



## LEVEL OF AGRICULTURAL PRODUCTIVITY IN MARATHWADA REGION

A. Nanaware

M. T. Musande

### Abstract:

*Agriculture productivity could be defined as the ratio of output to input in relation to land, capital, over all resources employed in agriculture. The level of agricultural productivity, as a concept, means the degree to which the economic, cultural, technical variable are able to exploit the biotic resource of the area for agricultural production. The measurement of agricultural productivity helps in knowing the area that is performing rather less efficiency in comparison to the neighboring areas. Therefore attempt is made here to study agricultural productivity in Marathwada region. The paper is based on secondary data sources. To determine level of agricultural productivity Jasbir Singh's crop yield and concentration indices ranking coefficient method is used. The study reveals that the high level of overall productivity in North-Western and Southern part of study region is a result of high development of surface irrigation facilities and fertile soil.*

**Key words:** crop yield, crop concentration indices, agricultural productivity.

### Introduction:

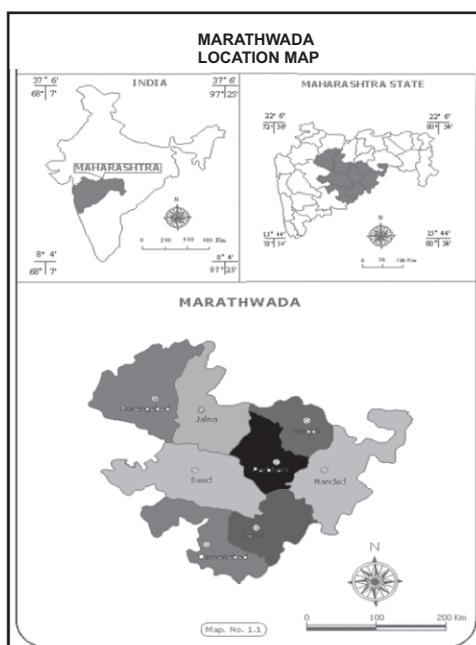
The concept of productivity is a relative term and cannot be uniformly applied all over the world. Some have viewed productivity as the overall effectiveness of productive unit, while some have confined the use of the term productivity to denote the ratio of output to the corresponding input of labour. However, all these apparently conflicting and different interpretations have one common characteristic i.e. productivity is some one's ability to produce more economically and efficiently. Therefore, agriculture productivity could be defined as the ratio of output to input in relation to land, capital, over all resources employed in agriculture (Noor Mohamad 1995). Bhatia (1967) defined "Agricultural efficiency as the aggregate performance of various crops in regard to their output per acre but the contribution of each crop to the agricultural efficiency would be relative to its share of the crop land". Productivity as defined as output per unit of input or per unit of area respectively and the importance of agricultural productivity is generally the result of a more efficient use of factors of production viz. environment, arable land, labour and capital (Jasbir Singh & Dhillon S. S. 1997). Agriculture productivity is a function of number of factors including physical, Socio economical and technical organization, mechanization (Noor Mohammad and Majeed, 1995). These factors are highly variables and dynamic both in space and in time leading to spatio-temporal variations in agriculture productivity. The level of agricultural productivity, as a concept, means the degree to which the economic, cultural, technical variable are able to exploit the biotic resource of the area for agricultural production (Singh, 1979).

The measurements of agricultural productivity enable a comparison of the relative performance of farmers between farm, between types of farming and between geographical areas. The agricultural, by far, is the best measure of agricultural development, because it represents the combined interplay of variety of factors that differ from area to area (Parimala and Qureshi, 1983). The measurement of agricultural productivity helps in knowing the area that is performing rather less efficiency in comparison to the neighboring areas. By delimiting the areas of low, medium and high productivity, agricultural plans may be formulated to remove and minimize for the regional inequalities. It also provides an opportunity to ascertain the ground reality, the real cause of agricultural backwardness of a region. (Majid Husain – reprinted, 2010). Therefore attempt is made here to study agricultural productivity in Marathwada region.

