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PRODUCTION AND EXPORT PERFORMANCE OF TURMERIC IN INDIA

Dr. R. Govindasamy
Guest lecturer, Department of Economics, Bharathiar University, Coimbatore

Abstract

Turmeric is also called as "Indian saffron". Turmeric is an important spice among the rice-eating peoples of India, South East Asia and Indonesia, In India, turmeric cultivated important States of Andhra Pradesh, Maharashtra, Orissa, Tamil Nadu, Karnataka and Kerala. India is the largest producer and consumer of turmeric in the world. Indian turmeric contributes about 78% world production and 60% of the exports of Turmeric. Under Turmeric had increase from 139300 hectares in the year 1995-96 to 219000 hectares during 2012-13. The area indices worked out for Turmeric showed fluctuating trend. The production of Turmeric was maximum during the year 2012 13 with 1167000 tonnes. The Export of Turmeric has increased from 23,018.83 tonnes in 1996-97 to 52,861.32 tonnes during 2012-13.

Keywords: *Turmeric, exports, spice, Indian foods, Health Benefits, cosmetic*

Introduction

Turmeric botanically name called Curcuma longa (LINN.) belongs to family Zingiberaceae. Turmeric also called as "Indian saffron". Turmeric is an important spice among the rice-eating peoples of India, South East Asia and Indonesia. The use of turmeric dates back nearly 4000 years, to the Vedic culture in India, when turmeric was the principal spice and also of religious significance and ceremonial occasions. Turmeric is mainly used as spice in Indian foods.

Origin and Health Benefits of Turmeric

It is a native of India. Apart from India, it is cultivated in Pakistan, *M*alaysia, Myanmar, Vietnam, Thailand, Philippines, Japan, Korea, China, Sri Lanka, Nepal, east and *We*st Africa, South Pacific Islands, *M*alagasy, Caribbean Islands and Central America. In India, it is cultivated in the States of Andhra Pradesh, *M*aharashtra, Orissa, Tamil Nadu, Karnataka and Kerala. Turmeric is a tropical crop cultivated from sea level to 1200 meter *M*SL. It grows in light black, black clay loams and red soils in irrigated and rain fed conditions. The crop cannot stand water logging or alkalinity.

Turmeric is a powerful medicine that has been used in the Chinese and Indian systems of medicine as an anti- inflammatory agent to treat a wide variety of conditions including jaundice, hemorrhage, tooth ache, bruises, chest pain, and colic. It has anti cancer and anti-viral activities and hence finds use in the drug industry and cosmetic and Textile industry. A type of starch is also being extracted from a particular type of turmeric.

International Scenario

Major Producers are Thailand, Central and Latin America, Taiwan and other Southeast Asian countries. The global production of turmeric is around 11 lakh tones per annum. India is the largest producer and consumer of turmeric in the world. The world production scenario contributing 78 per cent followed by China 8 per cent, Myanmar 4 per cent and Nigeria and Bangladesh together contributing to 6 per cent of the global production. India is the global leader in value added products of turmeric and exports. Other major exporters are Thailand, other Southeast Asian countries, Central and Latin America and Taiwan. United Arab Emirates (UAE) is the major importer of turmeric from India accounting for 18 per cent.

National Scenario

India is the largest producer, and the exporter of Turmeric. It accounts for 80per cent of the world output. Other major producers are China, Myanmar, Nigeria, Bangladesh, Pakistan, sri lanka, Taiwan, Burma, Indonesia, Malaysia, Vietnam, Thailand and Central America etc. Global production is around 8 to 9 lacks tonnes. Indian turmeric industry contributes about 78per cent world production and 60per cent of the exports of Turmeric. Asian countries consume much of their own turmeric production nearly 9 per cent.

Export Potential of Turmeric

United Arab Emirates (UAE) is the major importer of turmeric from India accounting for 18per cent of the total exports followed by United States of America (USA) with 8 per cent. The other leading importers are Bangladesh, Japan, Sri Lanka, UK, Malaysia, South Africa, Netherlands and Saudi Arabia. All these countries together account for 75 per cent of the world trade, and Asian countries supplies to the entire world. Remaining 25 per centis met by Europe and North America, Central and Latin American countries India exports Turmeric to other countries in a range of 5-6% of its total production. In India 90% is consumed locally and the rest is exported. Still India accounts 60% of the world turmeric exports.

