Growth and Export Performance of Ginger in India– An Economic Analysis

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ABSTRACT

India is rightly called as "spice bowl of the world" for its production of variety and superior quality of spices. Indian agriculture has to face competitiveness in international trade for each commodity due to liberalisation and agreement of WTO. Spices are the major exports from India and it is generally expected that trade policies would influence the spice trade. In the area of export ginger occupies fifth position in terms of quality and sixth position in export earnings among the spices. In recent years, there have been ups and downs in export of ginger from India. This situation called for a detailed study. Hence this study was conducted to analyze growth and export performance of ginger in India. The required data collected for the period of 29 years. The objectives are analyzed with nominal protection coefficient and growth rate analysis. The growth rate between pre and post-WTO period in terms of area and production were positive. The export growth of post WTO period in terms of quantity and values were found to be not significant and declining but unit price value were found to be significant and positive. Nominal protection coefficient was found to be more than one indicates the non profitability of export.

Keywords: Ginger, Export performance, Compound Growth Rate, Nominal Protection Coefficient

India is known for spice production and export all over the world. Other countries export spices are China, Japan, Indonesia, Australia, Nigeria, West Indies islands, Malaysia, Pakistan, Spain, Egypt and Tanzania. The share of spices to our country's export earning was 1.24 per cent and its share in agricultural and allied product was 8.5%. From India spices like pepper, ginger, turmeric, chilli, tejpat, small and large cardamom, coriander, cumin and garlic etc are produced and exported. Ginger is one of the spices that support large number of farmers in the states of Kerala, Karnataka, Arunachal Pradesh, Orissa, West Bengal, Sikkim and Madhya Pradesh. Kerala ranks first in ginger production and nearly 1/3 production is from this state. The two popular varieties of Indian ginger in the international market are Cochin Ginger (NUGC) and Calicut Ginger (NUBK) Ginger. It is available in four forms such as oil, oleoresins, ground ginger and fresh ginger. Fresh ginger is used as vegetable produced mainly in Kerala, a major share of which is exported. Nearly 30 per cent of total production is converted into dry ginger, while half of the production is consumed as green ginger and the remaining is used as seed materials. Country wise production of ginger is presented in Table1. It is evident from the table that India ranks second in terms of production followed by China in 2009. Though India's ginger production was the highest in the world its share in the export was found to be less than 10 percent.

World Trade of Ginger – A Scenario

World trade in ginger is estimated at $258 million in 2008-09. India's share in ginger trade which was 15.08 percent in 1997-98 had declined to 2.8 per cent in 2008-09. While China's share had increased to around 70 per cent. In ginger oil and oleoresin trade India's share was high. Cochin ginger is popular and it fetches a premium price because of its superior quality. USA, Bangladesh, UK and Spain

are the major importers of India's ginger. The main competitors of ginger export are China, Nigeria and Thailand. The export growth depends not only on domestic production and distribution but also on other factors such as world economic scenario, domestic prices relative to world prices, exchange rate, inflation rate in the countries competing with India for the world market and taxes and subsides on exports.

Table 1. Country Wise Ginger Production during 2009

Country	Production (tonnes)	Percentage to world
Nigeria	168800	10.34
India	380100	23.28
Indonesia	122181	7.48
China	381393	23.36
Nepal	178987	10.96
Bangladesh	72608	4.45
Thailand	170125	10.42
Others	158408	9.70
World	1387445	100.00

Source: www.fao.org

Objectives

Keeping the above aspect in view an attempt is made in this paper to analyze the growth and export performance of ginger with the overall objective is to assess the production and export of ginger during pre and post-WTO periods.

The specific objectives of the study are

(i) to study the growth of area, production and productivity and export of ginger in India;

(ii) to assess the export competitiveness of ginger; and

(iii) to suggest suitable policy measures.