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### The Study Area

The Maharashtra state is administratively divided into six divisions, viz. Konkan, Nasik, Pune, Amravati, Nagpur and Aurangabad. The Aurangabad division is also known as Marathwada region, which was formerly a part of Hyderabad state. Marathwada forms the central portion of Maharashtra with Aurangabad city being located almost in the centre of the state (Fig. -1). Marathwada is one of the most backward regions of Maharashtra state. The Marathwada region lies in the upper Godavari basin. The absolute location of district is  $17^{\circ} 35'$  to  $20^{\circ} 40'$  North latitude and  $74^{\circ} 40'$  to  $78^{\circ} 19'$  East longitude. The study region is bounded on the North by Jalgaon, Buldhana, and Akola districts, to the North-east by Yavatmal district, to the East by Kamareddi, Nizamabad and Adilabad districts of Andhra Pradesh, to the South and South-east by Bidar and Gulbarga districts of Karnataka state, to the West by Ahmednagar to the Southwest by Solapur and to the North-west by Nasik district. Its shape is roughly triangular. East-West maximum extent is 394 Kilometers and North-south extent is 330 Kilometers. The total geographical area of district is 64434 Sq. Km. which constitutes 20.95 percent of the state and its population is 1.87 cores which is 16.66 percent of the state (2011). Administratively area is divided into eight districts and 76 tehsils.



### Objectives:

The main objective of this paper is to determine agricultural productivity and find out weaker areas productivity in Marathwada region.

### Data collection and Methodology:

The present study is based on secondary data source. In order to meet this objective the relevant information and data regarding area and per hectare yield of crops collected from Socio Economic Review and District Statistical Abstract of Districts in Marathwada region and Season and Crop Reports for the year of 1981 -85 and 2005-2010. The data regarding population is collected from census of Maharashtra, the information about geographical area is collected from Gazetteers.

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Collected rough data are processed. To determine agricultural productivity the Jasbir Singh's the crop yield and concentration indices ranking coefficient method (1976) is used. The procedure explained as follows.

$$Y_i = \frac{Y_{ae}}{Y_{ar}} \times 100 \quad (I)$$

Where,

$Y_i$  = is the crop yield index.

$Y_{ae}$  = is the average yield per hectare of crop 'a' in the component enumeration unit.

$Y_{ar}$  = is the average yield of the crop 'a' in the entire region.

$$C_i = \frac{P_{ae}}{P_{ar}} \times 100 \quad (II)$$

Where,

$C_i$  = is the crop concentration index.

$P_{ae}$  = is the percentage strength of crop 'a' in the total cropped area in the component enumeration unit.

$P_{ar}$  = is the percentage strength of crop 'a' in the total cropped area in the entire region.

The derived crop yields and concentration indices for crops are ranked separately, yield and concentration ranks for individual crops are added and there after divided by two thus giving the crop yield and concentration indices ranking coefficient.

The equation is as follows.

$$\text{Crop yield and Concentration Indices ranking Coefficient} = \frac{\text{Crop yield index ranking crop 'A' + Crop concentration index ranking crop 'A'}}{2}$$

This will give an idea of the level of agricultural productivity the lower the ranking coefficient, the higher the level of agricultural productivity and vice versa. The ranking coefficients for individual crops thus derived are arranged in order and coefficients are grouped in to three efficiency grade viz. high grade, moderate grade and low grade for discussing the spatial variations in the region. In similar way, adding the value former all the crops selected for each district and divided by 'n' for overall ranking coefficient. Where 'n' refers to number of selected crops. In order to get accurate and average result of productivity level the quinquennial average of Yield and area under crops statistics has taken to avoid the annual fluctuation in the level of productivity. Analysis of the study has been made with help of the Jasbir Singh's techniques and on the basis of this results and conclusion are drawn.

