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A Critical Study of Agricultural Productivity in Lower Sina Basin

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Abstract

Agricultural productivity is a measure of efficiency with which inputs are used to provide an output.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 is also provides an opportunity to ascertain the ground reality, the real cause of agricultural backwardness of a region. Therefore, attempt is made here to study agriculture productivity in lower Sina basin. This paper is based on secondary data source. To determine agricultural productivity Jasbir Singh's method (1976) is applied. The study reveals that high agricultural productivity of Jowar in Karmala, Barshi and North Solapur tahsil, is a result of development of surface irrigation facilities and black soil. The high agricultural productivity of Sugarcane in Madha and Mohol tahsil mainly due to the Bhima-Sina joint canal, while it is low in Paranda, Barshi and South Solapur tahsil due to the lower development of surface irrigation facility.

Keywords:*Agriculture, Productivity.*

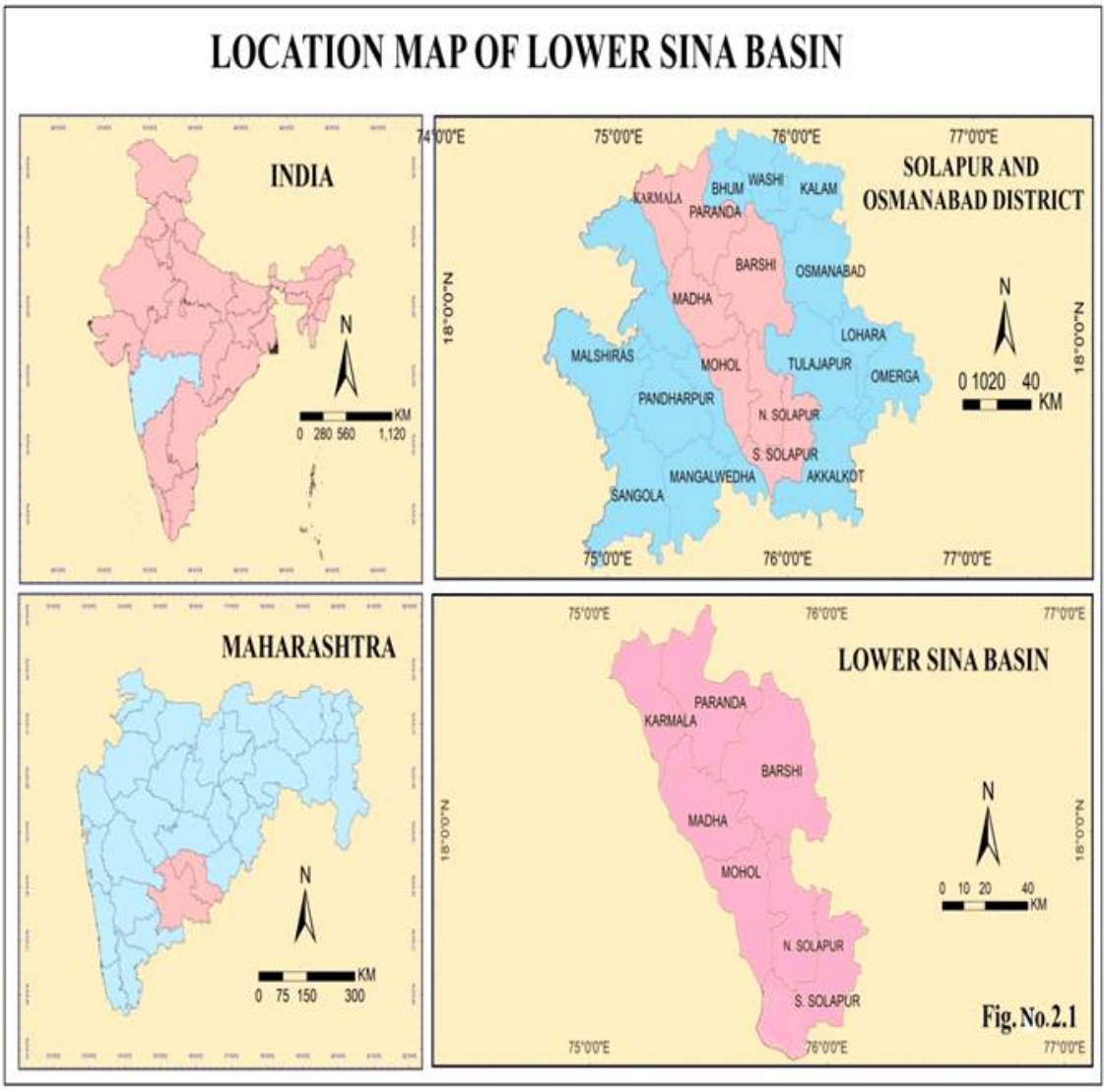
Introduction:

