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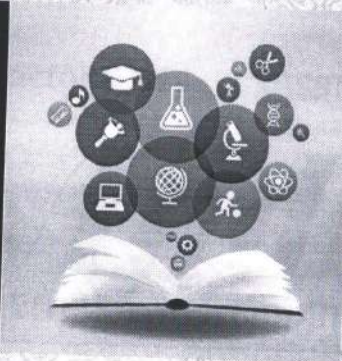
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**Spatial Analysis of Agricultural Efficiency in Yavatmal District
(Maharashtra State)**

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Abstract

Agriculture is the primary occupation of India and more than 70% population is engaged in agriculture and related occupation. Agricultural efficiency is depending on the production of agriculture and it is one of the important indicators of agricultural development.

Present paper reveals the tahsil wise analysis of agricultural efficiency and change in efficiency of Yavatmal District.

Keywords

Agricultural efficiency, production, development, change

Introduction

Agricultural efficiency is a main indicator of development in agricultural sector. It is the simply ratio of farm output and farm input. It denotes the efficiency of agricultural productions compare to their cultivation. In India the efficiency of agriculture is not sufficient compare to the population pressure.

The present paper is based on the tahsil wise analysis of agricultural efficiency and change in efficiency index in Yavatmal district of Maharashtra state.

Objectives

The objectives of the present paper has follows,

- 1) To calculate and analysis tahsilwise efficiency of agriculture in the study region.
- 2) To discuss the change in agricultural efficiency in the study region.

Data Source & Methodology

Present investigation is based on the secondary source of data and raw data is compiled from District Agriculture Office, Yavatmal and Socioeconomic Review of Yavatmal District.

Efficiency index of agriculture is calculated with the help of Ganguli's (1938) method by using following formula,

$$E_n = (I_{yn} \times C_n) \div 100$$

Where as,

E_n - Agriculture efficiency,

I_{yn} - Yield of Crops,

C_n - Crop land share in percentage

$$I_{yn} = (Y_i \div Y_n) \times 100,$$

Where, Y_i = Production \div Area, Y_n = Total Production \div Total Area

$$C_n = (Area \div Total Area) \times 100$$

Change = Current Index – Previous Index



The analysis is based on the data year 2005-06 and 1015-16. The results are shows in the table and map of the study region also change in the index is presented on bar graph.

Study Region

Yavatmal district is the part of Amravati division and located in Maharashtra state. Geographically district is situated in between 19⁰ 26' N to 20⁰ 42' N latitude and 77⁰ 18' E to 79⁰ 9' E longitude. District covered total 13584 sqkm area with 16 tahsils and total population of the district is 2772348 as per the census year 2011.

Yavatmal district is abounded with Amravati and Wardha district towards north, Washim and Hingoli district on west, Nanded district and Telangana state towards south and Chandrapur district is located on east.

Agricultural Efficiency

The efficiency index of both years is divided into three categories, index below 10 considered as low efficiency region, index in between 10 to 12 as moderate and index above 12 as high agricultural efficiency region.

Tahsil wise efficiency index of agriculture of both year 2005-06 and 2015-16 also change during this period is presented in table no 1.

Table No 1

Yavatmal District – Agricultural Efficiency (2005-06and 2015-16)

Tahsils	Agricultural Efficiency Index 2005-06	Agricultural Efficiency Index 2015-16	Change
Yavatmal	10.32	10.53	+0.21
Babhulgaon	11.54	6.89	-4.65
Kalamb	9.06	8.61	-0.45
Ralegaon	7.81	7.13	-0.68
Maregaon	8.39	11.04	+2.65
Wani	7.08	8.34	+1.26
Kelapur	12.37	12.16	-0.21
Ghatanji	8.14	7.73	-0.41
Umarkhed	7.86	13.11	+5.25
Mahagaon	7.97	12.03	+4.06
Pusad	8.61	12.54	+3.93
Digras	12.93	9.22	-3.71
Darwha	11.26	11.17	-0.09
Ner	7.89	12.11	+4.22
Zarizamni	10.46	6.37	-4.09
Arni	6.77	11.97	+5.2

