CHAPTER - THREE

CHANGING STRUCTURE OF FOODGRAINS PRODUCTION IN CHANDGAD TALUKA (1950-51 to 1983-84)

3.1 INTRODUCTION

In a backward economy the cultivation of cereals dominates the entire agricultural production activity. Chandgad taluka, though being a smaller unit, should not be an exception to the characteristics of agriculture stated at the outset of this chapter.

Of the gross cropped area the percentage of the total area under cereals worked out to be 60.59 percent in the beginning of the period (averages of 1950-1953). Eventhough the period of 34 years has lapsed still a little more than half of the gross cropped area (53.15%) is being occupied by the cereals in the taluka. In the total cereals rice is the important cereal of the taluka. In the beginning of the period the relative shares of the area under rice in the gross cropped area and in the area under total cereals amounted to 26.96 percent and 44.50 percent respectively (averages of 1950-1953) over the period the corresponding figures changed to 28.44 and 53.50 percent which reveals the cultivation of rice in the taluka has gained an importance in its overall cropping pattern.

3.2 THE AREA, YIELD AND OUTPUT OF RICE

During the pre-high yielding varieties period (pre-Hyvs) area under rice increased at the rate of

1.44 percent per annum compound. The productivity of rice also increased at the rate of 2.0 percent per annum. The positive growth rates of area and yield pushed the output growth to the rate of 3.44 percent compound per annum over this relatively short period. Though the period covers three Five Year Plans no improved varieties of rice were introduced. The traditional or local varieties of rice were in vogue.[1] As a result the cultivation of rice continued to be tradition bound. Since the taluka has got the comparative advantage in cultivating rice over other crops and because of the assured south-west mansoon precipitation in sufficient quantity; the improvement in the productivity of the crop did take place. Its contribution to the growth of rice output was larger than that of area.

The subsequent period (Post-Hyvs period) the area under rice grew more or less at the same rate recorded during the preceeding period i.e. Pre-Hyvs period. The introduction of Hyvs of rice made a dent on the productivity of the crop. It grew at the rate of 5.72% compound per annum pushing the output growth rate to 7.32 percent per annum compound. The substantial increase in the output of the crop caused by appreciation of the yield could be attributed to the break through in the form of a technological change covering new high yielding varieties of seeds, chemical fertilizers, insecticides and pesticides, effected during this period.

The new varieties become more successful in the taluka because the taluka itself comes under the shadow of assured South-West monsoon rainfall. Because of improvement in the yield the area growth rate continued even slightly at a higher rate. Over the long period under study, however, the area under rice increased at the rate of 0.57% compound per annum, lower than those recorded during the sub two periods. The long term yield growth rate worked out to be 2.91 percent per annum compound. The output increased was caused mainly due to the yield appreciation of the crop. The output growth during this long period worked out to be 3.50% per annum compound. The area growth rate is much less than those of yield and output. The positive growth rate of area, though marginal, could be accounted for by the extension of rice cultivation to marginal lands. Here the extension of the rice cultivation took place by converting the marginal lands into the lands suitable for its cultivation. The conversion of the marginal lands took place through the utilisation of the family bounded labour and some times hired wage labour, in case of well to do farmers.

3.3 THE AREA, YIELD AND OUTPUT OF RAGI (NACHANI)

Next in importance in the group of cereals cultivated in Chandgad Taluka comes ragi which is also known by the name Nachani. The climatic, rainfall and soil conditions required for cultivation of ragi are

more or less similar to those required for the cultivation of rice. However, its cultivation is undertaken not on more fertile lands but on the less fertile lands. Ragi being the most important item of consumption next to rice, some portion of the land is allocated to its cultivation at micro level. The area under ragi in relative terms formed 16.59 percent and 27.39 percent to the gross cropped area and to the area under all cereals cultivated in the taluka respectively (averages of 1950-53). The same relative shares increased to 20.40 percent and 38.39 percent in the areas gross cropped area and the area under all cereals by the end of the period under study (1981-84 averages). During the first period 1950-1966 the area under Ragi grew at the rate of 2.29 percent compound per annum. The yield of the crop increased at the rate of 1.74 percent compound per annum. Both area and yield contributed to the growth of the output at the rate of 4.00 percent compound per annum which could be considered as a rather substantial growth rate. This high growth rate was to some extent responsible for the favourable agro-claimatic condition inclusive of rainfall during this period. In the next sub period i.e. 1966-84 the rate of area growth under the crop slowed down to 1.90 percent. This decline was mainly on account of intra group substitution of crops, mainly between rice and ragi. Despite the introduction of new varieties of seeds the productivity of the crop grew

substantially viz., 3.50 percent per annum. This record increase in the yield growth rate was achieved mainly because of intensive application of a package of improved fertilisers which are popularly known as mishra khate thereby meaning the mixtures of different types of fertilizers. If we compare the yield growth rates of rice and ragi in the same period we notice that the yield growth rate of rice registered during this period is higher than that of ragi. The remarkable yield growth rate of rice was mainly owing to the adoption of new technology i.e. (Hyvs) high yielding varieties of seeds which was absent in respect of ragi. The intensive application of fertilizers to local varieties of seeds helped push the yield growth rate. Both positive area and yield growth rates pushed the output growth rate to 5.5 percent compound per annum. Very recently a very few new varieties of seeds have been introduced on an experimental basis and as yet those have to become popular and more suitable to the agro-climatic conditions of the taluka. The long term growth rates (1950-84) of area, yield and output work out to be 1.93, 2.25 and 4.50 percent compound per annum correspondingly. By way of passing a general remark, we may maintain that the performance of this particular crop seems to be rather close to that of rice. If we compare the similar growth rates of these two crops for the longer period of time, we notice that the area and output growth rates are

rather substantially higher than those of rice and the productivity growth rate being slightly lower than that of rice. The extent of the area under ragi could be attributed to the farmers increasing tendency to bring the marginal lands under its cultivation. By bringing the marginal lands under its cultivation the farmers could satisfy the domestic consumption requirements. Its extension of cultivation, improvement in its productivity and consequent increase in its output could be wel-come because ragi is the most nutritious food consumed by the vast majority of medium, semi-medium, small, marginal farmers and landless agricultural labourers. Between these two crops we may draw a distinction that former being a principal commercial crop the farmers belonging to the above categories give priority to its cultivation at the time of production decisions during every kharif season.

3.4 AREA, YIELD AND OUTPUT OF JOWAR (Kharif)

Another cereal cultivated in the taluka is kharif Jowar. The proportion of area occupied by it in the gross cropped area of the taluka formed 2.83 percent (1950-53 averages). Its relative share in the total area under cereals formed 4.67 percent in the beginning of the period. The same proportions declined to 1.01 percent to G.C.A. and 1.89 percent to total area under cereals (averages of 1981-84) by the end of the period under study. Kharif jowar is cultivated on the dry lands

where water logging does not take place. During the first pre-Hyvs period the annual compound growth rate of its area worked out to be (-)6.57 percent, while the annual compound growth rate of its yield worked out to be 3.00 percent. However, the area growth rate being negative slightly more than that of yield, the contribution made by the positive growth rate of yield to the output growth was nullified. Hence the output of the kharif jowar declined at the rate of (-)3.27 percent compound per annum. During the next post-Hyvs period the rate of area decrease worked out to be (-) 1.02 percent compound per annum; whereas the annual compound growth rate of yield increased to 4.30 percent causing the output growth to be positive that is 2.98 percent compound per annum. The higher annual compound growth rate of increase of the yield during the later period could be attributed to the improved varieties of seeds, fertilisers and cultural practices. The long term annual compound growth rates of the area under, yield and output of kharif jowar worked out to be (-) 4.76 percent, 1.54 and (-) 3.13 percent compound per annum, Looking at the annual compound growth rates, we, therefore, conclude, that kharif jowar has been losing in its area at a rather faster rate causing the long term growth rate of output to be negative despite the marginal positive increase in the long term

growth rate of yield. The new high yielding varieties of kharif jowar are more suitable to the areas of assured rainfall from south west monsoon but the soil conditions of the taluka are not suitable for the cultivation of kharif jowar. Therefore, the area under kharif jowar has been gradually diverted to other competing crops having comparative advantage from the cultivation of kahrif jowar in the taluka. With the development of irrigation, the lands under kharif jowar have been diverted to the cultivation of perenially irrigated sugar cane. The other minor millets also have been dropped out from the cropping pattern of the taluka.

