

A STUDY OF CROP COMBINATION REGION OF BARAMATI TAHSIL IN PUNE DISTRICT (Maharashtra State)

Dr. Sunil B. Ogale

Assistant Professor Department of Geography, Vidya Pratishthan's A.S.C. College Baramati,
Pune University Maharashtra State, India

Copyright © 2014 ISSR Journals. This is an open access article distributed under the *Creative Commons Attribution License*, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: The present study is an attempt to identify agricultural crop combination region of Baramati tahsil in Pune district for its better landuse planning. Baramati tahsil is situated in east part in Pune district covering 1382 square kilometer area and having 429690 populations (2011). This taluka consists of 117 revenue villages with one urban settlement. Administratively, this taluka has divided into six revenue circles. Population density of taluka is 311 persons per square kilometer (2011). The study region extends from 18° 2' 44" N to 18° 23' 19" North latitudes and 74° 13' 8" E to 74° 42' 47" East longitudes. The region falls under scarcity zone having rainfall between 400 to 500 mm. Monsoon generally commences in June, occurring highest rainfall in June (158 mm) and lowest in December (12 mm). The highest mean temperature is observed in May (34.60 centigrade) and lowest in January (18.50 centigrade). The slope of region is towards northwest and southeast. The study area has basaltic base having step like topography. Baramati tahsil is somewhat rectangular in shape. The study region is mainly agrarian having 84.89 percent net sown area of the total geographical area. Rafiullah (1965) modified Weaver's method and introduced a new method known as "Maximum Positive Deviation Method" apply to compute crop combination region for Baramati tahsil because of its accuracy.

KEYWORDS: Agriculture, Agricultural region, Crop Combination.

INTRODUCTION

The study of crop combination regions constitutes an important aspect of agricultural geography as it provides a good basis agricultural regionalization. Crops are generally grown in combinations (Weaver, 1954). The study of crop combination of any region has gained importance in geographical study. It gives us the relative position of crops on regional scale. Farmers grow crops in varied physical and cultural conditions. The pattern of crop combination gives rise to spatial predominance of certain crops or combination resulting the emergence of crop regions. Such analysis would ultimately minimize the change of oversimplified generalization (Ali, M. 1978). Crop combination study in geography is fruitful in many ways, firstly it provides an adequate understanding of an individual crop. Secondly, combination is in itself an integrative reality that demands definition and distribution analysis, and finally crop combination regions are essential for the construction of more complex structure of vivid agricultural region (Weaver, 1954). The study of crop combination thus forms an integral part of agricultural geography, and such study is greatly helpful for regional agricultural planning. First attempt for delineation of agricultural regions was made by Weaver in 1954. He studied crop combination for Middle East countries. Later on many more methods were introduced. Thomas (1963) modified Weaver's formula by including all crops with zero percent theoretical values in each step of the method, in the crop combination studies carried out in Wales but it did not yield different results than obtained by Weaver's method. Coppock (1964) also modified version of Weaver's method wherein he considered the rank in recognizing the leading crops. The Weaver's technique was subsequently modified by Doi (1959) where he supplied one sheet of table required only the summing up of actual percentages under different crops instead of finding differences between actual percentage and theoretical distribution. The present study attempts to study agricultural regionalization at micro level or village level of Baramati Tahsil.

STUDY AREA

Baramati tahsil lies between $18^{\circ} 2' 44''$ N to $18^{\circ} 23' 19''$ North latitudes and $74^{\circ} 13' 8''$ E to $74^{\circ} 42' 47''$ East longitudes. It is located at an altitude of 538 meters above mean sea level. The tahsil lies in the eastern part of Pune district of Maharashtra. The river Nira flows west to east forming the southern boundary of the Tahsil and the district. The river Karha flows northwest to south-east Baramati tahsil is bounded by Indapur tahsil towards the east, Satara district towards the south, Purandar tahsil towards the west and Daund Tahsil towards the north. The total geographical area (TGA) of Baramati tahsil is 1382 sq. km., which is about 8.80 percent of TGA of the Pune district (See Fig.1).

