C H A P T E R - III

AREA, OUTPUT AND YIELD OF CEREALS

3.1 INTRODUCTION :

The principal cereals grown in Kopargaon taluka are R.Jowar and Bajari. The percentage of the area occupied by these two cereals to the net sown area worked out to be more than 50 percent i.e. 63.87. Since these two cereals are the major cereals, the percentage of these two cereals in the total area of all cereals worked out to be 87.51 for the year 1965-66. The other cereals which could be described as the minor cereals are rice, whear, K.Jowar and other cereals. These are cultivated in the taluka on a very small scale. In the following paragraoh we intend to analyse the behaviour of area, production and yield of the major cereals over the period under study (1965 to 1981).

3.2 RICE :

Area, production and Yield of Rice during the period 1965-66 to 1980-81.

Even though rice is not a major cereal cultivated in the taluka, we highlight the changes in area, output and yield over the period. Strangely enough the area occupied by rice never exceeded even 1.00 percent of the net area sown in the

taluka through out the period. Notwithstanding the area occupied by rice in absolute terms more than doubled by the end of the period as compared to the base year of 1965-66. Formerly the rice was grown on the marshy lands which are very scare in the taluka. But with the development of irrigation facilities and change in the farmers taste, the area under rice has been rising in the taluka as the area index reveals. The area index shotup from 100.00 (base year) to 340.59 (1967-68). There after a declining trend in the area set in. The index number fell off too 241.58 (1969-70) The production index behaved rather in a similar way. The index number of its production shotup from 100.00 to 759.09 (1967-68) and there after it declined to 368.18 (1969-70). The abnormal rise in the production of rice in the year 1967-68 could be attributed to both the rise in the area under, and productivity of the crop. Despite the rise in the area and production, the yield of the crop fluctuated rather voilently. The yield index , as in respect of area and production indices, shotup from 100.00 (1965-66) to 218.91 (1967-68). The yield per hectare slightly more than doubled in that year. In the succeding two years (1968-70) it declined to 187.61 and 149.54 consecutively.

In the first year of the next sub period (1970-75) the area under rice troppled as the index number touched 300.99.

There after, in the succeding three years (1971-74) the area under rice fell off as the index number changed to 189.10 (1973-74). Despite the continuous decrease the area more than quadrapled as the index number shotup to 453.46 (1974-75). The production of the rice seems to have risen substantially during this period excepting the drought year.(1972-73) in which the production was hit hard. The production index, however, dropped from 534.09 to 77.72 in the drought year. In the subsequent two years (1973-75) the production index s shotup and touch 500.00 and 1486.36 consecutively. This abnormal rise in the production index could be attributed to the very low level of output in the base year. Off course the considerable improvement in the productivity of the crop had contributed to the rise in the production. Barring the drought year of 1972-73 the productivity index continuously rose from 174.54 to 321.84. The productivity per hectare more than trippled by the end of the period. (1974-75). Both the extension of the area under the crop, and improvement in its productivity have contributed to the substantial increase in the output. As a result the percentage share of this cereal in the total output of all cereals which did never exceeded even 1 percent, during the preceding years, rose to 2.09.

The rising trend which was set in 1974-75 continued during the first two years of the last sub period (1975-81) The area index t uched on all time record level of 1627.72 (1976-77). Similarly the out put index touched an all time record level of 6020.45 in the same year. This all time increase in output had been brought about by the extension of the area under the crop. The rising trend did not continue during the subsequent years. (1977-81). During these years the area index decreased from 497.02 to 225.74 (1981), The contraction in the area in the latter years could be attributed to the poor south west monsoon precipitation during these years. Contrary to the area behaviour, the production of the crop during these years tended to fluctuate as the index numbers reveal. A substantial growth of output seems to have been achieved in the year 1978-79 as the index number touched to 2056.81. In the last subsequent two years (1979-81) the production dropped rather sharply as the index number reached 661.36 and 972.72 consecutively. The productivity of the crop during this sub period, despite minor fluctuations that had occured in the intervening years seems to have increased rather substantially as the index numbers remained at higher levels than the index numbers worked out for the earlier years. The productivity index however, fell off from it's all time record level of 417.79 (1975-76) to 241.99 (1979-80). However, in the intervening years 1976-79 the productivity index ranged between

383.10 and 353.15. In the last year of the sub period the productivity index shot up again to 422.97 which indicotes a considerable improvement in the productivity per hectare. By and large the productivity of the crop seems to have improved considerably during the latter part of the whole period under study. The productivity improvement rather than the area extension had contributed largely to the output growth. This could be taken as indicative of a gradual shift from traditional method of cultivation to a more scientific cultivation of the crop by the farmers. The adoption of improved cultural practices by the farmers should be held responsible for an increasing trend of both production and yield noticed during the latter part of the period.

3.3 WHEAT :

Area, Production and yield of Wheat during the period 1965-66 to 1980-81.

Wheat is a rabi crop and is cultivated where irrigation facilities are made available in the taluka. The percentage of the area under wheat to the net area sown worked out to be 8.79 for the base year 1965-66. The relative percentage share of the wheat hectarage in the net sown area gone up to 12.38 (1969-70). Similarly It's relative percentage share in the total area under cereals increased from 12.05 (1965-66) to 16.82 (1969-70). The area index number, as a consequence, increased

from 100.00 to 140.47 correspondingly. The increase in the area during 1965-70 had been brought about by the extension of the area under irrigation and the introduction of the high yielding varieties of seeds of the crop. The relative percentage share of wheat production in the total production of all cereals formed 15.23 (1965-66). During the subsequent year's it rather fluctuated between a range of 24.71 percent. (1968-69) and 17.06 percent. (1967-68). The production index shot up from 100.00 (1965-66) to 191.64 (1968-69). In the last year of the sub period (1969-70) the production index marginally declined and reached 181.79. The yield index of the crop, despite the minor fluctuations, remained above the base years level. However, it fluctuated between 159.80 (1968-69) and 106.66 (1967-68).

In the next sub period the area under the crop seems to have been declined rather considerably as the index number having reached at its peak 163.07 in 1971-72 and continuously declined during the period of 1972-75. Consequently the index number dropped to 79.51. Similarly the relative percentage share of its area fell from 14.28 to 7.44 in the net sown area, and also it's relative share in the total area under cereals dropped from 18.92 to 9.62 percent during the period under reference. The output index moved in an upward direction However, the production of the crop seems to have fluctuated

in the intervening years of this sub period as the production index reveals. The relative percentage share of it's production increased from 26.02 (1970–71) to 51.92 (1972–73) and there after tended to decline in the subsequent two years. (1973–75) The percentages worked out to be 31.38 and 19.17 consecutively. The relatively high percentage share of it production in the total output of cereals could be accounted for the by increase in the productivity of crop in that year. The increasing productivity of crop seems to have been more than offset by the declining area under wheat. The productivity index consistently rose from 141.37 (1970–71) to 276.86 (1973–74) and it again tended to decline as the index number fell to 195.88 (1974–75). The productivity improvement over the preceding sub period could be attributed to the fact that the high yielding varieties of seeds introduced during 1965–66 had become more established in the taluka.

