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Growth Rate of Production, Productivity and Area of Pepper in India: A Comparative Study in the Pre and Post Globalisation Era

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ABSTRACT

This paper analyses the growth performance of pepper in India in terms of area, production, productivity and price for last 50 years (1970-71 to 2019-20), which was not satisfactory. Though the growth rate of pepper in terms of area has accelerated by 5.4 per cent, production has been accelerated barely by one per cent. However, the productivity of pepper has decelerated by one per cent and the real price has accelerated by 0.2 per cent. The instability analysis shows that instability is highest in terms of area and productivity and it is more violent in post-globalisation era. Among pepper producing states in the country, the performance of Karnataka,the largest producer followed by Kerala and Tamil Nadu is satisfactory. The productivity of pepper is highest in Karnataka as compared to Kerala and Tamil Nadu. The deterioration in the area, production, and productivity of pepper in Kerala is very striking and it needs policy follow up. The instability analysis draws inferences about the vulnerability of area and productivity of a major foreign exchange earning cash crop in the post-globalisation period.

Key words: Growth rate of area of pepper, Growth rate of production of pepper, Growth rate of productivity of pepper, Growth rate of real price of pepper, Indo-Sri Lanka Free Trade Agreement (ISFTA), Pre-Globalisation era, Post Globalisation era.

INTRODUCTION

India is widely known as the “land of spices”. India produces a wide range of spices and holds a prominent position in world spice production. Spices are being grown in every state of India. One of the most important spices extensively grown and traded in India is pepper. In ancient times India held an important position in the pepper market and was an important trade destination for many countries in the world. During the 1960s and 70s, India had dominated the production and export of pepper in the world. Recently, India is losing its comparative advantage in the world pepper market, especially after the trade liberalisation under the WTO regime due to competitive disadvantage in the production of pepper in India (Jose, 2018). Vietnam is the largest producer of pepper in the world followed by Brazil and Indonesia. India is the fourth largest pepper producer in the world (International Pepper Community, 2019).

India had dominated in the production and export of pepper in the pre-globalisation era. India had adopted an import

substitution policy after independence. With the introduction of new economic reforms of 1991 and the formation of the World Trade Organisation (1995) comprised "trade-in agriculture" in multilateral trade system and the formulation of the Agreement on Agriculture (AOA) resulted in new economic reforms to emphasise openness, liberalisation, and promotion of exports. India has signed many Free Trade Agreements (FTAs) with various countries, in which the agreements with India-Sri Lanka and India-ASEAN agreements were important. The agreement allowed the duty-free or concessional export and import from the member countries to India. As per FTA, the import of pepper from Sri Lanka to India is duty-free (zero duty import upto 2500 tonnes annually), due to which the import of pepper from Sri Lanka has increased (The Economic Times, 2019). India imports pepper mainly for value addition and re-export.

India is also known as the home of pepper. Nature has given us an upper hand in the world of pepper because of the geographical and climatic particularity of south India. Karnataka, Kerala and Tamil Nadu are the major pepper producing states in India. Other pepper producing states in India are the North-Eastern region, Andhra Pradesh, Orissa, Andaman and Nicobar, which together contributed 4.77 per cent of the area under pepper cultivation and 7.02 per cent of the total production in India 2017 (Spices Board, 2017). In 2019-20 the estimated production of pepper was 61000 tonnes and the area under cultivation of pepper was 137378 hectares and the productivity per hectare was 444 Kg (Spices Board, 2019-20). The contribution of pepper is very important in both agriculture and industry as it generates income, employment and export earnings.

The signs of continuous sluggishness have been reflecting in the performance of the agricultural sector, particularly spices in India (Suresh, 2008). India, being the largest producer and exporter of pepper, it plays a key role in the agricultural economy of the country. In the current global market, black pepper from India has witnessed an increase in cultivation area even though its production and productivity has decreased dramatically. India is the largest consumer of pepper among the producing countries and the import of pepper to India has been increasing over the years. Fluctuations in the price and increased cost of production have rendered pepper cultivation unremunerative in India (Hema, 2007). Many pepper growers in the producing states like Kerala, Karnataka and Tamil Nadu are either ignoring or abandoning or at least restricting further investment in pepper cultivation (Jose, 2018).