Source - Author

Agricultural Efficiency (2005-06)

The zone wise region of agricultural efficiency as follows,

Low Agricultural Efficiency Region

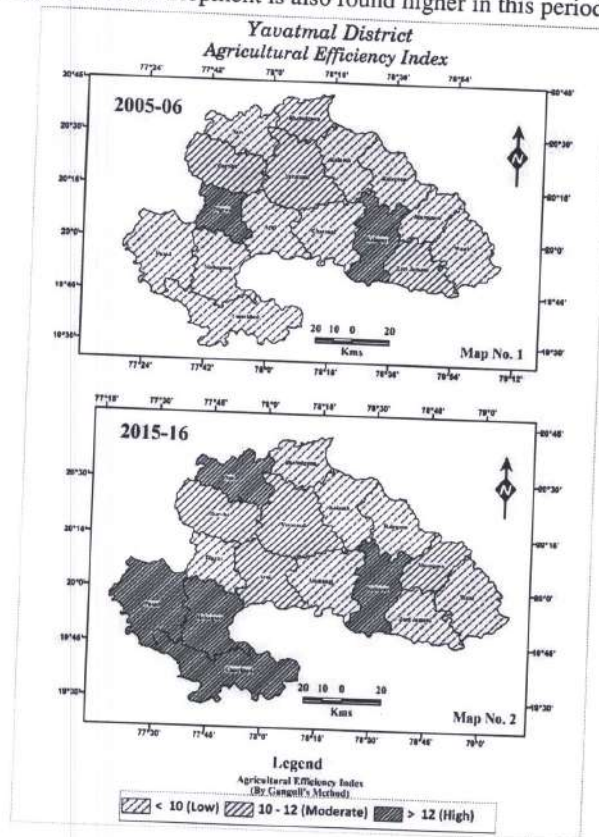
In the study region more than 50% part has found the low agricultural efficiency. Total ten tahsils are included in low efficiency of agriculture (Table No 1). Arni (6.77) and Wani (7.08) tahsil found the lowest index of efficiency in the entire region. The ratio of crop cultivation and production is poor in these regions.

Moderate Agricultural Efficiency Region

Yavatmal, Zarizamani, Darwha and Babhulgaon tahsils found moderate efficiency respectively. The ratio of cultivation and per yield production is an average of this region. The irrigation facilities, farm implements are quite developed in this region and it impacts on the agricultural efficiency.

High Agricultural Efficiency Region

Digras (12.93) and Kelapur (12.37) tahsils recorded the highest index of efficiency in 2005-06 (Map No 1). The ratio of farm input and output is grater in the region compare to other tahsil. The agriculture development is also found higher in this period.



Agricultural Efficiency (2015-16)

The zone wise region of agricultural efficiency in the year 2015-16 as follows,

Low Agricultural Efficiency Region

In the period 2015-16 total seven tahsils recorded low index of agricultural efficiency and Zarizamani is the lowest of them. The in proper pattern of crop cultivation is the main reason of low efficiency in these regions.

Moderate Agricultural Efficiency Region

Yavatmal, Maregaon, Darwha and Arni tahsils found the moderate efficiency in 2015-16. Yavatmal and Darwha tahsil was also moderate in 2005-06, Maregaon and Arni was low in 2005-06 (Map No 2). The progress is found in Arni and Maregoan tahsil compare to previous decade.