Review of literature

Mahesh (2000) studied the export competitiveness of Indian tea by estimating the NPC and DRC under both importable and exportable hypotheses during the year 1998-99. The results revealed that under importable hypothesis the NPC and DRC were 0.71 and 0.66 respectively. The NPC was below unity, which indicated that the domestic tea was an effective import substitute, where as the DRC was also less than one implying that the tea growers spend less than a rupee equivalent of foreign exchange on the production. Hence, it was profitable to use non-tradable inputs in the production of tea in India. Under exportable hypothesis, the NPC and DRC were 0.98 and 0.93 respectively. The NPC was less than unity which reveals that tea was competitive in the international market and it represents an effective export commodity where as DRC was also less than one implying its export competitiveness in the international market.

Jayesh (2001) studied the production and export performance of pepper and cardamom in south India. He found that all the south Indian states except Karnataka (-0.47 %) and Tamil Nadu (-1.62 %) recorded significant growth in area and production of pepper and in case of cardamom, all the states recorded a negative growth in area, while the productivity and production showed significant growth. A positive growth was found in the export quantity, value and unit value of pepper. But a negative growth was recorded in the export of cardamom.

Jayesh (2001) used the nominal protection coefficient technique for the export competitiveness of Indian pepper. Under the exportable hypothesis, the nominal protection coefficient value were found to be lesser than unity (0.849) in Calicut and (0.817) in Sirsi markets, indicating that the Indian pepper is competitive in the international market and which is an efficient export oriented commodity.

Sharma and Sharma (2003) studied the production and export performance of tea and reported that the growth rates were positive for area, production and productivity of tea. The share of Indian tea export in the total export was as high as 72.17 per cent in 1950, which had steadily declined to 23.79 per cent in 1999.

Sudeesh et.al, (2007) studied the export performance of Indian spices revealed that there was a relatively higher growth in export of spices from India during the pre-WTO era, magnitude of which fell in post-WTO period. Latter period also saw a significant reduction in instability in exports of spices, mainly in quantum of exports.

Jose and Jayasekhar (2008) studied the growth trends in area, production and productivity of Arecanut in India during the period from 1971 to 2004. It revealed that the area and the production of Arecanut in India increased tremendously at the rate of 2.2 per cent and 3.2 per cent respectively. The rate of increase in both area and production is mainly due to favorable price prevailed during the period.

Methodology

The present study is based on secondary data. The time-series data on area, production, productivity, export quantity, value and domestic and world price were collected from published sources of the indiastat for the period of 29 years (from 1980-81 to 2008-2009). For analytical purpose, this entire period was divided subjectively into two sub periods, with the implicit assumption that each sub period has distinct nature and pattern of development due to the establishment of WTO. Pre-WTO period covers the period 1980-1981 to 1994-1995 and Post-WTO period covers 1995-1996 to 2008-2009. Secondary data on monthly domestic prices were collected from published source of the Spices Board for the period of five years (from 2004-05 to 2008-09). Annual domestic price were arrived by averaging monthly data.

Compound Growth Rate of ginger was estimated for two periods' viz., pre-WTO Period (1980-81 to 1994-95) and post-WTO Period (1995-96 to 2008-2009) periods. This grouping was done mainly to find out the effect of WTO agreements and to compare the export performance of the ginger. The growth in area, production, productivity, quantity exported, export value and unit value realized from exports were estimated by using the exponential growth function of the form

$$Y = a\,b^t \cdot e_t \qquad\qquad \text{.................... (1)}$$

Where, Y = Dependent variable, t = Time variable, e_t = Error term, a and b are unknown constants to be estimated. The unknown constants a and b were found by applying methods of least squares by transforming the equation into logarithmic form

$$\ln Y = \ln a + t \ln b \qquad\qquad \text{.................... (2)}$$

Where, log Y is natural logarithm of Y, log a and log b are similarly defined. The compound growth rate 'r' was computed by using the relationship

$$r = (\text{Antilog of } (\ln b) - 1) \times 100 \qquad \text{.................. (3)}$$

$$\text{where, } \ln b = \frac{\sum (t \ln Y) - (\sum t \sum \ln Y)/n}{\sum t^2 - (\sum t)^2/n}$$

and n is number of time points.