In the above context, it is significant to analyse the performance of pepper production in India during the pre-globalisation and post-globalisation periods. It is also important to examine the performance of the largest pepper producing states in India, in quantitative terms.

OBJECTIVES

1. To analyse the growth performance of pepper in terms of area under cultivation, production, productivity and price in India.
2. To examine the growth performance of the major pepper producing states in India.

MATERIALS AND METHODS

The method of study is both explorative and analytical in nature. The long-term growth path was traced by estimating the annual growth rates statistically using annual time series data. The rate of change of growth rate was then measured by the acceleration/deceleration of growth. A semi log-linear function was used to estimate the annual compound growth rate in that the regression coefficient β stands for the exponential growth rate. The acceleration/ deceleration of growth was estimated by using a quadratic model. Fifty years of time series data were collected from 1970-71 to 2019-20 and the information is retrieved from various publications, official reports, research papers/articles, PhD theses etc. The data sources mainly include reports of Spices Board of India, RBI Handbook on Indian Economy, International Pepper Community, internet and other national and international journals. The analysis was carried out for two periods, the pre-globalization period (1970- 71 to 1990-91) and the post-globalization period (1991-92 to 2019-20) and for the overall period (1970-71 to 2019-20). OLS method of regression was used to estimate the growth rates. For estimating the growth rate of real price, the pepper prices and average inflation rates for 50 years (1970 to 2020) have been collected from the websites of World Bank, RBI and Macrotrends. Pepper price of 1970 has been taken as the base price and multiplied by the reciprocal of each year cumulative inflation rate from 1970 onwards to estimate the real price movement from 1970. The variability in the area, production and price have been measured using the Cuddy-Della Valle index (CDVI), (Cuddy and Della Valle, 1978 and Della Valle, 1979) which is used as a measure of variability in time series data (Pre- globalisation 1970-71, post- globalisation 1991-92 2019-20 & overall performance 1970-70 to 1991-2020). The higher the CDVI score, the higher is the instability. The other statistical tools such as percentages, bar diagrams and charts were used for the economic analysis.

ANALYSIS FRAMEWORK

The analysis was carried out to estimate the growth rate of area, production, productivity and price of pepper in India. Time series data relating to the period 1970-71 to 2019-20 were used for estimating the growth rates. The analysis was carried out for two periods, the pre- globalization period (1970-71 to 1990-91) and the post-globalization period (1991-92 to 2019-20) and for the overall period (1970-71 to 2019-20).

To calculate the compound growth rate of area, production, real price and productivity of pepper in India during pre-globalization and post-globalization periods, the following exponential function was used.

$Y = a\, b^{t} e^{e}$ ..... (1)

Where, Y = Area / Production / Productivity a = Intercept b = Regression coefficient t = Time variable e = Disturbance term in the year't'

By transforming equation (1) into log linear form:

$\log Y = \log a + t \log b + e$ ---------- (2)

Compound growth rate can be obtained using:

$$CGR = [\text{antilog } b - 1] * 100$$

The equation (2) has been estimated by applying Ordinary Least Square (OLS) method. The t- test was applied to test the significance of 'b'. This equation presumes that a change in agriculture output each year would depend upon the output in the preceding year.

Table 1. Growth rate of area under cultivation of pepper

Growth rate of area under cultivation of pepper in pre - globalization era							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1970-71 to 1990-91	11.842* (219.69)	-0.065* (-5.79)	0.004* (7.43)	0.835	Decelerating	6.5	1.5
Growth rate of area under cultivation of pepper in post - globalization era							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1991-92 to 2019-20	10.294* (19.71)	0.124* (4.12)	-0.002* (-4.67)	0.648	Accelerating	12.4	0.8
Growth rate of area under cultivation of pepper - 1970-71 to 2019-20							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1970-71 to 2019-20 (Overall)	11.307* (134.18)	0.054* (7.06)	-0.001* (-5.95)	0.573	Accelerating	5.4	0.4

