

## Factors Affecting Attitude of Fish Farmers towards Scientific Fish Culture in West Bengal

Biswajit Goswami<sup>1</sup>

1. Lecturer (Fishery Sc.), Dakshin Dinajpur KKV, UBKV, D. Dinajpur-733133

Corresponding author e-mail: bisug2003@gmail.com

### ABSTRACT

*The present study was carried out during 2005-2008 in the purposively selected North 24 Parganas district of West Bengal focused on the factors influencing attitude of fish farmers towards scientific fish culture practices. The data were gathered using a structured and pre tested interview schedule from 120 randomly selected fish farmers. The findings revealed that majority of fish farmers were middle aged group category. Overall education level is medium that is, primary and middle school level. Majority of fish farmers possessed low to medium level of experience in fish farming. Majority of the fish farmers belonged to medium social participation, low land holding and high income group as they have other source of income. Majority of farmers belonged to high to medium level of innovative proneness and medium level of value orientation, risk orientation and economic motivation. Most of the farmers belonged to low to medium level of credit orientation, and possessed medium to high level of knowledge. Majority of the farmers exhibited medium level of mass media participation and medium to low level of extension agency contact while their cosmopolitanism was high. Majority of the ponds were medium to small sized and water holding capacity were low to medium and rainfed. Most of the ponds were infested with weeds and the extent of weed infestation was low. The attitude of the majority of the fish farmers in North 24 Parganas varied from medium favourable to more favourable attitude towards scientific fish culture practices. However, nearly 1/5th of them were in less favourable category. In North 24 Parganas, out of 24 variables included in the study, 10 variables were positively and significantly related with the attitude of fish farmers towards scientific fish culture practices. Among the variables, all the psychological (except credit orientation), communication factors (except extension agency contact) education, annual income, social participation were positively and significantly related with attitude towards scientific fish culture Path analysis revealed that knowledge about scientific fish culture exhibited highest positive direct effect on the attitude of fish farmers towards scientific fish culture followed by the variables, cosmopolitanism, economic motivation, occupation and family type. Among the total indirect effects, the highest and lowest favourable contributions were by the variables value orientation, age respectively. Majority of the substantial indirect effects were channelised through value orientation, knowledge, cosmopolitanism, economic motivation, family type. Hence, these factors emerged as most dominant variables in influencing the attitude of fish farmers. Hence, these factors emerged as most dominant variables in influencing the attitude of fish farmers. Hence, in the context of climate change, it is a practical challenge for social science to mitigate the problem through technology dissemination system which must be focused on these variables by organizing extension methods.*

**Keywords:** Scientific fish culture; Attitude; Fish farmers;

**F**ish has nearly ever been occupying an important place in the global food basket as a relatively cheap source of animal protein with higher consumer acceptability. Fish and fisheries have gained considerable importance both as a source of nutrition and as a source of steady and growing income at various levels - individual, state and national. Coming to the Indian

scenario, the fisheries sector occupies a unique status in the national economy and provides employment opportunities to a significant section of the growing population in the country. In the last 50 years fish production has increased substantially with a corresponding reflection on a rising trend of its contributions to the gross domestic product (GDP) and

the country's export earning. The present annual fish production is about 11.70 lakhs tones. But the state incidentally is the highest consumer of fish. The contribution of West Bengal to the total production of the country is about 18.28 per cent while the contribution of West Bengal to total consumption of fish food is about 28.57 per cent. There is a gap in between supply and demand.

Attitude is the degree of positive and negative feelings associated with some psychological object towards which people differ in varying degrees. It is developed in three phases, firstly towards the object, then the effect connected with the object and finally the action that can be undertaken with respect to that object. Attitudes are not innate but are formed as a result of the individual contact with object and its environment (Supe, 2002).

Scientific fish culture involves stocking and growing two or more compatible and complementary fish species like, Indian Major Carps (IMC) and exotic carps in a water body like pond to maximize the fish production by fullest utilization of all available niches in the pond ecosystem. The principle behind the scientific fish culture is to produce maximum quantity of fish per unit area from a scientifically managed water body by stocking fast growing, economically important, compatible species having shortest food chain utilizing the all ecological niches of the water body.

