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A Geographical Study of Agriculture Productivity and Efficiency in Junnar Tahsil of Pune

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Abstract:-

Agriculture plays an important role in economic development in the developing countries' in the world. It also ensuring food security, the sector does not only provide major source of rural employment and backbone of rural economies, but also contributes substantially earnings through export. The diffusion of Green Revolution technology in the region was the expansion of agricultural area and replacement of traditional varieties with modern varieties. Agricultural productivity is the actual performance of the land in terms of per hectare yield, whereas Agriculture efficiency is a ratio between the achievement in terms of agriculture production and the actual potential of land productivity. This is particularly in the context of existing of different kinds of production of cash crops and subsistence crops. The physiographic element has a direct influence on the soil types and its temporal distribution. The Tahsil has mainly agriculture as the major source of income. Therefore it is interesting to study the facts and factors related crop productivity and agricultural efficiency. This may help in regional planning of the Tahsil.

Keywords: Agriculture Productivity and Efficiency, Green Revolution

Introduction:-

Agriculture is not just food providing source, but also it is backbone of the livelihood of 60% of people of India. Development of agriculture has a direct impact on poverty eradication, food and nutrition security, health and multiple indirect effects to entire economy. Agriculture is largest sector and contributes major share GDP of India. The growth of agriculture sector has witnessed many changes in agriculture practices and crops. The agriculture production is the effects of farming. The agricultural efficiency considers the productivity of a particular unit of land. It is study fertility, productivity and capabilities of land. It helps to check future planning to use agriculture land. There are number of factors are responsible for agricultural efficiency. The agricultural productivity of different crop is changing in the Junnar Tahsil. The study highlights agricultural productivity and efficiency in terms of crops.

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Aims & objectives:-

The main purpose of study is to understand the correlation between cropping pattern and land use. The study is based on following objectives.

- To highlight spatio-temporal changes in crop productivity of the study area.
- To assess agricultural efficiency of the study area.

Study area:-

Junnar Tahsil is located in the northern zone of the Pune district. It occurs in the section of steep isohyetal gradient having rainfall around 50 to 250 cm. The latitudinal extent of the Tahsil is 19° 00' to 19° 24' north and longitudinal extent is 73° 40' to 74° 18' east. The area of the Tahsil is 1474.77 Sq.km. Junnar is mainly rural in character as 183 villages are there. Junnar Tahsil has the human population as about 3, 99,302. The rural population is 93.66 %, while the urban population is 6.34 %. Generally, marginal, small and domestic industries are lacking in this area. It means that there are no industrial development, so naturally they are depends on agriculture for their livelihood. The Junnar Tahsil mainly divided into nine circles namely Junnar, Nimgaonsava, Otur, Belhe, Aptale, Narayangaon, Vadgaon Anand, Dingore and Rajur. The total area under the crops covers 56287.15 hectares area. The Tahsil has 67 villages categorized as tribal villages in which the human resource development is on lower side. Further, spatial variations in regional development have been significant in the Junnar Tahsil.

