



## AGRICULTURAL LANDUSE CHANGES IN THE DROUGHT PRONE AREA OF SATARA DISTRICT (1995 – 2015)

Mr. P. R. Jadhav<sup>1</sup> and Dr. B. D. Ghodke<sup>2</sup>

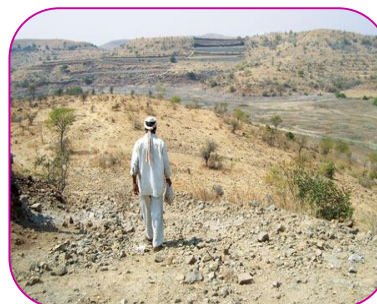
<sup>1</sup>Research Student , Prof. Ramkrishna More College Akurdi, Pune.  
Savitribai Phule Pune University , Pune.

<sup>2</sup>Associate Professor, S. P. College, Pune.  
Research Guide, Prof. R. M. College, Akurdi, Pune.

### ABSTRACT

Drought in India is the common phenomena which has Disturb Indian economy mainly in the agricultural field. Last year that is 2014-15 there was the severe drought in Indi mainly in Maharashtra which resulted into the total loss of grains, many farmers where force were into suicides due to indepthness. This made vivid picture of the economic instability of the Indian farmers caused by the drought.

Satara is one of the classy District of Maharashtra state. But it laying in the drought prone area zone. Out of the total tahsil of Satara, the four tahsils fully and one tahsil partially has been marked the drought prone Tahsils by Government of Maharashtra which have been selected for the present study.



**KEY WORDS :** Agriculture, Drought prone, Indepthness.

### INTRODUCTION

The irrigation commission 1972 observed 'Assuming that districts which receive less than 75cm of rainfall per annum are liable to drought'. There are about 77 such districts in the country. Besides this the commission identifies drought and chronic areas on the basis of annual and south-west monsoon rainfall data from 1901 – 1960 for about five hundred station and it has considered. 20% to 25% probability of rainfall departure from the normal, such areas are considered as drought areas. According to commission identification the study area of Satara district (Maharashtra) falls in drought area.

The rainfall analysis for the period 1991 – 2015 reveals that normal annual rainfall over the Satara district varies from 495 to 5555 mm. in the eastern part of the district around Man, Khatav, Phaltan, and Khandala Tahsil. The study also reveals that entire eastern and north eastern parts of the district comprising almost entire Man, Khatav, Phaltan and Khandala tahsil in the plain which experienced droughts categorized as 'Drought Area'. The average annual rainfall of case study area is 542mm.

### OBJECTIVES:

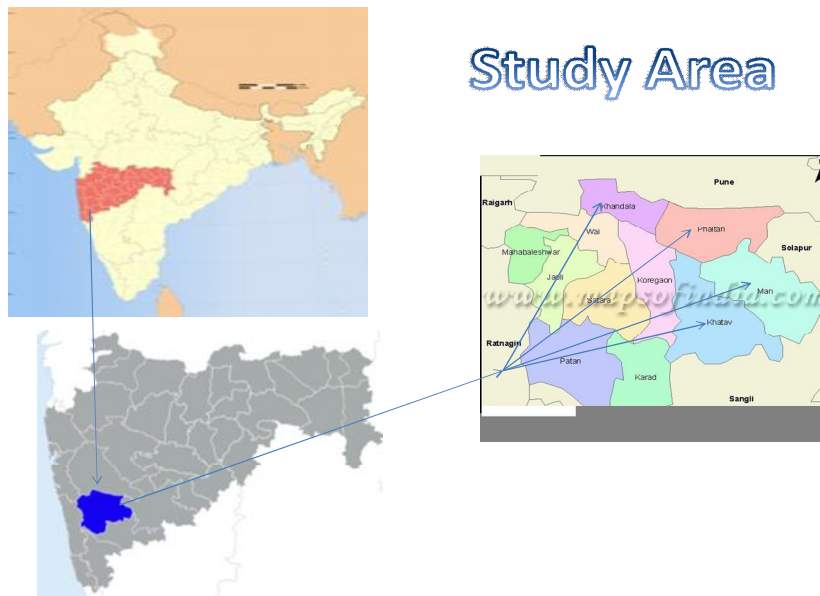
1. To find out the agricultural pattern in both Kharif and Rabbi seasons in the study area.
2. To find out the temporal changes in the agricultural pattern from 1995-2015.
3. To suggest the means for saving of Kharif and Rabbi crops.