During the last sub period (1975–81) the area index did not reveal and uniform trend. The falling trend noticed during the preceding sub period (1970–75) seems to have broken. The increasing trend of the area seems to have set in as the index number of touched 211.32 during 1976–77. As a result the relative percentage share to the net area sown and the total area under cereals increased to 20.19 and 24.01 respectively in that year. During the rest of the years of the sub period (1977–81) the area had been declining as the

index numbers reveal. The index number change from 155.34 (1977-78) to 71.59.(1981-81) This fall in the area under the crop caused a decrease in it's relative percentage share to the net sown area. (7.74). The production index indicate's the substantial improvement in the production achieved during the latter part of period under study. The production index shot up from 155.75 (1974-75) the last year of the preceding sub period, to 448.34 (1975-76) and further to 563.12 (1976-77) During the subsequent years the increasing trend did not continue as the index number consistently declined from 456.30 (1977-78) to 156.53 (1980-81). The percentage of the production in the total production of cereals declined from 23.01 (1975-76) to 15.57 (1980-81). The productivity index behaved in sympathy with the production index. It changed from 247.05 (1975-76) to 293.72 (1977-78) and there after it declined rather considerably as the index number changed from 233.52 (1978-79) to 218.62. (1980-81). Despite the fall in the productivity index during the last three years of the sub period (1978-81) the productivity of the crop per hectare seems to have more than doubled.

Despite the falling trend of the area, the substantial increase in out put during the latter part of the period could be attributed mainly to the rise in the productivity per hectare as compared to the earlier years of the period. Wheat

being a superior cereal, farmers have revealed their preference over other cereals by adopting the scientific methods of cultivation. With assured irrigation and favourable north east monsoon have induced farmers to extend the area under wheat. Even though seed fertilizer revolution popularly known as green revolution occured during 1965-66, the farmers in Kopargaon taluka took a rather long time to adopt the improved and scientific cultural practices of the crop. This is why we did not notice a considerable improvement in respect of both production and yield in the earlier years of the period. As the farmers became familer with high yielding varieties of seeds, systematic application of chemical fertilizer and pesticides through extension services provided by the government agencies and diversion of irrigated lands for cultivation of wheat have contributed to rising productivity during the latter part of the period.

3.4 R.JOWAR :

Area, Production and Yield of R.Jowar during the period 1965-66 to 1980-81.

R.Jowar is the major cereal cultivated in Kopargaon taluka. In the begining of the period the area under R.Jowar and it's production amounted to 44.00 percent and 60.28 percent to the net sown area and to the total area under all cereals

respectively. It's production also worked out to be 72.50 percent to the total output of the of all cereals in that year. Mostly R.Jowar iscultivated under rain fed conditions in the taluka. A large majority of the farmers cultivate R. Jowar partly for self consumption and partly for sale. The area under production of the crop is largely influnced by behaviour of north east monsoon, as it is a rabi crop. The sowning operations of this crop start by the mid of October and ends by the end of the first week of the November. As it is cultivated under rain fed conditions, its output is largely influnced by the vagaries of north east monsoon.

During the first sub period (1965-70) the area under R. Howar seem's to have declined considerably as the area index points out. The area index declined from 100.00 (base year) to 72.71. (1969-70) As a consequence, its relative percentage shares in the net area sown and in the total area under all cereals declined from 44.00 and 60.28 to 32.05 and 43.56 correspondingly. The output index having fallen below the base years level 92.25 and 99.27 (1966-68) tended to rise marginally and remained above the base years level at 101.90 and 122.19 in the following years. (1968-70). Despite a marginal rise in the output of the crop, its percentage share in the total output of all cereals declined from 72.50 to 66.55

by the end of the sub period. Contrary to the behaviour of area and output indices the productivity index behaved in an upward direction during this period. It remained above the base year's level throughout this sub period. Despite the improvement of productivity during 1966-68 (productivity index 131.95 and 130.30) the production of the crop seems to have fallen below the base year level. This was caused mainly by the substantial fall in the area under the crop. The productivity index during the last two years 1968-70 changed to 111.34 and 168.04 consecutively.

From the behaviour of the area index worked out for next sub period 1970-75, we notice the continuation of the declining trend of the area under the crop. Only during the year 1971-72 the R.Jowar hectarage seems to have increased as compared to the preceding years. The area index marginally moved above the base year level.(103.24). As against this, the area dropped to an abnormal level as the area index reveals (30.69) in the drought years of 1973-74. The production index after having reached a peak of 122.19 (1969-70) remained substantially below the base year's level through 1973-74. It however, fluctuated between the range of 59.81 (1971-72) and 29.97 (1972-73). It's relative production in the total production fell just to 18.95 percent in the total drought year. The productivity index reveals the similar declining

trend during 1970–73. The index number changed from its peak 168.4 to 38.55. The abnormal fall during these years 1970–74 in the production of R.Jowar was an outcome of the fall in both area and productivity of the crop. The decline in the area under R.Jowar generally takes place on account of poor and late north east monsoon precipitation. The poor performance of R.Jowar in respect of it's productivity per hectare could be accounted for by non introduction and non adoption of improved cultural practices by the farmers. These bad drought's year's were follwed by agriculturally good year (1974–75) in which all the three area, production and yield indices spured up to 54.41, 101.08 and 185.77 respectively. The percentage share of its production in the total output of the cereals gone up to 59.19 which was mainly the result of higher yield per hectare (901. K.G. per hectare).

In the last sub period (1975–81) both area and output of the crop seem's to have behaved rather erratically. It is interesting to note that the area index remained at lower levels than base years, level throughout the sub period. The area under R.Jowar was hit hard as the index number fell to 21.15 in the 1976–77. Owing to poor north east monsoon conditions, the area had gone out of R.Jowar cultivation in the taluka. During the succeding two years (1977–79) to

there seems to be no gain in the area under R.Jowar as the area index number remained at 37.41 and 26.42 consecutively. As opposed to the behaviour of the area index the productivity index tended to increase rather substantially during these years. The productivity index changed from 157.52 (1975-76) to 214.43 (1977-78). The productivity seems to have been more than doubled during these years. But the high level of productivity achieved during these years did not produce favourable effects on the output. On the contrary the output remained below base years level during these corresponding years. The prpduction index number tended to fall from its peak of the 144.17 (1975-76) to 48.73 (1978-79). This falling trend could be attributed to the falling trend of the area which more than offset the favourable effects of rising trend of productivity on production. During the last two years of the period (1979-81) the area gone out of R. Jowar cultivation seems to have regained as the index number increased to 83.79 and 81.25 consecutively. It's relative percentage shares in the net area sown and the aggregate area under cereals increased to 50.95 and 43.98 and 68.47 and 70.62 respectively in the corresponding years. The putput index too increased to 194.01 and 152.29 (1979-81). The relative percentage share of it's production in the total production of cereals, which was lower substantially during the

intervening years of the whole period, increased to 72.07 exactly equal to the base years relative share of the crop in question. This output growth was an out come of the increase in both the area and yield. The yield index touched an all time record level of 231.54 (1979-80) and then marginally declined to 187.42 in the subsequent year.(1980-81).