The concept of productivity is a relative term and cannot be uniformity 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. Productivity defined in economic or agricultural geography as output per unit of input or per unit of area respectively. Agricultural productivity is a measure of efficiency with which inputs are used to provide an output (Nanaware A.H., 2015).

. Agriculture productivity is a function of number of factors including physical, Socio economical and technical organization, mechanization (Noor Mohammad and Majeed Abdul, 1995). These factors are highly variables and dynamic both in space and in time leading to spatio-temporal variations in agriculture productivity. The regional differences in agricultural productivity are the result partly of natural advantages of a biotic environment and partly of farming efficiency as controlled by cultural ecology.The choice of farm inputs, and their relative quantities, and the techniques and the skill is largely depend on education and educational attainment of farmers (Nanaware A.H., 2018). It is widely accepted that agriculture production is the result of combinations of infra-structural elements, viz, physical, techno-economic, socio-economic, socio-culture, etc. by which agriculture efficiency is influenced (Singh S. and ChauhanV.S., 1994).By delimiting the areas of low, medium and high productivity, agricultural plans may be formulated to remove and minimize for the regional inequalities. It is also provides an opportunity to ascertain the ground reality, the real cause of agricultural backwardness of a region. Therefore, attempt is made here to study agriculture productivity in lower Sina basin.

Location of study region:

The study area is located in South central part of Maharashtra State. It is situated between 170 20' 22" North latitude to 180 40' 00" North latitude and 750 02' 00" East longitude to 760 10' 00" East longitude. It lies on the Deccan plateau. On an average height of study area is510 meters above mean sea level.



The study region is bounded to the North by upper Sina basin, to the East by Manjra sub basin No 4 to the West by upper Bhima basin No 17and 18 to the South side is bounded by Karnataka State. Its shape is roughly rectangular, its East side covered by large area of the Balaghat ranges and uneven with patches of low level plain.

The total geographical area of Sina basin is 12742 square kilometers and total length of river is 300kilometers out of them length of lower Sinais 180 kilometers and total geographical area of lower Sina basin is 6683.3 square kilometers. Lower Sina drainstotal seventahsil of Maharashtra State, out of them sixtahsil are Solapur district i.e. Karmala, Barshi, Madha, Mohol, North Solapur and South Solapur, onetahsil are Osmanabad district i.e. Parandatahsil.

Objectives:

The main objective of the present study is to anlyse agriculture productivity in lower Sina basin.

Data Collection and Methodology:

The present study is based on secondary data source. To fulfill the objective data regarding per hectare yield and production is collected from Socio Economic review and District Statistical Abstract of Solapur and Osmanabad districts. Agricultural epitomes published by state Government for the period of 1991-95 and 2011 to 2015.

After data collection, the data is processed. To avoid fluctuation and to get reliable result the five years average is taken into consideration. Tahsil is taken as the basic unit of investigation. To determine agricultural productivity, the technique introduced by Jasbir Singh (1976) is applied.

The procedure explained as follows.

$$Yi = \frac{Yae}{Yar} X\ 100$$

Where,

Yi = is the crop yield index.