Research in aquaculture is a valuable input to increase and stabilize production. With this guiding principle in view the last three decades have made sustained research efforts, which resulted in the development of modern high-yielding production technologies. The results of the research which are found to be relevant for general adoption are tested for their feasibility and economic viability on the farmers' fields in the target area, before they are accepted for inclusion into modern technology, which is a combination of several tested practices comprising a 'package'. The package is then transferred to the farmers. An important precondition to a sound economy is a balanced growth of research and extension system. In fact, the two systems are complementary to each other and must go hand in hand. However, it is a pity that this important fact was not fully realized earlier. There is a wide gap between what could be achieved and what is being achieved on the farm. A big gap exists between available technologies and their rapid transfer to the farmer. It is

estimated that only 20-25% of the modern technologies developed are used under actual field condition in India. Despite all the rich profitability of the technology of scientific fish culture practices the extent of, its spread has still remained insignificant due to various reasons. The present study has been designed to investigate some factors which closely related with the attitude of fish farmers towards scientific fish culture, so that the knowledge could be used in rapid diffusion of the scientific technology to the fish farmers.

Keeping in view the dearth of such studies especially in West Bengal, the present study was undertaken with the following objectives –

- i. To ascertain the attitude of fish farmers towards scientific fish culture.
- ii. To determine the factors affecting the attitude of the fish farmers with regard to scientific fish farmers
- iii. To bring out the relationship of socio economic and psychological characteristics of fish farmers with attitude towards scientific fish culture.

## METHODOLOGY

The present study was carried out using *ex-post facto* research design during 2005-06 in the purposively selected North 24 Parganas District of West Bengal. A combination of purposive and systematic random sampling procedures 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 twenty two Development Blocks in North 24-Parganas 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 each were selected by simple random sampling technique. In 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 dependent variable, attitude of fish farmers towards scientific fish culture, was quantified by Scale developed by Nagarajaiah (2002). Based on a

thorough review of relevant literature and discussion with the experts in the subjects, a total of 24 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 researchers study. The data were collected with the help of structured and pre tested interview scheduled developed for this purpose from the respondents through personal interview.

## RESULTS AND DISCUSSION

The distribution of respondents based on their level of attitude towards scientific fish culture practices is shown in Table 1. Almost an equal percentage of fish farmers belong to either medium favourable attitude category (40.8%) or more favourable attitude category (35%), as to their response towards scientific fish culture practices, which in turn indicates a positive attitude amongst the greater number of fish farmers. However, 22.5 per cent of the respondents (25.8%) show a less favourable attitude. The mean attitude scores of the less favourable, favourable and more favourable categories are 61.3, 66.5 and 78.2 respectively.

**Table 1. Distribution of respondents based on their level of attitude of fish farmers towards**

Attitude categories	No.	%	MAS*
Less favourable	27	22.5	61.3
Medium favourable	49	40.8	66.5
More favourable	44	36.7	78.2

\*Mean attitude scores

The plausible explanation for favourable attitude of the respondents towards scientific fish culture is that the age group of the majority of them varies from young to middle aged which is conducive to their being responsive to new ideas on fish culture practices. Acquisition of skills has given them better confidence, which in turn has led to a favourable attitude. These findings are in agreement with those of *Ponnappan (1982)*, *Balasubramaniam (1988)*, *Haque (1989)*, *Mahandra Kumar (1996)* and *Talukder (2000)*. Further, another favourable factor of training has done a lot to brining about a suitable change in the attitude of the trainees towards prawn farming, as also viewed by *Basava Kumar and Yaligar (2000)*.

