Trends in Growth and Direction of Kokum Black Exports from India

ABSTRACT:

An attempt was made to study the trends in export growth and direction of kokum black from India. Export data was used for last 15 years (2004-05 to 2018-19). Further, destination wise time series data on export was collected from annual publication of Agricultural and Processed Foods Export Development Authority, India (APEDA) and its website www.apeda.com and website of Directorate General of Commercial Intelligence and Statisticswas obtained. The average export quantity of kokum black for last fifteen years was 43983 MTs and export earnings realized at constant prices were Rs.78.65 lakhs.Oman registered a positive and significant growth. It is concluded that, kokum black export has decreasing trend for both in terms of quantity (-2.26%) as well as real price (0.71%). USA was relatively loyal and stable importers of Indian kokum black. However, UK and Australia were found to be most unstable importers.

Key word: Kokum black, price, quantity, export.

1. INTRODUCTION:

Export is a drive of growth and development. It helps in procuring the latest technology, machinery, goods and services which is not available indigenously. It occupies very important place in the economic set up of developed countries because they contribute in the foreign exchange. Export allows us to expand market at global level. It is allowing to use resources more efficiently. Export allows country to participate in global market/economy, which increase employment, income level of individuals as well as nation.

India has been a significant exporter of kokum black due to its popularity in both domestic and international markets. The export of kokum black from India has experienced fluctuations over the years, influenced by factors such as availability, demand, and government policies.Kokum (Garcinia indica) is one of the important minor fruit crops in Konkan region of Maharashtra stare. Soil and climatic conditionof Konkan region are suitable for kokum cultivation of kokum plant. The fruits of kokum plant are useful for anthelmintic, cardiotonic and heart complaints. In Konkan region many homes, small, medium and large-scale processing units are engaged in kokum processing. Kokum black, also known as black kokum or black kokum rind, is the dried outer shell of the kokum fruit (Garcinia indica). It is widely used in culinary applications, particularly in Indian cuisine, as a souring agent and for its unique flavour. The specific objectives of the study were to examine the trends in exports and direction of trade of kokum fruit products produced in India.

The primary destinations for Indian kokum black exports have included countries in South Asia, Southeast Asia, the Middle East, Europe, and North America. Some of the major export destinations for kokum black from India include: 1) South Asian Countries: Neighbouring countries like Bangladesh, Sri Lanka, and Nepal have been among the major importers of kokum black from India. 2) Southeast Asian Countries: Nations such as Thailand, Malaysia, Indonesia, and Singapore have also shown interest in Indian kokum black. 3) Middle Eastern Countries: Countries in the Middle East, such as the United Arab Emirates, have been importers of kokum black for use in their culinary traditions. 4) European and North American Countries: European nations and the United States have

also seen imports of kokum black to cater to the demands of the growing interest in Indian and Asian cuisines.

Objectives:

1. To examine the trends in exports and direction of trade of Kokum Black.

2. METHODOLOGY:

The secondary data were used for present investigation. The detailed information from secondary sources on kokum black export, the country wise time series data on export in terms of value and quantity were collected for last 15 years(2004-05 to 2018-19). Further, destination wise time series data on export was collected from annual publication of Agricultural and Processed Foods Export Development Authority, India (APEDA) and its website www.apeda.com and website of Directorate General of Commercial Intelligence and Statistics.

2.1 Analytical tools

For present study, following analytical tools were used,

2.1.1 Compound growth rate analysis:

Growth rates on exports of kokum black products were computed for a period of 15 years. The exponential form of the function $Y_t = ab^t$ is most frequently used. In the present study, compound growth rates in export of kokum fruit processed products will be estimated by specifying the following relationship.

$$Y_t = ab^t U_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (eq.1)$$

Where,

Y_t = Quantity and value of kokum black exported in year 't'
t = Year which takes value 1, 2……n
U_t = Disturbance term in year 't'
'a' and 'b' are the parameters to be estimated

The equation (1) can be transformed into log linear form and written as;

$$Log\ Y = log\ a + 1\ log\ b + log\ U_t \ldots\ldots\ldots\ldots\ldots\ldots (eq.2)$$

Equation (2) would be estimated by using ordinary least squares (OLS) technique, Compound growth rate ($\hat{g}$) was then estimated by the identify given in equation (3).

$$\hat{g} = \left(\hat{b} - 1\right) \times 100 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (eq.3)$$

Where,

$\hat{g}$ = Estimated compound growth rate in per cent per annum
$\hat{b}$ = Antilog of log b

The standard error of the growth rate was estimated and tested for its significance with '*t*' statistics.

