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A DELINEATION OF CROP COMBINATION REGION: A CASE STUDY OF BAWADA CIRCLE IN INDAPUR TAHSIL (PUNE DISTRICT)

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ABSTRACT

Agriculture in a way is the result of human efforts applied in the exploitation of land resources towards the satisfaction of one of man's basic needs, food. In spite of the rapid growth of industries and service sectors in India, agriculture still is an important economic activity, employing 62 percent of total workers in 2001(Maharashtra 64 percent in 2001).In this paper an attempt has been made to analyse crop combination regions in study area. Crop combination is one of the technique delineating agricultural regions. Ten major crops have been considered for analysis. The study is based on primary sources. TheRafiullah's Crop Combination Method is using for the study the crop combination regions. The factors like rainfall irrigationetc. affect the crop combination. In BawadaCircle three crop combination regions are delineated and four major crops are identified these are jowar, sugarcane,corn and wheat.

KEY WORLD : *Delineation,Landuse, Crop Combination,Agricultural Region.*

1. INTRODUCTION

Agriculture in a way is the result of human efforts applied in the exploitation of land resources towards the satisfaction of one of man's basic needs, food. In spite of the rapid growth of industries and service sectors in India, agriculture still is an important economic activity, employing 62 percent of total workers in 2001(Maharashtra 64 percent in 2001). After independence, Indian government is paying more attention for agricultural development through five year plans. Green revolution is responsible for increasing production to feed to population. Hence it is necessary to use every piece of land properly. Agriculture provides raw materials to small as well as large scale industries and much of export items (Davis, 1982) May agro-based industries give output and employment to many people. Rainfall is vital and instrumental in case of Indian agriculture.

The combination analysis was initially introduced in geography by Weaver in 1954 for computing crop formula combination for Midwestern United States. In addition, the technique can also be applied to identify and locate areas sharing a significant proportion of a single agricultural element or crop at higher rank. The principal of combination analysis is, thus, promises to be an important tool of statistical studies in various fields of geography particularly in agricultural geography. The present treatise has modest attempt to study the crop combination pattern in Bawada Circle of Indapurtahsil for its better agricultural landuse planning.

2. STUDY AREA

The Bawada Circle is one of the circles in Indapurtahsil consisting of 18 villages. Geographically, this area extents from 17.894959°to 18.072995°North latitudes and 74.940695° to 75.135104°East longitudes. The study area experiences semi-arid climate. Month April, May and June are the hottest months with maximum mean temperature of 40° centigrade. Temperature gradually reduces in December and January with minimum mean temperature 12 ° centigrade. The medium black and deep black soils appear within study area. The soil fertility encourages growing various crops like sugarcane, jowar, bajra, wheat, vegetables etc.

