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Dynamics of Tea Export in India

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A B S T R A C T

Plantation sector plays an important role in export to meet the domestic requirement and in employment generation and poverty alleviation, particularly in rural areas. The total production of tea in India is 1,208,780 tonnes. Assam is the single largest tea growing state accounting for half of the country's total production. India is the second largest producer and fourth largest exporter of tea in the world. The world total export quantity of tea is 1,829,550 tonnes. The total consumption of tea in India has gradually increased from 2013-14 (911,000 tonnes) to 2015-16 (951,000 tonnes).The paper attempts to quantify the changing structure of Indian tea exports. Data for analysis was taken for a period of 30 years from 1985 to 2015. Compound growth rate (CAGR) was used for analysing the growth in tea area, production, yield, export quantity and export value over the years. The study revealed that the growth rate the area, production and yield, export quantity, export value of tea showed 1.5 per cent, 2.2 per cent, 0.6 per cent, 1 per cent, 2 per cent respectively in study period. EPR was used to estimate the comparative advantage of the commodity. The Export Performance Ratio (EPR) initial value of tea was 21.25 and finally reached 3.84 in 2015.which revealed that tea EPR value was decreased more than seven times in the overall period.

Introduction

Tea (*Camellia sinensis*) is the second most widely consumed drink world-wide after water. India is the second largest producer of tea in the world, and India has world's largest consumers of tea. Plantation sector contributes to the employment both directly and indirectly to Indian people. Out of the total population of India, more than two million people are engaged in plantation sector directly and another six million peoples are indirectly engaged plantation sector (Gholam Abbas Darvishi and Indira, 2013)[1]. Tea is mainly cultivated in North-East and Southern part of India. Tea has different varieties, which can be cultivated in different regions of India. It can be classified into ten distinct tea producing regions, which are Darjeeling, Assam, Dooars and Terai, Kangra, Nilgiri, Annamalai, Wayanad, Karnataka, Munnar, Travancore. There are four types of tea produced in the processing unit, which are Green Tea (non-fermented), Black Tea

(fermented), Oolong Tea (partly fermented), White Tea (least processed). All four types of tea are made from the same tea plant, depends on how it is processed after being picked. All four types of tea contain different types of polyphenolic compounds with antioxidant properties. The antioxidants namely "flavonoids" in both black and green tea help to neutralize "free radicals" produced in the body as part of normal functioning and thereby decrease the likelihood of a heart attack or stroke caused by blocked arteries.

In 2015, the total production of tea in India is 1208780 tonnes. Out of it, 629050tonnes was produced by Assam followed by West Bengal 312100tonnes and Tamil Nadu 174710tonnes, Kerala 63480 tonnes, Karnataka 5520 tonnes and others North Indian states 23920 tonnes. Since the year of independence 1947, tea production increased by more than 250 per cent and area under tea plantation increased by 40 per cent. Assam is the single largest tea growing state accounting for half of the country's total production (Saravanakumar and Chinnasamy, 2013)[2]. Among the global production of Tea was 5173471 tonnes. Out of this, China alone contributed 2095717 tonnes (40%), followed by India 1208780 tonnes (23%), Kenya 445105 tonnes (9%), Sri Lanka 338032 tonnes (7%) and others 1087307 tonnes (21%). As compared to previous year, the global production in 2014 was increased by 183000 tonnes.

India is the second largest producer and fourth largest exporter of the tea in world. The world total export quantity of tea is 1829550 tonnes. In the year 2014, India exported 207440 tonnes of tea, out of 17 per cent of total production. Recently Kenya emerged as the leading exporter of tea with 499380 tonnes followed by Sri Lanka (317885 tonnes), China (301484 tonnes), and India (207440 tonnes), Vietnam (130000 tonnes). India is also the world's largest consumer of black tea

with the domestic market consuming 911000 tonnes of tea during 2013-14. In India, up to 1991, there was no import of tea. In 1992 import of tea was started at 1,371 tonnes and in 2014, import of tea has highly increased at 20590 tonnes and the unit price was Rs.132.41 per kilo gram. In the light of the above facts, the present study has been conducted with following specific objectives: the first one to study the trend in area, production, yield, export quantity and export value of tea in India using compound growth rate and workout the instability in area, production, yield, export quantity and export value of tea. The focus of the study is to examine the export performance ratio of tea in India.