The Nominal Protection Coefficient (NPC) is simplest coefficient used to assess the level of protection resulting from market distortions. It measures the export competitiveness. It is the ratio between the domestic price and world price. The NPC can be applied to both exportable and importable.
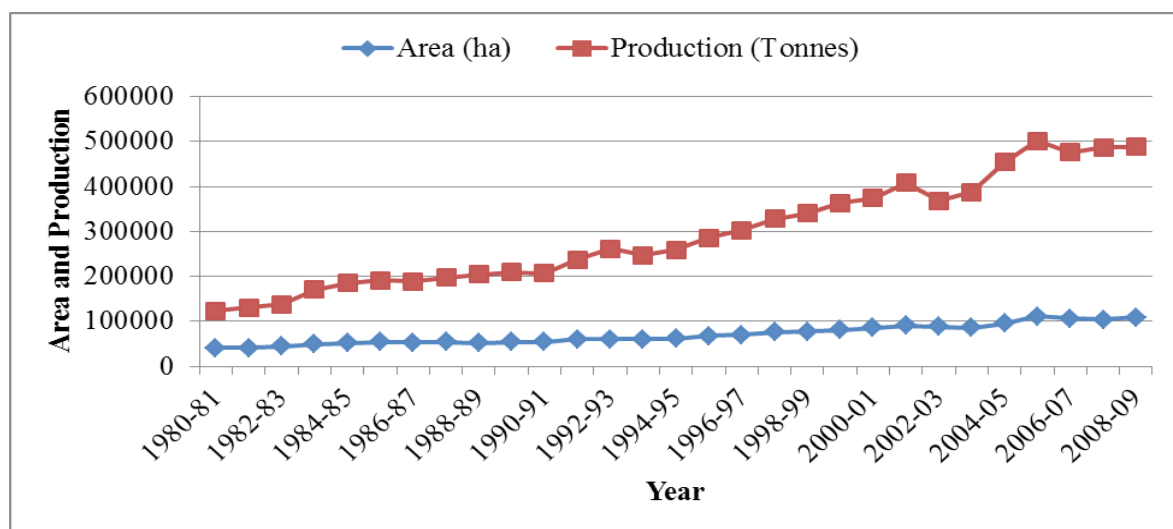

Figure 1. Area Production of ginger during 1980-81 to 2008-09

Results and Discussion

The area, production and productivity of ginger in India during 1980-81 to 2008-09 is provided in Appendix-I. Area under ginger crop during 1980-81 was 40450 ha and reached high level of 110600 ha during 2005-06. During Pre-WTO period (1980-81 to 1994-95) increase in ginger area was around 20,000 ha and it was around 50,000 ha during Post-WTO period. Production of ginger was also high in Post-WTO than Per-WTO. This shows that WTO agreements provided opportunity for more export of ginger that resulted in increase in area and production. The area and production of ginger are also presented in the Fig 1. Area and production of ginger showed increasing trend during the study period.

Growth Analysis of Ginger

The Compound Growth Rates (CGRs) of Ginger crop for the periods 1980-81 to 1994-95 (Pre-WTO Period), 1995-96 to 2008-09 (Post-WTO Period) and 1980-81to 2008-09 (Overall Period) were estimated and are furnished in Table 2. The growth rates of ginger in terms of area, production and productivity showed variations. During Pre WTO Period, the compound growth rate for area (2.58 per cent) was positive and significant but it was lower than post-WTO period (3.78). It was concluded that the area of the ginger crop was increased during Post-WTO period. The ginger production had a high significant growth rate of 5.71 per cent during the Pre- WTO period as compared with lower growth rate of Post-WTO period (4.51) and Overall Period. Though the area increased from around 60,000 ha to 108,600 ha during Post-WTO period growth rate of production was less. It is mainly due to productivity.

Regarding the yield of ginger Pre-WTO Period had a high significant growth rate (3.05 per cent) as compared with Post-WTO period (0.70) and Overall Period (1.85). This was reflected in production growth rate. It was concluded from the above results that the growth rate of ginger in terms of area was high during Post-WTO period. Productivity of ginger influences the production and hence technologies have to be developed to increase the ginger productivity. It was average of 3454 kgs/ha during the Post-WTO period.

