



PERCEPTION OF COST OF SHRIMP CULTURE TECHNOLOGIES AND POLICIES AFFECTING THE ADOPTION OF SHRIMP CULTURE TECHNOLOGIES: A COMPARATIVE STUDY BETWEEN SHRIMP FARMERS OF NELLORE AND NAGAPATTINAM

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Abstract

A study was undertaken to find out the perception of cost and policies affecting the adoption of shrimp culture technologies in the two districts of Andhra Pradesh and Tamil Nadu, India. A total of 120 respondents, 60 from Nellore district of Andhra Pradesh and 60 from Nagapattinam district of Tamilnadu were selected. The results indicate that there was significant difference in the perception of cost of Technologies by the shrimp farmers of Nellore and shrimp farmers of Nagapattinam. An increase in the cost of technologies was not found to affect the extent of adoption of technologies by shrimp farmers of Nellore, but an increase in the cost of technologies namely cost of soil management and cost of pond bottom sterilization was found to negatively influence the extent of adoption by shrimp farmers of Nagapattinam. Further it was observed that there was significant difference in the perception of policies by shrimp farmers of Nellore and Nagapattinam.

Key words: Shrimp culture technologies, shrimp farmers, cost of technologies, policies

Shrimp culture has been listed as one of the priority sectors in India by the Government for increasing export and thereby contributing to the foreign exchange reserves. Out of the Shrimp producing states in India, the highest area under production is in Andhra Pradesh State (79,600 ha), and Tamil Nadu State ranked first with respect to productivity, the productivity being 1674 kg/ha. (Radhakrishnan, 2002). In Shrimp culture, cost of the technologies used and the policies affecting the shrimp culture are crucial factors, which determine the extent of adoption of Shrimp culture technologies.

Hence a study was conducted to find out the influence of cost of technologies and policies affecting Shrimp farming on the extent of adoption of Shrimp culture technologies in Nellore district of Andhra Pradesh and Nagapattinam district of Tamil Nadu respectively.

Materials and Methods

Sixty Shrimp farmers drawn randomly from 6 villages belonging to 3 blocks of Nellore district and 60 farmers from 6 villages belonging to 3 blocks of Nagapattinam district formed the sample for the study. The sampling method followed was the multi stage random sampling.

Cost was operationalised as the expenditure incurred for each of the Shrimp culture technologies adopted by the individual respondent. Cost was measured based on a scoring procedure developed for the study. Thus for every Rs.50,000 a score of 1 was assigned. For measurement of the perception of the shrimp farmers towards the policy issues affecting Shrimp farming, a group of policy issues which secured the first 11 ranks were selected based on Judges ranking. The adoption behaviour of Shrimp farmers was studied by selecting 12 practices/recommendations, starting from pond preparation till harvest based on Judges ranking, and measured by using the adoption quotient developed by Balasubramaniam (1988) using the formula

$$\text{Adoption Quotient} = \frac{\sum_{j=1}^M \left\{ \frac{e_j}{E_j} \times w_j \right\}}{\sum_{j=1}^M w_j} \times 100$$

e_j = Extent of adoption of Jth practice in terms of Magnitude

E_j = Potentiality for adoption of Jth practice in terms of magnitude

w_j = Weightage assigned to Jth practice

M = Number of applicable practices

Σ = Summation

The data was collected using structured interview schedule; and analysed by using statistical techniques such as stepwise multiple regression analysis (step down procedure) and by using the 't' test.

Results and Discussion

Table 1 shows the Perception of cost of Shrimp culture technologies by Shrimp farmers of Nellore. It could be observed from the Table that out of the twelve costs for each of the twelve technologies studied such as the cost of pond bottom conditioning, cost of pond bottom sterilization,

cost of measurement of soil pH, cost of lime application, cost of predator eradication, cost of manures and fertilizers, cost of acclimatization and stocking of fry, cost of water management, cost of soil management, cost of feed management, cost of health management and cost of harvesting; only two costs namely the cost of measurement of Soil pH and cost of pond bottom conditioning were found to positively influence the extent of adoption of Shrimp culture technologies. This might be because measurement of Soil pH and pond bottom conditioning are technologies routinely and commonly adopted by majority of the Shrimp farmers and hence an increase in the cost of these two technologies would still continue to produce a resultant increase in the overall extent of adoption. Further it could be seen from the table that the R^2 value was 0.69 and that the f value was highly significant. Thus the cost of measurement of Soil pH and cost of pond bottom conditioning were able to explain 69 percent of the variation in the extent of adoption of Shrimp culture technologies by Shrimp farmers of Nellore.

