



AN ASSESSMENT OF FLORICULTURE USING RANKING COEFFICIENT AND CROP COMBINATION IN SOLAPUR DISTRICT, MAHARASHTRA.

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ABSTRACT

In the contemporary period, the cultivation of diverse species of crops has changed the traditional perspective of agriculture. The cultivation of different crops has experienced intensification as well as growth in terms of production and quality. Therefore, in agricultural geography, different statistical techniques have been exercised to study these patterns and establish relationship between the physical determinants of agriculture and production of crops. These outlooks have embodied the dynamic aspect of agriculture all over the world and forge to configure the future. Now-a-days, in Solapur district, the floriculture practice is carried out in 11 tahsils and considered to be an important facet of the economy. Hence, the present paper is an attempt to study the existing role of floriculture in different tahsils of Solapur district using the ranking coefficient method and to identify the crop combination region for better land use planning.

Keywords: ranking coefficient, crop combination, concentration index, Solapur district, floriculture.

INTRODUCTION

In the contemporary agricultural practice, floriculture is considered to be an important activity in terms of higher returns to the farmers (Rathod, 2017). The cultivation of flower and ornamental plants within the garden and arable land is known as floriculture (Biswas, 2013). India has managed to increase the production of flowers by identifying the huge potential for export to foreign countries (Prakash and Muniyandi, 2014). The overall increase in production has urged farmers to opt for floriculture as a major crop throughout the year. As a result, the farmers get high income and additional employment opportunities are created.

The term agricultural productivity means that the production and inputs are similar to the produced output. This productivity is influenced by a number of physical factors like physiography, climate, soil, water, and socioeconomic conditions (Husain 2004; Dushing et.al., 2014). The farmer's attitude towards the better standard of living along with interdependency on the physical and socioeconomic factors has resulted in opting of floriculture activity in the region.

The pattern of crop combination gives rise to spatial predominance of certain crops or combination resulting the emergence of crop regions (Ogale, 2014). The study of crop combination aids in comprehending the complex structure of the agricultural regions and to understand the agricultural mosaic, cropping pattern, crop concentration, cropping variation, crop diversification and operation of a given area (Chakraborty, 2012; Dushing et.al., 2014). Weavers method is widely used and has been applied largely by the geographers to bring the more crop associations in an aerial unit (Premakumar et.al., 2015).

In the present study, an attempt has been made to identify the dominant flower producing region with the help of ranking coefficient method and to understand agricultural crop combination in 11 tahsils of Solapur district.

STUDY AREA

The district of Solapur is located in the Maharashtra state of India. The latitudinal and longitudinal extent of the study area is: 17⁰10' N to 18⁰ 32' N latitudes and 74⁰ 42' E to 76⁰ 15' E longitudes.



Figure 1: Location map of the study area.

The east-west and north-south length of the district is about 200 km and 150 km respectively (Rathod 2017). According to the 2011 census, the total population of Solapur district is 43,15,527 and the geographical area is about 14,895 sq. km divided into 11 tahsils (Barakade and Sule, 2011). It ranks fourth in terms of area (4.88 percent) a seventh in terms of Population (4.51 percent) amongst the 35 districts in the Maharashtra state (Rathod 2017). The study area lies in the rain shadow zone of Western Ghats, hence the average annual rainfall in the district is 584.3 mm (http://solapur.gov.in/htmldocs/1977/gen_climate.html).

DATABASE AND METHODOLOGY

The database for the present study comprised of primary and secondary data. Primary data consisted of in-depth interview and field survey, while secondary data was collected from various Government reports, journals and magazines. The analysis in the present study was carried out from this database and applying ranking coefficient formula and Weavers's method of crop combination (Husain 2004).

$$\text{Ranking co-efficient of the areal unit} = \frac{\text{All ranks}}{\text{Number of observations}}$$

Using the above mentioned formula, the ranking coefficient values or average ranks for various Tahsils have been calculated.

For Weaver's crop combination method, the formula used was:

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

Where, d = relative value; d² = difference between the actual crop percentages in a given region (areal unit) and the appropriate percentage in the theoretical curve; n = number of crops in a given combination.

