

# Cropping Patter in Buldhana District

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## ABSTRACT

The research entitled "Cropping pattern in Buldhana district" was carried out with the objective of studying changes in crop behaviour in the Buldhana district. The present study was based on secondary data collected from 1990-91 to 2009-10. In all 15 crops were considered and covered more than 80 percent of the total cropped area of the study area. The Simple tabular analysis was used to examine the changes in cropping patterns in various *talhsils* of the Buldhana district. In the majority of *talhsils* of Buldhana district i.e. Malkapur, Khamgaon, Nandura, and Shegaon, cropping pattern have significantly increased during the study period.

**Keywords:** Cropping pattern, crop area and *Talhsils* of Buldhana

The study of cropping patterns assumes great significance as it is one of the critical paths for the balanced development of agriculture to meet human requirements. The adoption of a better cropping pattern optimally suited to the technological changes is an important one for augmenting agricultural growth. Cropping pattern of a particular area either state, region, district etc., emerges through the interaction of physical, social, economic, technological, and infrastructural factors. It is a function of climatic elements, their periodicity expressed in terms of seasons, nature of soils, physiography, and man-introduced factors like irrigation, fertilizers etc. Amongst the climatic factor, precipitation, its distribution, and periodicity have a more excellent determinant value. Cropping pattern indicates the percentage of area occupied by different crops. Cropping pattern has been dynamic to cope up the changing scenario and to meet -changing demands of a growing population ever.

## MATERIALS AND METHODS

For the present study, the primary food grain and non-food grain crops of Buldhana district were

selected, and time series secondary data were collected from different published sources for the study.

## Analysis of changes in cropping pattern behavior

Cropping patterns in terms of Percentage share of individual crops in the gross cropped area were worked out at different points in time. The point at which analysis of cropping patterns was be done are 1990-1991, 1995-1996, 2000-2001, 2005-06, 2009-2010.

## RESULTS AND DISCUSSION

### 1.To study the change in cropping pattern behavior

#### 1.1 Changes in cropping pattern in Malkapur *tehsil*

The changes in the cropping pattern in Malkapur

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*tahsil* are presented in the Table 1. In Malkapur *tahsil*, Cotton, Soybean, and *Kharif* Jowar were significant crops during the study period. The proportion of area under Cotton crop was 46.52 percent in 1990-91 and in the year 2000-01, it was 45.45 percent, indicated that decreasing area under cultivation of Cotton. Next to Cotton, Soybean was the important emerging crop of the *tahsil*, showing an increasing area in the last five years, 1.95 percent to 5.68 percent from 2005-06 to 2009-10. The area under *tur* ranges between 9.22 to 6.98 in the study period. Regarding areas under Wheat, Black Gram, and Gram, no more changes were observed in the study period. The area under *Kharif* Jowar was percent in 1990-91, which was declined to 28.01 percent as in the year 2009-10. No significant changes in gross cropped area were

observed in the period of study. The greatest percent change in the area was found in the other crops, i.e., 10.19 percent to 11.63 percent the base period from 1990-91 to 2009-10, which may be due to the entrance of other cash crops in the district. From the above table, it also showed that the Gram crop has shown the most replaced crop, which has been decreased to 73.95 percent to the base period may be because it is a subsistence crop to the farmers. It is also shown in Malkapur *tahsil* the cotton crop covers the consistent area which is somehow in decreasing i.e. 1.07 percent to the base period 1990-91 to 2009-10 which revealed that it is still the primary crop of the *tahsil* which is used mainly as a cash crop to the farmers.

