

THE INTENSITY OF CROPPING IN JALPAIGURI DISTRICT, WEST BENGAL, INDIA

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ABSTRACT

The main objective of this study is to analyse the extent of intensification of agriculture in Terai-Doors region of Jalpaiguri district, to find out the spread of agriculture and to find out the factors responsible for increasing the intensity of cropping. The analysis reveals that there is block wise variation in the intensity of cropping and it is high where density of population is high, but significantly low of so many parts. Therefore, all kinds of efforts should be made to increase the intensity of cropping in the region in order to achieve higher level of agricultural production.

Key words: Intensity of cropping, Irrigation, Agricultural worker, Production, Population.

OBJECTIVES

- To analyse the existing conditions of agriculture spatially.
- To analyse the factor responsible for increasing the intensity of cropping.
- To measure the level of efficiency of agriculture in the region.
- To analyse the community cultural efficiency in the region.
- To find out to what extent of agriculture in the region can be further intensified.

METHODOLOGY

The entire information and data have been taken mainly from District Statistical Handbook (2008) and District Census Handbook (2001) and also from the office of the Revenue circle, Department of Irrigation (Jalpaiguri). For measuring the intensity of cropping, very simple mathematical tools have been used and for finding out the factors responsible for increasing intensity of cropping, the correction co-efficient technique has been used.

STUDY AREA

Jalpaiguri is a district of West Bengal in northern part of the state, lying between $26^{\circ}16'N$ and $27^{\circ}00'N$ latitude and between $88^{\circ}04'E$ and $89^{\circ}53'E$ longitudes. It has 13 blocks with 688139 house-holds. The district situated in the northern part of West Bengal has international borders with Bhutan and Bangladesh in the north and south respectively and borders with Assam state and the Darjeeling district in the east, west and northwest (Grunning, 2008)

INTRODUCTION

Intensity of cropping refers to the number of crops raised on a field during an agriculture year and thus it indicates the level of efficiency of agricultural land use. In the Terai-Doors region of Jalpaiguri district, most of the cultivable land has already been brought under cultivation. Thus, the physical expansion is necessary for satisfaction of increasing population. The Productivity of single crop can also be increased with the help of modern method of cultivation. But there is always a limit to the maximum productivity of crops as after a certain level of productivity, the law of diminishing return operates in the production function in fact, marginal productivity is decreased and afterwards, it even becomes negative. Therefore, intensive utilization of the net sown area for more than one crop is beneficial for increasing agricultural production (Das and Das, 1994).

INTENSITY OF CROPPING

The index of intensity of cropping in the region as a whole was 117.67 in 2007-2008. Table 1 shows that the intensity of cropping was highest in the Mal block followed by the Metiali block. From the census report of 2001, it is found that both blocks have highest growth of population, the peasants of which were compelled to cultivate the same plot of land twice and thrice a year. The intensity of cropping was medium in the Dhupguri, Falakata blocks where the production of kharif-rabi crops is high due to fertile land. The intensity of cropping is found to be lowest in Rajganj(102.25), Jalpaiguri(101.08), Maynaguri(105.00), Kalchini(109.79), Alipurduar-II(105.19). These blocks have rural and urban population.

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Table-1
Block-wise intensity of cropping in the year of 2007-2008

Blocks	Net sown area in sq.k.m.	Total cropped area in sq.k.m.	Index of intensity of cropping
1.Rajganj	601.29	614.82	102.25
2.Jalpaiguri	495.30	500.65	101.08
3.Maynaguri	505.3	530.60	105.00
4.Dhupguri	495.12	565.10	114.13
5.Mal	398.19	545.90	137.10
6.Metiali	152.48	204.90	134.38
7.Nagrakata	302.41	397.48	131.44
8.Kumargram	409.17	517.68	126.52
9.Falakata	308.18	353.93	114.85
10.Madarihat - Birpara	303.35	376.75	124.20
11.Kalchini	648.16	711.61	109.79
12.Alipurduar I	305.92	378.59	123.75
13.Alipurduar II	303.18	318.92	105.19

Source: Office of the revenue circle

Data for net sown area and total cropped area has been collected from the office of the revenue circle and the index of intensity of cropping has been calculated by the formula –

$$\text{Total cropped area} / \text{Net sown area} \times 100$$

Some of the known factors, such as density of rural population, irrigation, agricultural workers, Scheduled caste and Scheduled tribe people are assumed to be responsible for spatial variation in the level of intensity of cropping.

