Agricultural Productivity And Agricultural Intensity In Rohtas District, Bihar

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Agricultural development and agricultural productivity has been increased with the changes in traditional agricultural practices. Agricultural productivity is influenced by physical, socio-economic, institutional and organisational factors. Thus, agricultural productivity is a function of interaction of physical and cultural variables and it reveals itself through per hectare productivity and total volume of production.

Productivity is the relationship in physical quantities between input and output. The term productivity is generally used rather proudly to denote the ratio of output to any or all associated inputs in real terms Kendrick J.W.(1961),P.6.Thus, it is clear that strictly productivity is a relationship between input and output.

Keywords: Agricultural development, Agricultural productivity

Introduction

The present study deals with the agricultural development in Rohtas district of Bihar. Agriculture is the main occupation of rural population and major source of their income. New methods of agricultural techniques are being adopted but still it is largely dependent on environmental conditions and presents wide variations in different blocks of the districts, population and unemployment are growing rapidly while the land is limited. This has caused the major problem i.e. the demand of food supply for the increased population as well as the dependency of agriculture on monsoonal rainfall; various steps have been taken both by the state as well as central governments for agricultural development. To improve agricultural productivity the modern techniques are being used in agriculture. The main characteristics of modern agriculture are the application of high yielding varieties (HYV) of seeds, chemical fertilizers, pesticides, machinery etc. With the availability of water or improved irrigation facilities.

Study Area

The present paper deals with the agricultural development in Rohtas district of Bihar. The district of Rohtas come into existence on 10th November1972.Rohtas district is situated between 24.30' N to 25.20'N latitude and 84.30'E to 84.40'E longitude. Geographically, this district can be divided into two parts (i) Hilly and (ii)Plain areas. The hilly areas comprise the Rohtas block while the plain area in the eastern side is drained by Sone and on the western side by Durgawati river, Kaimur districts from the western boundary of the district. It is bounded on the north by the district of Palamau and Garhawa and in the east by the district of Aurangabad and part of Gaya. The climate of the district is of moderately extreme type. It becomes quite hot during summer and fairly cool during the winter. The district gets maximum rains during month of July and August, being the rainy months of the year. There is a slight rainfall in October. Some winter rain occurs in January and February. The month of July gets the maximum rainfall. Normal rainfall is 975mm and average rainfall is 952mm.

Objective

The main objectives of the present study are as follows:

1. To estimate the agricultural productivity

2. To find out the regional imbalances in crop productivity and agricultural development

3. To find out the relationship between crop productivity and various agricultural development variables.

Methodology

The present study is entirely based on secondary data and major source of data is District Statistical Patrika1981, 2001. The present study is an attempt to analyse the inter-block variations in agricultural productivity. For this purpose agricultural productivity has been calculated separately at block level. The productivity is measured by the output per hectare and is computed by using the following formula.

$$y = \frac{\sum_{i=1}^{n} Q_i}{\sum_{i=1}^{n} A_i}$$

Where,

Y=Agricultural productivity

Q= Agricultural production of various crops

A= Area under production of various crops

Productivity has been calculated on the basis of data available for 1981 and 2001.

Result and Discussion

Agricultural Productivity

Agricultural development and productivity is influenced by physical, socio-economic, institutional and organisational factors. It has been certainly influenced with the changes in traditional agricultural practices. Thus agricultural productivity is a function of interaction of physical and cultural variables and it reveals itself through per hectare productivity and total volume of production.

Agricultural Productivity is the relationship in physical quantities between input and output. The term productivity is generally used rather proudly to denote the ratio of output to any or all associated inputs in real terms (Kendrick J.W.1961, p.6. Thus it is clear that strictly productivity is a relationship between input and output. Productivity also improves if with a relatively smaller addition of inputs you get a proportionately longer output. It is relationship between output and input which determines productivity.