Majority of fish farmers in North 24 Parganas belonged to the middle aged group. Overall education level was up to medium school level that is, primary to middle high school. Majority of fish farmers belonged to medium social participation, low land holding and high income group as they have other source of income. Majority of farmers belonged to high to medium level of innovative proneness and medium level of value orientation, risk orientation and economic motivation. Most of the farmers belonged to low to medium level of credit orientation, and possessed medium to high level of knowledge. Majority of fish farmers exhibited medium level of mass media participation and medium to low level of extension agency contact while their cosmopolitaness was high. Majority of the ponds were medium to small sized and water holding capacity were low to medium and rainfed. Most of the ponds were infested with weeds and the extent of weed infestation was low. Table 2 revealed that among the variables, all

**Table 2. Relation analysis of different independent variables with the attitude of fish farmers towards scientific fish culture as dependent variable (n=120)**

Independent Variables	Correlation coefficient (r)
Age	-0.147 NS
Caste	-0.172 NS
Family size	0.134 NS
Family type	0.141 NS
Education	0.184*
Fish farming experiences	0.097 NS
Occupation	0.136 NS
Annual income	0.350**
Land holding	0.146 NS
Social participation	0.347**
Possession of fishing equipment	-0.046 NS
Mass media participation	0.331**
Extension agency contact	0.146 NS
Cosmopolitaness	0.480**
Innovative proneness	0.417**
Credit orientation	-0.017 NS
Value orientation	0.330**
Risk orientation	0.237**
Economic motivation	0.322**
Knowledge	0.621**
Size of water body	-0.037 NS
Duration of water availability	0.005 NS
Source of water	0.085 NS
Extent of weed infestation	0.164 NS

NS = Non significant; \* = Significant at 0.05 level of probability; \*\* = Significant at 0.01 level of probability

the psychological (except credit orientation), communication factors (except extension agency contact) education, annual income, social participation were positively and significantly related with attitude towards scientific fish culture.

Education level of fish farmers showed positive and significant relationship with their attitude of fish farmers of district. Similar findings was reported by *Roy and Pathak (2000)*. Annual income exhibited a positive and significant relationship with attitude of fish farmers towards scientific fish culture. This findings was in agreement with the observations by *Raju Naik et al. (1994)*, *Natarajan Muthaiah (1995)*, *Mahandra Kumar (1996)*, *Arabind (1999)* and *Awasthi et al. (2000)*. A positive and significant relationship was found between social participation and attitude of fish farmers towards scientific fish culture. The finding of the study was in agreement with the results obtained by *Prasad (1995)*, *Mahandra Kumar (1996)* and *Nijagonda (2000)*. This might be due to the fact that respondents with high social participation come across different people with diversified experiences and widen the horizon about the enterprise and develop favourable attitude. The variable possession of fishing equipment was not related to attitude of fish farmers. This implied that irrespective of possession of fishing equipment the respondents had their attitude and this variable had no role in developing favourable attitude towards scientific fish culture.

The relationship between mass media participation and attitude of fish farmers was found to be positively significant. The findings of the study were in line with the study reports of by *Natarajan and Muthaiah (1995)* and *Prasad (1995)*. Extension agency contact show a non-significant relationship with the attitude of the fish farmers towards scientific fish culture. This implies that irrespective of extension agency contact the farmers of that district develop their attitude, so this variable has no role in developing a favourable attitude on their part towards fish culture. Cosmopolitanness had positive and highly significant relationship with attitude of fish farmers. The findings are in-agreement with that of *Dixit (1988)*, *Mahandra Kumar (1996)*, *Surekha et al. (1997)* and *Awasthi et al. (2000)*.

It evident from the results that positive and highly significant relationship of innovative proneness existed with attitude of respondents towards scientific fish culture. The results implies that higher the innovative

proneness, more favourable would be attitude towards enterprise. Innovative proneness is product of confidence and conviction for which favourable attitude is pre-requisite. Similar finding was reported by *Nagarajaiah (2002)*. A positive and highly significant relationship was found between value orientation and fish farmers' attitude towards scientific fish culture. It may be inferred that value orientation had influence on the attitude formation. The findings of the study were in conformity with the findings reported by *Dana (1987)*.