3.5 DECLINING AREA UNDER MINOR MILLETS

Besides the major cereals whose area yield and output growth rates have been described above there are other minor millets such as sawa, vari, kodra etc. grown in the taluka. During the initial years of the period of the study and even before that the minor millets constituted the major items of food consumption of the rural population. The minor millets were generally grown on the less fertile lands, which are known as varkas lands. The relative share of the area under these crops formed 13.59 percent in the gross cropped area (average of triennial ending 1953). By the end of the period, on the one hand, Gross Cropped area increased but on the other hand, the area under minor

millets decreased. As a result their relative share in the gross cropped area decreased to 3.11 percent (the average of triennial ending 1984). Even if we look to the area index, we can observe that the index number tended to decline, rather consistently over the period. The index number changed from 100 (1950-51 base) to 32.70 in the terminal year of the period (1983-84). Similarly the annual compound growth rate of the area for the whole period worked out to be (-) 7.87 percent. This high rate of decrease could be accounted for by the change in the taste of the consumers who are producers themselves, causing the marginal lands, which were originally suitable for cultivation of minor millets being gradually converted into those lands fit for cultivation of high value cereals, oilseeds and other crops such as rice, ground-nuts, potatoes and sweet potatoes and even sugar cane where irrigation facilities have been extended. Most generally with the development process the farmers are expected to shift from the cultivation of low value crops to the cultivation of high value crops and that to the commercial crops. The farmers respond in terms as substituting the high value crops for low value crops and try to concentrate all their resources to maximise their output. Even though the area under minor millets declined at a faster rate it did not affect adversely the growth rate of area under good grains. The area under foodgrains remained

more or less constant, the rate of increase being just 0.15 percent compound per annum. However, it is quite difficult to ascertain how much area under minor millets have been diverted to other individual high value crops. Because of the development, tangible and intangible of agricultural lands, the substitutability as between the various crops seems to have been increased. For instance with the development of the irrigation, the lands under minor millets have been diverted to cultivation of sugar-cane and with contour bunding and levelling of the lands which were previously used for cultivation of minor millets, have been diverted to the cultivation of rice, nachani and even the cash crops like groundnuts. This change in the overall agricultural production pattern is being induced by the overall development process initiated since 1950-51. This sort of change in the agricultural production structure no doubt is welcome, because this type of change has initiated the development process in in the other sectors of the taluka's economy. As mentioned some where, because of increasing area under irrigation and a corresponding increase in the sugarcane area, the co-operative sugar factory came into being and it fostered the development of roads, communications, the lift irrigation and to some extent the propagation of modern technology.

3.6 THE AREA, YIELD AND OUTPUT (COMPOSITE) OF ALL CEREALS

Apart from the major cereals whose behaviour in respect of their area, yield and output over the period under review, described in the foregoing paragraphs and which constitute the bulk of the foodgrain crops grown in the taluka, there are stray minor cereals still cultivated in the taluka. Since their respective area, yield and output data are not available for the whole period consistently, we have not been able to calculate the annual compound growth rates or their dimensions namely, area, yield and output growth rates. Before we comment on the behaviour of the area under, yield (composite) and output of all cereals together, we can say at the beginning that the minor cereals are in the process of being dropped out from the overall cropping pattern of the taluka. Out of the gross cropped area 33,374 hectares, 20,222 hectares of land i.e. 60.59 percent (average of 1950-53) was devoted to the cultivation of cereals. By the end of the period, the gross cropped area of the district increased to 45,105 hectares out of which 23,975 hectares (averages of 1981-84) devoted to cultivation of cereals forming 53.15 percent to the gross cropped area. By comparing changes in terms of their relative shares in the gross cropped area at two different points of time the cereals have been losing their area consistently over the longer

period of time. Out of this area the relative percentage share of rice and ragi in the gross cropped area (GCA) increased to 90.89 percent in the total area of the taluka under cereals (53.50 percent rice area, 38.39 percent ragi area). This was an increase over their respective percentage shares in the Gross Cropped Area of the Taluka which in the beginning, formed 44.50 percent and 27.39 percent respectively; both of them aggregating to 71.89 percent in the area under total cereals.

In the first period that is between 1950 and 1966 the annual compound area growth rate of all cereals worked out to be 1.05 percent. The composite yield of all cereals increased at the rate of 2.39 percent compound per annum over the same period. Both the area expansion and productivity growth of all cereals, together contributed to output growth of the cereals. The output of all cereals in the taluka increased at the compound growth rate of 3.49 percent per annum. During the post-Hyvs period, the area growth rate slowed down to 0.84 percent compound per annum. On the contrary the yield of all cereals taken together grew at the annual compound growth rate of 4.85 percent during the post-Hyvs period. This was mainly because of the spectucular growth rate in respect of rice achieved during the same period (5.72 percent compound per annum). The output of all cereals increased at the rate of 5.73 percent compound per annum, the contribution of yield being larger than

that of area contribution. As regards the long term growth rate also we notice that the area under cereals has been declined by a little less than half-percentage i.e. 0.4 percent compound per annum. This slow down of the area growth rate over the longer period points out that the farmers have been substituting area under cereals and especially the area under minor cereals to the cultivation of commercial crops like sugarcane in the perennially irrigated areas and the rice which could be considered as a staple food crop for the medium and larger farmers of the taluka. With regard to the long term yield and output growth rates of the cereals one may feel to be complacent for both of them being registered at 2.57 and 3.01 percent compound per annum respectively. We may, therefore, conclude that the farmers of the taluka have learnt the art of managing their resources at their command, more productively and skillfully adopting the new technology in respect of rice. The output growth rate exceeds that of population growth rate of 2.5 percent for the whole of India. Despite a shift to the cultivation of cash crops that has already been occured, the production of food grains kept pace with that of population growth in the taluka the population growth rate in the taluka is assumed to be on par with that of whole of India.

3.7 GROWTH RATE OF AREA, YIELD AND OUTPUT OF PULSES

A variety of pulse crops are grown in the taluka. Some of them are kharif pulse crops while some others are rabi crops being cultivated after the harvesting of rice (paddy). The pulse crops grown in the kharif season are tur (arahar), udid (black gram), chavali and pawata and the rabi pulse crops are vatana, masur, green gram, ghevada.

Even though the large varieties of pulse crops are grown, the total area occupied by them accounted for 6.43 percent in the Gross Cropped Area (GCA) of the taluka (averages of 1950-53). By the end of the period the total area occupied by these crops accounts for just 0.91 percent of the gross cropped area. The declining share of the area under total pulses could be accounted for by the process of their being dropped out from the cropping pattern in the 1960s and 1970s. The process was set in by the expansion of the sugar-cane area. The another important reason is that the farmers have introduced the substitute crops like vegetable crops and potatoes especially in the assured irrigated areas. The growth of vegetables and potatoes in the taluka could be ascribed to an increasing monetization of the rural economy. Farmers prefer to have regular flow of monetary income which can be realised, through a shift to the cultivation of such crops which have regular and sustained demand of the urban population. A shift

of cultivation from such crops could be taken as an indicator of economic development of that particular region of these various pulse crops for which data with regard to their respective area and output are available are only tur and gram. With regard to the later also data are not available in a continuous series, therefore, in the following paras we confine our analysis to kharif pulse crops tur and the total pulses for which area and output data are available.

3.8 AREA, YIELD AND OUTPUT OF TUR

During the first period of 1950-66 the area under tur declined at the rate of (-)2.90 percent compound per annum. As against this, the yield increased at the rate of 2.31 percent compound per annum during the same period. However, the rate of increase being less than area decreasing rate the output of the crop declined by (-) 0.54 percent compound per annum. During the second period of 1966 to 1984 the area growth rate pushed further down to (-) 2.43 percent compound per annum. As opposed to this the rate of increase in its yield slowed down and it worked out to be 1.99 percent compound per annum during the same period. The loss of the area was at a quite higher rate than the rate of increase of the yield. The output growth rate pushed further to (-)1.32 percent compound per annum. During the whole period 1950-84, we observed that the loss of

the crop output was mainly on account of contraction of the area. The annual compound growth rate of both worked out to be (-) 6.04 and (-)6.15 percent compound respectively. The yield growth rate was just a little less than half percent that is just 0.44 percent compound per annum. The process of the declining area and consequent declining output in the taluka over the period could be explained by taking into account the expansion of sugar cane area, in the first instance along the banks of Ghattaprabha and Tamraparni rivers, with the development of lift irrigation along the rivers sugar cane cultivation came into being on those lands which were previously devoted for rice cultivation. Further with the development of well irrigation the sugar cane cultivation increased further. With the increasing diversion of paddy lands to sugar cane plantation the area under tur tended to decline at a faster rate; for tur was not a pure crop but it was a mixed crop, sown along with rice on medium lands. With the new technology of rice cultivation the farmers have given up the practice of sowing tur along with rice as they formerly used to. One more explanation for area contraction could be given. That is in recent years, the farmers in the taluka prefer to cultivate sweet potatoes, on the same land which were used for cultivating rice along with tur. Sweet potatoes being a ready commercial crop, with an increasing demand for it, from urban population especially the

increasing demand from Belgaum city provided an incentive to the farmers to cultivate sweet potatos. Hence the cultivation of tur to be on the decline in the taluka. Incidentally, we note that the cultivation of sweet potatos are relatively profitable and women labour saving when compared with cultivation of rice along with tur on the same fertile or less fertile land.