Several methods have developed for the measurement of agricultural productivity and efficiency. These measures are frequently the correlation of single input or a group of inputs or to a part thereof.KendallM.C.1939,P.24-28,(ranking co-efficient method), EnayadiG.Y.1964,Sapre and Deshpande,1964,P.242-252,B.N.Sinha1968,P.101-127.M.Shafi,1972,P.4-14,Jasbir Singh,1976,P.15-33,S.K.Sharma,1980,P.21-30 and other geographers have applied different methods to determine agricultural productivity. It is utilized after revising the methods of Enayadi (Y/Yn T/Tn) for determining agricultural productivity of Great –Indian plains by M. Shafi.

It is a ratio between production of all crops unit of area in the block and combined yield rate of the same crops in the block. To make it easier and to remove decimals this ratio can be divided by 100. Thus, the result obtained would be index of productivity as percentage of district average.

It is generally agreed that the yield per hectare may be considered to represent the agricultural productivity in a particular area which is partly the result of natural circumstances and partly of economic, cultural, technical and organisational variables.

Agricultural productivity largely depends upon climate, terrain and soil, socio-economic condition such as size of holding, farming efficiency, capital, government policies and technological operation: like irrigation and mechanization etc. Environment, arable land, labour and capital are the chief determinants of agricultural productivity in any region. Three conventional categories of inputs land, labour and capital are the best partial productivity measures. On account of the population explosion and limited land resources, agricultural productivity got special attention to increase crop production per hectare.

From time to time, considerable efforts have been made to increase the productivity level. The measurement of agricultural productivity level helps in assisting the relative performance of areas and comparing their output. By delimiting the areas of low, medium and high productivity, agricultural plans may be formulated to remove and minimize the regional inequalities; it also provides an opportunity to ascertain the ground reality and to assess the causative factors behind agricultural backwardness of a region.

Productivity of study area has been calculated on the basis of data available for 1981 and 2001. The results obtained have been grouped into three productivity groups.

High productivity (150+)

According to 1981 data only three blocks come under this category i.e. Nokha (169.22), Dehri (162.16) and Nasriganj(151.94). Whereas according to 2001 data there are four blocks which fall under this category. These are Nokha, Rohtas, Dehri and Nasriganj blocks.

Medium Productivity (100-150)

Under this range of productivity there are seven blocks namely Dinara, Sasaram, Chenari, Karagahar, Rohtas, Bikramganj, Dawath, Karakat. Whereas according to 2001 data, the blocks under this category are Sasaram, Sheosagar, Chenari, Karagahar, Akorhigola, Rohtas, Tilouthu, Bikramganj, Sanjhauli, Dawath, Karakat, Rajpur.

Low Productivity (below 100)

According to 1981 data, Sheosagar, Nauhatta blocks fall under this category. Whereas according to 2001 data only Nauhatta (68.45) blocks fall under this category.

Table 1

Productivity, Yield/ha and per capita Production of foodgrains in Rohtas District

Blocks	Productivity (1981)	Yield/ha(1981)	Percapita Production In Q.t.(1981)	Productivity (2001)	Yield/ha (2001)	Percapita Production In Q.t.(2001)
Sasaram	112.45	1092	3.12	132.21	1424	5.48
Nokha	169.22	1919	6.71	194.36	2410	8.43
Sheosagar	99.81	1098	6.74	105.30	1264	8.48
Chenari	11.81	1230	4.89	113.49	1410	6.23
Karagahar	107.76	1222	4.13	110.73	1324	6.48
Kochas	-	-	-	162.82	1532	8.23
Dehri	162.16	1839	3.05	183.14	2046	5.21
Akorhigola	-	-	-	141.20	1486	5.48
Rohtas	109.08	1237	2.09	112.32	1424	3.18
Tilouthu	-	-	-	112.22	1413	3.16
Nauhatta	65.07	738	1.50	68.45	854	1.80
Bikramganj	136.86	1552	5.95	148.23	1842	7.28
Sanjhauli	-	-	-	146.21	1738	7.12
Dawath	113.49	1287	5.51	115.84	1390	6.81
Suryapura	-	-	-	114.29	1148	6.04
Dinara	126.27	1432	8.07	132.21	1586	9.08
Karakat	110.31	1251	3.63	112.86	1481	4.89
Nasariganj	151.94	1723	4.76	163.84	1918	5.24
Rajpur	-	-	-	114.23	1280	5.32

