

CHAPTER	
3	TOTAL CEREALS JOWAR AND BAJRA

3.1 FOCUS OF ANALYSIS

This chapter is concerned with the analysis of behaviour of area under cereals in Sangli district. Within the crop group food crops, cereals assume the most important position as they are the staple crops which provide the basic requirement of food for the people in the district. Among the cereals, jowar and bajra in their order constitute major staples produced by the farmers of the district. Therefore, it is proposed in this chapter to examine the trends in the area of land under cereals in general and jowar and bajra in particular. In all the three contexts, analyses are done for the district as a whole and for each taluka of the district. District analysis is one way only: it considers the area under the crop group/crop as a percentage of the GCA of the district. Taluka analyses have two dimensions:

(A) Taluka area as percentage of district area under the

crop group/crop

$$= \frac{\text{Area under the crop group/crop in the taluka}}{\text{Area under crop group/crop in the district}} \times 100$$

This will show the relative position of each taluka in the district and will also throw light on the regional concentration of area under the crop group/crop within the district. The trend is observed.

(B) Area under crop group/crop in each taluka as percentage of its own gross cropped area.

$$= \frac{\text{Area under the crop group/crop in the taluka}}{\text{Gross cropped Area of the taluka}} \times 100$$

This will bring out initially importance of the crop group/crop in the agricultural activity of each taluka. Variation in percentages would indicate the extent of crop substitutions, if any, within the taluka. The trend is served.

3.2 DISTRICT AREA OF TOTAL CEREALS

what crop area is

Cereals form very important class under food crops in Sangli district. Table 3.1 bears testimony to it. Aggregate area under cereals moved rundabout 4 lakh hectares over the span of 24 years accounting for an overall average of 60.31 per cent of the district's GCA. The triennial percentage of the aggregate area under cereals to the GCA moved within the narrow limits of 58.49 per cent to 63.52 per cent. However, the overall trend was increasing.

TREND OF THE PERCENTAGE OF THE DISTRICT AREA UNDER TOTAL CEREALS

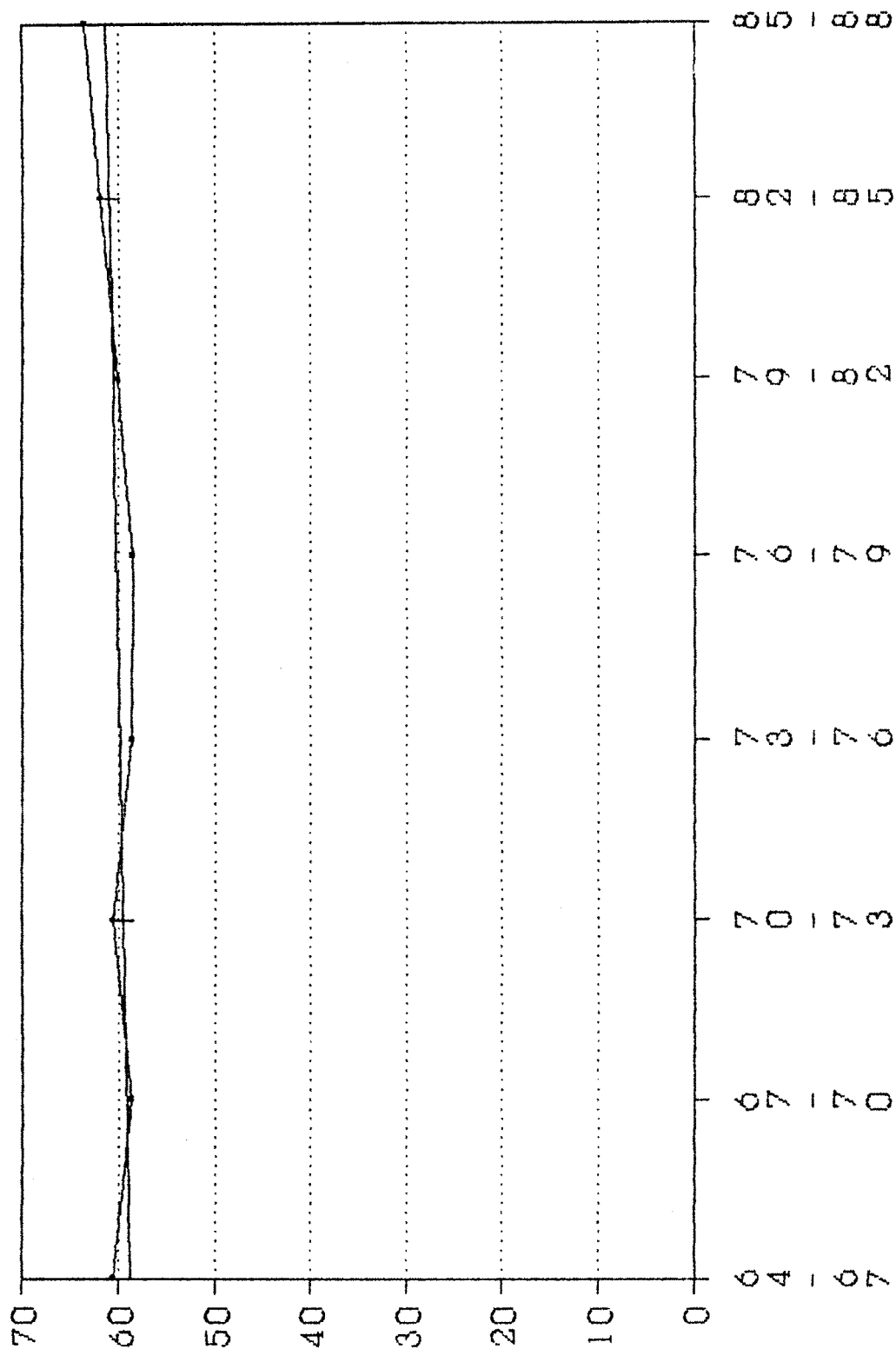


Table 3.1

Talukawise area under total cereals in Sangli district

(Area in heactors)

Triennial Year	District gross cropped area	Area under total cereals	Miraj	Tasgaon	Khanapur	Atpadi	Jat	Kavathe Mahankal	Walva	Shirala
1	2	3	4	5	6	7	8	9	10	11
1964 - 65	6,77,929	4,10,196	39,374	47,556	63,502	52,497	1,24,757	35,412	30,582	16,515
to		(100.00)	(9.59)	(11.59)	(15.48)	(12.79)	(30.41)	(8.63)	(7.45)	(4.02)
1966 - 67	(100.00)	(60.51)	(48.45)	(53.01)	(56.86)	(74.72)	(78.41)	(68.40)	(45.89)	(34.74)
1967 - 68	6,54,469	3,83,517	36,661	39,784	58,489	52,081	1,19,609	34,464	27,717	14,710
to		(100.00)	(9.55)	(10.37)	(15.25)	(13.57)	(31.18)	(8.98)	(7.22)	(3.83)
1969 - 70	(100.00)	(58.59)	(46.70)	(46.24)	(52.67)	(82.13)	(77.20)	(69.10)	(42.94)	(31.89)
1970 - 71	6,27,792	3,80,629	39,002	45,083	56,482	46,223	1,19,731	31,926	27,597	14,582
to		(100.00)	(10.24)	(11.84)	(14.83)	(12.14)	(31.45)	(8.38)	(7.25)	(3.83)
1972 - 73	(100.00)	(60.63)	(51.81)	(53.86)	(52.86)	(81.31)	(81.06)	(69.35)	(42.15)	(31.77)
1973 - 74	6,34,105	3,71,802	41,242	47,072	55,676	45,371	1,04,917	35,214	28,447	13,850
to		(100.00)	(11.09)	(12.66)	(14.97)	(12.20)	(28.21)	(9.47)	(7.65)	(3.72)
1975 - 76	(100.00)	(58.63)	(55.57)	(58.02)	(50.86)	(67.13)	(73.30)	(75.65)	(44.11)	(29.86)
1976 - 77	6,45,928	3,77,795	42,125	52,464	61,677	40,396	99,012	35,486	31,704	14,946
to		(100.00)	(11.15)	(13.88)	(16.32)	(10.69)	(26.20)	(9.39)	(8.39)	(3.95)
1978 - 79	(100.00)	(58.49)	(54.57)	(56.81)	(55.54)	(57.65)	(72.84)	(76.32)	(47.76)	(32.17)
1979 - 80	6,47,887	3,89,985	40,365	53,813	61,134	42,202	1,04,779	37,045	33,595	16,749
to		(100.00)	(10.35)	(13.79)	(15.67)	(10.82)	(26.86)	(9.49)	(8.61)	(4.29)
1981 - 82	(100.00)	(60.19)	(53.19)	(59.43)	(53.26)	(66.00)	(75.26)	(76.10)	(49.81)	(35.33)
1982 - 83	6,33,725	3,92,594	47,644	55,405	60,142	38,163	1,07,395	37,888	29,901	16,053
to		(100.00)	(12.13)	(14.11)	(15.31)	(9.72)	(27.35)	(9.65)	(7.61)	(4.08)
1984 - 85	(100.00)	(61.95)	(56.95)	(62.49)	(61.54)	(61.81)	(76.31)	(77.21)	(45.84)	(34.29)
1985 - 86	6,41,952	4,07,739	46,509	50,810	61,486	40,473	1,18,313	41,474	32,849	15,825
to		(100.00)	(11.40)	(12.46)	(15.07)	(9.92)	(29.01)	(10.17)	(8.05)	(3.88)
1987 - 88	(100.00)	(63.52)	(54.82)	(58.40)	(66.95)	(65.04)	(77.07)	(82.12)	(49.54)	(34.60)
Average 1964-65 1987-88 (24 years)	----	(100.00) (60.35)	(10.68) (52.75)	(12.58) (56.03)	(15.40) (56.31)	(11.48) (69.47)	(28.83) (76.43)	(9.27) (74.28)	(7.77) (46.00)	(3.95) (33.07)

Note : 1. Figures in lower parentheses in column 3 are percentage to column 2

2. Figures in upper parentheses in columns 4 to 11 are percentages to column 3

3. Figures in lower parentheses in columns 4 to 11 are percentages to the GCA of the respective talukas

Source: Compiled on the basis of data collected from the relevant issues of Socio Economic Review and District statistical abstract of Sangli District for the years from 1964-65 to 1987-88, Directorate of Economics & Statistics Government of Maharashtra, Bombay.

3.3 MICRO-LEVEL INVESTIGATION: TALUKA PROFILE OF CEREALS

Talukawise study of cultivation of cereals may be treated as micro-level investigation. It pertains to consideration of talukawise trends of area under cereals. Triennial figures of each taluka are presented in columns 4 to 11 of Table 3.1. The analysis is done from two angles: (A) taluka area as percentage of the district area under cereals; (B) taluka area as percentage of the gross cropped area (GCA) of the taluka itself. Results in each respect are presented with reference to three parameters: (a) average area, (b) trend of area and (c) co-efficient of variation of area. Table 3.1 provides the reference data.

3.3.1 Taluka Area Vis-A-Vis District Area Of Cereals

In Table 3.1 all the 8 talukas of Sangli district are covered in columns 4 to 11. These columns exhibit first the absolute average area in hectares for each triennial period. Then follow, in the upper brackets, percentage of taluka area to the district total area under cereals for the respective triennium. Last row in the table gives, in the upper brackets, average share of each taluka in the district total over the entire period, 1964 to 1988.

3.3.1.1 Average area

Overall view of the range within which each taluka

shared the crop area under cereals is presented in Table 3.2.

Table 3.2

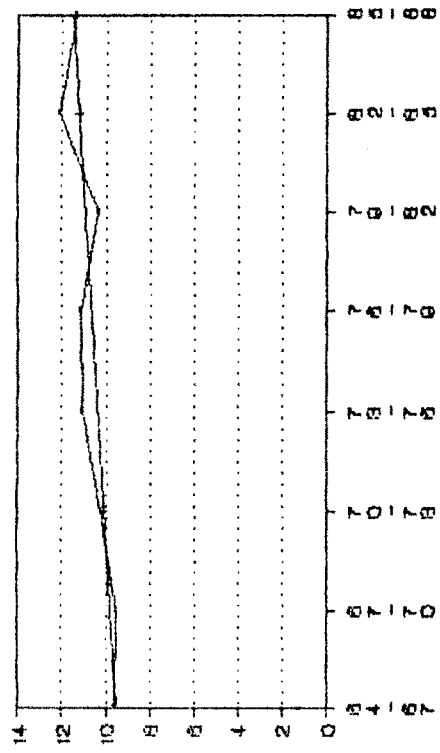
Talukawise range of share of area under cereals (1964-88)

Taluka	Range of Share	Range magnitude (percentage points)	Average share for the entire period
1 Miraj	9.55 to 12.13	2.58	10.68
2 Tasgaon	10.37 to 14.11	3.74	12.58
3 Khanapur	14.83 to 16.32	1.49	15.40
4 Atpadi	9.72 to 13.57	3.85	11.48
5 Jat	26.20 to 31.45	5.25	28.83
6 Kavathe Mahankal	8.38 to 10.17	1.79	9.27
7 Walva	7.22 to 8.39	1.17	7.77
8 Shirala	3.72 to 4.29	0.57	3.95

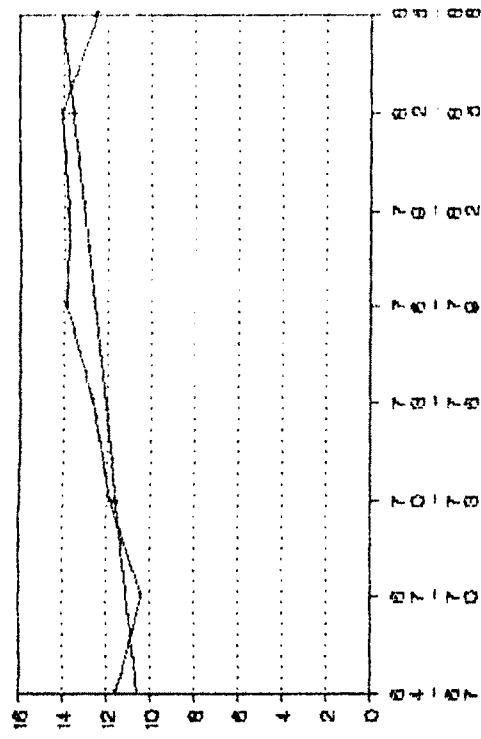
Source: Compiled from Table 3.1

It is clear from Table 3.2 that Jat taluka had the maximum share of 28.83 percent and Shirala taluka had the lowest percentage (3.95 per cent) under cereals. All the other talukas shared between 7.77 and 15.40 per cent of their land for this crop group. The order of the talukas in their declining order of percentage area under cereals would be as follows: Jath, Khanapur, Tasganon, Atpadi, Miraj, Kavathe Mahankal, Walva and Shirala. Importantly, even though Jat shared the maximum percentage area under cereals,