The results of the study revealed a positive and highly significant relationship between risk orientation and attitude of respondents towards scientific fish culture. A fish farmer convinced about the advantages of new technology will take risk and might develop favourable attitude towards it. The results implied that higher the risk orientation, more favourable would be attitude. The findings was in agreement with the results of the study by reported by *Prasad (1995)*, *Mahandra Kumar (1996)*, *Awasthi et al. (2000)*, *Balasubramaniam et al. (2001)* and *Nagarajaiah (2002)*. However, the results reported by *Siddaramaiah and Reddy (1993)* differed from the findings of the present study.

A positive and high significant association was found between economic motivation and attitude of fish farmers towards scientific fish culture. Trained respondents with higher economic motivation have wider exposure to various sources of information and extension services to know more about improved technologies. The acquired knowledge about scientific fish farming with economic motivation leads to develop favourable attitude towards scientific fish culture. The findings of the study was in conformity with the findings of *Ponnappan (1982)*, *Perumal et al. (1988)*, *Prasad (1995)*, *Mahandra Kumar (1996)*, *Awasthi et al. (2000)* and *Nagarajaiah (2000)*.

Knowledge exhibited positive and significant relationship with the attitude of fish farmers. The results imply that respondents with more knowledge have more favourable attitude towards scientific fish culture. To conclude, it may be said that farmers having high knowledge level had favourable attitude. The above results was found in conformity with the findings of *Sidhu (1980)* and *Nagarajaiah (2002)*.

All the 24 variables, when pooled together explained 56 percent variation in the attitude of the fish

farmers and significant contribution to the variation was attributed to variables viz., caste, family size, annual income, cosmopolitanness, innovative proneness, knowledge and size of the water body.

Path analysis (Table 3) revealed that knowledge about scientific fish culture exhibited highest positive direct effect on the attitude of fish farmers towards scientific fish culture followed by the variables, cosmopolitanness, economic motivation, occupation and family type. Among the total indirect effects, the highest and lowest favourable contributions were by the variables value orientation, age respectively. Majority of the substantial indirect effects were channelised through value orientation, knowledge, cosmopolitanness, economic motivation, family type.

Hence, these factors emerged as most dominant variables in influencing the attitude of fish farmers.

Knowledge, value orientation, cosmopolitanness, economic motivation, family type, innovative proneness, annual income, family size and size of water body play an important role in developing the attitude of the respondents towards scientific fish culture practices. Hence, these factors emerged as most dominant variables in influencing the attitude of fish farmers. Any positive change in these variables would lead to the development of favourable attitude amongst the fish farmers. These results are in strongly corroborated by the findings of step wise multiple regression analysis.

**Table 3. Path coefficient showing direct, indirect and substantial indirect effects of independent variables on attitude of fish farmers towards scientific fish culture practices**

