

The Performance of Shrimp Industry in Andhra Pradesh

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ABSTRACT

The present study was conducted to know the performance of shrimp industry in Visakhapatnam, Nellore and West Godavari districts of Andhra Pradesh. The primary data collected from the respondents was analyzed using Likert's summated rating technique, Multiple Linear Regression (MLR), and Responses Priority Index (RPI). The findings of the study has revealed that the majority of shrimp exporters were found to have moderately favorable attitude (43.3 per cent) towards rating of shrimp industry followed by those with highly favorable attitude (33.3 per cent) and low favorable attitude (23.3 per cent). The socio-economic factors influencing the revenue of shrimp industry showed that at 5 per cent level of probability, experience in years was positively significant whereas business operation was negatively significant. At 1 per cent level of probability BAP star rating and quantity of exports were positively significant. Remaining variables viz., age, education and rating of shrimp industry were found non-significant. It could be inferred that availability of quality raw material ranked first as the most important constraint for the exporters followed by high cost of investment and lack of diversified products.

Key words: Attitude, BAP, Likert's technique, MLR, RPI, probability

INTRODUCTION

The state of Andhra Pradesh is strategically located on the South-Eastern coast of India and is the natural gateway to East and South East Asia. Nine out of thirteen districts of Andhra Pradesh are along the coastline with a total length of around 974 km and a continental shelf of more than 33,227 km². The state stands first in aquaculture production from brackish water and fresh water resources and fourth in marine fish production in India. The total potential area for brackish water fishing is around 1,74,000 ha involving more than 15,000 farmers. Mangrove wet lands of 28200 ha is also promoting the brackish water aquaculture in the state and there are a total of 104 reservoirs in the state with 2.40 lakh hectares of water spread area. The total fish production during 2019-20 was reported to be 36.1 lakh tons and 5.5 lakh tons from inland and marine fisheries respectively. With regard to exports, out of the total marine products (13 Lakh MT) exported from India of worth US\$ 6.68 Billion, the share of Andhra Pradesh is 5 lakh tons accounting to a worth of US\$ 2.40 Billion i.e. 42 per cent of total India's production. Andhra Pradesh is first in aquaculture production from brackish water and fresh water resources and fourth in marine fish production in

India. Andhra Pradesh is the top cultured shrimp producer in India. In 2014-15 out of the 130,949 ha under shrimp farming in India, 40,445 ha (31%) was in AP. Out of the all India production of 434,558 tonnes, 279,727 tonnes (64%) is from AP (Source: MPEDA).

Brackish water aquaculture in Andhra Pradesh is almost synonymous with shrimp culture where in during the year 2019-20 out of the 1,00,206 ha (711674 MT) of shrimp farming in India, Andhra Pradesh accounted for 63.55 per cent of area occupying 72 per cent (51074 MT) (MPEDA) of total nations shrimp production. *Penaeus vannamei* and *Penaeus monodon* are the two predominant species cultivated in India. The black tiger shrimp culture i.e. *Penaeus monodon* was introduced in late 1990s and its production has reached to peak in 1994. However continuous outbreak of White Spot Syndrome Virus (WSSV) in *P. monodon* culture has led to collapse of shrimp culture in India (Balakrishnan et. al. 2011). The establishment of Coastal Aquaculture Authority during 2005 in India has helped to regulate and frame the guidelines for the shrimp farming in coastal areas based on the previous experiences faced by the farmers in tiger shrimp and they have successfully introduced

Penaeusvannamei, a shrimp variety in 2009, following which the Government of India has to take up a large scale production of the same species for commercial purpose.

In fact, fisheries sector has been identified as a growth engine for socio-economic development of the new state of Andhra Pradesh. The Government of Andhra Pradesh created a policy for the rapid growth in aquaculture during 2015-20 with a vision to promote Andhra Pradesh as the “Aqua hub of India”, by setting a mission on aquaculture in order to promote export market through quality management, packaging, labeling, marketing and brand development. However, as far as the production of shrimp is concerned, it faces few challenges like production of quality seed, lack of access to modern technology, credit facilities, transportation services and domestic market development etc. Hence, with this background, the study has been chosen with an objective. To assess the performance of shrimp industry in Visakhapatnam, Nellore and West Godavari districts and to identify the opportunities to augment foreign exchange reserves.