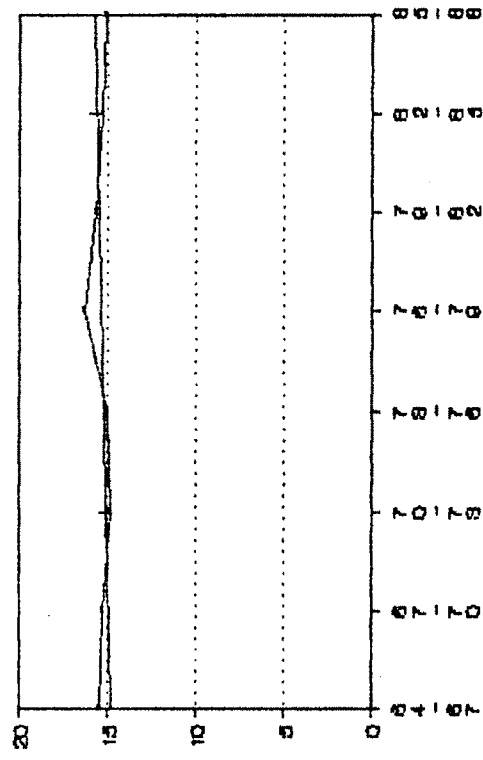
TREND OF THE PERCENTAGE OF TALUKA AREA IN THE DISTRICT TOTAL CEREALS



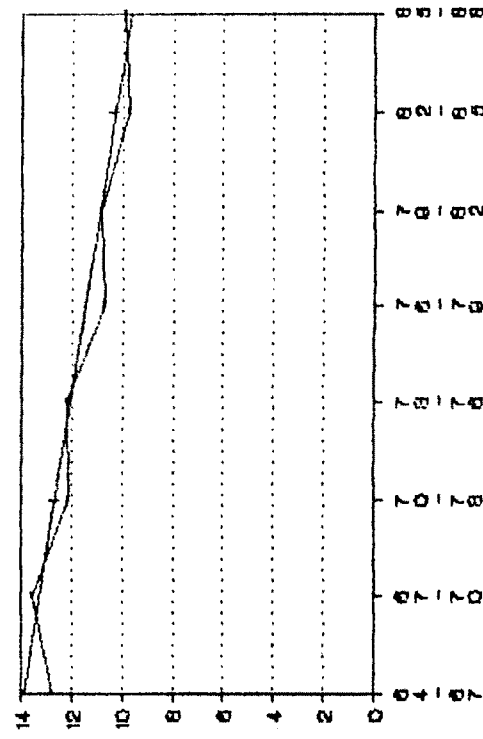
MIRAJ



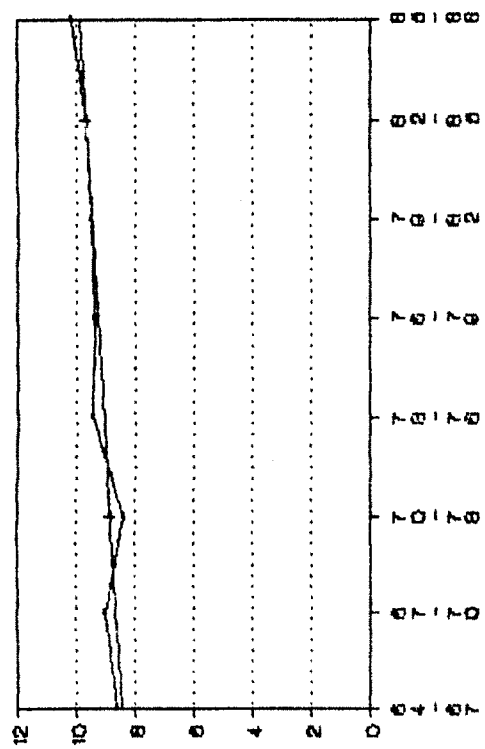
TASGAON



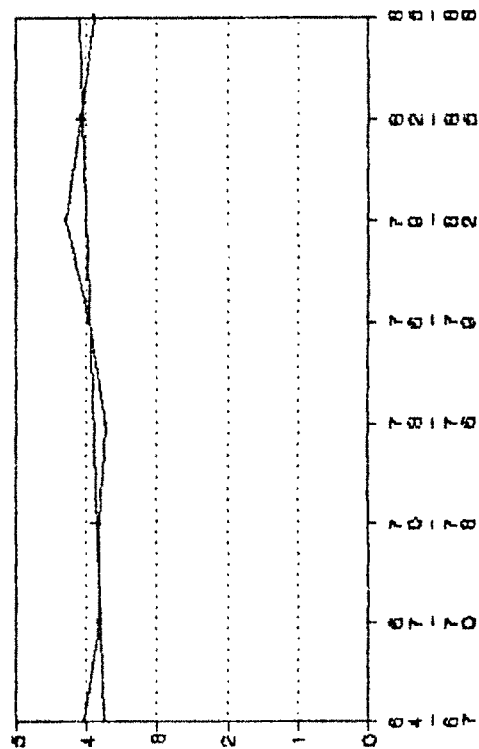
KHANAPUR



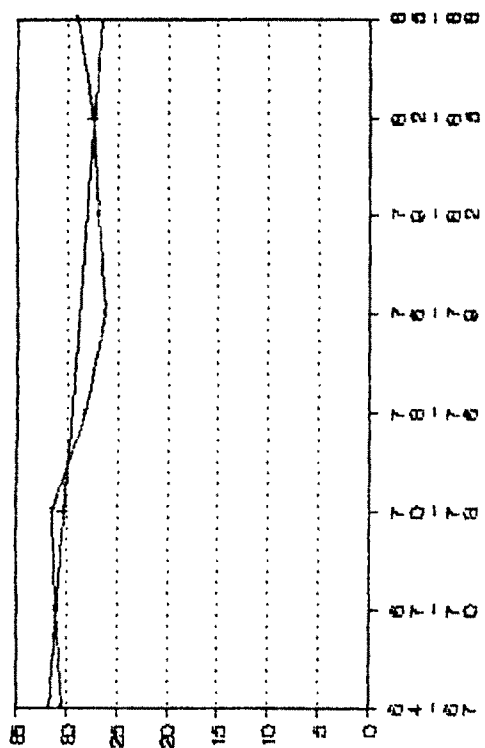
ATPADI



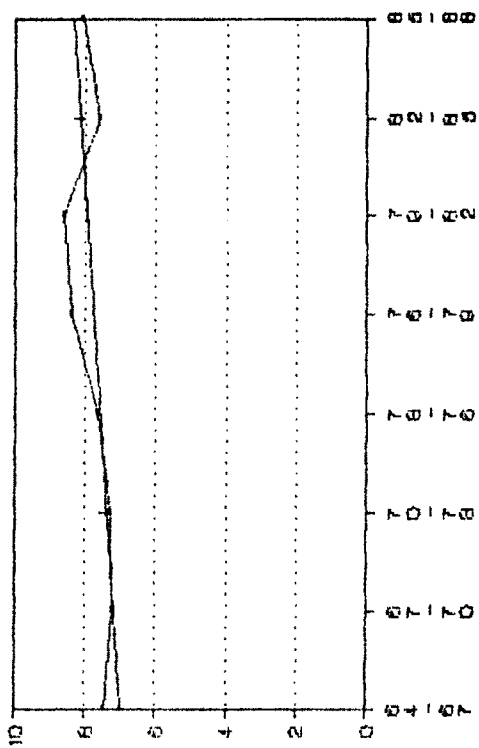
KAVATHE MAHANKAL



SHRALA



JAT



WALWA

it had the highest range magnitude of 5.25 per cent and Shirala had the lowest (0.57 per cent). However, by and large, the percentage area under cereals in all the talukas had moved within relatively narrow ranges, which is indicative of the inelasticity of supplies of the cereals.

3.3.1.2 Trends

The time series data of each taluka can now be utilised to find out the trend of percentage of taluka area in the district total. The trend lines for each taluka are shown in graphical presentation (Fig.3.2). It is seen from the Fig.s that Miraj, Khanapur, Tasgaon, Kavathe Mahankal, Walwa and Shirala recorded increasing trends as regards the percentage of area under cereals. Further, it could be seen that Khanapur, Kavathe Mahankal and Shirala showed marginal upward trend. The graphs in case of Jat and Atpadi showed decreasing trends. This is in spite of the fact the Jat taluka shared the maximum area under cereals. No taluka showed a constant trend.

Overall effect on district trend caused by upward and downward trends has been on the side of an upward trend. It means that the impact of upward trend in the six talukas overweighed the impact of downtrend in only two talukas.

3.3.1.3 Coefficient of variation

Fluctuations in area under cereals in the talukas

are gauged by using the statistical method of Coefficient of Variation (C.V.). It measures the variations in the area under cereals around the mean value of the trienniums. Following Table 3.3, maximum fluctuation of 11.37 percent under cereals is observed in case of Atpadi whereas area under this class of crops in Khanapur fluctuated only marginally as indicated by 2.88 per cent. Calculated figures of coefficient of variation of each taluka in the district are arranged in their ascending order in Table 3.3.

Table 3.3

C.V. values of taluka shares in the district area under cereals

Taluka	Coefficient of variation (percentage)
1 Khanapur	2.88
2 Shirala	4.23
3 Kavathe Mahankal	5.83
4 Walva	6.24
5 Jat	6.52
6 Miraj	7.96
7 Tasgaon	9.70
8 Atpadi	11.37

Source : Calculated on the basis of data in Table 3.1

The ascending order is as follows: Shirala, Kavathe Mahankal, Walva, Jat, Miraj, Tasgaon and Atpadi. It could be interpreted from the C.V. values that since for all the talukas except Atpadi, the values lie below 10 per cent, fluctuations in the percentage areas were rather moderate over the district and could be considered as obvious in agricultural production.

3.3.2 Taluka Area Of Cereals Vis-A-Vis Gross Cropped Area Of The Taluka

In this section taluka area under cereals will be considered for comparison with gross cropped area of the taluka. The level of importance of cereals for the taluka will be known by the same. For the purpose, in Table 3.1 in columns 4 to 11, the lower parentheses give the percentages of cereal crops areas to the gross cropped area of the taluka, similarly in the last row of the talbe, the figures in lower parentheses indicate average percentage of cereal crop areas in each taluka over the entire period 1964-88. The interpretation follows.

3.3.2.1 Average area

The range within which area under cereals as percentage of the GCA of the taluka moved over the period of 24 years could be noticed at a glance from Table 3.4.

Table 3.4

Talukawise range of area under cereals as percentage of the
GCA (1964-88)
(Percentage)

Taluka	Range of share	Range magnitude (percentage points)	Average for the entire period
1 Miraj	46.70 to 56.95	10.25	52.75
2 Tasgaon	46.24 to 62.49	16.25	56.03
3 Khanapur	50.86 to 66.95	16.09	56.31
4 Atpadi	61.81 to 82.13	20.32	69.47
5 Jat	72.84 to 81.06	8.22	76.43
6 Kavathe Mahankal	68.40 to 82.12	13.72	74.28
7 Walva	42.15 to 49.81	7.66	46.00
8 Shirala	29.86 to 35.33	5.47	33.07

Source: Compiled from Table 3.1

With reference to Table 3.4 it could be interpreted that except Shirala and Walva all the other talukas had average area under cereals more than fifty per cent for the entire period under consideration. Shirala taluka had only 33.07 per cent of area under cereals and it varied in the range of 29.86 per cent to 35.33 per cent of the gross ^{sp}cropped area. However, this range is very small compared to that of the other talukas of the district. Walva taluka had 46 per cent land under cereals which is the next higher value under this class of crop. Its percentage of area under this crop had moved between 42.15 and 49.81 per cent of the gross

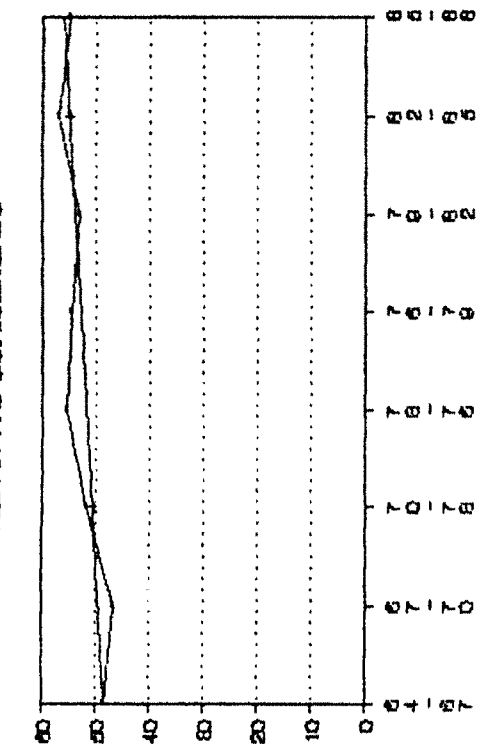
cropped area of the taluka. Hence the range magnitude is 7.66 percentage points. Jat had the highest area to the tune of 76.43 per cent of its GCA under this class of crops. The range of area varied between 72.84 and 81.06 per cent, showing the range magnitude of only 8.22 percentage points. Next to Jat followed in declining order of percentage of land under cereals Kavathe Mahankal taluka Atpadi, Khanapur, Tasgaon and Miraj. Kavathe Mahankal, Jat and Atpadi appeared to be the principal talukas growing jowar as nearly 60 to 70 per cent of their GCA was devoted to jowar crop. But among them, among all the talukas, Atpadi showed wide variations in area. Miraj, Tasgaon and Khanapur talukas remained at roundabout 50 to 55 per cent land share showing at the same time considerable variations. Walva and Shirala remained at the lowest ladder with less than 50 per cent land used for cereals but with very low variations.

3.3.2.2 Trends

The time series data of each taluka, when considered at a stretch, will bring out the trend of the share of cereals crops in the GCA of the talukas. The trend lines of the talukas are exhibited in Fig. 3.3, a glance at which brings out the following results.

