An Analysis of Growth Trends of Coconut Crop in India

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Abstract: *The study was under taken to examine the growth in area, production and yield of coconut among the states of India with a thrust being given to southern states where coconut is concentrated heavily. The objective of the study is accomplished with the help of secondary data considered for a period of 15 years from 2000-01 to 2015-16. The linear and compound growth rates were worked out. The magnitude of variability was calculated through the instability index. The contribution of area and productivity to increase in output was worked out by using decomposition analysis. From study it is observed that the growth rates of area, production and yield of coconut in India over the period were positive and significant except Kerala. The yield effect was the most important factor for an increase in production of coconut for all the states.*

I. INTRODUCTION

Coconut is an important commercial crop in India. Unlike other crops, coconut due to its multiple usage is grown even in urban houses. However, the concentration of coconut is more in the costal areas of almost all the states. With the increasing area under non-agricultural uses, like other crops the area under coconut is also expected to decline to decline. The present paper makes an attempt to find out whether the area under coconut is declining, if so, has it been compensated at least by an equal or more than equal increase in yield so as to meet both the domestic as well as increasing demand for the product at the international market.

Importance of Coconut

Coconut is a traditional plantation crop grown in India for the last 3000 years and it has the longest history in the country. The country-wide demand for coconut for both edible and non-edible uses triggers interest among the people to grow at least two or three saplings in their homesteads. No ritual or ceremony is performed without coconut and coconut palm products in the country. The significance of the palm, therefore, lies more in the fact that it satisfies the social and cultural needs of the people. The crop assumes considerable significance in the national economy in view of the employment and income it generates (Jayavel et.al.2011). Coconut is one of the important and oldest food as well as a cash crop of the country of India which is grown in the coastal areas of the almost all states of India. Unlike many of the crops all the parts of the coconut like the palm, husk etc are used as by-products which have commercial use. Thus, the tree is known as the 'Tree of Life', the 'Tree of Heaven', the 'Tree of Abundance', 'Nature's Super Market', 'King of Palms', the 'Kalpavriksha', as well as 'God's Gift to Mankind' is grown in more than 93 countries. It provides food, drink, medicine, shelter, aesthetic materials and wealth for millions of people in the world.

The states under coconut cultivation are grouped as traditional and non-traditional states based on the agro-climatic conditions, the area of cultivation, soil conditions and topography. Kerala, Tamilnadu, Karnataka, Andhra Pradesh, Orissa, West Bengal, Pondicherry, Maharashtra and the Lakshadweep and the Andaman and Nicobar Islands are the traditional coconut growing states. Assam, Gujarat, Bihar, Madhya Pradesh, Tripura, Nagaland, Manipur, Arunachel Pradesh and Rajastan are the non-traditional states (Acharya, 2003).

II. LITERATURE REVIEW

Gopala krishnan (1998) made an attempt in explaining the historical growth of coconut and revealed that the coconut board of India is taking various measures to stabilize the coconut performance in India.

Barman and Ahmed (1998) studied the output and yield of coconut in the context of Bangladesh and concluded that there has been a continuous expansion in the area under coconut in the coastal regions of Chittagong and Khulna divisions of Bangladesh. The study added that these two regions alone constituted around 83 per cent of output of the country,

Singh (1998) attempted to examine the area under coconut and its output and yield in the various coconut growing regions of the globe. The study indicated that though a wide variety of coconut produces are traded, the traditional items like, coconut oil, copra, coir and copra meals dominate the coconut market.

Mamoria (1999), concentrating on the Indian coconut production, indicated that coconut is grown more in the southern parts of the country which include the states of Doman and Diu, Goa, Karnataka, Kerala and Tamil Nadu. In the states of Tamilnadu, coconut is grown largely in the districts of Coimbatore, Kanyakumari, Madurai, Ramanathapuram, Salem, Thanjavur, Theni and Tiruchirappalli districts.

Rethinam & Idroes (2003) portrayed the scope for increasing the production of coconut. Given that coconut is a vegetable oil yielding crops, occupies more than 12 million hectares spread over more than 90 countries. The area under coconut grows at an annual growth rate of more than three per cent during the last four decennial periods.