For analysis, the data were tabulated and subjected to descriptive statistical analysis to arrive at the meaningful conclusion. In case of kokum black products, the data for period of 2003-04 to

2018-19 were collected. The collected data were processed to arrive at the desired results in case of top five importing countries and total export from India. There is usually fluctuation in the international or external value of any currency over a period of time. Therefore, considering 2011-12 as the base year, growth rates at constant price were worked out to give the real picture of export earnings. For converting values of current prices into those at constant prices, suitable indices of unit export values were constructed.[7]

$$\textit{Deflation factor} = \frac{\textit{Wholesale price indices of the current year}}{\textit{Wholesale price indices of the base year}}$$

The formula used for converting the values of current prices received into constant prices is as follows:

i) Before base year:

$$\textit{Year value at constant price for the years} = \frac{\textit{Actual price in the year}}{\textit{Deflation factor}}$$

ii) After base year:

$$\textit{Year value at constant price for the years} = \textit{Actual price} \times \textit{Deflation factor}$$

2.1.2 Linking factor for WPI series (BASE: 2011–12):

In order to maintain continuity in the time series data on wholesale price index, it is imperative to provide a linking factor so that the new series, when released, may be compared with the outgoing one. The office of the Economic Adviser Government of India has been using the arithmetic conversion method to link the various price index series. The linking factors given by office of Economic Advisor for manufactured products were used as for conversion of data for previous years as well as later years to base year 2011-12. [1,9]

2.1.3 Markov chain analysis:

Markov chain analysis was used to find out the direction of trade of kokum black to various countries and to study the changes in it. The trade directions of Indian kokum black exports were analysed using the first order Markov chain approach. Approach to Markov chain analysis is the estimation of the transitional probability matrix P. The elements P_{ij} of the matrix P indicates the probability that export will switch from country i^{th} to country j^{th} with the passage of time. The diagonal elements of the matrix measure the probability that the export share of a country will be retained. Hence, an examination of the diagonal elements indicates the loyalty of an importing country to a particular country's exports. The average exports to a particular country will be considered to be a random variable which depends only on the past exports to that country, which can be denoted algebraically as,[7]

$$E_{jt} = \sum_{i=1}^{n} (Ei_{t-1}) P_{ij} + e_{jt}$$

Where,

E_{jt}	=	Exports from India to j^{th} country during the year t.
E_{it-1}	=	Exports to i^{th} country during the period t-1.
P_{ij}	=	Probability that the exports will shift from i^{th} country to j^{th} country.
e_{jt}	=	The error term which is statistically independent of $E_{i(t-1)}$
t	=	Number of years considered for the analysis

r = Number of importing countries

The transitional probabilities P_{ij} that can be arranged in a (c × r) matrix have the following properties.

i) $0 \leq P_{ij} \leq 1$ and

ii) $\sum_{i=1}^{n} P_{ij=1}$ for all i,
i = 1

Thus, the expected export shares of each country during period 't' were obtained by multiplying the export to these countries in the previous period (t-l) with the transitional probability matrix. There are several approaches to estimate the transitional probabilities of the Markov chain model such as unweighted restricted least squares, weighted restricted least squares, Bayesian maximum likelihood, unrestricted least squares, etc. In the present study. Minimum Absolute Deviations (MAD) estimation procedure was employed to estimate the transitional probability, which minimizes the sum of absolute deviations. The conventional linear programming technique was used, as this satisfies the properties of transitional probabilities of non- negativity restrictions and row sum constraints in estimation. The linear programming formulation in matrix from is stated as,[7]

Minimize,

$$OP^{*} + Ie$$

Subject to,

$$XP^{*} + V = Y,$$

$$GP^{*} = 1 \text{ and}$$

$$P^{*} \geq 0$$

Where,

0 = Vector of zeroes.
P* = The vector in which probability P_{ij} are arranged.
I = An apparently dimensioned vector of area,
e = A vector of absolute error (1 U 1),
Y = The vector of export to each country.
X = The block diagonal matrix of lagged Y values.
V = The vector of errors
G = The grouping matrix to add, the row elements of P arranged in P* to unity.

3. RESULT AND DISCUSSION:

3.1 Kokum black export:

To know the growth in the export of Indian kokum black over the period of time, growth rate analysis was done using exponential function. The compound growth rate and average export of black kokum with respect to quantity as well as value and average export in last 15 year with constant price is presented in the Table 1.

Table1 Export scenario of kokum black and its growth.