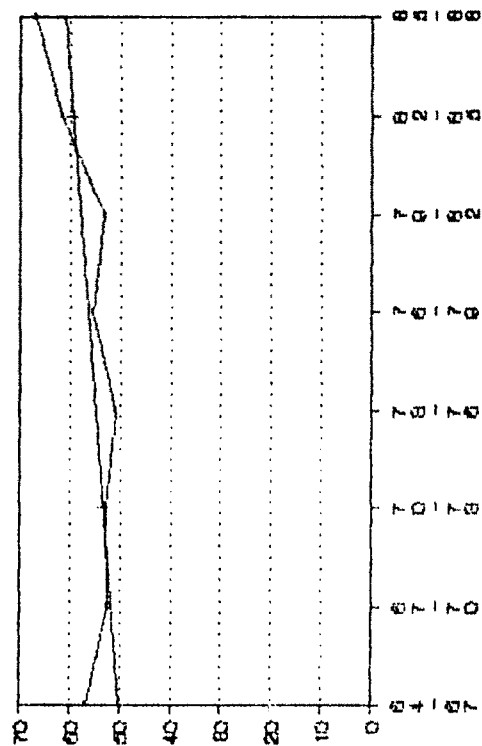
- (1) Six talukas (Miraj, Tasgaon, Khanapur, Kavathe Mahankal, Walva, Shirala) of Sangli district out of 8 talukas showed increasing trend of area shared under

TREND OF THE PERCENTAGE OF TALUKA
AREA IN ITS CROACERIALS



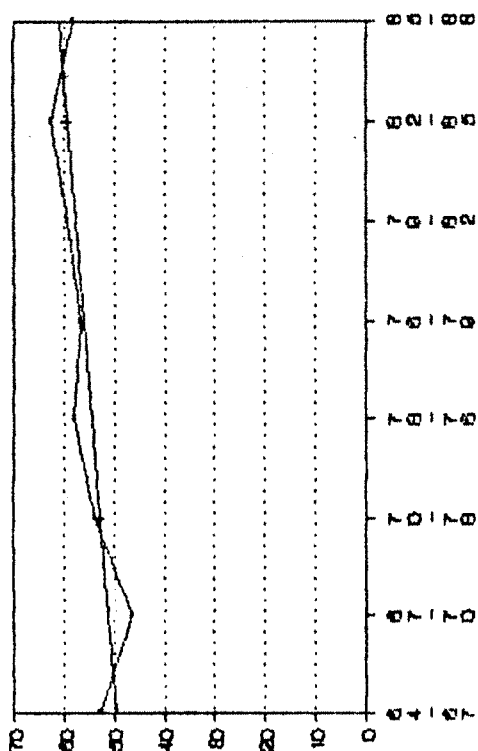
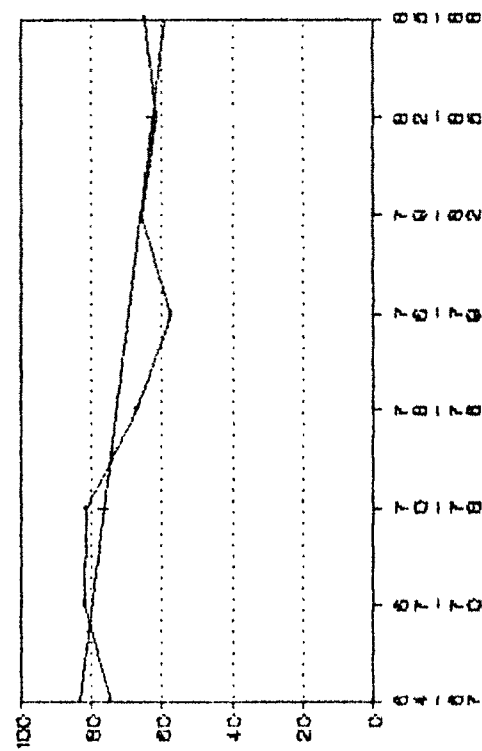
MIRAJ

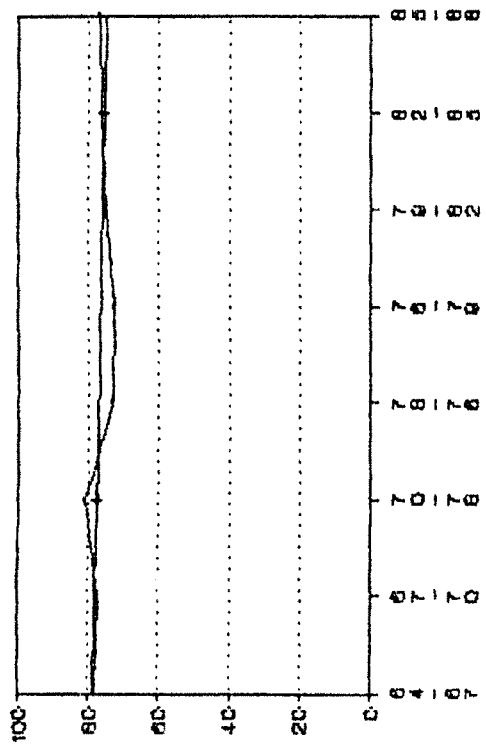
TASGAON



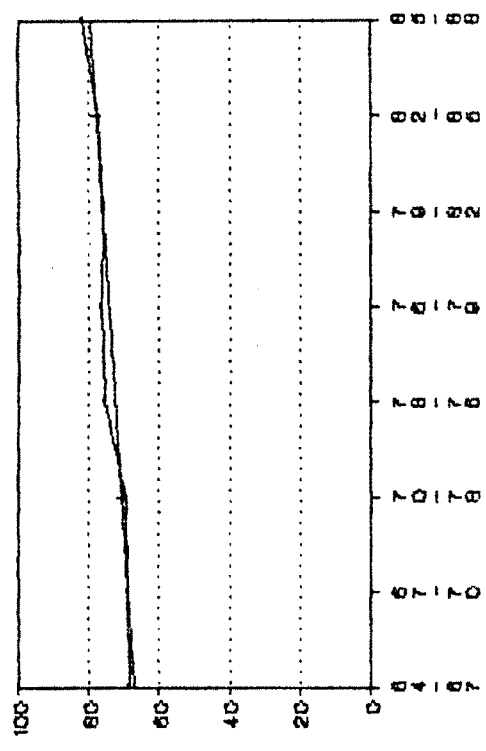
KHANAPUR

APTADI

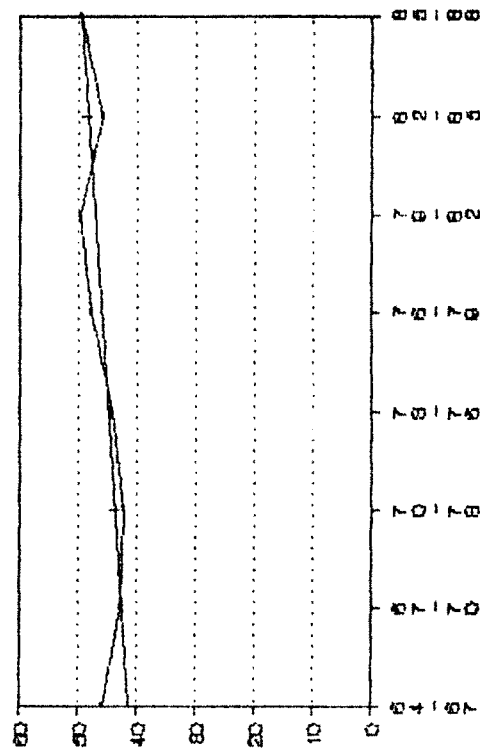




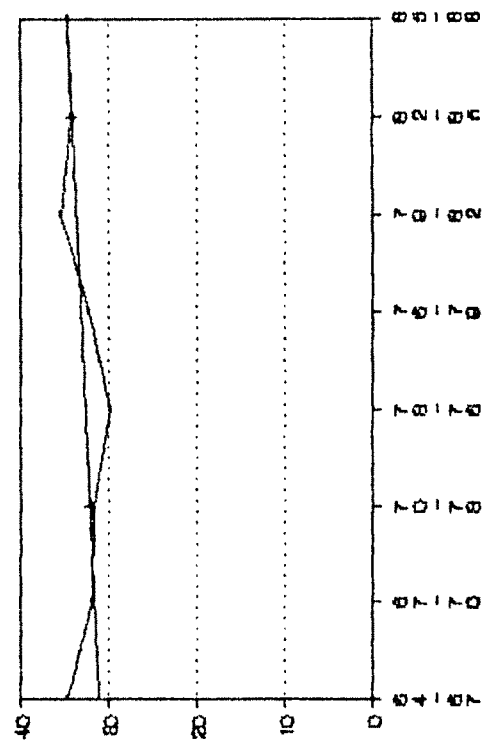
JAT



KAVATHE MAHANKAL



WALVA



SHIRALA

cereals.

- (2) Jat showed decreasing trend eventhough it shared the highest area of this class of crops, within its territory.
- (3) Atpadi showed the same trend as that of Jat eventhough the third higher share of area for cereals is given by this taluka.

3.3.2.3 Coefficient of variation

The magnitude of variation from one triennium to another will be measured by using the technique of coefficient of variation. Taluka wise coefficient are shown in Table 3.5

Table 3.5

C.V. values of taluka shares of cereals in their GCA

Taluka	Coefficient of variation (percentage)
1 Jat	3.28
2 Shirala	5.44
3 Walva	5.85
4 Kavathe Mahanhal	6.12
5 Miraj	6.33
6 Tasgaon	8.30
7 Khanapur	9.00
8 Atpadi	12.08

Source : Compiled from Table 3.1

Jat had the lowest coefficient of variation. It was noticed previously thus it had the highest percentage area under cereals. Hence it could be concluded that the taluka was almost consistent in sustaining this crop. The next higher degree of C.V. in sequence was shown by Shirala, Walva, Kavathe Mahankal, Miraj, Tasgaon, Khanapur and Atpadi. Atpadi alone was beyond 10 per cent of fluctuations in area, while all the other talukas were below it. Thus, an overall impression one gets is that all these talukas generally tried to maintain the cultivation of cereals within narrow range of fluctuations.

3.4 DISTRICT AREA OF JOWAR

Compiled data of Table 3.6 gives the information regarding the jowar crop that it occupied an area in the range of 31.67 per cent to 40.01 per cent of the GCA of Sangli district. Hence it could be interpreted that this is the most important foodgrain crop of this district. The area share of this crop among that of other food grains is the highest. Total foodgrains covered around 70 to 75 per cent of the district. Hence it could be said that jowar occupied almost 50 per cent of the area covered by total foodgrains. Jowar is the principal cereal crop of Sangli district.

Jowar is principally grown in Jat northern part of Miraj, Khanapur, Kavathe Mahankal, Walva and eastern part of Shirala except Warna region. Annual rainfall is ideal for

**TREND OF THE PERCENTAGE OF THE
DISTRICT AREA UNDER TOTAL JOWAR**

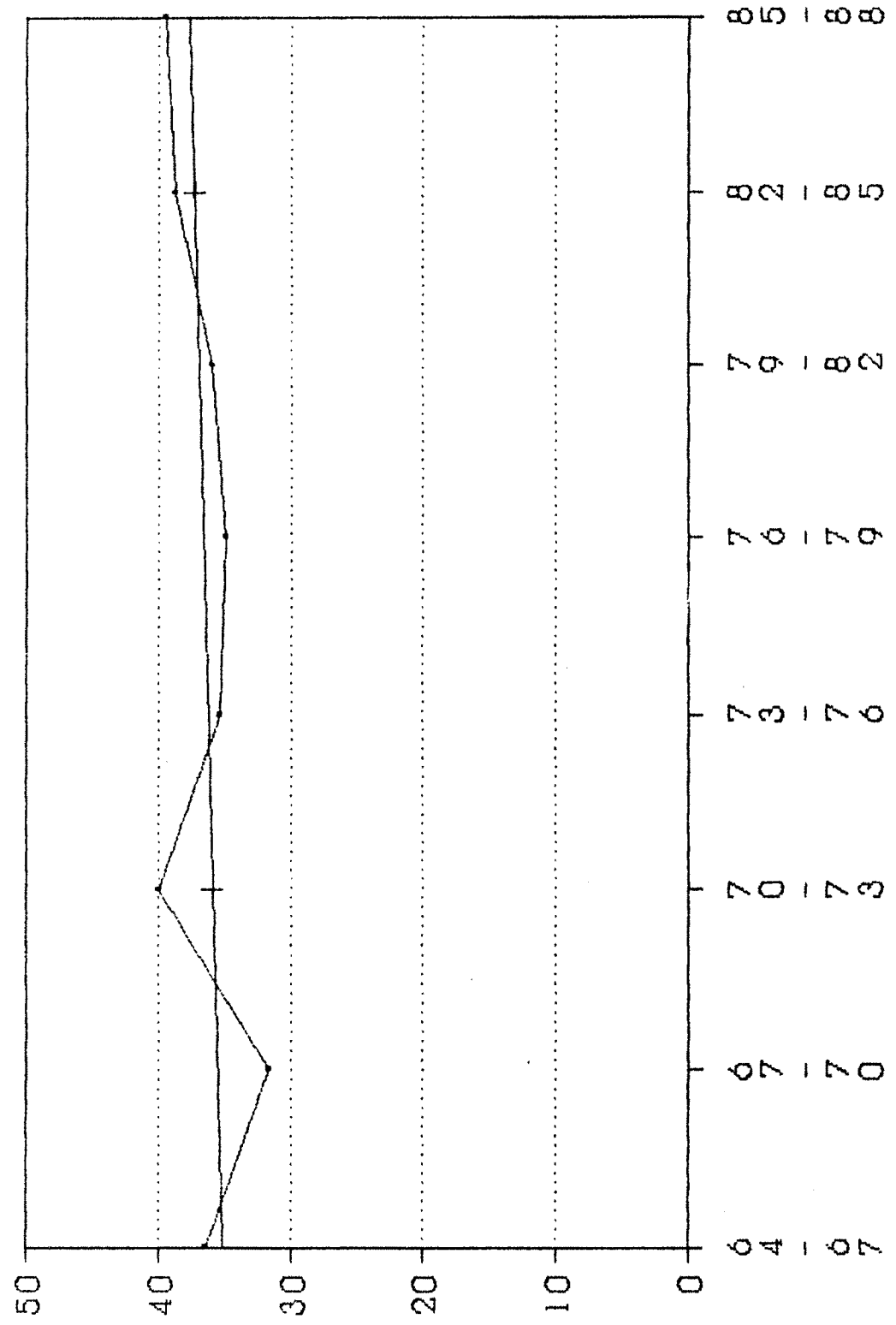


Table 3.6

Talukawise area under jowar in Sangli district

(Area in hectares)