*indicates significant at 5per cent level; Parenthesis indicates t-value; NGR-Nature of growth rate; DW – Durbin Watson

There was a significant decelerating trend in the growth rate of area under cultivation of pepper in the pre-globalization era (1970-71 to 1990-91) because the area utilized for pepper cultivation was mainly concentrated in only one state (Kerala) and the contribution of the other states were negligible. The growth rate decelerated by 6.5 per cent per year during these periods. In the post-globalization era (1990-91 to 2019-20) the growth rate was accelerated by 12.4 per cent per year due to a huge increase in the area utilized for pepper cultivation in the states like Karnataka and Tamil Nadu. Increase in price of pepper and instability in the price of coffee have motivated the farmers to increase pepper production in Karnataka (Jose, Rinu, 2018).Taking the sub periods together, area under cultivation of pepper for 50 years (1970-71 to 2019-20) has shown a significant accelerating trend. The growth rate was accelerated by 5.4 per cent.

There was a significant accelerating trend in the pre-globalization period from 1970-71 to 1990-91 in terms of production of

Table 2. Growth rate of production of pepper

Growth rate of production of pepper in pre - globalization era						
Period	Regression Coefficients		R-Square	NGR	Growth Rate	DW
	a	b				
1970-71 to 1990-91	10.356* (121.19)	0.025* (3.72)	0.421	Accelerating	2.5	2.5
Growth rate of production of pepper in post - globalization era						
Period	Regression Coefficients		R-Square	NGR	Growth Rate	DW
	a	b				
1991-92 to 2019-20	11.193* (79.50)	-0.007 (-1.71)	0.100	Decelerating	0.7	1.9
Growth rate of production of pepper 1970-71 to 2019-20						
Period	Regression Coefficients		R-Square	NGR	Growth Rate	DW
	a	b				
1970-71 to 2019-20	10.566* (169.04)	0.010* (4.71)	0.317	Accelerating	1.0	1.9

* indicates significant at 5per cent level; Parenthesis indicates t-value; NGR-Nature of growth rate; DW – Durbin Watson

pepper.The growth rate was accelerated by 2.5 per cent. Kerala was the largest pepper producing state in India and an average share in the production of pepper from this state alone was more than 75 per cent (Spice Board of India, Cochin) during these periods. The post globalization period has shown a decelerating trend due to declining trend in the production of pepper in Kerala and increase in import of pepper from Sri Lanka. India levies zero duty import on 2,500 tonnes of pepper from Sri Lanka annually under the Indo-Sri Lanka Free Trade Agreement. Any export above the limit is subjected to 8 per cent duty under South Asia Free Trade Agreement, as against the usual customs duty of 70 per cent on pepper import into India(The Economic Times, 2019).The growth rate was decelerated by 0.7 per cent per year. The growth rate of pepper production for 50 years (1970-71 to 2019-20) has shown a significant accelerating trend and the growth rate has accelerated by 1.0 per cent. There was a significant accelerating trend in the growth rate of productivity of pepper in the pre-globalization era (1970-71 to 1990-91). The growth rate was accelerated by 6.5 per cent per year. The post-globalization era (1990-91 to 2019-20) has shown a significant decelerating trend in the growth rate of productivity of pepper (11.7 per cent per year).This is due to the wide gap in the productivity of the largest pepper producing states in India, for example, the highest productivity of Karnataka was 1071 Kg Per Hectare and Kerala was 315 Kg Per Hectare.The productivity of pepper is

Table 3. Growth rate of Productivity of pepper

Growth rate of productivity of pepper in pre - globalization era							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1970-71 to 1990-91	5.475* (36.30)	0.065* (2.16)	-0.002 (-1.813)	0.281	Accelerating	6.5	2.9
Growth rate of productivity of pepper in post - globalization era							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1991-92 to 2019-20	7.617* (8.94)	-0.117* (-2.39)	0.002 (2.55)	0.241	Decelerating	11.7	1.7
Overall Growth rates of productivity from 1970-71 to 2019-20							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1970-71 to 2019-20	5.884* (52.20)	-0.010 (-0.985)	0.0001 (0.961)	0.573	Decelerating	1.0	1.5