Materials and Methods

To examine the trend in the area, production, productivity, export quantity and export value of tea in India compound growth rate (CGR) was worked out, to examine the tendency of the variable to increase, decrease or stagnant over a period of time. It also indicates the magnitude of the rate of change in the variable under consideration per unit of time.

$$Y = ab^t \quad \text{--- (1)}$$

Where,

Y = Area, Production, Productivity / export quantity / export value
t = Time variable or element which takes the value 1, 2, 3… n
b = Regression coefficient
a = Intercept value (value of Y when t = 0)

Equation (1) will be converted into the natural logarithmic form in order to facilitate the use of linear regression. Taking logarithms on both sides we obtain,

Log Y = Log a+ t Log b

The compound growth rates 'r' will be computed by using the formula:

CGR (r) = [Antilog (log b) -1] x 100

Where, r = Compound growth rate

Instability in export is expected to hamper the process of economic development. The degree of instability in the area, production, yield, export quantity and export value of tea was measured by using the coefficient of variation. The standard deviation as a percentage of mean is called as the coefficient of variation.

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{X}} \times 100$$

Where,

σ = Standard deviation

$$\sigma = \sqrt{\frac{\Sigma(X-\bar{X})^2}{n}}$$

$\bar{X}$ = Arithmetic mean

To measures the comparative advantage of the commodity of tea exports, Export Performance Ratio (EPR), as suggested by Balassa (Balassa B, 1965)[3] was used. Export performance ratio is a measure of international trade specialization. It identifies the comparative advantage or disadvantages a country has for a commodity with respect to another country or group of countries or the world. The EPR of the ith commodity (EPR) can be expressed as:

$$\text{EPR}_i = ((E_i/CE))/(W_i/WE)$$

Where,

E_i= Export of tea commodity from India
CE = Aggregate export of agricultural products from India
W_i = Total world export of tea commodity

product

WE = Total world export of all agricultural products

A value of EPR greater than unity implies that India has a comparative advantage in the exports of particular commodity products and vice versa.

Results and Discussion

The compound growth trend equation was fitted to assess growth trend in area, yield, production, export quantity and value of tea. To assess the trends in area, yield, production, export quantity and value of export, the data over the period from 1986 to 2015 were considered. The total study period (1986 to 2015) was divided into three periods namely, period I (1986 to 2000), period II (2001 to 2015) and overall period (1986 to 2015).

Table 1 represents compound growth rate of area under tea in India. As comparing to both the periods, the highest growth in area under tea was observed during period II (2001 to 2015) it indicating that the area under plantation crop increasing gradually especially tea in India (Majunder *et al.,* 2010)[4]. The overall compound growth rate of area in tea was observed 1.5 per cent. The growth rate of per hectare yield of tea was 1.2 and 1.6 per cent respectively in period I and period II it was observed from Table 1. But overall growth rate of yield in period was estimated to be at 0.6 per cent per annum it's revealed India is steadily losing its ground in the productivity level. The compound growth rate of production for period I and period II was found to be 2.1 per cent and 2.8 per cent per annum respectively. The results revealed that production registered positive and increasing trend in both a period. But overall period growth rate of production was estimated to be 2.2 per cent per annum. It is

observed that production of tea increases continuously in the overall study period (Samantaray NM and Ashutosh K, 2012)[5]. The sub-period wise growth trend analysis of tea export quantity suggests that highest growth was observed during period II and lowest during period I. The growth rate of export quantity was negative in period I -0.9 per cent per annum it is indicating that export of tea decreasing continuously over the time, whereas it was positive compound growth rate of 3.6 per cent per annum during period II.

