International Journal of Advance and Applied Research (IJAAR)
Peer Reviewed Bi-Monthly

ISSN – 2347-7075
Vol. 1 No.4
Mar- Apr 2014

A GEOGRAPHICAL STUDY OF SPATIAL VARIATION IN CROP COMBINATION OF JUNNAR TAHSIL, DIST-PUNE. (MAHARASHTRA)

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ABSTRACT:

The crops are generally grown in combination and it is rarely that a particular crop occupies a position of total isolation given areas unit at given set of time. An attempt is made here to study the crop combination circles of Junnar tahsil. The study ravels that tahsil reflects three to seven crop combination. Monoculture is not observed in any circle of the tahsil, the decrease in three crop combination and increase up to seven crops combinations reflect a clear trend towards the complexity of crop combination. Sugarcane, Fodder Crop, Groundnut and Onion are the major crop in the tahsil, the crop combination regions are indicate the direct the direct impact of rainfall, soil, irrigation facilities and economic condition of farmers.

Keywords: *crop combination*

INTRODUCTION:

A crop combination region constitutes an important aspect of agriculture. The crop combinations give an idea about the agricultural topology and agriculture income of a region. Such region provides a real 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.

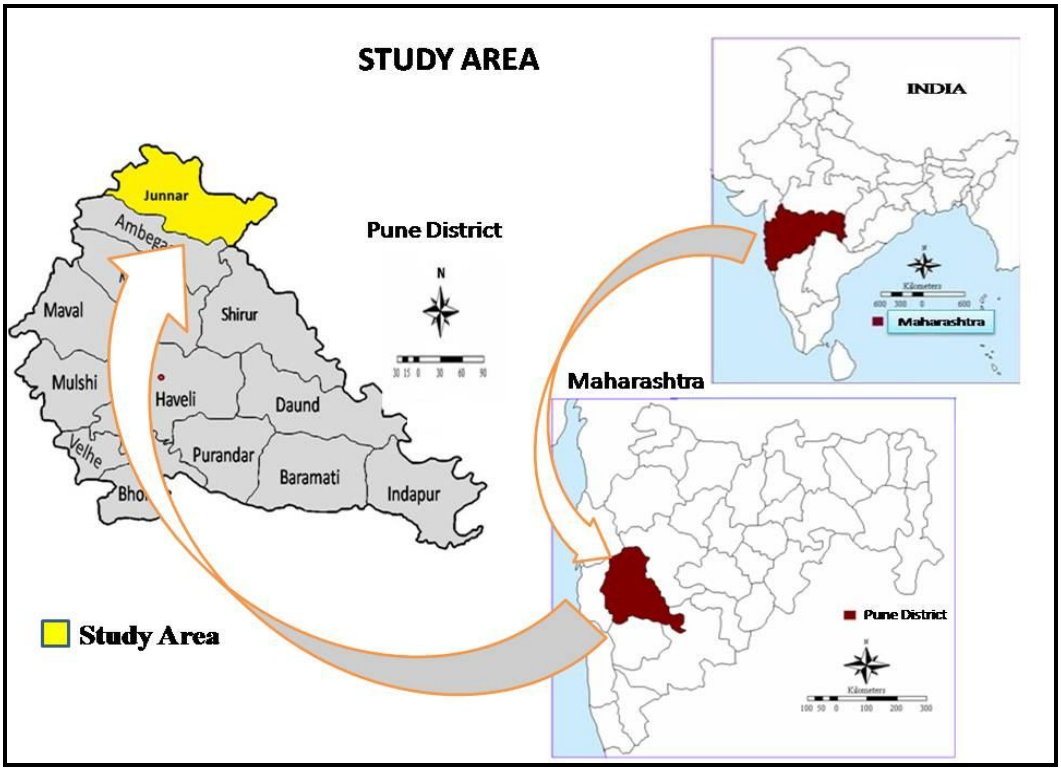
Agriculture is the main economic activity in the study area. The spatial distribution of various crops and their growth depends upon physio-socio-economic conditions prevalent in the region. The cultivation of crops and their growth are closely related to the decision making process on one hand and adaptation of innovation in agriculture, i.e. use of high yielding varieties, improved and efficient implements, applications of chemical fertilizers and pesticides. The hectarage, under individual crop gives relative strength and realistic picture of crop landuse in the analysis of crop ranking of the region. The ranks of crops and their combination provide spatial variation in the distribution

patterns. In this respect the study of crop combination and diversification manifests the present agricultural scenario.

The Crop Combination analysis technique identifies and locates areas sharing significant proportion of crops at higher rank, thus helps to understand the agricultural mosaic, cropping pattern, crop concentration, cropping variation, crop diversification and operation of a given area thus aiding to draw a rough sketch of agricultural topology and provide agricultural regionalization.

