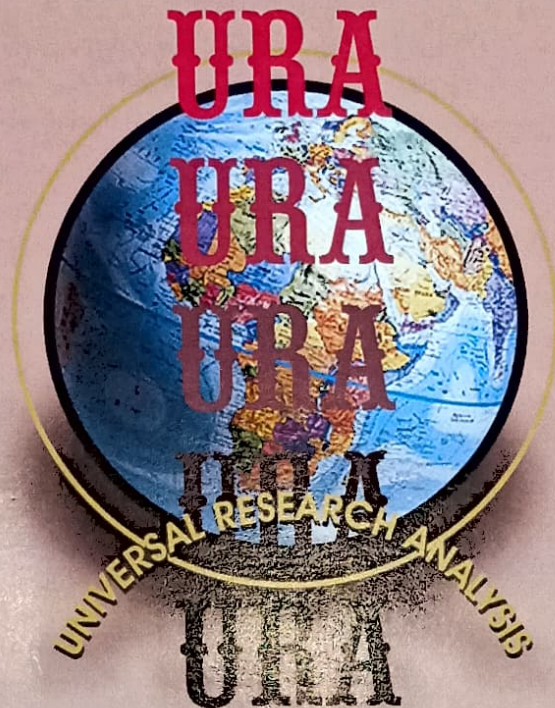


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RESEARCH ANALYSIS



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Crop Combinations in Marathwada Region

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Research Paper - Geography

Introduction :

The study of spatio-temporal transformations in crop combinations is very useful for future agricultural planning. Crop combinations study should be useful for agricultural market development, for the development of agro-based industries. The study of crop combinations study is also useful to find out the crop combinations regions and planners can plan properly for sustainable agricultural development.

Many agricultural geographers, economists studied the crop combination regions of different part of the world. Many agricultural geographers like Weaver (1954)¹, Sing Jasbir & Dhillon S.S. (2006)², Majid Hussain (2007)³, Scott (1957)⁴, Barrau J. (1961)⁵, Coppock (1960)⁶, Jonasson (1968)⁷, Fafiullah (1956)⁸, Morgan & Munton (1969)⁹, Doi (1959)¹⁰, Thomas (1963)¹¹ used their methods for the calculations of crop combinations for different regions of the world.

Significance of the crop combination study :

- a) Crop combinations study always useful for the development of agriculture in a particular region. It is also useful for sustainable development.
- b) With the study of crop combination regions, agricultural area can be divided in agricultural region which are very useful for administrators and planners.
- c) The study of crop combination is very important for rotation of crops and to increase per hectare yield.

Study Area :

Agriculturally and economically most backward region of India i.e. Marathwada region is selected for the study. Before 1983, there were five districts in Marathwada but after 2000 Marathwada is divided into eight districts, Marathwada lies between 17°35' north latitude to 20°41' north latitude and 74°40' east longitude to 78°16' east longitude. Marathwada region semi-arid region of Maharashtra state. The distance of Marathwada in the direction from east to west is 394 kilometers and north south extent is near about 330 kilometers.

Physiography :

Crop combination regions are related to the physiography of that region. The height of Balaghat mountain ranges in Beed, Osmanabad and Latur districts are more than 600 meters Ajantha mountain ranges extended up to Kinwat tahsil and the height is between 600 to 900 meters. An average height of Marathwada region is between 450 to 600 meters. Area of river basin height is between 300 to 450 meters. Area of less than 300 meters is very less in Marathwada region.

Soils :

Very deep black, deep black and shallow black soil is found in Marathwada region. Most of the area is made by plateau and rivers banks made by deep alluvial soils. Godawari and Bhima basins covered most of the part of Marathwada region.

Climate :

The annual average rainfall is between 750 to 800 millimeters. More than 1000 millimeter rainfall is received in Kinwat area and in western part of Marathwada the average rainfall is less than 600 millimeters. Summer is very hot and dry winter is cool and dry and rainy season is humid in total Marathwada region. The agricultural activities are very related to climatic conditions.

Objectives of the study :

Followign are the main objectives of the study.

- a) To study the crop combinations regions of different districts of Marathwada region during the period 2000-01.
- b) To study the crop combinations regions of different districts of Marathwada

region for the period 2008-09.

- c) To study the changes taken place in crop combination in different districts of Marathwada region during the period 2000-01 to 2008-09.

Methodology :

Weavers method has been applied for the calculations of crop combination regions of different districts of Marathwada region. Minimum deviation method of crop combination of weaver has been applied for the calculation of crop combination. Districtwise crop combination is calculated and it is shown by the choropleth maps. The changes in crop combination for the period 2000-01 to 2008-09 have been plotted in different districts of Marathwada region. Data has been collected from secondary sources. Secondary data collected from office of the Agricultural commissioners, Govt. of Maharashtra Pune and Socio- Economic Reviews and District Statistical Abstracts of all districts of Marathwada region for the year 2001-02 and 2009-10.