The growth rate of export quantity in overall period was estimated to be 1 per cent this revealed that exports and production do not follow the same pattern with time. It is showed that there is a negative relationship between production of tea and exports. The growth trend analysis of tea export value registered a significant and positive growth trend during period II (2001-2015) and overall period (1985-2015). During the period I, tea export value registered a negative compound growth rate of -1.2 per cent per annum which means exports are expected to decrease year to year. But overall period, the tea export value from India was growing with a compound growth rate of 2.2 per cent per annum it means that India could export less amount of tea now. This is due to the reduction in the production and increase in domestic consumption of tea. India is the world's largest tea consumer, with an increasing domestic consumption from 73 Million Kilos in 1951 to 1012 Million Kilos in 2012 (Dhakre DS, 2015)[6].

Instability analysis of tea

In order to study the instability in area, yield, production, export quantity and export value of tea during the study period, co-efficient of variation was used, the results are presented in table 2.

Table 2 revealed that the less variability in area of tea observed at 5.33 per cent and 6.00 per cent in period I and period II respectively, while it was the highest in overall period with co-efficient of variation at 13.70 per cent. As regard the yield of tea, a positive correlation was observed in period I and period II with co-efficient of variation at 6.50 per cent and 8.97 respectively, but in overall period co-efficient of variation was 8.07 per cent.

There was a less variation between period II and overall period. During the overall period, coefficient of variation of tea production was found to be 19.25 per cent. The variation during overall period was higher as compared to period I and period II which was 9.68 per cent and 13.02 per cent because of high production (Sivanesan, 2013)[7].

As regard to the export quantity of tea, high variability was observed in period I and period II with co-efficient of variation at 13.19 per cent and 21.12 respectively but in overall period co-efficient of variation was 19.05 per cent. Export earnings in terms of value showed higher instability in overall period with 32.51 per cent of co-efficient of variation when compared to the period I (20.96 per cent). The instability in co-efficient of variation period II was 34.70 per cent.

Export performance ratio of tea

Export performance ratio is the method to analyze the performance of tea over the years. In the present study, export performance was computed for a period of 30 years from 1986-2015. It is presented in Table 3.

The EPR of tea in figure 1 shows that there is fluctuation in the export performance and continuously decreasing in the overall period of study. It can be observed that the ratios for tea showed positive results with a decreasing trend.

Table.1 Trend in area, yield, production, export quantity, export value of Tea in India

Source	Particulars	Period I (1986-2000)	Period II (2001-2015)	Overall period (1986-2000)
Area (Ha)	R^2	0.612	0.697	0.913
	Coefficient	0.009	0.0113	0.0150
	P value	0.00056	0.0001	$0.225E^{-15}$
	Growth rate	**0.9*****	**1.1****	**1.5****
Yield in (Kg/H	R^2	0.610	0.651	0.430
	Coefficient	0.0115	0.0154	0.0059
	P value	0.00058	0.0002	$0.832E^{-4}$
	Growth rate	**1.2****	**1.6****	**0.6*****
Production (Tonnes)	R^2	0.897	0.944	0.962
	Coefficient	0.0205	0.0278	0.0213
	P value	$0.879E^{-7}$	$0.161E^{-8}$	$0.208E^{-20}$
	Growth rate	**2.1****	**2.8****	**2.2****
Export quanti (Tonnes)	R^2	0.089	0.657	0.242
	Coefficient	-0.0092	0.0357	0.0101
	P value	0.2803	0.0002	0.0057
	Growth rate	**-0.9**	**3.6****	**1****
Export value i (1000 US $)	R^2	0.060	0.890	0.302
	Coefficient	-0.0118	0.0755	0.0195
	P value	0.3786	$0.133E^{-6}$	0.0016
	Growth rate	**-1.2**	**7.8***	**2****