One could notice from the behaviour of area, production and productivity index numbers worked out for the individual years of the whole period, the declining trends of both area and production through 1978-79 and with exception of some years (1970-73) the rising trend of the productivity per hectare through out the period. The improvement in the productivity that occured during the latter year's could be regarded as an indicator of a switch over from age old methods of cultivation to a more scientific method of cultivation by the farmers. ofcourse one should not leave aside the role played by weather conditions in the variations of the productivity from year to year. So far our knowledge goes, still the local varieties of R.Jowar such as maldandi, Shalu are prevalent in the taluka. As such, no attempt to introduced the high yielding variaties of seeds of R.Jowar has been made so far by either the government agencies or by an agricultural university of Rahuri in the A.nagar district. R.Jowar being a dominant crop grown by the large majority of the farmer's in the perennially

non irrigated areas no adequate attention seems to have been paid to raise the production. Only during last two years of the period (1979-81) the production of the crop resumed it's upwards trend. This upward trend was caused by rising trend of the productivity. A rather substantial rise in the productivity in the latter years of the period had been the result of the increasing area under irrigated R.Jowar. The farmers in the taluka and been diverting their irrigation resources towards cultivation of food grain crops.

3.5 K.JOWAR :

Area, Production and Yield of K.Jowar during the Period (1965-66 to 1980-81).

K.Jowar is not grown as widely as other cereals like wheat and R.Jowar in the taluka. Between 1965-66 and 1973-74 the farmer's did not cultivate K.Jowar in the taluka, even though high yielding varieties of K.Jowar were introduced in the year 1965-66. Begining of cultivating K.Jowar seems to have been made from the year 1974-75. Assuming the 1974-75 as the base year we worked out the index numbers for the subsequent years. It seems from the area index numbers that the farmers have shifted the area under R.Jowar to K.Jowar. Between 1975-76 and 1978-79 the area index continuously

increased and shot up to 7698.49. It's relative share in the net area sown consequently increased from 0.41 percent to 33.76 percent. Analogously its percentage share increased substantially from 0.53 to 39.35 in the total area under cereals. The production had also increased as a result of the spurt in the areas under K.Jowar. The production index, however, fluctuated. It varied between a wide range of 100.00 (1974-75), and 9962.02.(1976-77) One should also notice that the relative percentage share of the production of K.Jowar increased from 2.27 to 71.56 (1978-79). The productivity index reveals an improvement in the productivity of K.Jowar. However, it fluctuated between a range of 100.00 (1974-75) and 199.81 (1976-77). Both increase in area under and productivity of K.Jowar have contributed to acceleration of output growth. But from the behaviour of area and productivity indices, we notice that it is the area extension that had largely contributed to the output growth. During the last two years 1979-81 rising trends of area, output and yield broke down. The area, production and yield indices dropped to 514.15, 349.36 and 67.93 respectively in the year 1980-81. Contraction of the area under K.Jowar could be attributed to the falling trend of the productivity per hectare. The farmers have as a result diverted their lands under K.Jowar to the cultivation of R.Jowar.

Both contracting area and declining productivity have contributed to a fall in the relative percentage share from 71.56 (1978-79) to 6.14 (1980-81).

The new high yielding varieties of K.Jowar caused a spurt in the area under K.Jowar and the relative improvement in it's productivity as compared to other subsitute crops' viz. R.Jowar and bajari. The rising trend of the productivity of K.Jowar however, could not sustain for long. This could be construed that the high yielding varieties of K.Jowar are not at all suitable to the agro climatic conditions prevailing in the taluka. Kopargaon taluka being drought prone, the uncertainty of south west monsoon, the cultivation of K.Jowar is saddled with uncertainty of its production. The high yielding varieties of K.Jowar are cultivated under south west monsoon rain condition, the irregularity of it in the taluka seem's to have prevented the farmers from cultivating K.Jowar.

3.6 BAJARI :

Area, Production and yield of Bajari during the period 1965-66 to 1980-81.

The cultivation of bajari comes next to the cultivation of R.Jowar in the taluka. It is mainly cultivated in the non irrigated areas under south west monsoon rain fed condition. The sowing season starts in the last week of June and ends with

The second week of July. A large majority of the farmers in the dry parts of the taluka cultivate it partly for self consumption and partly for sale. Even though R.Jowar and bajari are the food crops, they could be regarded as the cash crops of the farmers in the taluka. Especially the big farmers cultivate these two cereals mainly for sale. The surpluses over and above their family consumption requirements are sold to satisfy their monetary requirements.

As mentioned earlier bajari ranks second to R. Jowar in respect of area occupied by it. The area under bajari amounted to 19.87 percent to the net area sown and 27.23 percent to the total area under cereals in the base year. (1965-66). The area under bajari increased in the subsequent two years (1966-68) as the index number changed from 100.00 to 170.85. Therefore the area decreased as the index number of feel off to 118.44 and 1 144.32(1968- 80). The production index in this sub period remained above the base years level. Neverthe less it fluctuated between the range of 119.13 (1968-69) and 197.59 (1966-67). The relative percentage share in the total output of cereals however, remained almost unchanged.(12%). The productivity index unlike area and production indices reveals a downward trend of the productivity per hectare through 1969-70, with the exception of the year 1966-67 in which the productivity index rose above the base years level. (117.14). The productivity index fell to 93.14 (1969-70).

In the first year of the next subperiod (1970-71) the area under bajari remained constant as compared to the preceding year, while the output of bajari increased by more than three and half times as compared to the base years output. The index number shot up to 364.94 in that year. This more than three food increase in output was entirely the result of the remarkable improvement of the productivity. The index increased by a little more than two and half times (253.14) as compared to the base year. In the subsequent two years (1971-73) the area under, production and productivity of crop fell off rather considerably. (Refer to the table and respective columns of bajari). These bad years from the point of view of bajari were followed by expectionally good year.(1973-74). The area under bajari once again regained as the area index reveals (239.73). Its percentage shares increased to 48.71 and 66.92 to the net area sown and to the total area under cereals respectively. The productivity of the crop in that year increased slightly more than two and half times. (254.85) Both area and productivity of crop have contributed to an unprecendented output growth.(611.00). As a result it's relative percentage share shot up to 48.88 in the total output of all cereals. These upwards trends in respect of area, production and yield set in in 1973-74 did not continue in the

subsequent year. (1974-75) The area, production and yield indices fell to 205.28, 167.75 and 81.71 respectively. The productivity rather than area seem's to have been adversly affected the production of the crop in that year.