Yae = is the average yield per hectare of crop 'a' in the component enumeration unit.

Yar = is the average yield of the crop 'a' in the entire region.

$$Ci = \frac{Pae}{Par} X\ 100$$

Where,

Ci = is the crop concentration index.

Pae = is the percentage strength of crop 'a' in the total copped area in the

Component enumeration unit.

Par = 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.

$$\text{Crop Yield and Concentration Indices Ranking Coefficient For Crop-A} = \frac{\text{Crop Yield Index Ranking Crop 'A'} + \text{Crop Concentration Index Ranking Crop 'A'}}{2}$$

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. This technique helps to identify the crop of good level of productivity in the region. 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 of all the crops selected for each tahsil and divided by 'n' has divided overall ranking coefficient. Where 'n' refers to selected crops having percentage strength above 5. On the basic of Jasbir Singh's technique the result and conclusion are drawn.

Result and Discussion

Agricultural Productivity in Selected Crops:

Jowar:

The table 1 showsthat the high productivity of Jowar was observed in North Solapur and Mohol tahsilduring 1991-95. The moderate productivity is recorded in Karmala, Barshi, Madha and South Solapur tahsil. It is low only in Paranda tahsil due to low rainfall.

The table1 shows that the high productivity of Jowar was observed in Karmala, Barshi and

North Solapur tahsilduring 2011-15. Themoderateproductivity of Jowar is found in Madha and Mohol tahsil, while it is low in South Solapur and Paranda tahsil due to lower development of irrigation facilities.

During the period investigation Jowar productivity decreased as per gradation high to moderate change from Mohol tahsil and moderate to low South Solapur tahsil because with the increase of irrigated area under Jowar is devoted to cash crops i.e. Sugarcane respectively.

Table 1: Crop Yield & Concentration Indices Ranking Coefficient of Selected Crops (1991-92 to 1995-96 and 2011-12 to 2015-16)

1991-92 to 1995-96							
Tahsil	Jowar	Wheat	Maize	Tur	Gram	Groundnut	Sugarcane
Karmala	4.5	4	3.5	5.5	2.5	2	4.5
Barshi	4.5	2.5	3	1.5	1	2	5.5
Madha	4.5	5	5	4	5.5	4.5	2
Mohol	2	1	2.5	4.5	5	5	3
N. Solapur	1	4	3.5	5.5	5	5	3.5
S. Solapur	4.5	4.5	4	4	5.5	5	2.5
Paranda	7	7	6.5	3	3.5	4.5	7
2011-12 to 2015-16							
Tahsil	Jowar	Wheat	Maize	Tur	Gram	Groundnut	Sugarcane
Karmala	2	5.5	1	4.5	6	3	4
Barshi	2	5.5	4.5	1.5	2	2.5	5.5
Madha	4.5	3	3	4	5	6	2
Mohol	4.5	1	2.5	4.5	3.5	4	1.5
N. Solapur	2.5	3	4.5	5	7	5	3
S. Solapur	5.5	3.5	5.5	5	2.5	3.5	5
Paranda	7	6.5	7	3.5	2	2	7

Source: Compiled by researcher, on the basis of Socio economic Review and district Statistical Abstract of Solapur and Osmanabad District 1991-92 to 2015-16, Chief Statistical office of Agriculture Maharashtra State, Pune.

Wheat:

The table 1indicates that the high productivity of Wheatis observed in Barshi and Mohol tahsilduring 1991-95.The moderate productivity is recorded in Karmala, Madha, North Solapur and South Solapur tahsil. It is low only in Paranda tahsil due to low rainfall.

The table 1 shows that during 2011-15, high productivity of Wheat was observed only in Mohol tahsil due to use of high yielding varieties and availability of water for irrigation. The moderate productivity of Wheat is recorded in Madha, North Solapur and South Solapur tahsil. It is low in Karmala, Barshi and Paranda tahsil.

During the period of investigation the productivity of Wheat is increased in Madha and Mohol tahsil because with the increase of irrigated area under Wheatcrops respectively.