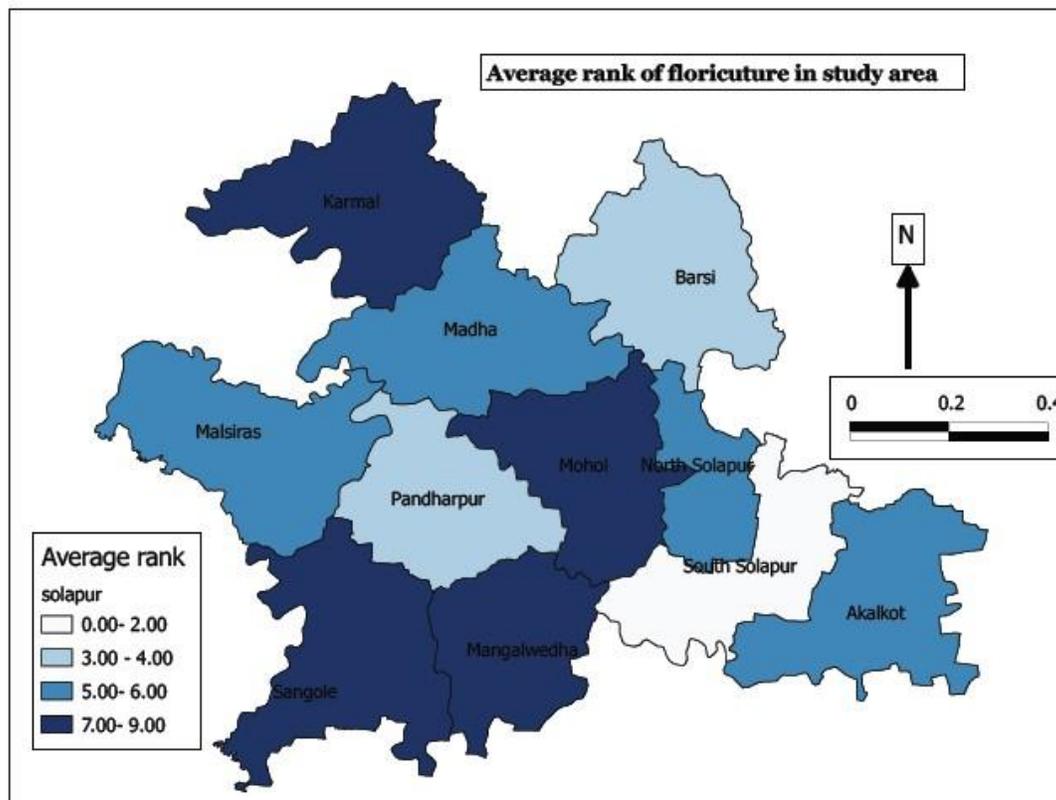
The Ranking coefficient method:

In this technique, the component areal units are ranked and the ranking coefficient for each unit is obtained (Husain, 2004). The ranks acquired for the areal units are arranged in an

ascending order. The area with high yield of flower production will have a low ranking coefficient while the area with low yield will have a high ranking coefficient.

Table 1: Ranking coefficient values for 11 Tahsils of Solapur district.

Sr. No.	Name of Tahsils	Average rank
1	South Solapur	2
2	Barshi	3.85
3	Pandharpur	4.05
4	Malshiras	5.45
5	Madha	5.7
6	North Solapur	5.75
7	Akkalkot	6.25
8	Karmala	6.75
9	Mohol	8.1
10	Mangalweda	8.95
11	Sangola	9.15



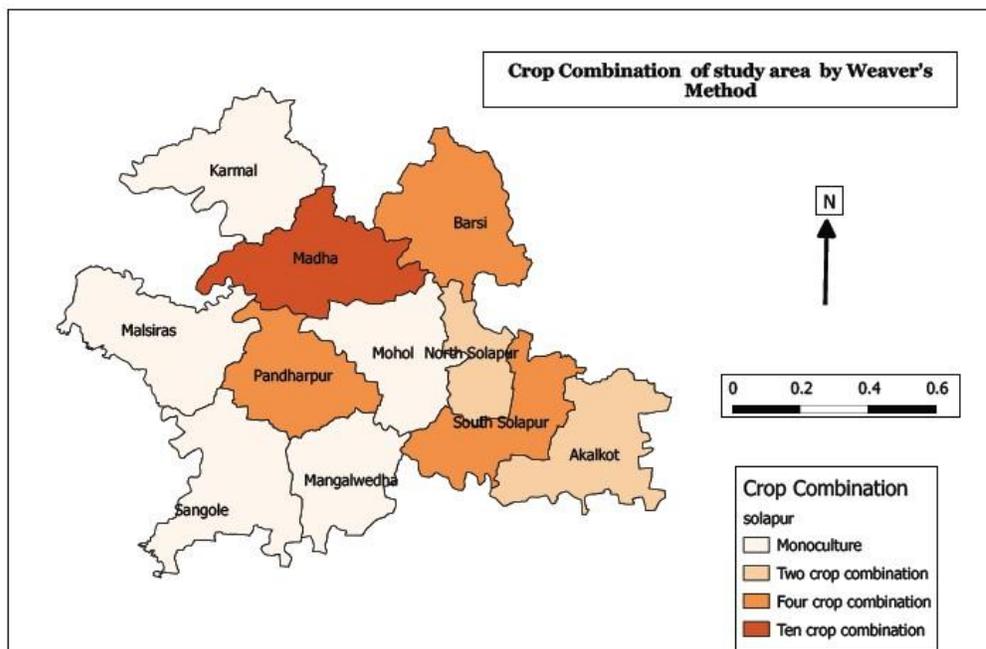
Crop combination regions:

One of an important aspect of agricultural geography is the study of crop combination regions as it provides a good basis for agricultural regionalization (Ogale 2014). This

statistical technique was established by Weaver (1954) to establish crop combination of the Middle West (USA) (Husain 2004). In the present study, the delineation of the crop combination regions was carried out executing Weaver's method and 10 crops were used for computation of crop combination region. For monoculture, the theoretical value was considered at 100%, for 2-crop combination it was 50%, for 3-crop combination it was 33.3%, for 4-crop combination it was 25% and for 10-crop combination it was 10%.