Table 2. Compound Growth Rate of Area, Production, Productivity of Ginger in India

(Percent per annum)

	Particulars	Pre-WTO Period (1980-81 to 1994-95)	Post-WTO Period (1995-96 to 2008-09)	Overall Period (1980-81 to 2006-07)
Area	R^2	0.83	0.92	0.97
	Coefficient	0.025**	0.037**	0.035**
		(0.003)	(0.003)	(0.001)
	CGR	2.58	3.78	3.57
Produc-tion	R^2	0.90	0.91	0.97
	Coefficient	0.055*	0.044*	0.053*
		(0.005)	(0.004)	(0.001)
	CGR	5.71	4.51	5.48
	R^2	0.88	0.28	0.84
	Coefficient	0.03**	0.007**	0.018**
		(0.003)	(0.003)	(0.001)
	CGR	3.05	0.70	1.85

Note: Figures in the parentheses indicates Standard Errors of the respective Coefficient.

** - Significant at 1 per cent level; *-Significant at 5 percent level

Export Performance of Ginger

The export of ginger in India during 1980-81 to 2008-09 is given in Appendix-II. It could be seen that the export of ginger in 1980-81 was 6811 tonnes and it reached the higher level of 18442 tonnes in 1993-94. Export was found to be the highest i.e. 28268 tonnes in 1996-97.It showed declining trend from 1998-99 to 2003-04. Price per kg of ginger was less than ₹20 in most of the years during Pre-WTO period and it had increased during Post-WTO period. The highest price realised was ₹49.45/kg in 2006-07. This had contributed for higher export value of ginger during Post-WTO period.

The growth rate of ginger in terms of export quantity, value and unit value were estimated and are given in Table 3. Though the Ginger shows the significant growth in export quantity in Overall period with 0.98 per cent, it had registered positive growth rate in in Pre-WTO period (2.58) and negative growth in Post-WTO Period with -7.55 per cent but it is not

Table: 3 Compound Growth Rate of Ginger Export from India during 1980-81 to 2008-09

(Percent per annum)

	Particulars	Pre-WTO Period (1980-81 to 1994-95)	Post-WTO Period (1995-96 to 2008-09)	Overall Period (1980-81 to 2006-07)
Export Quantity	R2	0.55	0.20	0.18
	Coefficient	0.094*	-0.078	0.033**
		(0.024)	(0.051)	(0.014)
	CGR	2.58	-7.55	3.39
Export Value	R2	0.44	0.03	0.64
	Coefficient	0.092*	-0.023*	0.084*
		(0.029)	(0.009)	(0.012)
	CGR	9.72	-2.29	8.84
Unit Value	R2	0.003	0.41	0.62
	Coefficient	-0.001	0.055*	0.051*
		(0.019)	(0.022)	(0.008)
	CGR	-0.12	5.69	5.27

Note: Figures in the parentheses indicates Standard Errors of the respective Coefficient.
** - Significant at 1 per cent level;
* - Significant at 5 per cent level

significant. The stiff competition from other ginger exporting countries such as China, Nepal, Nigeria and Thailand had resulted in negative growth rate of ginger export from India. The growth rates for export value of ginger exhibits significant growth in Pre-WTO period and overall periods. But compared with overall Period, the Pre-WTO Period was registered high growth rate of 9.72 per cent. At overall, the growth of ginger significantly stands at 8.84 per cent. Decline in quantity exported during Post-WTO period is reflected in export value though there is positive growth in unit value during this period. The export unit value growth rate was non significant with -0.12 per cent during pre WTO period. However there was a positive and significant growth rate during post-WTO Period and overall period with 5.69 per cent and 5.27 per cent, respectively. It could be concluded from the above results that India's export of ginger had declined during post-WTO period and also shows high variations. This needs attention.

Nominal Protection Coefficient (NPC) of Ginger

To assess the export competitiveness of ginger NPC was worked out for the years 2004-05 to 2008-09 and the same are presented in Table 4. It is evident from

the table that NPC is less than one in all the years which was mainly due to higher domestic price than the world price. So it is not profitable to Export. This may be the reason for decline in export of ginger from India. However it needs an indepth study covering all the stakeholders to find out the reasons.