Triennial Year	District Total		Miraj	Tasgaon	Khanapur	Atpadi	Jat	Kavathe Mahankal	Walva	Shirala
	Gross Cropped Area	Area under jowar								
1	2	3	4	5	6	7	8	9	10	11
1964 - 65 to 1966 - 67	6,77,929 (100.00)	2,46,564 (100.00) (36.37)	29,723 (12.05) (36.57)	40,981 (16.62) (45.68)	36,931 (14.97) (33.07)	16,062 (6.51) (22.86)	73,484 (29.80) (46.19)	17,314 (7.02) (33.44)	26,150 (10.60) (39.24)	4,730 (1.92) (9.96)
1967 - 68 to 1969 - 70	6,54,469 (100.00)	2,07,286 (100.00) (31.67)	25,401 (12.25) (32.36)	31,587 (15.23) (36.71)	27,871 (13.44) (25.10)	15,510 (7.48) (24.45)	62,667 (30.23) (40.45)	16,653 (8.03) (33.39)	22,734 (10.96) (34.22)	4,211 (2.03) (9.13)
1970 - 71 to 1972 - 73	6,27,792 (100.00)	2,51,217 (100.00) (40.01)	27,675 (11.01) (36.76)	31,005 (12.34) (37.04)	28,393 (11.30) (26.57)	25,851 (10.29) (45.47)	1,07,113 (42.63) (72.52)	19,688 (7.83) (42.77)	22,800 (9.07) (34.82)	3,985 (1.58) (8.68)
1973 - 74 to 1975 - 76	6,34,105 (100.00)	2,24,318 (100.00) (35.38)	28,016 (12.49) (37.75)	39,314 (17.53) (48.46)	28,733 (12.81) (26.25)	18,623 (8.30) (27.55)	61,694 (27.50) (43.10)	20,518 (9.14) (44.08)	23,286 (10.38) (36.11)	4,133 (1.84) (8.91)
1976 - 77 to 1978 - 79	6,45,928 (100.00)	2,25,833 (100.00) (34.96)	27,621 (12.23) (35.38)	41,446 (18.35) (44.88)	36,523 (16.17) (32.89)	17,007 (7.53) (24.27)	54,577 (24.16) (40.14)	21,435 (9.49) (46.10)	23,213 (10.28) (34.97)	4,010 (1.77) (8.63)
1979 - 80 to 1981 - 82	6,47,887 (100.00)	2,32,969 (100.00) (35.96)	26,252 (11.27) (34.59)	42,636 (18.30) (47.09)	36,850 (15.82) (32.10)	17,332 (7.44) (27.11)	63,177 (27.11) (45.38)	18,241 (7.82) (37.47)	24,113 (10.35) (35.75)	4,370 (1.87) (9.22)
1982 - 83 to 1984 - 85	6,33,725 (100.00)	2,45,268 (100.00) (38.78)	32,055 (13.06) (38.31)	47,084 (19.19) (53.10)	35,403 (14.43) (36.23)	18,828 (7.67) (30.49)	63,635 (25.94) (45.22)	21,231 (8.65) (43.27)	22,505 (9.17) (34.49)	4,526 (1.84) (9.67)
1985 - 86 to 1987 - 88	6,41,952 (100.00)	2,53,685 (100.00) (39.51)	29,663 (11.69) (34.97)	43,532 (17.16) (50.03)	40,136 (15.82) (43.70)	19,575 (7.71) (31.46)	66,912 (26.37) (43.59)	23,233 (9.15) (46.00)	25,980 (10.24) (39.18)	4,562 (1.83) (10.17)
Average 1964-65 1987-88 (24 years)	----	(100.00) (36.58)	(12.00) (35.83)	(16.84) (45.37)	(14.34) (31.98)	(7.86) (29.20)	(29.21) (47.07)	(8.39) (40.81)	(10.25) (36.09)	(1.83) (9.29)

Note : 1. Figures in lower parentheses in column 3 are percentage to column 2

2. Figures in upper parentheses in column 4 to 11 are percentages to column 3

3. Figures in lower parentheses in columns 4 to 11 are percentages to the GCA of the respective talukas

Source: Compiled on the basis of data collected from the relevant issues of Socio Economic Review and District statistical abstract of Sangli District for the years from 1964-65 to 1987-88, Directorate of Economics & Statistics Government of Maharashtra, Bombay.

growing of jowar crop in the entire district; hence jowar is grown principally wherever irrigation facility is very meager. Sp

On the basis of triennial averages, it is seen that the absolute area under jowar varied in the range of 2.07 lakh hectares to 2.53 lakh hectares during the time span 1964 to 1988. The highest average acreage recorded was during the triennium 1985-88 and the lowest was in the triennium 1967-70. There were fluctuations in the area covered by this crop over the entire period. There were normally drops during 1964-79 and then since 1979 again the area picked up ultimately to cross the limit of 1964-67 during the final triennium 1985-88. Both on the count of the absolute area and its percentage to the GCA, there was an increasing trend, though moderate in the area under jowar in Sangli district. For the entire period, on an average, about 37 per cent of the district GCA was occupied by jowar crop.

3.5 TALUKA PROFILE OF JOWAR

Talukawise details of jowar cultivation in the district are listed in columns 4 to 11 of Table 3.6. For the purpose of analysis of data, similar to cereals, two stage method is adopted. (A) Taluka area as percentage of district total area under jowar. (B) Taluka area as percentage of GCA of the taluka itself. Again results in each respect are presented with reference to the three parameters: (i) average

area: (ii) trend of area. (iii) coefficient of variation of area.

3.5.1 Taluka Area Vis-A-Vis District Area Of Jowar

In Table 3.6 all the 8 talukas of Sangli district are covered by columns 4 to 11. These columns exhibit firstly the absolute area in hectares for each triennial period. Then follow in upper bracket the percentage of taluka area to the district total area under jowar for respective triennium. The last row in the table gives in the upper brackets average share of each taluka in the district total over the entire period 1964-88. This section delves into these details Analysis follows.

3.5.1.1 Average area

A summary account of the range in which each taluka shared the crop area under jowar is presented in Table no.3.7.

The table could reveal that Jat shared the maximum area (29.21 per cent) under the crop in the district. Tasgaon followed the maxima but had a considerable difference from Jat. Thereafter followed closely Khanapur, Miraj and Walva. Kavathe Mahankal and Atpadi were closer to each other, but had less than 10 per cent of the district land under jowar. Shirala, with its average of 1.83 per cent,

cannot really be considered a jowar growing tract.

Table 3.7

Talukawise range of share of area under jowar (1964-88)
(percentage)

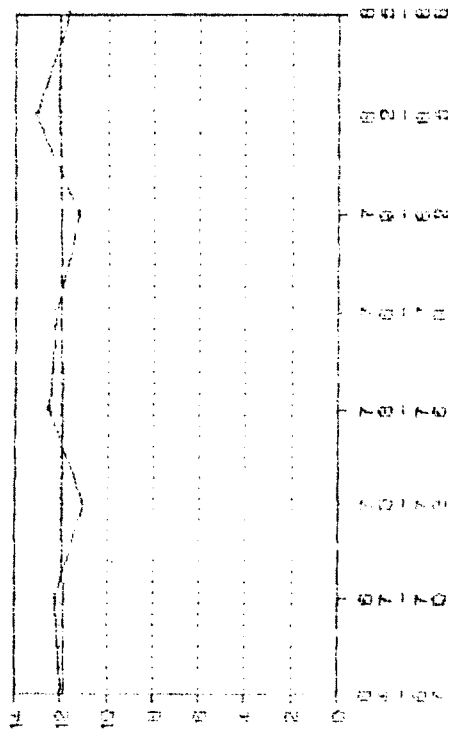
Taluka	Range of share	Range magnitude (percentage points)	Average for the entire period
1 Miraj	11.06 to 13.06	2.00	12.00
2 Tasgaon	12.34 to 19.19	6.85	16.84
3 Khanapur	11.30 to 16.17	4.87	14.34
4 Atpadi	6.51 to 10.29	3.78	7.86
5 Jat	24.16 to 42.63	18.47	29.21
6 Kavathe Mahankal	7.02 to 9.49	2.47	8.39
7 Walva	9.07 to 10.96	1.89	10.25
8 Shirala	1.58 to 2.03	0.45	1.83

Source: Compiled from Table 3.6

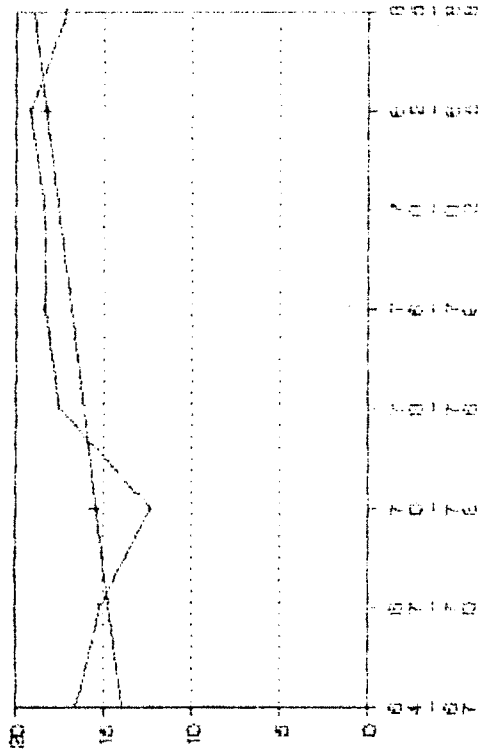
3.5.1.2 Trends

The time series data of each taluka from Table 3.6 will now be taken into account so as to find out the behavioural pattern of the fluctuations in the taluka area of jowar within the district area. This is an attempt to fit the trend line. Fig. 3.5 exhibits talukawise trends. The graphs show that Miraj taluka had almost constant trend with slight upward inclination while Tasgaon, Khanapur, Kavathe Mahankal depicted conspicuous upward trend. The downward

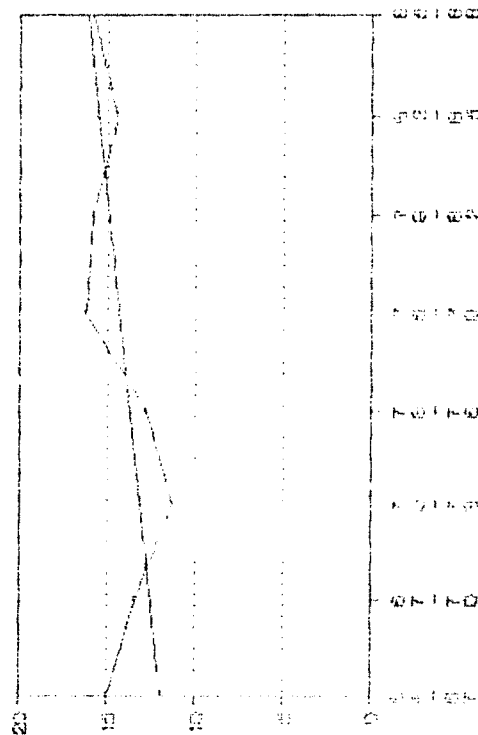
TREND OF THE PERCENTAGE OF FLUOR
AREA IN THE INTRACORONARY



