages which formed the universe were stratified on the basis of the number of fish farmers. Number of fish farmers from each village were selected by using proportionate stratified random sampling technique. A total 120 fish farmers comprising proportionate number from each village constituted the respondents for the study.

The knowledge was measured by using teacher made knowledge test. In the knowledge test, there were 41 questions. The score for each correct answer was arrigned one and zero for incorrect answer. Thus maximum obtainable score of knowledge was 41, where as minimum could be zero and extent of knowledge was calculated by following formula.

$$\text{Extent of knowledge} = \frac{\text{No of correct responses}}{\text{Total no. of knowledge item}} \times 100$$

Based on a thorough review of relevant literature and discussion with the experts in the subjects, a total of 23 independent variables having some bearing on the dependent variables were identified for inclusion in the study. These independent variables represented socio-personal, socio-economic, communicational, psychological and situational variables of the respondents and were empirically measured by procedures evolved for the purpose, and also by using scales and scoring procedures developed by earlier researcher's study. The data was collected with the help of structured and pre tested interview scheduled developed for this purpose from the respondents through personal interview.

RESULTS AND DISCUSSION

In the present study knowledge was operationalised as the extent to which understood information possessed by the respondents about the specific items of recommended scientific fish culture practices in the study area.

a) Knowledge level of fish farmers regarding scientific fish culture practices

The findings presented in table 1 revealed that out of 120 fish farmers majority i.e. 61 (50.8%) have medium level of knowledge whereas 43 (35.8%) have a high level of knowledge, followed by 31 (25.9%) with a low level of knowledge.

Table 1: Distribution of respondents based on their level of knowledge of fish farmers towards scientific fish culture

Category	Frequency	%	Mean	SD
Low	31	25.9	77.5	12.5
Medium	46	38.3		
High	43	35.8		

The above findings are in line with those of Meeran (1983), Mahendra Kumar (1996), Meti (1998), Awasthi *et al* (2000), who also reported that majority of fish farmers having medium level of knowledge related to fish culture practices. It could be interpreted from these figures that there was no scope to covert the respondent from medium knowledge category to high score category.

b) Knowledge level of fish farmers regarding specific recommended scientific fish culture

Perusal of the table-2 indicates that a more or less high percentage of fish farmers have precise knowledge of scientific fish farming in such vital matters or item as the names of some aquatic weeds (95.83%), the need for the use of common organic manures in fish culture (95.83%), the necessity of liming of fish ponds (95%), the need for manuring in the fish ponds (95%), the names of Indian Major Carps (95%), the nature of the soil suitable for fish culture (94.17%), the need for the control of predatory and weed fish (94.17%), the necessity for eradicating excess aquatic weeds (92.5%), names of predatory and weed fishes (90.83%), the indicators of oxygen depletion in the pond (87.5%), the necessity of supplementary feeds (86.67%), the names of fish diseases (86.67%), the manuring schedule recommended to be practised after stocking (85%), knowledge about the remedies for acidic condition of pond water (81.67%), the correct dose of lime (77.5%), the dose of organic manure to be applied (80.0%), the correct species combination in composite fish culture (77.5%) and water quality management (involving necessity to stop manuring and feeding beyond a certain level) (72.5%).

Further, the level of correct knowledge of fish farmers in general, in respect to different items of fish farming varies from item to item, though ranging from slightly above 50 per cent to nearly seventy per cent. For instance, the level in question varies as follows for certain items:

advantages of manuring (68.33%), feeding method (67.5%), disease control method (65%),names of the exotic carps (62.5%) fastest growing major carp and exotic carps (59.17%), ideal size of fish seed for stocking (55.83%), the optimum size of harvesting (55.83%), need for the use of inorganic fertilizer(54.17%) and method of eradication of predatory and weed fishes (54.17%).