**Table 1:** Changes in Cropping Pattern in Malkapur *Tahsil*

| Sl. No. | Crops               | Year          |               |                       |               |                       |               |                       |               |                       |
|---------|---------------------|---------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|
|         |                     | 1990-91       | 1995-96       | % change over 1990-91 | 2000-01       | % change over 1990-91 | 2005-06       | % change over 1990-91 | 2009-10       | % change over 1990-91 |
|         |                     | 1990-1991     | 1995-96       |                       | 2000-01       |                       | 2005-06       |                       | 2009-10       |                       |
| 1       | Cotton              | 19001 (46.52) | 16918 (40.43) | -10.96                | 22387 (55.68) | 17.82                 | 19700 (40.83) | 3.67                  | 23107 (45.45) | 21.69                 |
| 2       | Soybean             | —             | —             | —                     | —             | —                     | 943 (1.95)    | —                     | 2890 (5.68)   | —                     |
| 3       | Wheat               | 750 (1.83)    | 708 (1.69)    | -5.6                  | 340 (0.84)    | -54.66                | 2427 (5.03)   | 223.6                 | 2050 (4.03)   | 173.33                |
| 4       | <i>Kharif</i> Jowar | 10549 (25.83) | 15475 (36.98) | 46.69                 | 10225 (25.43) | -3.07                 | 17630 (36.54) | 67.12                 | 4310 (8.47)   | -57.84                |
| 5       | <i>Tur</i>          | 3769 (9.22)   | 3960 (9.46)   | 5.06                  | 1000 (2.48)   | -73.46                | 1611 (3.33)   | -57.25                | 3550 (6.98)   | -5.81                 |
| 6       | Gram                | 745 (1.82)    | 1294 (3.09)   | 73.95                 | 1000 (2.46)   | 34.22                 | 314 (0.65)    | -57.85                | 1070 (2.10)   | 43.62                 |
| 7       | Green Gram          | 1143 (2.79)   | 1123 (2.68)   | -1.74                 | 1100 (2.73)   | -3.76                 | 987 (2.04)    | 86.35                 | 1610 (3.16)   | 40.85                 |
| 8       | Black Gram          | 1143 (0.70)   | 704 (1.68)    | -38.40                | 800 (1.98)    | -30.08                | 674 (1.39)    | -41.03                | 1450 (2.85)   | 28.85                 |
| 9       | <i>Rabi</i> Jowar   | —             | —             | —                     | —             | —                     | 10 (0.02)     | 0                     | 5 (0.09)      | 0                     |
| 10      | Maize               | 100 (0.24)    | 590 (1.41)    | 490                   | 850 (2.11)    | 750                   | 907 (1.88)    | 807                   | 4030 (7.93)   | 3930                  |
| 11      | Bajara              | 243 (0.59)    | 145 (0.34)    | -40.32                | —             | —                     | —             | —                     | —             | —                     |
| 12      | Ground nut          | 10 (0.02)     | 23 (0.05)     | 130                   | 5 (0.01)      | —                     | 15 (0.03)     | 50                    | 5 (0.09)      | 0                     |
| 13      | Seasamum            | 32 (0.07)     | 76 (0.18)     | 137.5                 | 100 (0.24)    | 212.5                 | 67 (0.14)     | 109.37                | 50 (0.09)     | 56.25                 |
| 14      | Safflower           | —             | —             | —                     | —             | —                     | —             | —                     | —             | —                     |
| 15      | Sunflower           | 45 (0.11)     | 65 (0.15)     | 44.44                 | 800 (1.98)    | 1677.77               | 840 (1.74)    | 1766.66               | 790 (1.55)    | 1655.55               |
| 16      | Other crops         | 4164 (10.19)  | 760 (1.81)    | -81.74                | 1601 (3.98)   | -61.55                | 2113 (4.38)   | -49.25                | 5915 (11.63)  | 42.02                 |
| 17      | Gross cropped area  | 40840 (100)   | 41841 (100)   | 2.45                  | 40203 (100)   | -1.55                 | 48238 (100)   | 18.11                 | 50832 (100)   | 24.46                 |

Figures in the parentheses are percentages over gross cropped area.

## 1.2 Changes in cropping pattern in Khamgaon tehsil

The changes in the cropping pattern in Khamgaon *tehsil* are presented in Table 2. The area under Cotton crop was 32.02 percent in 1990-91 and in the year 2009-10, it was 28.86 percent, which indicated that slightly decreasing area under Cotton. The area under Soybean crop was 16.44 per cent, which is an excellent diversified crop, during the study period. The area under Tur ranged from 6.24 to 8.66 during the study period. A slightly increases in the area, i.e., 4.33 percent to 9.63 percent, was observed in respect of Wheat during the study period. The Decreasing

area has been observed in Green gram, *Kharif* Jowar, Black gram, and gram. The area under Green gram was 5.48 percent in 2009-10, which declined from 6.46 percent in the year 1988-89. The area under *Kharif* Jowar was 13.67 percent in 2009-10, which declined from 30.57 percent in the year 1990-91. The area under Black gram was 3.40 percent in 1990-91, an increase from 3.51 percent in the year 1990-91. The area under Bajara was 1.26 percent in 2009-10, which declined from 6.02 percent in the year 1990-91. No significant changes in gross cropped area were observed during the study period.