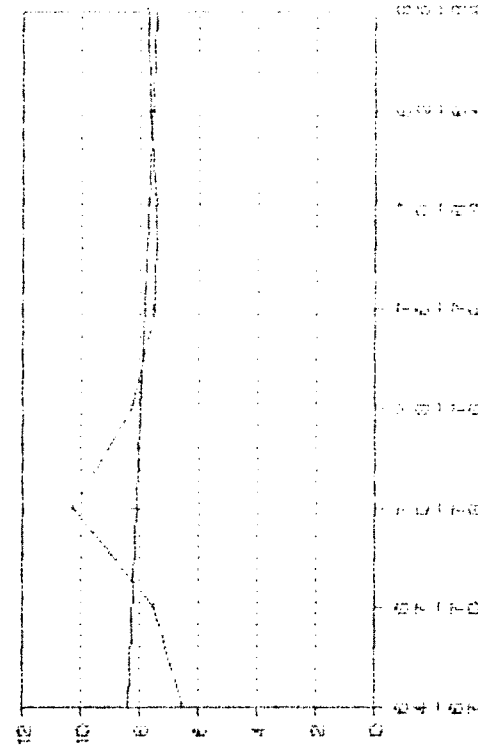
KHAMRUPUR



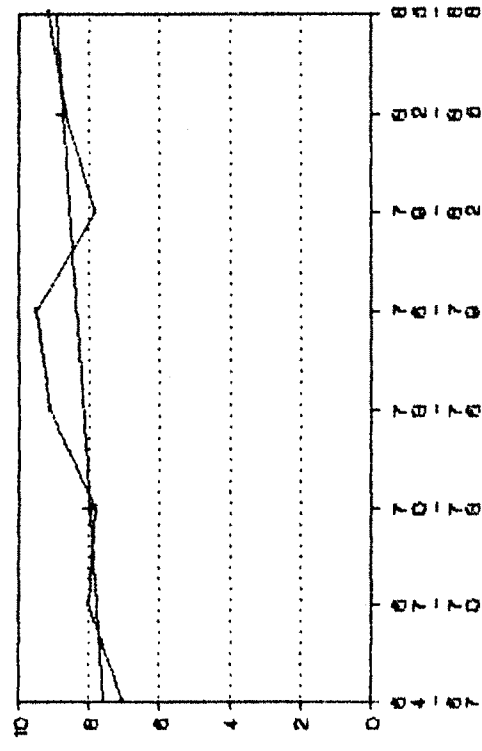
TASSON



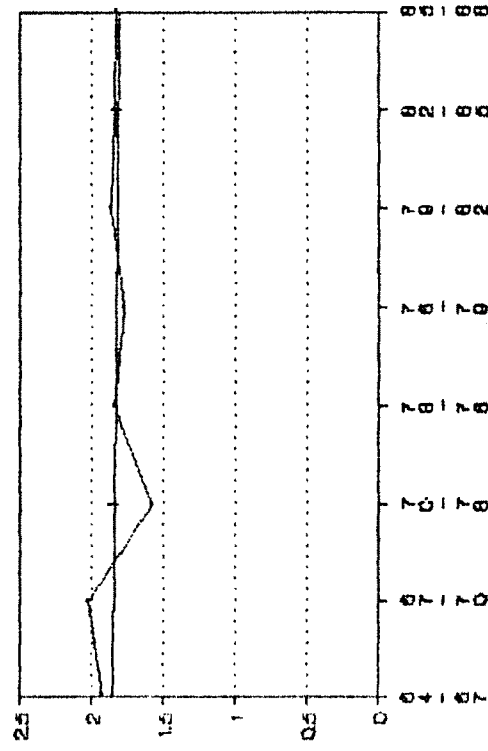
KHAMRUPUR



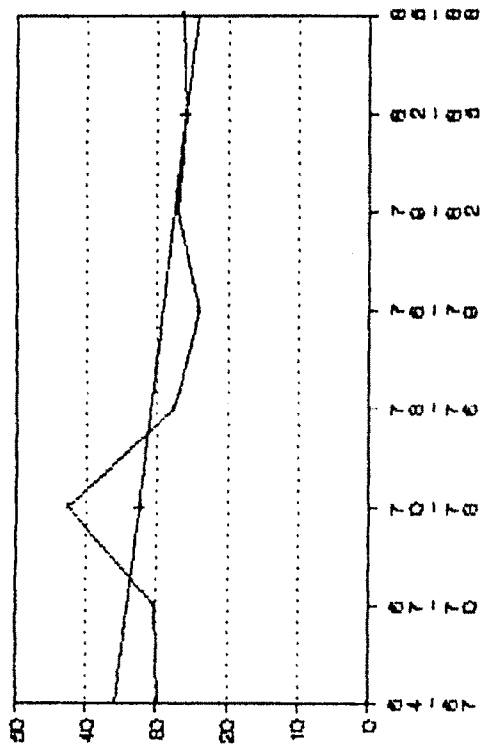
AT RADJI



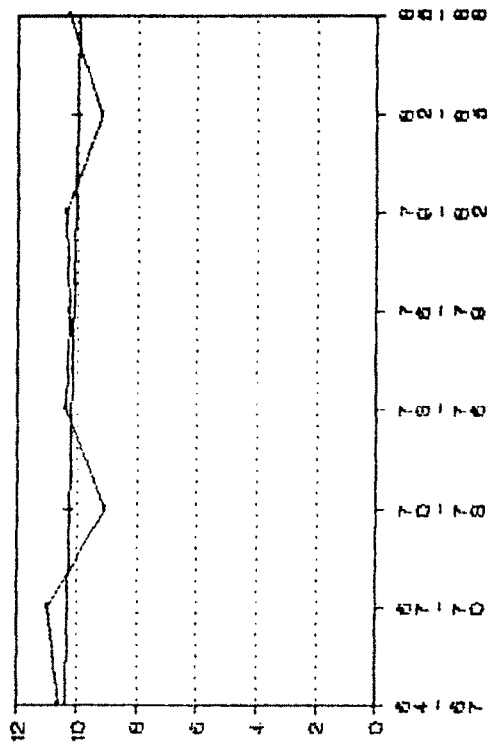
KAVATHE MAHANKAL



SHIRALA



JAT



WALVA

trend is clearly seen in case of Atpadi and Walva Shirala showed almost a constant trend with slight toward inclination. The resultant of this mixed trends on the district as a whole was upward trend.

3.5.1.3 Coefficient of variation

For comparing long-term fluctuations of taluka shares in the district total of the area under jowar, the technique of coefficient of variation has been employed. Estimated values of C.V. of each taluka are presented in Table 3.8.

Table 3.8

C.V. values of taluka shares in the district area under jowar

Taluka	Coefficient of variation (percentage)
1 Miraj	5.17
2 Walva	6.18
3 Shirala	6.58
4 Kavathe Mahanhal	9.48
5 Khanapur	11.17
6 Tasgaon	12.13
7 Atpadi	13.04
8 Jat	18.47

Source : Compiled from Table 3.6

Value of coefficient of variation is a pointer to the degree of year to year variations in the taluka area of the land as percentage of the district total. Lower the values, lesser the magnitude of change and higher the value, greater the magnitude of change. As it is seen from the table that even though Jat shared the maximum area under the crop, the C.V. in its case is the highest having the value 18.47 per cent, indicating thereby greater degree of area variability from year to year. Similar tendency could be seen with Khanapur, Tasgaon and Atpadi as their C.V. values exceed 10 per cent. Miraj had the lowest percentage value. Walva and Shirala were close to it while Kavathe Mahankal was near about 10 per cent.

3.5.2 Taluka Area Of Jowar Vis-A-Vis Gross Cropped Area Of The Taluka

This sub-section will throw light on the behaviour of taluka area under jowar with reference to the gross cropped area of the taluka and will thus introduce second dimension of the investigation. For this purpose, data in the lower parentheses of columns 4 to 11 in Table 3.6 will be used and the same three dimensional analysis would be presented.

3.5.2.1 Average area

It is but natural that share of area under jowar in the GCA would change from year to year and taluka to taluka. Triennial averages of these shares are averaged for the entire span. It will be worthwhile to know the range within which the area under jowar in each taluka as percentage of the GCA of the taluka had moved from one triennium to the other Table 3.9 gives the necessary details.

Table 3.9

Talukawise range of area under jowar as percentage of the GCA of the taluka (1964-88)

(percentage)			
Taluka	Range of share	Range magnitude (percentage points)	Average for the entire period
1 Miraj	32.36 to 38.31	5.95	35.83
2 Tasgaon	36.71 to 53.10	16.39	45.37
3 Khanapur	25.10 to 43.70	18.60	31.98
4 Atpadi	22.86 to 45.47	22.61	29.20
5 Jat	40.14 to 72.52	32.38	47.07
6 Kavathe Mahankal	33.39 to 46.10	12.71	40.81
7 Walva	34.22 to 39.24	5.02	36.09
8 Shirala	8.63 to 9.96	1.33	9.29

Source: Compiled from Table 3.6

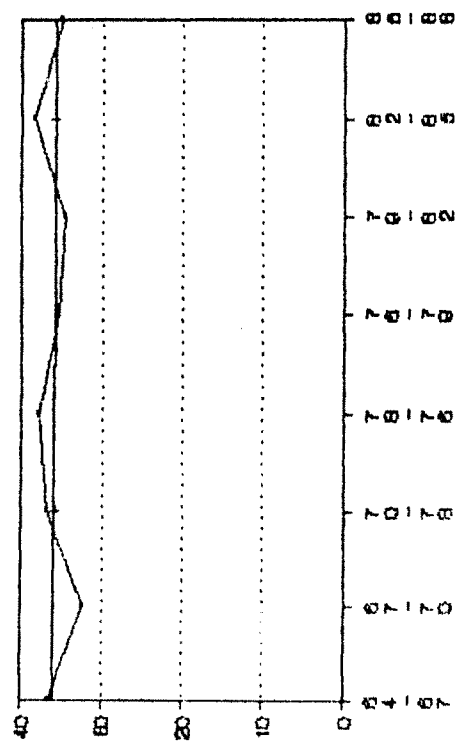
Jat had the maximum average area under the crop followed closely by Tasgaon. Both the talukas had little less than half of their GCA used for jowar cultivation. Miraj, Kavathe Mahankal and Walva were in the second stage utilising nearly 35 to 40 per cent of their GCA for jowar crop. Khanapur and Atpadi remained on the third ladder using 30 to 32 per cent of their land. Shirala was on the lowest ladder with little less than 10 per cent land covered by jowar crop.

The range magnitude gives the amplitude of variation within which the percentage area had moved from triennium to triennium. Higher the range magnitude, higher the variation and vice versa. The hierarchy of range magnitude could be arranged as follows: Jat, Atpadi, Khanapur, Tasgaon, Kavathe Mahankal, Miraj, Walva and Shirala. Thus movements of crop areas in Miraj, Walva and Shirala talukas were within very moderate limits.

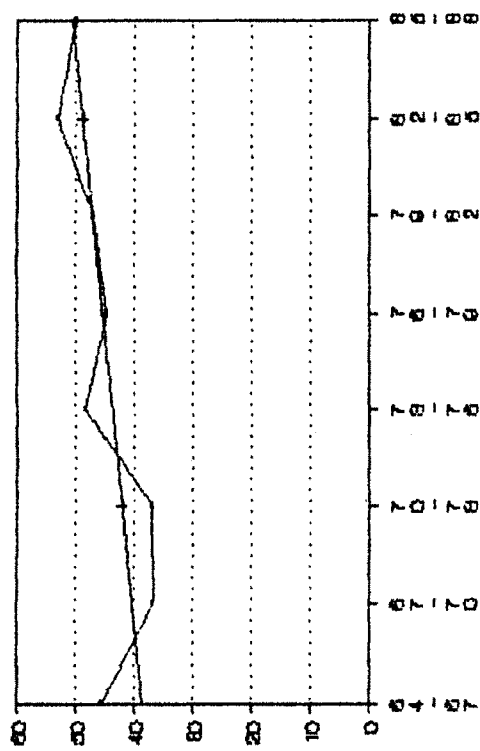
3.5.2.2 Trends

There were ups and downs in the land use for jowar in every taluka. Long-run behaviour of these fluctuations become visible through fitting of a trend line over the entire period. This is done in the Fig. 3.6 observation of this Fig. reveals that Miraj and Walva showed almost constant trend even though fluctuations were wide Miraj

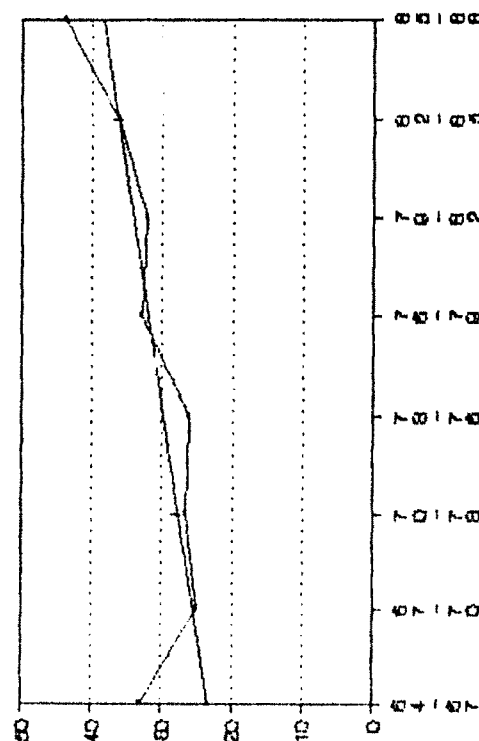
TREND OF THE PERCENTAGE OF TALUKA
AREA IN ITS GCA: JOWAR