However, it is clear from table that the majority of the fish farmers lack correct information about such important matters as the knowledge items pertaining to nutrients required for production of fish food organism, the names of fish growing well in weed infested ponds, the advantages of using inorganic fertilizers, the names of piscicides, application of mohua oil cake harvesting period, the minimum depth of water required for fish culture, the time gap required between manure application and stocking of fish seed, the correct feeding rate of supplementary feed and the necessity of checking growth. Thus, it can be concluded that though fish farmers are aware of routine and general practices, the scientific fish farming are poorly understood. The reason may be low education, lack of adequate scientific curriculum in training programme, poor communication characteristics. More or less similar findings were reported by Praveena (1993) with respect to rate of application of manures, fertilizers and diseases. Mahandra Kumar (1996) reported correct knowledge on pond

Table 2: Knowledge level of fish farmers regarding specific items of recommended scientific fish culture

Sl. No.	Practices	Response category (yes)	
		Fre-quency	Percentage
1.	What kind of soil is good for fish culture ?	113	94.17
2.	What is the minimum depth of water required for fish culture ?	32	26.67
3.	What are the nutrients required for production of natural fish food organisms in fish pond ?	58	48.33
4.	Is it necessary to use lime in fish culture ?	114	95
5.	How do you correct acidic condition of fish culture pond / tank ?	98	81.67
6.	Do you know the recommended dosage of lime used in general ?	93	77.5
7.	Should we have to manure the fish culture ponds ?	114	95
8.	What are the advantages of manuring fish culture pond ?	82	68.33
9.	Name some common organic manures used in fish culture	115	95.83
10.	Do you know the rate of application of cow dung (including initial dose and subsequent monthly doses) ?	96	80
11.	How many days before of stocking of fish seed manure should be applied ?	32	26.67
12.	Is it necessary to use inorganic fertilizers in addition to organic manures in fish culture ?	65	54.17
13.	What are the advantages of using inorganic fertilizer ?	44	36.67
14.	Is it necessary to eradicate excess aquatic weeds ?	111	92.5
15.	Name some aquatic weeds	115	95.83
16.	Do you feel predatory and weed fishes are desirable in fish culture pond ?	113	94.17
17.	Mention any two predatory and two weed fishes known to you.	109	90.83
18	What in the manual method of eradication / control of predatory and weed fishes ?	65	54.17
19.	Name any piscide used in fish culture	57	47.5
20.	Do you know the recommended dosage of mohua oil cake or bleaching powder ?	51	42.5
21.	Name three Indian major carps	114	95
22.	Name three exotic carps	75	62.5
23.	Which is the fastest growing major carp and exotic carp ?	71	59.17
24.	Catla and silvercarp are surface feeders.Rohu is a column feeder Mrigal feeds on bottom vegetationCommon carp is omnivorous	65	54.17
25.	Which fish grows well in weed infested ponds?	58	48.33
26.	What is recommended rate stocking for irrigation tanks when CFC is practiced ?	86	71.67
27.	Do you know the recommended species combination for composite fish culture 3 SSP – 400 C : 300 R : 300 M (or 300 CC) 4 SSP – 300 C : 250 R : 150 M : 300 CC6 SSP – 150 C : 250 R : 100 M : 200 SC : 100 GC : 200 CC	93	77.5
28.	What is the ideal size of fish seed for stocking ?	67	55.83
29.	Whether supplementary feeding is necessary in CFC?	104	86.67
30.	Name the commonly used supplementary feeds.	111	92.5
31.	What is the best method of feeding ?	81	67.5
32.	Generally supplementary feeding in provided at	46	38.33
33.	After stocking, once in how many days should manuring be done ?	87	72.5
34.	Do you know the recommended manuring schedule to be practiced after stocking ?	102	85
35.	Do you known the indicators of oxygen depletion in fish pond ?	105	87.5
36.	Is it necessary to stop manuring and feeding when pond water turns greenish ?	87	72.5
37.	Name any fish disease that occurs in fish culture ponds	104	86.67
38.	How do you control disease outbreaks ?	78	65
39.	Is it necessary to check the growth after stocking ?	47	39.17
40.	In general, after how many months of stocking should the fish crop be harvested ?	56	46.67
41.	What should be the optimum size of harvesting ?	67	55.83

management and pond preparation issues which involved scientific aspects by 38 to 58 per cent of respondents.

Path analysis

The path analysis presented in table-3 indicated that innovative proneness was the most potent variable in effecting the knowledge of farmers positively. The direct effect (0.3613) of this variable was highest. Indirectly it was exerting influence through mass media participation, extension agency contact and risk orientation. Incidentally this variable was being used by as many as ten variables in exercising their indirect influence, which indicate its significant role on knowledge. Next in order of importance was extension agency contact, which had 0.4202** correlation coefficient, 0.2217 direct effect and 0.2403 indirect effect on the knowledge of farmers. Its total indirect effect was channelised through mass media participation, innovative proneness and economic motivation. This variable is being in directly influenced by to variables.