METHODOLOGY

The present study was conducted during the year 2018-19 and for the purpose of the study, data has been collected on the socio economic factors and problems encountered by the exporters through survey method. The study was conducted in three districts of Andhra Pradesh which were selected based on export potential and processing of shrimp i.e. Visakhapatnam, Nellore and West Godavari. In Andhra Pradesh altogether there are fifty seven (57) exporters constituting both manufacturer and merchant exporters registered with Marine Products Export Development Authority (MPEDA) for exporting all items of marine products and with a capacity of handling 2861.17 MT. Out of 57 exporters, a sample of 30 (about 53%) were selected by simple random sampling (Tippett's) method and personally interviewed with the help of a pre-tested comprehensive questionnaire. The survey data collected from 30 exporters was analyzed to understand their problems and to suggest suitable

policy measures for the promotion of shrimp exports. The following tools were used in order to analyze the collected data.

2.1 Likert's summated rating technique

The attitude of respondents on performance of existing shrimp industry in Andhra Pradesh was operationally defined in this study as the degree of positive or negative feeling expressed by the shrimp exporters. It was measured by the attitude scale constructed to rate the shrimp industry through summated rating scale given by Likert (1932). This technique was used to construct the attitude scale due to its high reliability co-efficient and moreover, it gives a 5 point judgment on each item rather than mere acceptance or rejection.

2.1.1 Administration of the scale

For studying the attitude of shrimp exporters following 11 statements were administered

1. Supply chain in shrimp industry
2. On time delivery
3. Logistics
4. Product branding
5. Inventory management
6. Export incentives
7. Promotional activities
8. International marketing efforts
9. Product quality
10. Development of new products
11. Targeting new international markets

Each item of the scale was provided with 5-point response continuum. These were “Excellent”, “Good”, “Acceptable”, “Poor” and “Very Poor” with scores of 5,4,3,2 and 1, respectively. Score for each individual in the scale was computed by summing up the weights of individual item response. The possible maximum and minimum scores of each respondent were 55 and 11, respectively. Based on summing up of the scores, the shrimp exporters were categorized into three groups based on mean and standard deviation as presented in Table 1.

Table 1
Scaling of respondents based on their attitudes

Sl. No.	Attitude	Score Range
1	Less favorable	Below (Mean - S.D)
2	Moderately favorable	Between (Mean ± S.D)
3	Highly favorable	Above (Mean + S.D)

2.2 Multiple Linear Regression (MLR)

Multiple linear regression analysis was used to study the socio-economic factors of shrimp exporters which were influencing the revenue of the shrimp industry in Andhra Pradesh. Hence seven parameters were identified and the following multiple linear regression equation was fitted to the data having these seven parameters.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e$$

Where

- a = intercept, b₁ to b₇ are partial regression coefficients and e is error term
- Y = Value of shrimp exports in lakh
- X₁ = Age
- X₂ = Education (1= SSC, 2= Intermediate, 3= Graduate)
- X₃ = Years in experience (1= 10-20 years, 2= 20-30 years, 3=30-40 years, 4= 40-50 years)
- X₄ = Quantity of shrimp exports in tones
- X₅ = Best Aquaculture Practices (BAP) star rating (BAP 1, BAP 2, BAP 3 and BAP 4)
- X₆ = Business operation (1= Sole proprietary, 2= Partnership, 3= Joint stock)
- X₇ = Rating of shrimp industry given by exporters (mean score obtained by Likert ranking technique)

2.3 Responses Priority Index (RPI)

In the quantification of constraints expressed by the respondents, there was a problem whether to give more emphasis for number of responses to a particular priority or to the highest number of responses to a constraint in first priority.