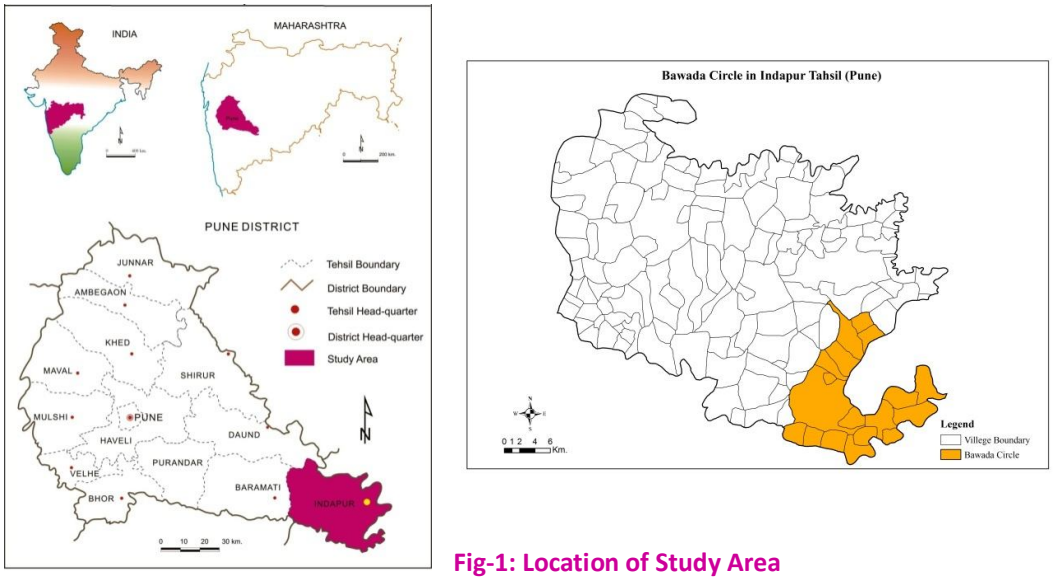

Fig-1: Location of Study Area

3. OBJECTIVES

1. To delineateCrop Combinationregions of study area
2. To suggest solutions for better landuse in study area

4. DATA SOURCES

The present study is based on primary data. Primary data have obtained from the questionnaires. The questionnaires cover aspect like crop landuse, farmer's education, income from various sources and problems regarding agriculture and allied sectors. Besides this information concerned*Talathi* and *Sarpanch* were contacted to get more information of these villages. The data regarding major ten crops were obtained for the year 2011 at village level for 18 villages through questionnaires. These crops include jowar, wheat, sugarcane, bajra, corn, fodder crops, pulses, oil seeds, fruits and vegetables. The data collected were then converted into percentage.

5. METHODOLOGY

The Rafiullah's Crop Combination Methodis used for the study.Rafiullah in 1965 has modified Weaver's method and introduced a new method known as "Maximum Positive Deviation Method" The statistical technique adopted by Rafiullah is more accurate and rational and therefore it is quite popular for delineation of crop combination regions.

Rafiullah's Crop Combination Method (Maximum Positive Deviation Method)

Formula $d = \sqrt{\frac{\sum D_p^2 - D_n^2}{N^2}}$

Whereas:
d = is the deviation,
Dp = is the positive difference from the medial value
Dn = is negative difference from the medial value and
N = is the number of crops.

According to this method, percentage of all crops have arranged in descending order for 18 villages. The crops having area less than 5 percent were omitted from the calculation and maximum positive deviation of variance was obtained. For monoculture medial value was considered at 50 percent for two crop combination it is 25 percent, three crop combinations the value is 16.7 percent, for four it is 12.5 percent and for five crops it is 10 percent and so on. In present study area, 10 crops were considered for computation of crop combination region. The obtained results of crop combination have shown in Fig.2 and Table-1and 2

6. RESULT AND DISCUSSION

The table shows the crop combinations in Bawada Circle of Indapurtahsil

Table 1: Crop Combinations

Sr. No	Village Name	Crop Combinations	Crops
1	Bedshinge	2	Sugar Cane, Jowar
2	Bhatnimgaon	1	Sugar Cane
3	Awasari	1	Sugar Cane
4	Surwad	1	Jowar
5	Bhandgaon	3	Sugar Cane, Jowar, Corn
6	Vakilwasti	1	Sugar Cane
7	Bawada	1	Jowar
8	Nirnimgaon	1	Jowar
9	Kacharewadi	3	Sugar Cane, Jowar, Corn
10	Sarati	1	Sugar Cane
11	Ganeshwadi	1	Sugar Cane
12	Pimpri Bk.	2	Sugar Cane, Wheat
13	Tannu	2	Sugar Cane, Jowar
14	Narsingpur	1	Sugar Cane
15	Giravi	2	Sugar Cane, Jowar
16	Ozare	1	Jowar
17	Gondi	1	Sugar Cane
18	Lumewadi	3	Sugar Cane, Jowar, Corn