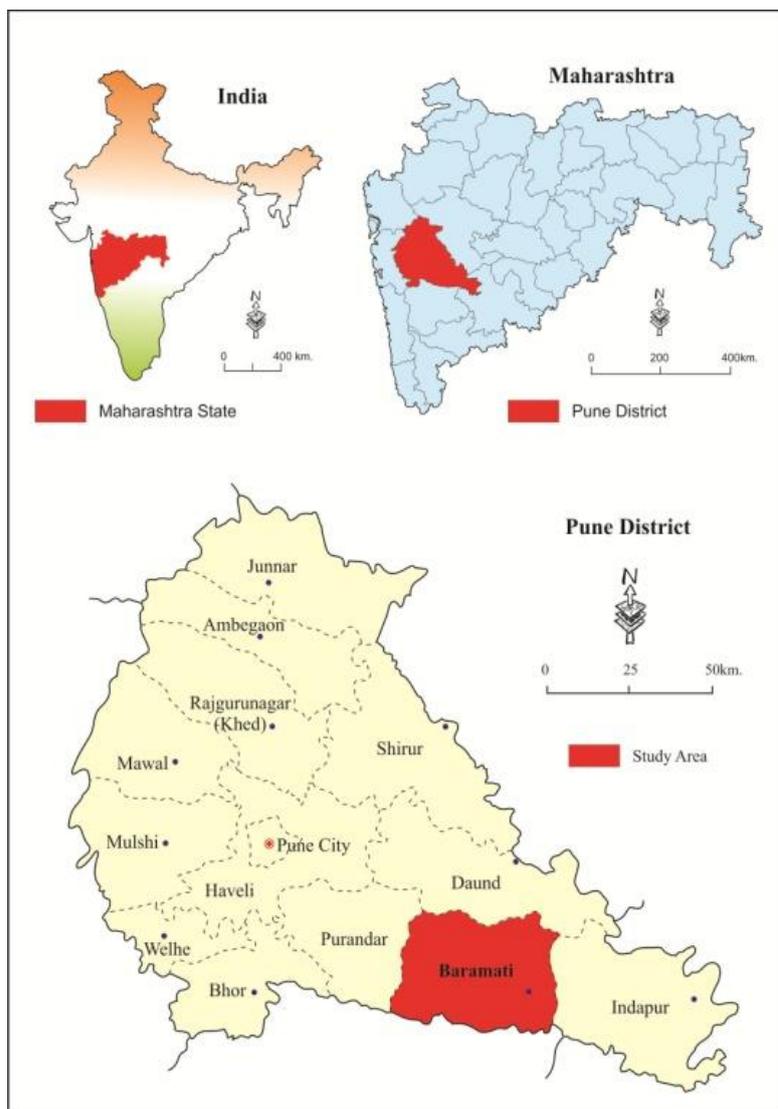


Fig.1 Location Map of the Study Area

OBJECTIVE:-

- 1) Identifying crop combination region of the Baramati tahsil.

DATABASE AND METHODOLOGY:-

The Present study was based on primary and secondary data sources. The published sources namely Tahsil Revenue Record, Socio-economic abstract of Pune District, District Census Handbook, Department of Irrigation, Groundwater Survey and Development Agency, Land Record office to obtain village wise crop data in Tahsil. Primary data was also collected at house hold level through questionnaires. Rafiullah’s method used in crop combination has been applied for Baramati Tahsil. Rafiullah’s (1956) Crop Combination modified Weaver method and introduced a new method known as ‘Maximum Positive Deviation Method’ The modified formula –

$$d = \sqrt{\frac{\sum D^2p - D^2n}{N^2}}$$

The under root sign may be ignored to save laborious calculations and the formula may be used in the following form:

$$d = \frac{\sum D^2p - D^2n}{N^2}$$

- d = deviation
- N = number of crops
- Dp = Positive difference
- Dn = Negative difference

SOIL TYPES:-

The fertility of soil is one of the factors affecting land capability of agricultural development. There are three types of soil found in the study area, namely, coarse shallow plateau soil, medium deep soil and deep black soil. Coarse shallow soil is observed in the hilly region. The medium black soil appeared in the surrounding area of Nira river and its tributary Karha. This soil is suitable for cultivation of sugarcane, wheat, oilseeds and pulses. The deep black soil lies along the bank of Nira river occupying 20 percent of the study region. This soil is rich in moisture and has high retentive capacity (See Fig. 2 Soil Type of the Baramati Tahsil)