Since the data with regard to area, yield and output of other pulse crops are not available in continuous series, we do not attempt cropwise analysis here. Fortunately data with regard to area under and yield (composite) of all the pulses are available in a continuous series, we have worked out the annual compound growth rates for area under yield and output of all pulses clubbed together for the period under reference. During the first period decrease in the area under all pulses was rather at a smaller rate (-) 0.39 percent. The yield, however, increased at the rate of 2.71 percent compound and the output registered at 2.39 percent compound per annum. This growth of output was because of the appreciation of the yield, which offset more than the loss caused by the area decline. During the second half of the period the rate of area decrease pushed further upto (-) 8.28 percent. Similarly the rate of increase in the yield slowed down considerably to 0.22 percent compound per annum. During this period the growth rate of output registered to be negative

(-) 7.96 percent compound per annum. The output growth rate moved in unison with the area declining rate, the corresponding long term growth rates being (-) 5.78, 0.26 and (-) 5.49 percent compound per annum. From the view point of long term growth rates, the pulses have been losing their area rather fastly and very closely to that of area under tur. The decline in the area seems to have influenced largely the output growth rate (-) 5.49 percent compound per annum. The productivity of the pulses seems to be improving at the positive rate that is just by 0.27 percent compound per annum. The important commercial crop that is sugar cane output expanding but not by the increase in the yield per unit of land but by extending sugar cane cultivation to other lands which were devoted previously to rice and the pulse crops during the rabi season. The extension of sugar cultivation closely corresponded to the extension of irrigation facilities that have taken place; the cropping pattern have completely changed and all the lands perenially irrigated have been occupied by sugar cane gardens. Once the irrigated land go in to the production of sugarcane; one can rule out the possibilities of the reclamation by other less competitive crops excepting only when constrained by the compulsion of rotation at least after three years of sugarcane cultivation. This is the way in which the pulses, though from nutritional point of view are quite important, have been receding into the background. The

area under rice has not been adversely affected because of the extension of rice cultivation to marginal and sub-marginal lands by the farmers in order that they can compensate at least partially the loss in their rice output caused by diversion of these lands to the sugar cane cultivation where the irrigation sources have been made available. Thus the extension of rice cultivation to marginal and submarginal lands occured mainly on account of the consumption habit of the population of the taluka. Their consumption habits are mainly rice oriented and as such the farmers prefer to cultivate rice in order to satisfy the domestic consumption requirements and in some cases to meet their monetary needs by disposing of rice in the market.

3.9 AREA UNDER TOTAL FOODCROPS - CEREALS AND PULSES

After having clubbed together the area under all cereals and pulses the area under foodgrains or foodcrops formed 67.02 percent of the gross cropped area (averages of 1950-53). Over the period of 34 years the percentage share of the area under foodgrains in the gross cropped area decreased to 54.07 percent (averages of 1982-84). During the first short period, however, the annual compound growth rates of area under foodgrains worked out to be little less than 1 percent that is 0.92 percent. This annual compound growth rate slowed down during the subsequent period to just one half of the preceeding one i.e. 0.52 percent compound. The

long term growth rate 1950-84 still works out to be lower than those recorded in the short period that is 0.15 percent. As against the lower area growth rates both the yield and output growth rates for the three periods worked out to be substantially higher during the first period, the yield growth rate worked out to be 2.36 percent compound per annum. During the subsequent period i.e. during the post-Hyvs period. The yield growth rate slightly more than doubled and worked out to be 4.95 percent. The rapid increase in the yield growth rate could be accounted for by spread of Hyvs of rice seeds and increased use of chemical fertilizers. The overall growth rate of the productivity of all the foodgrains taken together seems to have increased by 2.61 percent compound per annum. The foodgrains output during the three periods, seems to have largely influenced by the positive growth rates of yield corresponding more or less to those of output growth rates. As compared to the contribution of area to the output growth, the contribution of yield improvement could be considered as significant. The increase in the output growth rate indicates, the increasing awareness on the part of the farmers to increase the output of foodgrains mainly cereals required for domestic consumption purposes, (rice and nachani) and further more the output growth of major cereals such as rice could be attributed to the growing commercialisation of the crop and to the

increasing degree of monetisation of the farming community. The output growth rates recorded for three different periods are 2.43, 5.49 and 2.81 percent compound per annum correspondingly. Though the output growth of the foodgrains seems to be satisfactory, the imbalances therein seems to have occurred. Both area and output growth rates of pulses over the period under reference reveal decling trends, decreased rather at substantially higher rates viz., (-)5.78 and (-)5.49 percent compound per annum respectively. The decline in the output of pulses as stated earlier, was the result of the area decline and more or less a status quo position on their productivity front. The main reason for the declining growth rates of pulses has been the extension of sugarcane cultivation which lasts for twelve months. Hence the pulses which continued to be catch crops after the rice harvest season (October and November) have to be sown the sugar cane plantation. Incidentally we note that, though in recent years, the relative prices have changed in favour of pulses, but the farmers do not seem to be responding to changes in the relative price structures by diverting the area to pulse crops accordingly.

Table No.3.1

The Annual Compound Growth Rates of Area, Yield and Output of major Cereals, Pulses and of the Total Foodgrains during 1950-51 to 1983-84.

Sr. No.	Crops	Period	Area	Yield	Output
1.	Rice	Period I	1.44	1.98	3.44
		Period II	1.52	5.72	7.32
		The Whole Period III	0.57	2.91	3.50
2.	Nachani	Period I	2.29	1.74	4.00
		Period II	1.90	3.50	5.50
		The Whole Period III	1.93	2.25	4.50
3.	Jowar	Period I	(-)6.57	3.00	(-)3.27
		Period II	(-)1.02	4.30	2.98
		The Whole Period III	(-)4.76	1.54	(-)3.13
4.	Minor Millets	Period I	N.W.	-	-
		Period II	N.W.	-	-
		The Whole Period III	(-)7.87	-	-
5.	Total Cereals	Period I	1.05	2.39	3.49
		Period II	0.84	4.85	5.73
		The Whole Period III	0.44	2.57	3.01

Contd...

Table No.3.1 Contd...

6.	Tur	Period I	(-)2.90	2.31	(-)0.54
		Period II	(-)3.43	1.99	(-)1.32
		The Whole Period III	(-)6.50	0.44	(-)6.04
7.	Total Pulses	Period I	(-)0.39	2.78	2.39
		Period II	(-)8.20	0.22	(-)7.96
		The Whole Period III	(-)5.78	0.26	(-)5.49
8.	Total Foodgrains	Period I	0.92	2.36	2.43
		Period II	0.52	4.95	5.49
		The Whole Period III	0.15	2.61	2.81

Notes : (1) Period I - Pre Hyvs 1950-51 to 1965-66
(2) Period II - Post Hyvs 1966-67 to 1983-84
(3) Period III - The Whole Period under study i.e. 1950-51 to 1983-84.
(4) N.W. = Not worked out.

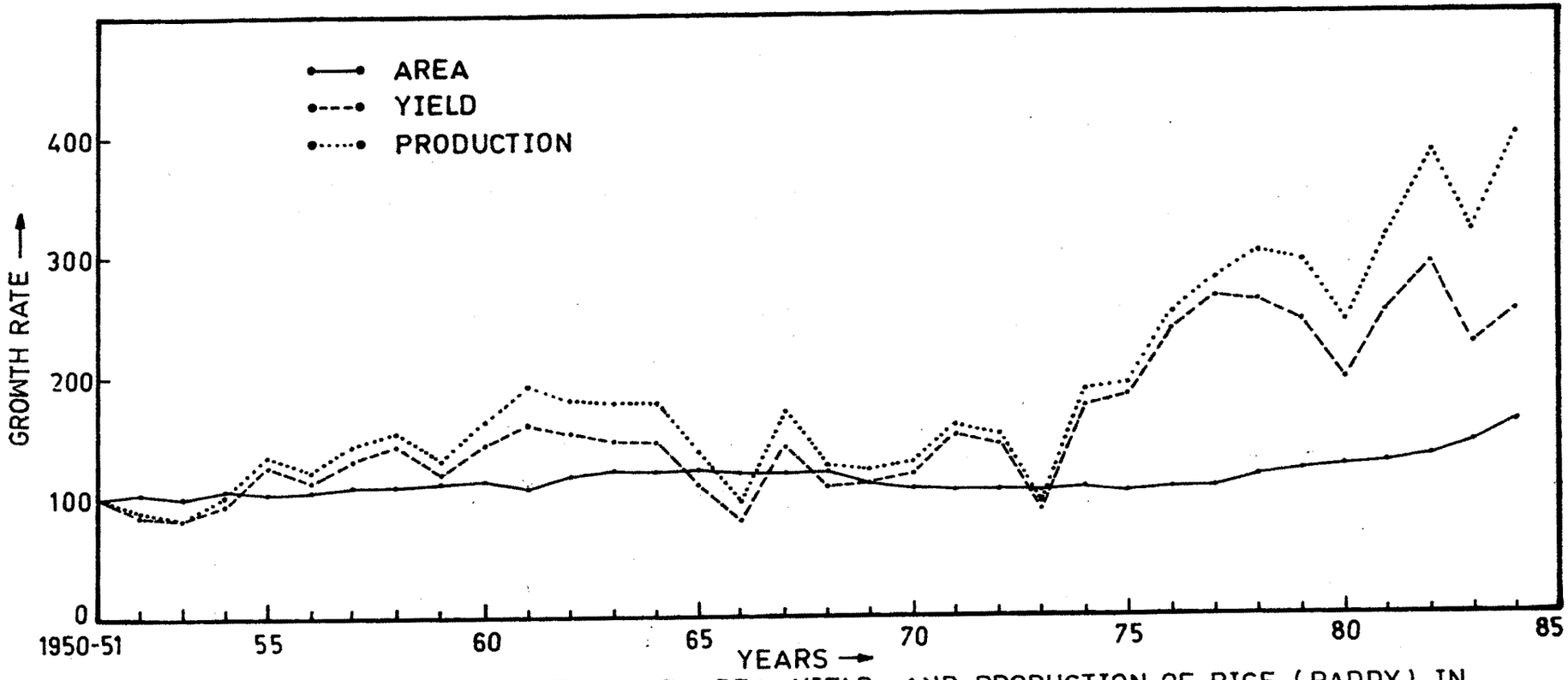
Source : Compiled from data available from the sources mentioned as in Table No.2.1.