### METHODOLOGY:

1. The secondary data is based on the govt. publication census hand book from 1995 to 2015.
2. The primary data has generated by using the questionnaire techniques which were used at the tahsil level which were selected at the Tahsils.

**STUDY AREA:**

The drought-prone area of Satara district is located between the 17°39' to 18°03' north latitudes and 74° 01' to 74°54' east longitudes. In the study area summer highest day temperature is in between 33°C to 41°C. Average temp of the study region is 25°C.



The study area is a part of Satara district with an average height of 600 above mean sea level. Sahyadri and Mahadeo both are two main hill ranges in this area. These two hill ranges occupied by several sub-hills. The Sahyadri, which extends as a continuous wall in north-south direction, besides these it has a total length of 197 km. There are some uneven ranges, provide the location for ghat routes.

In the study region the Mahadeo range is one prime range, which is runs eastward and south-east direction. It has two-three sub-ranges. The first sub-range 'Chandan Vandan' covers half of study are and lies in the west. Remaining two hills range covers 50 % of the study area named Vardangarh and Mahimangarh and lies towards east.

**CROPPING PATTERN IN THE STUDY AREA:**

The cropping pattern of area depends on rainfall, irrigation, use of High Yielding Variety seeds, technical skill, availability of agricultural inputs viz. capital, fertilizer, pesticides etc. Table No.1 and 2 display temporal variations of 14 crops in study region from 1995 to 2015.

**Cropping Pattern of Kharif and Rabbi (1995 to 2015):**

| Crops   | 1995  | 2015  | Change | Crops  | 1995  | 2015  | Change |
|---------|-------|-------|--------|--------|-------|-------|--------|
| Rice    | 0.76  | 0.66  | -0.1   | Rabbi  |       |       |        |
| Jawar   | 5.52  | 0.44  | -5.08  | Jawar  | 80.67 | 69.23 | -11.44 |
| Bajara  | 68.35 | 61.95 | -6.4   | Wheat  | 10.07 | 9.27  | -0.8   |
| Maize   | 0.47  | 8.69  | 8.22   | Maize  | 0.85  | 6.38  | 5.53   |
| others  |       |       |        | Other  | 0     | 0.2   | 0.2    |
| Cereals | 0.09  | 0.12  | 0.03   | Gram   | 4.92  | 7.21  | 2.29   |
| Tur     | 2.65  | 0.36  | -2.29  | Others | 0.04  | 0.11  | 0.07   |

|                   |             |            |       |                  |              |              |       |
|-------------------|-------------|------------|-------|------------------|--------------|--------------|-------|
| <b>Udit</b>       | 0.81        | 0.79       | -0.02 | <b>Sunflower</b> | 0.27         | 0.03         | -0.24 |
| <b>Mug</b>        | 1.83        | 4.59       | 2.76  | <b>Safflower</b> | 3.02         | 0.04         | -2.98 |
| <b>others</b>     |             |            |       | <b>Other</b>     | 0.12         | 0.06         | -0.06 |
| <b>Pulses</b>     | 8.36        | 0.44       | -7.92 | <b>Sugercane</b> | 0            | 7.13         | 7.13  |
| <b>Ground nut</b> | 2.23        | 1.78       | -0.45 | <b>Total</b>     | <b>99.96</b> | <b>99.66</b> |       |
| <b>Soyabin</b>    | 0.32        | 5.23       | 4.91  |                  |              |              |       |
| <b>Sunflower</b>  | 0.53        | 0.07       | -0.46 |                  |              |              |       |
| <b>Sugercane</b>  | 5.01        | 14.37      | 9.36  |                  |              |              |       |
| <b>Cotton</b>     | 2.97        | 0.44       | -2.53 |                  |              |              |       |
| <b>Total</b>      | <b>99.9</b> | <b>100</b> |       |                  |              |              |       |

Source: data compiled by researcher

**Cropping Pattern of Kharif (1995-2015):**

Bajara is the major crop produced in both years (1995-2015). It is decreased up to 6.4 percent in 2015. The area under all cereals crops is decreased in last twenty years because increases the percent of case crops i. e. sugarcane. The 9.36 percent of area increase under sugarcane and mainly Phaltan tahsil is dominant for agricultural change because of irrigation facilities. The canal irrigation is main source of irrigation in drought prone area.