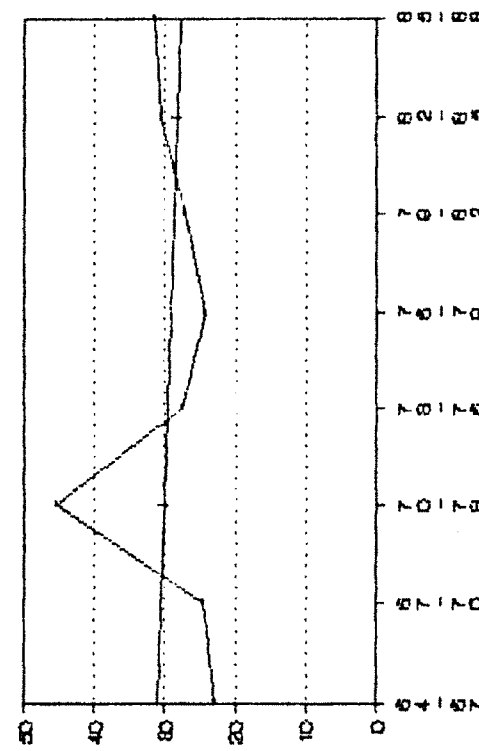
MIRAJ



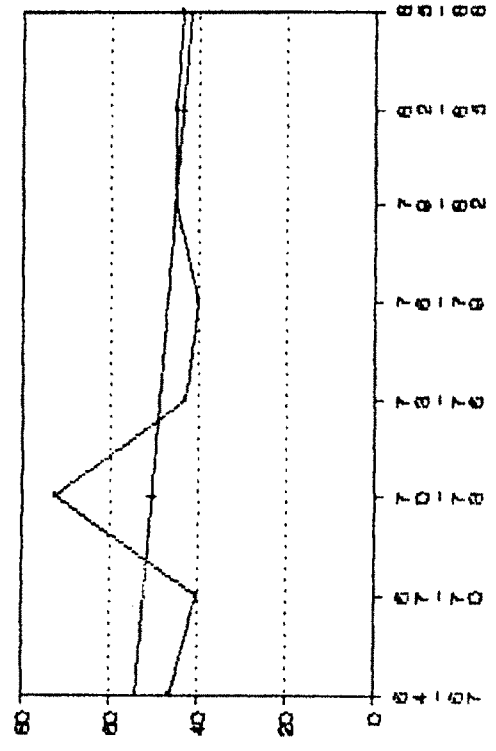
TASGAON



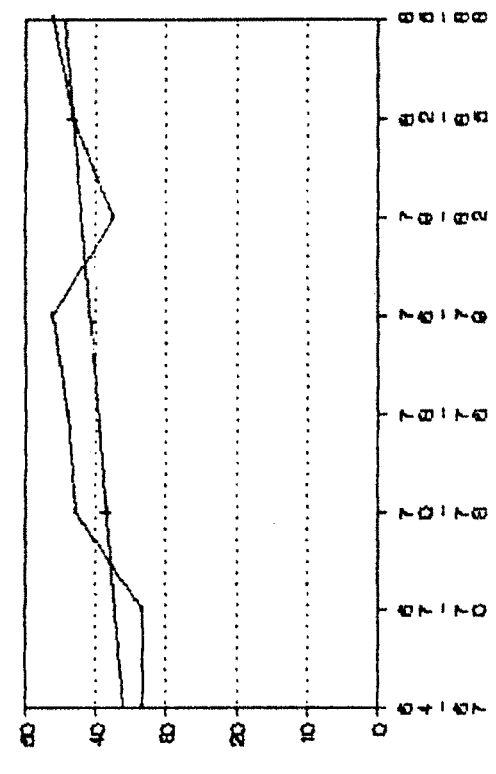
KHANAPUR



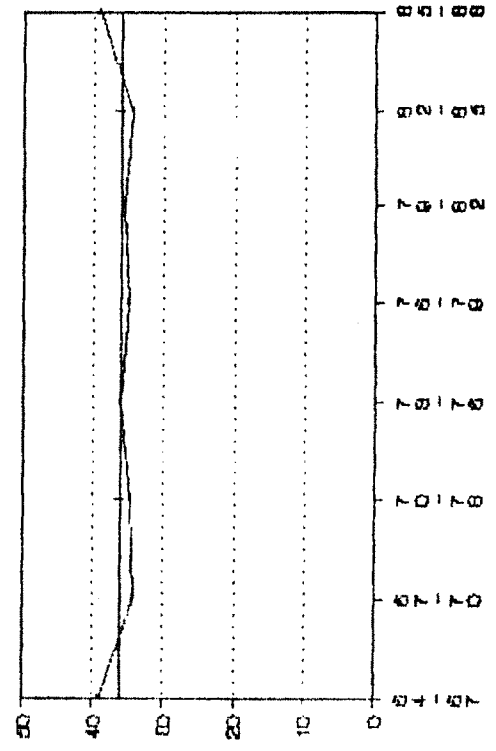
ATPADI



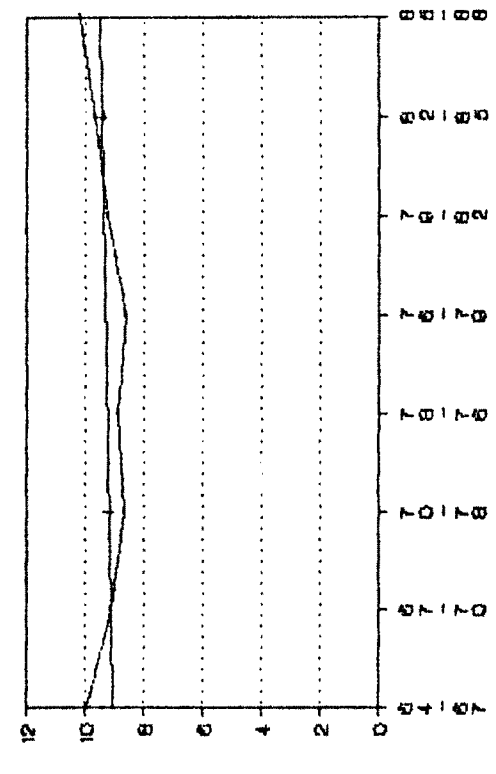
LAT



KAVATHE MAHANIKAL



WALVA



SHRALA

showed conspicuous downward trend upto 1970 and afterwards share of area under the crop increased above the average. In case of Walva, during the first triennium 1964-67 and the last triennium 1985-88 the values were above the average and in case of the in between trienniums the values were lowre than the average. Tasgaon, Khanapur, Kavathe Mahankal and Shirala had an overall upward trend. Atpadi and Jat experienced decreasing trend eventhough their average share of area in their GCA was quite higher than the other talukas.

3.5.3.2 Coefficient of variation

The degree of variability in jowar area of each taluka with respect to its GCA can be noticed with the help of the results presented in Table 3.10.

Table 3.10

C.V. values of taluka shares of jowar in their GCA

Taluka	Coefficient of variation (percentage)
1 Miraj	5.00
2 Walva	5.23
3 Shirala	5.83
4 Tasgaon	12.03
5 Kavathe Mahankal	12.12
6 Khanapur	18.06
7 Jat	20.90
8 Atpadi	23.15

Source : Compiled from Table 3.6

Higher the C.V. higher the variation in the area shared and vice-versa. Miraj, Walva and Shirala showed moderate variations in their area. Other 5 talukas had

C.V.values above 10 per cent indicating greater degree of variability form year to year. But within these, Tasgaon and Kavathe Mahankal were little above 10 per cent. On the contrary, Khanapur, Jat and Atpadi exhibited wider annual fluctuations in their area.

Importantly, Miraj and Walva which had constant trend as per Fig. 3.6 to also had the lowest values of C.V.

3.6 DISTRICT AREA OF BAJRA

Sangli district has substantially large area under bajra production. In the triennium 1967-70 it covered the largest area of 1,42,389 hectares which was 21.75 per cent of the GCA of the district. However, in the next triennium the total area slashed to 94,992 hectares (15.13 per cent). Eventhough there were ups and downs upto 1979 the trend was downward upto this year and thereafter there was increase in the area cultivated under this crops upto 1988. But the overall trend was conspicuosuly decreasing over the entire span under consideration. It, therefore, reveals that the cultivators appear to have withdrawn their land from cultivation of bajra in favour of some other crop. This overall decline in bajra area is a significiant aspect of change in the cropping pattern of Sangli district.

TREND OF THE PERCENTAGE OF THE DISTRICT AREA UNDER BAJRA

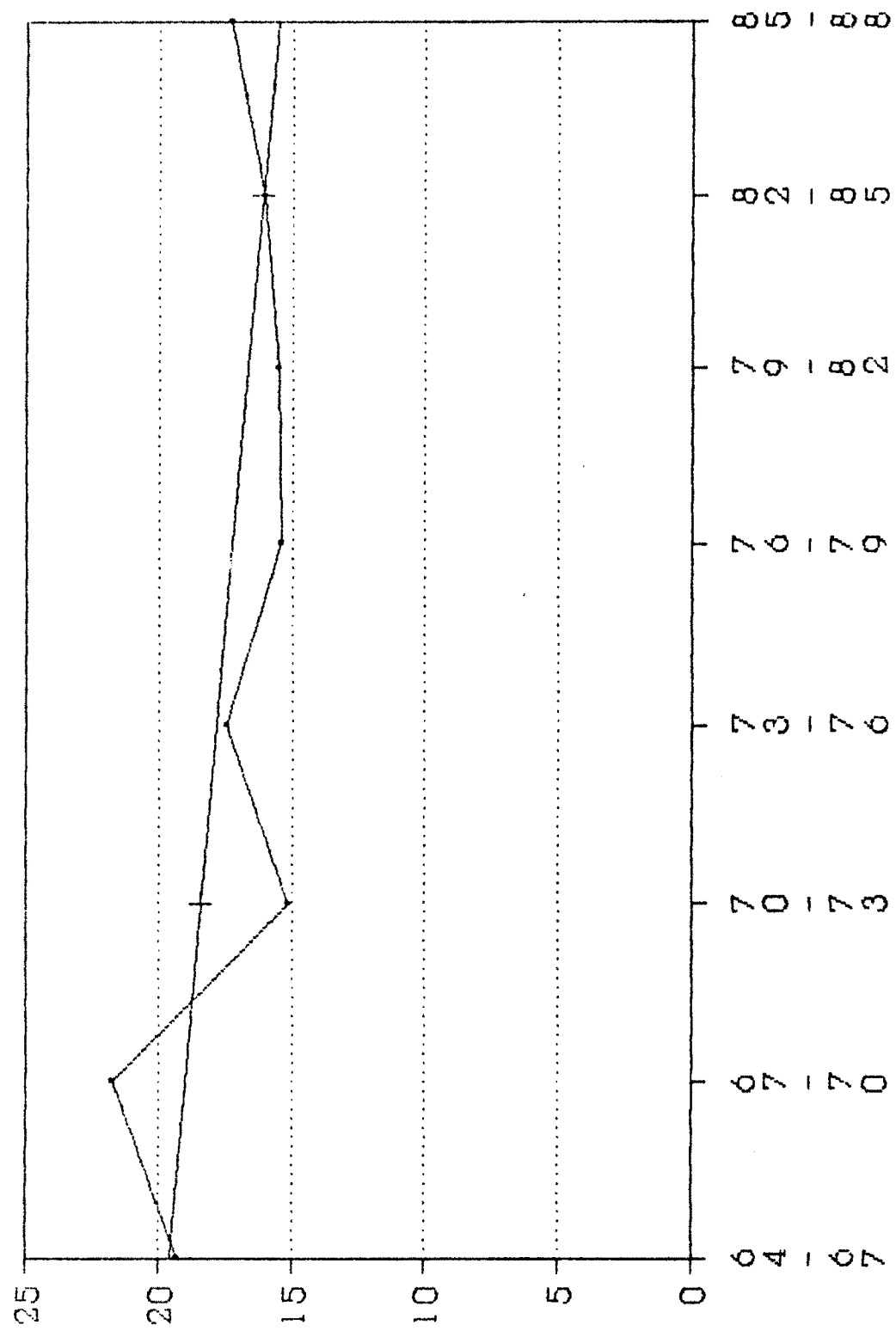


Table 3.11

Talukawise area under bajra in Sangli district

(Area in heactors)

Triennial Year	District gross cropped area	Area under total cereals	Miraj	Tasgaon	Khanapur	Atpadi	Jat	Kavatthe Mahankal	Walva	Shirala
1	2	3	4	5	6	7	8	9	10	11
1964 - 65 to 1966 - 67	6,77,929 (100.00)	1,30,890 (100.00) (19.30)	6,293 (4.80) (7.74)	3,523 (2.69) (3.93)	21,541 (16.45) (19.29)	35,101 (26.81) (49.96)	47,255 (36.10) (29.70)	16,817 (12.84) (32.48)	354 (0.27) (0.53)	4 (0.003) (0.008)
1967 - 68 to 1969 - 70	6,54,469 (100.00)	1,42,389 (100.00) (21.75)	8,024 (5.63) (10.22)	4,003 (2.81) (4.65)	24,790 (17.41) (22.32)	35,552 (24.96) (56.06)	52,738 (37.03) (34.03)	16,712 (11.73) (33.51)	567 (0.39) (0.88)	2 (0.001) (0.004)
1970 - 71 to 1972 - 73	6,27,792 (100.00)	94,992 (100.00) (15.13)	7,574 (7.97) (10.06)	2,886 (3.03) (3.45)	23,112 (24.33) (21.63)	19,238 (20.25) (33.84)	30,972 (32.60) (20.97)	11,008 (11.58) (23.91)	200 (0.21) (0.30)	0.66 (0.00) (0.001)
1973 - 74 to 1975 - 76	6,34,105 (100.00)	1,10,654 (100.00) (17.45)	8,970 (8.10) (12.08)	2,936 (2.65) (3.62)	21,288 (19.23) (19.45)	25,276 (22.84) (37.39)	38,701 (34.97) (27.03)	13,026 (11.77) (27.98)	446 (0.40) (0.69)	8.33 (0.00) (0.018)
1976 - 77 to 1978 - 79	6,45,928 (100.00)	99,604 (100.00) (15.42)	7,929 (7.96) (10.27)	2,364 (2.37) (2.56)	17,927 (17.99) (16.14)	21,062 (21.14) (30.06)	38,107 (38.25) (28.03)	11,767 (11.81) (25.31)	442 (0.44) (0.67)	5.33 (0.00) (0.011)
1979 - 80 to 1981 - 82	6,47,887 (100.00)	1,00,442 (100.00) (15.50)	7,316 (7.28) (9.64)	2,676 (2.66) (2.96)	15,857 (15.78) (13.82)	22,022 (21.92) (34.44)	36,123 (35.96) (25.95)	16,176 (16.10) (33.23)	215 (0.21) (0.31)	22 (0.02) (0.05)
1982 - 83 to 1984 - 85	6,33,725 (100.00)	1,01,697 (100.00) (16.05)	8,782 (8.63) (10.50)	1,968 (1.93) (2.22)	18,493 (18.18) (18.92)	18,028 (17.72) (29.20)	39,371 (38.71) (27.98)	14,816 (14.56) (30.19)	285 (0.28) (0.43)	566 (0.005) (0.01)
1985 - 86 to 1987 - 88	6,41,952 (100.00)	1,11,101 (100.00) (17.31)	9,307 (8.37) (10.97)	2,159 (1.94) (2.48)	15,751 (14.17) (17.15)	19,576 (17.62) (31.46)	47,135 (42.42) (30.70)	17,030 (15.32) (33.72)	142 (0.12) (0.21)	--- --- ---
Average 1964-65 1987-88 (24 years)	----	(100.00) (16.52)	(7.34) (10.19)	(2.51) (3.23)	(17.94) (18.59)	(21.66) (37.80)	(37.01) (28.05)	(13.21) (30.04)	(0.29) (0.50)	(0.004) (0.013)

- Note : 1. Figures in lower parentheses in column 3 are percentage to column 2
 2. Figures in upper parentheses in column 4 to 11 are percentages to column 3
 3. Figures in lower parentheses in columns 4 to 11 are percentages to the GCA of the respective talukas

Source: Compiled on the basis of data collected from the relevant issues of Socio Economic Review and District statistical abstract of Sangli District for the years from 1964-65 to 1987-88, Directorate of Economics & Statistics Government of Maharashtra, Bombay.

3.7 TALUKA PROFILE OF BAJRA

Taluakawise details of bajra cultivation in the district are presented in columns 4 to 11 of Table 3.11 for the purpose of analysis of this data, like that of jowar, here also two stage method is adopted: (a) taluka area as percentage of the district total area under bajra and (b) taluka area as percentage of the GCA of the taluka itself. Results in both the respects are presented with reference to the three parameters: (i) average area, (ii) trend of area and (iii) coefficient of variation of area.