Table No. 3.2

The Index Numbers of Area, Yield and Production of Rice (Paddy) in Chandgad Taluka during 1950-51 to 1983-84

Year	Area in Hects.	Index	Yield in Kgs.	Index	Output in M.Ts.	Index
1950-51	8863	100.00	850	100.00	7534	100.00
1951-52	9227	104.11	724	85.18	6680	88.66
1952-53	8903	100.45	701	82.47	6241	82.84
1953-54	9551	107.76	815	95.88	7784	103.32
1954-55	9389	105.93	1092	128.47	10253	136.09
1955-56	9591	108.21	971	114.24	9313	123.61
1956-57	9591	108.21	1121	131.88	10752	142.71
1957-58	9591	108.21	1208	142.12	11586	153.78
1958-59	9854	111.18	1005	118.24	9883	131.18
1959-60	10077	113.70	1213	142.71	12223	162.24
1960-61	10345	106.72	1388	163.29	14359	190.59
1961-62	10556	119.10	1304	153.41	13765	182.70
1962-63	10801	121.87	1248	146.82	13480	178.92
1963-64	10811	121.98	1234	145.18	13341	177.08
1964-65	10977	123.85	951	111.88	10439	138.56
1965-66	10695	120.67	680	80.00	7272	96.52
1966-67	10763	121.44	1209	142.24	13012	172.71
1967-68	10243	121.57	920	108.24	9424	125.09
1968-69	9851	111.15	944	111.06	9299	123.43
1969-70	9525	107.47	1013	119.18	9649	128.07
1970-71	9343	105.42	1288	151.53	12034	159.73
1971-72	9359	105.60	1216	143.06	11381	151.06
1972-73	9385	105.89	769	90.47	7217	95.19
1973-74	9559	107.85	1479	174.00	14138	187.66
1974-75	9287	104.78	1565	184.12	14534	192.91
1975-76	9443	106.54	2007	236.12	18952	251.55
1976-77	9450	106.62	2227	262.00	21045	279.33
1977-78	10317	116.40	2212	260.24	22821	302.91
1978-79	10654	120.21	2066	243.09	22011	292.15
1979-80	11035	124.51	1661	195.41	18329	243.28
1980-81	11107	125.32	2133	250.94	23691	314.45
1981-82	11743	132.49	2466	290.12	28958	384.36
1982-83	12652	142.75	1893	222.71	23950	317.89
1983-84	14084	158.91	2129	250.47	29985	397.99

Source : (1) Census of India, 1961, District Census Handbook, Kolhapur compiled by The Maharashtra Census Office, Bombay published by the Director, Govt.Printing & Stationary, Maharashtra State, Bombay.
(2) Socio-Economic Review and Dist. Statistical Abstracts of Kolhapur District published by Agriculture & Cooperation Dept. of Govt. of Maharashtra (From 1960-61 onwards)



GRAPH NO.3·1— THE INDEX NUMBERS OF AREA, YIELD AND PRODUCTION OF RICE (PADDY) IN CHANDGAD TALUKA DURING 1950-51 TO 1983-84.

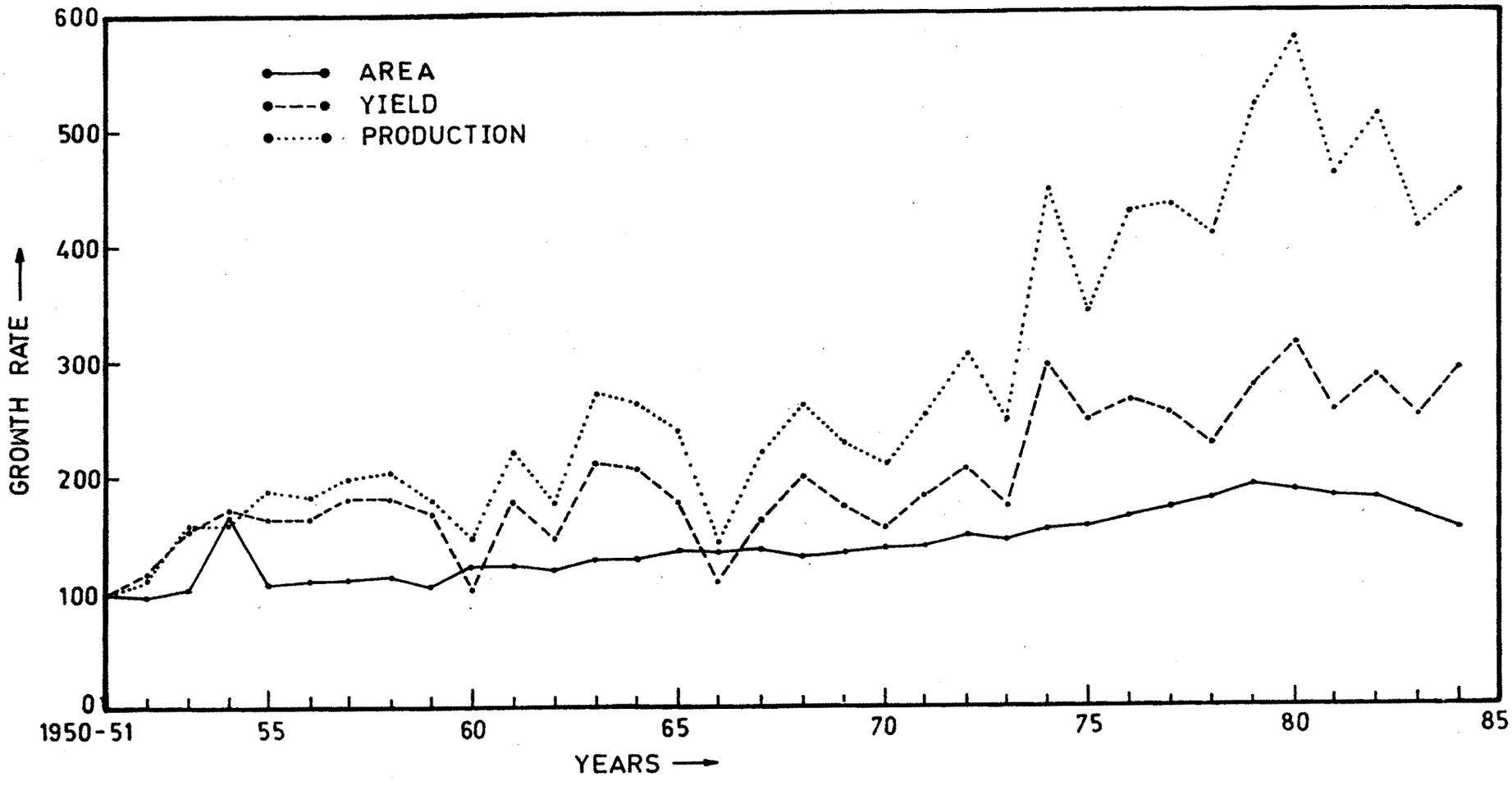
Table No.3.3

The Index Numbers of Area, Yield and Output of Nachani in Chandgad Taluka during 1950-51 to 1983-84