Source: Computed by Researcher

Crop Combination Regions

1. One Crop Combination Regions (Monoculture)

Sugarcaneand jowarhave identified as monoculture in Bawada Circle of Indapurtahsil (Fig.-2). These two crops are sown in eleven villages as a monoculture. (61percent to total villages) Among these two crops sugarcane is leading crop cultivating highest coverage in eleven villages namelyBhatnimgaon, Awasari,

Vakilwasti, Sarati, Ganeshwadi, Narsingpur, and Gondi(Table 1). This crop is grown on 1521 hectares area. Sugarcane belt is concentrated in south and east partof study region. Irrigation and fertile soil are major factors for growing sugarcane along the banks of RiverBhimaand Nira.Jowar crops have identified as monoculture inSurwad, Bawada, Nirnimgaon, and Ozare villages.

Table- 2: Crop Combination Regions

Crops Combination Regions	Crops in Combination	No. of Villages	Percent to Total Village	Area in Hectares	Percent of Area
Monoculture	S	7	38.9	1521	23.9
	J	4	22.2	1275	20
Two crop	SJ	3	16.7	1309	20.5
Combination	SW	1	5.5	649	10.2
Three crop Combination	SJC	3	16.7	1620	25.4

Source: Computed by Researcher

Note: J = Jowar, S = Sugarcane, C = Corn, W = Wheat

2. Two Crop Combination Regions

Three crops have entered in two combinations regions. These crops are sugarcane, jowar, and wheat. Fig.-2 and Table -1 reveal two crop combination regions in Bawada Circle of Indapurtahsil. Sugarcane has largest area entering in this combination with jowar and wheat (1958 hectares). Three villages in study area have combination of sugarcane with jowarlocated in east and north parts in Bawada Circle of Indapurtahsil. Pimpri Bk. is located in east parts of Bawada Circle which is entered in two combination of sugarcane with wheat.

Three Crop Combination Regions

Three crop combinations cover 1620 hectares of area in Bawada Circle of Indapurtahsil(Fig.-2). In this combination namely, jowar, sugarcane and corn crops have entered. Bhandgaon, Kacharewadi and Lumewadihave found three crop combination of jowar combined with sugarcane and corn crops. Kacharewadi and Lumewadi village are located at the bank of Nira River and Bhandgaon village is located at bank of Bhima River, so water availability is more in these villages. Water is one of the important factors in the agriculture. Farmer's takes advantages of this water and grow more crops in the agriculture field.

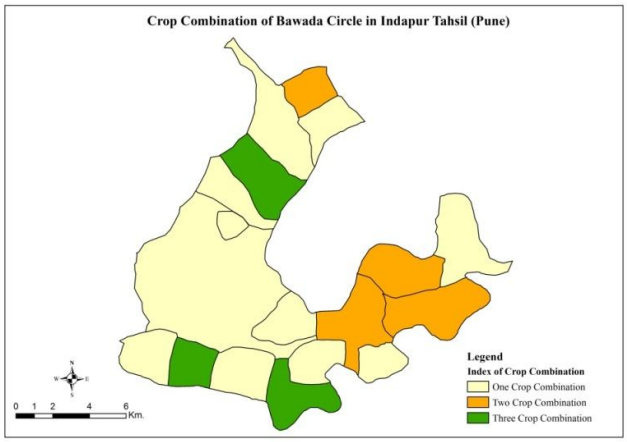

Fig 2: Crop Combination Regions

7. CONCLUSION AND SUGGESTIONS

1. IndapurCircle of IndapurTahsilhasthree crop combinations. These crops are sugarcane,jowar,corn and wheat.
2. Sugarcane has largest area entering in this combination with jowar, corn and wheat.
3. Sugarcane cultivation area is facing the problem of soil salinity.
4. The cultivation of sugarcane crop in villages can be replaced by fruit and fodder crops. By replacing sugarcane the problem of soil salinity can be overcome and more income can be generated form saline-alkali soil.

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