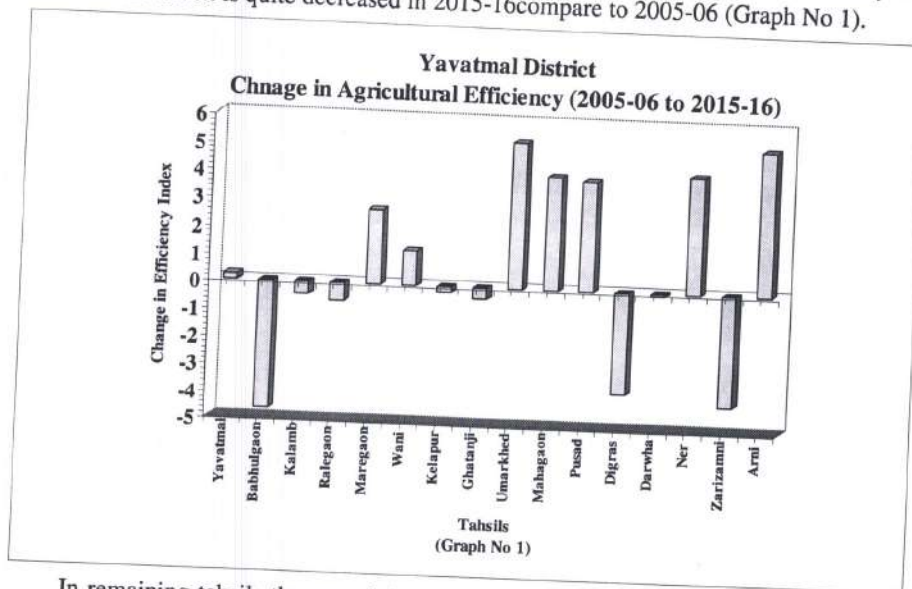
High Agricultural Efficiency Region

Mahagaon (12.03), Ner (12.11), Kelapur (12.16), Pusad (12.54), Umarched (13.11) tahsils recorded highest efficiency index of agriculture in 2015-16. All these tahsils except Kelapur was low in 2005-06. The development in agricultural efficiency in these tahsils is maximum and remarkable in the region.

The irrigation facilities and development of farm implements in Pusad and Umarched tahsils helps to the development in agriculture.

Change in Efficiency (2005-06 to 2015-16)

Both changes positive and negative are found in the efficiency of study region. The negative changes are occurred in Babhulgaon, Zarizamani, Digras, Ralegaon, Kalamb, Ghatanji, Kelapur and Darwha tahsil. Kelpaur tahsil is still high agricultural efficiency in the district but the index is quite decreased in 2015-16 compare to 2005-06 (Graph No 1).



In remaining tahsils the growth is found in agricultural efficiency, but this growth is not uniform and sufficient. Maximum growth is found in Arni and Umarched tahsil, the index



is increased more than 5 in these tahsils. While minimum growth is found in Yavatmal tahsil. Yavatmal tahsil is moderate in both decades. The growth in index in other tahsils is found in between 1 to 5. It indicates the moderate pattern of development in agricultural productivity and efficiency.

Conclusion and Suggestions

Agricultural efficiency of the study region is uneven and variations are found during 2005-06 to 2015-16. The impact of Penganga River is positively shows on the agricultural efficiency on Umardhed tahsil. The development in agriculture fertilizers, agricultural societies, irrigation facilities and farm implements in Pusad tahsil helps to improve in agricultural efficiency.

Babhulgaon, Zarizamani tahsil was moderate in 2005-06 but in 2015-16 the efficiency index is found low due to the poor ratio in farm input and output. Maximum degradation is found in Babhulgaon tahsil due to the improper pattern of cultivation. Pusad, Ner, Mahagaon, and Umardhed tahsil was low in 2005-06 but in 2015-16 these tahsils included in high efficiency region because the growth in ratio of cropcultivation and per yield production.

In most of the tahsils of Yavatmal district, crop yields increased but not as much as the area under cultivation increased. Therefore, it is found that agricultural efficiency has decreased in 50% of the study area.

It is noticed that the farmers in the study area are constantly growing crops in an area. For agriculture, some land has to be fallow for some time, which helps in maintaining the fertility of the land. However, the area under cultivable land in the district has been reduced, which has a direct impact on agricultural efficiency.

In order to improve agricultural efficiency in the study area, it is necessary to increase the yield per hectare of agriculture. For this, modern cropping methods and techniques must be used everywhere. Also, agricultural land should be plowed gradually for some time to help maintain the fertility of the land and also increase the yield per hectare. Proper use of fertilizers, planting of crops according to the season, selection of crops according to water estimation etc. will help in increasing the efficiency of agriculture.

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