Lathika & Kumar (2005) in their research paper attempted to examine the growth in area, output and yield of coconut in India during the five year period of 2000 to 2005. The study concluded that the effect of area in contributing to growth in output is more than the effect of yield. The study also indicated that the growth is higher in recent times in the case of the states of Orissa and Kerala though the states of Karnataka and Andhra Pradesh have already set their path in the area expansion.

Arancon (2010) examined the output of coconut at the global level. The study indicated that for some of the coconut products like, coco powder, coco chemicals, shell, coir and coir products have shown an increasing trend during the study period. However, the products like, coconut oil, cream, copra have shown a declining trend in the exports.

Kishore & Murthy (2016) in their study estimated the growth in area, output and yield of coconut in the state of Karnataka. To examine the growth, the study made use of the compound growth rate. The required secondary data were collected for fifteen year period from 2000-2001 to 2014-15. The study found that the growth in area, output and yield of coconut indicated a significant positive growth rate.

With a moderate decline in the share of labour force depending on agriculture, still due to the sizable population of the country depends on agriculture, the Indian agriculture is still in the mainstay of economic growth though the share of agriculture to GDP has been declining continuously from 36.40 per cent in 1982-83 to 17.32 per cent in 2016-17.

Objectives and Hypothesis of the Study

The literature mentioned above covering almost the past 20 year period from 1998 to 2016 indicated that invariably at the global level as well as in the states of India, the area, output and yield of coconut have grown positively and significantly. Given the importance of coconut in India, the present study primarily aimed at examining whether this significant positive growth continues at present also. To achieve this end, the present study examines the trends in the growth of area, output and yield of coconut in the coconut growing states of India and also to find out the inequality in the growth. The Study hypotheses that 1) 'there is no significant growth in area, output and yield of coconut.2) 'there is no significant difference in the growth of area, output and yield of coconut among the coconut growing states of India.

III. METHODS AND MATERIALS

To accomplish this objective, the data on area, output and yield of coconut were collected for a period of 15 years from 2000-01 to 2015-16. The required secondary data were collected from the website of coconut board, from the published annual reports of the Ministry of Agriculture, Government of India and from the annual reports on Agriculture published by CMIE.

To calculate the average area, output and yield the simple arithmetic mean is calculated. The growth trend is measured in terms linear and compound growth rate. The volatility in the growth is measured using the Instability Index. The significance of the growth is tested using the 't' test. The impact area effect Compound growth rates were estimated with the following exponential function

$$Y=ABt$$

Where,
Y = area/production/yield of crop
A= Intercept
B= regression coefficient
T = time variable
B = r + 1
Compound growth rate = (Antilog (10gb) -11 x 100
The linear growth rate is estimated using the linear trend model of the form:

$$Y = A+Bt$$

Where,
Y = area/production/yield of crop
A = Intercept
B = regression coefficient
T = time variable
The linear growth rate = (B/X bar)*100

The Instability Index is calculated as:

$$I = \frac{\sqrt{\frac{e^2}{n-k}}}{\bar{x}} \times 100$$

Where,
e = the error term in the linear trend model
n-k = the degrees of freedom.
To know the contribution of area and productivity to incremental production for coconut, the model suggested by Sharma (1977) and Narula and Vidyasagar (1973) was used. The form of the model is :

$$\Delta P = \Delta A Y_o + \Delta Y A_o + \Delta A \Delta Y$$

Where,
ΔP = Change in Production of coconut
ΔA = Change in the area under coconut
ΔY = Change in the yield of coconut.
ΔAYo = Area Effect
ΔYAo = Yield Effect
ΔAΔY = Interaction Effect (change in production due to change in area and yield together.)

Growth Performance of Coconut by States Of India

Based on the above reasoning, in this article it is attempted to make a comparative analysis of the growth of coconut among the major coconut producing states of India and also among the major coconut producing districts of Tamilnadu. To understand the relative contribution of area and yield on coconut production, a decomposition analysis has been made.

