can be assessed *in situ* by measuring the height and circumference of the fruit. The findings may be helpful to the who are interested in studying the growth and development of the papaya fruit without removing the fruit by non-destructive analysis. In addition, it will save lot of time and labour, besides avoiding destruction of valuable economic materials.

REFERENCES

EVANS,G.C., RAYMOND,S., ECKERT,R.E. and KINSINGER,F.E. 1961. A technique for estimating grass yields in green house experiments. J. Range, manage, 14 : 42-47.

HAMMERTON,J.L. 1977. Predicting dry matter yield of pigeonpea plants from non- destructive measurements. J. agric. Sci. (Camb) 88 : 449- 454.

ROSE,Y.K. and VLASOVA,M.P. 1966. The biometric chara- cteristics and drymatter of the growth of maize stands. In: Plant phostosynthetic production manual of methods (Z.sestak, J.Catsky and P.G.Jarvis.) D.W.Junk, N.V.Publishers.

SNEDECOR,G.W. and COCHRAN,W.G. 1967. Statistical methods, IOWA State University Press, Ames, U.S.A.

WORMER,T.M. and NGUGI,D. 1968. Calculating the weight of young coffee trees from non- destructive observations. Exptl. Agric. 4: 29-4.

Madras Agric. J., 23-27 January, 1993 https://doi.org/10.29321/MAJ.10.A01623

AN ECONOMIC ANALYSIS OF MARINE PRODUCT EXPORT FROM INDIA

S.DEVARAJAN

ABSTRACT

Trend lines were fitted to predict the growth rate for marine product from India to other countries. The total marine product export increased at 8.55 per cent and the value by 22.56 per cent. Share of shrimp to total marine product export increased from 54.0 per cent in 1960 to 58.41 per cent in 1986. While the value increased from 70.22 per cent to 82.12 per cent for theabove period indicating the prawn forms major share. The analysis of market share revealed that Japan and U.S.A. are the two major importers of marine products accounting for 44.85 per cent and 12.96 per cent while the value by 67.62 per cent and 12.48 per cent respectively. Since the prawn forms major share in marine product export, it is necessary to revitalise the Industry by providing liberalised credit to processors to introduce new technologies by sophisticated machineries offering tax concessions to traders and arranging participation in the world fairs.

The crustaceans comprising of prawns, lobsters and crabs receive much attention in marine fisheries due to their export importance and their high unit value. Among these, prawn has the major share accounting for 22 per cent of landed wet weight with its value exceeding 60 per cent. The status of prawn fisheries was examined at macro-level which would help fishery's sector to identify the bottlenecks for poor catch and remove such impediments so as to boost up exports of marine products. Hence, an attempt was made to analyse the pattern and directioin of trade for fisheries products.

METHODOLOGY:

Time series data were collected the Statistics of marine product export and Annual marine product export review published by Marine Product Export Development Authority, Cochin. Trend lines were fitted to predict the growth rate of marine product exports, different forms of shrimp export such as frezen prawn, canned prawn and dried prawn, and market share by major importing countries. Compound growth rates were worked out from the extimated equations and inferences were drawn to explain the prawn fishery in relation to its export importance.

Associate Professor, Tamil Nadu Rice Research Institute, Aduthurai.

Table 1. Marine product export from India

Sl. No.	Particulars	Intercept	Regression Co-efficient	'F' Value	R^2	Compound growth rate
1.	Quantity	2.627906** (0.073593)	0.082076** (0.004765)	296.656	0.925153**	8.55
2.	Value	1.381069** (0.125362)	0.2034746** (0.008117)	628.3147	0.963208**	22.56
3.	Unit value Realised/Kilogram	1.056143** (0.082896)	0.1214007** (0.005377)	511.5221	0.955184**	12.90

The model used for trend analysis was the exponential from for predicting the trend and estimating the compound growth rate. The model used is :