Table 1

Stepwise multiple regression analysis of perception of cost on the extent of adoption of shrimp culture technologies by shrimp farmers of Nellore

(n = 60)

S.No.	Explanatory variables	Regression Coefficient	Standard error	t-value	R^2
1	Cost of measurement of soil pH (X3)	3.768	0.438	8.595**	
2	Cost of Pond bottom conditioning (X1)	0.084	0.022	3.779*	0.69*
	Constant	2.128	0.040	53.555**	

$\hat{Y} = 2.128 + 3.768 X_3 + 0.084 X_1$, NS - Non Significant

F value = 57.263* * Significant at 5% level ** Significant at 1% level

Table 2 shows the Perception of cost of Shrimp culture technologies by Shrimp farmers of Nagapattinam.

Table 2

Stepwise multiple regression analysis of perception of cost on the extent of adoption of shrimp culture technologies by shrimp farmers of Nagapattinam

(n = 60)

S.No.	Explanatory variables	Regression Coefficient	Standard error	t-value	R^2
1	Cost of soil management (X9)	-0.252	0.037	-6.868**	
2	Cost of measurement of soil pH (X3)	0.107	0.018	5.850**	
3	Cost of Pond bottom conditioning (X1)	0.036	0.012	2.947*	0.71**
4	Cost of Pond bottom sterilization (X2)	-0.066	0.029	-2.418*	
	Constant	2.590	0.078	33.153**	

$\hat{Y} = 2.590 - 0.252 X_9 + 0.107 X_3 + 0.036 X_1 - 0.066 X_2$, NS - Non Significant

F value = 33.666* * Significant at 5% level, ** Significant at 1% level

A perusal of the table revealed that out of the twelve costs studied only perception of four costs namely cost of soil management, cost of measurement of Soil pH, cost of pond bottom conditioning and cost of pond bottom sterilization were found to influence the overall extent of adoption. It could be further observed from Table 2 that the cost of measurement of Soil pH and cost of pond bottom conditioning exerted a positive and significant influence on the extent of adoption of measurement of Soil pH. Measurement of soil pH and pond bottom conditioning are important technologies which contribute to proper pond maintenance and these technologies have to be essentially adopted by the Shrimp farmers to get a healthy crop. Further, it could be observed that the perception of the two costs namely cost of soil management and cost of pond bottom sterilization were found to exert a negative and significant influence on the extent of adoption of Shrimp culture technologies. This might be because, cost of Soil management includes the cost of Chemicals and labour cost and cost of pond bottom sterilization includes the cost of lime and other Chemicals used and hence an increase in the cost of these components would lead to a decrease in the extent of adoption of Shrimp culture technologies. It could be further seen from the table that the R^2 value was 0.71 and that the f value was highly significant. This meant that the cost of these four technologies were able to explain 71 percent of the variation in the extent of adoption. It could be observed from Table 3 that based on the significant value of 't' that there is significant difference in the perception of cost of technologies by the Shrimp farmers of Nellore and Shrimp farmers of Nagapattinam.

Table 3
Comparison between shrimp farmers of Nellore and shrimp farmers of Nagapattinam with respect to their perception of cost of technologies

(n = 120)

S.No. District	Mean	Standard Deviation	Mean Difference	Std Error of Mean Difference	t-value
1 Nellore (n = 60)	105.47	221.364			
2 Nagapattinam (n = 60) (df = 118)	42.09	27.59	63.38	28.799	-2.201*

A perusal of Table 4 reveals that of all the eleven policies studied, the policies such as antidumping duty likely to be levied on Indian exports of Shrimps by the U.S, the registration of Shrimp farms by Shrimp farmers with the Aquaculture Authority of India (AAI), the guidelines of the AAI for the installation of effluent treatment systems, and the impact of the supreme court verdict on Shrimp exports from India have influenced the extent of adoption of Shrimp culture technologies by Nellore farmers.