Year.	Area in Hects.	Index	Yield in Kgs.	Index	Output in M.Ts.	Index
1950-51	5544	100.00	375	100.00	2079	100.00
1951-52	5403	97.46	437	116.53	2361	113.56
1952-53	5666	102.20	576	153.60	3264	157.00
1953-54	9140	164.86	645	172.00	3315	159.45
1954-55	6475	106.79	608	162.13	3937	189.37
1955-56	6111	110.24	608	162.13	3715	178.69
1956-57	6111	110.24	679	181.06	4149	199.57
1957-58	6232	112.41	677	180.53	4219	202.93
1958-59	6909	106.58	627	167.20	3705	178.21
1959-60	6758	121.90	758	102.13	5123	246.42
1960-61	6852	123.59	672	179.20	4605	221.50
1961-62	6667	120.26	553	147.47	3687	177.34
1962-63	7125	128.52	793	211.47	5650	271.76
1963-64	7063	127.40	770	205.33	5439	261.62
1964-65	7437	134.14	663	176.80	4931	237.18
1965-66	7450	134.38	405	108.00	3017	142.12
1966-67	7538	135.95	606	161.60	4568	219.72
1967-68	7241	130.61	747	199.20	5409	260.17
1968-69	7376	133.04	647	172.53	4772	229.53
1969-70	7593	136.96	572	152.53	4343	208.90
1970-71	7671	138.37	684	182.40	5247	252.38
1971-72	8237	148.57	767	204.53	6318	303.90
1972-73	8007	144.43	649	173.07	5197	249.98
1973-74	8380	151.15	1106	294.93	9268	445.79
1974-75	8572	154.62	923	246.13	7912	340.57
1975-76	8999	162.32	986	262.93	8873	426.79
1976-77	9510	171.34	945	252.00	8987	432.27
1977-78	9959	179.64	851	226.93	8475	407.65
1978-79	10430	188.13	1033	275.47	10774	518.23
1979-80	10258	185.02	1170	312.00	12002	577.30
1980-81	10025	180.83	952	253.87	9544	459.07
1981-82	9961	179.67	1066	284.27	10618	510.73
1982-83	9196	165.87	937	249.87	8617	414.48
1983-84	8452	152.45	1091	290.93	9221	443.53

Source (1) Census of India, 1961, District Census Handbook Kolhapur, compiled by The Maharashtra Census Office, Bombay published by the Director, Govt. Printing & Stationary, Maharashtra State, Bombay, 1964.

(2) Socio-Economic Review and District Statistical Abstracts of Kolhapur District published by the Deptt. of Agriculture and Cooperation the Govt. of Maharashtra (From 1960-61 onwards).



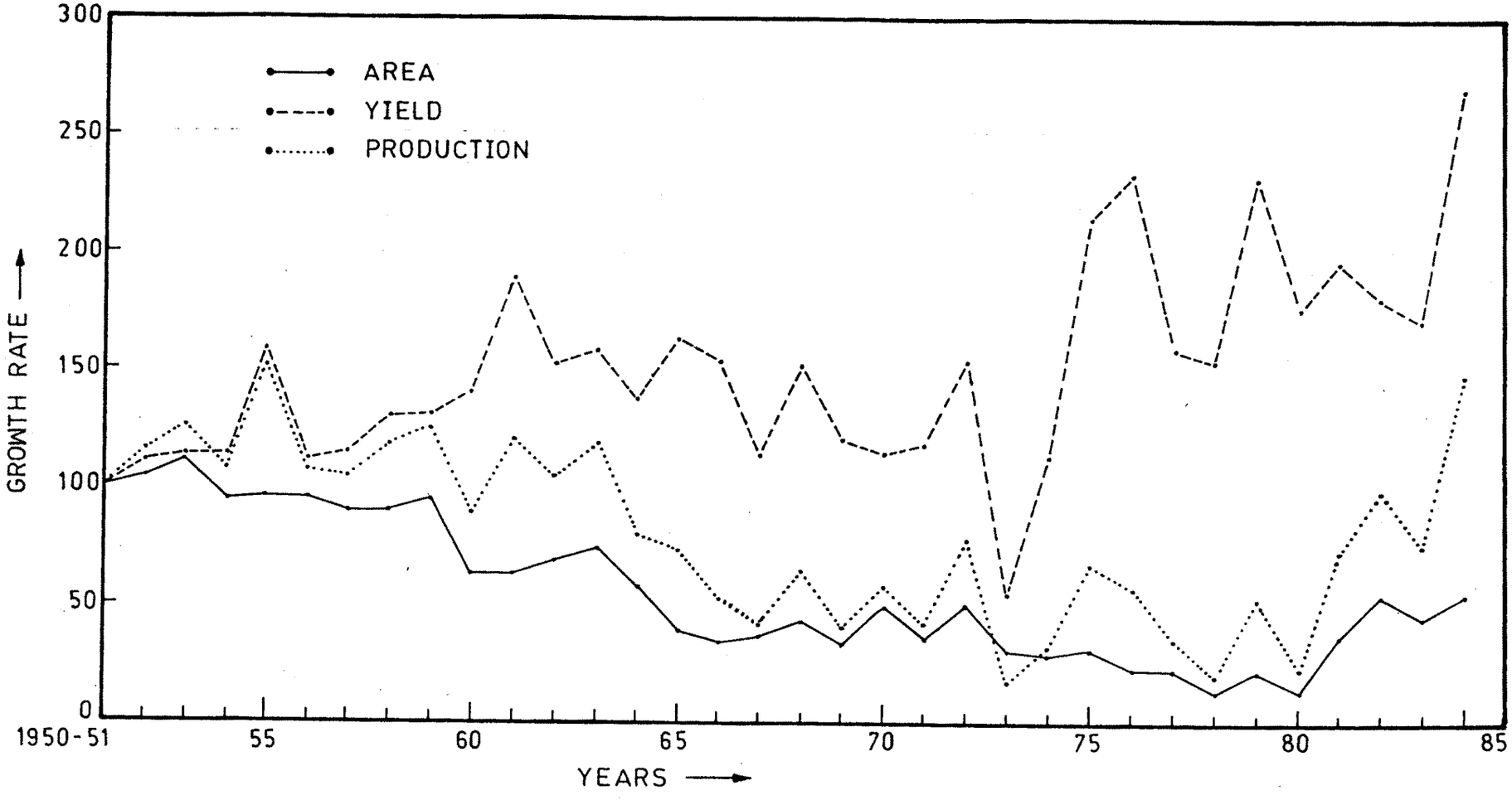
GRAPH NO.3·2 – THE INDEX NUMBERS OF AREA, YIELD AND PRODUCTION OF NACHANI IN CHANDGAD TALUKA DURING 1950–51 TO 1983–84.

Table No.3.4

The Index Numbers of Area, Yield and Production of Kharif Jowar in Chandgad Taluka during 1950-51 to 1983-84

Year	Area in Hects.	Index	Yield in Kgs.	Index	Output in M.Ts.	Index
1950-51	890	100.00	788	100.00	701	100.00
1951-52	931	104.61	877	111.29	816	116.40
1952-53	1012	113.71	879	111.55	890	126.96
1953-54	850	95.51	899	114.09	764	108.99
1954-55	850	95.51	1247	158.25	1060	151.21
1955-56	850	95.51	887	112.56	754	107.56
1956-57	809	90.90	911	115.61	737	105.14
1957-58	809	90.90	1030	130.71	833	118.83
1958-59	850	95.51	1035	131.35	880	125.53
1959-60	567	63.71	1116	141.62	633	90.30
1960-61	567	63.71	1487	188.71	843	120.26
1961-62	616	69.21	1195	151.65	736	105.00
1962-63	664	74.61	1255	159.26	833	118.83
1963-64	518	58.20	1086	137.82	563	80.31
1964-65	394	44.27	1326	168.27	522	74.47
1965-66	308	34.61	1218	154.57	375	53.49
1966-67	327	36.74	902	114.47	295	42.08
1967-68	383	43.03	1193	151.40	457	65.19
1968-69	301	33.82	960	121.83	289	41.23
1969-70	450	50.56	908	115.23	409	58.35
1970-71	321	36.07	931	118.15	299	42.65
1971-72	449	50.45	1209	153.43	543	77.46
1972-73	282	31.69	434	55.08	122	17.40
1973-74	251	28.20	906	114.97	227	32.38
1974-75	279	31.35	1699	215.61	474	67.62
1975-76	218	24.49	1849	234.64	403	57.49
1976-77	200	22.47	1256	159.39	251	35.81
1977-78	116	13.03	1214	154.06	141	20.11
1978-79	202	22.70	1829	232.11	369	52.64
1979-80	120	13.48	1394	176.90	167	23.82
1980-81	333	37.42	1550	196.70	516	73.61
1981-82	481	54.04	1432	181.73	689	98.29
1982-83	393	44.16	1354	171.83	532	75.89
1983-84	488	54.83	2129	270.18	1039	148.22

Source : (1) Census of India, 1961, District Census Handbook, Kolhapur compiled by The Government of Maharashtra Census Office, Bombay published by the Director, Government Printing and Stationary, K Maharashtra State, Bombay.
(2) Socio-Economic Review and Dist. Statistical Abstracts of Kolhapur District published by Agriculture & Cooperation Deptt. of Govt. of Maharashtra (From 1960-61 onwards)



GRAPH NO.3-3 — THE INDEX NUMBERS OF AREA, YIELD AND PRODUCTION OF KHARIF JOWAR IN CHANDGAD TALUKA DURING 1950-51 TO 1983-84.