SN	Variables	Correlation coefficient	Direct effects	Rank	Total indirect effect	Rank	Variables through which substantial indirect effects are channeled through		
							I	II	III
X1	Age	-0.150	0.062	11	-0.212	23	0.085(X20)	0.077(X3)	0.065(X4)
X2	Caste	-0.170	-0.097	17	-0.073	19	0.105(X7)	0.093(X14)	0.047(X17)
X3	Family size	0.130	0.228	6	-0.098	20	0.149(X4)	0.066(X19)	0.048(X21)
X4	Family type	0.140	0.272	5	-0.132	21	0.125(X3)	0.058(X8)	0.057(X17)
X5	Education	0.180	0.110	9	0.070	12	0.154(X14)	0.141(X20)	0.101(X17)
X6	Fish farming experience	0.100	-0.165	19	0.265	8	0.121(X20)	0.098(X17)	0.078(X19)
X7	Occupation	0.140	0.291	4	-0.151	22	0.082(X21)	0.077(X6)	0.070(X20)
X8	Annual income	0.350	0.205	7	0.145	10	0.171(X20)	0.170(X21)	0.168(X17)
X9	Size of land holding	0.150	0.153	8	-0.003	17	0.197(X21)	0.161(X20)	0.141(X17)
X10	Social participation	0.350	-0.123	18	0.473	2	0.216(X20)	0.187(X14)	0.148(X17)
X12	Mass media participation	0.330	0.029	13	0.301	6	0.271(X20)	0.187(X14)	0.161(X17)
X13	Extension agency contact	0.150	-0.201	21	0.351	5	0.215(X14)	0.171(X20)	0.124(X17)
X14	Cosmopolitanness	0.480	0.467	2	0.013	15	0.286(X20)	0.222(X17)	0.161(X19)
X15	Innovative proneness	0.420	0.002	14	0.418	3	0.224(X14)	0.211(X20)	0.128(X19)
X16	Credit orientation	-0.020	-0.032	15	0.012	16	0.067(X17)	0.060(X19)	0.057(X4)
X17	Value orientation	0.330	-0.336	22	0.666	1	0.308(X14)	0.301(X20)	0.209(X19)
X18	Risk orientation	0.240	-0.174	20	0.414	4	0.233(X14)	0.226(X20)	0.197(X19)
X19	Economic motivation	0.320	0.299	3	0.021	13	0.252(X14)	0.246(X20)	0.235(X17)
X20	Knowledge	0.620	0.502	1	0.118	11	0.266(X14)	0.202(X17)	0.146(X19)
X21	Size of water body	-0.040	-0.340	23	0.300	7	0.155(X17)	0.146(X19)	0.103(X8)
X22	Duration of water availability	0.010	0.037	12	-0.027	18	0.170(X21)	0.094(X17)	0.093(X3)
X23	Source of water	0.090	0.073	10	0.017	14	0.055(X20)	0.043(X4)	0.039(X8)
X24	Extent of weed infestation	0.160	-0.094	16	0.254	9	0.122(X4)	0.072(X8)	0.061(X7)

Residual effect : 0.604

## CONCLUSION

The study revealed that majority of the fish farmers possessed medium favourable attitude to more favourable attitude towards scientific fish culture practices. Knowledge, value orientation, cosmopolitanism, economic motivation, family type, innovative proneness, annual income, family size and size of water body reflected the strong association and effect with the attitude and these factors emerged as most dominant variables in influencing the attitude of fish farmers. Based on the above findings the study recommends the following to bring about change in the attitude of fish farmers in order to promote large scale adoption of scientific fish culture to increase fish production as well as their socio economic conditions.

- Make adequate use of various teaching methods effectively like demonstration, field day, On-farm testing, exhibition, film show, educational tour, campaigns, farm clinic, seminar, workshop and information communication technology like radio, TV, different audio visual aids and internet, etc. for raising the level of knowledge on different aspects of scientific fish culture together with marketing and cultural practices.

- Economic benefits of scientific culture need to be vividly focused to change attitude of the fish farmers to adopt scientific fish culture practices.
- Cosmopolite methods like exposure visits, study tours etc need to be organized by the concerned extension agency.
- More number of younger fish farmers need to be encouraged in training on scientific fish culture practices.
- It is urgently needed to recognize and reorient the fishery extension system with limited resources and scarce extension staff to provide technical and input support to the farmers to enhance knowledge, positive attitude and adoption level through administrative and policy measures.
- It is necessary to formulating and monitoring of visit schedule of extension official with creation of monitoring and evaluation cell at apex level by the decision makers.

