

Level of Knowledge of Brackishwater Shrimp Farmers about the Improved Practices in Shrimp Farming

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The study was undertaken to ascertain the level of knowledge of brackishwater shrimp farmers about the improved practices in shrimp farming in the State of Kerala and to find out the relationship of socio-psychological and economic characteristics with level of knowledge. A group of 100 shrimp farmers from six maritime Districts of Kerala State viz., Kollam, Alappuzha, Ernakulam, Thrissur, Kozhikode and Kannur was selected using Proportionate Random Sampling technique which constituted the sample for the present study. The results of the study show that majority of the respondents possessed medium level of knowledge (93%). Only five per cent of the farmers possessed high level of knowledge while two per cent had low level of knowledge in brackish water shrimp farming. Age, occupation, experience, annual income, farm-size, and indebtedness showed non-significant association with level of knowledge of brackish water farmers whereas, education, information source utilization, risk orientation, social participation, marketing orientation and extension participation were positively and significantly correlated.

Key words : Knowledge, Brackish water, Shrimp farmer, Aquaculture

During the early nineties, the growth in aquaculture production has been driven by shrimp farming in view of its economic importance and export potential. But the farmers resorted to intensive culture practices with increased level of feed, seed, fertilizer etc. which adversely affected the environment and threatened the long-term sustainability of shrimp farming. Therefore, concerted efforts were made to ensure sustainable shrimp production and to augment income of farmers and other stakeholders. Brackish waters are also utilised for shrimp farming. It is necessary to give maximum attention for the sustainable development of brackish water farming providing due consideration to the principles of economic development, social security and environmental protection

(Parthasarathy and Nirmala, 2000). Different agencies direct their efforts in increasing the level of knowledge of shrimp farmers and to ensure the adoption of better management practices. Several studies indicate that better knowledge leads to greater adoption of a technology (Pathak & Sasmal, 1992; Sanoria and Sharma, 1983, Somasundaram and Singh, 1978). Therefore, high priority should be given for the dissemination of adequate knowledge about improved practices in shrimp farming so as to ensure sustainable shrimp production for the future. The present study is undertaken to ascertain the level of knowledge of the shrimp farmers about the improved practices in shrimp farming and to find out the relationship of socio-psychological and economic factors with level of knowledge.

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Materials and Methods

The study was conducted among shrimp farmers in the six maritime Districts of the Kerala State viz., Kollam, Alappuzha, Ernakulam, Thrissur, Kozhikode and Kannur. The extensive brackish water resources like prawn filtration fields and public sector brackishwater farms of the State provide great scope for the development of shrimp farming. Hundred shrimp farmers covering the above Districts were selected for the study using Proportionate Random Sampling technique which constituted the sample for the present study. Strengthening of the dykes and deepening of the channels, fixing and repairing of the sluice gate, draining and raking of pond bottom, drying the pond, removal of aquatic weeds, eradication of existing fishes, liming, application of organic fertilizer, stocking the seeds, acclimatization of the seeds, nursery rearing, supplementary feeding, maintenance of dissolved oxygen level, monitoring and control of pH, control of algal blooms, need based water exchange, need based control of disease and parasites, periodic assessment of growth and biomass, and harvesting crop at most economic size were the improved practices identified for the study. For measuring the level of knowledge, a knowledge test was developed based on the procedure developed by Popat et al. (1985). Initially a set of 50 questions depicting the level of knowledge of the farmers on the above 19 improved practices were prepared and subjected to relevancy rating by 30 experts working in the field of fisheries. The range of relevancy ratio was 1.36 to 3. Forty four items with relevancy ratio above 2.74 (mean) was selected for pre-testing and administered to 30 shrimp farmers prior to the preparation of the final schedule. The responses of the farmers were used for item analysis. Item analysis yielded two kinds of information viz., index of item difficulty (P-value) i.e, the

percentage of respondents answering an item correctly and index of item discrimination ($E^{1/3}$) i.e, the extent to which an item discriminates the well informed individual from poorly informed ones. The index of item difficulty ranging from 50 to 83.33 and discrimination index between 0.3 to 0.8 was considered for final knowledge test. The split half method was used to test the reliability. The final selection of items for knowledge test was made on the aforesaid criteria and 22 items in brackishwater shrimp farming were selected which formed the actual format of the knowledge test. A well structured interview schedule was used to collect the data from the respondents. Each correct answer was given a score of one and the incorrect response zero. Based on the summation of scores for the correct answer for all items of a particular respondent the knowledge index was calculated as shown below,

Knowledge Index =

$$\frac{\text{Total Score obtained} \times 100}{\text{Total number of statements}}$$

Data on socio-psychological and economic profile of the shrimp farmers viz., age, education, occupation, experience, annual income, farm size, information source utilization, indebtedness, risk orientation, social participation, economic motivation and extension orientation were also collected.

Results and Discussion

The average age of the selected group was 46.97 and 67% of the group were middle aged. All had primary education and 58% had high school or above education. Farming alone was the occupation of 62%. Seventy six percentage had medium experience while 13% had low experience. Only 17% of the group had annual income less than Rs.

50,000 and 3% above Rs. 3,00,000. 91% of the farm size was medium and the average farm size was 4 acres. 65% had medium information source utilisation ability. Forty seven percent had no debt and only 4% had debt above two lakhs. Majority had medium level risk orientation, social participation, market orientation and extension participation

Table 1 gives the knowledge of the selected group and 93% belong to the medium knowledge level. These findings are in line with findings of David (2006) who reported that majority of the respondents had moderate level of knowledge regarding fish production technology. The mean knowledge score of the brackish water farmers was 85.31 ± 6.61 .

