Fishery Technology
2005, Vol. 42(2) pp : 225 - 230

Socio-Economic Profile of Shrimp Farmers and its Influence on the Extent of Adoption of Shrimp Culture Technologies

P.S. Swathi Lekshmi*, K. Chandrakandan, M. Kumaran*** and N. Balasubramani***
Tamil Nadu Agricultural University,
Coimbatore - 641 003, India

The study of the socio-economic profile of shrimp farmers of Nellore in Andhra Pradesh and Nagapattinam in Tamil Nadu revealed that 40% of the shrimp farmers had collegiate level of education, and they had medium levels of farming experience, information seeking behaviour, extension contact, economic motivation and risk orientation. The results of correlation analysis revealed that of the seventeen independent variables studied eleven independent variables had positive and significant relationship with the extent of adoption of shrimp culture technologies by shrimp farmers of Nellore. Among the shrimp farmers of Nagapattinam, seven independent variables had positive and significant relationship with the extent of adoption. The results of step wise multiple regression analysis revealed that variables such as information seeking behaviour, credit orientation and material possession explained 48% of the variation in the extent of adoption by shrimp farmers of Nellore and variables like extension contact, risk orientation, farming experience, type of ownership, annual income and material possession explained 84 percent of the variation in the extent of adoption by shrimp farmers of Nagapattinam.

Key words : Shrimp farmers, socio-economic profile, shrimp culture technologies, extent of adoption

Socio-economic profile of the shrimp farmers have a direct bearing on the adoption of technologies. Social and economic factors at various levels of social systems form an environment where people interact through roles and relationships defined by age, education, social participation, economic motivation and other socio-economic variables. In the present study, the influence of socio-economic profile of the shrimp farmers in Nellore in Andhra Pradesh and Nagapattinam in Tamil Nadu on the extent of technology adoption was studied.

Materials and Methods

The research work was carried out in Nellore district of Andhra Pradesh and Nagapattinam district of Tamil Nadu. Out of the three blocks selected in Nellore district, two villages from each block was selected randomly. Employing random sampling procedure 10 Shrimp farmers from each village were selected. With respect to Nagapattinam district, out of the three blocks selected in the district, two villages from each block was selected randomly. Using random sampling procedure 10 shrimp farmers from each village were selected. Thus the total sample size fixed for the study was 120. The sampling method followed was multi stage random sampling.

A total of seventeen independent variables were measured and analysed. These independent variables were measured by standardised scoring procedures, and the cumulative frequency method was used to

*PhD Scholars, T.N. Agriculture University, Coimbatore.
**Professor, Agricultural Extension, T.N. Agricultural University, Coimbatore
***Scientist(SS), Agricultural Extension, Central Institute of Brackish Water Aquaculture, Chennai.

classify the respondents into three categories namely low, medium and high.

The dependant variable studied was the adoption behaviour of the shrimp farmers for selected twelve shrimp farming practices starting from pond preparation till harvest The adoption behaviour was measured using the adoption quotient developed by Balasubramaniam (1988).

$$\text{Adoption quotient} = \frac{\sum_{j=1}^{M}\left\{\frac{ej}{Ej}\times wj\right\}}{\sum_{j=1}^{M} W_j}\times 100$$

ej = Extent of adoption of jth practice in terms of magnitude

Ej = Potentiality for adoption of jth practice in terms of magnitude

wj = Weightage assigned to jth practice

M = No. of applicable practices

Σ = Summation

Statistical techniques such as percentage analysis, cumulative frequency, correlation analysis and stepwise multiple regression analysis were used for the analysis of data.

Results and Discussion

Seventeen profile characteristics of shrimp farmers belonging to the two districts of Nellore and Nagapattinam are presented in Table 1.