3.7.1 Taluka Area Vis-A-Vis District Area Of Bajra

In Table 3.11 all the 8 talukas of Sangli district are covered in columns 4 to 11. These columns exhibit in the first place, the average absolute area in hectares for each triennial period then follow in upper parentheses percentages of taluka area to the district total area under bajra for the respective triennium. Last row in the table gives in upper brackets average share of each taluka in district total over the entire period 1964-88. This section examines these details interpretation follows:

3.7.1.1 Average area

A bird's eye-view of the range in which each taluka shared the crop area under bajra in the district can

be had from table 3.12

Table 3.12

Talukawise range of share area under bajra (1964-88)

(percentage)

Taluka	Range of share	Range magnitude (percentage points)	Average for the entire period
1 Miraj	4.80 to 8.63	3.83	7.34
2 Tasgaon	1.93 to 3.03	1.10	2.51
3 Khanapur	14.17 to 24.33	10.16	17.94
4 Atpadi	17.72 to 26.81	9.09	21.66
5 Jat	32.60 to 42.42	9.82	37.01
6 Kavathe Mahankal	11.58 to 16.10	4.52	13.21
7 Walva	0.12 to 0.44	0.32	0.29
8 Shirala	0.00 to 0.02	0.02	0.04

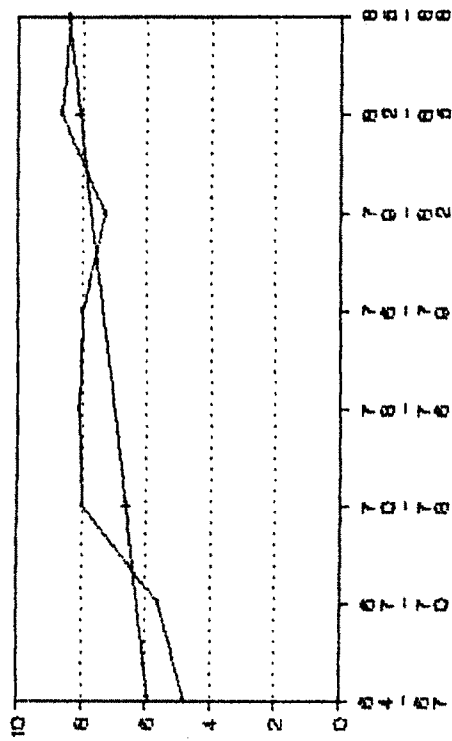
Source: Compiled from Table 3.11

Scrutiny of the table reveals a skewed distribution of bajra production in the district. Jat and Atpadi shared 37.01 per cent and 21.66 per cent of area under bajra in the district respectively. Thus, the two talukas together commanded nearly 59 per cent of the bajra land of the district. The next group could be of Khanapur and Kavathe Mahankal which together had another 31 per cent of the district land. Miraj, Walva and Shirala had almost negligi-

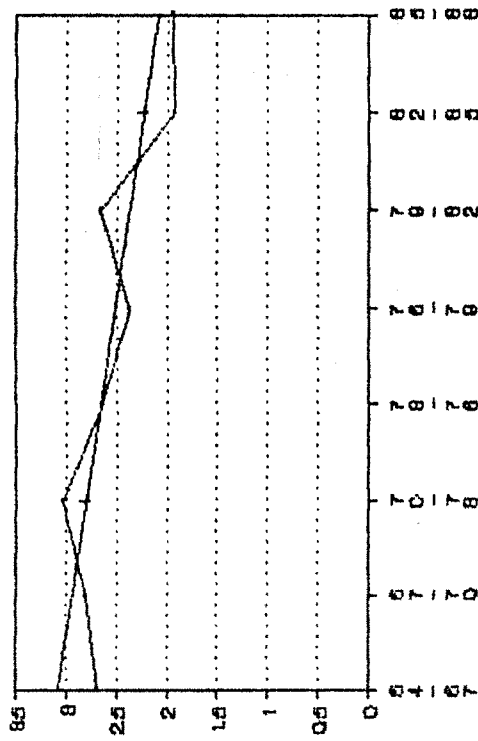
ble proportion of bajra cultivation, more so in case of the last two talukas.

The values in the column range magnitude (percentage points) will describe the total variation range within which the area had moved. Lower the range, lower is the variation and vice versa. Khanapur, Jat and Atpadi talukas remained in the higher brackets of variations in their acreage even though the production area was much more as compared to other talukas. In the middle of range magnitude Kavathe Mahankal, Miraj and Tasgaon could be placed. Walva and Shirala, which did not have any noticeable area under bajra, had obviously very negligible limits of variations. Jat, Atpadi, Khanapur and Kavathe Mahankal are from the plains and are located in the eastern region of the district. Hence it may be said that bajra cultivation is largely specific to the eastern talukas due to scanty rainfall. Walva and Shirala talukas are situated in the western region in the proximity of better rainfall area. Hence they are agro-climatically not suitable for bajra cultivation. Miraj (west) taluka is having irrigation facilities, hence cultivators prefer cash crops than cereals. Tasgaon area is also situated in the plains of eastern region in which cereals other than bajra are preferred. The southern part of the taluka is known for sugarcane cultivation. *known*

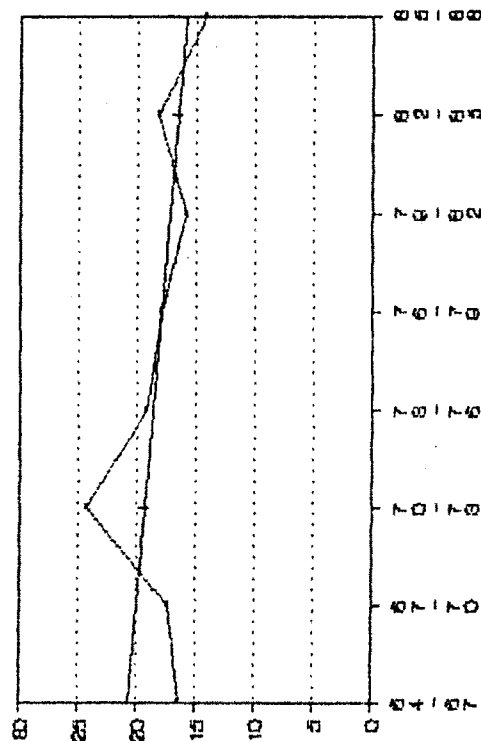
AREA IN THE DISTRICT: BAJRA



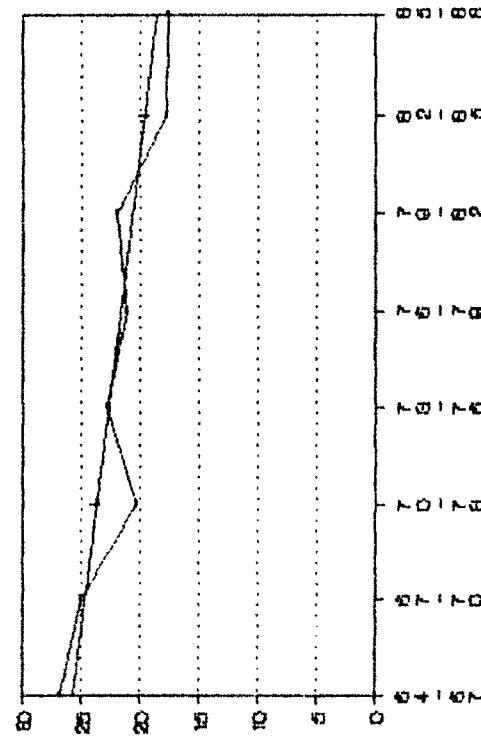
MIRAJ



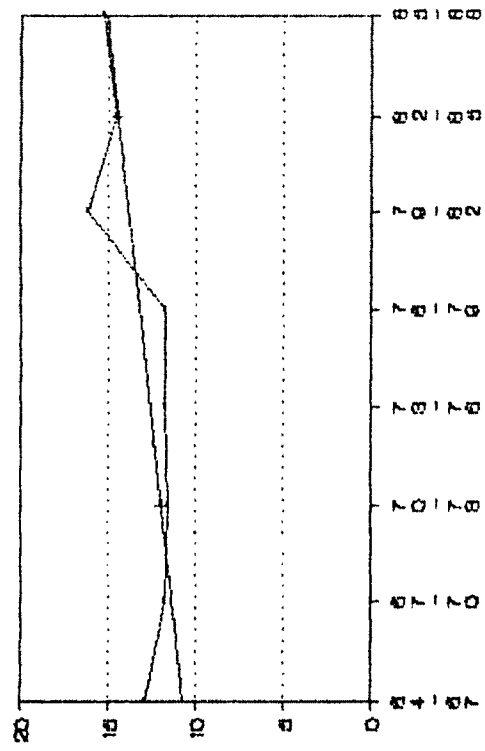
TASGAON



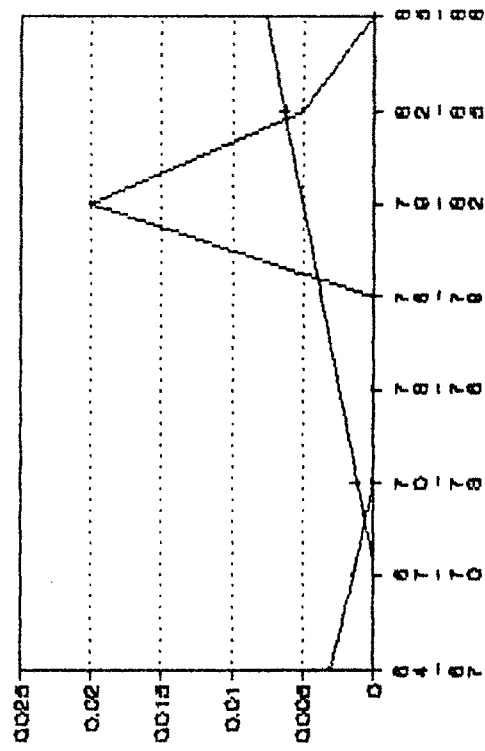
KHANAPUR



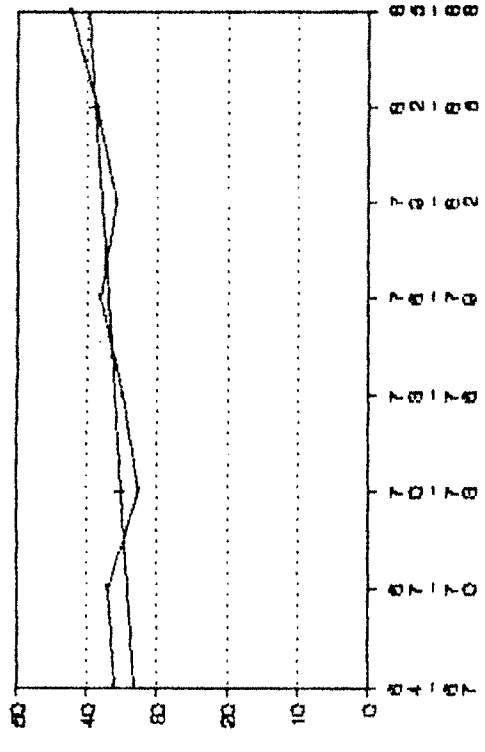
ATRADI



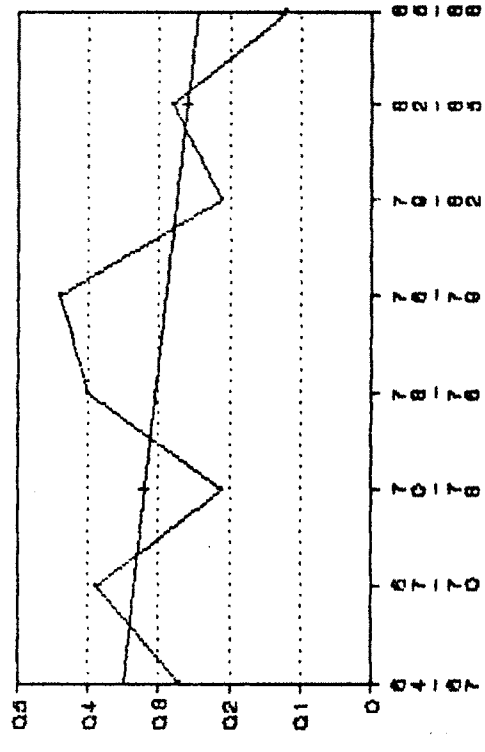
KAVATHE MAHANIKAL



SHRALA



JAT



WALVA

3.7.1.2 Trends

By taking triennial averages of the percentage of area under bajra for the entire period, it would be possible to fit the trend lines in order to know the nature of variations in the area of land in each taluka. Talukawise graphical presentarison are given in Fig. 3.8. It is noticed that 4 talukas (Miraj, Jat, Kavathe Mahankal, Shirala) registered uptrend whereas remaining 4 talukas (Khanapur, Tasgaon, Atpadi and Walva) registered downtrend. Eventhough the number of talukas in the two groups is even, ultimate effcect of these upward and downward trends was an overall downtrend which means that the four talukas exhibiting downtrend had greater influence on the district scene.

3.7.1.3 Coefficient of variation

Fluctuations in the taluka area under bajra from triennium to triennium have different intensities. The degree of varilability is measured by using the tool coefficient of variation. Talukawise results are shown in Table 3.13.

In case of bajra crop, fluctuations in taluka are as were very intense. Share of Jat taluka was maximum in the production of bajra as compared to othr talukas. Eventhen its coefficient of variation was the lowest of all and below 10 per cent indicating thereby a fair degree of statility in

the area. Kavathe Mahankal and Atpadi shared area under cultivation of the crop less than that of Jat but their C.V. values are more than Jat. Actually, Kavathe Mahankal, Atpadi, Tasgaon, Khanapur and Miraj fall into the bracket of talukas having C.V. values between 13 and 17 per cent showing wide annual fluctuations. Walva and Shirala had very negligible area under this crop, but the C.V. values are excessively high, particularly with Shirala. But this did not have significant effect on the total production of bajra in the district due to the negligible area under the crop in the two talukas.

Table 3.13

C.V. values of taluka shares of district area under bajra

Taluka	Coefficient of variation (percentage)
1 Jat	7.35
2 Kavathe Mahankal	13.01
3 Atpadi	13.94
4 Tasgaon	14.87
5 Khanapur	15.75
6 Miraj	17.67
7 Walva	35.91
8 Shirala	172.84

Source : Compiled from Table 3.11

3.7.2 Taluka Area Of Bajra Vis-A-Vis Gross Cropped Area Of The Taluka

This sub-section will bring to the limelight the behaviour of taluka area under bajra with reference to the GCA of the taluka and will thus introduce a second dimension of the study. For this purpose, data in the lower brackets of columns 4 to 11 in Table 3.11 will be used and the same three dimensional analysis would be presented.

3.7.2.1 Average area

Table 3.14 presents the range within which area under bajra in each taluka as percentage of the taluka's GCA has moved from one triennium to the other.