Table 1. Distribution of brackishwater shrimp farmers according to level of knowledge.

Category	Frequency	Percentage
Low (78 and below)	2	2
Medium (79 – 91)	93	93
High (above 92)	5	5

Correlation was worked out to see whether there exist any relationship between selected characteristics of farmers with their level of knowledge. The correlation coefficients showing the relationship between the level of knowledge of shrimp farmers and twelve independent variables selected for the study are given in Table 2.

Age, occupation, experience, annual income, farm size, and indebtedness showed non-significant association with level of knowledge of brackish water shrimp farmers whereas education, information source utilization, risk orientation, social participation, marketing orientation and extension

Table 2. Correlation between the independent variables and the level of knowledge of the brackish water shrimp farmers.

Variable No.	Independent variables	Correlation coefficients
X ₁	Age	0.043 ^{NS}
X ₂	Education	0.342 ^{**}
X ₃	Occupation	0.142 ^{NS}
X ₄	Experience	0.015 ^{NS}
X ₅	Annual income	0.097 ^{NS}
X ₆	Farm size	-0.0001 ^{NS}
X ₇	Information source utilization	0.218 [*]
X ₈	Indebtedness	0.017 ^{NS}
X ₉	Risk orientation	0.302 ^{**}
X ₁₀	Social participation	0.336 ^{**}
X ₁₁	Marketing orientation	0.370 ^{**}
X ₁₂	Extension participation	0.510 ^{**}

* Significant at five per cent level

** Significant at one per cent level

NS Non Significant

participation were positively and significantly correlated. Education enables the respondents to have an effective interaction with other information sources helping to acquire more information about improved practices. The persons with high risk orientation are usually ready to cultivate different crops, able to face challenges and take risks. These characteristics together with their contact with cosmopolite sources of information will help to increase the level of knowledge. The positive and significant relationship of education, information source utilization and risk orientation with level of knowledge is in consonance with the findings of Mercikutty (1997) and Ashaletha (2000). Social participation provides an opportunity for farmers to interact with one another, thereby sharing the knowledge and experiences, which in turn increases the level of knowledge. This is supported by the findings of Sharma and Sharma (1988) and

Singh et al. (2002). When an individual gets an opportunity to participate in different extension activities like meetings, seminars etc. he is exposed to latest findings of the research system which in turn increases the level of knowledge. Observations of Singh et al. (2002) conform the above findings.

The results of the multiple regression analysis showing contribution of the independent variables acting together in the variations in the level of knowledge of brackish water shrimp farmers are given in Table 3.

Table 3 reveals that 12 independent variables taken together explained the variation to the extent of 42.59 per cent ($R^2 = 0.4259$). This variation was proved significant by F-value.

The multiple regression equation is

$$Y_2 = 55.15 + 0.052 X_1 + 2.036 X_2 + 0.892 X_3 + 0.017 X_4 + 0.506 X_5 + -0.092 X_6 + 0.111 X_7 + 0.185 X_8 + 0.098 X_9 + -0.091 X_{10} + 0.022 X_{11} + 1.253 X_{12}$$

The final result evidenced that out of the total variation of 42.59 per cent explained by 12 independent variables together, 38.2 per cent of the variations in the dependent variable was explained by the variable education (X_2) and extension participation (X_{12}) (Table 4).

The final regression equation in the prediction of dependent variable is $Y_2 = 63.926 + 2.103 X_2 + 1.338 X_{12}$.

It can be predicted that other factors being kept constant, one unit change in the independent variable of education and

Table 3. Regression coefficients for the level of knowledge of brackish water shrimp farmers and independent variables. (n = 100)

Variable No.	Variables	Regression Coefficients	S.E. of 'b'	t value
X_1	Age	0.052	0.082	0.636
X_2	Education	2.063	0.639	3.183**
X_3	Occupation	0.892	0.664	1.343
X_4	Experience	0.017	0.247	0.070
X_5	Annual income	0.506	0.391	1.293
X_6	Farm size	-0.092	0.314	-0.294
X_7	Information source utilization	0.111	0.082	1.354
X_8	Indebtedness	0.185	0.403	0.460
X_9	Risk orientation	0.098	0.365	0.269
X_{10}	Social participation	-0.091	0.284	-0.320
X_{11}	Marketing orientation	0.022	0.942	0.023
X_{12}	Extension participation	1.253	0.312	4.013**
$R^2 = 0.4259$		$F = 5.3794^{**}$	b = regression coefficient	

* Significant at five per cent level of probability

** Significant at one per cent level of probability S.E. = standard error

Table 4. Step-wise regression analysis showing the final step with all the significant variables included in the study of the level of knowledge of brackish water shrimp farmers.

Variables		Partial regression coefficients	S.E. of 'b'	t- value
X ₂	Education	2.103	0.481	4.369**
X ₁₂	Extension participation	1.338	0.208	6.439**
R ² = 0.382			F = 29.95**	

* Significant at five per cent level of probability

** Significant at one per cent level of probability

extension participation leads to corresponding change of 2.103 and 1.338 in knowledge level of brackish water shrimp farmers.

The results of the study pointed out that majority of the respondents had medium level of knowledge. The variables education, information source utilization, risk orientation, social participation, marketing orientation and extension participation had positive impact on the level of knowledge. Therefore more emphasis should be given to these variables while disseminating the technology to shrimp farmers. Knowledge is an important input for the adoption of technology by the farmers. Therefore efforts must be made by the extension agencies to increase the level of knowledge of farmers so as to promote shrimp farming in an eco-friendly manner, ensuring sustainability for the future.

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