The Green gram crop has shown the most replaced crop, which has been increased to 385.55 percent

**Table 2:** Changes in Cropping Pattern in Khamgaon Tahsil (Area in ha)

| Sl. No. | Crops               | Year          |               |                       |               |                       |               |                       |               |                       |
|---------|---------------------|---------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|
|         |                     | 1990-91       | 1995-96       | % change over 1990-91 | 2000-01       | % change over 1990-91 | 2005-06       | % change over 1990-91 | 2009-10       | % change over 1990-91 |
| 1       | Cotton              | 21435 (32.02) | 25731 (37.92) | 20.04                 | 35200 (40.5)  | 64.1                  | 26110 (33.71) | 21.81                 | 26329 (28.86) | 22.83                 |
| 2       | Soybean             | —             | —             | —                     | 2738 (3.15)   | —                     | 3166 (4.08)   | —                     | 15000 (16.44) | —                     |
| 3       | Wheat               | 2903 (4.33)   | 2050 (3.02)   | -29.38                | 2253 (2.59)   | -22.39                | 5436 (7.01)   | 87.25                 | 8791 (9.63)   | 202.82                |
| 4       | <i>Kharif</i> Jowar | 20466 (30.57) | 12420 (18.30) | -39.31                | 13082 (15.08) | -36.07                | 11200 (14.46) | -45.27                | 12476 (13.67) | -39.04                |
| 5       | <i>Tur</i>          | 4180 (6.24)   | 5901 (8.69)   | 41.17                 | 4775 (5.50)   | 14.23                 | 4657 (6.01)   | 11.41                 | 7900 (8.66)   | 88.99                 |
| 6       | Gram                | 1367 (2.04)   | 2960 (4.36)   | 116.53                | 270 (0.31)    | -80.24                | 4761 (6.14)   | 248.28                | 5905 (6.47)   | 331.96                |
| 7       | Green Gram          | 1034 (1.54)   | 4392 (6.46)   | 324.75                | 5415 (6.24)   | 423.69                | 4766 (6.15)   | 360.92                | 5000 (5.48)   | 383.55                |
| 8       | Black Gram          | 2276 (3.40)   | 6109 (9.00)   | 168.40                | 4735 (5.50)   | 108.04                | 4232 (5.47)   | 85.94                 | 3210 (3.51)   | 41.03                 |
| 9       | <i>Rabi</i> Jowar   | —             | —             | —                     | —             | —                     | 4 (0.05)      | —                     | 10 (0.01)     | —                     |
| 10      | Maize               | —             | —             | —                     | 193 (0.22)    | —                     | 198 (0.25)    | —                     | 2750 (3.01)   | —                     |
| 11      | Bajara              | 4032 (6.02)   | 4230 (6.23)   | 4.91                  | 1800 (2.07)   | -55.35                | 1598 (2.06)   | -60.36                | 1154 (1.26)   | -71.37                |
| 12      | Ground nut          | —             | —             | —                     | —             | —                     | —             | —                     | —             | —                     |
| 13      | Seasamum            | 3243 (4.84)   | 3150 (4.64)   | -2.86                 | 1503 (1.73)   | -53.65                | 1487 (1.92)   | -54.14                | 900 (0.98)    | -72.24                |
| 14      | Safflower           | —             | —             | —                     | —             | —                     | —             | —                     | —             | —                     |
| 15      | Sunflower           | —             | —             | —                     | 1050 (1.21)   | —                     | 1875 (2.42)   | —                     | 1658 (1.81)   | —                     |
| 16      | Other crops         | 5991 (8.95)   | 906 (1.34)    | -84.87                | 13723 (15.82) | 129.06                | 7944 (10.25)  | 32.59                 | 72 (0.07)     | -98.79                |
| 17      | Gross cropped area  | 66927 (100)   | 67849 (100)   | 1.37                  | 86737 (100)   | 29.59                 | 77439 (100)   | 15.70                 | 91205 (100)   | 36.27                 |

Figures in the parentheses are percentages over gross cropped area.

from 1990-91 to 2009-2010 maybe because it is a subsistence crop to the farmers. It is also shown in the Khamgaon *tahsil* that Cotton crop covers the consistent area which is somehow in decreasing trend 20.04 percent to the base period 1990-91 to 2009-10, which revealed that it is still the primary crop of the *tahsil* which is used mainly as a cash crop to the farmers.

