RESEARCH NOTE

Discriminating Factors of High and Low Adopters of Shrimp Farmers in Nagapattinam of Tamil Nadu

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ABSTRACT

Shrimp aquaculture has witnessed a spectacular growth in India during the last decade. Technologies for undertaking shrimp culture on a scientific scale have been developed during the recent past. Adoption of these technologies at the farmers' level depends on a number of factors affecting shrimp culture. A study was conducted among 60 shrimp farmers of Nagapattinam district of Tamil Nadu, India, to find out the factors that discriminate between high and low adoption categories. It was observed that of the 60 shrimp farmers studied, 39 belonged to the high adoption category and 21 belonged to the low adoption category. Further it was observed that the variables having substantial importance in classifying the shrimp farmers into high adoption category and low adoption category were efficiency and feasibility of the technologies used with a relative importance of 85.95 per cent and 14.05 per cent respectively.

Key words : *Shrimp aquaculture; Shrimp culture;*

Innovation by farmers is not always based on economic considerations. The economic profitability of an innovation is a matter of individual perception which is influenced by the personal, social and cultural contexts in which the decision to adopt an innovation is made (*Dasgupta,1989*). Against this background an attempt was made to delineate the factors responsible for categorizing the shrimp farmers into high and low adoption categories based on their perceived attributes of technology, perceived cost and perceived policy. Shrimp farming has become the mainstay of the coastal economy of India. Though shrimp farming was initiated in the country as early as 1989-90, scientific technologies and recommendations were not developed for most of the culture practices (*Meeran, 1996*). It was only after the mid 1990's that technologies for commercial shrimp culture were developed and disseminated to the farmers. The adoption of these improved technologies by the shrimp farmers depends upon the attributes of the technology, cost and policy factors that affect the shrimp industry. While the economic profitability of an innovation is an obvious incentive for adoption, the decision to adopt or reject an innovation depends upon the social and cultural milieu in which the innovation is introduced.

METHODOLOGY

A sample of 60 respondents was drawn from six villages of three blocks in Nagapattinam district of Tamil Nadu State, India. Data were collected with respect to the perceived attributes of technology, cost and policy. The perception of attributes of shrimp culture technologies and policies affecting shrimp culture were measured with the help of scales specifically developed for the purpose.

The selection of attributes and policies affecting shrimp farming was done based on judges ranking, and the selected attributes and policy statements were administered to the shrimp farmers on a five point continuum, ranging from strongly agree, agree, undecided and disagree. The scores of 5, 4, 3, 2, 1 and 1, 2, 3, 4, 5 were assigned for positive and negative criteria respectively. The perception of the cost of shrimp culture technologies were studied based on the scoring procedure developed for the study. For every Rs. 50,000 incurred as expenditure, a score of 1 was allotted. Use of appropriate statistical techniques such as the Discriminant function analysis was done in order to test the significance of the variables in discriminating

the shrimp farmers into two categories namely high adoption category and low adoption category, and also to find out the relative importance of the variables in discriminating between the high and low adoption categories. A linear combination of predictor variables, weighed in such a way that it will best discriminate among groups with the least error is called a linear discriminant function and is given by:

$D=L_1X_1 + L_2X_2 + \ldots\ldots\ldots\ldots + L_KX_K$, where X_i's are predictor variables, Li's represents the discriminant co-efficients, and D is the value of the discriminant function of a particular individual/element such that if this value is greater than a certain critical value D*, the individual is classified in group I i.e. high adoption category, otherwise the individual would be classified in Group II i.e. low adoption category.

The respondents were classified into two groups namely high adoption group and low adoption group, based on the mean adoption score. The predictor variables used for the study were the attributes of shrimp culture technologies (X_1 to X_{12}), perception of cost of technologies (X_{13}), and perception of policies affecting shrimp culture (X_{14}).

RESULTS AND DISCUSSION

From Table 1 it could be observed that out of the 60 shrimp farmers of Nagapattinam, 39 farmers belonged to the high adoption category and 21 farmers belonged to the low adoption category.