***, **,* indicates significance at 1, 5, 10 per cent level, respectively

Table.2 Instability of area, yield, production, export quantity and value of Indian tea (1986 to 2015)
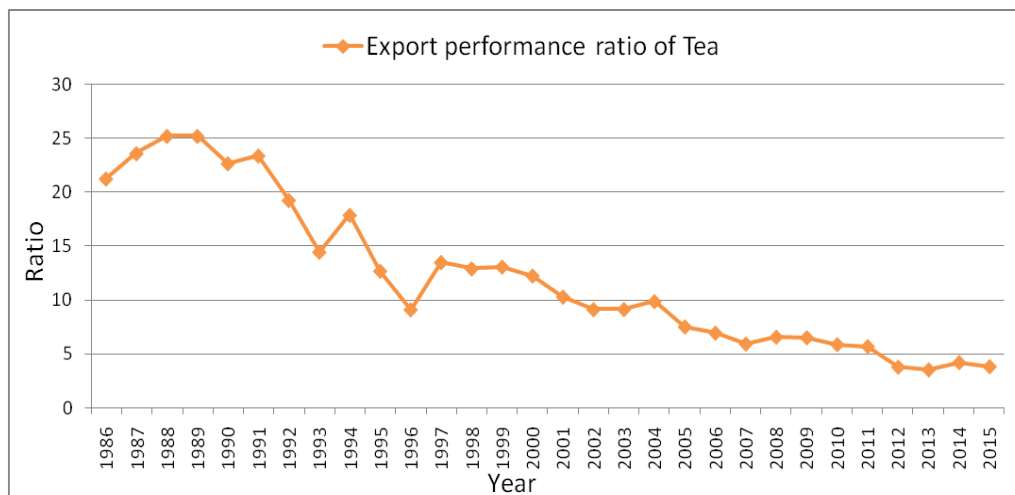
Particulars	Mean	SD	CV
Area (Ha)			
Period I	432658.2	23097.48	5.33
Period II	556285	33430.5	6.00
Overall Period	494471.6	67759.91	13.70
Yield (Kg/Ha)			
Period I	1698.2	110.532	6.50
Period II	1789.933	160.5742	8.97
Overall Period	1744.067	140.8465	8.07
Production (Tonnes)			
Period I	735760.2	71230.7	9.68
Period II	1001514	130484.8	13.02
Overall Period	868637.3	167241.4	19.25
Export Quantity (Tonnes)			
Period I	183588.7	24218.38	13.19
Period II	212563.4	44900.74	21.12
Overall Period	198076.1	37741.65	19.05
Export value (1000 US $)			
Period I	430006.2	90147.49	20.96
Period II	563430.5	195523.7	34.70
Overall Period	496718.3	161503.4	32.51

Note: SD- Standard Deviation and CV- Co-efficient of Variation

Table.3 Export performance ratio of tea (1986 to 2015)

S.no	Year	EPR of tea
1	1986	21.25
2	1987	23.61
3	1988	25.21
4	1989	25.21
5	1990	22.67
6	1991	23.38
7	1992	19.26
8	1993	14.46
9	1994	17.89
10	1995	12.70
11	1996	9.12
12	1997	13.50
13	1998	12.91
14	1999	13.08
15	2000	12.25
16	2001	10.30
17	2002	9.14
18	2003	9.15
19	2004	9.88
20	2005	7.53
21	2006	6.96
22	2007	5.94
23	2008	6.58
24	2009	6.53
25	2010	5.89
26	2011	5.71
27	2012	3.80
28	2013	3.55
29	2014	4.22
30	2015	3.84

Fig.1 The export performance ratio of tea in India

The EPR value of tea was continuously decreasing with minor fluctuation are from 21.25 (in 1986) to 3.84 (in 2015). This ratio was continuously decreasing at increasing rate over the years and reached to minimum of 3.84 during 2015.Which revealed that EPR value was decreasing more than seven times. During the study period in the case of tea, performance ratio reached the maximum 25.21 in the year of 1988 and 1989.

The EPR of tea during the early 1990s recorded an increasing trend. However, after 1990s the EPR fell sharply, revealing erosion of comparative advantage of Indian tea. The trend would be reversed through corrective measures in the form promotional efforts of the government, which needs to be sustained on a long term basis (Kumar P *et.al.* 2008)[8].

In conclusion, plantation sector plays an important role in export to meet domestic requirement and in employment generation and poverty alleviation particularly in rural areas. India is the second largest producer of tea in the world and the largest consumer. Area and production of tea from India was showing increasing trend. The export performance and export value of tea from India is decreasing every year due to the increasing domestic consumption. Indian tea is slowly losing ground in the international market.

In order to gain the comparative advantages, Indian tea industry needs improvement in research facility research facility, introduction of modern technology, processing facility etc. Increase in export business helps in earning scarce foreign exchange and stimulates the domestic industry to manufacture the quality product.

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