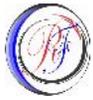
Table -2: Crop combination for 11 Tahsils of Solapur district.

Sr. No.	Crop combination	Name of Tahsils
1	Monoculture	Karmala
2	Monoculture	Mangalwedha
3	Monoculture	Malshiras
4	Monoculture	Mohol
5	Monoculture	Sangola
6	2-crop combination	North Solapur
7	3-crop combination	Akkalkot
8	4-crop combination	South Solapur
9	4-crop combination	Pandharpur
10	4-crop combination	Barshi
11	10-crop combination	Madha



Results and Discussion

From Table-1 and Table-2, it is remarkable to note that each tahsil is dominated by specific flower crop. Based on the values of ranking coefficient, it is evident that South Solapur Tahsil has the lowest rank and Sangola Tahsil has the highest rank. These ranks



clearly indicate that the overall floriculture production in South Solapur Tahsil is comparatively higher than other tahsils of the Solapur District. The lowest floriculture yield is observed in Sangola Tahsil. The other tahsils range in between the highest and lowest floriculture production. The tahsils of South Solapur, Barshi and Pandharpur have high yields of floriculture while the tahsils of Mohol, Mangalwedha and Sangola have a low harvest of flowers.

Rathod (2017) has calculated the location quotient for the 11 tahsils of Solapur District and ascertained that high concentration zone of flowers was observed in South Solapur, Pandharpur and Barshi Tahsils while low concentration zone of flowers was noticed in Mohol, Mangalwedha and Sangola Tahsils.

In the crop combination method, the monoculture was identified in Karmala, Mangalwedha, Malshiras, Mohol and Sangola Tahsils. 2-crop combination was noticed in North Solapur Tahsil; 3-crop combination was found in Akkalkot Tahsil; 4-crop combination was recognized in South Solapur, Pandharpur and Barshi Tahsils, while 10-crop combination was ascertained in Madha Tahsil.

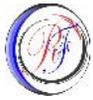
The crop combination identified the number of crops cultivated together in the region, but it was dominated by different flower species. In Karmala, Malshiras, Mohol and Sangola tahsils, the monoculture was of marigold; while in Mangalwedha Tahsil, the monoculture was of chrysanthemum. In North Solapur Tahsil, the 2-crop combination was of marigold and chrysanthemum species. In Akkalkot Tahsil, the 3-crop combination was of chrysanthemum, marigold and gaillardia species. In South Solapur Tahsil, the 4-crop combination was of marigold, chrysanthemum, rose and other flowers; in Pandharpur Tahsil, the 4-crop combination was of other flowers, marigold, rose and tuberose; in Barshi Tahsil, the 4-crop combination was of chrysanthemum, rose, marigold and gaillardia species. Lastly, the 10-crop combination was found in Madha Tahsil, which included flowers like marigold, other flowers, gaillardia, rose, chrysanthemum, tuberose, gladiolus, gerbera, jasmine and carnation.

CONCLUSION

The ranking coefficient is a critical method of determining the agricultural productivity of a region and assists in comprehending the agricultural scenario of the region. It helps in demarcating low, medium and high productivity areas. The analysis of crop combination significantly helps in the planning of the agricultural regions and furnish the relative position of crops on regional scale (Chakraborty 2012). Such techniques are useful in identifying the zones or regions where more input is needed.

By integrating the three methods, i.e. Ranking coefficient, Location quotient and Crop combination, it is identified that tahsils with low productivity have a high ranking coefficient, low concentration zone and monoculture is more dominant as in case of Mohol, Mangalwedha and Sangola tahsils. On the other hand, tahsils with high productivity have a low ranking coefficient, high to moderate concentration zone and multiple crop combination (4-crop combination) as in case of South Solapur, Pandharpur and Barshi tahsils.

Monoculture was found out in 5 tahsils; 2-crop, 3-crop and 10-crop combination was identified in one tahsil each, while 4-crop combination was determined in three tahsils. Rathod (2017) has ascertained certain reasons behind the high concentration zone like irrigation, well trained farmers, high yielding varieties, good economic status, composed and



chemical fertilizers, pesticides, good transport system, near market places and demand of flowers. Thus, there will be regional disparities which highlight the diversity of a region. Therefore, proper practices should be adopted for the overall development of the Solapur region.

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