

CHAPTER - X

AGRICULTURAL PRODUCTIVITY REGIONS

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Introduction

Delineation of agricultural productivity regions has an important bearing on the field of agricultural geography since development planning in this field is closely associated with it. The agricultural productivity of an area is the result of combinations of infra-structural elements-physico-socio-economic, institutional and organisational etc. by which agricultural efficiency is influenced. Thus the agricultural productivity is a function of combined interplay of a number of factors and it manifests itself through per acre productivity and total volume of production. Therefore the study of agricultural production may be done by considering three different aspects such as output per unit area, out put per man hour and input-output ratio (stamp 1960). Input-output ratios indicates the net returns achieved from agricultural production which may indeed be utilized for agricultural planning. Agricultural output per unit area as well as per man hour indicates significance of intensity of agricultural technology in a particular area.

Methodology :

The productivity of land in India has been measured by different techniques viz output per unit area, output per unit of labour applied and output-input ratio. In 1960 Shafi studied the agricultural productivity in Uttarpradesh² applying ranking coefficient of yield of main crops per unit area which could be formulated as

$$\frac{r_1 + r_2 + r_3 \dots \dots \dots r_n \dots \dots \dots}{n} \quad (1)$$

(where r = ranking of yield of individual crops; and n = number of crops.

Another method for measuring agricultural efficiency was used for the study of Ganges valley in India and an index of agricultural efficiency was prepared by Ganguly in 1983 by multiplying the percentages of crops' share with percentages of crops' yield in an areal unit and later averaging them into one.³ It can be formulated into the following three stages to derive at the final equation.

$$I_{yn} = \frac{y_i}{y_r} \times 100 \dots (ii)$$

$$E_{in} = (I_{yn} \cdot C_n) / 100 \dots (iii)$$

$$E_i = \frac{E_{i_1} + E_{i_2} + E_{i_3} + E_{in}}{\dots} \dots (iv)$$

(where I_{yn} = % yield of crop n; y_i = yield of individual crop in an areal unit; y_r = yield of individual crop in the total area; E_{in} = efficiency of crop n in an areal unit; C_n = crop land share in %; E_i = agricultural efficiency of all crops in an areal unit.)

In 1968 Sen Gupta⁴ applied a formula originally formulated by Bhatia⁵ for studying agricultural efficiency in India as a whole. Bhatia in his formula used Ganguli's percentages yield of crops (I_{yn}) instead of yield ranking of individual crops (r_n) which has been formulated by him as the following

$$E_i = \frac{I_{y_1} \cdot C_1 + I_{y_2} \cdot C_2 + I_{y_3} \cdot C_3 \dots \dots I_{yn} \cdot C_n}{C_1 + C_2 + C_3 + \dots \dots \dots C_n} \dots (V)$$

(The same notation as given above)

In this formula the yield of crops was considered merely in relation to crop land share which could be termed as standardized yield index.

In most of these studies the crop acreage and yield of the selected crops have been taken into consideration. Such studies hardly give an exact picture of the productivity of an area as many of the crops, although insignificant from the stand point of area and production but quite important in terms of money

value are sadly excluded. For the determination of agricultural productivity other things remaining the same, the higher the return in terms of value in money, is greater the productivity of any unit of area; any crop therefore should not be excluded from the study only because it occupies an appreciably negligible portion of the sown area and its output in quantity seems meagre. In order to obtain a more reliable picture of agricultural productivity it is therefore essential that all the crops grown in a unit be taken into consideration. Such study is possible by converting the production of each crop into money. The procedure is lengthy involving enormous and cumbersome calculations but the result thus obtained will be far more accurate, authentic and reliable. Such a useful index of calculating agricultural productivity of Sutlej Ganga plains was formulated by changing the production in money value per areal unit with the ratio of whole region by Hussain⁶ in 1976.

In order to delineate the pattern of agricultural productivity of the District of Hooghly an index as devised by Hussain in 1976 has been prepared indicating the area of all crops, their total production and their prices then prevailing. For this purpose area and production converted in terms of money

at the then prevailing price of each commodity grown in each of the component areal units ie 15 different blocks has been taken into consideration. The results thus obtained were examined in relation to the total output converted into money of all crops considered for the whole district divided by the total area under all crops of the same and then it was multiplied by 100 for deriving the results in to percentages.