Trends in the Growth of Area under Coconut in Different States of India

In the case of the state of Andhra Pradesh in the year 2000-01, the area under coconut which stood at 102.6 increased to reach an area of 103.95 hectares in 2015-16. The average area stood at 108.86 hectares for the entire study period. Given the trend, the area under coconut has registered a linear growth rate of 0.98 per cent and a compound growth rate of 0.93 per cent per annum during the study period. The instability index registered indicates that it is 37.14 per cent. The F value of 3.35 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the state of Tamilnadu in the year 2000-01, the area under coconut which stood at 323.5 increased to reach an area of 459.74 hectares in 2015-16. The average area stood at 393.68 hectares for the entire study period. Given the trend, the area under coconut has registered a linear growth rate of 2.51 per cent and a compound growth rate of 2.53 per cent per annum during the study period. The instability index registered indicates that it is 12.79 per cent. The F value of 182.93 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the state of Karnataka, in the year 2000-01, the area under coconut which stood at 333.80 increased to reach an area of 526.38 hectares in 2015-16. The average area stood at 429.48 hectares for the entire study period. Given the trend, the area under coconut has registered a linear growth rate of 2.97 per cent and a compound growth rate of 2.99 per cent per annum during the study period. The instability index registered indicates that it is 19.06 per cent. The F value of 115.92 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the state of Kerala, in the year 2000-01, the area under coconut which stood at 928.80 increased to reach an area of 770.62 hectares in 2015-16. The average area stood at 831.35 hectares for the entire study period. Given the trend, the area under coconut has registered a linear growth rate of -1.76 per cent and a compound growth rate of -1.777 per cent per annum during the study period indicating a decline in the area under coconut in the state. The instability index registered indicates that it is 15.94 per cent. The F value of 57.87 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the state of Southern States, in the year 2000-01, the area under coconut which stood at 1685.70 increased to reach an area of 1860.69 hectares in 2015-16. The average area stood at 1763.37 hectares for the entire study period. Given the trend, the area under coconut has registered negligible linear and compound growth rates of 0.52 per cent and 0.51 per cent respectively per annum during the study period indicating a decline in the area under coconut in the state. The instability index registered indicates that it is 12.98 per cent. The F value of 7.53 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the other states, in the year 2000-01, the area under coconut which stood at 138.20 increased to reach an area of 227.78 hectares in 2015-16. The average area stood at 1763.37 hectares for the entire study period. Given the trend, the area under coconut has registered negligible linear and compound growth rates of 0.52 per cent and 0.51 per cent respectively per annum during the study period. The instability

index registered indicates that it is 12.98 per cent. The F value of 7.53 registered for the Regression model indicates that the trend equation is significant at five per cent.

Given the trends in the growth of coconut by states, the area under coconut. All India level indicates that in the year 2000-01 it stood at 1823.90 hectares and this increased to reach a level of 2088.47 hectares in 2015-16. The average area stood at 1964.46 hectares for the entire study period. Given the trend, the area under coconut has registered negligible linear and compound growth rates of 0.70 per cent and 0.69 per cent respectively per annum during the study period indicating a decline in the area under coconut in the state. The instability index registered indicates that it is 13.19 per cent. The F value of 13.35 registered for the Regression model indicates that the trend equation is significant at five per cent.

Trends in the Growth of Output of Coconut in Different States of India

As given in table 2, in the case of the state of Andhra Pradesh in the year 2000-01, the output of coconut stood at 1092.70 lakh nuts in the year 2000-01 which increased to reach an output level of 1427.46 lakh nuts in 2015-16. The average output stood at 1300.08. Given the trend, the output of coconut has registered a linear growth rate of 3.24 per cent and a compound growth rate of 3.02 per cent per annum during the study period. The instability index registered indicates that it is 82.25 per cent. The F value of 7.41 registered for the Regression model indicates that the trend equation is significant at five per cent.