(Source: Statistical Patrika 1981, 2001)

Agricultural Intensity or Cropping Intensity

Cropping intensity is also a measure of the agricultural productivity. Cropping intensity means raising a number of crops from the same field in the same agricultural year. It is defined as the extent to which the net area sown is cropped or resown. In other words, intensity of cropping refers to the number of crops raised on a field during an agricultural year. In the 'new agricultural strategy' priority has been given to the intensification of crop land use for checking the widening gap between increasing human population and food production. Because, that in the present circumstances, when fragmentation and encroachment has reduced the culturable area and pressure of population has increased on soil, only high cropping intensity can solve the basic food problem or the intensification of farming is an effective means of increasing the food production in the area.

The cropping intensity is measured in the percentage ratio of the gross cropped area to the net sown area. It can be expressed by the formula as follows:

$$CI = \frac{GAS \times 100}{NAS}$$

Where,

CI= Cropping Intensity

GAS= Gross cropped area

NAS= Net area sown

High cropping intensity (250-300)

In 1981 high cropping intensity is not recorded in any block. Whereas, according to 2001 data Sasaram, Nokha, Chenari, Karagahar, Kochas, Bikramganj, Sanjhauli, Dawath, Suryapura, Dinara, Karakat, Nasriganj and Rajpur blocks come under this category.

Medium cropping intensity (200-250)

According to 1981 data, the block under this range are Sasaram, Nokha, Karagahar, Bikramganj, Dawath, Dinara, Karakat, Nasriganj. Whereas, according to 2001 data the blocks under this range are Sheosagar, Dehri, Akorhigola, Tilouthu and Rohtas.

Low cropping intensity (less than 200)

