
Chapter Three
Trends in Area, Production and Productivity

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An analysis of the components of increase in production of ginger is done in this chapter to know the respective contribution of area and yield in the production of ginger.

Trend is a component of variation which reveals the general direction of change over a period of time. Compound growth rate has been worked out by fitting exponential function $Y = AB^t$ to the area, production and yield per hectare of ginger in India, Kerala, other major producing states in India and Ernakulam and Wynad districts of Kerala, using the linear form:

$$\text{Log } Y = \text{Log } A + t \text{ Log } B$$

$$y = a + bt + e$$

Where Log Y is the log of dependent variable (acreage, production or yield per hectare) and 't' is independent time variable.

3.1. Trends in Area, Production and Yield per Hectare of Ginger in India

The area, production and yield per hectare of ginger in India during 1957-58 to 93-94 are presented in Table 3.1. Production of ginger in India has increased substantially during 1957-58 to 1993-94.

Table 3.1**Area, Production and Yield per Hectare of Ginger in India**

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1957-58	17,000	16,000	941
1958-59	15,000	14,000	933
1959-60	18,000	16,000	889
1960-61	19,000	18,000	947
1961-62	21,000	19,000	905
1962-63	21,000	20,000	952
1963-64	23,000	21,000	913
1964-65	23,000	21,000	913
1965-66	23,000	22,000	957
1966-67	23,000	21,000	913
1967-68	21,000	20,000	952
1968-69	20,000	18,000	900
1969-70	21,000	21,000	1,000
1970-71	21,600	29,290	1,356
1971-72	24,600	34,710	1,411

(Cont'd...)

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1972-73	22,900	33,630	1,469
1973-74	24,900	38,460	1,545
1974-75	24,100	37,910	1,573
1975-76	27,200	45,150	1,660
1976-77	25,700	43,390	1,688
1977-78	36,000	71,700	1,992
1978-79	40,800	75,720	1,856
1979-80	41,400	71,140	1,718
1980-81	40,500	82,440	2,036
1981-82	41,100	89,710	2,183
1982-83	43,800	94,170	2,150
1983-84	49,000	1,21,310	2,476
1984-85	51,500	1,33,860	2,600
1985-86	53,500	1,38,020	2,580
1986-87	52,630	1,36,010	2,584
1987-88	54,240	1,42,840	2,633
1988-89	51,870	1,52,120	2,933
1989-90	53,560	1,56,120	2,915

(Cont'd...)

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1990-91	53,930	1,53,450	2,845
1991-92	59,830	1,82,650	3,053
1992-93	59,870	2,01,630	3,368
1993-94 (P)	59,890	1,99,390	3,329

(P) : Provisional

Source: Directorate of Cocoa, Arecanut and Spices, Calicut.

The production of ginger has increased from 16,000 tonnes in 1957-58 to 43,390 tonnes in 1976-77. The increase in production is due to an increase in area by 51% and yield per hectare by 79% over 1957-58.

A substantial increase in ginger production is noticed in 1977-78 when Meghalaya entered in the ginger production. In 1977-78, 71,700 tonnes of ginger was produced in India, ie., 65% increase over the previous year. In 1992-93, India produced the highest quantity of 2,01,630 tonnes.

Compound growth rates are estimated for the overall period (1957-58 to 93-94) and the two sub-period, ie., 1957-58 to 1976-77 and 1977-78 to 1993-94. As table 3.2 reveals the coefficients of trends in all periods are found to be positive.

Table 3.2**Compound Growth Rates of Area, Production and Yield per Hectare of Ginger in Kerala and India.**

Period	Kerala			India		
	A	P	Y	A	P	Y
1957-58 to 1976-77	0.62	6.31	5.69	2.02	5.61	3.59
1977-78 to 1993-94	1.23	3.41	2.18	2.99	6.81	3.83
1957-58 to 1993-94	1.04	5.47	4.43	3.91	8.13	4.20

Note: A - Area, P - Production, Y - Yield.