STUDY AREA:

Junnar Tahsil is located in the northern zone of the Pune district. It occurs in the zone of steep isohyetal gradient having rainfall around 50 to 250 cm. The latitudinal extent of the Tahsil is 19° 00' to 19° 24' north and longitudinal extent is 73° 40' to 74° 18' east. The area of the Tahsil is 1579.84 Sq.km. Junnar is mainly rural in character as 183 villages are there, according to 2001 census. Junnar Tahsil has the human population as about 3, 44,897, the rural population of the Tahsil is 98%, While the urban population is 2% according to 2001 census. Generally small and domestic industries are lacking in this area it means that there are no industrial development, so naturally they are depends on agriculture for their livelihood. The crops are growing more or less proportion in the study region. The Junnar tahsil mainly divided into nine circles namely Junnar, Nimgaonsava, Otur, Belhe, Aptale, Narayangaon, Vadgaon Anand, Dingore and Rajur. The total area under the crops covers 56287.15 hectares area.



OBJECTIVES:

The research paper is based on following objectives:

1. To highlight on the Spatio-temporal changes in crop combination regions of the tahsil
2. To find out and analyze the crop combination of study region.
3. To understand the cropping pattern of various circles.

DATABASE AND METHODOLOGY:

The secondary data of various crops have been collected from namuna no. 20 in land record department at tahsil office at circle level.

Present study is based on the secondary data collected from tahsil Department of Junnar tahsil on circle level. The distribution of Crops 2011-12 has studied in this research paper. All information analyzed with the help of GIS technique in software and drawing some conclusions. Simple statistical method has used to compute crop ranking and Weavers Crop combination technique for analyses of spatial crop combination. In order to assess the crop combination, the following formula has been adopted.

$$d = \frac{\Sigma d^2}{n}$$

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. 'n' crops are those crops which occupy 5% area about total net sown area.

WEAVER'S CROP COMBINATION METHOD:

In the field of agricultural geography Weaver was the first Geographer who used (1954) statistical technique to show the crop combination of the Middle West USA). In his attempt for the delineation of agricultural regions of the Middle West in the United States, Weaver based his analysis on acreage statistics. Weaver computed the percentage of total harvested cropland occupied by each crop that held as much as one percent of the 184 total cultivated land in each of the 1081 counties covered his work. Excluding a few counties like Houston and Minnesota in which the crop combination was easy to ascertain, other counties showed a complex and confused picture of the percentage, occupied by different crops. It was therefore necessary to device "a rigorous approach that would provide objective constant and precisely repeatable procedure and would yield comparable results for different years and localities". In his work Weaver calculated deviation of the real percentage of crops (occupying one percent of the cropped area) for all the possible combinations in the component areal units against a theoretical standard. The theoretical curve for the standard measurement was employed as Follows;

Monoculture = 100 % of the total harvested crop land in one crop.
Two crop combination = 50 % in each of two crops.
Three crop combination = 33.3 % in each of three crops.
Four crop combination = 25 % in each of four crops.
Five crop combination = 20 % in each of five crops.
Ten crop combination = 10 % in each of ten crops.
For the determination of the minimum deviation the standard deviation method was used:

Where d is the difference between the actual crop percentages in a given county (areal unit) and the appropriate percentage in the theoretical curve and n is the number of crops in a given combination.

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

$$d = \frac{\Sigma d^2}{n}$$

RESULT AND DISCUSSION:

Table No.1: Crop Combination of Junnar Tahsil

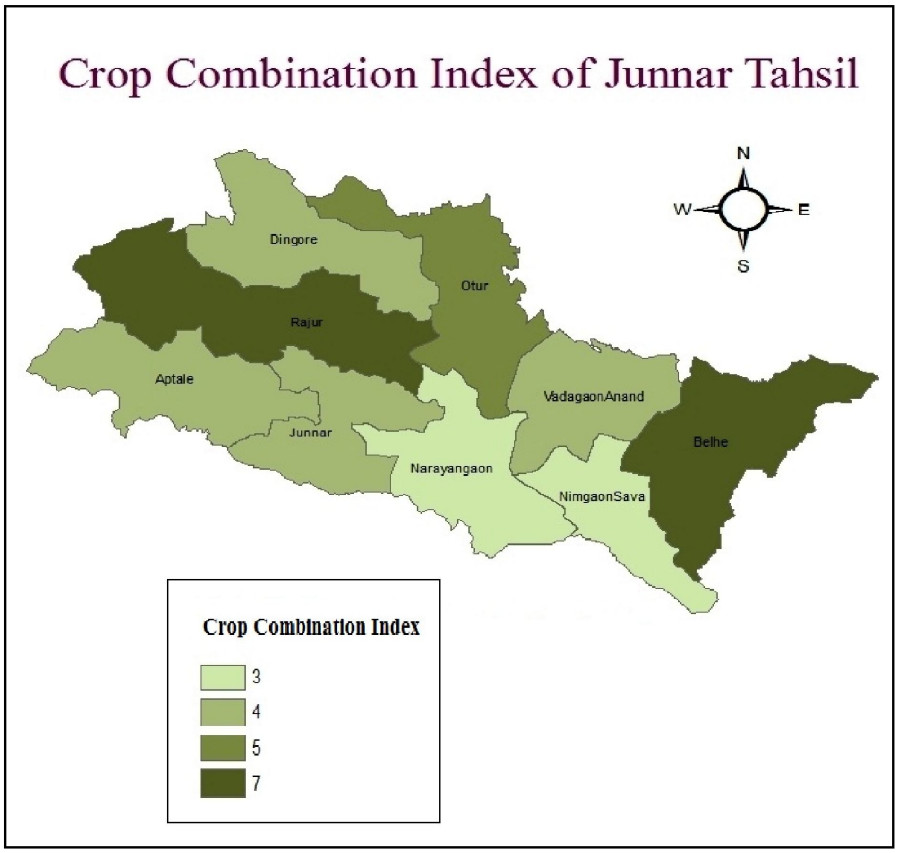
Sr. No.	Circles	Crops Combination	Crops
1	**Rajur**	Seven Crops	Sugarcane, Groundnut, Onion, Fodder Crops, Banana, Gram, Wheat
2	**Dingore**	Four Crops	Onion, Rice, Groundnut, Wheat
3	**Vadgaon Anand**	Four Crops	Groundnut, Soyabin, Fodder Crops, Onion
4	**Narayangaon**	Three Crops	Other Food Crops, Sugarcane, Fodder Crops
5	**Aptale**	Four Crops	Groundnut, Gram, Nachani, Sugarcane
6	**Belhe**	Seven Crops	Bajara, Jowar, Corne/Maize, Fodder Crops, Moong, Wheat, Groundnut
7	**Otur**	Five Crops	Sugarcane, Other Fruits Crops, Onion, Other Food Crops, Banana
8	**Nimgaon Sava**	Three Crops	Sugarcane, Fodder Crops, Other Vegetable Crops
9	**Junnar**	Four Crops	Sugarcane, Groundnut, Soyabin, Onion

The table no.1 depicts that the crop combination of Junnar Tahsil, from three crop combination to seven crop combination. The details are as follows

- **Three Crop Combinations: -** Narayangaon and Nimgaon Sava circles identified as three crop combination. Narayangaon observed other food crops, Sugarcane and fodder crops; whereas Nimgaon Sava observed Sugarcane, Fodder Crops and Other Vegetables. In both circle Sugarcane and Fodder Crops are common crops, the circles lies in the eastern part of the tahsil, which has

well irrigated, good fertile soil. Sugarcane factory is located near to these circles as well as one Milk Dairy is also there, that promotes the farmers to cultivate such type of crop.

- **Four Crop Combinations: -** Dingore, Vadgaon Anand, Aptale and Junnar circles have four crop combinations. Dingore circle observed Onion, Rice, Groundnut, Wheat crops, Vadgaon Anand have found Groundnut, Soyabin, Fodder Crops, Onion crops, Aptale circle identifies Groundnut, Gram, Nachani, Sugarcane crops and Junnar circle has Sugarcane, Groundnut, Soyabin, Onion crops combination. In these circles groundnut is one of the common crop. In these circles have found such type of crop combination because of good fertile soil as well as good irrigation facility.



- **Five Crop Combinations: -** Otur Circle has identified five crop combinations. The crops are Sugarcane, Other Fruits Crops, Onion, Other Food Crops, and Banana. As compare to other circle, the proportion cash crop is more in this circle. Because of fertile soil, good irrigation facility. This circle has lies along with highway and connected to Mumbai market.
- **Seven Crop Combination**:- Rajur and Belhe circles have noticed as seven crop combination. Rajur circle has observed Sugarcane, Groundnut, Onion, Fodder Crops, Banana, Gram, and Wheat crops. Belhe circle has identified Bajara, Jowar, Corne/Maize, Fodder Crops, Moong, Wheat, and Groundnut

crops. Rajur circle has engaged to produce cash crop production, whereas Belhe circle has produce food crops. Belhe circle has limited irrigation facilities and less fertile soil, on the other side Rajur circle has well irrigation facility and fertile soil. This type of geographical condition is affected on cropping pattern in the circles.

CONCLUSION:

The method of crop combination displays spatial variation of crop as well as cropping pattern, crop concentration, cropping variation, crop diversification and operation of a given area. The present study shows four types of crop combination which is three crop combinations, four crop combinations, five crop combinations and seven crop combinations. It means that there is no individual dominated crop in the tahsil. The crops are cultivated in the combination of three or more than three crops upto seven crops. Sugarcane, fodder crops, groundnut and onion are the major dominated crop in the tahsil. The proportion of food crops are less as compare to cash crop like sugarcane, onion, vegetables, fodder crops and groundnut. Only Belhe circle has considerable food crop combination, except that no other circle has such type of combination. The fertile soil, well irrigation facility, Sugar industry and Milk Dairy as well as Pune and Mumbai Markets are near to tahsil and they promote the farmers to take production of cash crops.

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