It is quite logic to assume that those farmers who had more extension agency contact would like to acquire more knowledge on scientific fish culture practices. The mass media participation was positively correlated and contributing significantly to the variation in the knowledge. Its direct effect (0.1240) and total indirect effect (0.2470) was found to be additive. This showed that who had more exposure to mass media such as radio, television, news Paper etc. acquire, more knowledge on scientific fish culture practices.

CONCLUSION

As whole it would be concluded that majority of respondent (50.8%) of the study area having medium level of knowledge toward scientific fish culture. It is worth to increase innovative proneness, extension agency contact and mass media participation. Hence, it was suggested that technology dissemination system must focused on these variables by organising awareness campaigns, field day, demonstration, exhibitions, krishan gosti, krishan mela *etc.* So that farmers could able to accrue latest knowledge on scientific fish culture practices.

REFERANCES

Awasthi, H.K., Singh, P.R. and Sharma, R.N. 2000. Knowledge and attitude of dairy farmers towards improved diary practices, *Maharashtra Journal Extension Education.* 19, 290-292.

Mahandra Kumar, K. 1996. Communication behaviour of fish farmers in Tamil Nadu, Ph.D. thesis, CIFE, Mumbai.

Meeran, N.M. 1983. A study on the adoption behaviour of fish farmers, M.Sc. (Ag). thesis (unpub.), Agricultural College and Research Institute, Madurai, TNAU.

Praveena, I. 1993. A study on the constraints in adoption of fish culture as perceived by fish farmers of Nellore district of Andhra Pradesh. M.Sc. thesis, EEI, APAU, Hyderabad.

Sarangi, N. and Jena,J.K. 2005. Including promising species. The Hindu Survey of Indian Agriculture, 137.

Table 3: Path analysis of selected independent variables with knowledge of fish farmers towards scientific fish culture practices

Variable code	Variables	Correlation coefficient	Direct effects	Rank	Total indirect effect	Rank	variables through which substantial indirect effects are channeled through		
							I	II	III
Socio-personal variables									
X5	Education	0.3150	0.1161	5	0.1954	12	0.1284 (X_{15})	0.0899(X_{13})	0.0618(X_{12})
X6	Fish farming experience	0.3295	0.1049	6	0.2246	11	0.1453(X_{13})	0.0463(X_{15})	0.0340(X_{14})
Socioeconomic variables									
X8	Annual income	0.2407	0.0410	10	0.2371	10	0.1015 (X_{15})	0.053(X_{12})	0.037(X_{13})
X9	Land holding	0.2027	0.0423	9	0.2501	6	0.0704(X_{15})	0.042(X_{17})	0.037(X_{19})
X10	Social participation	0.2831	0.0432	8	0.2406	8	0.0775(X_{13})	0.065(X_{15})	0.035(X_{14})
Communication variable									
X12	Mass media participation	0.3771	0.1240	4	0.2470	7	0.0385(X_{13})	0.0214(X_{15})	0.0112(X_{18})
X13	Extension agency contact	0.4202	0.2217	2	0.2403	9	0.1160(X_{12})	0.0597(X_{15})	0.00485(X_{19})
X14	Cosmopoliteness	0.4312	0.0529	7	0.4823	2	0.2390(X_{15})	0.1238(X_{13})	0.0582(X_{12})
Psychological variable									
X15	Innovative proneness	0.5160	0.3613	1	0.2847	5	0.1471(X_{12})	0.0534(X_{13})	0.0494(X_{18})
X17	Value orientation	0.4920	0.1794	3	0.3654	4	0.1943(X_{13})	0.1137(X_{12})	0.0597(X_{15})
X18	Risk orientation	0.5127	0.0235	12	0.4221	3	0.1278(X_{15})	0.0.0617(X_{12})	0.0540(X_{5})
X19	Economic motivation	0.4093	0.007	13	0.5004	1	0.2272(X_{18})	0.1310(X_{13})	0.0529(X_{10})
Situational variable									
X23	Extent of weed infestation	0.1963	0.034	11	0.1885	13	0.0576(X_{10})	0.0528 (X_{19})	0.0264(X_{14})

Residual effect : 0.4593