Source: Computed from the data published by:

1. Directorate of Economics and Statistics, Trivandrum
2. Directorate of Cocoa, Arecanut and Spices, Calicut

The compound growth rates of area, production and yield per hectare of ginger in India during 1957-58 to 1993-94 were 3.91%, 8.13% and 4.2% respectively. The corresponding figures were 2.02%, 5.61% and 3.59% for the first sub-period and 2.99%, 6.81% and 3.83% for the second sub-period. The growth rates for the second sub-period were higher than the first sub-

period. Increase in output in all the periods has influenced both by area and yield. Yield seems to have been the main source of growth in output; area being of secondary importance.

3.2. Growth Trends in Kerala

Area, production and yield per hectare of ginger in Kerala have shown in increasing trend during 1957-58 to 1993-94 (Table 3.3). Production of ginger increased from 9,950 tonnes in 1957-58 to 25,450 tonnes in 1976-77, further to 47,650 tonnes in 1986-87 and it reached the maximum level of 50,309 tonnes in 1991-92. The significant increase in production was mostly due to a substantial increase in yield per hectare. However, during 1993-94 production declined to 37,676 tonnes with a decline in area from 15,400 hectares in 1991-92 to 11,125 hectares in 1993-94. During 1994-95 area and production again increased to 14,018 hectares and 47,673 tonnes.

Table 3.3

Area, Production and Yield per Hectare of Ginger in Kerala

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1957-58	9,270	9,950	1,073
1958-59	8,970	7,780	867
1959-60	11,060	9,980	902
1960-61	12,000	11,270	939
1961-62	12,050	11,370	944
1962-63	12,070	11,430	947
1963-64	11,960	11,290	944
1964-65	11,970	11,330	947
1965-66	11,850	11,190	944
1966-67	11,790	11,050	937
1967-68	11,800	11,120	942
1968-69	11,420	10,840	949
1969-70	11,520	12,000	1,042
1970-71	12,170	19,680	1,617
1971-72	11,870	23,210	1,955

(Cont'd...)

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1972-73	11,800	23,490	1,991
1973-74	12,040	26,680	2,216
1974-75	12,200	26,000	2,131
1975-76	12,100	28,500	2,355
1976-77	10,350	25,450	2,459
1977-78	11,450	29,030	2,535
1978-79	12,710	32,910	2,589
1979-80	13,260	32,220	2,430
1980-81	12,660	32,040	2,531
1981-82	13,450	34,380	2,556
1982-83	13,180	32,800	2,489
1983-84	14,880	36,710	2,467
1984-85	14,540	41,250	2,837
1985-86	15,670	44,470	2,838
1986-87	16,590	47,650	2,872
1987-88	14,440	45,510	3,152
1988-89	14,160	45,020	3,179
1989-90	14,430	47,270	3,276