***** indicates significant at 5per cent level; Parenthesis indicates t-value; NGR-Nature of growth rate; DW – Durbin Watson

comparatively very low in Kerala from other states because the pepper production practices in Kerala is unscientific and only useful for short run productivity gains. The measures adopted for plant protection and recklesstillage, without taking adequate measures to put a check on soil erosion washed out the fertile nutrient rich top soilwhich had been deposited by nature for centuries on the hill sides.Violent fluctuations in the use of chemical fertilizers, which were mostly responsive to crop price, to reap the immediate price dividend ultimately affected crop productivity (Scaria, 2017). There was statistically significant decelerating trend in the growth rate of productivity of pepper for 50 years (i.e., 1970-71 to 2019-20). The growth rate has decelerated by 1.0 per cent.

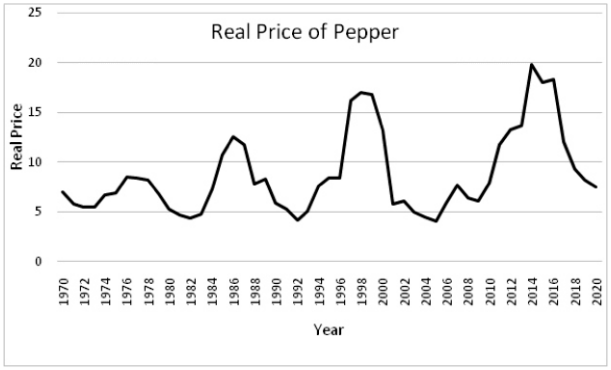


Figure 1. Real Price of Pepper

The price of the pepper has accelerated in the pre-globalizationeraby 0.3 per cent per year and in post- globalization period it has decelerated by 0.1 per cent. Low quality pepper from Vietnam continues to enter in to the market through Sri Lanka, and, aided by a low duty structure under ASEAN trade agreement, SAFTA and ISFTA, was the major reason for the declining price of

Table 4. Growth rate of Real price of pepper

Growth rate of Real price of pepper during pre-globalization era							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1970-71 to 1990-91	0.485 (1.478)	0.003 (0.015)	0.741* (4.181)	0.52	Accelerating	0.3	1.2
Growth rate of Real price of pepper during post-globalization era							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1991-92 to 2019-20	0.441 (1.508)	-0.001 (-0.012)	0.804* (6.772)	0.67	Decelerating	0.1	1.4
Overall Growth rates of Real price of pepper from 1970-71 to 2019-20							
Period	Regression Coefficients			R-Square	NGR	Growth Rate	DW
	a	b	c				
1970-71 to 2019-20	0.391* (2.199)	0.002 (0.852)	0.781* (8.508)	0.66	Accelerating	0.2	1.3

indicates significant at 5per cent level; Parenthesis indicates t-value; NGR-Nature of growth rate; DW – Durbin Watson

pepper. Sri Lanka has circumvented by buying Vietnam Pepper at low prices, adding value and dumping it in India as its own pepper. Any import above 2,500 tonnes under SAFTA from Sri Lanka should be charged at 52 percent at par with other Asian countries. Sri Lanka has circumvented by buying Vietnam Pepper at low prices, adding value and dumping it in India as its own pepper (Thomas,2019). The growth rate of the price of pepper for 50 years (*i.e.*, 1970-71 to 2019-20) has accelerated by 0.2 per cent per year.