$$Y = AB^t e^U$$

where

Y = the variable for which growth rate to be estimated

t = time variable

A = intercept

B = regression co-efficient of 't' equals (1+r) where 'r' is growth rate

U = regression error

It was estimated by OLS method. Compound growth rate was estimated by,

r = ((Antilog of B) - 1) x 100

Table 2. Pattern of shrimp export from India

Sl. No.	Particulars	Intercept	Regression Co-efficient	'F' Value	R^2	Compound growth rate
	Frozen prawn					
	Quantity	1.698634** (0.1719521)	0.116266** (0.01156675)	101.0371	0.814572**	12.33
	Value	3.2185** (0.198397)	0.231071** (0.013346)	299.7885	0.928746**	25.99
	Unit value Realised/Kilogram	1.519925** (0.056379)	0.114805** (0.003792)	916.3849	0.975516**	12.16
	Canned prawn					
	Quantity	1.823392** (0.453862)	-0.224420** (0.030530)	54.03425	0.701431**(-)	25.16
	Value	3.654842** (0.500803)	-0.121727** (0.033688)	13.05673	0.362116**(-)	12.94
	Unit value Realised/Kilogram	1.841821** (0.087177)	0.101608** (0.005864)	120.11	0.928841**	10.69
	Dried prawn					
	Quantity	1.31964** (0.411971)	-0.2175827** (0.027712)	61.6464	0.728281**(-)	24.31
	Value	2.518107** (0.337116)	-0.150526** (0.022677)	44.06134	0.657030**(-)	16.24
	Unit value Realised/Kilogram	1.154859 (0.135340)	0.069276** (0.009104)	57.90348	0.715711**	7.17
	Total prawn					
	Quantity	2.216494** (0.115136)	0.088465** (0.007745)	130.4706	0.850134**	9.25
	Value	3.673789** (0.155917)	0.207645 (0.010488)	391.9667	0.944574**	23.08
	Unit value Realised/Kilogram	1.45688** (0.062567)	0.119201 (0.004209)	802.1503	0.972126**	12.66

Table 3. Shrimp and Marine product export from India to Japan and U.S.A.

Sl. No.	Particulars	Intercept	Regression Co-efficient	'F' Value	R^2	Compound growth rate
1.	SHRIMP - Japan					
	(a) Quantity	2.504329** (0.151004)	0.082420** (0.014736)	31.28042	0.675889**	8.59
	(b) Value	5.215595** (0.173822)	0.185288** (0.014963)	119.3094	0.888318**	20.36
	(c) Unit value Realised/Kg	2.694757** (0.071426)	0.104378** (0.006970)	224.2284	0.937298**	11.00
2.	MARINE PRODUCT - Japan					
	(a) Quantity	2.492684** (0.145376)	0.089440** (0.014187)	39.74389	0.896200**	9.36
	(b) Value	5.189604** (0.171874)	0.190881** (0.016793)	129.5082	0.896200**	21.03
	(c) Unit value Realised/Kg	1.166094** (0.063124)	0.044498** (0.001699)	37.363	0.889142**	10.78

* Significant at five per cent level; ** Significant at one per cent level.
Figures in parentheses indicate standard errors of estimate.

Results were used to explain the export trade of fishery products from India with special emphasis on prawn export and draw policy implications to improve the export trade of fish from India.

MARINE PRODUCT EXPORT: The increase in marine product export was at the rate of 8.55 per cent per year while the total value increased by 22.56 per cent and the unit value per kg of product by 12.90 per cent during 1962-1986. In absolute term, the quantity of marine product exported from India increased from 11,619 tonnes to 89,283 tonnes.

PATTERN OF MARINE PRODUCT EXPORT: Initially marine product export

Table 3. (Contd.,)

Sl. No.	Particulars	Intercept	Regression Co-efficient	'F' Value	R^2	Compound growth rate
1.	SHRIMP - Japan					
	(a) Quantity	2.668035* (0.161021)	-0.019904^{NS} (0.013023)	2.336101	0.134753^{NS}(–)	2.01
	(b) Value	4.830241** (0.161021)	0.084882** (0.015714)	29.17828	0.660467**	8.96
	(c) Unit value Realised/Kg	2.161375** (0.049093)	0.104834** (0.004791)	478.8003	0.969623**	11.10
2.	MARINE PRODUCT - Japan					
	(a) Quantity	2.842788** (0.119333)	-0.024405^{NS} (0.011646)	4.391617	0.226469**(–)	2.47
	(b) Value	5.092066** (0.144808)	0.74428** (0.014132)	27.73837	0.649027**	7.72
	(c) Unit value Realised/Kg	2.249722** (0.043369)	0.098798** (0.004232)	544.907	0.973210**	10.38

* Significant at five per cent level; ** Significant at one per cent level.
Figures in parentheses indicate standard errors of estimate.
NS : Non significant.

included all forms of prawn such as frozen prawn, canned prawn and dried prawn. From 1972, there was a jump in the export of frozen prawn with gradual decline in canned and dried prawn and finally reaching a negligible quantity. Results of trend analysis (Table II) showed that the quantity of frozen shrimp export was increasing at a compound growth rate of 12.33 per cent year while canned and dried prawn decreased by 25.16 per cent and 24.31 per cent respectively during 1962-86.

The value of export per year increased by 25.99 per cent in frozen prawn and decreased by 12.94 per cent and 16.24 per cent in canned prawn and dried prawn respectively. The price per kg of different forms of exported shrimp showed that the unit price increased for all categories. But the increase was at a high rate (12.16 per cent) for frozen praen against 10.69 per cent and 7.17 per cent for canned and dried prawn respectively.

Shrimp and total marine product export in terms of quantity and values are that the total marine product export from India increased from 11619 tonnes in 1960 to 74542 tonnes in 1980 and 892283 tonnes in 1986. The value of export increased from Rs.3.75 crores in 1960 to Rs.218.87 crores in 1980 and to Rs.462.68 crores in 1986. The share of shrimp to total marine product export in terms of quantity increased from 454.0 per cent in 1960 to 58.41 per cent in 1986 while in values terms it increased from 70.22 per cent to 82.12 per cent for the above period. The above results indicated that the export of shrimp as well as total marine product increased significantly. Further, it can be seen that the frozen shrimp formed the major share in marine product export. This was due to the fact that prawn is the high unit value product among the fishery products since it has greater demand in the world market.