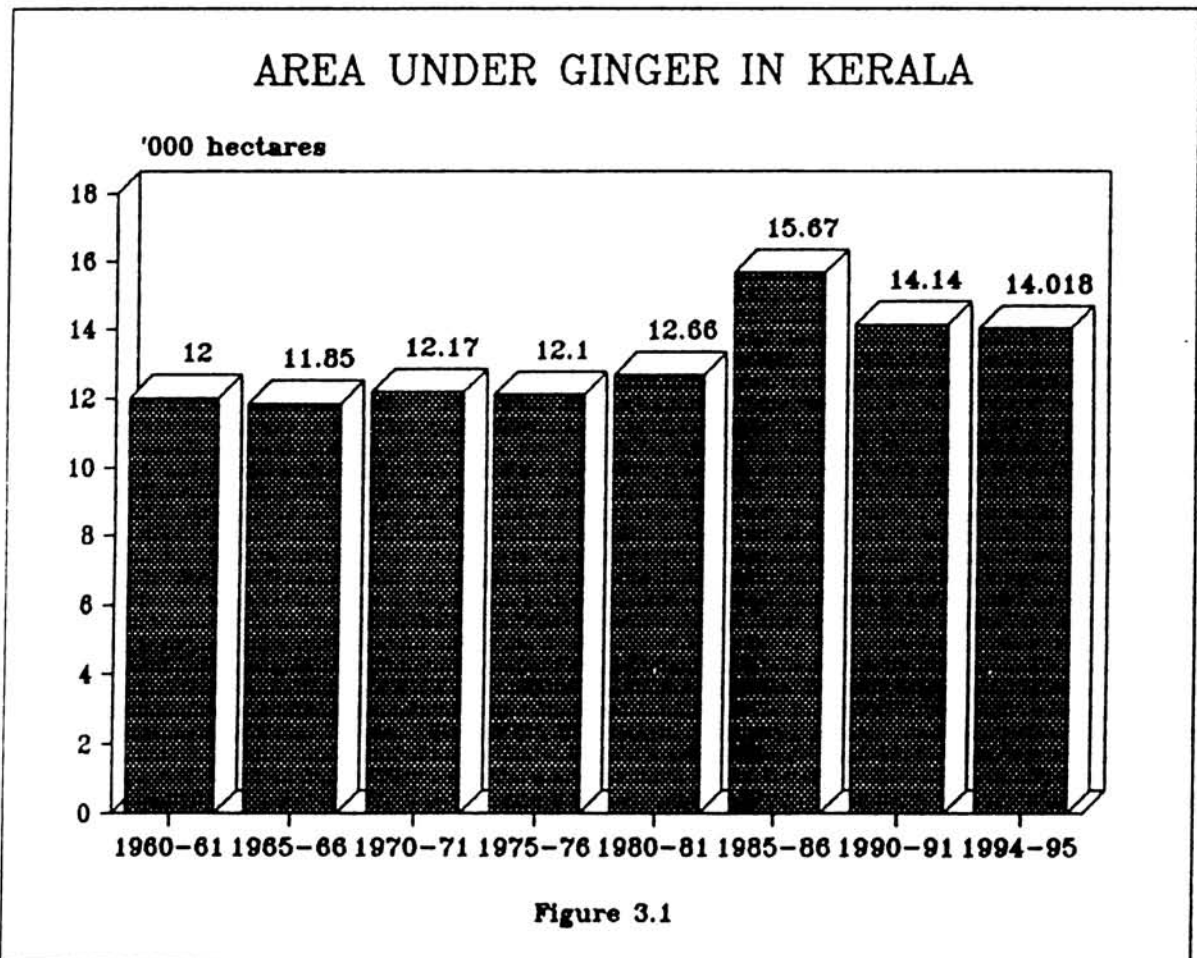
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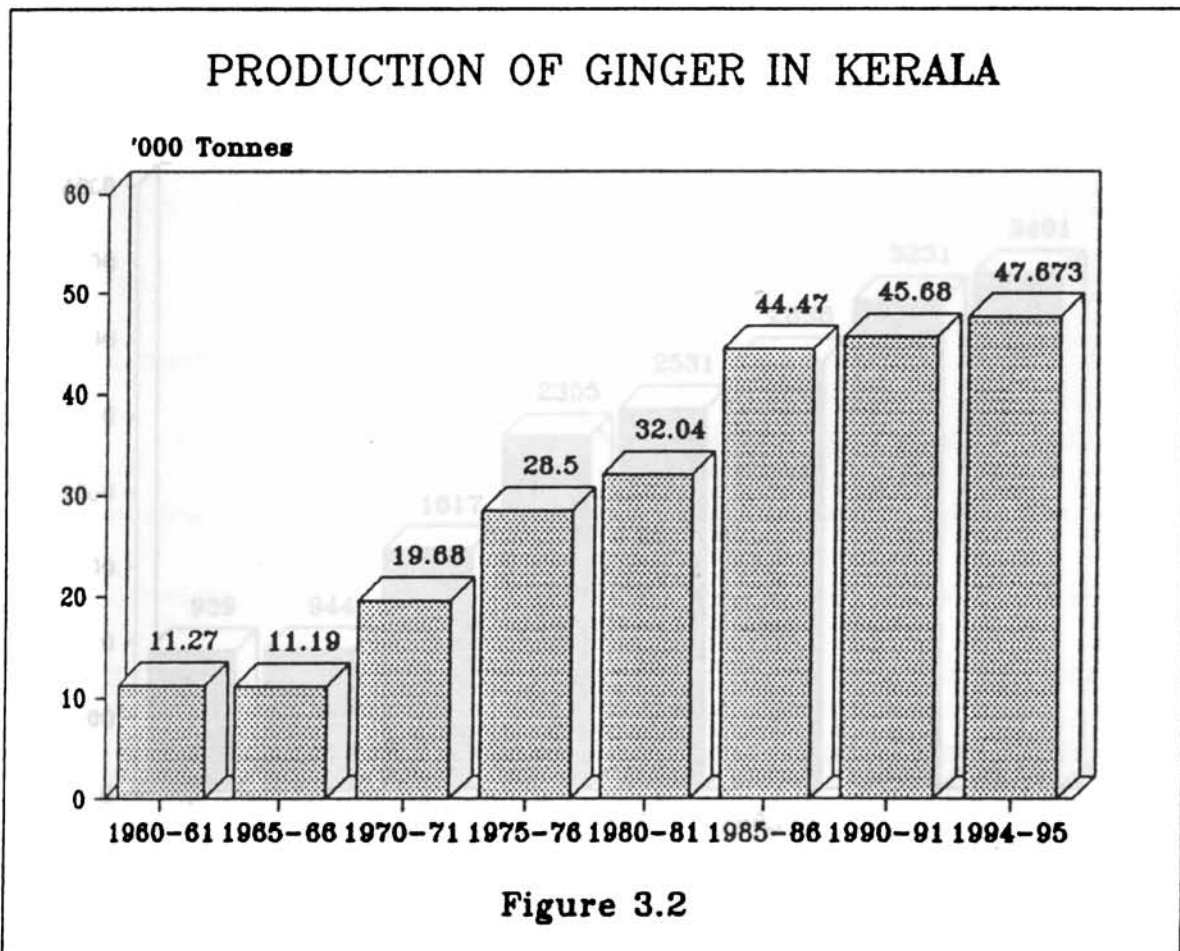
Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1990-91	14,140	45,680	3,231
1991-92	15,400	50,309	3,267
1992-93	13,937	45,403	3,258
1993-94	11,125	37,676	3,387
1994-95 (P)	14,018	47,673	3,401