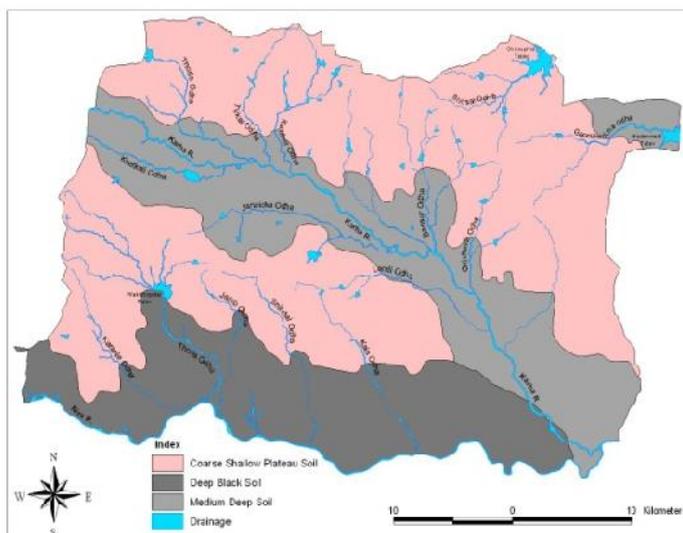


Fig. 2.5: Soil Map of the Study Area

Fig. 2 Soil Type of the Study Area

CROP COMBINATION REGIONS:-

The study of crop combination regions constitutes an important aspect of agricultural geography as it provides a good basis agricultural regionalization. The statistical technique adopted by Rafiulla is more accurate and rational and therefore it is quite popular for delineation of crop combination regions. According to this method percentage area of all crops was arranged in descending order for 117 villages. The crops having area less than 5 percent were omitted from the calculation and maximum positive deviation of variance was calculated. For monoculture medial value was considered at 50 percent, for two crop-combinations it is 25 percent, three crop-combination the value is 16.7 percent, for four it is 12.5 percent and for five crop it is 10 percent and so on. In present study area, 9 crops were used for computation of crop combination region. The obtained results of crop combination are shown in **Fig. 3, Table-1** and **Table-2**. Three crop combination regions have been identified in the Baramati tahsil by applying Rafiullah’s method.

Table- 1: Crop Combination Regions in Baramati Tahsil

Sr. No.	Types of Crop Combination	Number of Villages	Percent to total villages	Area in hectares	Percent of Area
1	Monoculture	89	76.07	83608	80.31
2	Two crop Combination	26	22.22	18985	18.24
3	Three crop Combination	02	1.71	1514	1.45
	Total	117	100.00	104107	100.00

Source: Computed by Researcher.

MONOCULTURE

Jowar, sugarcane, Bajara and wheat crops have monoculture in the Baramati tahsil . These four crops are identified in eighty-nine villages (76.07 percent to total villages). Jowar is leading crop in study region showing highest coverage in forty-six villages (Fig. 3). It is grown on 47562 hectares area. Sugarcane is identified as monoculture in twenty-nine villages in south and central parts in study region on deep soil and irrigation (Fig. 3). Irrigation and fertile soil are major factors for growing sugarcane along the bank of Nira river and these villages are lying in east, central and south parts in study region on deep soil and Nira left canal irrigation in Baramati tahsil. Bajara is identified as monoculture occupying only 12.13 percent area in the study region, it is occurred in northwest and northeast part of coarse shallow soils. Napatvalan village is identified as monoculture in wheat crop in study region. Napatvalan is located on fertile soil (**See, Fig. 3**).

Table-2: Crop Combination Types and Crops

Crop Combination Types	Crops in Combination	Number of villages	Percent of total village	Area in hectares	Percent to total area
Monoculture	Jowar	46	39.32	47562	45.68
	Bajara	13	11.11	12623	12.13
	Sugarcane	29	24.79	22986	22.08
	Wheat	01	0.85	437	0.42
Two Crop Combination	Sugarcane + Wheat	21	17.95	15401	14.79
	Jawar + Bajara	03	2.56	2955	2.84
	Sugarcane + Fodder Crops	01	0.85	456	0.44
	Sugarcane + Pulses	01	0.85	173	0.17
Three Crop Combination	Sugarcane + Wheat + Fodder Crops	02	1.71	1514	1.45

Source: Author

TWO CROP COMBINATION REGIONS

Six crops, namely, sugarcane, wheat, jowar, bajara, fodder crops and pulses enter into two crop combinations in different villages. Fig. 3 reveals two crop combination twenty-six villages area is south part of the study region. Sugarcane has largest area entering in this combination with bajra, wheat, jowar, foddercrops and pulses. Twenty-one villages in study area have combination of sugarcane with wheat, bajra, jowar and foddercrops located in south and south-east parts in Baramati tahsil on deep black fertile soil. Three villages have found two crop combinations of jowar and bajara lying in west, east and central parts on coarse shallow and medium black soil. Jowar and bajra crop combination appeared in Morgaon, Sonkaswadi and Rui. Sortewadi and Pimplewasti located in south part entered in combination of sugarcane with foddercrops and pulses. These villages are located on the bank of Nira river. Jowar entered with bajara as two crop combination in Morgaon and Rui on coarse shallow soil.

THREE CROP COMBINATION REGIONS

Three crop combinations cover 1514 hectares of area in Baramati tahsil (Fig.3). In this combination following crops have entered i.e. sugarcane, wheat, and fodder crop (Table-2). Kurnewadi and Malad village have found three crop combination where sugarcane combined with wheat and fodder crop lie along the Nira and Karha river in south part in study region. The river Karha flows towards northwest to southeast and it joins Nira river in southeastern part in study area. Malad village located on the bank of Nira river, has found three crop combination of sugarcane, wheat and fodder crops in south part on fertile soil and irrigation facility in the study region.