Instability Analysis

The instability in the time series data is measured using Cuddy-Della Valle index (CDVI). The Cuddy-Della Valle Index corrects the coefficient of variation by the equation, $I = (CV)(1 - \bar{R}2)0.5$

The above table shows the results of estimated instability in the area, production, productivity and price of pepper in India for 50 years. The result shows that in the pre globalization era (1970-71 to 1990-91), the

Table 5. Instability Analysis

Particulars	Period		
	1970-71 to 1990-91	1991-92 to 2019-20	1970-71 to 2019-20
Area	14.99	18.58	25.64
Production	19.78	17.04	21.54
Productivity	17.96	26.24	24.07

lowest instability was in the area (14.99) of pepper cultivation followed by productivity (17.96). The highest instability was observed in the production (19.78) of pepper. In the post- globalized era (1991-92 to 2019-20) the highest instability was observed in productivity (26.24) of pepper. The instability was lowest in the production (17.04) of pepper followed by the area (18.58) under pepper cultivation. The overall (1970-71 to 2019-20) instability was highest in the area (25.64) and the productivity (24.07) of pepper. The instability was low in the production (21.54) of pepper.

The trend analysis shows that in the pre-globalization period i.e., from 1970-71 to 1990-91, there were a decelerating trend in the area and the accelerating trend in the production of pepper in India. The productivity and price have shown increasing trends. The rate of acceleration was comparatively high in productivity. The post-globalization period trend (1991-92 to 2019-20) shows an accelerating trend in the area, decelerating trend in production, productivity and price of pepper. The overall (50 years) trends of pepper from 1970-71 to 2019-20 show an acceleration in the area and production. The productivity of pepper shows a decelerating trend and the price of the pepper has shown an increasing trend. In the pre globalization era, the lowest instability was in pepper cultivation followed by productivity. The highest instability was observed in the production of pepper. In the post- globalized era, the highest instability was observed in the productivity of pepper and the lowest instability was observed in the production of pepper followed by the area under pepper cultivation. The overall (1970-71 to 2019-20) instability was highest in the area and the productivity of pepper. The instability was low in the production of pepper as compared to the area and productivity of pepper.

The area of production and productivity fluctuate more violently in the post globalisation era compared to pre-globalisation period whereas production remains more stable in the post globalisation era.

Quantitative Description of the top pepper producing states in India

Pepper vines are mainly grown in hilly terrain with well-drained soil under high temperatures (23^0 – 32^0 C and the ideal temperature is around 28^0 C, Spices Board of India) and ample rainfall (annual rainfall of 1250-2000 mm, Spices Board of India). Pepper is grown in the home gardens, as an intercrop in the arecanut and coffee plantations and as a mono crop. Karnataka, Kerala and Tamil Nadu are the major pepper producing states in India.

I. Area

The Table 6 shows that in terms of area utilized for pepper cultivation in India, Kerala is dominating. For about forty years from 1970-71, more than 95 per cent of the area used for pepper cultivation in India was from Kerala alone. From 2004-05 onward, the area used for pepper cultivation in Kerala has shown decreasing trend and it has reached 60 per cent (82540 Hectares) in 2019-20. Next comes Karnataka. For about 40 years from 1970-71, the area used for pepper cultivation in Karnataka was low, below nine per cent. From 2009-10 onwards there was an increasing trend in the area and 2019-20, it has reached to 29 per cent (40170 Hectare). Tamil Nadu is the third largest pepper producing state in India.

Table 6. Area utilized for pepper production in India (Ha = Hectare, Per. = Percentage)

Year	Kerala		Karnataka		Tamil Nadu		Others	
	Area (Ha)	Per.	Area (Ha)	Per.	Area (Ha)	Per.	Area (Ha)	Per.
1970-71	117540	98	2160	2	230	0.2	30	0.03
1974-75	118410	97	3320	3	180	0.1	10	0.01
1979-80	107180	97	2960	3	570	0.5	10	0.01
1984-85	105840	97	2580	2	970	0.9	10	0.01
1989-90	151420	88	2710	2	1640	1.0	15720	9.17
1994-95	186720	97	3080	2	3050	1.6	420	0.22
1999-00	198410	95	6680	3	3970	1.9	610	0.29
2004-05	237670	89	24260	9	4120	1.5	1062	0.40
2009-10	171489	86	19706	10	2786	1.4	5005	2.52
2014-15	85430	69	32670	26	4000	3.2	1800	1.45
2019-20	82540	60	40170	29	5764	4.2	8904	6.48