It is strange enough to note that the last year of the preceding sub period (1974-75) in which both productivity and production were affected severly was followed by an expectionally good year from the point of view of productivity and production. Both productivity and production indices reached unprecendented levels of 516.57 and 712.24 respectively. The area under the crop during the last sub periods tended to fall off rather considerably. The area index reveals that for two years (1975-77) remained almost unchanged (137) and there after the falling trend seems to have gathered a momentum, as the index number dropped to 30.49.(1980-81) From the behaviour of the area index in the latter year's of the whole period, one may conclude that bajari has been losing it's area consistently in favour of K.Jowar under which a large proportion of the the culturable lands has been devoted by the farmers in the taluka in these corresponding years. A remarkable increase in the productivity of K.Jowar, caused by the adoption, by the large majority of farmers, of high yielding varieties of K. Jowar induced the farmers to devote a large portion of their holdings to its cultivation. In point of fact the farmers s substituted K.Jowar for bajari.(Refer to the table No. 2 and respectively column of K.Jowar). The production index also

reveals the falling trend of bajari production. The index number fell off from its peak 712.24 (1975-76) to 137.85 (1976-77). In the last four years (1977-81) the production index remained substantially lower than base years level. The production index dropped to 55.05. (1980-81). This abnormal low level of output was caused by the abnormal fall in the hectarage. The productivity index also reveals a falling tendency as compared with the productivity level achieved during 1975-76. It dropped to 60.57 (1977-78) and it remained above the base years level in the subsequent years. In the last two years (1979-81) it seems to have resumed it's upward trend. Nevertheless it did not make any impact on the p production. The impact of declining area under the crop during the latter part of period in the production seems to have been more pronounced. The relative shares of its area and production in the aggregate area under and output of all cereals have suffered rather severaly as their percentages worked out to be 11.97 and 4.24 respectively for the year 1980-81.

Looking to the respective column of area, production and yield of bajari, it strikes that the behaviour of area, production and yield have not been uniform through out the whole period. In some years the area under the crop goes up

while its productivity per hectare tends to decline. The production changes in sympathy with area changes in some years while in some other years it changed in sympathy with changes in its yield. The area under the crop is influnced by the early and evenly spread of south west monsoon, where as its productivity is influnced by weather conditions at the time of its maturity. Before we conclude we shall make a passing reference to the fact that the farmers have shifted to the cultivation of high yielding varieties of bajari. The high yielding varieties of bajari being short duration crop, the adoption of which enable's the farmers to vultivate rabi crops like wheat and R.Jowar during the rabi season. The gaoran variety (local varity) of bajari is in the process of being dropped out in the cropping pattern of the taluka. Not with standing, its is regaretable to note that satisfactory improvement in it's productivity as in respect of improved varieties of wheat and K.Jowar, did not occur.

3.7 OTHER CEREALS :

Area, Production and Yield of other cereals during the Period 1965-66 to 1980-81.

The category of other minor cereals grown in the taluka mainly includes maize and hulga. The other cereals cultivated

in the taluka occupy a very insignificant place in the overall cropping pattern. Even among the major cereals cultivated in the taluka, they consiitute quite insignificant proportion to the total area under cultivation and to the total production of all cereals. Nevertheless we have worked out the area under production and yield indices and we intend to analyse briefly their behaviour in the following paragraph.

In the base year the area occupied by other cereals worked out to be just 0.19 and 0.26 percent to the net area sown and to the total area under cereals respectively. Similarly the relative share of their production in the total production of cereals amounted to just 0.26. Both area and production declined in 1972-73 as their index numbers fell to 17.17 and 10.60 respectively. As a result their percentage shares in the total area and production of all cereals declined to 0.05 and 0.04 respectively. The yield index reveals a rather fluctuating trend. It ranged between 130.69 (1967-68) and 59.90 (1972-73).

In the subsequent years of the whole period (1973-81) all the three area, production and yield tended to rise. However, we notice rather voilent fluctuations in both area and production in the intervening years. The area index reveals both upward and downward movements in the alternate years. It has fluctuated between a wide range of 39.87 (1979-80)

and 574.84 (1976-77) the production index seems to have behaved in a similar way. Year to year fluctuations seem to have occurred as the production index varied between a wide range of 90.90 (1979-80) and 1000.00 (1976-77). The relative percentage's of their area and production, however, did never exceed even 1 percent in the total area and production of all cereals. Despite the year to year fluctuations in both area and production, the productivity of these cereals has improved considerably in these latter years. The productivity index reveals a consistent increase through (1980-81) as the index changed from 135.39 (1973-74) to 256.18 (1980-81). The productivity of these crops has increased by slightly more than two and half times as compared to the base year.

The phenomenal increase in productivity of the minor cereals noticed during the latter part of the period could be accounted for by the fact that the farmers have given preference to the cultivation of maize over the cultivation of other minor cereals. High yielding varieties of maize of have countributed to a rather substantial rise in the productivity of other cereals during the latter years. High yielding varieties and local varieties (goaran macca) are gown under irrigated conditions. Hence, we find an improvement in the productivity per hectare. The farmers cultivate this crop with a view to satisfying both human consumption and animal consumption requirements. The relatively high increase in the

area since 1974-75 as compared to the preceding years is the result of the expansion of the area under improved varieties of K.Jowar at the cost of decline in the area under rabi jowar which caused the problem of scarecity of fodder. To meet the scarecity of the fodder, the farmer's have shifted their lands to the cultivation of maize, the stalk of which could be used to feed both draught and milk animals.

3.8 TOTAL CREALS :

Behabiour of Area and Output :

After having described rather in detail the behaviour of area, putput and yield of individual cereal crops, we now intend to high light the behaviour of area and output of all cereals grown in the taluka through out the whole period under study.

The percentage figures of the area under cereals to the net area sown worked out for the indivudual years do not show major change in the proportion of the area devoted to the cultivation of the cereals during the period under reference. However, we notice upward and downward movements' of the area in the individual years. Between 1965-66 and 1974-75 the proportion of the area under cereals hovered round about three fourth of the net sown area in the taluka. (Refer the respective

column) of the Table No.2). During the last six years of the period its percentage share in the net sown area seems to have increased as compared to the earlier year. The percentage of the area under cereals rose to 93.61 (1975-76) and thereafter it tended to fall during the succeding years. During 1980-81 the area devoted to the cultivation of cereals amounted to less than three fourth of the net sown area (62.28).

We come a cross a some sort of statistical error in the compliation of the areas under different landuse categories for the year 1977-78. The area sown under the category of the net sown, is just 41,000 hectares, which is substantially lower than the total area under cereals (67265) hectares) the net area sown could never be less than the total area under cereals. As such we calculated its percentage share to the gross cropped area for that year, which amounted to 91.51 percent.

The behaviour of area index reveals that no substantial changes have occured in the total area under all cereals. Between 1965-66 and 1971-72 the area remained all most constant as the index number ranged between 100.00 (1965-66) and 106.57 (1967-68) for the succeeding three years, (1972-75) the area index dropped below the base years level. The area under cereals dropped below the base years level during these years because

of drought conditions prevailing in the taluka. During the year 1975-76 the area under cereal sharply increase as the index number touched 120.56. After having reached this peak the area again started to dwindle as the index from 120.56 to just 69.36 (1980-81). Barring some minor fluctuation's either in upward direction or in downward direction in the intervening years the area under cereals has almost remained constant. However, the declining trend of the latter years of the period seems to be rather pronounced. This could be interpreted as the shifting of lands under cereals to the cultivation of commercial crops.

Looking to the last columns of the table we may notice that the proportions of both area and production of cereals to the area and production of food grains in the taluka worked out to be on an average 95 percent. This reveals thqt the cultivation of cereals is the major agricultural activity practiced by a large majority of the farmers. Proportion of the area under pulses did not show any rising trend even though the relative prices of pulses have been rising continuously. The farmer's still show the preference for the cultivation of cereals over the cultivation of pulses. The major cereals cultivated in the taluka still occupied a predominant position in the over all cropping pattern of the taluka.