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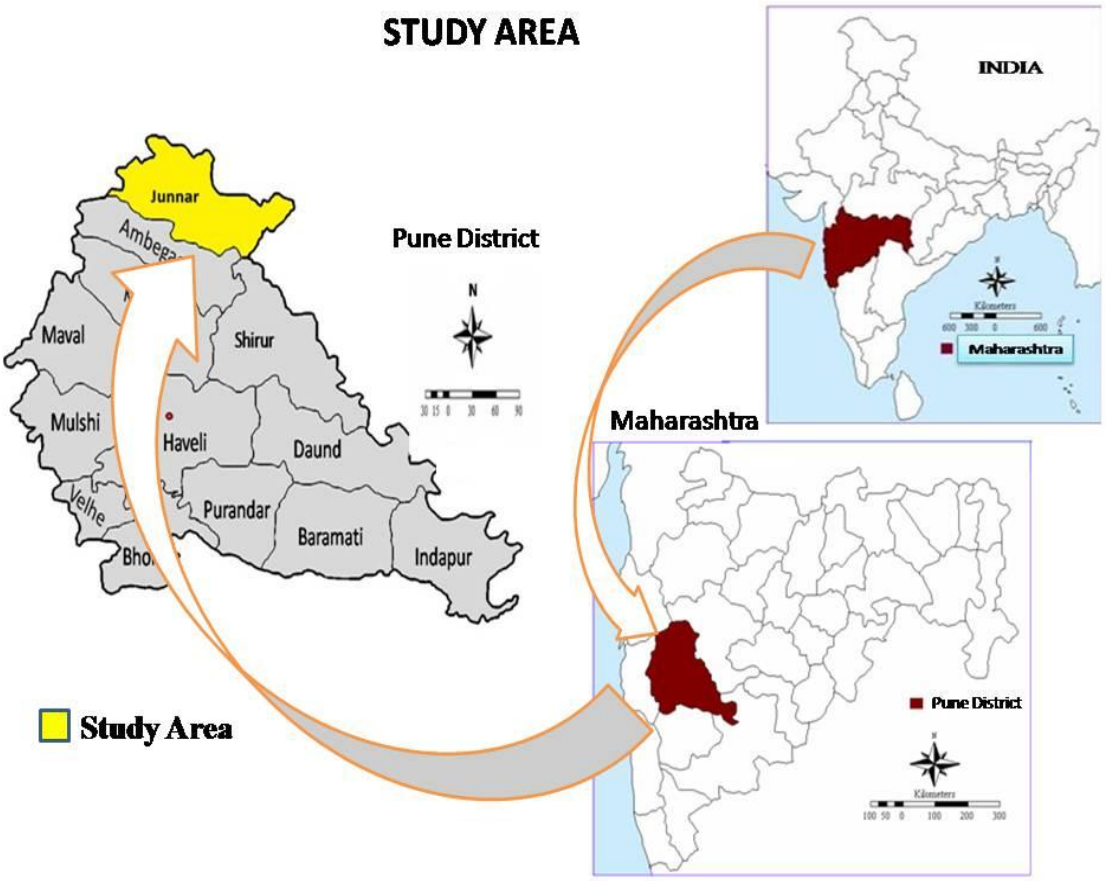

Methodology:-

The study involves data collection, compilation, computation, analysis and interpretation of the basic data and it represent with the help of GIS techniques. Sapre and Deshpande's Index and Kendall's Ranking Coefficient used to compute Agriculture Productivity and Efficiency.

Result and Analysis:-

Agricultural Productivity Based on Sapre and Deshpande's Index:-

Sapre and Deshpande (1964) suggested a slight modification in Kendall's 'ranking coefficient' technique. They have used the 'weighted average ranks' instead of the 'simple average of ranks'. The weighted ranks of various crops are proportionate to the percentage of cropland under each crop. The formula for assessing productivity index would be read thus:

$$\text{Agricultural Productivity Index} = \frac{(r1*c1) + (r2*c2) + (rn * cn)}{c1 + c2 + c3.....cn}$$

Where,

r = Ranking of yield of individual crop

c = Crop land share in percentage.

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According to this method, low index value means high productivity and vice- versa. To measurement of agricultural productivity Rice, Jowar, Bajra, Ragi, Wheat Tur, Udid, Mung, Gram, Groundnut, Soyabean and Sugarcane crops have been considered. The Productivity index of each tahsil was worked out for the years 2006-07 and 2011-12.

Table No. 1 Agricultural Productivity of Junnar Tahsil Based on Sapre and Deshpande's Index (2006-07 and 2011-12)

Sr. No.	Index Value	Agricultural Productivity	2006-07	2011-12
1.	Below 3.50	High	3.43	--
2.	3.50 - 4.50	Moderate	--	--
3.	Above 4.50	Low	--	6.00

The spatial and temporal pattern of agricultural productivity on the basis of Sapre and Deshpande's index shows a wide range of variation. The index values groups in table 1 show temporal variation in productivity. The table depicts that the agriculture productivity in 2006-07 is high but in 2011-12 it shows low. Crop productivity is a combined effect of physio-socio-economic elements. The physiographic has a direct influence on the soil types and its temporal distribution. The agricultural productivity of Rice, Jowar, Bajra, Ragi, Wheat Tur, Udid, Mung, Gram, Groundnut, Soyabean and Sugarcane crops are high in the 2006-07 but in 2011-12 it seems to be low because of changing cropping pattern.

