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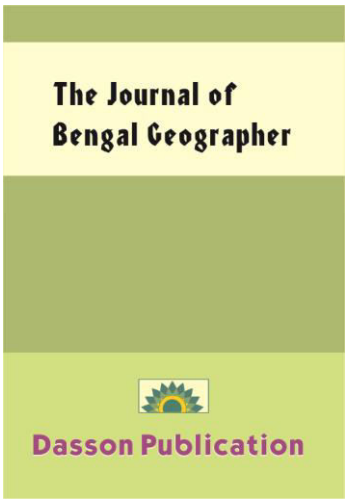

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A spatial analysis of potato productivity in Hooghly district of west Bengal

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Abstract

West Bengal ranks second in terms of potato production in India (Department of Agriculture Cooperation, Govt. of India). Hooghly district is one of the leading potato producing districts of West Bengal. The paper attempts to analyse the level of potato productivity in Hooghly district of West Bengal during the time span of 2007-08. The present study is entirely based on the secondary data which have been collected mainly from the District Statistical Handbook, 2008. Crop yield and concentration indices ranking coefficient of Singh (1976) has been used to demarcate the blocks of Hooghly district in terms of potato productivity. The paper reveals that the highest yield index of potato is found in Pursurah block (133.05) and the lowest in Khanakul- II (20.37). The highest concentration index of potato has been recorded in Pursurah (151.05) and the lowest as 22.02 in Serampur-Uttarpara block. The highest level of potato productivity has been found in Pursurah block and the lowest in Balagarh block. To minimise the disparity in potato productivity across the blocks of Hooghly district, special emphasis should be given to the efficient use of modern technological inputs and allocation of fertile alluvial tracts with better use of irrigation.

Key words : *1.Crop Concentration, 2.Productivity, 3.Ranking Coefficient, 4.Yield Index.*

Introduction

The English word 'Potato' comes from the Spanish term 'Patata'. The word potato may refer either to the plant itself or to the edible tuber. The potato is best known for its carbohydrate content (Approximately 26 gm in a medium potato). The potato was first domesticated in the region of modern day Southern Peru and extreme north western Bolivia between 8000 B.C. and 5000 B.C. It has since spread around the world and become a staple crop in many countries.

In India, along with rice and wheat, potato has gained an important place as a secondary crop. The percentage share of area to gross-cropped area of potato in India has increased from 0.75 in 2005-06 to 0.79 in 2010-11 (Source: Directorate of Economics & Statistics, Department of Agriculture & Cooperation, and Govt. of India). According to the Department of Agriculture Cooperation (Horticulture Division), Govt. of India, the top potato producing state both in terms of area and production is Uttar- Pradesh followed by West Bengal and Bihar as on 22nd January, 2015.

The study area

The Hooghly district of West Bengal (Fig. 1 and Table 1) represents an important and remarkable place in the field of agriculture in West Bengal. Though rice is the prime crop of the district, the agricultural economy largely depends on potato. A significant number of cold storages for potato is located in the district.