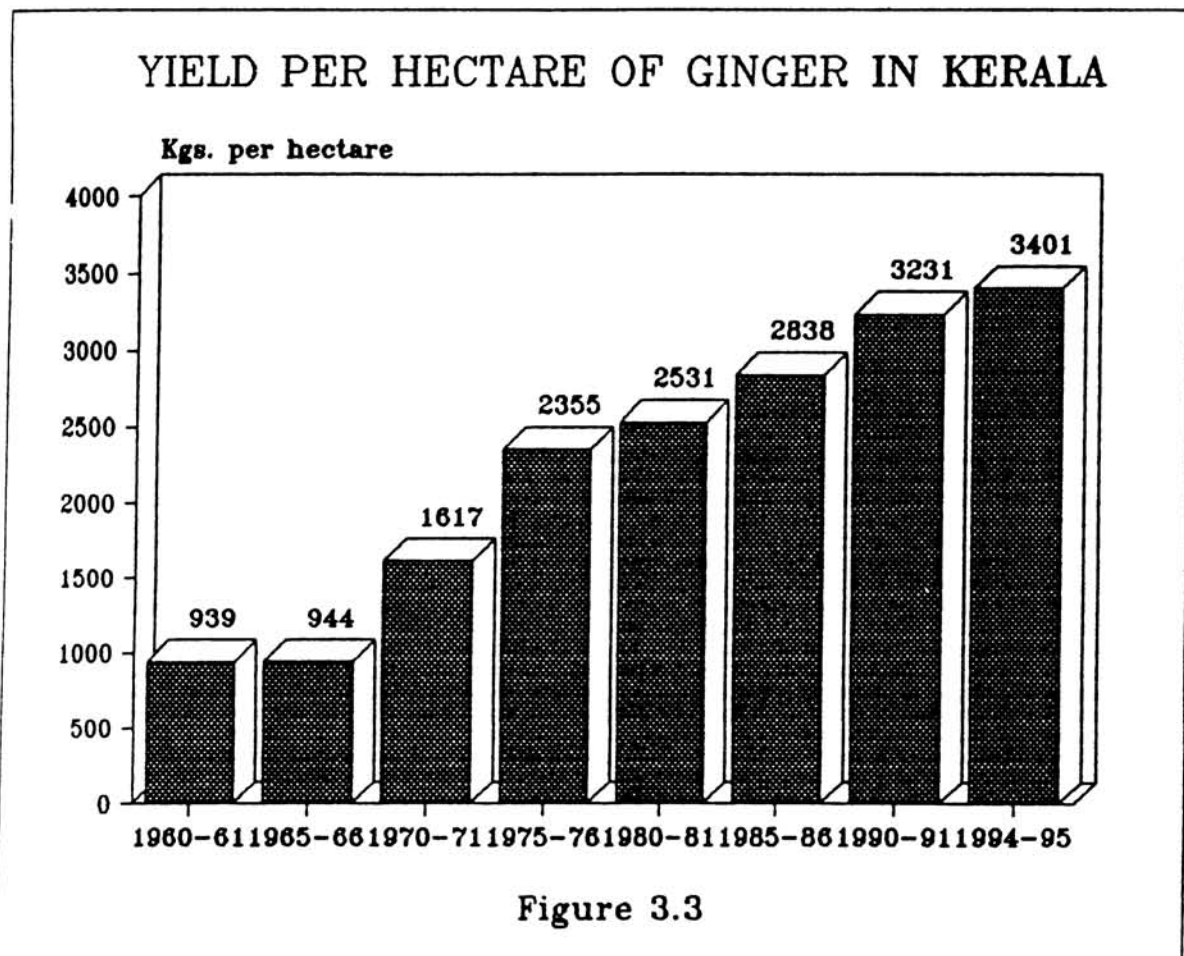
(P): Provisional

Source: Directorate of Economics and Statistics, Trivandrum.

Table 3.2 reveals that the compound growth rate of production has been lower during the second sub-period (1977-78 to 93-94) as compared to the first sub-period (1957-58 to 1976-77). The fall in the growth rate of yield from 5.69% during 1957-58 to 1976-77 to 2.18% during 1977-78 to 1993-94 is the reason for the low growth rate of production. The growth rates of area in both the periods are substantially lower than the all India growth rates which is due to remarkable increase in ginger area in other major producing states. During 1957-58 to 1976-77, there has been a marginal increase in area (0.62%).







Despite the slow growth of area during these periods, the output of the state recorded a significant growth rate. It implies that yield increase has played a major role in the growth of ginger production in Kerala.

3.3. State-wise Analysis

Although ginger is cultivated in almost all over the country, four states, namely, Kerala, Meghalaya, West Bengal and Orissa together account for about 65% of its area under cultivation and 60% of the total ginger production in India. Among them Kerala and Meghalaya together contribute about 45% of the country's output.

Till 1977-78 Kerala's contribution in the country's production was more than 60% but with the development of ginger cultivation in Meghalaya, Kerala's share come down to about one-fourth now. Although Meghalaya ranks only third in area, it ranks second in production because of higher yield per hectare.

Table 3.4, 3.5 and 3.6 show the data on area, production and yield per hectare of ginger in Kerala, Meghalaya, Orissa and West Bengal, which are the major ginger producing states in India.