Source: Spices Board of India, Cochin

However, the area utilized for pepper cultivation in Tamil Nadu was comparatively very low as compared to Kerala and Karnataka. From 1970-71, for about 20 years the area used in Tamil Nadu was less than one per cent. From 1994-95 onwards the area utilized for the cultivation of pepper has increased and in 2019-20 it has reached 4.2 per cent (5764 Hectare). The contribution of other states of India is low. For 20 years the area used for pepper cultivation was 0.01per cent. In the year 1989-90 the contribution was the largest i.e., 9.17 per cent. Thereafter there was a gradual increase in the area under cultivation in other states of India and it has reached 6.48 per cent (8904 Hectare) in 2019-20.

Table 7. Largest Pepper producing states in India [Prod. = Production (Tonnes) and Per. = Percentage (%)]

Year	Kerala		Karnataka		Tamil Nadu		Others	
	Prod.	Per.	Prod.	Per.	Prod.	Per.	Prod.	Per.
1970-71	25030	89	1070	4	50	0.18	1850	6.6
1974-75	27230	71	910	2	40	0.10	9970	26.1
1979-80	26790	71	780	2	120	0.32	10310	27.1
1984-85	17350	64	660	2	210	0.78	8780	32.5
1989-90	37340	57	690	1	350	0.54	26620	41
1994-95	59260	98	760	1	640	1.05	80	0.1
1999-00	47540	82	1650	3	860	1.48	7950	13.7
2004-05	74980	92	5430	7	910	1.12	120	0.1
2009-10	27500	55	15000	30	750	1.50	6750	13.5
2014-15	30000	43	35000	50	3000	4.29	2000	2.9
2019-20	20000	33	30000	49	3000	4.92	8000	13.1

Source: Spices Board of India, Cochin

II. Production

It is observed from the above table that from 1970-71 the production of pepper in Kerala was dominated for about 40 years. Thereafter, it shows a decreasing trend from 2009-10 and the share of Kerala in terms of production has reached 33 per cent (20000 Tonnes) in 2019-20. From 1970-71 the production was very low in Karnataka for 40 years. From 2009-10 onwards there was an increasing trend in the production of pepper in Karnataka and the contribution of Karnataka has reached 49 per cent (30000 Tonnes) in 2019-20. Karnataka has been dominating in the production of pepper and it has become the largest pepper producing state in India. Tamil Nadu is the third largest state in India in the production of pepper. However, the production in Tamil Nadu was very low as compared to Karnataka and Kerala. From 1970-71 for about 30 years the contribution of Tamil Nadu in the production of the pepper was below 1 per cent. The contribution of production has remained the same for about 15 years *i.e.*, below 1.5 per cent. From 2014-15 onwards, the production has increased and its contribution has reached to 4.92 per cent (3000 Tonnes) in 2019-20. The contribution of the other states in India in the production of pepper has shown an increasing trend up to 1989-90 and in 1989-90, the other states have contributed highest *i.e.*, 41 per cent (26620 Tonnes). Thereafter the pepper production started to decrease and the share of production by other states in India has reached 0.1per cent in 2004-05. In 2019-20 the production was 8000 tonnes *i.e.*, 13.1 per cent (8000 tonnes) share.

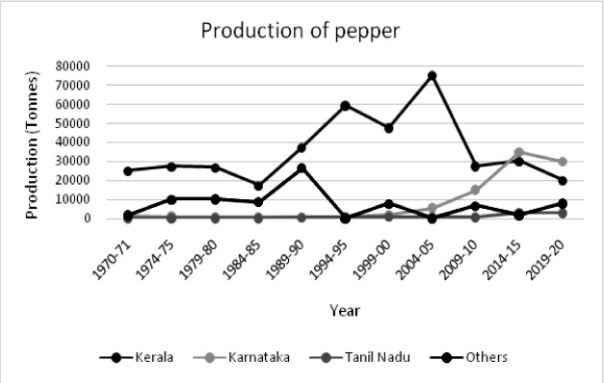


Figure 2. Production of Pepper in India (Tonnes)

