



## A STUDY OF CROP COMBINATION IN SOLAPUR DISTRICT OF MAHARASHTRA

TODKARI G.U.

Dept. of Geography, Shri Sant Damji Mahavidyala Mangalweda, Dist-Solapur, MS, India.

\*Corresponding Author: Email- govindtodkari@gmail.com

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**Abstract-** A crop combination region constitutes an important aspect of agriculture geography. It is fulfill in many ways such as to understand the cropping pattern, crop concentration and operation in a given area. The crop combinations give an idea about the agricultural topology and agriculture income of a region. Such region provides areal significance and strength of individual crops, to advocate suitable device for planning improvements in the under developed regions. In simple manner crop combination analysis is really core of agricultural geographic investigation. Solapur district occupies southern part of Maharashtra state. It occupies an area of 14,84559 sq.km. And supports 32.32 lack of population in 2001 censuses. Administrative the district is divided in to eleven tahsils. Physiography, temperature, rainfall, soil and drainage influence on agriculture landuse pattern in this district. Temperature is high in summer. Because of district is located in drought prone area of Maharashtra. Rainfall varies between 200 to 600 millimeters rainfall from west to east in entire district. Fourteen crops have been considered for crop combination. Among these, jawar, wheat, bajara, sugarcane, gram, maize, safflower, cotton, etc. are the major crops. By computing crop combination in Solapur District has identified ten crop combination. Such type of study represents real situation of cropping pattern in Solapur District and helps to planners, agricultural scientists and research scholars.

**Key words-** Scanty rainfall, Dry climate, Dry farming, Rough nature

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### Introduction

The study of crop combination regions constitutes an important aspect of Agriculture Geography as it provides a good basis for agriculture regionalization. Any study of crops on the regional scale must take into consideration the combinational analysis and the relative position of the crops. The concept of crop combination is a scientific device to study the existing spatial relationship of crops in association with each other in Agriculture Geography and land utilization. Crops are generally grown in combination and it is rarely that a particular crop occupies a position of total isolation from other crops in a given aerial unit at a given point of time. In recent years, the concept of crop combination has engaged the attention of geographers and agriculture land-use planners.

### Objective

The present investigation aims to find out crop combination region

in Solapur District and evaluation the change in crop combination region during the period of 1991 to 2005 in study region.

### Study Area

The present study deals with the geographical perspectives of the agriculture in Solapur district. The Solapur district is bounded by 17°05' North latitudes to 18° 32' North latitudes and 74°42' east to 76°15' East longitudes. The total geographical area of Solapur district is 14895 K.m<sup>2</sup>. divided into eleven tahsils.

Climate of the district is dry. The daily mean maximum temperature range between 30° C to 35° C and minimum temperature range between 18°C to 21°C. The highest temperature is 47° C recorded in the month of May. The average annual rainfall is registered 510 mm. The soil of the district essentially derived from the Deccan trap. The soil of the district can broadly classify into three groups shallow, medium and deep soil.

**Data Base and Methodology**

The Present study is based on primary and secondary data sources. The published sources namely Tahsil Revenue Record, Socio-economic abstract of Solapur District, District Census Handbook, Department of Irrigation, Groundwater Survey and Development Agency. Primary data was also collected at house hold level through questionnaires. For the determination of the minimum deviation the standard deviation method is used by using the formula.

$$SD = \frac{\sum d}{n}$$

However, as Weaver pointed out, the relative, not absolute value being significant, square roots were not extracted so, the actual formula used was as follows:

$$d = \frac{\sum d}{n}$$

Where 'd' is the difference between the crop percentage in a given country (areal unit) and the appropriate percentage in the theoretical curve and n is the number of crops in a given combination. As a result of the statistical processing by Weaver's deviation method, 10 crop combination regions are identified in Solapur District from main 14 crops.