Table 3.4

Area Under Ginger in Major Producing States of India (hectares)

Year	Kerala	Meghalaya	Orissa	W. Bengal	India
1970-71	12,170	—	1,510	1,500	21,600
1971-72	11,870	—	2,310	1,600	24,600
1972-73	11,800	—	1,860	1,500	22,900
1973-74	12,040	—	2,300	1,900	24,900
1974-75	12,200	—	1,710	1,800	24,100
1975-76	12,100	—	2,660	1,690	27,200
1976-77	10,350	—	2,920	1,850	25,700
1977-78	11,450	4,270	3,220	2,370	36,000
1978-79	12,710	4,270	3,430	2,390	40,800
1979-80	13,260	5,270	4,070	2,520	41,400
1980-81	12,660	5,450	4,900	2,870	40,500
1981-82	13,450	5,650	3,480	3,100	41,100
1982-83	13,180	5,820	5,440	3,150	43,800
1983-84	14,880	6,800	5,520	3,480	49,000
1984-85	14,540	7,000	5,730	3,770	51,500

(Cont'd...)

Year	Kerala	Meghalaya	Orissa	W. Bengal	India
1985-86	15,670	5,350	6,290	4,300	53,500
1986-87	16,590	5,500	6,660	4,620	52,630
1987-88	14,440	6,300	7,250	4,690	54,240
1988-89	14,160	6,300	8,290	4,930	51,870
1989-90	14,430	6,300	8,810	5,230	53,560
1990-91	14,140	6,400	8,670	5,380	53,930
1991-92	15,400	6,590	9,670	9,810	59,830
1992-93	13,937	6,640	9,590	6,860	59,870
1993-94(P)	11,125	6,640	9,590	7,180	59,890

(P) : Provisional

Source: Directorate of Cocoa, Arecanut and Spices, Calicut.

Table 3.5**Production of Ginger in Major Producing States in India (tonnes)**

Year	Kerala	Meghalaya	Orissa	W. Bengal	India
1970-71	19,680	---	1,970	2,200	29,290
1971-72	23,210	---	1,280	2,500	34,710
1972-73	23,490	---	1,900	1,840	33,630
1973-74	26,680	---	2,190	1,900	38,460
1974-75	26,000	---	730	2,410	37,910
1975-76	28,500	---	2,960	2,670	45,150
1976-77	25,450	---	2,290	2,680	43,390
1977-78	29,030	16,800	2,470	3,610	71,700
1978-79	32,910	16,800	2,910	3,450	75,720
1979-80	32,220	12,910	4,230	3,550	71,140
1980-81	32,040	21,850	5,310	4,420	82,440
1981-82	34,380	24,190	3,340	5,060	89,710
1982-83	32,800	24,050	5,410	4,970	94,170
1983-84	36,710	27,750	12,670	5,600	1,21,310
1984-85	41,250	28,560	12,820	5,890	1,33,860
1985-86	44,470	23,350	14,650	6,820	1,38,020

(Cont'd...)

Year	Kerala	Meghalaya	Orissa	W. Bengal	India
1986-87	47,650	26,000	11,040	7,020	1,36,010
1987-88	45,510	30,100	10,110	7,460	1,42,840
1988-89	45,020	29,000	12,420	8,650	1,52,120
1989-90	47,270	29,300	15,640	9,060	1,56,120
1990-91	45,680	29,590	13,820	9,040	1,53,450
1991-92	50,309	38,520	14,740	12,760	1,82,650
1992-93	45,403	40,800	14,280	12,760	2,01,630
1993-94(P)	37,676	40,800	14,280	13,600	1,99,390

(P) : Provisional

Source: Directorate of Cocoa, Arecanut and Spices, Calicut.

Table 3.6

Yield per hectare of Ginger in Major Producing States of India (Kgs.)