But, both lead to different conclusions. To resolve this, Responses-Priority Index (RPI) as a product of Proportion of Responses (PR) and Priority Estimate (PE) was adopted. The PR for the ith constraint will give the ratio of number of responses for a particular constraint to the total responses as given below (Rao, 2012).

$$(RPI)_i = \frac{\sum_{j=1}^k f_{ij} \cdot X_{[(k+1)-j]}}{\sum_{i=1}^I \sum_{j=1}^k f_{ij}}$$

Where,

- (RPI)_i = Response Priority Index for ith constraint.
- $\sum_{j=1}^k f_{ij}$ = Total number of responses for the ith constraint.
- f_{ij} = Number of responses for the jth priority of ith constraint (j=1,2,3.....I; i= 1,2,3k).
- k= Number of priorities.
- X_[(k+1)-j] = Scores for jth priority.
- $\sum_{i=1}^I \sum_{j=1}^k f_{ij}$ = Total number of responses to all constraints.

Here, larger the RPI, higher the importance for the particular constraint.

RESULTS AND DISCUSSIONS

The data collected from the respondents was analyzed using the above mentioned tools and the results are presented in the following sections.

3.1 Attitude of the shrimp exporters in rating of shrimp industry in Andhra Pradesh

On perusal of figures in Table 2, more proportion of the shrimp exporters (43.3%) were found to have moderately favorable attitude towards rating of shrimp industry followed by those with high favorable attitude (33.3%) and low favorable attitude (23.3%). However, about 76.6 per cent of the respondent's attitude was found to be positive towards performance of shrimp industry in A.P. The reason behind this would be that these exporters have own processing facilities, own farm, hatcheries and feed mills. So as a result of which they can with stand the fluctuations that occurs in the industry.

Table 2
Distribution of exporters towards rating of shrimp industry

Sl.No.	Category	frequency	percentage
1	Less favorable	7	23.3
2	Moderately favorable	13	43.3
3	High favorable	10	33.3
	Total	30	100
	Mean = 36.43		SD= 3.45

The reason for low favorable attitude by remaining 23 per cent of the respondents might be due to that they are merchant exporters from small medium enterprise industries who face the problem like insufficient supply of shrimp for processing. Moreover, they are small and medium producers who fail to upgrade the facilities in order to meet new standards, certification cost, especially inspection and testing costs are beyond the reach of small and medium enterprises. Dey *et al.* (2005) opined that stringent implementation of SPS standards have significantly increased the cost of processing and the cost per unit of fish processed is higher for the smaller plants.

3.2 Socio economic factors influencing the revenue of sample respondents

An attempt has been made in the present study to find out the amount of contribution made by the profile characteristics, quantity of exports and attitude of the exporters towards shrimp industry in explaining the variation in the dependent variable, namely revenue of shrimp industry in Andhra Pradesh. The profile characteristics being age, education, years of experience, business operation and BAP (Best Aquaculture Practices) star rating and the results are presented in Table 3.

Table 3
Multiple linear regression on revenue of shrimp industry

Sl. No	Independent variables	Regression co-efficient	Standard error	t value
1	Age	489.362	379.4	1.69 NS
2	Education	3807.23	7346.4	0.465NS
3	Experience (in years)	6594.78	2976.7	2.56*
4	Business operation	-15691.65	6744.9	-2.38*
5	BAP star rating	1536.37	3161.09	4.91**
6	Quantity of exports	12419.21	3510.11	3.53**
7	Rating of the shrimp industry	-480.03	483.90	-0.968NS

* Significant at 0.05 level of probability **Significant at 0.01 level of probability, NS= Non Significant, $R^2 = 0.77$

The R^2 value of 0.77 (Table 3) indicated that all the selected seven independent variables together have explained about 77 per cent variation in the revenue of shrimp industry. Remaining 23 per cent may be due to extraneous effects of the variables.

From the above table the MLR equation can be fitted as

$$Y = 58079.51 + 489.362X_1 + 3807.23X_2 + 6594.78X_3 - 15691.65X_4 + 1536.37X_5 + 12419.21X_6 - 480.03X_7$$

From the above regression coefficients, it is revealed that at 5 per cent level of probability, experience (in years) was positively significant whereas business operation is negatively significant. It means that as the years of experience increases it would increase the value of exports by

₹ 6594.78 lakh. Since the business operation is negatively significant it indicates the operation of the business is inefficient and hence need to be improved through partnership arrangements. At 1 per cent level of probability, BAP star rating and quantity of exports were positively significant. It means that if BAP star rating and quantity of exports increases they would increase the value of exports to ₹ 1,536.37 and ₹ 12,419.21 lakh, respectively. Remaining variables viz., age, education and rating of shrimp industry were found to be non-significant.