### 1.3 Changes in cropping pattern in Nandura *tahsil*

The changes in cropping pattern in Nandura *tahsil* during 1990-91 to 2009-10 were worked and presented in Table 3. In Nandura *tahsil*, the area under cotton cultivation increased in 1990-91 i.e., 40.50 percent from 50.96 percent in 2009-10. After that, substantial changes have not been observed up

to 2009-10. The area under *Kharif* Jowar has decreased to 5.88 percent to 23.50 percent in the year 1990-91. The increasing area has been observed in Mung (3.48 % to 4.20 %), Bajara (1.21 % to 1.49 %), Gram (0.90 % to 4.26 %) and Black Gram (2.48 % to 3.97 %), during the entire period of study i.e. 1990-91 to 2009-10. No more fluctuation in the area under the Soybean crop was observed. The proportion of Wheat crop was satisfactory more as emerging crop of the area. The area under Wheat was 7.26 percent as of 2009-10. Wheat crop has shown the most replaced crop which has been decreased to 610.33 percent to the base period i.e., 1990-91 maybe because it is a subsistence crop to the farmers. It is also shown in the Nandura *tahsil* that Cotton crop covers the consistent area which is somehow in increasing trend 50.40 percent to the base period 1990-91 to 2009-10 which revealed

**Table 3:** Changes in Cropping Pattern in Nandura Tahsil (Area in ha)

| Sl. No. | Crops               | Year          |               |                       |               |                       |               |                       |               |                       |
|---------|---------------------|---------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|
|         |                     | 1990-91       | 1995-96       | % change over 1990-91 | 2000-01       | % change over 1990-91 | 2005-06       | % change over 1990-91 | 2009-10       | % change over 1990-91 |
|         |                     | 1990-1991     | 1995-96       |                       | 2000-01       |                       | 2005-06       |                       | 2009-10       |                       |
| 1       | Cotton              | 17948 (40.50) | 19431 (41.96) | 8.26                  | 19590 (41.87) | 9.14                  | 18526 (38.84) | 3.22                  | 26995 (50.96) | 50.40                 |
| 2       | Soybean             | —             | —             | —                     | —             | —                     | 2900 (6.07)   | —                     | 3004 (5.67)   | —                     |
| 3       | Wheat               | 542 (1.22)    | 1125 (2.42)   | 107.56                | 675 (1.44)    | 24.53                 | 1726 (3.61)   | 218.45                | 3850 (7.26)   | 610.33                |
| 4       | <i>Kharif</i> Jowar | 10415 (23.50) | 15038 (32.47) | 44.38                 | 17079 (36.51) | 63.98                 | 11980 (25.11) | 15.02                 | 3119 (5.88)   | -70.05                |
| 5       | <i>Tur</i>          | 3200 (7.22)   | 2400 (5.18)   | -25                   | 1305 (2.78)   | -59.21                | 2345 (4.91)   | -26.71                | 3457 (6.52)   | 8.03                  |
| 6       | Gram                | 402 (0.90)    | 2100 (4.53)   | 422.38                | 1450 (3.09)   | 260.96                | 1825 (3.82)   | 353.98                | 2260 (4.26)   | 462.18                |
| 7       | Green Gram          | 1543 (3.48)   | 2500 (5.39)   | 62.02                 | 1180 (2.52)   | -23.52                | 2139 (4.48)   | 38.62                 | 2228 (4.20)   | 44.39                 |
| 8       | Black Gram          | 1100 (2.48)   | 1210 (2.61)   | 10                    | 1470 (3.14)   | 33.63                 | 2032 (4.26)   | 84.72                 | 2103 (3.97)   | 91.18                 |
| 9       | <i>Rabi</i> Jowar   | —             | —             | —                     | —             | —                     | —             | —                     | —             | —                     |
| 10      | Maize               | —             | —             | —                     | 905 (1.93)    | —                     | 1098 (1.93)   | —                     | 3009 (2.30)   | —                     |
| 11      | Bajara              | 540 (1.21)    | 632 (1.36)    | 17.04                 | 875 (1.87)    | 62.03                 | 600 (1.25)    | 11.11                 | 792 (1.49)    | 46.66                 |
| 12      | Ground nut          | 12 (0.02)     | 10 (0.02)     | -16.66                | 26 (0.05)     | 116.66                | 12 (0.02)     | 0                     | 6 (0.01)      | -                     |
| 13      | Seasamum            | 142 (0.32)    | 321 (0.69)    | 126.06                | 934 (1.99)    | 557.74                | 132 (0.27)    | -7.04                 | 25 (0.04)     | -82.39                |
| 14      | Safflower           | 15 (0.03)     | 43 (0.09)     | 186.66                | 53 (0.11)     | 253.33                | 23 (0.05)     | 53.33                 | —             | —                     |
| 15      | Sunflower           | 98 (0.22)     | 324 (0.69)    | 230.61                | 830 (1.77)    | 746.93                | 894 (1.87)    | 812.24                | 659 (1.24)    | 572.44                |
| 16      | Other crops         | 8351 (18.84)  | 1166 (2.51)   | -86.03                | 406 (0.86)    | -95.13                | 1466 (3.07)   | -82.44                | 1700 (3.20)   | -79.64                |
| 17      | Gross cropped area  | 44308 (100)   | 46300 (100)   | 4.49                  | 46778 (100)   | 5.57                  | 46232 (100)   | 4.34                  | 51501 (100)   | 16.23                 |