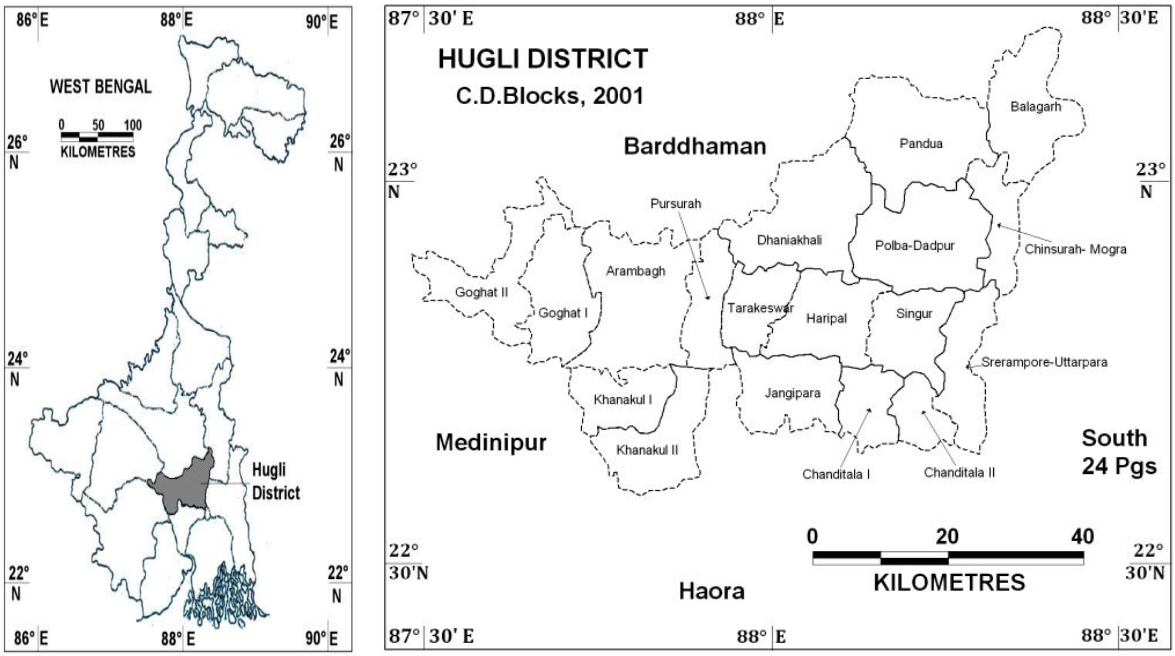

Fig. 1: location of Hooghly district

Table 1: Hooghly district at a glance

Latitudinal Extension	$22^0\ 39'\ 32''$ N-$23^0\ 01'\ 20''$ N	Villages	2585
Longitudinal Extension	$87^0\ 30'\ 15''$ E-$88^0\ 30'\ 20''$ E	**Agro Climatic Zone (NARP)**	Old Alluvial Zone
Total Population (2011)	5519145	**Geographical Area ('000 hc)**	317.09
Sub-divisions	4	**Cultivable Area ('000 hc)**	220.35
C.D. Blocks	18	**Net Sown Area in 2007-08 ('000 hc)**	219.91
Gram Panchyats	210	**Net Irrigated Area in 2007-08 ('000 hc)**	157.52

Source: Official Website of Hooghly district

Objectives

1. To find out the yield index of potato at block level in Hooghly district in 2007-08.

2. To calculate the concentration index of potato at block level in Hooghly district in 07-08.

3. To delineate the potato productivity at block level in Hooghly district in 07-08.

Materials and methods

The present study is entirely based on secondary data. The sources of secondary data include different reports of Department of Agriculture, Govt. of India and West Bengal; Official website of Hooghly district and District Statistical Handbook of Hooghly, 2008. The data have been analysed with the help of crop yield and concentration indices ranking coefficient of Singh (1976) and suitable cartographic techniques.

A brief outline of potato production of west Bengal

Rice and potato are considered to be the principal food crops of West Bengal. It is 2nd largest producer of potato in India with an average annual output of 8.9 million tonnes. The state accounts for about 30% of India's potato production. Moderately cool temperature with adequate dew is an ideal condition for good potato harvest in West Bengal. The temporal change in the production and yield of potato in West Bengal is shown in Table 2 and 3 respectively.

Table 2: production of potato in west Bengal

Year	2006-07	2007-08	2008-09
Production (Million Tonnes)	5.05	9.90	4.12

Source: Department of Agriculture, Govt. of West Bengal

Table 3: yield of potato in west Bengal

Year	2007-08	2008-09	2009-10
Yield (Kg/Hectare)	24704	10677	22500

Source: Department of Agriculture, Govt. of West Bengal

Crop yield index and crop concentration index of potato in Hooghly district

The crop yield index and the crop concentration index of potato in Hooghly district have been computed with the help of crop yield and concentration indices ranking coefficient of Singh (1976).

$$Yi = \frac{Yae}{Yar} \times 100 \dots\dots\dots\dots (i)$$

Where,

Yi is the crop yield index

Yae is the average yield per hectare of crop 'a' (i.e. potato) in the component enumeration unit (i.e. block level)

Yar is the average yield of crop 'a' (i.e. potato) in the entire district (i.e. Hooghly)

$$Ci = \frac{Pae}{Par} \times 100 \dots\dots\dots\dots (ii)$$

Where,

Ci is the crop concentration index

Pae is the percentage sharing of crop 'a' (i.e. potato) to the total harvested area in the component enumeration unit (i.e. block level)

Par is the percentage sharing of crop 'a' (i.e. potato) to the total harvested area in the entire district (i.e. Hooghly)

$$RCYiCi = \frac{\text{Yi ranking of Crop "a"} + \text{Ci ranking of crop "a"}}{2} \dots\dots\dots\dots (iii)$$

Where,

RCYiCi is crop yield and concentration indices ranking coefficient of crop 'a' (i.e. potato)

Here, the lower value of the ranking co-efficient indicates the higher degree of productivity and the higher value of the ranking coefficient implies the lower degree of productivity (Table 4).