**Level of productivity:**

**1. Jowar:**

The table-1 indicates that during 2005-10, high productivity of Jowar is observed in Latur, Osmanabad, Parbhani and Nanded districts It is high in Latur district, due to high percentage of medium black soil, while it is high in Nanded district, due to high proportion of deep soil and high rainfall. The moderate productivity is recorded in Jalna, Hingoli and Beed districts, while it is low in Aurangabad district.

During the period of investigation the productivity of Jowar decreased in Osmanabad and

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Parbhani districts, as per gradation, high to low change in Osmanabad and Parbhani district, because of with the increase of irrigated some area under Jowar is devoted to cash crops, i.e. Sugarcane and Cotton in Parbhani district and Sugarcane in Osmanabad district.

**2. Wheat:**

During the period of 2005-10, high productivity of Wheat is found in Aurangabad, Parbhani, Hingoli and Beed districts, it is high in Aurangabad, Parbhani and Hingoli districts, due to increase in irrigated area, while it is high in Beed, due to use of high yield varieties. The moderate productivity of Wheat is found in Jalna and Latur districts, while it is low in Osmanabad and Nanded districts.

During the period of investigation the productivity of Wheat is increased in Aurangabad, Parbhani and Hingoli district mainly due to increase in irrigated area.

**Table-1: Agricultural productivity in Marathwada Region  
(Crop Yield & concentration indices ranking Coefficient of Selected crops 1981-82 to 1985-86 and 2005-06 to 2009-10)**

1981-82 to 1985-86								
District	Jowar	Wheat	Bajara	Tur	Gram	Groundnut	Cotton	Sugarcane
Aurangabad	6.5	1	1	7	6.5	5.5	3.5	1
Jalna	4.5	2	2.5	5.5	6	6.5	2.5	4
Parbhani	4	4.5	7	4.5	4	2.5	3.5	7
Hingoli	5	3	6.5	3	6	5	4	6
Beed	5	5.5	3	5.5	3.5	4.5	5.5	3.5
Nanded	3.5	7	5.5	5.5	6.5	5.5	2	7.5
Osmanabad	3.5	2.5	5	2	1	2.5	8	3
Latur	4	4.5	5.5	3	2.5	4	7	4
2005-06 to 2009-10								
District	Jowar	Wheat	Bajara	Tur	Gram	Groundnut	Cotton	Sugarcane
Aurangabad	5.5	3	1.5	5.5	3.5	3.5	4.5	3.5
Jalna	5	5	3	3.5	5.5	5	2	5.5
Parbhani	4	2.5	4	5.5	2.5	3	2	3.5
Hingoli	5	2.5	7.5	4.5	4.5	4	3.5	8
Beed	5.5	3.5	2.5	6.5	6.5	5	6	2.5
Nanded	3.5	7	6.5	6	5.5	6.5	4.5	6
Osmanabad	4.5	7	5.5	2.5	4	4.5	7	3
Latur	3	5.5	5.5	2	4	4.5	6.5	4

*Source: Compiled by Researcher, on the basis of Socio economic Review and district*

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*Statistical Abstract of all district of marathwada region 1981-82 to 2009-10, Chief Statistical Office of Agriculture Maharashtra state pune.*

### **3. Bajara:**

The table-1 exhibits that the high productivity of Bajara is recorded in Aurangabad, Jalna and Beed districts in 2005-10. It is high in Aurangabad and Jalna districts, due to suitable soil and increase of irrigated area. The moderate productivity of Bajara is recorded in Parbhani, Osmanabad and Latur districts, while it is low in Hingoli and Nanded districts.

During the period of under view the productivity of Bajara increased in Aurangabad, Jalna and Beed districts, as per gradation low to moderate change is recorded in Parbhani district, due to increased to irrigated area and use of high yield varieties.

### **4. Tur:**

During the 2005-10, high productivity of Tur is recorded in Latur, Osmanabad and Jalna districts, it is high in Latur and Osmanabad, due to high proportion of medium deep soils and suitable rainfall. The moderate productivity of Tur is observed in Aurangabad, Parbhani and Hingoli districts, while it is low in Nanded and Beed districts.