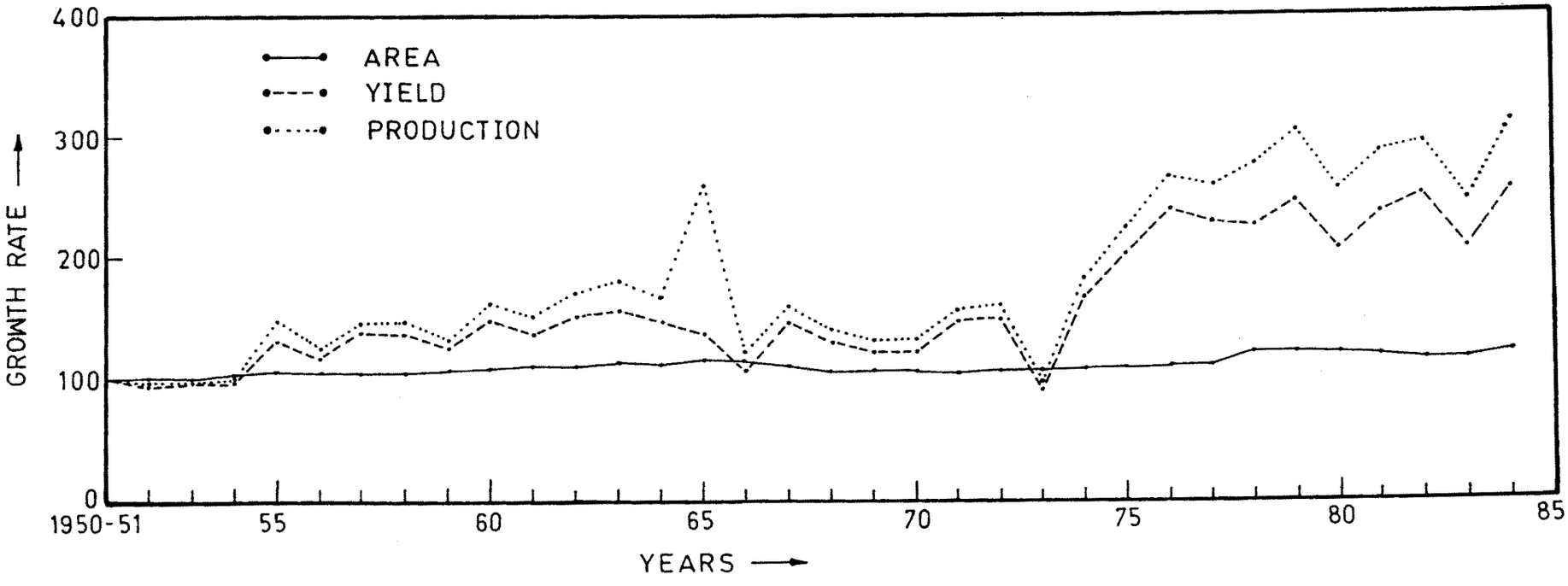
Table No.3.5

The Index Numbers of Area, under Yield composite and Output of Total Cereals in Chandgad Taluka during 1950-51 to 1983-84

Year	Area in Hects.	Index	Yield in Kgs.	Index	Output in M.Ts.	Index
1950-51	20114	100.00	682	100.00	13718	100.00
1951-52	20437	101.60	652	95.60	13325	97.13
1952-53	20114	100.00	679	99.56	13657	99.55
1953-54	20761	103.22	672	98.53	13951	101.70
1954-55	21894	108.85	944	134.42	20668	150.66
1955-56	21449	106.64	803	117.74	17224	125.56
1956-57	21166	105.23	951	139.44	20129	146.73
1957-58	21490	106.84	953	139.74	20880	149.29
1958-59	21530	107.04	860	126.10	18516	134.97
1959-60	22178	110.26	1023	150.00	22688	165.39
1960-61	22569	112.20	941	137.98	21237	154.81
1961-62	22747	113.08	1046	153.37	23793	173.44
1962-63	23182	115.25	1080	158.36	25037	182.51
1963-64	22908	113.89	1012	148.39	23183	168.99
1964-65	23681	117.73	937	137.39	22189	261.75
1965-66	23178	115.23	733	107.48	16989	123.84
1966-67	22885	113.77	967	149.79	22130	161.32
1967-68	21671	107.74	902	132.26	19547	142.49
1968-69	21665	107.71	838	122.87	18155	132.34
1969-70	21965	109.20	847	124.19	18604	135.62
1970-71	21153	105.16	1016	148.97	21491	156.66
1971-72	21585	107.31	1032	151.32	22276	162.38
1972-73	21559	107.18	619	90.76	13345	97.28
1973-74	21928	109.02	1150	168.62	25217	183.82
1974-75	22261	110.67	1394	204.40	31032	226.21
1975-76	22351	111.12	1647	241.50	36812	268.34
1976-77	22820	113.45	1572	230.50	35873	261.50
1977-78	24714	122.87	1544	226.39	38158	278.16
1978-79	24744	123.02	1695	248.53	41941	305.73
1979-80	24868	123.63	1432	209.97	35611	259.59
1980-81	24366	121.14	1622	237.83	39522	288.10
1981-82	23449	116.58	1733	254.11	40637	296.23
1982-83	23901	118.83	1431	209.82	34202	249.32
1983-84	24575	122.18	1755	257.33	43129	314.39

Source (1) Census of India, 1961, District Census Handbook Kolhapur compiled by The Maharashtra Census Office, Bombay published by the Director, Govt. Printing & Stationary, Maharashtra State, Bombay.

(2) Socio-Economic Review and Dist. Statistical Abstracts of Kolhapur District published by Agriculture & Cooperation Deptt. of Govt. of Maharashtra (From 1960-61 onwards).



GRAPH NO. 3·4 – THE INDEX NUMBERS OF AREA, YIELD AND PRODUCTION OF TOTAL CEREALS IN CHANDGAD TALUKA DURING 1950-51 TO 1983-84.