As given in table 2, in the case of the state of Tamilnadu in the year 2000-01, the output of coconut stood at 3192 lakh nuts in the year 2000-01 which increased to reach an output level of 6171.06 lakh nuts in 2015-16. The average output stood at 5081.41. Given the trend, the output of coconut has registered a linear growth rate of 6.03 per cent and a compound growth rate of 6.80 per cent per annum during the study period. The instability index registered indicates that it is 48.05 per cent. The F value of 75.00 registered for the Regression model indicates that the trend equation is significant at five per cent.

As given in table 2, in the case of the state of Karnataka in the year 2000-01, the output of coconut stood at 1754.20 lakh nuts in the year 2000-01 which increased to reach an output level of 5128.81 lakh nuts in 2015-16. The average output stood at 2883.27. Given the trend, the output of coconut has registered a linear growth rate of 11.15 per cent and a compound growth rate of 11.40 per cent per annum during the study period. The instability index registered indicates that it is 137.08 per cent. The F value of 31.50 registered for the Regression model indicates that the trend equation is significant at five per cent.

As given in table 2, in the case of the state of Kerala in the year 2000-01, the output of coconut stood at 5536 lakh nuts in the year 2000-01 which increased to reach an output level of 7429.39 lakh nuts in 2015-16. The average output stood at 5925.33. Given the trend, the output of coconut has registered a negligible positive linear growth rate of 0.66 per cent and a compound growth rate of 0.58 per cent per annum during the study period. The instability index registered indicates that it is 33.03 per cent. The F value of 1.92 registered for the Regression model indicates that though the linear trend equation is relevant, the relationship is not significant.

Given the trends in the growth of output of individual states in the south India, the performance of total south India indicates that in the year 2000-01, the output of coconut stood at 11574.90 lakh nuts in the year 2000-01 which increased to reach an output level of 20156.75 lakh nuts in 2015-16. The average output stood at 15190.08. Given the trend, the output of coconut has registered a positive linear growth rate of 4.67 per cent and a compound growth rate of 4.77 per cent per annum during the study period. The instability index registered indicates that it is 38.65 per cent. The F value of 69.46 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the other states, that is the Northern States, in the year 2000-01, the output of coconut stood at 1103.50 lakh nuts in the year 2000-01 which increased to reach an output level of 2010.70 lakh nuts in 2015-16. The average output stood at 1589.73. Given the trend, the output of coconut has registered a positive linear growth rate of 3.76 per cent and a compound growth rate of 3.81 per cent per annum during the study period. The instability index registered indicates that it is 36.34 per cent. The F value of 51.03 registered for the Regression model indicates that though the linear trend equation is relevant, the relationship is not significant.

Given the discussion on the state wise growth in output of coconut, in the present paragraph it is attempted to examine the overall performance of India. As it is seen in the table 2, in the year 2000-01, the All India total output of coconut stood at 12678.40 lakh nuts in the year 2000-01 which increased to reach a total output level of 22167.45 lakh nuts in 2015-16. The average total output stood at 16779.81. Given the trend, the total output of coconut has registered a positive linear growth rate of 4.58 per cent and a compound growth rate of 4.67 per cent per annum during the study period. The instability index registered indicates that it is 37.40 per cent. The F value of 71.49 registered for the Regression model indicates that though the linear trend equation is relevant, the relationship is not significant.

Trends in the Growth in Yield of Coconut in Different States of India

In the case of the state of Andhra Pradesh in the year 2000-2001, the yield of coconut which stood at 10650 nuts per hectare, has increased to reach 13732 nuts per hectare in the year 2015 - 2016. The average level of yield of coconut stood at 11814.44 nuts per hectare registering an annual linear growth rate 2.17 per cent and an annual compound growth rate 2.07 per cent. Given the trends in the growth, the instability index is registered