Table 1. Classification of Respondents into High and Low Adoption Categories Based on Discriminant Function (N= 60)

Adoption category	Assigned locations using Discriminatory function		Total
	High	Low	
High	38	1	39
Low	20	1	21
Total	58	2	60

It could be observed from Table 2 that the D^2 value was 0.3510 and the f value was highly significant at one per cent level of significance. This implied that the fourteen variables were significantly discriminating between the high and low adoption categories of shrimp farmers. Further, out of the fourteen variables studied, six had shown significant positive influence in differentiating the high from the low adoption categories of shrimp farmers.

The seven variables in the descending order of their

Table 2. Discriminant Function Analysis In Relation To the Relative Importance of Variables In Discriminating Between The Groups (N = 60)

Variables	Discriminant Function Coefficient L(i)	Relative importance = (L(i)*D(i)/D^2 *100 (%)
Efficiency	1.0170	85.95
Feasibility	1.0472	14.05
Immediacy of returns	-0.0992	0
Physical compatability	0.1464	0
Observability	-0.0683	0
Profitability	-0.4081	0
Perceived risk	0.2401	0
Input availability	-0.1684	0
Cost	0.4667	0
Complexity	-0.2506	0
Trialability	-0.8817	0
Multiple advantage	-0.0192	0
Cost of technologies	0.0172	0
Policies	0.2591	0
Total		100.00

$D^2 = 0.3510$ High group (n_1) = 39
Low group (n_2) = 21 F = 16.90*

$D = 1.0170X_1 + 1.0472\ X_2 - 0.992X_3 + 0.1464X_4 - 0.0683X_5 - 0.4081X_6 + 0.241X_7 - 0.1684X_8 + 0.4667X_9 - 0.2506X_{10} - 0.8817X_{11} - 0.0192X_{12} + 0.0171X_{13} + 0.2591X_{14}$

D = value of the discriminant function of an individual Shrimp farmer $X_1, X_2 \ldots\ldots\ldots X_{14}$ = Predictor variables.

importance were Feasibility (1.0472), Efficiency (1.0170), Cost (0.2401), Physical compatibility (0.1464) and Cost of technology (0.0172). This indicated that the increased differential scores in these variables would increase the difference between the high and low adoption categories. It is suggested that the respondents who scored high in these variables might have differentiated more significantly between the high and low adoption categories, among the shrimp farmers.

The analysis also revealed that the remaining seven variables Trialability (-0.8817), Profitability (-0.4081), Complexity (-0.2506), Input +availability (-0.1684), Immediacy of returns (-0.0992), Observability (-0.0683) and Multiple advantage (-0.0192) had shown significant negative discriminant function coefficients in the descending order of their importance. The analysis also revealed that these variables had shown significant negative influence in differentiating the high adoption

category and low adoption categories. This suggested that the respondents who scored high in these variables might have differentiated less between the high and low adoption categories of shrimp farmers.

Further observation of Table 2 shows the relative importance of the variables in discriminating between the high and low adoption categories. It could be seen from the table that the variables having substantial importance in the classification of shrimp farmers into the high adoption category (first group) and low adoption category (second group) were efficiency and feasibility with a relative importance of 85.95 per cent and 14.05 per cent respectively.

CONCLUSION

The study reveals that the attributes of technology namely efficiency and feasibility were found to discriminate between high and low adoption categories of shrimp farmers. Shrimp farming is a highly dynamic system and shrimps are highly sensitive to changes in water quality, dissolved oxygen, soil conditions in the pond, and to disease attack. Efficiency of the technology implies that sufficient time, money and labour should be saved with decrease in discomfort to the farmer. Hence efficiency of technology is warranted in the first place followed by feasibility of the technology.

Feasibility of the technology on the other hand implies the possibility of getting suitable conditions in terms of water sources, inputs such as seed, feed and power. The findings of the study implies that scientists and researchers should concentrate their efforts in developing and standardizing technologies in shrimp farming which are more efficient and feasible.

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