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Export performance of Turmeric in India

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Abstract

This study was aimed at investigating the “Export Performance of Turmeric in India”. The nature of data for study is mainly based on secondary sources. The nature of data for study is mainly based on secondary sources. The time series data was obtained for 20 years from the year 2000-01 to 2019-20. The period of study was divided into different periods, i.e. Period I (2000-01 to 2009-10), Period II (2010-11 to 2019-20) and Overall period (2000-01 to 2019-20). The data on export quantity and value were collected from the Directorate General of Commercial Intelligence and Statistics (DGCIS), Government of India, Food and Agriculture Organization (FAO) and National Agricultural Processed Food Product Export Development Authority (APEDA). To examine the growth in export of turmeric from India compound growth rate (CGR) was computed based on its fit using non-linear models, especially the exponential model. Coefficient of variation and Cuddy-Della Valle Instability Index will be used to estimate the instability in export of turmeric data. The present study was undertaken to analyse growth rates and instability in export of turmeric. The study revealed that, compound growth rates were found positive and statistically significant at 1 percent level of significance for all periods for quantity, value in rupees and value in dollar except for value in US dollar in period II. It's significant at 10 percent level of significance. CV and CDI of turmeric export measured in quantity was 0.47 and 0.15 respectively. It was 0.87 and 0.32 for value in rupees and 0.74 and 0.31 for value in dollar respectively. Thus, the export of turmeric from India in terms of quantity, value in rupees and value in dollar were not steady during the reference period. So, the government of India should take the necessary steps to increase both area and production by way of more subsidies (irrigation, fertilizer and insecticides, etc.) and introduce high yield varieties of turmeric seeds.

Keywords: turmeric, export, instability, cuddy della index

1. Introduction

Turmeric (*Curcuma longa*) is popular known as Golden Spice which is widely grown in various countries such as India, China, Myanmar, Bangladesh, Pakistan, Sri Lanka, Taiwan, Burma, Indonesia, etc. Turmeric, with its excellent yellow colour, has been used as a dye, medicine, and flavouring since 600 BC. In 1280, Marco Polo defined Turmeric as "a vegetable with the properties of saffron, yet it is not really saffron." Indonesians used Turmeric to dye their bodies as part of their wedding ritual. Turmeric has been used medicinally all over Asia to treat stomach and liver ailments. It also was used superficially, to heal sores and as a cosmetic in many centuries. Due to its ancient derivation, its actual place of origin cannot be ascertained, but however it has been cultivated in many parts of South Asia and South East Asia. In South Asia, India is a major producer, consumer and exporter of turmeric. Java, Sumatra are the major producers in Indonesia. Apart from this turmeric is also now grown in Philippines, Japan, Korea, China, Sri Lanka, Nepal, East & West Africa, Caribbean Islands and Central America.

India is the leader in terms of production, consumption and export. During 2019-20, the turmeric is exported with the value Rs.139,707.58 lakhs. India exports about 10 per cent of its turmeric per annum. The key export destination for Indian turmeric is Iran (12 per cent), Bangladesh (8.46 per cent), Malaysia (6.87 per cent), Sri Lanka (5.62 per cent), USA (5.48 per cent), UK (4.14 per cent) Japan (3.69 per cent) and south Africa (2.92 per cent). All these countries together account for 62 per cent of the India's total exports. Remaining 38 per cent is being shipped to Europe, North America, Central and Latin American Countries during 2019-20.

India has 178.47 thousand hectares under turmeric cultivation with a total production of 946.00 thousand MT (2019-20). The area and production of turmeric in India is growing at the rate of 2.16 and 4.42 per cent per annum during the period from 1995-96 to 2019-20. Andhra Pradesh is called the “turmeric bowl of India” as it topped both in area and production with

60,010 hectares and 3,59,500 tonnes respectively including Telangana. Tamil Nadu follows with respect to area under turmeric of about 26,070 hectares with production of 1,05,000 tonnes during 2015-16 (Spices Board). Tamil Nadu has witnessed sharp decline in total production due to shifting of area towards other crops such as sugarcane on account of poor price realization. Andhra Pradesh, Tamil Nadu and Karnataka constitute major share in India’s total production.