It could be observed from Table 1 that out of the total respondents, 47.50 percent of the shrimp farmers were old, 40.00 percent had collegiate level of education, 63.33 per cent had big farm size, 36.67 per cent had medium level of annual income, 70.00 per cent sold their produce to exporters, 56.67 per cent had low level of social participation, 57.50 per cent had medium level of extension contact, 55.83 per cent had medium level of economic motivation, and 84.17 per cent had medium level of credit orientation. Among Nellore farmers, 41.67% had higher secondary level of education, 60.00 percent sold their produce in the local market, 66.67 percent had low level of social participation, 45.00 percent had medium level of extension contact, 66.67 percent had medium level of economic motivation followed by 45.00 percent with medium level of risk orientation. Among Nagapattinam farmers, it could be inferred that 51.67% had collegiate level of education, 36.67 percent had medium level of annual income, and 100.00 percent of the respondents sold their produce to exporters. Most of the shrimp farmers of Nagapattinam (70.00%) had a medium level of extension contact and 68.33 percent had a medium level of risk orientation followed by 93.33 percent with a medium level of credit orientation.

It could be observed from Table 2 that the adoption behaviour of the shrimp farmers was high with respect to practices such as harvesting , pond bottom conditioning, pond bottom sterilization, acclimatisation and stocking of fry, liming of pond, feed management and health management. This finding is in agreement with the findings of Kumaran *et al* (2003) who reported that cent percent of the farmers had adopted pond preparation, stocking of hatchery produced disease checked seed and application of quality pelleted feed practices, as these were a prerequisite for successful culture.

The practices such as measurement of soil pH, manure and fertilizer application and water management had accorded comparatively low adoption behaviour. The farmers resort to measurement of soil pH mostly in new farms, and with respect to manure and fertilizer application, correct usage of ammonium sulphate, urea and super phosphate were not observed. As far as water management practices were concerned, the adoption of effluent treatment plants was done only by very few farmers.

In order to study the relationship between the profile characteristics and the extent of adoption, the correlation analysis of the seventeen profile characteristics with

Table 1. Profile of the respondents

Variable/ Categories	Shrimp farmers (Nellore) (n=60)		Shrimp farmers (Nagapattinam) (n=60)		Total respondents (n=120)	
	No	Percent	No	Percent	No	Percent
Age						
Young	19	31.67	8	13.33	27	22.50
Middle	9	15.00	27	45.00	36	30.00
Old	32	53.33	25	41.70	57	47.50
Educational Status						
Primary	18	30.10	16	26.67	34	28.33
Secondary	25	41.67	13	21.66	38	31.67
Collegiate	17	28.33	31	51.67	48	40.00
Family Type						
Joint	22	36.67	35	58.33	57	47.50
Nuclear	38	63.33	25	41.67	63	52.50
Family Size						
Up to 5	32	53.33	37	61.67	69	57.50
More than 6	28	46.67	23	38.33	51	42.50
Farm Size						
Marginal	15	25.00	5	83.33	20	16.67
Small	8	13.33	16	26.67	24	20.00
Big	37	61.67	39	65.00	76	63.33
Farming Experience						
Low	17	28.33	13	21.67	30	25.00
Medium	26	43.33	29	48.33	55	45.83
High	17	28.33	18	30.00	35	29.17
Occupation Status						
Shrimp farming as Primary	60	100.00	53	88.33	113	94.17
Shrimp farming as Secondary	0	0.00	7	11.67	7	5.83
Annual Income						
Low	20	33.33	20	33.33	40	33.33
Medium	22	36.67	22	36.67	44	36.67
High	18	30.00	18	30.00	36	30.00
Ownership Type						
Owned	53	88.34	56	93.33	109	90.83
Leased in	7	11.66	4	6.67	11	9.17
Marketing Behaviour						
Sold in local market	36	60.00	0	0.00	36	30.00
Procured by exporters	24	40.00	60	100.00	84	70.00
Material Possession						
Low	19	31.67	20	33.33	39	32.50
Medium	21	35.00	27	45.00	48	40.00
High	20	33.33	13	21.67	33	27.50
Social Participation						
Low	40	66.67	28	46.66	68	56.67
Medium	11	18.33	16	26.67	27	22.50
High	9	15.00	16	26.67	25	20.83
Information Seeking Behaviour						
Low	19	31.67	20	33.33	39	32.50
Medium	23	38.33	22	36.67	45	37.50
High	18	30.00	18	30.00	36	30.00
Extension Contact						
Low	17	28.33	18	30.00	35	29.17
Medium	27	45.00	42	70.00	69	57.50
High	16	26.67	0	0.00	16	13.33
Economic Motivation						
Low	7	11.67	19	31.67	26	21.67
Medium	40	66.67	27	45.00	67	55.83
High	13	21.66	14	23.33	27	22.50
Risk Orientation						
Low	13	21.67	8	13.33	21	17.50
Medium	27	45.00	41	68.33	68	56.67
High	20	33.33	11	18.33	31	25.83
Credit Orientation						
Low	3	5.00	3	5.00	6	5.00
Medium	45	75.00	56	93.33	101	84.17
High	12	20.00	1	1.67	13	10.83