as 52.58 per cent. The F value of 8.09 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the state of Tamilnadu in the year 2001-2001, the yield of coconut which stood at 9867 nuts per hectare, has increased to reach 13423 nuts per hectare in the year 2015 - 2016. The average level of yield of coconut stood at 12666.56 nuts per hectare registering an annual linear growth rate 3.73 per cent and an annual compound growth rate 4.17 per cent. Given the trends in the growth, the instability index is registered as 52.59 per cent. The F value of 23.98 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the state of Karnataka in the year 2002 - 2001, the yield of coconut which stood at 5255 nuts per hectare, has increased to reach 9744 nuts per hectare in the year 2015-2016. The average level of yield of coconut stood at 6314.63 nuts per hectare registering an annual linear growth rate 8.23 per cent and an annual compound growth rate 8.17 per cent. Given the trends in the growth, the instability index is registered as 114.29 per cent. The F value of 24.69 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of the state of Kerala in the year 2003 - 2001, the yield of coconut which stood at 5980 nuts per hectare, has increased to reach 9641 nuts per hectare in the year 2015 - 2016. The average level of yield of coconut stood at 7187.25 nuts per hectare registering an annual linear growth rate 2.39 per cent and an annual compound growth rate 2.39 per cent. Given the trends in the growth, the instability index is registered as 26.4 per cent. The F value of 38.91 registered for the Regression model indicates that the trend equation is significant at five per cent.

Given the growth of yield of coconut for major southern states, the yield of coconut for the Southern States as a whole indicate that in the year 2004 - 2001, the yield of coconut which stood at 6866.524 nuts per hectare, has increased to reach 10832.94 nuts per hectare in the year 2015-2016. The average level of yield of coconut stood at 8567.27 nuts per hectare registering an annual linear growth rate 4.12 per cent and an annual compound growth rate 4.24 per cent. Given the trends in the growth, the instability index is registered as 29.57 per cent 92.53 registered for the Regression model indicates that the trend equation is significant at five per cent. In the case of other States in the year 2005 - 2001, the yield of coconut which stood at 7984.805 nuts per hectare has increased to reach 8827.377 nuts per hectare in the year 2015 - 2016. The average level of yield of coconut stood at 7861.07 nuts per hectare registering an annual linear growth rate 1.4 per cent and an annual compound growth rate 1.39 per cent. Given the trends in the growth, the instability index is registered as 30.13 per cent. The F value of 10.22 registered for the Regression model indicates that the trend equation is significant at five per cent.

In the case of All India as a whole, in the year 2006 - 2001, the yield of coconut which stood at 6951 nuts per hectare, has increased to reach 10614 nuts per hectare in the year 2015 - 2016. The average level of yield of coconut stood at 8486.69 nuts per hectare registering an annual linear growth rate 3.86 per cent and an annual compound growth rate 3.95 per cent. Given the trends in the growth, the instability index is registered as 28.81 per cent. The F value of 85.33 registered for the Regression model indicates that the trend equation is significant at five per cent.

Contribution of Area and Yield to Output Changes in Coconut in the States of India

Given the analysis of the growth performance of coconut, in the present and in the subsequent paragraphs it is attempted to examine the impact of area under coconut and yield effect on the output of coconut. For this purpose, a Decomposition Analysis has been used. The decomposition analysis is based on the slope coefficient of the log values of the area, output and yield of coconut.

As it could be seen in the table 7, in the case of Andhra Pradesh the area effect that is the contribution of area to output change is of coconut is 30.98 per cent, while the contribution of yield to output change is 69.02 per cent. In the case of the state of Tamilnadu the area effect is 37.9 per cent, while the contribution of yield to output change is 62.1 per cent. In the case of the state of Karnataka while the area effect is 27.28 per cent, the yield effect is 72.72 per cent. For Kerala the area effect is -307.06 while the yield effect is 407.06 per cent. In the case of the state of Southern states as a whole, while the area effect is 10.84 per cent, the yield effect is 89.16 per cent. In the case of the state of other States, that is the northern states, the area effect is worked out to 62.94 per cent, while the yield effect is 37.06 per cent. For all India as a whole, the area effect that is the contribution of area to output change in coconut is 15.07 per cent, while the contribution of yield to output change is 84.93 per cent.

Thus from the above analysis it can be concluded that the area effect is found to register the highest in the case of northern implying the least contribution of yield to output. However, the yield effect is found to be the highest in the case of Kerala state with the area effect registering the highest negative. In the case of Tamilnadu, the yield effect (62.10 per cent) is found to be highest when compared to the area effect (3790 per cent). It can be concluded that except Kerala, the contribution of both area and yield to output change is found to be positive for all the states.