The maize, mug and soyabin these are the food grain crops are increases in last twenty years. The soyabin crop increases 4.91 percent in last twenty years and the other pulses is decreases in the study area (-7.92).

**Cropping Pattern of Rabbi (1995-2015):**

Jowar is the major crop produced in both kharif and Rabbi season. It is observed that the area under Jowar is decreased up to 11.44 in study period. But the other cereals crops are increases i.e. Maize and Wheat. In this season there are many crops are cultivated with the help of irrigation so the short time crops are dominant in the study area. i. e. gram, Maize and sunflower. In case of Oilseed crops shows negative changes because land under other crops increased particularly cash crops and agricultural land used for other purposes.

**Tahsilwise cropping Pattern Kharif (1995-2015):**

The major six crops are selected for temporal cropping pattern changes in the study area:

**Cropping Pattern of Kharif 1995:**

| Crops                | Khatav       | Man         | Phaltan      | Khandala     |
|----------------------|--------------|-------------|--------------|--------------|
| <b>Jawar</b>         | 15.23        | 4.54        | 2.63         | 4.58         |
| <b>Bajara</b>        | 65.62        | 79.67       | 64.38        | 72.3         |
| <b>others Pulses</b> | 10.7         | 11.54       | 4.64         | 8.95         |
| <b>Ground nut</b>    | 4.6          | 2.53        | 3.21         | 10.06        |
| <b>Soyabin</b>       | 1.44         | 0.36        | 0.03         | 0.16         |
| <b>Sugercane</b>     | 2.02         | 0.76        | 25           | 3.88         |
| <b>Total</b>         | <b>99.61</b> | <b>99.4</b> | <b>99.89</b> | <b>99.93</b> |

**Cropping Pattern of Kharif 2015:**

| Crops                | Khatav       | Man          | Phaltan      | Khandala     |
|----------------------|--------------|--------------|--------------|--------------|
| <b>Jawar</b>         | <b>3.65</b>  | 7.58         | 2.75         | 0            |
| <b>Bajara</b>        | <b>34.46</b> | 85.55        | 40.21        | 57.29        |
| <b>others Pulses</b> | <b>28.72</b> | 3.51         | 0.43         | 3.36         |
| <b>Ground nut</b>    | <b>13.53</b> | 2.27         | 8.63         | 8.81         |
| <b>Soyabin</b>       | <b>12.62</b> | 0.24         | 7.1          | 6.5          |
| <b>Sugercane</b>     | <b>7.01</b>  | 0.47         | 40.83        | 23.8         |
| <b>Total</b>         | <b>99.99</b> | <b>99.62</b> | <b>99.95</b> | <b>99.76</b> |

Source: data complied by researcher

Bajara is the major crop of kharif season and it is dominant crop in both Man (65.62 and Khatav(79.67) Tahsil. But the remaining Tahsils i. e. Phaltan and Khandala we found negative change of this

crop. It is decreased in all tahsil of case study area. In 2015 the area under sugarcane increases in highly in Phaltan(40.83) and Khandala(23.8) Tahsil due to availability irrigation facilities.

The area under Jawar cultivation was 15.23 percent in Khatav tahsil but in 2015 only 3,65 percent of area under this crop due to increases of cash and short time crops in this tahsils. In Man Tahsil, the area under Jawar was 4.54 percent and it is increases 7.58 in 2015.

The other pulses like Tur, Udit and Mug was above 10 percent in 1995 and its crops are decreases almost in 50 percent in 2015. The ten time increases of sugarcane crops in Phaltan and Khandala Tahsil.