Year	Kerala	Meghalaya	Orissa	W. Bengal	India
1970-71	1,617	---	1,305	1,467	1,356
1971-72	1,955	---	554	1,563	1,411
1972-73	1,991	---	1,022	1,226	1,469
1973-74	2,216	---	952	1,000	1,545
1974-75	2,131	---	427	1,339	1,573
1975-76	2,355	---	1,113	1,580	1,660
1976-77	2,459	---	784	1,449	1,688
1977-78	2,535	3,934	767	1,523	1,992
1978-79	2,589	3,934	848	1,443	1,856
1979-80	2,430	2,450	1,039	1,409	1,718
1980-81	2,531	4,009	1,084	1,540	2,036
1981-82	2,556	4,281	960	1,632	2,183
1982-83	2,489	4,132	994	1,578	2,150
1983-84	2,467	4,080	2,295	1,609	2,476
1984-85	2,837	4,080	2,237	1,562	2,600
1985-86	2,838	4,364	2,329	1,586	2,580

(Cont'd...)

Year	Kerala	Meghalaya	Orissa	W. Bengal	India
1986-87	2,872	4,727	1,658	1,519	2,584
1987-88	3,152	4,778	1,394	1,594	2,633
1988-89	3,179	4,603	1,498	1,795	2,933
1989-90	3,276	4,651	1,775	1,716	2,915
1990-91	3 231	4,623	1,594	1,696	2,845
1991-92	3,267	5,845	1,524	1,301	3,053
1992-93	3,258	6,144	1,489	1,860	3,368
1993-94(P)	3,387	6,144	1,489	1,894	3,329

(P) : Provisional

Source: Directorate of Cocoa, Arecanut and Spices, Calicut.

For comparison, the compound growth rates are estimated for the period 1970-71 to 1993-94 and the sub-period 1977-78 to 93-94 (till 1977-78 data for Meghalaya is not available).

As given in the Table 3.7, the compound growth rates of all states are positive during the period 1977-78 to 1993-94, of them, Orissa, and West Bengal recorded spectacular growth rates in area and output which were substantially higher than all-India growth rates.

Orissa also shows the highest growth rate in yield per hectare among the major ginger producing states. Thus higher output growth rate in Orissa was contributed by both area and yield.

The growth rates of yield was found to be the lowest in West Bengal where the output growth was mostly due to increase in area.

In Meghalaya, growth rates of area and yield are equally important for the higher growth rate of output.

The compound growth rates of area, production and yield per hectare of ginger in Kerala during all the periods are not impressive in comparison with that of all-India growth rates and of other major producing states.

Table 3.7

Compound Growth Rates of Area, Production and Yield per Hectare in Different States.

Period	Kerala		Orissa		Meghalaya		West Bengal		India				
	A	Y	A	Y	A	Y	A	Y	A	Y			
1970-71 to 1993-94	1.32	3.86	2.54	8.22	12.21	3.99	---	7.52	8.69	1.19	4.75	8.75	4.00
1977-78 to 1993-94	1.23	3.41	2.18	7.27	11.16	3.89	3.92	7.79	8.77	1.00	2.99	6.81	3.83

Note: A - Area, P - Production, Y - Yield

Source: Computed from the data published by :

1. Directorate of Economics and Statistics, Trivandrum.
2. Directorate of Cocoa, Arecanut and Spices, Calicut.

3.4. Growth Trends of Ginger in Wynad and Ernakulam Districts

The average growth rate of Kerala does not reveal the real growth pattern. The two top ranking districts of Kerala, Wynad and Ernakulam together account for about 54% of area and about 63% of state's output. In Ernakulam district both area and output of ginger were declining during 1977-78 to 1993-94 (Table 3.8) whereas Wynad recorded spectacular growth in area as well as output during 1981-82 to 1993-94 (Table 3.9).

Table 3.8

Area, Production and Yield per hectare of Ginger in Ernakulam District

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1977-78	2,387	5,905	2,474
1978-79	2,496	6,682	2,677
1979-80	3,077	7,714	2,506
1980-81	2,162	5,474	2,532
1981-82	2,425	6,140	2,532

(Cont'd...)