Top five turmeric importing countries during the study measured in quantity were UAE (10.49 percent), Iran (9.59 percent), Bangladesh (9.02 percent), USA (6.85 percent) and Malaysia (5.99 percent). In terms of value measured in rupees, top five turmeric importing countries with their contribution were USA (14.51percent), Iran (8.69 percent), UAE (7.79 percent), Bangladesh (7.72 percent) and Malaysia (5.79 percent). In terms of value measured in dollar to top five turmeric importing countries and their contribution to that turmeric export were USA (13.54percent), UAE (8.55 percent), Iran (8.27 percent), Bangladesh (7.62 percent) and Malaysia (6.13 percent).The objectives of the study are:

- 1) To study the growth in export of turmeric.
- 2) To estimate the instability in export of turmeric.

2. Methodology

The study area pertains to the country as a whole in general. Growth rate and instability in export were studied for the country as a whole.Turmeric was purposefully chosen for this study due to its importance among spices in India. India is one of the largest producers as well as exporters of turmeric in the world. The nature of data for study is mainly based on secondary sources. The time series data was obtained for 20 years from the year 2000-01 to 2019-20. The period of study was divided into different periods, i.e. Period I (2000-01 to 2009-10), Period II (2010-11 to 2019-20) and Overall period (2000-01 to 2019-20).The data on export quantity and value were collected from the Directorate General of Commercial Intelligence and Statistics (DGCIS), Government of India, Food and Agriculture Organization (FAO) and National Agricultural Processed Food Product Export Development Authority (APEDA).

2.1 Growth analysis

To examine the growth in export of turmeric from India compound growth rate (CGR) was computed based on its fit using non-linear models, especially the exponential model. Conventionally, the compound growth rate were estimated after the converting the growth model to semi-log form and estimated through Ordinary Least Square (OLS) technique assuming multiplicative errors term. However, there are several problems associated with this technique including the difficulty in estimating standard error of estimates of original parameters. Hence, a non-linear estimation technique for solving exponential model assuming additive error terms was used to estimate compound growth rate by using exponential growth function as given below:

$$Y^t = \text{constant} * (1 + \text{CGR})^t + E_t \quad (1)$$

Where,

Y^t = time series data for export quantity / export value for year t

t = Time trends for years of interest

E_t = error terms

CGR is compound growth rate for the period under consideration.

The Marquardt algorithm was used to parameters of equation. The significance of regression coefficient will be tested by applying standard 't' test procedure.

2.2 Instability

Cuddy-Della Valle Instability Index will be used to estimate the instability in export of turmeric data. This index is modification of coefficient of variation (CV) to accommodate for trend which is commonly present in time series economic data. It is superior over other scale dependent measure such as Standard Deviation or Root mean Square of the residuals (RMSE) obtained from the fitted trend lines of raw data and hence suitable for cross comparison. The Cuddy-Della Instability Index calculated as follows:

$$I_x = CV \sqrt{1 - R^2}$$

Where,

CV= coefficient of variation (σ/x)

R^2 = adjusted coefficient of multiple determination

Where, ever trend in time series data is non- significant, instability of that particular was analysed with the help of conventional statistical tool of instability i.e. coefficient of variation. The coefficient of variation was calculated by using formula,

$$CV (\%) = \frac{\text{Standard deviation (a)}}{\text{Mean (x)}} \times 100$$

3. Results and Discussion

Considering the objectives of the study, the required data collected was analysed and interpreted. The results obtained are presented and discussed below.

3.1 Growth rates of turmeric export from India

The results obtained by using the exponential growth function used for the estimation of export of turmeric are presented in the table 1.