Qty in 000 MT, Value in Rs. lakh

Sl. No.	Name of country	Compound growth rates(2004-05 to 2018-19)			Average export (last 15 years)		
		Quantity	Value		Quantity	Running sum (% share)	Value (constant prices 2011-12)
		CGR (%)	CGR at nominal price (%)	CGR at real price (%)			
1	USA	7.27^{NS}	30.78**	1.14^{NS}	14.61	33.23	46.20
		(0.043)	(0.054)	(0.009)	(33.23)		(58.73)
2	UK	-4.20^{NS}	93.43^{NS}	39.44^{NS}	6.82	48.74	4.62
		(0.031)	(0.379)	(0.482)	(15.51)		(5.87)
3	UAE	5.07^{NS}	55.12^{NS}	7.99^{NS}	3.39	56.44	2.14
		(0.038)	(0.731)	(0.754)	(7.70)		(2.73)
4	Australia	16.28**	77.66^{NS}	36.23^{NS}	1.28	59.35	1.94
		(0.041)	(0.516)	(0.591)	(2.90)		(2.47)
5	Oman	4.13^{NS}	21.39**	9.23**	0.68	60.89	0.65
		(0.058)	(0.055)	(0.032)	(1.55)		(0.83)
6	Other				17.20	100.00	23.10
					(39.11)		(29.37)
	Total	**-2.26^{NS}**	**0.80^{NS}**	**0.71^{NS}**	**43.98**		**78.65**
		(0.032)	**(0.007)**	**(0.008)**	**(100.00)**		**(100.00)**

(Figures in parentheses indicate standard error and percentages to total)

*** = Significant at one per cent, ** = Significant at 5 per cent, NS= Non-Significant

The average export quantity of kokum black for last fifteen years was 43983 MTs and export earnings realized at constant prices wereRs.78.65 lakhs. It was also revealed that, the top five importingcountries together shared about 60.89per cent share of total exportfrom India, which indicated importance of major importing countries. It is seen from the table that, the compound growth rate for kokum black exported in respect of quantity showed positive and significant growth for Australia. Export of kokum black increased significantly at the rate of 16.28 per cent per annum. While, for other importing countries it was negative and non-significant. [2]

The compound growth rate for value of kokum black export in respect of real value shows positive and significant growth for Oman increased. The compound growth rate for real value of kokum black export increases significantly at the rate of 9.23 per cent per annum. Growth in value of export was found to be very high indicating good potential and higher profit for Indian kokum butter export. It is concluded that, kokum black export has non-significant decreasing trend for both quantity (-2.26%) as well as real price (0.71%). [3,5,10]

Transitional probabilities in export of kokum black:

The direction of trade of Indian kokum black to different importing countries was studied by estimating the transitional probability matrix using the Markov chain framework. Transitional probabilities are presented in Table 2.

There were five major countries, which imported Indian kokum black. USA, UK, UAE, Australia and Oman. The exports to remaining countries were pooled under the 'other' countries. Table 2 shows that, USA was relatively loyal and stable importers of Indian kokum black during study period. USA, UAE and Oman retained their previous share of imports of Indian kokum black to an extent of about 39 per cent, 28 per cent and 17 per cent respectively. [4,7]

Table 2 Transitional probabilities matrix of kokum black export from India.

Sl. No.	Country	U S A	U K	U A E	Australia	Oman	Other
1	**U S A**	**0.39**	0.17	0.22	0	0.09	0.13
2	**U K**	0.24	**0**	0.38	0.12	0.06	0.20
3	**U A E**	0	0.41	**0.28**	0.14	0.16	0.01
4	**Australia**	0.50	0.16	0	**0**	0.20	0.14
5	**Oman**	0.56	0.09	0.14	0.03	**0.17**	0.01
6	**Other**	0.09	0.19	0	0.35	0.23	**0.14**

USA gained 56 per cent share of Oman, 24 per cent from UK and 50 per cent from Australia. USA lost its 22 per cent and 17 per cent of its previous periods import to the UAE and UK. UAE have gained 38 per cent of import share from UK and 22 per cent from the USA. Whereas, it has lost 41 per cent, 14 per cent and 16 per cent of its pervious share to UK, Australia and Oman, respectively. Whereas, Oman gained 23 per cent and 16 per cent import share of other countries and UAE. Oman lost 56 per cent of its previous share to the USA. At same time it gained 23 per cent and 16 per cent from other countries and UAE. The most unstable markets were UK and Australia which showed zero retention probabilities. [5,6,7,10]

Suggestions:

The major suggestions of exporters in study area were taxes imposed by government, proper market for processed products and necessity of long-term policy for export and promotion of processed products of minor fruits.

Conclusion:

The average export quantity of kokum black for last fifteen years was 43983 MTs and export earnings realized at constant prices were Rs.78.65 lakhs. Oman registered a positive and significant growth. Kokum black export has decreasing trend for both quantity (-2.26%) as well as value (0.71%). USA was relatively loyal and stable importers of Indian kokum black. However, UK and Australia were the most unstable importers.

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