Figures in the parentheses are percentages over gross cropped area.

that it is still the major crop of the *tahsil* which is used mainly as a cash crop to the farmers.

#### 1.4 Changes in cropping pattern in Shegaon *tahsil*

The changes in cropping pattern in Shegaon tahsil during 1990-91 to 2009-2010 are presented in Table 4. It is revealed that the area under cotton decreased drastically from 41.93 percent to 4.96 percent over the period of 20 years. In the case of *kharif* Jowar, its share in the gross cropped area fell to the level

of 22.17 percent in 1990-91 to 1.56 percent in 2009-10. The proportion of area under *tur* in the gross cropped area ranges in between 5.72 to 1.04 percent during the study period. The proportion of area under wheat tremendously changes from 2.46 to 0.29 percent during study period. The area under crops decreasing mung (5.11% to 1.01%), gram (2.63% to 0.42 %), blackgram (5.12 % to 0.69 %), bajara (1.27 % to 0.02 %) shows decreasing proportion respectively. No significant change in the gross cropped area as observed in the study period.

**Table 4:** Changes in Cropping Pattern in Shegaon *Tahsil* (Area in ha)

| Sl. No. | Crops              | Year             |                  |                       |                  |                       |                  |                       |                   |                       |  |
|---------|--------------------|------------------|------------------|-----------------------|------------------|-----------------------|------------------|-----------------------|-------------------|-----------------------|--|
|         |                    | 1990-91          |                  | 1995-96               |                  | 2000-01               |                  | 2005-06               |                   | 2009-10               |  |
|         |                    | 1990-1991        | 1995-96          | % change over 1990-91 | 2000-01          | % change over 1990-91 | 2005-06          | % change over 1990-91 | 2009-10           | % change over 1990-91 |  |
| 1       | Cotton             | 21554<br>(41.93) | 22708<br>(45.26) | 5.35                  | 27763<br>(48.79) | -87.12                | 26755<br>(54.56) | -87.58                | 21335<br>(4.96)   | -90.10                |  |
| 2       | Soybean            | —                | 0                | —                     | 0                | —                     | 2599 (5.30)      | —                     | 3120 (0.72)       | —                     |  |
| 3       | Wheat              | 1266 (2.46)      | 252 (0.50)       | -80.09                | 1337<br>(2.34)   | 5.60                  | 1270 (2.59)      | 0.31                  | 1285 (0.29)       | 1.50                  |  |
| 4       | Kharif Jowar       | 11399<br>(22.17) | 10144<br>(20.22) | -11.00                | 11500<br>(20.21) | 0.88                  | 4430 (9.03)      | -61.13                | 6775 (1.56)       | -40.56                |  |
| 5       | Tur                | 2943 (5.72)      | 3721 (7.41)      | 26.43                 | 3826<br>(6.72)   | 30.00                 | 2976 (6.06)      | 1.12                  | 4530 (1.04)       | 53.92                 |  |
| 6       | Gram               | 1354 (2.63)      | 3434 (6.84)      | 153.61                | 750 (1.31)       | -44.60                | 996 (2.03)       | -26.44                | 1825 (0.42)       | 34.78                 |  |