Objectives of the Study

- To examine the trends in area, production and productivity of Turmeric in India and its important states.
- To analyze the export performance of turmeric in India.
- To measure the contribution of area, and yield in change in production of Turmeric.

Methodology

Collection of Data

The data required for this study were collected from secondary sources.

1. To examine the trends in area, production and productivity of Turmeric in India, and its important states wise area, production and productivity of Turmeri producing states were collected for the period (1995-96 to 2012-13).
2. To examine the trends in export of Turmeric in India data were collected for the period (1996-97 to 2012-13).

Estimation of Compound Growth Rate

Several methods are available to estimate growth rates. In this study exponential function was used to estimate compound growth rate by taking time as the independent variable and credit as dependent variable. This exponential trend equation gives constant rate of increase or decrease per unit of time and they are termed as 'Geometric' or Compound Growth Rate.

(1) **Compound growth rate is estimated by fitting exponential trend equation of the following type.**

$$Y = a\, b^{t} \text{----------(1)}$$

Where,

Y = Turmeric Value
t = time variable in years
a = constant And
And b = (1 + i)
where i = Compound Growth Rate

The equation (1) takes the following linear form by taking logarithms of both sides of the equation

Log *y* = log a + t log b

Compound growth rate is computed using the following formula.

Compound Growth Rate (CGR) = (Antilog (log b - 1) *100

(2) Growth of Turmeric Production an- Analysis By Component Elements

The production of any crop will be increased by *way* of increasing either area under the crop or both. In wheat more area has been brought under cultivation during the last few *y*ears. Similarly, yield also has increased considerably. Ultimately the production of Turmeric also increased over the years. The relative contribution of area, yield and their interaction in increased in production of crop can be estimated using the following measure

$$Q_0 = A_0\ Y_0$$

$$Q_n = An\ Y_n$$

Also, $Q_n = Q_{0\ +}\ \Delta Q\ An = A_o + \Delta A\ and\ Y_n = Y0 + \Delta Y$

Therefore $(Q_n + \Delta Q) = (A_0 + \Delta A)\ (Y_0 + \Delta Y)$

$$= A_{0\ Y0} + A0\ \Delta Y + Y_{0\ \Delta A} + \Delta A\ \Delta Y$$

$$\Delta Q = A_0\ Y_0 + A_0\ \Delta Y + Y0\ \Delta A + \Delta A\ \Delta Y - Q_0$$

$$\Delta Q = A_0\ \Delta Y + Y0\ _{\Delta A} + \Delta A\ \Delta Y$$

Yield Area Interaction
Effect Effect Effect

The first term $(A0\ \Delta Y)$ can be considered as the yield effect, the second term $(Y0\ \Delta A)$ as the area effect and the third $(\Delta A\ \Delta Y)$ as the interaction effect. The total change in production can thus be decomposed into three-effect viz., yield effect, area effect and the interaction effect.

Of course, it would be appropriate to indicate the limitation of this technique. This technique of analysis is based on only few years' information viz., the base and current periods information and as such, do not necessarily reflect the actual trend for all the years in the series.

Trends in Area, Production and Productivity of Turmeric in India

Area

The data related to area, production and productivity of Turmeric in India from 1995-96 to 2012-13 is provide in table.1. Its portraits reveal that the area under Turmeric had increase from 139300 hectares in the year 1995-96 to 219000 hectares in 2012-13. The area indices worked out for Turmeric showed fluctuating trend. The area indices worked out for Turmeric showed less than hundred in year 1996-97. During the reference period, the estimated compound growth rate of area under Turmeric was positive which was estimated to be 2.34 per cent per annum.

Production

The general trend of production indicated that it had increased from 462900 tonnes during the year 1995-96 to 1167000 tonnes in year 2012-13 with some fluctuation is in the intervening year. The production of Turmeric was maximum during the year 2012-13 with 1167000 tonnes. The indices for production of Turmeric reach maximum during the year 2012-13 with 252 per cent. The annual common growth rate was positive of 4.55 per cent per annum during reference period.