### Cropping Pattern Rabbi (1995-2015):

| Cropping Pattern Rabbi 1995 |              |              |              |              | Cropping Pattern Rabbi 2015 |             |              |              |             |
|-----------------------------|--------------|--------------|--------------|--------------|-----------------------------|-------------|--------------|--------------|-------------|
| Crops                       | Khatav       | Man          | Phaltan      | Khandala     | Crops                       | Khatav      | Man          | Phaltan      | Khandala    |
| Rabbi Jawar                 | 64.87        | 84.53        | 86.34        | 86.09        | Rabbi Jawar                 | 71.44       | 81.57        | 56.42        | 63.03       |
| Wheat                       | 12.83        | 9.82         | 9.87         | 6.68         | Wheat                       | 8.68        | 4.46         | 18.95        | 14.65       |
| Maize                       | 1.07         | 1.99         | 0.17         | 0.26         | Maize                       | 6.61        | 7.01         | 8.35         | 6.85        |
| Gram                        | 13.04        | 2.09         | 1.42         | 4.74         | Gram                        | 8.44        | 4.7          | 10.45        | 11.29       |
| Sunflower                   | 0.42         | 0.1          | 0.36         | 0.1          | Sunflower                   | 2.96        | 1.25         | 2.76         | 1.64        |
| Safflower                   | 7.36         | 1.42         | 1.8          | 1.61         | Safflower                   | 1.17        | 0.65         | 2.63         | 1.94        |
| <b>Total</b>                | <b>99.59</b> | <b>99.95</b> | <b>99.96</b> | <b>99.48</b> | <b>Total</b>                | <b>99.3</b> | <b>99.64</b> | <b>99.56</b> | <b>99.4</b> |

Source: data complied by researcher

Rabbi Jawar is the major crop in this season. The positive change shows by Man and Khatav Tahsil with increases Rabbi Jawar 7.17 in Khatav Tahsil. Phaltan and Khandala shows negative change of Rabibi Jawar and remaining part tahsil for Oilseed crops

Wheat is the most significant crop grown during the winter (Rabbi) season. It requires a cool climate with moderate rainfall less than 50cm and irrigation. As such in the study area is not suitable for this crop cultivation but the irrigation facility determines this crop cultivation. The negative change of this crop in Khatav and Man tahsils but the positive change shows in Phaltan and Khandala tahsil about Wheat crop. The Oilseed crops like Gram, Sunflower, Safflower are changing positively in the study area from 1995 to 2015.

### SUGGESTION:

1. Saving of standing kharif crop from drought affect.
  2. Providing pre-sowing irrigation for rabbi crop
  3. Providing a Minimal irrigation for growing vegetable, fruits and fodder crops in small area.
  4. Introduce of short duration varieties of crops and new agronomic practices are necessary.
  5. Field conservation practices like contour banding, terracing, land leveling etc.
  6. New irrigation project should be accelerated towards dry land areas.
  7. Afforestation, soil and moisture conservation.
  8. Restructuring of cropping pattern and pasture development.
- All these area the drought-fighting programme should be applied for the development of cropping pattern in drought prone area.

### CONCLUSION:

1. The North-east part of Satara District falls in drought prone area, which affects the cropping pattern.
2. Basically, the rainfed crops are the major crops of study area for i.e. Bajara, Kharif Jowar and Rubbi Jowar,
3. The cropping pattern of this area hampered frequently through the frequent drought conditions.

4. Very low per cent of the cultivated land is under irrigation by means of wells, Canal and surface irrigation in the study area which can not replaced the specific cropping pattern of the drought prone area.

#### REFERENCES:

1. Arora R. C. (1976) Development of Agriculture and Allied Sector, S. Chand and Co., New Delhi
2. Bhatia S.S. (1965) Pattern of Crop Concentration and Diversification in India, Economic Geography Vol. 41., No.1
3. Bansil P.C.(1975) Vikas Publising House, Delhi
4. Pawar C.T. (1989) Impact of irrigation. A Regional AGRICULTURAL PROBLEMS AND PROSPECTS OF DROUGHTPRONE AREA...Perspective Himalaya Publishing House,Bombay.
5. Singh, Jasbir (1974) An Agricultural Atlas of India. A Geographical Analysis, KurukshetraVishal Publication, Kurukshetra.
6. Singh R. L. (1975) New Perspective in Agricultural Geography National Geography Vol. II
- 7 Singh, Jasbir & S.S. Dhillon (1984) Agricultural Geography, Tata Mcgraw, Hill Publishing Co. Ltd., New Delhi, 2nd Edition
8. Socio-economic abstract of Satara District 1991,2001 and 2011.
9. Census handbook of Satara Distrct 2011
10. Maharashtra state irrigation dept. district Satara.



**Mr. P. R. Jadhav**

Research Student , Prof. Ramkrishna More College Akurdi, Pune.  
Savitribai Phule Pune University , Pune.



**Dr. B. D. Ghodke**

Associate Professor, S. P. College, Pune.  
Research Guide, Prof. R. M. College, Akurdi, Pune.