The formula may be stated as follows :-

$$I_j = \frac{\sum_{i=1}^n Y_{ij} \times C_{ij}}{a_{ij}} \div \frac{\sum_{i=1}^n Y_i \cdot C_i}{A_i} \times 100 \text{ (VI)}$$

Where I_j = Index of agricultural productivity of jth block;

Y_{ij} = Production of ith crop in jth block;

C_{ij} = Price of ith crop in jth block;

n = Number of crops grown in jth block;

a_{ij} = Area under ith crop in jth block;

y_i = Production of ith crop in the district

C_i = Price of ith crop in the district

A_i = Total area under ith crop in the district.

In word, the formula may be written as follows :

$$\text{Productivity Index} = \frac{\text{Production value in money of all crops in a Block}}{\text{Total cropped area in Block}} \div \frac{\text{Production value in money of all crops in the district}}{\text{Total cropped area in the district}} \times 100$$

Productivity Regions :

With the help of above methodology the productivity index of each block was obtained (Table 39 and 40 Appendix). The productivity indices of all the component areal units were then put in an ascending order and an index scale was obtained by dividing the array into five equal parts to distinguish the very low, low, medium, high and very high productivity ratings in the regions.

Table 1. Productivity Index Array.

<u>Degree of Productivity</u>	<u>Index value.</u>
Very low	<35
Low	35-70
Medium	70-105
High	105-140
Very high	>140

(1) Very Low Productivity area : It reveals from the pattern of regional agricultural productivity that only one block of the district of Hooghly i.e the Goghat Block situated in the wn. most part has the very low productivity (Fig. 69). Though the block occupies about 10% of the total cropped area of the district as a whole yet productivity is very low. The edaphic condition seems to be the cause of its very low productivity. It is also because that Aman paddy is the significant crop compared with other valuable cash crops like jute, potato etc. Among the varieties of paddy again 'Boro' which has a very high yield rate occupies an insignificant portion of total cropped area in the block. This is again due to lack of adequate irrigation facilities which is indispensable for "Boro" cultivation.

(2) Low Productivity area : Low productivity area is found in Arambag, Serampore, Uttarpara, Chanditala and Polba-Dadpur Blocks. In Polba-Dadpur, Chanditala and Serampore-Uttarpara blocks Boro paddy is insignificant causing great reduction in total output in paddy. In all these blocks cash crop like jute is also unimportant. In Arambag block jute occupies 500 acres resulting much decreased output in jute.