Table 1: Area Production and Productivity of turmeric in India during 1995-96 to 2012-13

Year	Area		Production		Productivity	
	Hectare	Indices	Tonnes	Indices	Kg/Ha	Indices
1995-96	139300	-	462900	-	3323	-
1996-97	135200	97	528900	114	3912	118
1997-98	139700	100	549200	119	3931	118
1998-99	160700	115	597900	129	3721	112
1999-00	141200	101	668500	144	4734	142
2000-01	191700	138	714300	154	3726	112
2001-02	167100	120	562800	122	3368	101
2002-03	154200	111	573900	124	3722	112
2003-04	150100	108	564900	122	3764	113
2004-05	158700	114	718100	155	4525	136
2005-06	172000	123	851700	184	4952	149
2006-07	186000	134	837000	181	4500	135
2007-08	160000	115	665000	144	4156	125
2008-09	181000	130	821200	177	4535	136
2009-10	181000	130	793000	171	1382	132
2010-11	195100	140	992900	214	5089	153
2011-12	219000	157	1167000	252	5329	160
2012-13	219000	157	1167000	252	5329	160
CGR	**2.34**	-	**4.55**	-	**2.15**	-

Sources: Department of Agriculture and Cooperation (Horticulture Division)

Productivity

The productivity trend of India shows that it has increased from 3323 kg per hectare in the year 1995-96 to 5329 kg per hectare during 2012-13, with some fluctuation's in the intervening year. The productivity of turmeric reached the highest during the period 5329 kg per hectares. The index for productivity was maximum during the year 2012-13 with 160 percent. The estimated compound growth rate for productivity of Turmeric was 2.15 percent.

Table 2: Area and Yield effect of Turmeric production in India

S. No.	India	Period	A_0	Y_0	ΔA	ΔY	Area effect	Yield effect	Interaction effect
1	India	1995-1996 and 2012-2013	139300	3323	79700	2006	39.63	37.64	22.72

Relative contribution Area and productivity on production

Table 2 shows that the Effect of production, area and interaction of Turmeric production in India during the period 1995-96 to 2012-2013 area calculated. The total production of Turmeric increased during the reference period was about 79700 Million tonnes of which 37.64% was due to increase in productivity; 39.63% was due to interaction between both area and productivity. Area effect is more than yield effect in the case of change in total production in Turmeric.

State wise Area under Turmeric

The data on state wise area under Turmeric is presented in table 3 for the period 1995-96 to 2012-13. Out of the major production Turmeric states in India Andhra Pradesh had more area under Turmeric during the period of reference, which was followed by Assam, Bihar, Karnataka, Kerala, Maharashtra, Orissa, West Bengal and Tamil Nadu.

The area under Turmeric had increase from 139300 thousand hectares in the year 1995-96 to 219000 hectares in 2012-13. The area indices worked out for Turmeric showed a fluctuating trend. The estimated compound growth rate of area under Turmeric was positive which was estimated to be 2.34 per cent per annum.

Table 3: Area under Turmeric in Important States in India during 1995-96 to 2012-13

(Area In '000 hectares)

Year	Andhra Pradesh	Assam	Bihar	Karnataka	Kerala	Maharashtra	Orissa	West Bengal	Tamil Nadu
1995-96	52.5	9.4	2.7	4.7	4	7.3	33.9	12.6	15.6
1996-97	51.9	10	3.6	4.8	4.1	7.2	27	12.6	16
1997-98	48.2	10.1	2.9	4.3	3.8	7.3	25.5	12.5	18.2
1998-99	59.5	10.7	3.1	5	3.7	7.2	26.8	12.8	24.8
1999-00	64.2	11	3.1	6.8	4	6.9	28.1	13.3	32.5
2000-01	73.9	11.6	3.2	9.2	4.1	6.9	25.3	13.9	33
2001-02	61.7	11.8	2.9	6.7	3.6	6.8	27.1	12.8	23.6
2002-03	56.8	12.1	2.9	6.6	3.1	6.6	23.6	11.7	17.3
2003-04	58.4	12.2	3	5.4	2.8	6.8	23.8	12.6	16.2
2004-05	60.4	11.7	2.8	5.4	2.9	6.8	23.6	12.4	21.6
2005-06	70	11.7	3.5	5.4	3.4	6.8	24	11.8	26
2006-07	71	11.6	3	5.4	3.4	6.6	23.6	11.8	26
2007-08	69	11.7	3.5	5.4	4	6.6	23.8	11.7	27
2008-09	78	11.5	3.1	5.2	4.2	6.6	24	11.4	27.4
2009-10	72.2	12.3	3.5	5.4	4	6.8	24.3	12	27.6
2010-11	83	11.9	3.7	5.1	4	7	26.3	12.6	30
2011-12	86.1	11.7	4	5	3.8	6.7	23.5	12.1	26
2.12-13	88	12	4.2	5.2	4	6.8	23.8	13.2	33.7
CGR	**2.95**	**1.07**	**1.54**	**-0.25**	**0.06**	**0.43**	**-1.15**	**-0.35**	**2.83**