As opposed to the behaviour of area index, the production index seem's to have behaved rather erratically with the

exceptions of the drought years 1971-73 in which the production of cereals was hit hard,(the production index 98.91 and 66.01) the production index remained above the base years level in all the years of the period under study. During the earlier years the production did not rise remarkable, as the index number varied between 100.00 (1965-66) and 147.71 (1973-74). A remarkable spurt in the production seem's to have receieved in the latter years of the period. In the year 1975-76 the output of cereals nearly trippled (296.83). In the succeding year of 1976-77 the output more than quadrupled as the index number shot up to 426.74. As a result its relative percentage share in the total output of food grains worked out to be nearly 100 percent. (99.14%). Their after the index number started to dwindle continuously in the succeding years and touched 153.20 (1980-81). The rise in the index number during the latter part of the period was mainly due to the adoption of high yielding varieties of K.Jowar, bajari and wheat. Not with standing we notice that the productivity per hectare of high yielding varieties of cereals could not sustain during the latest years of the period (1979-81). Hence the falling trend of the output of all cereals from (1976-77) could be accounted for by falling productivity of major cereals.

1	2	3			4			5		
Year	Net Area Sown	RICE			WHEAT			K.JOWAR		
		Area	Yield	Production	Area	Yield	Production	Area	Yield	Productic
1965-1966	85962	101 (0.11) 100.00 0.16*	- 444 100.00 -	44 - 100.00 (0.17)	7561 (8.79) 100.00 12.05*	- 510 100.00 -	3856 - 100.00 (15.23)	04 - - -	- 461 - -	02 - - -
1966-1967	85365	301 (0.35) 298.01 0.46*	- 437 98.42 -	131 - 297.72 (0.44)	9712 (11.37) 128.44 14.84*	- 682 133.72 -	6642 - 171.78 (22.33)	- - - -	- - - -	- - - -
1967-1968	87227	344 (0.39) 340.59 0.51*	- 972 218.91 -	334 - 759.09 (1.24)	8395 (9.62) 111.03 12.55*	- 544 106.66 -	4567 - 118.43 (17.06)	- - - -	- - - -	- - - -
1968-1969	87324	275 (0.31) 272.27 0.42*	- 833 187.61 -	229 - 520.45 (0.76)	9067 (10.38) 119.91 14.10*	- 815 159.80 -	7390 - 191.64 (24.71)	- - - -	- - - -	- - - -
1969-1970	85788	244 (0.28) 241.58 0.38*	- 664 149.54 -	162 - 318.68 (0.48)	10621 (12.38) 140.47) 16.82*	- 660 129.41 -	7010 - 181.79 (20.81)	51 - - -	- - - -	48 - - -
1970-1971	85301	304 (0.35) 300.99 0.48*	- 775 174.54 -	235 - 534.09 (0.91)	9283 (10.88) 122.77 14.75*	- 721 141.37 -	6693 - 173.57 (26.02)	- - - -	- - - -	- - - -
1971-1972	86300	204 (0.23) 201.98 0.31*	- 814 183.33 -	166 - 377.27 (0.66)	12330 (14.28) 163.07 18.92*	- 780 152.94 -	9617 - 249.40 (38.42)	- - - -	- - - -	- - - -
1972-1973	72522	191 (0.26) 189.10 0.36*	- 172 38.73 -	032 - 77.72 (0.19)	9177 (12.65) 121.37 17.43*	- 945 185.29 -	8672 - 224.89 (51.92)	- - - -	- - - -	- - - -

1	2	3			4			5			6		
Year	Net Area Sown	RICE			WHEAT			K.JOWAR			R.JOWAR		
		Area	Yield	Production	Area	Yield	Production	Area	Yield	Production	Area	Yield	Productic
1965-1966	85962	101 (0.11) 100.00 0.16*	- 444 100.00 -	44 - 100.00 (0.17)	7561 (8.79) 100.00 12.05*	- 510 100.00 -	3856 - 100.00 (15.23)	04 - - -	- 461 - -	02 - - -	38822 (44.00) 100.00 60.28*	- 485 100.00 -	18344 - 100.00 (72.50)
1966-1967	85365	301 (0.35) 298.01 0.46*	- 437 98.42 -	131 - 297.72 (0.44)	9712 (11.37) 128.44 14.84*	- 682 133.72 -	6642 - 171.78 (22.33)	- - - -	- - - -	- - - -	26441 (30.97) 69.91 40.41*	- 640 131.95 -	16922 - 92.25 (57.05)
1967-1968	87227	344 (0.39) 340.59 0.51*	- 972 218.91 -	334 - 759.09 (1.24)	8395 (9.62) 111.03 12.55*	- 544 106.66 -	4567 - 118.43 (17.06)	- - - -	- - - -	- - - -	28813 (33.03) 76.18 43.09*	- 632 130.30 -	18210 - 99.27 (68.03)
1968-1969	87324	275 (0.31) 272.27 0.42*	- 833 187.61 -	229 - 520.45 (0.76)	9067 (10.38) 119.91 14.10*	- 815 159.80 -	7390 - 191.64 (24.71)	- - - -	- - - -	- - - -	34614 (39.63) 91.51 53.83*	- 540 111.34 -	18692 - 101.90 (62.51)
1969-1970	85788	244 (0.28) 241.58 0.38*	- 664 149.54 -	162 - 318.68 (0.48)	10621 (12.38) 140.47) 16.82*	- 660 129.41 -	7010 - 181.79 (20.81)	51 - - -	- - - -	48 - - -	27504 (32.05) 72.71 43.56*	- 815 168.04 -	22416 - 122.19 (66.55)
1970-1971	85301	304 (0.35) 300.99 0.48*	- 775 174.54 -	235 - 534.09 (0.91)	9283 (10.88) 122.77 14.75*	- 721 141.37 -	6693 - 173.57 (26.02)	- - - -	- - - -	- - - -	28625 (33.55) 75.68 45.49*	- 274 56.49 -	7843 - 42.75 (30.49)
1971-1972	86300	204 (0.23) 201.98 0.31*	- 814 183.33 -	166 - 377.27 (0.66)	12330 (14.28) 163.07 18.92*	- 780 152.94 -	9617 - 249.40 (38.42)	- - - -	- - - -	- - - -	39050 (45.24) 103.24 59.92*	- 281 57.93 -	10973 - 59.81 (43.84)
1972-1973	72522	191 (0.26) 189.10 0.36*	- 172 38.73 -	032 - 77.72 (0.19)	9177 (12.65) 121.37 17.43*	- 945 185.29 -	8672 - 224.89 (51.92)	- - - -	- - - -	- - - -	29406 (40.54) 77.74 55.85*	- 187 38.55 -	5499 - 29.91 (32.92)

TABLE NO.3.2

THE INDEX NUMBER OF AREA,PRODUCTION AND YIELD OF RICE,WHEAT, K.JOWAR, R.JOWAR AND BAJARI

[redacted] DURING 196[redacted]66 to 1980-81[redacted]