DIRECTION OF TRADE:

The major markets for frozen prawn were United kingdom. Japan accounted for 75.01 per cent of total export followed by U.S.A. (13.45 per cent) and United kingdom (5.04 per cent). Similarly in frozen lobster tail export, Japan accounted for 73.92 per cent followed by U.S.A. (18.65 per cent) and other countries (7.43 per cent). The major importers of marine products from India were Japan, U.S.A., France, Netherlands, United kingdom, Australia, Belgium and Srilanka. Of these countries Japan accounted for 44.85 per cent and U.S.A. 12.96 per cent of total marine product export from India. In terms of value Japan accounted for 67.62 per cent and U.S.A 12.48 per cent. Other major importers viz., France, Netherlands, U.K., Australia, Belgium and Sri Lanka which together accounted for 19.82 per cent quantity and 12.17 per cent value of total marine product export. The above results revealed that the percentage share of value of fishery products imported by Japan from India was more than that of quantity.

The growth of export of marine product and prawn from India to Japan and U.S.A. was analysed for the period 1970-86 and the results are presented in Table III. The export of marine product and prawn to Japan was 6678 tonnes and 6625 tonnes respectively in 1970 and it increased to 40043 tonnes and 33691 tonnes respectively in 1986. The compound growth rate was found to be 9.36 per cent for the marine product export to Japan and 8.59 per cent for shrimp export. The unit value of prawn increased at a faster rate that the unit value of marine products exported to Japan.

The export of marine product and prawn to U.S.A. showed a decreasing trend. Thequantity exported was 17769 tonnes and 13984 tonnes respectively in 1970 while the same were 11574 tonnes and 10462 tonnes in 1986. But the unit value realised per kilogram for marine product and prawn increased from Rs.16.80 crores to Rs.57.75 crores and Rs.11.78 crores to Rs.51.04 crores during the

above period. The compound growth rates estimated for quantity and value of total marine product and prawn export showed a decrease of 2.47 per cent and 2.01 per cent respectively. This reduction may be attributed to the competition from other exporting countries and/or satisfying the quality standards prescribed by United States of America.

CONCLUSION:

Shrimp continues to be India's main stay of foreign exchange earnings. India's percentage contribution of world export of fish and fishery products in terms of value increased to 1.7 per cent in 1986 from 1.2 per cent in 1973. This indicates that there is considerable scope to expand the export trade. Hence moderniation of processing plants by liberalising import policies to import sophisticated machineries and providing tax concessions to processors to encourage them to stay in the business will boost up the export trade of fishery products.

REFERENCES

JOSE PAUL. "Export potentialities of Sea-Foods with special reference to shrimps". (Unpublished Project report for MBM Degree, School of Management Studies, Cochin University, 1968).

VARGHESE,T. THOMAS. "Marine Product Exports". (Unpublished Project report for MBM Degree, Cochin University, 1982).

Indian Institute of Foreign Trade, "Export Potential of Indian States". New Delhi : Indian Institute of Foreign Trade, 1987.

Marine Product Development Authority. Indian Marine Product Exports 1986. (Cochin : Marine Product Export Development Authority).

Organisation for Economi Co-operation and Development problems of Trade in Fishery Products". (Paris : Organisation for economi Co-operation and Development, 1985).

Madras Agric. J., 27-33 January 1993

INFLUENCE OF SEASON ON YIELD AND QUALITY ATTRIBUTES OF SEED IN CHILLI (*Capsicum annum* L.)

C.P.THIAGARAJAN

ABSTRACT

The number of seed per fruit was more in rabi that kharif. Among the pickings the number of seed per fruit was higher in third and first pickings respectively in rabi and kharif. The recovery of large size seed (G_1) was more in kharif than rabi. Among pickings the highest recovery of G_1 was from the third picking and small size seed (G_3) was from last picking. The mean weight of seed obtained from the rabi season was higher than krarif. Seeds from the first picking recorded the maximum weight and that from last picking was minimum. The influence of season on germination was significant only in G_1. In general earlier pickings recorded higher germination than those from later pickings.

INTRODUCTION

Environment influences will be different on different characters of a seed. Low temperature may influence seedlessness (Charles *et al.*, 1979). Highest temperature during seed production exerted profound influence on fruit set and seed quality. Significant correlation was obtained between fruit size and number of seeds per fruit under high and low temperature (Rylski, 1973). Fruit set in capsicum was not affected by RH levels whereas increasing RH increased the seed set. The general seed yield and seed weight were greater from plants grown in short days (Studencova, 1965). Hence, it is imperative to undertake studies on the seasonal influence on fruit length, seed number, seed weight and seed quality in chillies.