

Impact of Irrigation on Agricultural Characteristics of Jehanabad District : Bihar

Kanchan Kumari

ABSTRACT

The Crop landuse and agricultural characteristics are the expressions of environmental conditions of a region. The selection of crops depends very much on the physical conditions like topography, soil and ground water and social and economic factors.

Keywords :- Landuse, Agriculture, Environment, Crop, Physical conditions, Topography.

1. Crop-pattern :

The area under study, the Jehanabad district is very much diversified in cropping. There is a very high premium on the food crops as usual and about 95% of the total net cropped area is devoted to such crops, Non-food crops occupy only 5% of the total cropped area. Among the food-crops, cereals contribute about 80%, pulses followed by oilseeds come next accounting 15% of the net cropped land. Other crops constitute only 5%, of which 2.40% area is devoted to vegetables; 1.15% to sugarcane, 0.40% to fruits; 0.20 to spices and .85% to other crops. Ground nuts, Sugarcane, vegetables, potatoes, Onions, watermelons and fruit-crops- Mango, Guava, BER, BEL, and Banana etc. - are the main commercial crops of the district.

Rice is the dominant crop claiming about 86% of the total cropped area of AGHANI season. It also shares about 69% of the GARMA season. The area under study claims high acreage, high production, and high per acre yield. Wheat occupies second place which is produced in about 72% of the total cropped land

of RABI season. Maize occupies third place. Pulses, oilseeds, fruit-crops etc. are grown throughout the areas of the district.

It is worth mentioning that the highest acreage has a gone to the paddy cultivation followed by wheat and maize. The production of potato and onion is on the increase in comparison to other crops. As compared to food crops, the area under non-food crops is insignificant. The increase in production of rice, wheat, maize, sugarcane, potato and onion may be due to the wide use of hybrid varieties of seeds and other agricultural inputs e.g. fertilizers, timely irrigation, insecticides pesticide and modern techniques for maximizing output.

2. The Crop Combination Analysis :

The analysis of the impact of irrigation in the cropping pattern, the combination pattern plays an important role. It is not only a criterion for the delineation of agricultural regions but also it is a base in the development and planning the crop-pattern. Many geographers have worked on it and evolved a number of methods.

Research Scholar, Deptt. of Geography, Magadh University, Bodh Gaya,

The study of crop-combination constitutes a significant aspect of agriculture geography. The crop combination regions author has realized to deal with the intensity of cropping, diversity of cropping and the crop ranting.

3. The Intensity of Cropping :s

The theory of crop intensity implies the degree of cropping or the number of crops grown on the same land using agricultural year. It emerges basically from the occupation of land during one agricultural year.

Net area sown + Area sown more than once is equal to = total cropped area.

In case only one crop is grown during the whole agricultural year the net sown and the total cropped area are equal and crop intensity is one. But, in case a portion of the cultivated area is sown more than once, suppose out of ten

hectares, if two hectares are sown more than once, the total cropped area is increased to that extent as - it becomes 10+2=12 hectares and the crop intensity also increases {the same land during the same agricultural year yields more than one, crop) to 1.2. This concept is useful in many ways. It is one of the production capacities of cultivated land. It also shows the nature of the cropping pattern. And, indirectly it throws light on the possibilities or otherwise of intensification of agriculture or enhancing of production through expansion of double cropping. The following formula is applied for the calculation of "Intensity of Cropping",

$$\text{Intensity or } I = \frac{\text{Total Cropped area}}{\text{Net area sown}} \times 100$$

The intensity index for different ANCHALS of the district of Jehanabad district, 1981 is given in the following table No. 1

Table No. 1
Intensity Index

Sl. No.	Anchals	Area in Hectares Total Cropped area	Net area sown	Index of Intensity of Cropping in %
1.	Jehanabad	19,798.34	13,574,084	146.58
2.	Makhdumpur	19,909.70	25,989.02	124.52
3.	Kako	15,605.31	10,531.44	148.09
4.	Ghosi	27,594.88	18,699.20	147.69
	District	1,73,164.99	1,19,814.39	142.86

Source : Department of Statistics, Gaya, 2016.

On the basis of above calculation, the intensity of cropping is classified as follows :

- (i) High Intensity index – above 145%
- (ii) Medium intensity index – 140-145%
- (iii) Low intensity index – Below 140%

This table also reveals that in all Anchals of Jehanabad district, the total cropped area

or gross area sown exceeds that of net area sown. The intensity varies from 124.52% to a maximum of 148.09%. The intensity of cropping is controlled by rainfall intensity, productivity of soil and the nature of the cropping-pattern.

In the present situations, when fragmentation and encroachment has reduced the

culturable area and the pressure of population has increased on soil, only high cropping intensity can solve the basic food problem.