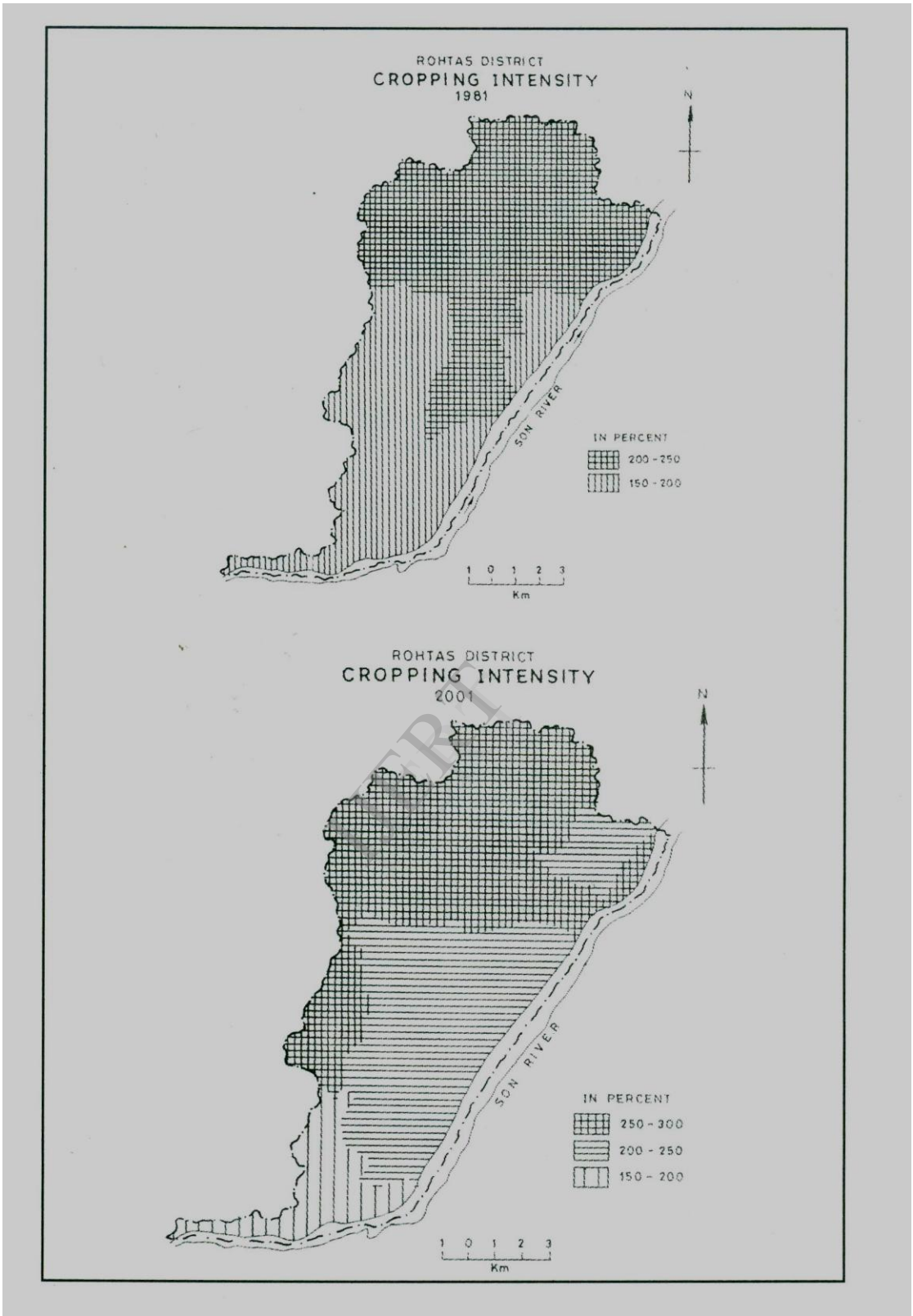
According to 1981 data, block except 8 which are given in medium cropping intensity come under this range whereas due to 2001 data, only Nauhatta block comes under this range.

Table 2

Cropping Intensity

S.No.	Blocks	1981	2001
1	Sasaram	204.03	284.40
2	Nokha	204.99	282.18
3	Chenari	180.03	26021
4	Karagahar	203.99	293.48
5	Kochas	-	284.12
6	Dehri	194.01	230.14
7	Akorhigola	-	232.84
8	Rohtas	175.10	204.19
9	Tilouthu	-	208.28
10	Nauhatta	151.05	198.36
11	Bikramganj	210.00	280.43
12	Sanjhauli	-	272.98
13	Dawath	204.02	268.25
14	Suryapura	-	264.96
15	Dinara	208.00	278.91
16	Karakat	203.06	258.18
17	Nasriganj	210.07	293.14
18	Rajpur	-	271.89
19	Sheosagar	195.02	230.48

(Source: Statistical Patrika 1981 and Agriculture Office (2001data) Sasaram


ROHTAS DISTRICT
CROPPING INTENSITY
1981
N
SON RIVER
IN PERCENT
200 - 250
150 - 200
1 0 1 2 3
Km
ROHTAS DISTRICT
CROPPING INTENSITY
2001
N
SON RIVER
IN PERCENT
250 - 300
200 - 250
150 - 200
1 0 1 2 3
Km

Conclusion

The results reveal that many socio-economic as well as physical factors are responsible for existing regional disparity blocks in agricultural productivity. Productivity, Yield/ha and per capita Production of food grains has increased tremendously due to the use of modern equipments, application of high yielding varieties (HYV) of seeds, chemical fertilizers, pesticides etc.

From the foregoing results it is clear that cropping intensity has increased with the use of modern agricultural inputs. It is also reflected at block level analysis for two periods i.e. 1981 and 2001.

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