DENSITY OF POPULATION AND INTENSITY OF CROPPING

It has been attempted here to test the hypothesis that there exists a positive correlation between population pressure and intensity of cropping. The hypothesis is based on the assumption that as the increase in population leads to the decrease in per capita production, the peasants are compelled to grow a number of crops from the same plot of land during an agricultural year in order to increase the total volume of outputs, so that per capita production does not fall. Table 2 shows the block-wise population density per kilometer and intensity of cropping. The correlation coefficient between the two variables (density and Intensity of cropping) is found to be only-0.32 which is very much insignificant.

This is proved that there is no correlation between population pressure and intensity of cropping and such a condition has been prevailing in the region because of a number of reasons:

- I. Population density is not very much high where intensity of cropping is also low due to the reason of unfertile land and cover of tea garden.
- II. In the tribal-dominated foot hill area, the tribal people who are traditionally subsistence-oriented do not feel the necessity of growing more than one crop in their farms.
- III. The intensity of cropping is not comparatively high in the fertile area where transport and communication are developed and small towns and market canters have sprung up here. There are many educational institutions and educational levels are high. However, there is ample potentiality in the region as a whole for the increase of intensity of cropping, if adequate infrastructure; inputs and incentive are provided to the people.

Table-2
Block-wise population pressure (2001) and intensity of cropping

Blocks	Area Sq.k.m.	Population	Density sq.k.m.	Intensity of cropping
1.Rajganj	614.82	283967	462	102.25
2.Jalpaiguri	500.65	280927	561	101.08
3.Maynaguri	530.60	281700	531	105.00
4.Dhupguri	565.10	418461	741	114.13
5.Mal	545.90	265392	486	137.10
6.Metiali	204.90	105906	517	134.38
7.Nagrakata	397.48	115907	292	131.44
8.Kumargram	517.68	178067	344	126.52
9.Falakata	353.93	254273	718	114.85
10.Madarihat Birpara	376.75	185470	492	124.20
11.Kalchini	711.61	252571	355	109.79
12.Alipurduar I	378.59	197331	521	123.75
13.Alipurduar II	318.92	196984	618	105.19

Source: Census of India 2001 and District Statistical Handbook-Jalpaiguri 2008. Intensity of cropping has been collected from table no-1

BLOCK-WISE IRRIGATION AND INTENSITY OF CROPPING

Intensity of irrigation is another factor for increasing the intensity of cropping in a region. Intensity of irrigation has command over the intensity of cropping and is the primary influent (Singh, 1976). An attempt is, therefore made here to find out the correlation between the two variables such as intensity of cropping and intensity of irrigation.

Table-3
Block-wise irrigation (2007-2008) and intensity of cropping.

Blocks	Area under irrigation in hectare	Intensity of cropping
1. Rajganj	25810	102.25
2. Jalpaiguri	18866	101.08
3.Maynaguri	8313	105.00
4.Dhupguri	9074	114.13
5.Mal	5204	137.10
6.Metiali	2205	134.38
7.Nagrakata	2215	131.44
8.Kumargram	3685	126.52
9.Falakata	7285	114.85
10.Madarihat - Birpara	5946	124.20
11.Kalchini	2400	109.79
12.Alipurduar I	5221	123.75
13.Alipurduar II	4373	105.19

Source: Computed on the basis of the data given in the table 1 and Department of Irrigation, Jalpaiguri.

Table 3 shows block-wise irrigated areas and intensity of cropping. The correlation coefficient between the two variables is found to be -0.63 which is insignificant. The hypothesis of correlation between irrigation and intensity of cropping is not valid in the study region. This might be happening due to the reason that in the fertile blocks, where the intensity of cropping is comparatively high, irrigation is insignificant, where as in the unfertile blocks, intensity of cropping is comparatively low, irrigation is significant. Irrigation in the study region leads to mono-cropping rather than multiple cropping as the peasants remain satisfied with higher yield of a single principle crop (paddy) with the help of irrigation. So they do not feel the necessity of growing more crops. Thus the subsistence nature is not yet given up by the indigenous peasants.