4. Diversity of Cropping :

The value of crop diversification index indicates the number of crops grown in a unit area in a point of time. It is an important aspect of the agricultural geography. The index of crop diversification computed statistically, presents a clear picture of the cropping pattern in our study area. It has been calculated with the help of the following formula :-

$$X = \frac{\% \text{ T.C.A.}}{N}$$

where, X = Crop diversification,

T.C.A. = Total group d Area,

N = Number of crops

Bhatia has developed another method to find out this diversification. Here the author has tried to apply it in a modified form.

D. I =

$$\frac{\text{Area under "n" crops as percentage of Gross cultivated Area}}{\text{Number "n" of crops.}}$$

where, D. I. = is the index diversification,

n = is the number of selected crops.

The magnitude of diversification and the index values are inversely related to each other. In other words, the high value of index will show a less magnitude of diversification.

Thus D.I. of Jehanabad District is

$$D. I = \frac{142.86}{12} = 11.95$$

In the same way, the D.I. of different ANCHALS have been calculated, which is shown in the following table No. 2.

Table No. 2

Sl. No.	Anchals	D.I.	Grade
1.	Jehanabad	12.22	Medium
2.	Makhdumpur	10.37	Low
3.	Kako	12.34	Medium
4.	Ghosi	13.42	Medium
	District	11.95	

Source : Self Computation.

The rugged or undulated terrain, wide varieties of soils, unfavorable climate and low level of advancement of the farmers of a particular area, induce the diversification of crops, whereas, on the contrary, the leveled land, uniform soil types, well developed sources of irrigation as well as marketing facilities, all taken together promote the specialization of crops to a satisfactory level.

The change in diversification from high to moderate is due to the impact of irrigation. In the farmer years, the supply of water for irrigation had not been regular with the result, a wide variety of crepe were grown in the irrigated to have some harvest in case of crop-failure. But with the development of irrigational facilities by different means, especially by Canal irrigation, have improved the cropping conditions to a greater extents. This provided a security to the farmers and safety to their crops so that they might use the larger area of their land to a limited variety of crops. This has been only possible with irrigation.

5. Crop Ranking:

A study of 'crop ranking' is very much useful in understanding the distributional patterns

of crops in an area as it provides an idea of relative dominance of different crops in order of importance. In the study undertaken, crops have been ranked on the basis of their relative a real strength as proportionate to the total cropped area. It also presents an understanding of the relative importance of different crops in each area unit, and helps in the selection of significant crops for detailed study in a region. The ranking of crops has been employed by geographers in studying the agricultural in different areas of the world. In India, crop remains method has been used by taking a district as a areal unit. In the study smaller areal unit, viz. ANCHAL has been used for differentiation of the dominant crops. On the basis of the relative strength of various crops by renting them for each ANCHAL according to the percentage of total cropped land occupied by each crop.

In the analysis of cropping pattern, it is of interest to know the general areas where different crops dominate. For this purpose comparison of relative strength of various crops is made by renting them for each ANCHALS, according to the percentage of the sown area occupied by each crop. The first, second, third and fourth ranking of crops are mapped and the resultant-patterns of their distribution have emerged which depicts clear distribution pattern.

In the study area, there are four crops that rank first in one or more ANCHALS. The first ranking crops are paddy, wheat, maize and gram. The pattern is quite obvious and need not any interpretation.

References:

1. Gurjar, R.K. (1987), "Irrigation for Agricultural Modernisation", (Jodhpur, Scientific Publishers), P. 85.
2. Kumar, B. (1988), "Imapct of Irrigation on Agriculture in Patna District, Bihar", (An Unpublished Ph.D. Thesis, Bodhgaya, Magadh University), P. 160.
3. Ref. 1., Op. cit., P. 109.
4. Ayyar, N.P. and Srivastava, S. (1972), "Landuse and Nutrition in Beas Basin", Proceeding of Symposium on Landuse in Developing Countries, Aligarh, 1972.
5. Bhatia, S.S. (1966), "Pattern of Crop distribution and diversification in India", Economic Geography, Vol. IV, No. 1. 1966.
6. Ref. 1., Op.cit.
7. Ibid.
8. Ibid., P. 110.
9. Ibid., P. 110.
10. (i) J.C. Weaver, (1954), "Changing Patterns of Cropped Landuse in the West", Economic Geography, No. 130., 1954, PP. 1-47.
(ii) J.T. Coppock, (1954), "Crop, Livestock and Enterprise Combinations in England and Wales", Economic Geography, Vol. 40., 1954, PP. 65-81.
11. For India, P. Sengupta has used the ranking crops to show change in Jute belt, The Indian Jute Belt, Orient Longman's, 1955, PP. 134-144. O.P. Bhardwaj has used the ranking crops
12. Ref. 2., Op. Cit., PP. 167-68.