IV. CONCLUSION

Thus, the above analysis can be summarized as: The positive growth in terms of area, output and yield of coconut could be found to be significant for all the states of India. However, the state of Kerala, called the house of coconut has experienced a significant decline in terms of area and yield with a negligible insignificant positive growth in output. The reasons for declining area under cultivation of coconut are fragmentation of palm gardens into housing plots and for commercial constructions. Another factor that contributes to the shrinkage of area under cultivation is adoption of rubber plants for better return. Farmers stated that steady fall in coconut prices was a factor that compelled them to look for other crops that ensure better returns. Coconut price has been stagnating at low levels compared to sharp increase in input costs. So, small and medium scale farmers tend to turn to other crops and vegetables, which require less investment and guarantee reasonable returns in a short period. Thus, coconut cultivation is no more source of income for people of Kerala.

Table1: Trends in State Wise Area under Coconut (In Ha.)

Year	Andhra Pradesh	Tamilnadu	Karnataka	Kerala	Southern States	Other States	All India
2000 - 2001	102.6	323.5	333.8	925.8	1685.7	138.2	1823.9
2001 - 2002	104	335.8	369.8	939.5	1749.1	183.2	1932.3
2002 - 2003	105.2	345.9	375.4	899.2	1725.7	196.1	1921.8
2003 - 2004	104	352.7	376	906.2	1738.9	194.8	1933.7
2004 - 2005	104	357.1	385.4	897.8	1744.3	190.7	1935
2005 - 2006	104	370.6	385.4	897.8	1757.8	189	1946.8
2006 - 2007	101.9	374.6	401	870.9	1748.4	188.4	1936.8
2007 - 2008	101.32	383.37	405	818.8	1708.49	194.7	1903.19
2008 - 2009	104	389.6	419	787.77	1700.37	194.2	1894.57
2009 - 2010	104	390	419	788	1701	194.2	1895.2
2010 - 2011	104	390	419	788	1701	194.9	1895.9
2011 - 2012	142	430.7	511	766	1849.7	221	2070.7
2012 - 2013	128.9	465.11	513.1	798.16	1905.27	231.4	2136.67
2013 - 2014	121.92	465.11	517.29	797.21	1901.53	238.97	2140.5
2014 - 2015	105.99	465.11	515.03	649.85	1735.98	239.83	1975.81
2015 - 2016	103.95	459.74	526.38	770.62	1860.69	227.78	2088.47
A. Mean	108.86	393.68	429.48	831.35	1763.37	201.09	1964.46
LGR	0.98	2.51*	2.97*	-1.76*	0.52*	2.30*	0.70*
CGR	0.93	2.53*	2.99*	-1.77*	0.51*	2.38*	0.69*
I. INDEX	37.14	12.79	19.06	15.94	12.98	25.58	13.19
F	3.35	182.93*	115.92*	57.87*	7.53*	38.35*	13.35*

* Indicates Significant at 5 per cent.

Source: Reports on Coconut Board India, Various years

Table2: Trends in State Wise Output under Coconut (In lakh Nuts)