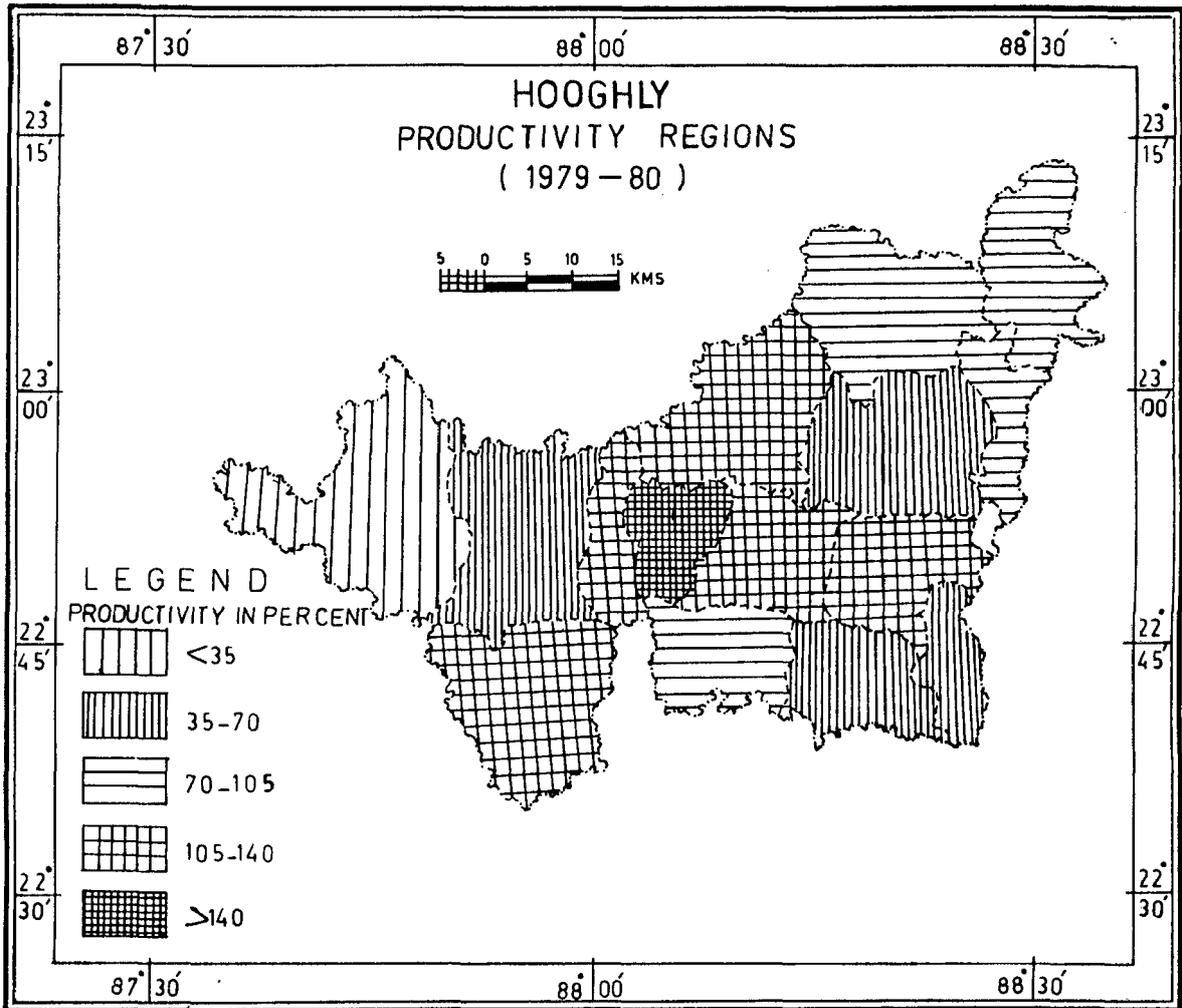


Fig. 69

(3) Medium Productivity Area : The areas of medium productivity are confined in the North Eastern part of the district covering Balagarh, Panduah, Chinsurah-Mogra. In addition to this north eastern part of the district medium productivity area occurs in Jangipara block situated in south eastern part. In these parts of the district cereal crops like paddy and wheat dominate the agricultural landscape. But cash crops like jute potato, til, mustard are also equally important.

(4) High Productivity area : High productivity areas comprise Dhaniakhali, Haripal, Singur and Khanakul blocks. This productivity areas are chiefly noticed in the central and West central part of the district. In all these blocks cereals like paddy and wheat are most important. Cash crops like jute and potato significantly dominate the agricultural landscape. Oil seeds like mustard and til are also important crops.

(5) Very high productivity area : Very high productivity area is found in the central part of the district covering two blocks namely Tarakeswar and Pursurah. In these two blocks cereals like paddy and wheat does not dominate the agricultural landscape. But cash crops like jute and potato are significantly important. Suitable edaphic condition and secured irrigation facilities are very much conducive for the successful production

of potato which fetch much more money to the farmers. Oil seeds like mustard and til are also important to some extent.

Remark : It appears from a study of agricultural productivity regions in the district that on an average the district possesses comparatively high productivity. This is because very low and low productivity regions occupy less area as compared with the regions of medium to high productivity. The spatial variation in the productivity seems to be the result of several conditions both natural and infra-structural. Among the natural factors the fertility status of the soil has considerable influence on the spatial variation in agricultural productivity. The Spearman's rank correlation coefficient between productivity index (Table 40 Appendix) and the fertility index (Proportionate score values vide table 15 B Appendix) shows a positive correlation coefficient of + . 50 which is significant at 5% level. Among the infrastructural facilities irrigation has contributed much to the spatial variation in agricultural productivity. Greater is the irrigation facility greater the scope for cultivation of a variety of crops during the dry period and greater the productivity of the crops

caused by regular and optimum supply of water to the respective crops. It has been found in chapter VIII relating to cropping pattern that the blocks having greater irrigation facilities lead in acreage of boro paddy and the cash crops like potato jute and oilseeds. Greater productivity, (both yield and production) of all those crops in the respective blocks has resulted in greater productivity index. This can be justified by the high positive correlation coefficient of + . 64 which is significant at 5% level. It is therefore expected that if further efforts are directed to extend the irrigation facilities in those blocks which are backward in irrigation and also to improve the fertility status by means of greater fertilizer input both organic and inorganic the agricultural productivity of the district may be increased considerably.

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