Table 4: Block wise crop yield and concentration indices ranking coefficient of potato in Hooghly district (2007-08)

C.D Blocks	Total Cropped Area (Hectare)	Area In Hectares	Production In Million Tonnes	Yield (Kg/hectares)	Yi	Rank Of Yi	Ci	Rank Of Ci	RCYiCi
Dhaniakhali	42419	7207	196369	27246.92	111.16	8	68.95	11	9.5
Pandua	44936	7498	200201	26700.57	108.93	10	67.72	12	11
Balagarh	30330	3738	60316	16135.87	65.83	15	50.02	14	14.5
Chinsurah-Mogra	5670	579	13037	22516.81	91.86	12	41.44	15	13.5
Polba-Dadpur	43537	7498	175588	23417.95	95.54	11	69.90	10	10.5
Tarakeswar	22103	7172	229048	31936.37	130.30	3	131.69	2	2.5
Haripal	30636	8172	222134	27182.35	110.90	9	108.26	3	6
Singur	22706	4936	91983	18635.19	76.03	14	88.23	8	11
Jangipara	24334	5194	156484	30127.79	122.92	5	86.63	9	7
Chanditala-I	13179	1051	30427	28950.81	118.11	7	32.37	16	11.5
Chanditala-II	3672	258	5655	21918.91	89.42	13	28.52	17	15
Serampur-Uttarpara	774	42	591	14071.00	57.41	16	22.02	18	17
Goghat-I	27673	4367	142090	32537.11	132.75	2	64.05	13	7.5
Goghat-II	36134	8395	260683	31052.13	126.69	4	94.29	5	4.5
Arambagh	48844	11699	349970	29914.52	122.05	6	97.21	4	5
Khanakul-I	29109	6616	69596	10519.37	42.92	17	92.24	6	11.5
Khanakul-II	12973	2831	14138	4993.95	20.37	18	88.56	7	12.5
Pursurah	20342	7571	246903	32611.70	133.05	1	151.05	1	1

Source: District Statistical Handbook of Hooghly, 2008 and Computed by authors

Yi is the crop yield index

Ci is the crop concentration index

RCYiCi is the crop yield and concentration indices ranking coefficient

The highest crop yield index has been recorded as 133.05 in Pursurah block and the lowest as 20.37 in Khanakul-II. On the basis of block wise crop yield index (Table 4), Hooghly district has been categorised into three distinct micro regions i.e. high, moderate and low yield index of potato (Table 5).

Table 5: block wise crop yield index of potato in Hooghly district (2007-08)

Categories	Crop Yield Index (Yi)	C.D. Blocks
High	More than 110	Dhaniakhali, Haripal, Jangipara, Chanditala-I, Goghat-I, Goghat-II, Arambagh, Pursurah, Tarakeswar
Moderate	70-110	Pandua, Chinsurah-Mogra, Polba-Dadpur, Singur, Chanditala-II
Low	Less than 70	Balagarh, Serampur-Uttarpara, Khanakul-I, Khanakul-II

Source: Prepared by authors from Table 4

The highest crop concentration index has been found as 151.05 in Pursurah block and the lowest as 22.02 in Serampur-Uttarpara. On the basis of block wise crop concentration index of potato, Hooghly district has also been categorised into three distinct micro regions i.e. high, moderate and low crop concentration index of potato (Table 6).

Table 6: block wise crop concentration index of potato in Hooghly district (2007-08)

Categories	Crop Concentration Index (Ci)	C.D. Blocks
High	More than 110	Tarakeswar, Pursurah
Moderate	70-110	Singur, Jangipara, Haripal, Goghat-II, Arambagh, Khanakul-I, Khanakul-II
Low	Less than 70	Dhaniakhali, Pandua, Balagarh, Chinsurah-Mogra, Polba-Dadpur, Chanditala-I, Chanditala-II, Serampur-Uttarpara, Goghat-I

Source: Prepared by authors from Table 4

Delineation of blocks of Hooghly district on the basis of potato productivity

On the basis of crop yield index and concentration indices ranking coefficient (Table 4), the blocks of Hooghly district have been delineated into three categories i.e. high, moderate and low (Fig. 2).