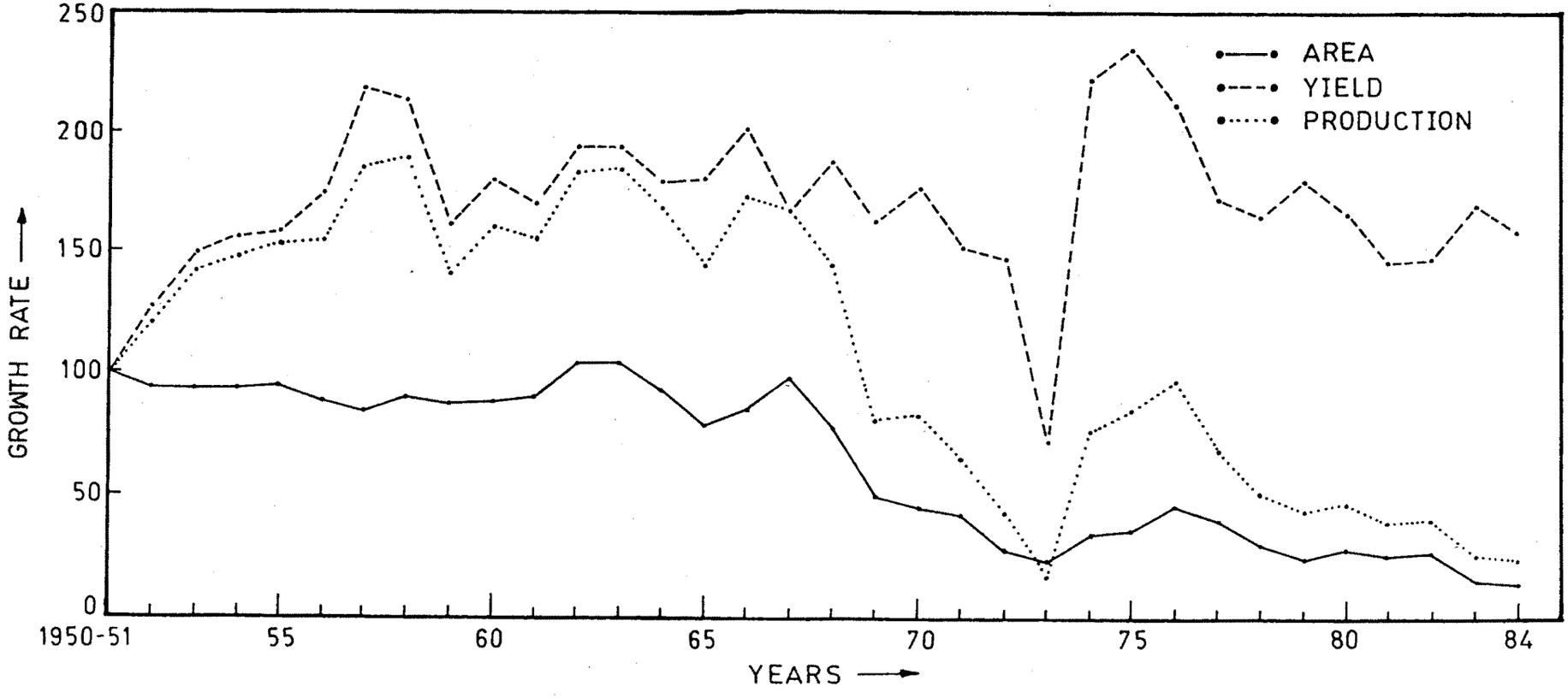
Table No.3.6

The Index Numbers of Area under, Yield and Output of Total Pulses in Chandgad Taluka during 1950-51 to 1983-84

Year	Area in Hects.	Index	Yield in Kgs.	Index	Output in M.Ts.	Index
1950-51	2226	100.00	289	100.00	643	100.00
1951-52	2104	94.52	368	127.34	774	120.30
1952-53	2104	94.52	435	150.52	915	142.30
1953-54	2104	94.52	454	157.09	955	148.52
1954-55	2145	96.36	462	159.86	991	154.12
1955-56	1983	89.83	506	175.09	1003	155.99
1956-57	1902	85.44	631	218.34	1200	186.63
1957-58	2023	90.88	616	213.15	1216	189.11
1958-59	1943	87.29	469	162.28	911	141.68
1959-60	1983	89.08	524	181.31	1039	161.59
1960-61	2030	91.19	496	171.63	1007	156.61
1961-62	2370	106.47	529	183.04	1254	195.02
1962-63	2338	105.03	536	185.47	1253	194.87
1963-64	2080	93.53	523	180.97	1089	169.36
1964-65	1777	79.83	525	181.66	933	145.10
1965-66	1927	86.57	581	201.04	1120	174.18
1966-67	2225	99.96	487	168.51	1084	168.58
1967-68	1725	77.49	545	188.58	940	146.19
1968-69	1113	50.00	469	162.28	522	81.18
1969-70	1038	46.63	514	177.85	534	83.05
1970-71	953	42.81	445	153.98	424	65.94
1971-72	642	28.84	431	149.13	277	43.08
1972-73	515	23.14	211	73.01	109	16.95
1973-74	773	34.73	642	222.15	496	77.14
1974-75	817	36.70	679	234.95	555	86.31
1975-76	1029	46.23	613	212.11	631	98.13
1976-77	895	40.21	500	173.01	447	69.52
1977-78	686	30.82	480	166.09	329	51.17
1978-79	538	24.17	520	179.93	280	43.55
1979-80	628	28.21	483	167.13	303	47.12
1980-81	571	25.65	425	147.06	243	37.79
1981-82	603	27.09	430	148.79	259	40.28
1982-83	345	15.50	492	170.24	170	26.44
1983-84	288	12.94	533	184.43	154	23.95

Source : (1) Census of India, 1961, District Census Handbook Kolhapur compiled by The Maharashtra Census Office, Bombay published by the Director, Govt. Printing & Stationary, Maharashtra State, Bombay.

(2) Socio-Economic Review and Dist.Statistical Abstracts of Kolhapur District published by Agriculture & Cooperation Deptt. of Govt. of Maharashtra (From 1960-61 onwards).



GRAPH NO. 3·5 – THE INDEX NUMBERS OF AREA, YIELD AND PRODUCTION OF TOTAL PULSES IN CHANDGAD TALUKA DURING 1950-51 TO 1983-84.

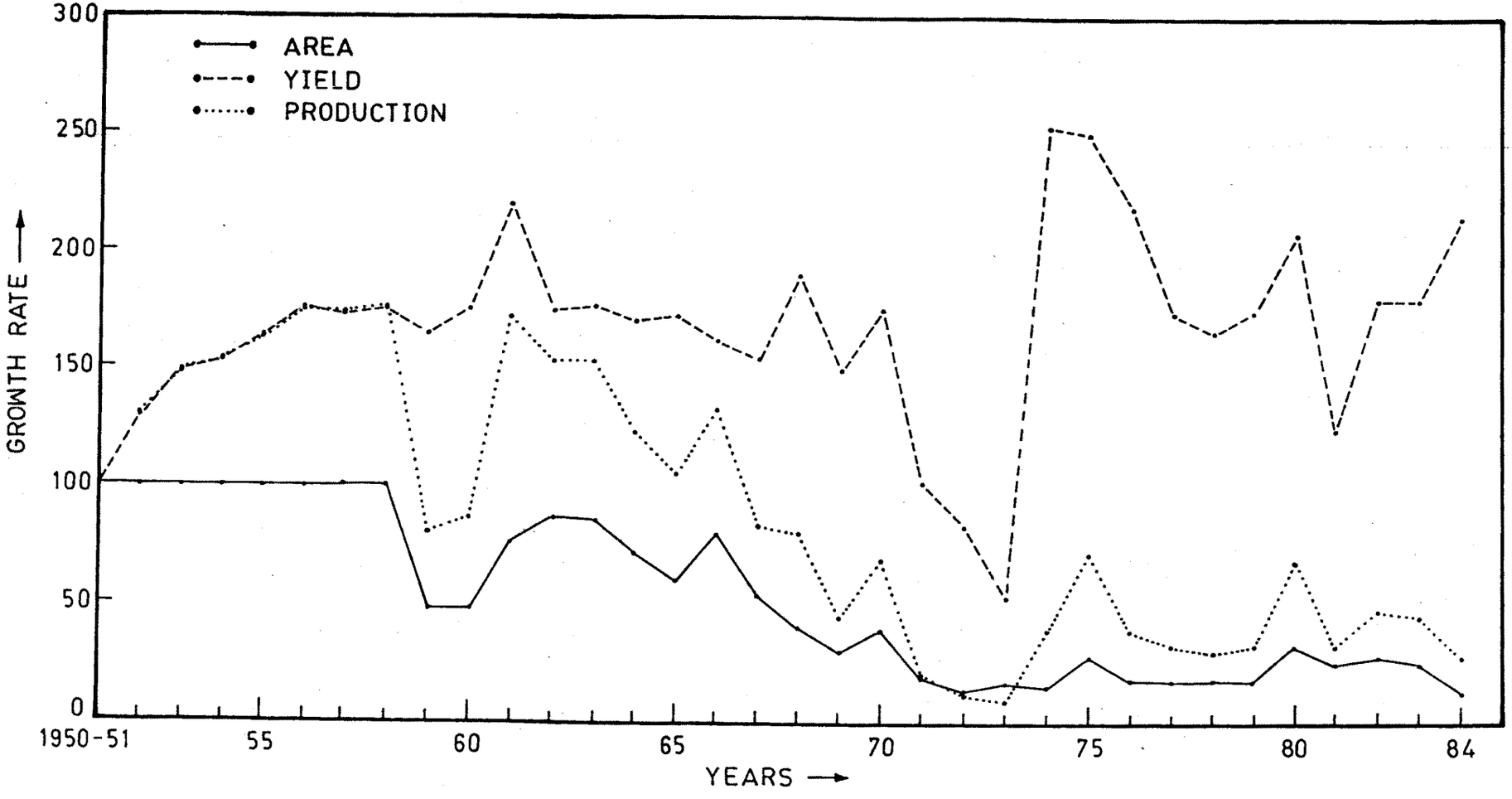
Table No.3.7

The Index Numbers of Area under, Yield and Output of Tur in Chandgad Taluka during 1950-51 to 1983-84