**Explanation-** Crop combination regions are delineated here on the basis of methods advocated by Weaver J.C. (1954). The most important and popular approach is presented by J.C. Weaver for delineating the complex structure of agricultural regions of middle west in the USA in 1954. In this study, he has taken into account the percentage of crop area to total cropped area and has calculated the deviation of real percentage for all the possible combinations in the component areal units against a theoretical standard.

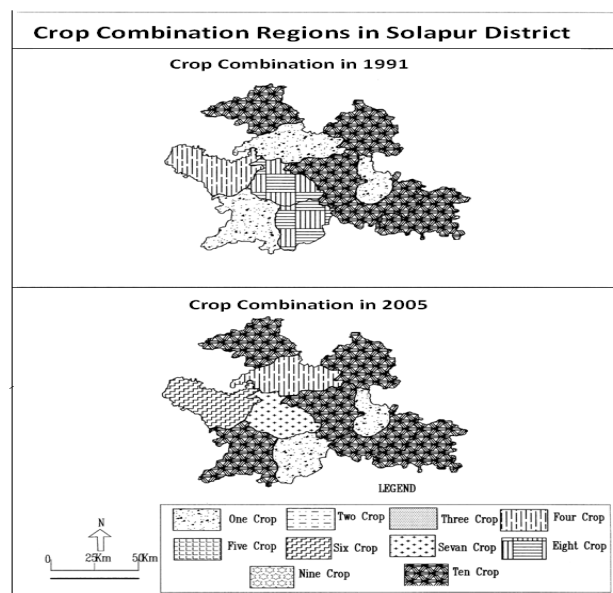
Table 1- Crop combination according to Weaver's method 1990-91

Crop combination.	No of talukas	Name of talukas	Name of crops
Mono	3	N. Solapur., Madha, Sangola	Jawar
4	1	Malshiras	Ja, Wh, Su, Ba
8	2	Pandharpur, Mangalwedha	Ja, Su, Gr, Sa, Wh, Ma, Gm, Ba Ja, Sa, Ba, Gr, Wh, Su, Gm, Ma
10	5	Karmala, Barshi, Mohol, S.Solapur, Akkalkot	Ja, Sa, Gr, Wh, Su, Tu, Gm, Ma, Ba, Fr Ja, Gm, Tu, Wh, Gr, Sa, Su, Fr, Ma, Ba Ja, Wh, Sa, Gr, Tu, Su, Ma, Gm, Fr, Ba Ja, Gm, Gr, Wh, Su, Tu, Ma, Sa, Fr, Ba Ja, Gr, Tu, Sa, Su, Wh, Gm, Ba, Co, Fr

Table 2- Crop combination according to weaver's method 2004-05

Crop combination	No of talukas	Name of talukas	Name of crops
Mono	2	N. Solapur, Mangalwedha	Jawar
4	1	Madha	Ja, Gm, Gr, Sa
6	1	Malshiras	Ja, Wh, Su, Ma, Ba, Gm
7	1	Pandharpur	Ja, Wh, Su, Ma, Gm, Ba, Fr
10	6	Karmala, Barshi, Mohol, Sangola, S. Solapur, Akkalkot	Ja, Sa, Ba, Gm, Gr, Su, Wh, Ma, Tr, Co Ja, Tr, Gm, Wh, Gr, Ba, Su, Sa, Ma, Fr Ja, Su, Wh, Gm, Ba, Ma, Sa, Gr, Tu, Fr Ja, Ma, Su, Ba, Gm, Wh, Sa, Fr, Co, Gr Ja, Su, Gm, Ba, Tu, Gm, Wh, Sa, Fr, Co Ja, Su, Gm, Tur, Wh, Ba, Gr, Sa, Co, Fr

[Ja-Jawar, Sa-Safflower, Ba-Bajara, Gm-Gram, Gr-Groundnut, Su-Sugarcane, Wh- Wheat, Ma-Maize, Tr-Tur, Co-Cotton, Fr-Fruit]