Table 2. Adoption behaviour of shrimp farmers

(n=120)

Shrimp farming Practices	Adoption Quotient (in %)
Pond bottom conditioning	8.00
Pond bottom sterilization	95.00
Measurement of Soil Ph	54.00
Liming the Pond	90.00
Use of Predator Eradication	87.00
Manure and fertilizer application	69.00
Acclimatisation and stocking of fry	92.00
Water management	69.00
Soil management	73.00
Feed management	88.00
Health management	83.00
Harvesting	99.00

their extent of adoption was studied, and the results presented in Table 3. From Table 3 it could be observed that out of the seventeen profile characteristics studied, the variables such as educational status, family size, farm size, marketing behaviour, material possession, social participation, information seeking behaviour, extension contact, economic motivation, risk orientation, and credit orientation showed a positive and significant relationship with the extent of adoption of shrimp culture technologies by the shrimp farmers of Nellore, and on the other hand the variable ownership type was found to maintain a negative and significant relationship with the extent of adoption. The correlation co-efficient values of the remaining five independent variables were not significant.

Table 3. Correlation analysis of profile of the respondents with their extent of adoption

Profile Characteristics	Simple Correlation	
	Shrimp farmers Nellore (n=60)	Shrimp farmers Nagapattinam (n=60)
Age	0.180	0.073
Educational status	0.575*	0.301*
Family type	-	0.037
Family size	0.605*	0.440*
Farm size	0.516*	0.146
Farming experience	0.437	0.519*
Occupation status	0.036	0.078
Annual income	-0.030	-0.063
Ownership type	-0.283*	0.005
Marketing behaviour	0.571*	-
Material possession	0.579*	0.376*
Social participation	0.400*	0.273*
Information seeking behaviour	0.610*	0.778**
Extension contact	0.417*	0.797*
Economic motivation	0.242*	0.477*
Risk orientation	0.383*	0.664**
Credit orientation	0.491*	-

** - Signification at 1% level *- Significant at 5% level

Variables like family type (Nellore) and marketing behaviour (Nagapattinam) are excluded from the analysis due to constant scoring.

With respect to shrimp farmers of Nagapattinam, it was observed that variables such as educational status, family size, farming experience, material possession, social participation, information seeking behaviour, extension contact, economic motivation, risk orientation and credit orientation maintained a positive and significant relationship with the extent of adoption.

Table 4. Characteristics of shrimp farmers of Nellore, on the extent of adoption of culture technologies

(n=60)

Sl. No.	Explanatory characteristics	Regression co-efficients	Standard Error	t-value
1.	Information seeking behaviour (X_{13})	0.008	0.003	2.560*
2.	Credit orientation (X_{17})	0.075	0.032	2.375*
3.	Material possession (X_{11})	0.003	0.002	2.047*
	Constant	1.517	0.163	9.330**

* Significant at 5% level ** significant at 1% level

$F = 17.308^{**}$; $R^2 = 0.48$

$Y = 1.517 + 0.008\ X_{13} + 0.075\ X_{17} + 0.003_{11}$

The negative and significant relationship of ownership type with the extent of adoption suggests that, the higher the tendency to possess own farms, the lesser would be the extent of adoption. This finding indicates that when the shrimp farmers take land on lease for shrimp culture, the total investment which they would have otherwise made, by purchasing land is lessened. Hence the farmer would be able to spend wisely on practices such as adoption of improved feed, disease management, soil and water management.