Year	Area in Hects.	Index	Yield in Kgs.	Index	Output in M.Ts.	Index
1950-51	81	100.00	c408	100.00	33	100.00
1951-52	81	100.00	529	129.66	43	130.30
1952-53	81	100.00	610	149.51	49	148.48
1953-54	81	100.00	625	153.19	51	154.55
1954-55	81	100.00	672	164.71	54	163.64
1955-56	81	100.00	721	176.72	58	175.76
1956-57	81	100.00	711	174.26	58	175.76
1957-58	81	100.00	714	175.00	58	176.76
1958-59	40	49.38	677	165.93	27	81.82
1959-60	40	49.38	721	176.72	29	87.88
1960-61	63	77.78	904	221.57	57	172.73
1961-62	71	87.65	721	176.72	51	154.53
1962-63	70	86.41	725	177.70	51	154.53
1963-64	59	72.84	699	171.32	41	124.24
1964-65	49	60.49	709	173.77	35	106.06
1965-66	66	81.48	664	162.74	44	133.33
1966-67	44	54.32	635	155.64	28	84.85
1967-68	34	41.98	782	191.67	27	81.82
1968-69	25	30.86	613	150.25	15	45.45
1969-70	32	39.51	722	176.96	23	69.70
1970-71	17	20.99	420	102.94	7	21.21
1971-72	12	14.81	345	84.56	4	12.12
1972-73	14	17.28	219	53.68	3	9.09
1973-74	13	16.05	1035	253.68	13	39.39
1974-75	23	28.40	1024	250.98	24	72.72
1975-76	15	18.52	895	219.36	13	39.39
1976-77	15	18 .52	710	174.01	11	33.33
1977-78	15	18.52	679	166.42	10	30.30
1978-79	15	18.52	717	175.74	11	33.33
1979-80	27	33.33	851	208.58	23	69.70
1980-81	21	25.93	511	125.25	11	33.33
1981-82	22	27.16	735	180.15	16	48.48
1982-83	21	25.93	735	180.15	15	45.45
1983-84	10	12.35	881	215.94	9	27.27

Source : (1) Census of India, 1961, District Census Handbook Kolhapur compiled by The Maharashtra Census Office, Bombay published by the Director, Govt. Printing & Stationary, Maharashtra State, Bombay.

(2) Socio-Economic Review and Dist. Statistical Abstracts of Kolhapur District published by Agriculture & Cooperation Deptt. of Govt. of Maharashtra (From 1960-61 onwards).



GRAPH NO. 3·6 – THE INDEX NUMBERS OF AREA, YIELD AND PRODUCTION OF TUR IN CHANDGAD TALUKA DURING 1950-51 TO 1983-84.

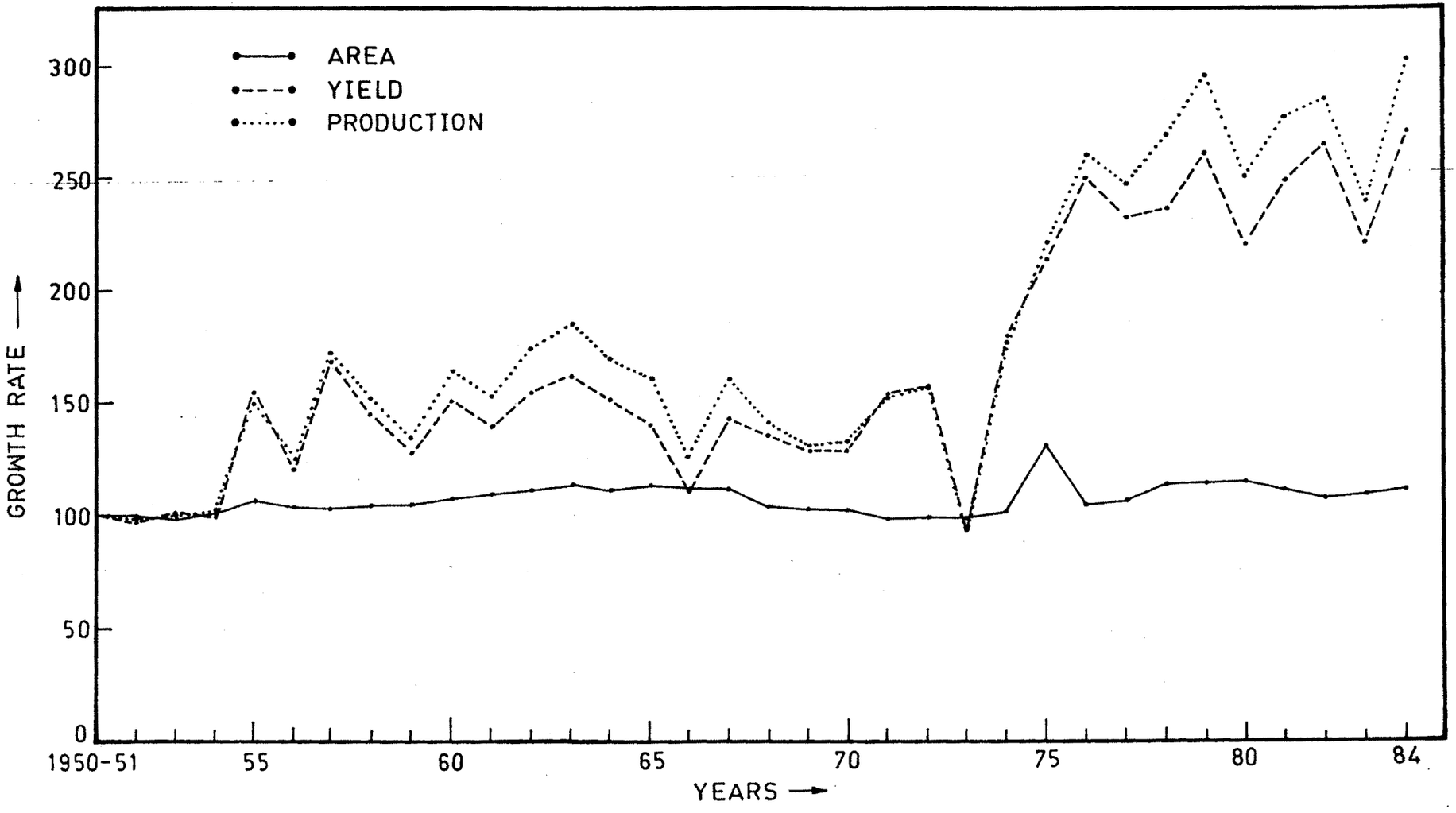
Table No.3.8

The Index Numbers of Area under, Yield and Output of Total Food Grain in Chandgad Taluka during 1950-51 to 1983-84

Year	Area in Hects.	Index	Yield in Kgs.	Index	Output in M.Ts.	Index
1950-51	22340	100.00	643	100.00	14361	100.00
1951-52	22541	100.90	625	97.20	14099	98.18
1952-53	22218	99.45	656	102.02	14572	101.47
1953-54	22865	102.35	652	101.40	14906	103.79
1954-55	24039	107.60	1000	155.52	21659	150.82
1955-56	23432	104.89	778	121.00	18227	126.92
1956-57	23068	103.26	925	143.86	21329	148.52
1957-58	23513	105.25	940	146.19	22096	153.86
1958-59	23473	105.07	828	128.77	19427	135.28
1959-60	24161	108.15	982	152.72	23727	165.22
1960-61	24599	110.11	904	140.59	22244	154.89
1961-62	25118	112.43	997	155.05	25047	174.41
1962-63	25520	114.23	1042	162.05	26590	185.15
1963-64	24990	111.86	971	151.01	24272	169.01
1964-65	25458	113.96	908	141.21	23122	161.01
1965-66	25105	112.37	721	112.13	18109	126.10
1966-67	25110	112.40	924	143.70	23214	161.65
1967-68	23393	104.71	876	136.24	20487	142.66
1968-69	22778	101.96	820	127.53	18677	130.05
1969-70	23003	102.97	832	129.39	19138	133.26
1970-71	22111	98.97	991	154.12	21915	152.60
1971-72	22227	99.49	1015	157.85	22553	157.04
1972-73	22074	98.81	609	94.71	13454	93.68
1973-74	22701	101.61	1133	176.21	25713	179.05
1974-75	23078	130.30	1369	212.91	31587	219.95
1975-76	23380	104.65	1601	248.99	37443	260.73
1976-77	23715	106.15	1495	232.50	35605	247.93
1977-78	25400	113.70	1515	235.61	38487	268.00
1978-79	25282	113.17	1670	259.72	42221	294.00
1979-80	25496	114.13	1409	219.13	35914	250.08
1980-81	24937	111.62	1595	248.06	39765	276.90
1981-82	24052	107.66	1700	264.39	40896	284.77
1982-83	24246	108.53	1418	220.53	34372	239.34
1983-84	24863	111.29	1741	270.76	43283	301.39

Source : (1) Census of India, 1961, District Census Handbook Kolhapur, compiled by The Maharashtra Census Office, Bombay published by the Director, Govt. Printing & Stationary, Maharashtra State, Bombay, 1964.

(2) Socio-Economic Review and District Statistical Abstracts of Kolhapur District published by the Deptt. of Agriculture and Cooperation the Govt. of Maharashtra (From 1960-61 onwards).



GRAPH NO. 3·7 – THE INDEX NUMBERS OF AREA YIELD AND PRODUCTION OF TOTAL FOOD GRAIN IN CHANDGAD TALUKA DURING 1950-51 TO 1983-84.