Results & Discussion :

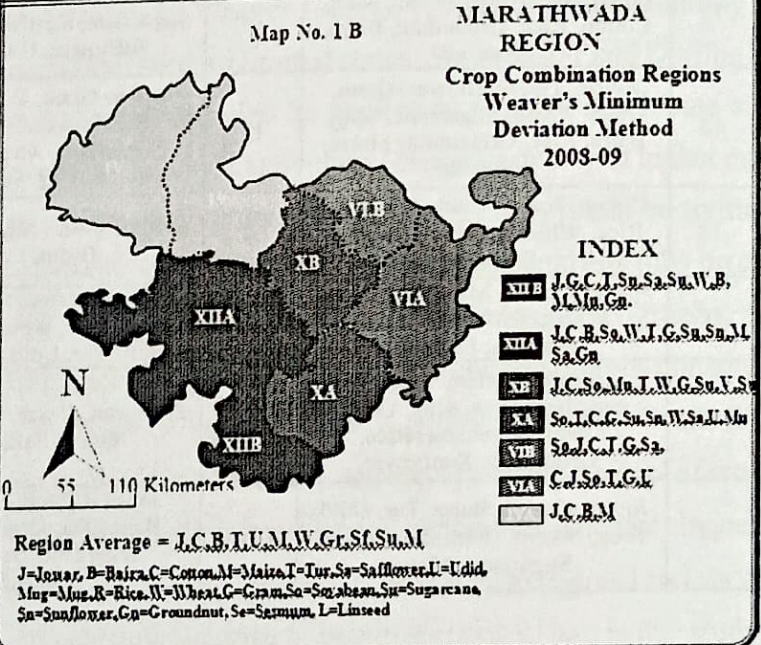
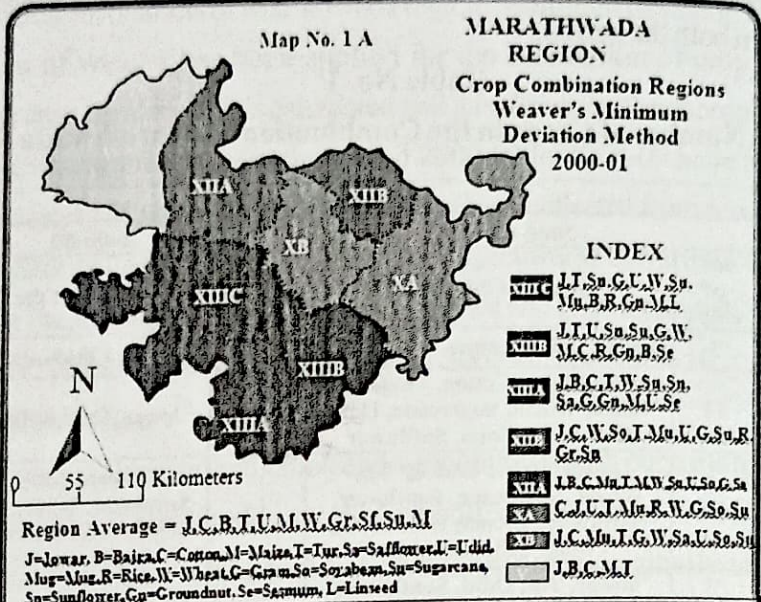
The geographical investigation and agricultural which purports to select various crops of agricultural elements to be studied collectively in an area may be formed as combination analysis. The combination analysis was originally introduced into geographical research by Weaver John C. (1954) in his outstanding study of crop combinations in Mid-western limited states. Singh Jasbir and Dhillon S.S. (2006) In addition, the technique can also be applied to identify and locate areas sharing a significant proportion of single agricultural elements or crop at higher rank, such as the significant rice or producing areas of India. As such, it can be termed as regional distribution analysis. The principle of combination analysis thus promises to be an important tool of statistical studies in various fields of geography, particularly in agricultural geography. "The study of crop combination regions constitutes important aspects of agricultural geography as it provides a good basis for agricultural regionalization." (Majid Hussain 2007) In recent years the concept of crop combination has engaged the attention of geographers and agricultural land use planners. The studies made so far in this field range in approach from topical to regional and vary in extent from small areas of minor political units to be entire country. Here in this study very suitable

crop combination method of Weaver has been applied for different districts of Marathwada region for the period 2000-01 to 2008-2009. As per the calculations of Weaver's method in 2000-01, 11 crop combinations have been recorded and 2008-09 there were 10 crop combinations have been observed in total Marathwada region. Out of the 11 crop combination in 2000-01 the crop udid, mug and maize not observed in 2008-09 and soyabean, safflower crops newly recorded in the combination. The rank of jowar and cotton has been constant in both the period.