7			8			9		10	11
BAJARI			OTHER CEREALS			TOTAL CEREALS		% of the total production of cereals to the total production of food grains.	The % of the area under cereals to the area under food grains.
Area	Yield	Production	Area	Yield	Production	Area	Production	Area	Production
17086	-	2990	163	-	66	62737	25302	66561	26166
(19.87)	175	-	(0.19)	404	-	(72.98)	-	62737	25302
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	94.25	96.69
27.23*	-	(11.81)	0.26*	-	(0.26)	-	-	-	-
28818	-	5908	157	-	72	65429	29657	69261	30795
(33.75)	205	-	(0.18)	461	-	(76.64)	-	65429	29657
168.66	117.14	197.59	96.31	114.10	109.09	104.28	117.21	94.46	96.30
44.04*	-	(19.92)	0.24*	-	(0.24)	-	-	-	-
29192	-	3591	118	-	62	66862	26764	71410	27876
(33.46)	123	-	(0.13)	528	-	(76.65)	-	68862	26764
170.85	70.28	120.10	27.39	130.69	93.93	106.57	105.77	93.63	96.01
43.66*	-	(13.42)	0.18*	-	(0.23)	-	-	-	-
20238	-	3562	106	-	28	64300	29901	67719	30819
(23.17)	176.	-	(0.12)	263	-	(73.63)	-	64300	29901
118.44	100.57	119.13	65.03	65.09	42.42	102.49	118.17	94.95	97.02
31.47*	-	(11.91)	0.16*	-	(0.09)	-	-	-	-
24660	-	4020	64	-	25	63144	33681	67088	34780
(28.74)	163	-	(0.07)	397	-	(73.60)	-	63144	33681
144.32	93.14	164.44	39.26	98.26	37.87	100.64	133.11	94.12	96.84
29.05*	-	(11.93)	0.10*	-	(0.07)	-	-	-	-
24632	-	10912	80	-	36	62924	25719	66683	26613
(28.87)	443	-	(0.09)	450	-	(73.76)	-	62924	25719
144.16	293.14	264.94	49.07	113.38	54.54	100.29	101.64	94.36	96.64
39.14*	-	(4.42)	0.13*	-	(0.14)	-	-	-	-
13548	-	4254	42	-	18	65175	95028	68318	25975
(15.69)	314	-	(0.04)	429	-	(75.52)	-	65175	25089
79.29	179.427	142.27	28.38	106.18	27.27	103.88	98.91	95.40	96.59
20.78*	-	(16.99)	0.06*	-	(0.07)	-	-	-	-
13846	-	2492	28	-	07	52648	16702	54310	16933
(19.09)	180	-	(0.03)	242	-	(75.60)	-	52648	16702
81.03	102.85	83.3	17.17	59.90	10.60	83.91	66.01	96.94	98.63
26.29*	-	(14.92)	0.05*	-	(0.04)	-	-	-	-

1973-1974	84600	191 (0.22) 189.10 0.31*	- 1155 260.13 -	220 - 500.00 (0.57)	8308 (9.82) 109.87 13.57*	- 1412 276.86 -	11731 - 304.22 (31.38)	- - - -	- - - -	- - - -	11611 (13.72) 30.69 18.97*	- 610 125.77 -	7083 - 38.61 (18.95)
1974-1975	80800	458 (0.56) 453.46 0.73*	- 1429 321.84 -	654 - 1486.36 (2.09)	6012 (7.44) (79.51 9.62*	- 999 195.88 -	6006 - 155.75 (19.17)	332 (0.41) 100.00 0.53*	- 2142 100.00 -	711 - 100.00 (2.27)	20581 25.47 54.41 32.92*	- 901 185.77 -	18543 - 101.08 (59.19)
1975-1976	80800	657 (0.81) 650.49 0.87*	- 1855 417.79 -	1218 - 2768.18 (1.62)	13721 (16.94) 181.47 18.14*	- 1260 247.05 -	17288 - 448.34 (23.01)	2730 (3.41) 822.29 3.61*	- 3155 147.29 -	8613 - 1211.39 (11.47)	34617 (42.84) 91.52 45.77*	- 764 157.52 -	26447 - 144.17 (35.21)
1976-1977	79110	1644 (2.07) 1627.72 2.47*	- 1608 362.16 -	2649 - 6020.45 (2.45)	15978 (20.19) 211.32 24.01*	-- 1359 266.47 -	21714 - 563.12 20.11*	16549 (20.92) 4984.64 24.87*	- 4280 199.81 -	70830 - 9962.02 (65.60)	8000 (10.11) 21.15 12.02*	- 1000 206.11 -	8000 - 43.61 (7.41)
1977-1978	41000	502 (1.22) 497.02 0.74*	- 1701 383.10 -	870 - 1977.27 (0.94)	11746 (28.64) 155.34 17.46*	- 1498 293.72 -	17505 - 456.30 (18.97)	17785 (43.38) 5356.93 26.56*	- 3193 149.06 -	56787 - 7986.92 (61.22)	14152 (34.51) 37.41 21.03*	- 1040 214.43 -	14718 - 80.23 (15.86)
1978-1979	75700	577 (0.76) 571.28 0.83*	- 1568 353.15 -	905 - 2056.81 (0.92)	12629 (16.68) 167.02 19.44*	- 1191 233.52 -	15041 - 390.06 (13.36)	25559 (33.76) 7698.49 39.35*	- 2472 128.01 -	70083 - 9856.96 (71.56)	9993 (13.20) 26.42 15.38*	- 889 183.29 -	88884 - 48.43 (9.07)
1979-1980	62200	272 (0.43) 269.30 0.58*	- 1070 241.99 -	291 661.36 (0.51)	7331 (11.78) 96.95 15.83*	- 1134 222.35 -	8313 - 215.58 (14.94)	3450 (5.55) 1039.15 7.45*	- 2843 132.72 -	9808 - 1379-46 (17.62)	31693 (50.95) 83.79 68.47*	- 1123 231.54 -	35591 - 194.01 (63.96)
1980-1981	69871	228 (0.32) 225.74 0.52*	- 1878 422.97 -	428 - 972.72 (1.10)	5413 (7.74) 71.59 12.44*	- 1115 218.62 -	6036 - 156.53 (15.57)	1707 (2.44) 514.15 3.92*	- 1455 67.93 -	2484 - 349.36 (6.40)	30734 (43.98) 81.25 70.62*	- 909 187.42 -	27937 - 152.29 72.07*

i)

Source : As in table No. 2.1

ii) Yield data collect from the Department of Agriculture M.S.(Central Building) Poona.

i) Figures in the bracket indicate the relative percentage shares in the GCAS, and the relative percentage shares of the production of individual cereals in the total production of all cereals taken together.

i) The figures with astericks indicate/total area under cereals.