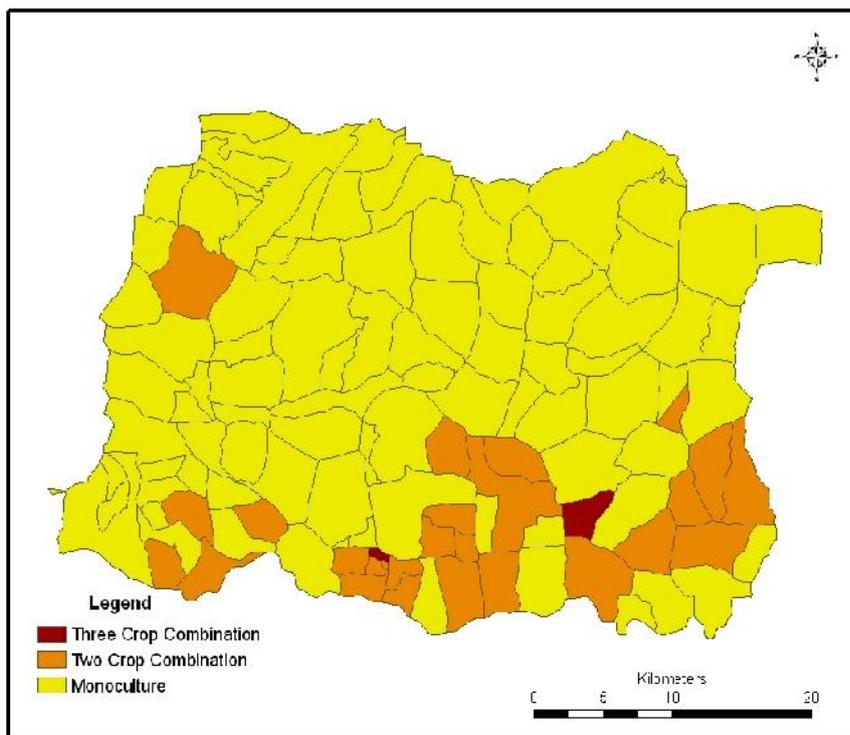


Fig.3 Crop Combination Region

CONCLUSIONS:-

The application of Rafiullah’s method shows the realistic picture of crop combination. Three crop combination regions has found in study area. Monoculture is in eighty-nine villages. Jowar, sugarcane, bajara and wheat entered in this combination. Jowar, sugarcane, bajara and wheat as monoculture crops. Jowar is cultivated in forty-six villages and sugarcane is cultivated in twenty-nine villages in study area. Two-crop combination region has observed in twenty-six villages and three crop combinations have observed two villages. A sugarcane, wheat and fodder crop is grown in this region on irrigation.

ACKNOWLEDGEMENTS

The author is grateful to Prof. and Head Dr. Virendra Nagrale Department of Geography S.N.D.T. Women University Pune Campus, Pune for his valuable guidance and moral support.

REFERENCES

- [1] Ali, Mohammad (1978): "Dynamics of Agricultural Development in India". (Ed.), Concept Publication, Private Company - New Delhi.
- [2] Athawale, A.G. (1966): "Some New Methods of Crop-combination", Geographical Review of India, Kolkata, December, Pp. 28-34.
- [3] Bhatia, S.S. (1965) : "Pattern of Crop-combination and Diversification in India". Economic Geography, Vol. 41, No. 1, pp. 38-50.
- [4] Bhatia, C.S. (1981) : "Changing Landuse and Cropping Pattern in Bihar," Perspective in Agricultural Geography, Concept Publication, New Delhi.
- [5] Coppock, J. T. (1964): "Crop Livestock and Enterprise Combinations in England and Wales," Economic Geography, Vol. 40, PP. 65-77.
- [6] Husain, Majid (1996) : "Systematic Agricultural Geography", Rawat Publication, New Delhi.
- [7] Noor Mohammad (1970) : "Crop-Combination in Trans-Ghagsa Plain". Geographical Review of India, Kalkutta, 32/1.
- [8] Sharma, S.C. (1971) : "Cropping Pattern and Crop-Combination Regions in Etweal Middle Ganga Yanuna Doab". The Deccan Geographer, Secunderabad, 10/1.
- [9] Singh, H. (1963) : "Crop Diversification in Malwa Tract of Punjab." The Indian Geographical Journal, Madras, Vol.38, 3 and 4.
- [10] Weaver, J.C. (1954) : "Crop Combination Regions in the Middle West". The Geographical Review". Vol. 44 No. 2. Pp. 176-181.