Table No. 1
Change in Number of Crops in the Combination in Marathwada Region

Name of Districts	Weaver's method			
	2000-01		2008-09	
	No. of crops	Name of the Crops	No. of crops	Name of the Crops
Aurangabad	5	Jowar, Bajra, Cotton, Maize, Tur	4	Jowar, Cotton, Bajra, Maize
Jalna	12	Jowar, Bajra, Cotton, Mug, Tur, Maize, Wheat, Sugarcane, Udid, Soyabean, Gram, Safflower	4	Jowar, Cotton, Bajra, Maize
Beed	13	Jowar, Bajra, Cotton, Tur, Wheat, Sugarcane, Sunflower, Safflower, Gream, Groundnut, Mug, Udid, Sesmum	12	Jowar, Cotton, Bajra, Soyabean, Wheat, Tur, Gram, Sugarcane, Sunflower, Maize, Safflower, Groundnut
Latur	13	Jowar, Tur, Udid, Sunflower, Gram, Sugarcane, Wheat, Mug, Cotton, Rice, Groundnut, Bajra, Sesmum	10	Soyabean, Tur, Cotton, Gram, Sugarcane, Sunflower, Wheat, Safflower, Udid, Mug
Osmanabad	13	Jowar, Tur, Sunflower, Gram, Udid, Wheat, Sugarcane, Mug, Bajra, Rice, Groundnut, Maize, Lineseed	12	Jowar, Gram, Cotton, Tur, Sunflower, Safflower, Sugarcane, Wheat, Bajra, Maize, Mug, Groundnut
Nanded	10	Cotton, Jowar, Udid, Tur, Mug, Rice, Wheat, Gram, Soyabean, Sugarcane	6	Cotton, Jowar, Soyabean, Tur, Gram, Udid
Parbhani	10	Jowar, Cotton, Mug, Tur, Gram, Wheat, Safflower, Udid, Soyabean, Sugarcane	10	Jowar, Cotton, Soyabean, Mug, Tur, Wheat, Gram, Sunflower, Udid, Sugarcane
Hingoli	12	Jowar, Cotton, Wheat, Soyabean, Tur, Mug, Udid, Gram, Sugarcane, Rice, Groundnut, Sunflower	6	Soyabean, Jowar, Cotton, Tur, Gram, Safflower
Total Marathwada Region	11	Jowar, Cotton, Bajra, Tur, Udid, Mug, Wheat, Gram, Sunflower, Sugarcane, Maize	10	Jowar, Cotton, Soyabean, Bajra, Tur, Gram, Wheat, Sugarcane, Safflower, Sunflower

Table No. 1 indicates that the transformations in number of crop combinations in different district of Marathwada region. In 2000-01 in Aurangabad district five crop combinations have been observed and in 2008-09, 4 crop combinations have been recorded. Tur crop was not observed in crop combination in 2008-09. Jowar, cotton, bajra and maize are the common crops in both the combinations.



In 2000-01, in Jalna district great variations have been recorded in crop combinations during the period 2000-01 and in 2008-09. There were 12 crop combinations in Jalna district in 2000-01 and in 2008-09 there were only 4 crop combinations have been observed. Crop mug, tur, wheat, sugarcane, udid, soyabean, gram and safflower have not been observed in crop combination during the period 2008-09.

There were 13 crop combination observed in Beed district during the period 2000-01 and in 2008-09 there were 12 crop combinations in Beed district. Sesmum crop was not observed in the crop combination during the period 2008-09.

In Latur district there were 13 crop combinations recorded during the period 2000-01 and in 2008-09 there were 10 crop combinations have been recorded in Latur district. Cotton, rice, bajra, sesmum has been not recorded in crop combination of Latur district for the period 2008-09.

In Osmanabad district 13 crop combinations was observed in 2000-01 and it was 12 crop combination observed in 2008-09. crop linseed was not observed in 2008-09.

In Nanded district there were 10 crop combination observed in 2000-01 and in 2008-09 there were 6 crop combination recorded, crop mug, rice, wheat and sugarcane has not been observed in Nanded district during the period 2008-09.

In Parbhani district 10 crop combination has been observed in both the period. The crop safflower was in crop combination in 2000-01 but in 2008-09 the crop sunflower was recorded in crop combination.

In Hingoli district major changes in crop combination has been observed during the period 2000-01 and 2008-09 period. There were 12 crop combinations observed in Hingoli district during the period 2000-01 and it was 6 crop combinations in 2008-09. Wheat, mug, udid, sugarcane, rice, groundnut and sunflower were not recorded in crop combination in 2008-09.

Conclusions :

Spatio-temporal transformations in crop combinations as per the weaver's method have been observed in different districts of marathwada region.

In total marathwada region slight transformations were recorded in crop combinations of both the period. The crop combinations were decreased from 11 to 10 crops during the period 2000-01 to 2008-09. Major changes were observed in Jalna district. There were 12 crops in the combination in 2000-01 and after nine years there were 4 crops combinations were observed. In Nanded district crop combinations were changed from 10 to 6 crops. In Hingoli 12 crops to 6 crops combinations were recorded. Crop combination is transforming in total marathwada region.

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