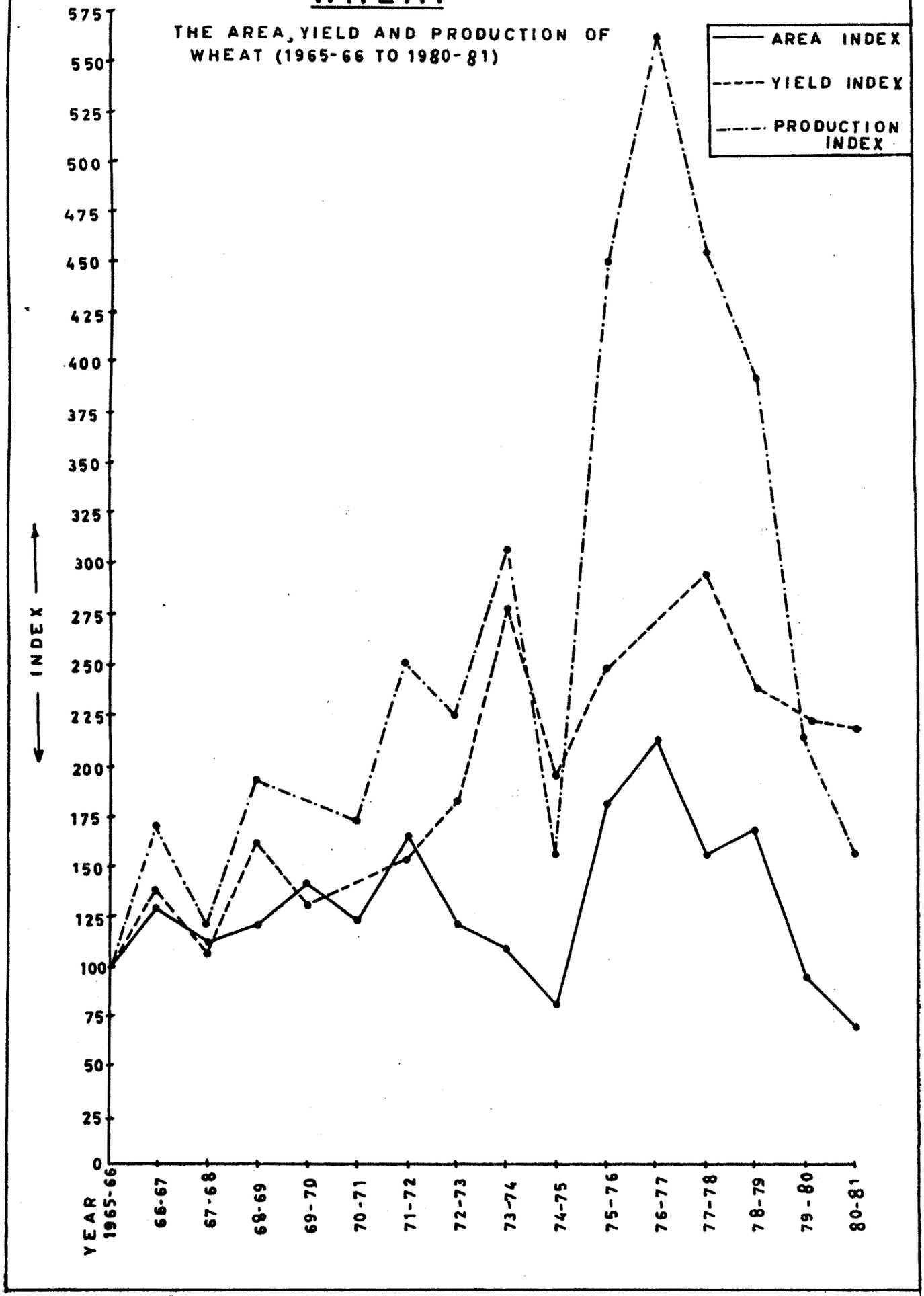
TABLE No. 3.2 (contd....)

40961	-	18269	133	-	73	61204	37376	63989	38105
(48.41)	446	-	(0.15)	547	-	(72.34)	-	61204	37376
239.73	254.85	611.00	81.59	135.39	110.60	97.55	147.71	95.64	98.08
66.92*	-	(48.88)	0.21*	-	(0.19)	-	-	-	-
35075	-	5016	554	-	400	62512	31330	66339	32550
(43.40)	143	-	(0.68)	522	-	(77.36)	-	62512	31330
205.28	81.71	167.75	339.87	178.71	660.06	99.64	123.82	94.23	96.25
56.10*	-	(16.01)	0.89*	-	(1.28)	-	-	-	-
23557	-	21296	355	-	244	75637	75106	80677	76720
29.98	904	-	(0.43)	688	-	(93.61)	-	75637	75106
107.87	516.57	712.24	217.79	170.29	396.69	120.56	296.83	93.75	97.89
31.14*	-	(28.35)	0.47*	-	(0.32)	-	-	-	-
23419	-	4122	937	-	660	66527	107975	68893	108903
(29.60)	176	-	(1.18)	704	-	(84.09)	-	66527	107975
137.06	100.57	137.85	574.84	174.25	1000.00	106.04	426.74	96.56	99.14
35.20*	-	(3.82)	1.41*	-	(0.61)	-	-	-	-
22552	-	2391	528	-	401	67265	92762	71717	94045
55.00	106	-	(1.28)	759	-	91.51	-	67265	92762
131.99	60.97	79.96	323.92	187.87	607.57	107.21	366.61	93.79	98.63
33.50*	-	(2.58)	0.78*	-	0.43	-	-	-	-
15964	-	2826	229	-	199	64960	97938	68060	97972
(21.08)	177	-	0.30	869	-	85.81	-	64960	97338
93.43	101.14	94.51	140.49	215.09	301.51	103.54	387.07	95.44	99.35
24.57*	-	(2.88)	0.35*	-	(0.20)	-	-	-	-
3479	-	1586	65	-	60	46290	55649	50022	56878
(5.59)	456	-	(0.10)	919	-	(74.42)	-	46290	55649
20.36	260.57	53.04	39.87	227.47	90.90	73.78	219.93	92.53	97.83
7.52*	-	(2.85)	0.14*	-	(0.11)	-	-	-	-
5210	-	1646	225	-	233	43513	38764	46875	39580
(7.46)	316	-	(0.32)	1035	-	(62.28)	-	43517	38764
30.49	180.57	55.05	138.03	256.18	253.03	69.36	153.20	92.83	97.93
11.98*	-	(4.24)	0.51*	-	(0.60)	-	-	-	-