Sources: Center of Monitoring the Indian Economy (CMI)

Turmeric Production in India

The Table 4 general trend of production indicated that it had increased from 462900 tonnes during the year 1995-96 to 1167000 thousand tonnes in year 2012-13 with some fluctuation is in the intervening year. The production of Turmeric was maxismum during the year 2012-13 with 1167000 tonnes. The annual compound growth rate was positive of 4.55 per cent per annum during reference period.

Productivity of Turmeric in India

Table 5 shows the productivity trend of India shows that it has increased from 3323 kg per hectare in the year 1995-96 to 5329 kg per hectare during 2012-13, with some fluctuation in the intervening year. The productivity of Turmeric reached the highest during the period 5329 kg per hectares. The estimated compound growth rate for productivity of Turmeric was 2.15per cent.

The estimated compound growth was positive in all. Districts excepts except Salem (9.08 per cent) which was followed by the villupuram with (7.02 per cent Cuddalore with (4.51per cent) and Erode (3.35 per cent).

Relative Contribution of Area and Change in Production of Turmeric

Table 6 shows that contribution of productivity and area on change in production of Turmeric in the states of India during the period 1995-96 and 2012-2013 is presented in the table. 4.1.9. The table shows that the yield effect was maximum in TamilNadu state 95.30 which was followed by Maharashtra 91.74 Bihar 79.62.respectively the Yield effect was 0 in Kerala.

The area effect was maximum in Kerala 100 which was followed by west Bengal 76.74 and Karnataka 65.97 respetivel. The Interaction effect was maximum in Andhra Pradesh 24.76 which was followed by Orissa 17.50 and Assam 7.27 respectively.

Table 4: Production of Turmeric in Important States in India during 195-1996 to 2012-2013

Year	Andhra Pradesh	Assam	Bihar	Karnataka	Kerala	Maharashtra	Orissa	Tamil Nadu	West Bengal
1995-96	244.1	6.6	2.6	20.6	9.6	9.3	51.8	79.7	22.5
1996-97	292.2	6.9	3.7	26.2	9.8	9.2	74.1	92	22.5
1997-98	273	7	3.2	24.1	9.1	9.1	60.8	110.7	23.6
1998-99	308.4	7.4	3.3	25.4	8	91	64.3	126	21.5
1999-00	312.6	7.6	3.3	29.6	8.4	8.7	61.2	167.4	20
2000-01	375.8	8	3.1	41	9	8.7	60.6	158.6	22.4
2001-02	249.5	8.2	3	35.6	7.9	8.5	65.8	118.3	22
2002-03	283.5	8.3	2.9	28.6	6.9	8.2	56	64.5	21.4
2003-04	320.7	8.4	2.9	26.4	5.7	8.5	56.4	67.2	24.5
2004-05	417.8	8.4	2.7	29.4	6.2	8.5	56	118.5	24.5
2005-06	518.5	8.4	3.4	26.4	8.2	8.4	57.1	143.4	25
2006-07	510	8.3	2.7	28.6	6.2	8.5	56	140	24
2007-08	518	8.2	2.9	26.8	6.9	8.4	56.4	143	25
2008-09	521	8	3.6	27	7	8	57	148	32
2009-10	506	8.8	4	27.3	6.9	8.1	56.4	151	35
2010-11	526	8.5	4.1	27.6	6.9	8.3	60.2	146	28
2011-12	564	8.1	4.3	27	6.6	8.3	60.2	146	28
2012-13	554.5	9.1	4.3	27.8	6.9	8	61.8	146	25
CGR	5.32	1.35	1.70	0.30	-2.13	-3.35	-0.31	-2.44	1.82

Sources: Centre of Manitoring the Indian Economy (CMIE) data

Table 5: Yield of Turmeric in Important States in India during from 1995-96 to 2012-13