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1982-83	1,945	4,876	2,507
1983-84	2,177	5,403	2,482
1984-85	2,282	7,385	3,236
1985-86	2,431	8,024	3,301
1986-87	2,767	9,134	3,301
1987-88	2,242	6,896	3,076
1988-89	1,985	4,964	2,501
1989-90	2,142	5,357	2,501
1990-91	1,943	5,459	2,810
1991-92	1,945	5,465	2,810
1992-93	1,761	4,948	2,810
1993-94	1,676	4,789	2,857

Source: Directorate of Economics and Statistics, Trivandrum.

Table 3.9**Area, Production and Yield per hectare of Ginger in Wynad District**

Year	Area (hectares)	Production (tonnes)	Yield (Kgs.)
1981-82	1,065	2,641	2,480
1982-83	1,158	2,786	2,406
1983-84	2,207	5,204	2,358
1984-85	2,757	10,554	3,828
1985-86	3,050	11,208	3,675
1986-87	3,324	12,216	3,675
1987-88	3,787	17,875	4,720
1988-89	4,272	19,528	4,571
1989-90	4,990	22,810	4,571
1990-91	6,397	23,019	3,598
1991-92	8,053	28,978	3,599
1992-93	7,198	25,901	3,598
1993-94	4,350	18,653	4,288

Source: Directorate of Economics and Statistics, Trivandrum.

The compound growth rate of output in Ernakulam during 1977-78 to 1993-94 was -1.39% (Table 3.10). The positive growth rate of yield per hectare in Ernakulam (0.76%) was quite insufficient to overcome the negative growth rate of area (-2.14%).

Table 3.10

Compound Growth Rates of Area, Production and Yield per Hectare of Ginger in Ernakulam and Wynad District.

Period	Ernakulam			Wynad		
	A	P	Y	A	P	Y
1977-78 to 1993-94	-2.14	-1.39	0.76	—	—	—
1981-82 to 1993-94	—	—	—	14.57	18.67	4.10

Note: A - Area, P - Production, Y - Yield.

Source: Computed from the data published by Directorate of Economics and Statistics, Trivandrum.

The crop shifting to pineapple, as reported by the farmers, was found to be the main reason for negative growth rate in area and output in Ernakulam

district. The area under pineapple in Ernakulam has been increasing during the last few years. Besides, the yield per hectare of ginger in Ernakulam is substantially lower than the average yield of Kerala. Thus crop shifting and low yield per hectare have resulted in negative growth rate of area, and output.

The compound growth rate of ginger output in Wynad during 1981-82 to 1993-94 (for which data is available) was as high as 18.67%. This remarkable growth rate in Wynad was mainly due to a significant growth in area (14.57%). Besides, the yield per hectare in Wynad is substantially higher than the yield per hectare of Kerala and India. However, production and area under ginger in Wynad have shown a declining trend during the last two years.

In Wynad ginger has been mostly cultivated as an intercrop in pepper gardens. Increasing area under pepper till 1991-92 was the main reason for higher growth rate of area. During the last two years, the area under ginger has declined with a decline in pepper area.

3.5. Conclusion

The analysis indicates that the growth performance of ginger has varied from state to state in India and from district to district in Kerala. The major contributor to increase in production in Kerala has been yield. While area under ginger increased in all other major producing states, it has declined in Kerala.

Three factors are responsible for the decelerated growth of ginger pro-

duction in Kerala. Firstly, there is only limited scope for increasing ginger cultivation as a monocrop-crop due to the general crop shifting in Kerala, ie., from annual crops to perennial crops. Secondly, emergence of substitute crop like pineapple has influenced the area under ginger in Ernakulam, one of the major ginger producing districts of Kerala. Thirdly, the yield per hectare in Kerala is substantially lower than the average yield.

Thus, the prospects for attaining growth through extension of cultivated area are diminishing fast. The wide difference in current yield rates among the states indicate the scope for increasing yield rates. Institutional arrangements should be made to provide quality seeds and other package of inputs to the farmers to boost the output of ginger.