In order to study the influence of profile characteristics on the extent of adoption by shrimp farmers of Nellore, the step wise multiple regression analysis was carried out and the results are furnished in Table 4. From Table 4 it could be observed that out of the seventeen profile characteristics studied, only three profile characteristics namely the information seeking behaviour, credit orientation, and material possession were found to influence the extent of adoption of shrimp culture technologies. On the basis of the multiple regression equation, it may be stated that the extent of adoption of shrimp culture technologies was a function of their information seeking behaviour, credit orientation and material possession.

Table 5. Step wise multiple regression analysis of profile characteristics of shrimp farmers of Nagapattinam, on the extent of adoption of shrimp culture technologies

(n=60)

Explanatory Characteristics	Regression coefficients	Standard Error	t-value
Extension contact (X^{14})	0.035	0.004	8.455**
Risk orientation (X_{16})	0.018	0.004	4.565**
Farming experience (X_5)	0.021	0.006	3.498*
Type of ownership (X_9)	-0.149	0.060	-2.502*
Annual income (X_6)	0.004	0.001	6.150**
Material possession (X_{11})	-0.005	0.002	-2.023
Constant	2.053	0.196	10.467

* Significant at 5% level ** -Significant at 1% level
F = 37.725 ** R^2 = 0.84
$Y = 2.053 + 0.035\ X_{14} + 0.018\ X_{16} + 0.021\ X_5 - 0.149\ X_9 + 0.004\ X_6 - 0.005\ X_{11}$

Further it could be seen that the R^2 value was 0.48 and that the f value was highly significant. This thereby means, that the finally selected 3 independent variables namely information seeking behaviour, credit orientation and material possession together were able to explain 48 per cent of the variation in the extent of adoption of shrimp culture technologies by the shrimp farmers of Nellore.

The stepwise multiple regression analysis of the profile characteristics of shrimp farmers of Nagapattinam on the extent of adoption of shrimp culture technologies is presented in Table 5. It may be observed that that out of the seventeen profile characteristics studied, only six characteristics were found to influence the extent of adoption of shrimp culture technologies by shrimp farmers.

The regression coefficients were significant for extension contact, risk orientation, farming experience, type of ownership, annual income and material possession. On the basis of the multiple regression equation, it may be stated that the extent of adoption of shrimp culture technologies was a function of their extension contact, risk orientation, farming experience, type of ownership and annual income.

Further, it would be observed that the R^2 value was 0.84 and that the F value was highly significant. This thereby means, that the finally selected five profile characteristics namely extension behaviour, risk orientation, farming experience, type of ownership, annual income together were able to explain 84 per cent of the variation in the extent of adoption of shrimp culture technologies, by shrimp farmers of Nagapattinam.

Thus it could be inferred that the extent of adoption of shrimp culture technologies by shrimp farmers of Nellore could be positively influenced by increasing their information seeking behaviour, credit orientation and material possession. Similarly, it

could be inferred that the extent of adoption of shrimp culture technologies by shrimp farmers of Nagapattinam could be positively influenced by increasing their extension contact, risk orientation, annual income and farming experience and negatively influenced by type of ownership. Farmers access to information sources can be enhanced by improving the quality and quantity of government extension services whose efforts may be supplemented and complemented by private extension. Besides, credit orientation of shrimp farmers can be enhanced by providing loans to shrimp farmers by Nationalised banks like NABARD. These measures would serve to further augment the growth of the shrimp industry in the country.

References

Balasubramaniam, S. (1988). *Analysis of Technology Transfer Effectiveness in Inland Fish Farming*, Ph.D. Thesis, TNAU, Coimbatore.

Kumaran. M, Pounusamy K. and Kalaimani N. (2001). *'Diffusion and Adoption of shrimp farming Technologies'*. Paper presented in the International symposium on fish for Nutritional security in the 21st Century, at CIFE, Mumbai, 4-6th December, 2001.