From the above findings, it can be concluded that as exports increases, the revenue will also increase. BAP star rating was positively significant which indicated that more rating for the product fetches higher demand in international market. If an industry have a BAP four star rating (processing and export of shrimp, farming in shrimp culture, possessing shrimp hatcheries and also engaged in shrimp feed mills business) it implies that, it is involved in regular supply of raw material

shrimp, low risk of antibiotic issues and less cost of investment.

3.3 Problems faced by shrimp exporters in Andhra Pradesh

Various problems faced by the shrimp exporters in A.P. were identified through survey method and were ranked in the order of priority as perceived by the respondents. The details of the same are furnished in Table 4. It could be inferred that the non-availability of quality raw material was ranked first as the most important problem for the exporters with a RPI of 0.84 and hence they have to depend mostly on the middle men for purchasing raw material for processing who actually pool the product from various farmers across different regions. Hence, the exporters have opined that they had no control over direct handling of the product. However, as the demand for shrimp was increasing in international market, raw materials had become scarce for merchant exporters as well.

Table 4
Prioritization of constraints of shrimp exporting in Andhra Pradesh

Sl. No	Constraints	Respective priority rankings							RPI	Rank
		1	2	3	4	5	6	7		
1	Non- availability of quality raw material	13	8	6	0	1	2	0	0.84	I
2	High cost of investment	2	10	4	8	0	5	1	0.65	II
3	Lack of diversified products	7	5	7	0	0	8	3	0.63	III
4	Poor technical advancement	0	7	5	10	7	1	0	0.62	IV
5	Uncertainty in prices	8	0	3	6	4	2	7	0.56	V
6	Lack of research and development	0	0	4	6	10	3	7	0.41	VI
7	Competition among the exporters	0	0	1	0	8	9	12	0.28	VII
	Total	30	30	30	30	30	30	30		

Whereas high cost of investment ranked second with a RPI of 0.66 followed by the lack of diversified products with RPI of 0.63, poor technical advancement with RPI of 0.62, uncertainty in prices with RPI of 0.56, lack of research and development with RPI of 0.41 and finally competition among the exporters with RPI of 0.28. Due to high cost of

investment, the export prices were not much higher than the production cost and hence the margins of the exporters have also come down. High cost of investment might be that the infrastructural cost is a major cost incurred and moreover unavailability of equipped transportation facilities also led to increased cost of investment. The diversification is

less due to poor technical advancement and weak infrastructure facilities like potable water and power. To develop value added products superior technology and skilled employees were needed.

CONCLUSION

It has been concluded from the study that the merchant exporters were found to be active only during peak period and hence their involvement in the business was only for a short period in a year. Some merchant exporters opined that with the shortage of supply they were unable to run their processing industry to the fullest capacity and that also increased the cost. In view of these reasons, the production strategy had to be improved so as to ensure adequate supply of quality raw material to the processors. In Andhra Pradesh major processing of shrimp is in the form of Individual quick frozen (IQF) and Block frozen techniques. Moreover, limited number of processing industries goes to little value added products like cooked and breaded form as compared to other competing countries like

Thailand and Vietnam who produce diversified products in order to realize more prices in international market. Hence in order to develop high value added shrimp processing industries in the state, there is a dire need to technically upgrade the required infrastructure. In this regard, the exporters are expecting for the govt. support with a scheme for raising funds at a flat rate of interest. Quality is considered as the life support of the industry due to discrimination in quality standards adopted by different importing countries. Certifications like HACCP, ISO 9000, Q certificate and European Community Directive were mandatory for exporters of perishable commodities. The incentives for farmer and exporters for appropriate implementation of HACCP processes and food safety standards in their products would be a key. The development of infrastructure, import of technology, foreign technical collaboration, investment and equipment is of vital importance.

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