| 7       | Green Gram         | 2629 (5.11)      | 4366 (8.70)      | 66.07                 | 4761<br>(8.04)   | 81.09                 | 4739 (9.66)      | 80.25                 | 4365 (1.01)       | 66.03                 |  |
| 8       | Black Gram         | 2659 (5.12)      | 3061 (6.10)      | 15.11                 | 4580<br>(6.72)   | 72.24                 | 3287 (6.70)      | 23.61                 | 2985 (0.69)       | 12.26                 |  |
| 9       | Rabi Jowar         | —                | 0                | —                     | 0                | —                     | 0                | —                     | 0                 | —                     |  |
| 10      | Maize              | 587 (1.14)       | 591 (1.68)       | 0.68                  | 5 (0.08)         | —                     | 326              | -44.46                | 635               | 8.17                  |  |
| 11      | Bajara             | 653 (1.27)       | 847 (6.84)       | 29.70                 | 25 (0.04)        | -96.17                | 43 (0.87)        | -93.41                | 87 (0.02)         | -86.67                |  |
| 12      | Ground nut         | —                | —                | —                     | —                | —                     | —                | —                     | —                 | —                     |  |
| 13      | Seasamum           | 132 (0.25)       | 149 (0.29)       | 12.87                 | 200 (0.35)       | 51.51                 | 250 (0.50)       | 89.39                 | 270 (0.06)        | 104.5                 |  |
| 14      | Safflower          | —                | —                | —                     | —                | —                     | 28 (0.057)       | —                     | 45 (0.01)         | —                     |  |
| 15      | Sunflower          | 40 (0.077)       | 67 (0.13)        | 67.5                  | 75 (0.13)        | 87.5                  | 79 (0.16)        | 97.5                  | 85 (0.01)         | 112.5                 |  |
| 16      | Other crops        | 6188 (12.03)     | 825 (1.64)       | -86.66                | 2085<br>(3.66)   | -66.30                | 1251 (2.55)      | -79.78                | 384820<br>(89.04) | 521.88                |  |
| 17      | Gross cropped area | 51404 (100)      | 50165 (100)      | -2.41                 | 56902<br>(100)   | 10.69                 | 49029<br>(100)   | -4.62                 | 432162<br>(100)   | -15.92                |  |

Figures in the parentheses are percentages over gross cropped area.

## CONCLUSION

- ♦ Cotton, *Kharif* Jowar, Tur, Green Gram, and Soybean are the primary crop of Buldhana district. (Nandura 5.88 % and Shegaon 1.56 %).
- ♦ Area under *Kharif* Jowar has reduced in all *tahsils* of Buldhana district. (Khamgaon 16.44%).
- ♦ Soybean is an emerging crop and attaining a major position in cropping patterns in different *tahsils* of the Buldhana district.

## REFERENCES

- Alagh, M. 2007. Indian agriculture-Growth and change. *Agric. Situ. India*, **64**(5): 55-66.
- Ali, M. 1985. Recent changes in cropping patterns and its Impact on out put of Food Grains and Non-Food Grains in Uzbekistan. *Res. J. Agric. Sci.*, **2**(2): 384-387.
- Gupta, A.K. 1963. Interstate differences in cropping pattern and productivity.
- Shafi, M. 2006. Recent changes in cropping patterns and its Impact on out put of Food Grains and Non-Food Grains in Uzbekistan. *Res. J. Agric. Sci.*, **2**(2): 384-387.
- Virenderkumar, S., Sharma, K. and Sharma, H.R. 2002. Changing cropping pattern in Himachal Pradesh: A district-wise study. *Himachal J. Agric. Reg.*, **28**(1&2): 58-62.