III. Productivity

Table 8. Pepper productivity (Kg) of largest pepper producing states in India Pty. = Productivity (Kg)

Year	Kerala Productivity (Kg)	Karnataka Productivity (Kg)	Tamil Nadu Productivity (Kg)	India Productivity (Kg)
1970-71	213	495	217	233
1974-75	230	274	222	313
1979-80	250	264	211	343
1984-85	164	256	216	247
1989-90	247	255	213	379
1994-95	317	247	210	314
1999-00	240	247	217	277
2004-05	315	224	221	305
2009-10	160	761	269	251
2014-15	351	1071	750	565
2019-20	242	747	520	444

Source: Spices Board of India, Cochin

The above table shows that the productivity trend in Kerala remained in the range 215 Kg – 315 Kg for 50 years (1970-71 to 2019-20). In the year 1970-71, the productivity was 213 Kg. The productivity was highest (317 Kg) in the year 1994-95 and lowest (160 Kg) in 2009-10. The productivity was 242 in 2019-20. There was an impressive trend in the productivity of Pepper in Karnataka. In 1970-71 the productivity was 495 Kg, thereafter it started to decline. For about 40 years, the average productivity of pepper was 252 Kg. In 2014-15 the productivity was highest in Karnataka i.e., 1071 Kg. thereafter the productivity has been reduced to 747 Kg. in 2019-20. The productivity trend in Tamil Nadu stood almost the same for 40 years. The average productivity from 1970-71 to 2009-10 was 222 Kg. From 2014-15 the productivity increased and reached its highest in the year 2014-15 (750 Kg.). In 2019-20 the productivity was 520 Kg the productivity trend shows that the productivity is highest in Karnataka followed by Tamil Nadu. The productivity of Kerala is very low as compared to Karnataka and Tamil Nadu. The pepper productivity in other states in India shows an increasing trend. In 1970-71 the productivity was 233 Kg;the productivity was highest in 2014-15 (565 Kg) and in 2019-20 the productivity was 444 Kg.

DISCUSSION

India was the major producer and exporter of pepper in the world. Pepper cultivation is concentrated in the Western Ghats in India. The study shows that the pre-globalization period (*i.e.*, from 1970-71 to 1990-91) have shown a decelerating trend in the area and an accelerating trend in the production of pepper in India. The productivity and price had shown an increasing trend. The rate of acceleration was comparatively high in productivity. The post-globalization period (1991-92 to 2019-20) shows an accelerating trend in the area, decelerating trend in production and productivity of pepper. The price has shown a decreasing trend. The overall (50 years) performance in terms of growth of pepper from 1970-71 to 2019-20 has shown an acceleration in the area, production and price. The productivity of pepper was decelerating. The growth rate in the area has accelerated by 5.4 per cent, production has accelerated by 1.0 per cent, productivity decelerated by 1.0 per cent and the real price has accelerated by 0.2per cent. The result of estimated instability in the area, production, productivity and price of pepper shows the overall (1970-71 to 2019-20) instability was highest in the area and the productivity of pepper and lowest in the production of pepper.

The present status of pepper production is not satisfactory in India. In the post-liberalisation period technical inefficiency, fall in productivity, climatic variations, price fluctuations, the incidence of pests and diseases and increased cost of production had resulted in a decline in pepper production in the country (Jose, 2018). Karnataka and Kerala are the major pepper producing states in India. In India, Karnataka is the largest producer of pepper followed by Kerala and Tamil Nadu. The Performance of pepper in Karnataka was satisfactory. There is deterioration in the area, production, and productivity of pepper in Kerala. An important feature of the present trade of pepper is related to the free import of pepper in India from Sri Lanka through an FTA between India and Sri

Lanka. The FTAs such as the ASEAN and ISFTA were a serious concern to the pepper cultivators as it harms the domestic market and reduces the production of pepper. The government must take special steps to increase pepper production as it is very urgent and important to take appropriate steps to rescue the pepper from the present crises because pepper can contribute much to the exchequer of India in the form of foreign exchange inflow and financial safety to the country.

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