Table 3.14

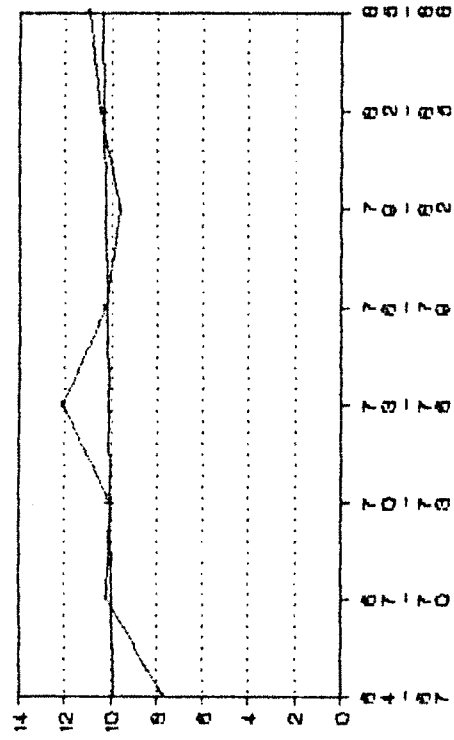
Talukawise range of area under bajra as percentage of the GCA of the taluka (1964-88)

(percentage)

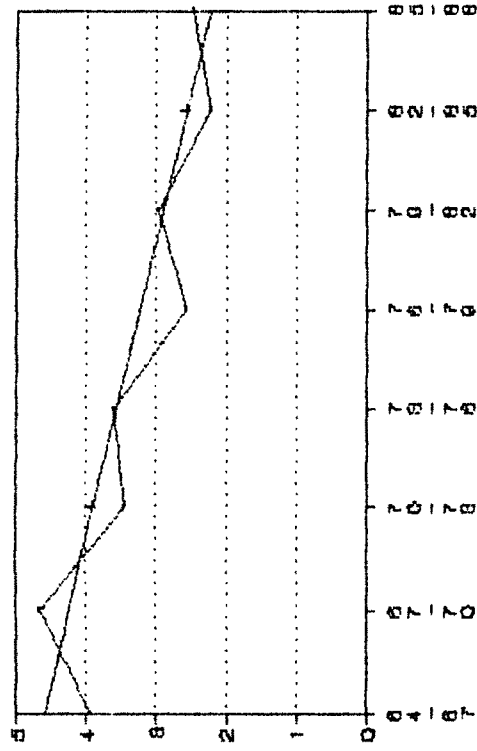
Taluka	Range of share	Range magnitude (percentage points)	Average for the entire period
1 Miraj	7.74 to 12.08	4.34	10.19
2 Tasgaon	2.22 to 4.65	2.43	3.23
3 Khanapur	13.82 to 22.32	8.50	18.59
4 Atpadi	29.20 to 56.06	26.86	37.80
5 Jat	20.97 to 34.03	13.06	28.05
6 Kavathe Mahankal	23.91 to 33.72	9.81	30.04
7 Walva	0.21 to 0.88	0.67	0.50
8 Shirala	0.00 to 0.05	0.05	0.013

Source: Compiled from Table 3.11

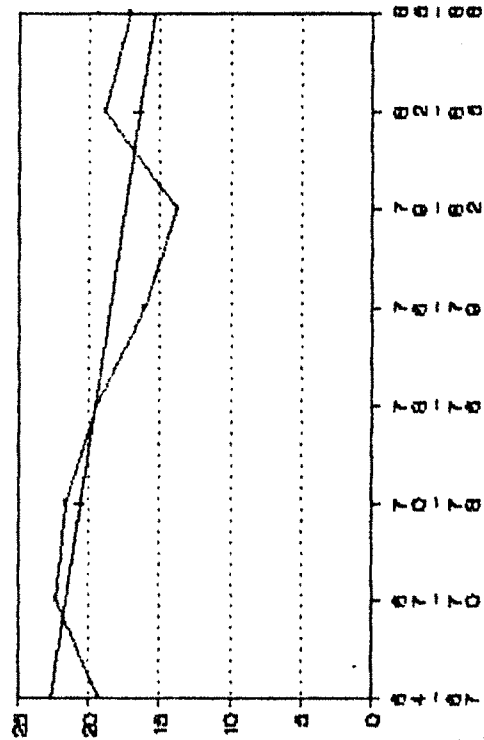
TREND OF THE PERCENTAGE OF THE
TALUKA AREA IN ITS GCA BAIRA



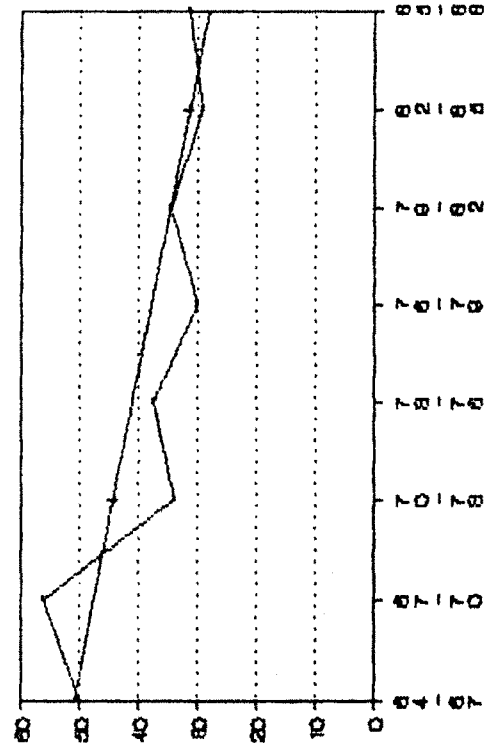
MIRAJ



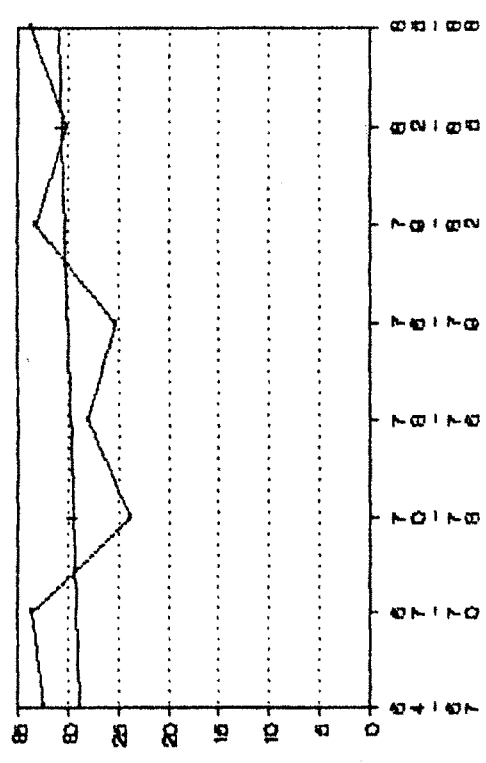
TASGAON



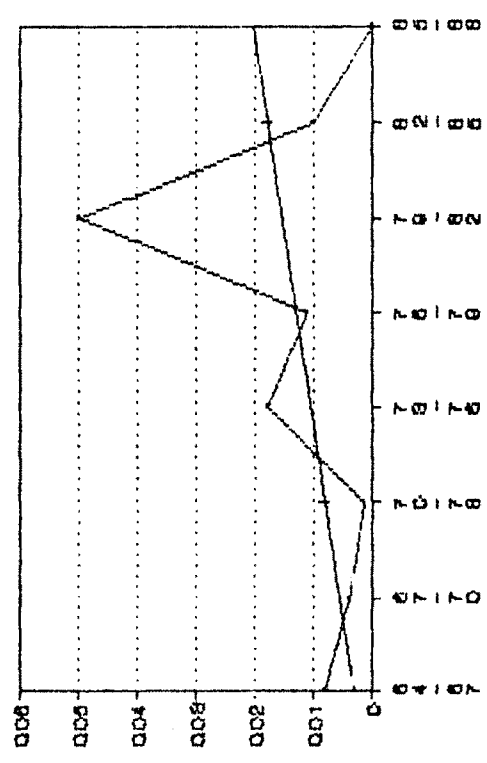
KHANAPUR



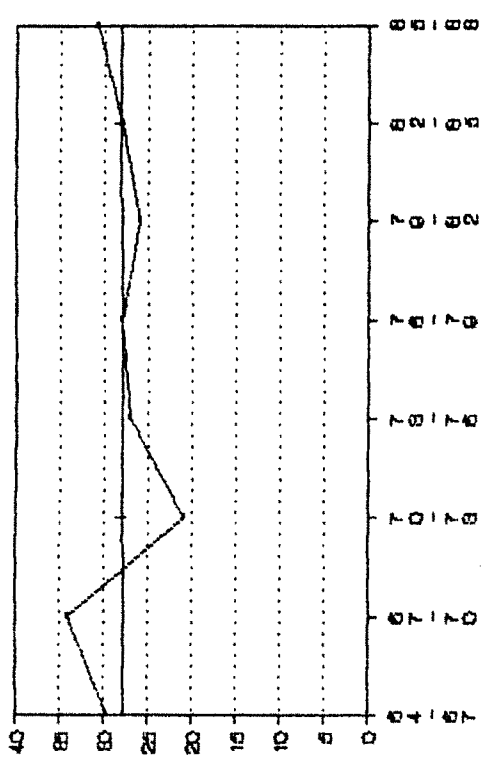
ATFADI



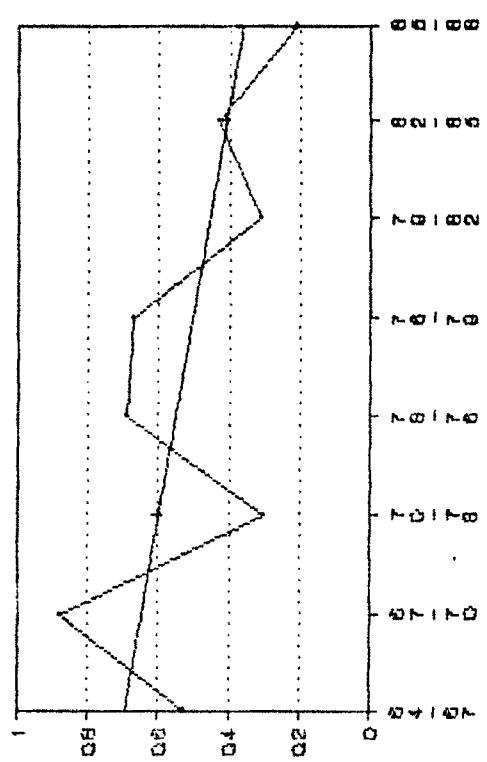
KAVATHE MAHANIKAL



SHRALA



JAT



WALVA

Atpadi, Kavathe Mahankal and Jat were the main talukas concentrating on production of bajra. Khanapur too had noticeable portion of its GCA under bajra. Tasgaon, Shirala and Walva did not much favour production of this crop. Eventhough Atpadi shared the maximum area under the crop within the taluka, its range magnitude in percentage points was the highest in the lot having the value 26.86 per cent. This means that variations in the area shared out of the GCA of the taluka, were considerable Kavathe Mahankal shared fairly high percentage of area out of its GCA but its range magnitude was 9.81 percentage points only. Range magnitude of Jat was more than Kavathe Mahankal. Other talukas had comparatively narrow range of percentges.

3.7.2.2 Trends

The underlying tendency in the ups and downs of the proportion of area under bajra in the GCA of the taluka is given by the trend line. Talukawise picture of trend lines is exhibited in Fig. 3.9. A careful examination of the diagrammatic presentation reveals that Miraj, Jat, Kavathe Mahankal and Shirala had rising trend but these rising trends were very marginal. On the other hand, falling trends in case of Tasgaon, Khanapur, Atpadi and Walva were significant. The talukas showing falling trend were gradually substituting other crops for bajra. The overall impact of these individual cases was that the district trend was

downward.

3.7.2.3 Coefficient of variation

Taluka area as percentage of its GCA has varied from time to time. The intensity of this variation is measured with the help of coefficient of variation. Taluka-wise results are given in Table 3.15.

Table 3.15

C.V. values of taluka shares of bajra in their GCA

Taluka	Coefficient of variation (percentage)
1 Miraj	11.29
2 Kavathe Mahankal	12.11
3 Jat	12.67
4 Khanapur	14.14
5 Tasgaon	24.00
6 Atpadi	24.43
7 Walva	43.32
8 Shirala	115.56

Source : Compiled from Table 3.11

The intensity of variation was high and was in the range of 11.29 to 115.56 per cent. Miraj, Kavathe Mahankal, Jat and Khanapur had the C.V. values within the range of 11 to 14 per cent. Eventhough fluctuations in area of Miraj and

Khanapur were in the relatively lower range, overall effect of this was less because their area share was only in the range of 10 to 18 per cent. Kavathe Mahankal and Jat had the C.V. values of 12.11 per cent and 12.67 per cent respectively, but the overall impact of this was quite significant since the average area shared was around 30 per cent of their GCA. Next group is of Tasgaon and Atpadi talukas which the C.V. values of 24 per cent. But the impact of this higher fluctuation on overall production of bajra in case of Tasgaon taluka was negligible because it had just 3 per cent of its GCA under bajra. Exactly opposite was the case of Atpadi because of its 37 per cent share in its GCA. Walva and Shirala taluka need not be considered very seriously as their shares in the bajra land were insignificant.

3.8 CONCLUSION

Production of cereals dominates the agricultural production activity in Sangli district, Jowar and bajra have remained as principal crops among the cereals. In between these two crops, jowar had major share in the GCA of the district almost twice that of bajra.

Perusal of the results of data over 1964-88 as given in Table 3.16 reveals that the share of cereals in the GCA of the district had an upward trend. When it comes to the component of crops, Jowar had conspicuous uptrend

whereas bajra had noticeable downward trend. Cereal production as a whole exhibited an upward trend whereas in case of bajra it was opposite. It could be interpreted that released bajra area was being used for production of jowar. This is, however, the first approximation. The alternatives pursued by the cultivators could be known only when the analysis of other crop groups is done.

Table 3.16

Summary of trends in area

Taluka	Cereals		Jowar		Bajra	
	(A) District	(B) GCA	(A) District	(B) GCA	(A) District	(B) GCA
1 Miraj	up	up	up	down	up	up
2 Tasgaon	up	up	up	up	down	down
3 Khanapur	up	up	up	up	down	down
4 Atpadi	down	down	down	down	down	down
5 Jat	down	down	down	down	up	up
6 Kavathe Mahankal	up	up	up	up	up	up
7 Walva	up	up	down	constant	down	down
8 Shirala	up	up	down	up	up	up
District resultant	uptrend		uptrend		downtrend	

Note: (1) 'A' : Trend with respect to taluka ~~to~~ area as percentage of the district area.

(2) 'B' : Trend with respect to taluka area as percentage of its GCA

With reference to individual talukas, change in the cropping pattern represented mixed situation. Restricting to the class of crops, viz. cereals, it was noticed that Miraj, Tasgaon, Kavathe Mahankal, Walva and Shirala registered uptrend whereas Jat and Atpadi showed downtrend. This was the experience of the talukas within the district as well as taluka settings.

Considering individual crops, viz. jowar and bajra, it was noticed that Miraj and Kavathe Mahankal showed upward trend for both the crops. Both Tasgaon and Khanapur showed upward trend for jowar and downward trend for bajra. Atpadi and Walva demonstrated downward trend for both the crops. Jat and Shirala showed downward trend in case of jowar and upward trend in case of bajra. This was experienced within the district setting.

The other dimension was looking the two crops as share of the taluka's GCA. Kavathe Mahankal and Shirala both presented upward trend. Tasgaon and Khanapur had upward trend for jowar and downward trend for bajra. Opposite was the experience of Miraj and Jat. Walva had constant trend in case of jowar and downward trend in case of bajra. Atpadi was a case of downward trend both in jowar and bajra.

In sum, a readjustment in cropping pattern of the district was taking place so far as cereals cultivation was concerned.