• **Monoculture (One crop combination)**

Three tahsils have the monoculture of Jawar crop covering considerable ( above 70 %) cultivated area of the region in the reference year 1990-91. The scanty rainfall ,the receptivity of black soil and lack of irrigation facilities have also led to the cultivation of jawar, which is generally drought resistant crop in Sangola, North Solapur and Madha tahsils of Solapur District. As per the reference year 2004-05, Jawar crop is the monoculture crop two tahsils of the region i.e. Mangalwedha and North Solapur. Mangalwedha is famous for *maladadi jawar*, black soil and lack of irrigation facilities responsible for them. In North Solapur there is no guaranteed source of water and rainfall is below 1500mm, however the area of jawar crop is large.

• **Four crop combination**

he pattern of two and three crop combination are absent in the reference years 1990-91 and 2004-05. Four crop combinations are observed in both the reference years in one taluka, but tahsils and crops are different in these years. Four crop combinations are included in one taluka (Malshiras) in the year 1990-91. Malshiras taluka lies at the northwestern part of the district, where rainfall varies from 500 mm to 1500mm. Soil is deep black to coarse shallow. Nira right and left canal is available for irrigation. Malshiras taluka is marked for jawar, sugarcane, bajara and wheat. In the year 2004-05, Madha taluka is marked with four crop combination i.e. jawar, gram, groundnut and safflower. Madha taluka lies at the north central part of Solapur district, where rainfall occurs from 400 mm to 900 mm. Soil is light black to shallow. Rough nature and dry climate are responsible for them.

• **Six crop combination**

his crop combination is observed in Malshiras tahsil in reference year 2004-05 i.e. jawar, wheat, sugarcane, maize, gram and bajara. This may be due to recent increase in irrigation facilities and improved techniques of dry farming. As per reference year 1990-91 five and six crop combination is absent. Five crop combination is also absent in the year 2004-05 in the study region.

- **Seven crop combination**

here is not a single taluka that comes under the seven crop combination as per year 1990-91. As per the year 2004-05, Pandharpur taluka comes under this crop combination. Hence, jawar, wheat, sugarcane, maize, gram, fruit and bajara crops have come in this combination. Pandharpur taluka is located in the central part of the district. Bhima river is the main source of irrigation, which flows from northwest to southeast. Nira and Ujani canals are also available for irrigation. Soil is shallow to deep black.

- **Eight crop combination**

Eight crop combination is observed in Pandharpur and Mangalweda talukas in the reference year 1990-91. These tahsils are located at the south central part of the district. Bhima river seasonably flows in those tahsils. Mangalwedha is under 600 mm to 1200 mm rainfall and the soil is light black to deep black. Hence jawar, sugarcane, groundnut, safflower, wheat, maize, gram and bajara crops from the eight crop combinations in both the tahsils. As per the year 2004-05, eight crop combination is not found in Solapur District.

- **Ten crop combination**

As per the year 1990-9, there are five talukas that come under this combination and as per 2004-05 reference year six talukas show ten crop combination. These talukas belong to the northeast and eastern part of the district, where rainfall is medium (below 600mm) and soil varies from black to coarse shallow. It has also some area under well irrigation. These talukas are noted for with jawar, sugarcane, groundnut, safflower, wheat, maize, gram, bajara, tur and fruits combination. In Akkalkot maize crop is absent and cotton crop is found there. All the above factors affect diversification of crop combination and distribution pattern of crops.

### **Conclusion**

Jawar is monoculture crop in Solapur District during the investigation but it is North Solapur, Sangola and Madha in 1991 year but it remains in North Solapur and Mangalwedha. During the investigation period the crop combination tremendously changed due to adoption of new techniques in agriculture operation. So farmers tend to cultivate many types of crops which percolate soil fertility. So ten crop combination is observed in six tahsils of district. It clearly indicates that the farmers of district are illiterate about the environment condition, soil fertility and favorable cropping pattern.

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