*Paper received on* : October 26, 2010

*Received after revision* : June 07, 2011

*Accepted on* : September 13, 2011

## REFERENCES

1. Awasthi, H.K., Singh, P.R. and Sharma, R.N. (2000). Knowledge and attitude of dairy farmers towards improved dairy practices. *Mah. J. Ext. Edu.* **19** : 290-292.
2. Arivand, N. (1999). Homestead Agro-forestry system in Kerala – Farmers perception and attitude, M.Sc. thesis (Unpub.), U.A.S., Bangalore.
3. Balasubramaniam, S. (1988). Analysis of technology transfer effectiveness in inland fish farming. Ph.D. thesis (unpub.), TNAU, Coimbatore.
4. Balasubramaniam, S., Bihari, B and Mohan, B. (2001). Socio-economic status of marine fishermen in two fishing villages of Orissa. *Fishery Technology.*, **38** (1) : 51-55.
5. Basavakumar, K.V. and Yaligar, D.M. (2000). Impact of training on the knowledge and opinion of trainees on brackish water prawn farming. *Karnataka J. Agril. Sci.* **13** (3) : 707-711.
6. Dana, S.S. (1987). A study of factors affecting the attitude of livestock-owners towards artificial insemination in cattle. M.V.Sc. thesis (Unpub.), IVRI, Izatnagar, U.P.
7. Dixit, S. (1988). A study on the impact of social forestry programme on rural beneficiaries, M.Sc. (Ag.) thesis (Unpub.), U.A.S., Bangalore.
8. Haque, M.A. (1989). Composite fish farming technology for rural development. In : Ray, G.L. (Ed.), *Agricultural Technologies for Rural development*, Vikas Publishing House Pvt. Ltd., New Delhi.
9. Mahandra Kumar K. (1996). Communication behaviour of fish farmers in Tamil Nadu, Ph.D. thesis (unpub.), CIFE, Mumbai.
10. Nagarajiah, C.S. (2002). A study on knowledge attitude and extent of adoption of composite fish culture practices in south Karnataka. Ph.D. thesis (Unpub). Central Institute of Fisheries Education, Versova, Mumbai-400061.
11. Natarajan, K. and Muthaiah, M. (1995). Attitude of farmers towards social forestry programme. *J. Ext. Edu.*, **6** (1) : 1089-1090.
12. Nijagonda, H. (2000). A study on attitude, communication and marketing pattern of red gram growers in Bidar district, M.Sc. (Ag.) thesis (Unpub.), U.A.S., Bangalore.

13. Perumal, G., Ponnappan, C. and Balasubramaniam, S. 1988. Attitude of fish farmers towards Fish Farmers Development Agency (FFDA), *Rural Development Reviews, TNAU*, **7** : 667-668.
14. Ponnappan, C. (1982). Fish Farmers Development Agency Programme : An analysis. M.Sc. (Ag.) thesis (Unpub.), TNAU, Coimbatore.
15. Prasad, M.S. (1995). Adoption of dry land agriculture technologies by farmers of Ranga Reddy district (AP). A Retrospective Analysis, Ph.D. thesis, U.A.S., Dharwad.
16. Raju Naik, H., Sundara Swamy, B. and Ansaraj, M.R. (1994). Attitude of farmers towards seed supplying agencies as influenced by their personal and socio-economic characteristics. *Mah. J. Ext. Edu.* **13** : 183-186.
17. Roy, L. and Pathak, M. (2000). Attitude of farm women towards post harvest activities. *Indian J. Ext. Edu.* **36** (1&2) : 82-84.
18. Siddaramaiah, B.S. and Reddy, H.C.V. (1993). Attitude and adoption behaviour of farmers towards watershed management. *Mysore J. Agri. Sci.* **27** (3) : 291-296.
19. Sidhu, K.S. (1980). A study of dimensional variation in the knowledge of dairy farmers of I.C.D.P. and non-I.C.D.P. area of Punjab. M.Sc. thesis (unpub.), Kurukshetra University, Kurukshetra.
20. Supe, S.V. (2002). Introduction to Extension Education. 4th edu. Chapter 2nd, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
21. Surekha, S., Pemalatha, B. and Nagaraja, N. (1997). Attitude of farmers towards watershed development. *Mah. J. Ext. Edu.*, **16** : 82-85.
22. Talukdar, P.K. (2000). Knowledge level and extent of adoption of composite fish culture practices by aquaculturists in Sonitpur district of Assam. M.F.Sc. thesis (unpub.), CIFE, Mumbai.

\*\*\*\*\*