WHEAT

GRAPH NO. 3-2

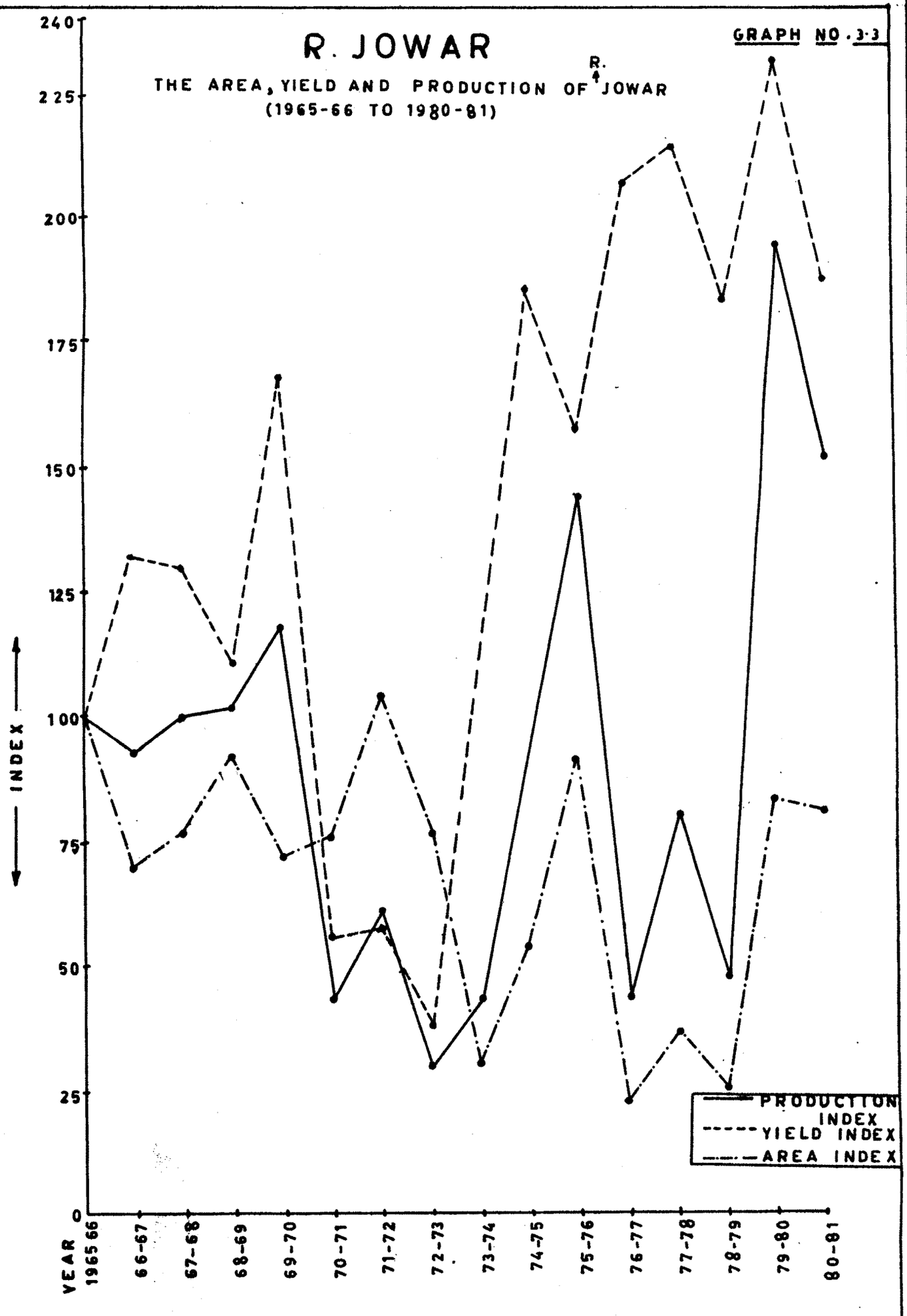
THE AREA, YIELD AND PRODUCTION OF WHEAT (1965-66 TO 1980-81)



R. JOWAR

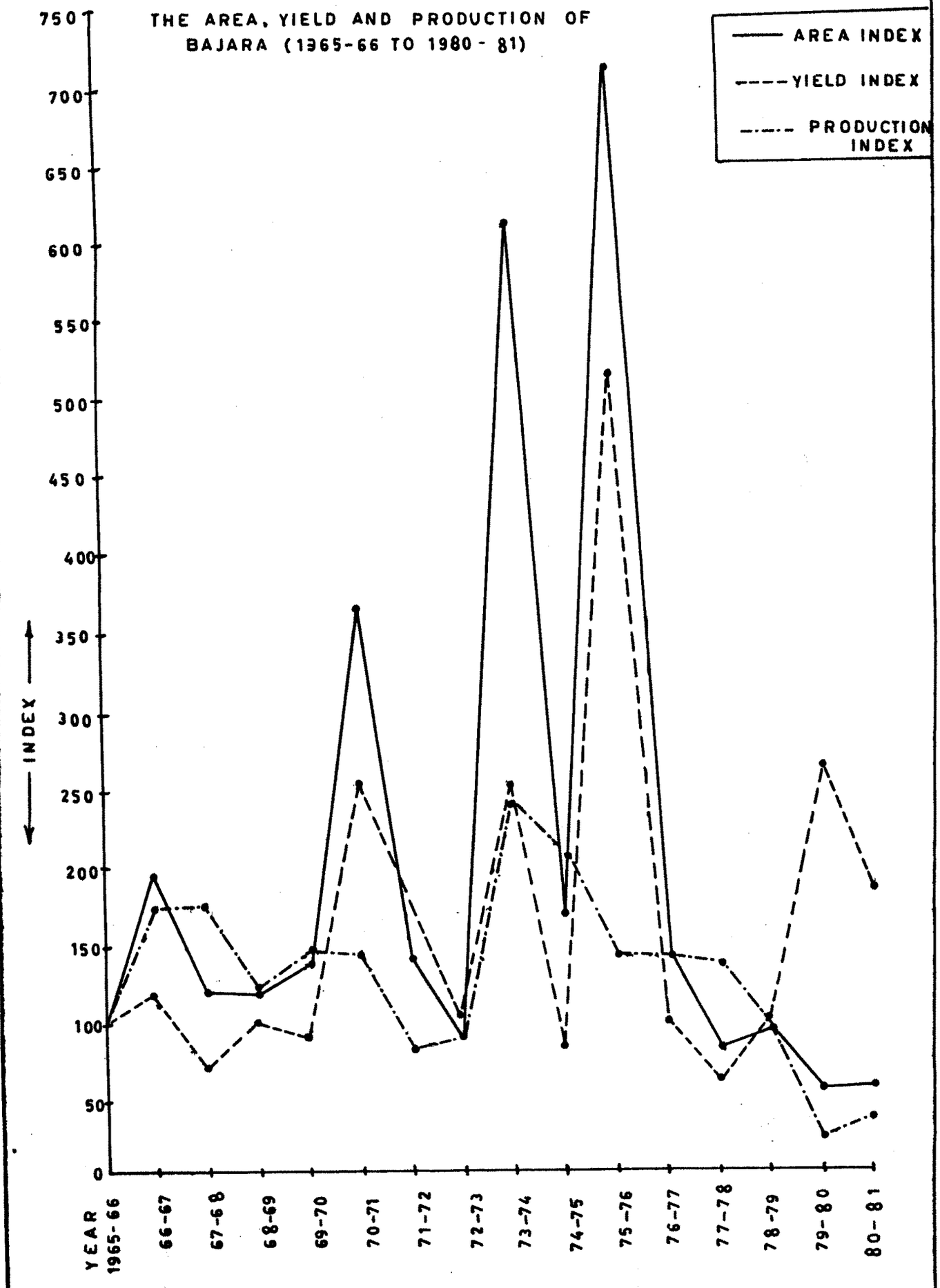
GRAPH NO. 3.3

THE AREA, YIELD AND PRODUCTION OF R. JOWAR
(1965-66 TO 1980-81)



BAJARA

GRAPH NO. 3.4



TOTAL CEREALS

GRAPH NO. 3.5

THE AREA, AND PRODUCTION OF TOTAL CEREALS. (1965-66 TO 1980-81)