

A SPATIO-TEMPORAL ANALYSIS OF CROP COMBINATION IN NASIK DISTRICT MAHARASHTRA

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The study of crop combination regions constitutes an important aspects of agricultural geography as it provides a good basis for agricultural regionalization. The crops are generally grown in combinations and it is rarely that a particular crop occupies a position of total isolation other crops in a given area at a given time. The physical factors determine the shape of the areas of crops, while the socio-economic relationships determine their extent. The government policies can decide to select the crops to grow. With the development of better irrigation facilities, new varieties of crops can be introduced in the place of traditional and unprofitable agricultural system.

STUDY AREA-Nasik is the third largest district of Maharashtra having a total geographical area of 15530 sq. km. It lies between 19° 35' 18½ to 20° 53' 07½ North latitude and 74° 16' 07½ to 74° 56' 22½ East latitudes. Physiographically, Nasik district comprises of a part of a Deccan Plateau, one of the oldest originated blocks of the earth surface. The district may be broadly divided into three geographical regions, viz. a) the downghat konkan tract; b) the Girna basin and c) the Godavari basin.

The soils of the district are essentially derived from the Deccan Trap which is the predominant rock formation of the district. The soil formation is mainly affected by the climatic condition and topography. In the western part of the district (i.e. downghat konkan track) soils have developed under humid conditions, with some laterite soils being observed at higher altitudes of the hills. The soils in Godavari, Kadva and the upper reaches of the Girna and Mosam valley are quite deep and fertile. The soil in the rest of the district is undulating and susceptible to erosion. Light shallow soil is found on hill slopes and very coarse soils at higher elevation. The district is mainly drained by three major rivers, viz. a) River Godavari b) River Girna and c) konkan Rivers.

The climate of the district is generally dry except during the south-west monsoon season. The average annual rainfall for the district as a whole is 1035.5mm. Within the district there are considerable variations. The rainfall in general decrease as one proceeds from west to east. Temperature begins to increase rapidly from the later half of February. May is the hottest

month with the mean daily maximum temperature 40.6°C at Malegaon and 37.4°C at Nasik. December is the coldest month with the mean daily minimum temperature 11.3°C at Malegaon and 10.2°C at Nasik. Agriculture is the chief support of the economy of the district and supports the population of 4987923 (2001 census).

OBJECTIVES-The main objectives of the study are;

1. To compare the crop ranking and crop combination regions for two periods, i.e., 1990-91 and 2000-2001.
2. To understand the cropping pattern of the district.
3. To give an insight in the cropping practices and the rotation of crops.

DATA BASE AND METHODOLOGY- Secondary data is taken from Land Record Department, Irrigation and Agriculture Department, Nasik district for a period of 1990-91 and 2000-2001. For identifying the group of significant crops of a region, it is essential to adopt a statistical base. According to a large number of experts have suggested a number of statistical methods to delineate crop combination regions. With considering the advantages and simplicity of Weaver's technique of crop combination the same has been applied in present study to compute crop ranking and combination regions at tahsil level and interpret the text. Weaver's formula for crop combination ;

$$d = ad^2/n$$

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

CROP RANKING- In both the study periods, Bajara was the first ranking crop in the whole region except Nasik, Peint, Dindori, Surgana and Igatpuri tahasils. Bajara is the main food crop in kharif season. Among the foodgrains, bajara occupies a large area about 45.63 percent in 1990-91 while it is 39.82 percent in 2000-2001 of the net sown area. The rainfall plays important role in bajara distribution because it is cultivated only in the monsoon season. After bajara in first ranking followed by rice, fodder, vegetable and nachani. The second ranking crop, pulses is the major crop and rice is the supporting crop in 1990-91, while in 2000-01 vegetable and fodder is the major

wheat, fruits, jawar and nachani. But during 2000-01 there was sixth tahasils for eight crop combination, these are Nasik, Dindori, Chandwad, Nandgaon, Yeola and Niphad. The crops were vegetable, fodder, wheat, fruits, pulses, oil-seeds, bajara, sugarcane, fiber crops and spices -condiments. During 1990-91 there was one tahasil (Sinnar) under nine crop combination. The crops were bajara, fodder, pulses, vegetable, wheat, jawar, oil-seeds, rice and sugarcane. While during 2000-01 there was two tahasils (Satana and Sinnar) for nine crop combination. The crops were bajara, maiz, pulses, fruits, sugarcane, wheat, vegetable, oil-seeds and rice.

Kalwan, Satana and Niphad has ten crop combination during 1990-91. The crops which grown in this tahasils were bajara, pulses, maiz, jawar, oil-seeds, wheat, rice, sugarcane, spices-condiments, vegetables, fodder, fruits and fiber crops. During 2000-01 there was two tahasils (Kalwan & Malegaon) for ten crop combination. The crops which grown in this tahasils were bajara, fodder, maiz, pulses, wheat, rice, vegetable, oil-seeds, jawar, fruits, and fiber crops.

As mention above the crop combination for the whole region was total different in one decades. During 1990-91 there was 1.77 percent land under fruits and 4.45 percent land under vegetable, while in 2000-



01 there was increase the percentage land under fruits and vegetable i.e. 3.25 and 7.79 percent respectively. This shows the great variation for changing cropland use. This increase is due to the increasing demand of fruits and vegetable from towns in the district as well as from Mumbai, the metropolitan city. It was also observed that there is a few change in fodder crop land during the study period.

CONCLUSION-The crop combinational analysis reveals that the irrigational facilities impact on the farmers to grow few number and major crops depending upon the prices in the market and their demand. Bajara and cash crops are produced in

the central and eastern part of the district only because of favorable physical condition and availability of irrigation facilities. Heavy rainfall and hilly area are responsible for producing rice and fodder. So they are concentrated in the western part of the district.

The study of cropping pattern of 2000-01 indicates a remarkable change where many new crops grown in rabbi season have been introduced in to the traditional paddy land has kharif crops. The traditional crops such as bajara, jawar, maiz, oil-seeds, cotton are considerably reduced in their percentage of area under cultivation. It is clearly found that the cropping pattern of the district is influenced by the physical as well as socio-economic factors of the study region.

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