Table 4. NPC of Ginger during 2004-05 to 2008-2009

Year	Domestic price Rs/kg	World price Rs/kg	NPC
2004-05	130.36	39.77	3.28
2005-06	99.4	41.71	2.38
2006-07	54.81	49.45	1.11
2007-08	60.31	39.55	1.52
2008-09	92.12	48.98	1.88

Conclusion

The overall objective of this paper is to study the growth performance of area, production, productivity and export performance of ginger from India during pre-WTO and post- WTO periods. It was found that ginger area had increased during post-WTO period and growth rate of production and productivity were positive but lower than the pre-WTO period. This is mainly due to stagnation of productivity. Ginger had

a negative growth rate in export quantity and value during post-WTO which was mainly due to stiff competition from other exporting countries. It can be concluded that WTO had not favored India's ginger export. Hence it is suggested that the efforts are needed to address the constraints in production and efforts are needed to increase productivity through advanced technologies such as biotechnology and tissue culture. Development of market infrastructure, storage, warehousing and transport will pave for increased export. In order to face competition and increase India's market share in the world market India need to consistently supply variety of quality ginger at competitive prices. Increase efficiency in production has to be increased so as to reduce unit cost of production. Organic ginger cultivation can be promoted.

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Appendix-I. Area, Production and Yield of Ginger in India during 1980-81 to 2006-07

S. No.	Year	Area (in ha.)	Production (in tonnes)	Yield (Kg/Ha.)
1	1980-81	40450	82440	2038
2	1981-82	41110	89710	2182
3	1982-83	43830	94170	2149
4	1983-84	48960	121310	2478
5	1984-85	51510	133860	2599
6	1985-86	53520	138020	2579
7	1986-87	52630	136010	2584
8	1987-88	54240	142840	2633
9	1988-89	51870	152120	2933
10	1989-90	53560	156120	2915
11	1990-91	53930	153450	2845
12	1991-92	59830	176950	2958
13	1992-93	59870	201630	3368
14	1993-94	60580	186200	3074
15	1994-95	61090	197650	3235
16	1995-96	66890	219300	3279
17	1996-97	70290	232510	3308
18	1997-98	75600	252100	3335
19	1998-99	77600	263200	3392
20	1999-00	80800	282600	3498
21	2000-01	86200	288000	3341
22	2001-02	90800	318000	3502
23	2002-03	88200	280200	3177
24	2003-04	85100	301900	3548
25	2004-05	95300	359000	3767
26	2005-06	110600	391200	3537
27	2006-07	105900	370300	3497
28	2007-08	104100	382600	3676
29	2008-09	108600	380100	3499

Source: www.indiastat.com

Appendix-II. Export of Ginger in India during 1980-81 to 2008-09

Year	Export Quantity (Tonnes)	Export Value (₹ Lakhs)	Unit Value (₹/Kg)
1980-81	6,811	367.97	5.4
1981-92	4,718	395.23	8.38
1982-83	3,955	588.49	14.88
1983-84	4,629	1190.16	25.71
1984-85	7,329	1872.76	25.55
1985-86	6,816	1089.35	15.98
1986-87	4,843	571.16	11.79
1987-88	2,628	488.99	18.61
1988-89	6,368	940.82	14.77
1989-90	8,139	1262.44	15.51
1990-91	6,555	1175.79	17.94
1991-92	14,259	2188.1	15.35
1992-93	9,825	1687.37	17.17
1993-94	18,442	2478.12	13.44
1994-95	12,022	1673.03	13.92
1995-96	18,483	3892.13	21.06
1996-97	29,737	5924.41	19.92
1997-98	28,268	7262.73	25.69
1998-99	8,683	4058.32	46.74
1999-00	8,923	3253.55	36.46
2000-01	6,288	2682.06	42.65
2001-02	6,464	2311.47	35.76
2002-03	8,461	2396.59	28.33
2003-04	5,000	2340.5	46.81
2004-05	14,908	5929.59	39.77
2005-06	10,981	4580.59	41.71
2006-07	9,661	4777.77	49.45
2007-08	8332	3296.08	39.55
2008-09	3229	1581.75	48.98

Source: www.indiastat.com