Year	Andhra Pradesh	Tamilnadu	Karnataka	Kerala	Southern States	Other States	All India
2000 - 2001	1092.7	3192	1754.2	5536	11574.9	1103.5	12678.4
2001 - 2002	1125	3293.6	1503.6	5744	11666.2	1296.7	12962.9
2002 - 2003	1158.6	2860.7	1525.3	5709	11253.6	1281.4	12535
2003 - 2004	1195	2560.5	1529.1	5484	10768.6	1409.6	12178.2
2004 - 2005	1199.3	3243.5	1209.6	5727	11379.4	1453.5	12832.9
2005 - 2006	892	4867.1	1209.6	6326	13294.9	1516.2	14811.1
2006 - 2007	1326.4	5429.9	1625	6054	14435.3	1405	15840.3
2007 - 2008	1119.26	4968.2	1635	5641	13363.46	1380.1	14743.56
2008 - 2009	970	5365	2176	5802	14313	1416.75	15729.75
2009 - 2010	1042.5	5770.6	2339.8	6239.5	15392.4	1525.97	16918.37
2010 - 2011	1042.52	5770.6	2339.81	6239.5	15392.43	1550.49	16942.92
2011 - 2012	1985.01	7057.88	5915.33	6211.21	21169.43	2181.79	23351.22
2012 - 2013	1933.07	6917.25	6058.86	5798.04	20707.22	1972.81	22680.03
2013 - 2014	1828.46	6917.25	5041.15	5968.01	19754.87	1910.32	21665.19
2014 - 2015	1463.56	6917.46	5141.15	4896.61	18418.78	2020.83	20439.61
2015 - 2016	1427.46	6171.06	5128.84	7429.39	20156.75	2010.7	22167.45
A. Mean	1300.05	5081.41	2883.27	5925.33	15190.08	1589.73	16779.81
LGR	3.24*	6.03*	11.15*	0.66	4.67*	3.76*	4.58*

CGR	3.02*	6.80*	11.40*	0.58	4.77*	3.81*	4.67*
I. INDEX	82.25	48.02	137.08	33.03	38.65	36.34	37.40
F	7.41*	75.00*	31.50*	1.92*	69.46*	51.03*	71.49*

* Indicates Significant at 5 per cent.

Source: Reports on Coconut Board India, Various years

Table3: Trends in State Wise Yield Under Coconut (In Number of Nuts Per Ha)

Year	Andhra Pradesh	Tamilnadu	Karnataka	Kerala	Southern States	Other States	All India
2000 - 2001	10650	9867	5255	5980	6866.524	7984.805	6951
2001 - 2002	10817	9808	4066	6114	6669.83	7078.057	6709
2002 - 2003	11013	8270	4063	6349	6521.18	6534.421	6523
2003 - 2004	11490	7260	4067	6052	6192.766	7236.14	6298
2004 - 2005	11532	9083	3139	6379	6523.763	7621.919	6632
2005 - 2006	8577	13133	3139	7046	7563.375	8022.222	7608
2006 - 2007	13017	14495	4052	6951	8256.291	7457.537	8179
2007 - 2008	11047	12959	4037	6889	7821.796	7088.341	7747
2008 - 2009	9327	13771	5193	7365	8417.58	7295.314	8303
2009 - 2010	10024	14796	5584	7918	9049.03	7857.724	8927
2010 - 2011	10024	14796	5584	7918	9049.048	7955.31	8937
2011 - 2012	13979	16387	11576	8109	11444.79	9872.353	11277
2012 - 2013	14997	14872	11808	7264	10868.39	8525.54	10615
2013 - 2014	14997	14872	9745	7486	10388.93	7993.974	10122
2014 - 2015	13808	14873	9982	7535	10610.02	8426.093	10345
2015 - 2016	13732	13423	9744	9641	10832.94	8827.377	10614
A. Mean	11814.44	12666.56	6314.63	7187.25	8567.27	7861.07	8486.69
LGR	2.17*	3.73*	8.23*	2.39*	4.12*	1.40*	3.86*
CGR	2.07*	4.17*	8.17*	2.39*	4.24*	1.39*	3.95*
I. INDEX	52.58	52.59	114.29	26.40	29.57	30.13	28.81
F	8.09*	23.98*	24.69*	38.91*	92.53*	10.22*	85.33*

* Indicates Significant at 5 per cent.

Source: Reports on Coconut Board India, Various years

Table7: District Wise Contribution of Area and Yield to Output Changes in Coconut in the States of India (In Percentage)

State	AREA EFFECT	OUTPUT EFFECT	Yield Effect
Andhra Pradesh	30.98	100.00	69.02
Tamilnadu	37.90	100.00	62.10
Karnataka	27.28	100.00	72.72
Kerala	-307.06	100.00	407.06
Southern States	10.84	100.00	89.16
Other States	62.94	100.00	37.06
All India	15.07	100.00	84.93

Source: Calculated from the earlier tables.

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