Year	Andhra Pradesh	Assam	Bihar	Karnataka	Kerala	Maharashtra	Orissa	West Bengal	Tamil Nadu
1995-96	4650	703	952	4383	2409	1247	1528	1786	5098
1996-97	5629	691	1019	5464	2428	1258	2744	1786	5744
1997-98	5663	692	1107	5552	2395	1247	2381	1888	6082
1998-99	5183	691	1069	5070	2168	1261	2400	1684	5090
1999-00	4870	691	1064	4334	2106	1261	2176	1508	5149
2000-01	5083	690	981	4437	2189	1258	2396	1616	4807
2001-02	4045	691	1041	5306	2219	1257	2426	1722	5002
2002-03	4990	689	990	4333	2210	1238	2368	1820	3731
2003-04	5487	687	966	4876	2040	1253	2373	1941	4156
2004-05	6922	718	965	4876	2167	1250	2377	1974	5479
2005-06	7409	718	958	4876	2434	1247	2377	2115	5520
2006-07	7183	715	900	5296	1823	1287	2373	2034	5385
2007-08	7507	700	828	4962	1725	1272	2369	2136	5296
2008-09	7408	692	848	5065	1702	1341	2655	2056	5226
2009-10	7662	701	872	4941	1843	1296	2842	2041	5448
2010-11	7896	769	830	5322	1901	1252	2451	2433	5423
2011-12	7997	723	865	5419	1894	1298	2877	2656	5213
2012-13	7631	780	865	5522	1868	1352	2654	2119	5233
CGR	3.47	0.45	-1.44	0.56	0.56	0.30	1.44	2.11	0.09

Source: Centre of Monitoring the Indian Economy (CMIE) Data

Table 6: Area and Yield effect of Turmeric production in important state in India during from 1995-96 to 2012-2013

S.No	States	Period	A_0	Y_0	ΔA	ΔY	Area effect	Yield effect	Interaction effect
1.	Andhra Pradesh	1995-96 to 2012-13	52.5	4650	35.5	2981	36.61	38.62	24.76
2.	Assam	1995-96 to 2012-13	9.4	703	2.6	77	26.30	66.42	7.27
3.	Bihar	1995-96 to 2012-13	2.7	952	1.5	87	13.09	79.62	7.27
4.	Karnataka	1995-96 to 2012-13	4.7	4383	0.5	1139	65.97	27.00	7.01
5.	Kerala	1995-96 to 2012-13	4	2409	0	541	10	0	0
6.	Maharashtra	1995-96 to 2012-13	7.3	1247	0.5	105	7.72	91.74	0.52
7.	Orissa	1995-96 to 2012-13	33.9	1528	10.1	1126	58.74	23.75	17.50
8	Tamil Nadu	1995-96 to 2012-13	15.6	5098	18.1	135	2.17	95.30	2.52
9	West Bengal	1995-96 to 2012-13	12.6	1786	0.6	333	76.74	19.60	3.6

The Export of Turmeric in India

India is the largest Turmeric producing country in the world. It is also a largest consumer in the world. Table 8 shows that trends of Export of Turmeric. It is increased from 23,018.83 tonnes in 1996-97 to 52,861.32 tonnes in 2012-13. The highest production of Turmeric in India was 54,816.41 tonnes in 2006-07. The maximum growth rate (29.53) found in the year 2005-06, and negative growth rate was (-18.16) in 2001-02.

Table 8: Export of Turmeric in India during (1996-97 to 2012-13)

(Quantity in Tonnes)

s. No.	Year	Tonnes	Growth
1.	**1996-97**	23,018.83	-
2.	**1997-98**	26837.76	-16.59
3.	**1998-99**	32,421.28	20.80
4.	**1999-00**	35,791.18	10.39
5.	**2000-01**	38148.90	6.59
6.	**2001-02**	31,222.94	-18.16
7.	**2002-03**	32,444.01	3.91
8.	**2003-04**	37,042.26	14.17
9.	**2004-05**	39,397.18	6.36
10.	**2005-06**	51,029.66	29.53
11.	**2006-07**	54,816.41	7.42
12.	**2007-08**	53,992.2	-1.50
13.	**2008-09**	44,983.87	1.95
14.	**2009-10**	42,641.31	1.83
15.	**2010-11**	50,007.48	0.02
16.	**2011-12**	54,654.00	0.37
17.	**2012-13**	52,861.32	-

Source: Export Data Bank

Conclusion

India is the largest producer and consumer of Turmeric and also the biggest exporter of the world. In this reference period the area and production was in fluctuating trend. The export of turmeric from India in terms of quantity and share 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 subsides (irrigation, fertilizer, and insecticide, etc.) and introduced high yield varieties of turmeric seeds.

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