AGRICULTURAL WORKERS AND INTENSITY OF CROPPING

Density of agricultural workers of net sown area is also assumed to be responsible for increasing the intensity of cropping. Therefore, the hypothesis postulated here is that there is positive correlation between the density of agricultural workers of net shown area and intensity of cropping (Mishra and Ramesh, 1989). The Block-wise percentage of agricultural worker of net sown area and intensity of cropping has been shown on table no.4. The correlation coefficient between the two variables is found to be -0.18 and is found to be very insignificant.

Table-4
Block-wise distribution of agricultural worker (2001) and intensity of cropping

Blocks	Agricultural worker in Number	Percentage of total worker	Intensity of cropping
1. Rajganj	20436	19.21	102.25
2. Jalpaiguri	33595	27.97	101.08
3. Maynaguri	42018	37.82	105.00
4. Dhupguri	33358	20.93	114.13
5. Mal	18921	17.74	137.10
6. Metiali	3581	8.26	134.38
7. Nagrakata	5042	10.91	131.44
8. Kumargram	21758	28.74	126.52
9. Falakata	28475	29.72	114.85
10. Madarihat - Birpara	8840	12.54	124.20
11. Kalchini	8306	9.27	109.79
12. Alipurduar I	22824	28.97	123.75
13. Alipurduar II	22407	29.93	105.19

Source:-Data for agricultural workers has been collected from the district census Handbook of Jalpaiguri District 1999-2001 and for intensity of cropping the source is as given in table no-01

Thus, it is clear that there is a very weak association between the percentage of agricultural workers and intensity of cropping. Such a negative correlation coefficient is found due to the fact that density of agricultural workers is comparatively high in the fertile land where intensity is also high. But the condition is reverse in the indigenous peasants' dominated built up plain. So the coefficient of correlation is very weak.

BLOCK-WISE PRODUCTION OF RICE AND INTENSITY OF CROPPING

There is a general possibility of positive correlation between the production of major crops and intensity of cropping because the production is closely related with intensity of cropping. Production of any region is dependent on fertilizer use, status of irrigation; demand of land use, farm mechanization and also on fertility of the land.

From the table no-5, we found the production of rice and intensity of cropping of the district. The coefficient of correlation between the two variables is found to be -0.72 which is very much insignificant. Thus, it is proved that the production of rice or major crops is closely related with intensity of cropping and it is high where production of rice is high and it is found to be low where production of rice is low. But it is not valid for the entire district.

Table -5
Block-wise production of rice and intensity of cropping, 2007-2008.

Name of the block	Production	Production in thousand Metric Tons
		Intensity of cropping
1.Rajgunj	54.366	102.25
2.JAlpaiguri	46.835	101.08
3.Moynaguri	50.185	105.00
4.Dhupguri	47.78	114.13
5.Mal	22.581	137.10
6.Metiali	4.397	134.38
7.Nagrakata	4.943	131.44
8.Kumargram	19.65	126.52
9.Falakata	41.32	114.85
10.Madarihat-Birpara	6.693	124.20
11.Kalchini	2.499	109.79
12.Alipurduar-I	28.224	123.75
13.Alipurduar-II	42.688	105.19

Source: Data of production (Rice) has been collected from District Statistical Handbook – Jalpaiguri 2008 and data for intensity of cropping has been collected from table no.1

CONCLUSION

From the above discussion, we find that there is weak association between intensity of cropping and population pressure but the increase in rural population of area leads to the decrease in per capita production, the presents are compelled to grow a number of crops from the same plot of land during an agricultural year in order to increase the total volume of output so that per capita production does not fall. On the other hand, other factors like irrigation, agricultural worker etc. does not have any link with the intensity of cropping in the study region. There is strong relation between productions of rice with intensity of cropping. It is also found from the discussion that the irrigation dominated blocks posses the lower intensity of cropping and overall agricultural efficiency in the region is very high due to few positive factors .All other factors are found to be insignificant in influencing intensity of cropping . Therefore, there is a tremendous scope for the increase in intensity of cropping in the region if adequate measures are taken in the proper perspective for agricultural development.

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