During the period of investigation Tur productivity in increased in Latur, Aurangabad and Jalna districts, due to use of high yielding varieties and increase in irrigated area. Low to high change is observed in Jalna district.

### **5. Gram:**

During the 2005-10, the high productivity of Gram is found in Aurangabad and Parbhani districts, due to fertile soil in Godavari river basin and development of irrigation facility and use of improved seeds. The moderate productivity of Gram is found in Latur, Osmanabad and Hingoli districts, while it is low in Nanded, Beed and Jalna districts, due to low proportion of fertile soil.

### **6. Groundnut:**

The high productivity of Groundnut is found in Parbhani, Aurangabad and Hingoli districts during 2005-10. It is high in Aurangabad and Parbhani districts, due to development of surface irrigated facility and suitable shallow soil, while it is high in Hingoli, due to assure rainfall. The moderate productivity of Groundnut is found in Jalna, Beed, Osmanabad and Latur districts, while it is low in Nanded districts i.e. above 4.87 ranks co-efficient.

### **7. Cotton:**

During the period of 2005-10, high productivity of Cotton is found in Jalna, Parbhani and Hingoli districts; it is high in Parbhani and Hingoli districts, due to high proportion of deep and medium deep black Cotton soil. The moderate productivity of Cotton is recorded in Aurangabad and Nanded districts, while it is low in Beed, Osmanabad and Latur districts, due to low proportion of deep black soil.

### **8. Sugarcane:**

The table-1 indicates that high productivity of Sugarcane is found in Aurangabad, Parbhani, Beed, Osmanabad and Latur districts during the period of 2005-10 due to development of surface irrigation facility. The moderate productivity of Sugarcane is recorded in Jalna and Nanded districts, while it is low in Hingoli district, due to lower development of surface irrigation facility and other technological factors.

During the period of investigation low to high change is recorded in Parbhani district, mainly due to considerable of development of surface irrigated area.

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**Overall productivity by Jasbir Singh Method (1976):**

During 2005-10, the high level of productivity is found in North-Western and Southern part of study region, which consist Aurangabad, Jalna Osmanabad and Latur district, due to high development of surface irrigation facilities and fertile soil. Aurangabad and Jalna districts is benefited by Jaykwadi major irrigation project and having fertile soil of Godavari basin, while Latur is irrigated by Terna as well as Manjara irrigated project and Osmanabad benefited by Terna major irrigated project. The moderate overall productivity is recorded in Parbhani, Beed and Hingoli districts, while it is low in Nanded district.

**Conclusions:**

The forgoing analysis reveals that there is great influence of geographical factors on level of agricultural productivity in Marathwada region. The highest productivity of Jowar in Latur district is mainly due to high percentage of medium black soil. The high level of Wheat productivity in Aurangabad, Parbhani and Hingoli districts, due to increase in irrigated area. The high productivity of Sugarcane, Gram, Wheat and Bajara in Aurangabad is a result of increase in irrigation facilities due to Jayakwadi major irrigation project. The high productivity of Tur in Latur and Osmanabad districts is mainly due to high proportion of medium deep soils and suitable rainfall. The highest productivity of Groundnut in Parbhani district is result of development of Surface irrigation facility. The low productivity of Cotton in Beed, Osmanbad and latur is mainly due to uncertain rainfall and low proportion of deep black soil. The low to high change in sugarcane productivity in Parbhani district and the high level of overall productivity in North-Western and Southern part of study region is a result of high development of surface irrigation facilities and fertile soil.

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\* **Dr. Arjun H. Nanaware**  
Dept of Geography & research center,  
Shri Shivaji Mahavidyalaya, Barshi.  
Dist Solapur (MS).

\*\* **Musande M. T.,**  
Research Students,  
Dept of Geography & research center,  
Shri Shivaji Mahavidyalaya, Barshi.  
Dist Solapur (MS).