Maize:

The table 1 showsthat during 1991-95, the high productivity of Maize was recordedin Karmala, Barshi, Mohol and North Solapur tahsil. The moderate productivity is recorded in Madha and South Solapur tahsil. It is low only in Paranda tahsil due to low rainfall.

During 2011-15, the high productivity of Maize was observed in Karmala and Mohol tahsil due to increase in irrigated area. The moderate productivity of Maize is recorded in Barshi, Madha and North Solapur tahsil, while it is low in Paranda and South Solapur tahsil.

During the period of investigation the productivity of Maize increased in Madha and Karmala tahsil, due to high yield varieties and increased in irrigated area.

Tur:

The table 1indicates that the high productivity of Tur was recordedonly in Barshi tahsil in 1991-95. The moderate productivity of Tur recorded in Paranda, Madha and South Solapur tahsil. It is low Karmala, Mohol and North Solapur tahsil.

During 2011-15, the high productivity of Tur is observed only in Barshi tahsil due to favorable soil and climate. The moderate productivity of Tur is recorded in Madha and Paranda tahsil, while it is low in Karmala, Mohol, North Solapur and South Solapur tahsil.

During the period of investigation the productivity of Tur increased in Paranda and Barshi tahsil due to high yield varieties.

Gram:

The table 1 exhibits that the high productivity of Gram was recorded in Karmala and Barshi tahsil during 1991-95. The moderate productivity of Gram is recorded only in Paranda tahsil, whereas it is low in Madha, Mohol, North Solapur and South Solapur tahsil.

During 2011-15, the high productivity of Gram is recorded in Barshi, Paranda and South Solapur tahsil. The moderate productivity of Gram is recorded in Madha and Mohol tahsil, while it is low in Karmala and North Solapur tahsil.

During the period of investigation the productivity of Gram was increased in Barshi and Paranda tahsil due to high yield varieties.

Groundnut:

The table shows that during 1991-95, the high productivity of Groundnut was recorded in Barshi and Karmala tahsil, whereas the low productivity of Groundnut was recorded in Madha, Mohol, North Solapur, South Solapur and Paranda tahsil.

The table shows during 2011-15, the high productivity of Groundnut is recorded in Barshi and Paranda tahsil due to development of surface irrigation facilities. The moderate productivity of Groundnut is recorded in Karmala, Mohol and South Solapur tahsil, while it is low in Madha and North Solapur tahsil.

During the period of investigation the productivity of Groundnut was increased in Karmala and Paranda tahsil due to development of irrigation facilities.

Sugarcane:

The table 1shows that during 1991-95, the high productivity of Sugarcane was found in Madha, Mohol, North Solapur and South Solapur tahsil. The moderate productivity of Sugarcane is recorded only in Karmala tahsil, while it is low in Barshi and Paranda tahsil.

The table 1indicates that during 2011-15, the high productivity of Sugarcane is recorded in Madha and Mohol tahsil due to Bhima-Sina joint canal. The moderate productivity of Sugarcane is recorded in Karmalaand North Solapur tahsil, while it is low in Paranda, Barshi and South Solapur tahsil.

During the period of investigation the productivity of Sugarcane was increased in Madha, Mohol and North Solapur tahsil, mainly due to development of surface irrigation facility.

Conclusions:

The study reveals that agricultural productivity in study region is function of geographical factors. The high agricultural productivity of Jowar in Karmala, Barshi and North Solapurtahsil is a result of fertile black (regur) soil and availability of irrigation facility. The high productivity of Wheat is recorded in Mohol tahsil due to use of high yielding varieties and availability of irrigation. The high productivity of Tur in Barshi tahsil is a result of favorable soil and climate. The high productivity of Sugarcane in Madha and Mohol tahsil mainly due to the Bhima-Sina joint canaland development of surface irrigation facility, it is low in Paranda, Barshi and South Solapur tahsil because of lower development of surface irrigation facility.

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