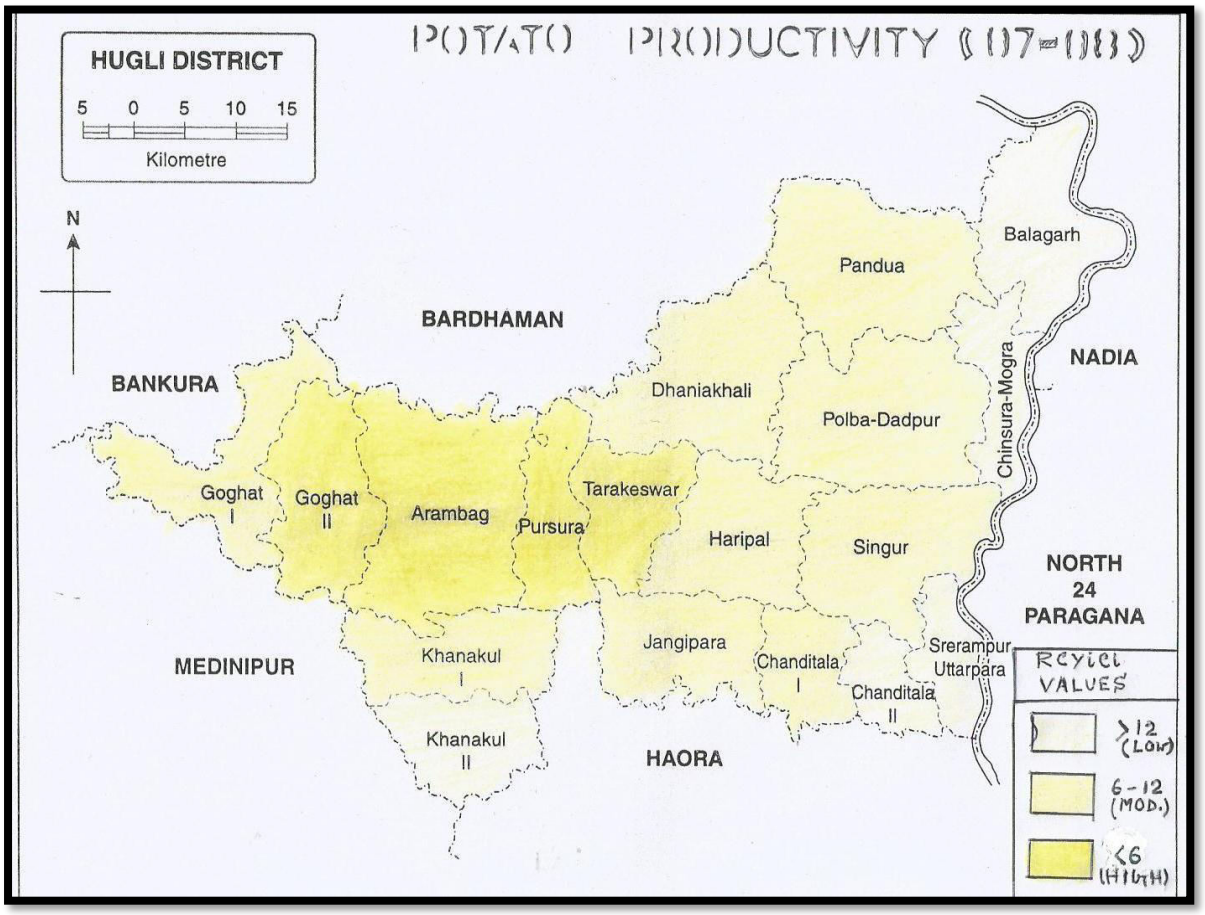

Fig. 2: potato productivity in Hooghly district (2007-08)

Conclusion

Potato productivity in Hooghly district is characterised by distinct regional variation. Though some blocks enjoy good status in terms of potato productivity but a significant number of blocks display poor productivity as compared with the more developed blocks. Lack of irrigation and technological inputs, low level of communication, low monetary return and fluctuation in market price, locational settings and above all the poverty of farmers are the main reasons behind the low status of potato productivity in those blocks. So proper strategies should be adopted to enhance the overall scenario of potato productivity of the district. Potato has a rich potentiality to act as a raw material for various food processing units. So emphasis should be given for establishing potato based food processing industries in the district. The govt of West Bengal should encourage the establishment of such industries in the district. Initiatives have already been taken. Agro PE & Pvt. Ltd., a Pailan Group Company have entered into a joint venture with A.F.T./PB conseil of France for setting up a food processing unit in Dhaniakhali, Hooghly to produce potato flakes. Through such initiatives, potato will not only become an important resource for employment generation in Hooghly district, but also contribute to the economy of West Bengal.

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