Table 4

Stepwise multiple regression analysis of perception of policies on the extent of adoption of shrimp culture technologies by shrimp farmers of Nellore

S.No.	Explanatory variable perception of policies	Regression coefficients	Standard error	t-value	R ²
1	Antidumping duty to be levied on Indian shrimp exports by the U.S. (X ₀)	-0.252	0.037	-6.868	
2	Registration of shrimp farms by shrimp farmers with the AAI (X ₁)	0.107	0.018	5.850	
3	Guidelines of AAI for effluent treatment systems (X ₂)	0.036	0.012	2.947	0.71
4	Impact of supreme court verdict on shrimp exports from India. (X ₃)	-0.066	0.027	-2.418	
	Constant	2.590	0.078	33.153	

$\hat{Y} = 2.590 - 0.252 X_0 + 0.107 X_1 + 0.036 X_2 - 0.066 X_3$ NS - Non Significant

F value = 33.67** * Significant at 5% level ** Significant at 1% level

It could be inferred that the statistically significant and positive regression coefficients of the third policy namely Registration of Shrimp farms by Shrimp farmers with the AAI and the policy namely the guidelines of the AAI for installation of effluent treatment systems indicate that a more favourable perception of these two policies by the Shrimp farmers would in turn increase the extent of adoption of Shrimp culture technologies.

The policy of antidumping duty was found to have a negative influence on the extent of adoption. This might be because, according to the policy the U.S. government would levy taxes on Shrimps exported from India, which in turn would reduce the prices at which Shrimp farmers sell their produce to exporters. With respect to the policy namely the impact of supreme court verdict on Shrimp exports from India, Shrimp farmers are of the opinion that more and more closure of Shrimp farms within the coastal regulation zone (CRZ) would lead to a decrease in the overall extent of adoption of Shrimp culture technologies and hence it would reduce the Shrimp exports from India. Further, it could be seen that all the four policies explained 71 percent of the variation in the extent of adoption of Shrimp culture technologies by the Shrimp farmers of Nellore. As could be seen from Table 5, of the eleven policies studied, only one policy namely the policy of antidumping duty was found to have a negative and significant influence on the extent of adoption of Shrimp culture technologies by Nagapattinam farmers. Besides, this policy explained 21 percent of the variation in the extent of adoption of Shrimp culture technologies by the Shrimp farmers of Nagapattinam. An observation of Table 6 revealed that there was significant difference in the perception of policies by the Shrimp farmers of Nellore and Nagapattinam. The policies with respect to Shrimp farming in the state of Andhra Pradesh

is not very rigid as compared to the state of Tamil Nadu and registration of Shrimp farms with the Aquaculture Authority of India has not been enforced strictly in Andhra Pradesh, as in Tamil Nadu.

Table 5

Stepwise multiple regression analysis of perception of policies on the extent of adoption of shrimp culture technologies

S.No.	Explanatory variable perception of policies	Regression coefficients	Standard error	t-value	R ²
1	Antidumping duty to be levied on Indian shrimp exports by the U.S. (X ₉)	-2.808	0.085	-33.090**	0.21
	Constant	-0.291	0.074	-3.932	

$\hat{Y} = -0.291 - 2.808 X_9$, F value = 15.46**, * Significant at 5% level, ** Significant at 1% level
NS - Non Significant

Table 6

Comparison between shrimp farmers of Nellore and shrimp farmers of Nagapattinam with respect to their perception of cost of policies

(n = 120)

S.No.	District	Mean	Standard Deviation	Mean Difference	Std Error of Mean Difference	t-value
1	Nellore (n = 60)	2.25	0.306			
2	Nagapattinam (n = 60) (df = 118)	2.56	0.163	0.3042	0.0448	6.79**

Shrimp farmers can be motivated to adopt improved technologies by giving incentives such as subsidies for purchase of inputs, feed, seed, and chemicals. Curbing of unfavourable policies such as antidumping duty, speedy implementation of bills such as the perennial pending Aquaculture Authority bill in the parliament in the larger interests of the farmers is warranted for increased shrimp production and productivity in the country.

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