The results revealed that, during period I, the average quantity of turmeric export to total countries was 45043.59 thousand metric tonnes. The value realized from turmeric export to total countries in rupees and dollar terms was 16846.29 lakh rupees and 37.06 million US dollar respectively. During period II, export of turmeric to other countries was increased in terms quantity and value. In quantity terms, average export of turmeric was 102915.70

Table 1: Compound growth rate in export of turmeric from India

Particulars	Period I			Period II			Overall Period			
	Qty	Rs.	US \$	Qty	Rs.	US \$	Qty	Rs.	US \$	
Growth	Mean	45043.59	16846.29	37.06	102915.7	103400.5	168.7	73979.65	60123.38	102.57
	CGR	6.74***	14.1***	14.86***	6.58***	10.59***	4.06*	7.96***	16.15***	12.4***
	SE	1.05	1.35	1.21	0.85	1.95	2.19	0.35	1.08	1.29
	“t”Value	6.37	10.44	12.24	7.71	5.43	1.85	22.14	14.95	9.59

Note: *** significant at 1%, ** significant at 5 %, * significant at 10%.

Thousand metric tonnes, whereas in value in rupees and dollar, it was 103400.50 lakh rupees and 168.07million US dollar respectively. In overall period of the study, export of turmeric to total countries measured in quantity was 73979.65 thousand metric tonnes. Valuer realized from the export in rupees and dollar was 60123.38 lakh rupees and 102.57 million US dollar respectively.

The result of compound growth rate (CGR) revealed that, the growth in turmeric export decreased in quantity, value in rupees and value in dollar in period II as compared to period I. The compound growth rate of turmeric export measured in quantity, value in rupees and value in dollar was 6.74, 14.10 and 14.86 percent per annum, respectively in period I. During period II; compound growth rate of turmeric export measured in quantity was 6.58 per annum. It was 10.59 and 4.06 per cent per annum for value in rupees and value in US dollar.

During overall period, compound growth rate of turmeric export was 7.96, 16.15 and 12.40 per cent per annum, respectively.

CGR is statistically significant at 1 percent level of significance for all periods for quantity, value in rupees and value in dollar except for value in US dollar in period II. It's significant at 10 percent level of significance.

3.2 Instability in export of turmeric from India

The instability in export of turmeric was estimated with the help of coefficient of variation and Cuddy- Della Valle Index and result were presented in table 4.22. Instability in export of turmeric was measured on important parameters viz; export of turmeric measured in quantity, value in rupees and value in dollars.

Table 2: Instability in export of turmeric from India

Particulars		Period I			Period II			Overall Period		
		Qty	Rs.	US \$	Qty	Rs.	US \$	Qty	Rs.	US \$
Instability	CV	0.22	0.52	0.51	0.23	0.38	0.28	0.47	0.87	0.74
	CDI	0.1	0.27	0.22	0.13	0.23	0.24	0.15	0.32	0.31

The results revealed that, instability in turmeric export measured in quantity was low during period II as compared to period I. Coefficient of variation and CDI value in quantity was 0.22 and 0.10 in period I and 0.23 and 0.13 in period II, respectively. The CV and CDI estimate of turmeric export measured in value in rupees in period I was 0.52 and 0.27 and in period II, it was 0.23 and 0.13, respectively. The CV and CDI estimate of turmeric export measured in value in dollar in period I was 0.51 and 0.22 and in period II, it was 0.28 and 0.24, respectively. In overall period, CV and CDI of turmeric export measured in quantity was 0.47 and 0.15 respectively. It was 0.87 and 0.32 for value in rupees and 0.74 and 0.31 for value in dollar respectively. The index reveals similar trend in all the three parameters.

4. Conclusion

The present study was undertaken to analyse growth rates and instability in export of turmeric. The study revealed that, compound growth rates were found positive and statistically significant at 1 percent level of significance for all periods for quantity, value in rupees and value in dollar except for value in US dollar in period II. It's significant at 10 percent level of significance. CV and CDI of turmeric export measured in quantity was 0.47 and 0.15 respectively. It was 0.87 and 0.32 for value in rupees and 0.74 and 0.31 for value in dollar respectively. Thus, the export of turmeric from India in terms of quantity, value in rupees and value in dollar were not steady during the reference period. So, the government of India should take the necessary steps to increase both area and production by way of more subsidies (irrigation, fertilizer and insecticides, etc.) and introduce high yield varieties of turmeric seeds.

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