Agriculture Efficiency:-

It is concerned only with the ranking of the yields in weight per unit of the land but is not in any way weighted according to the volume of production. Agriculture efficiency is a ratio between the achievement in terms of agriculture production and the actual potential of land productivity.

Computation of Agricultural Productivity based on Kendall's Ranking Coefficient:-

Kendall had described agriculture efficiencies in terms of productivity. He studies the area and yield of 48 Administrative countries. His crop was ranked according to the yield. Some of the ranked occupied by country was divided by number of crops to obtained average rank. Here the country which relatively higher will have low ranking, thus the co-efficiency and rank vice-versa.

$$\text{Agriculture Efficiency} = \frac{\text{Sum of the Rank}}{\text{Total No. of Crops}}$$

Table No. 2 Agriculture Efficiency Index (2001-02 to 2010-11)

Sr. No.	Category	Class	A.E. Index	Number Of Crops	Name of the Crops

1	Very High	0 - 2	0.71	1	Sugarcane
2	High	2 - 4	2.14, 2.64, 2.71	3	Summer Groundnut, Soyabean, Wheat
3	Moderate	4 - 6	4.1, 4.29, 5.86	3	Summer Groundnut, Rice, Mung
4	Low	6 - 8	6.79, 7.00, 7.07, 7.14, 7.36, 7.43	6	Udid, Gram, Tur, Jowar, Bajra, Ragi
5	Very Low	8 - 10	9.71	1	Niger

The above table depicts the Agriculture Efficiency Index of Junnar Tahsil for the period 2001-02 to 2010-11for various crops. The Agriculture Efficiency of Junnar Tahsil for different crops as follows:

- **Very High Agriculture Efficiency:-**

The tahsil has very high efficiency of sugarcane crop. The irrigation facilities, black soil, availability of labour, capital and sugarcane industry are favorable for sugarcane crop in the tahsil; because of sugarcane have very high agriculture efficiency in this tahsil. Sugarcane is grown in the middle and eastern parts of the tahsil.

- **High Agriculture Efficiency:-**

Summer Groundnut, Soyabean and Wheat are very high agriculture efficiency crops in the tahsil followed by sugarcane. These crops are grown in the middle and east part of the tahsil.

- **Moderate Agriculture Efficiency:-**

Kharip Groundnut, Rice and Mung crops have moderate agriculture efficiency in the tahsil. Rice has grown in the western part of the tahsil, the groundnut in the middle part and the Mung in the east part of the tahsil.

- **Low Agriculture Efficiency:-**

Udid, Gram, Tur, Jowar, Bajra and Ragi crops have low agriculture efficiency. The Ragi is grown in the western part of the tahsil and the udid, tur, jowar and bajra are grown in the middle and western part of the tahsil. The gram is grown everywhere in the tahsil.

- **Very Low Agriculture Efficiency:-**

Niger has very low agriculture efficiency in the tahsil. The Niger is grown in the eastern part of the tahsil, where rainfall is very less.

Conclusion:

The study focuses on the change in the crop productivity of the tahsil. The crop productivity shows a dynamic change in agriculture in the tahsil. The productivity of agriculture has been changed with time. The productivity of major crops in the Junnar tahsil is changing. The agricultural productivity of Rice, Jowar, Bajra, Ragi, Wheat Tur, Udid, Mung, Gram, Groundnut, Soyabean and Sugarcane crops are high in the 2006-07 but it shows low in 2011-12, because of

changing cropping pattern. Sugarcane is leading crop in the Junnar Tahsil and very high agriculture efficiency, because of favorable physiographic and economic condition.

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