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INTENSITY OF CROPPING IN THE COMMAND AREA OF DOODHGANGA IRRIGATION PROJECT IN KOLHAPUR DISTRICT: A SPATIO-TEMPORAL ANALYSIS

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ABSTRACT

The intensity of land utilization is reflected in number of crops raised during the year. Among the various determinants of agriculture, it is assumed that irrigation positively affects the intensity of cropping. An attempt has been made in this paper to analyze the change in the intensity of cropping in the command area of Doodhganga Irrigation Project in both pre and post period. Such spatio-temporal study is based on secondary sources of data. The period for this investigation is considered from 1980-82 to 2010-12. The spatial and temporal variations in the intensity of cropping worked out on the basis of village as an areal unit and triennial as time unit. The analysis reveals that, the intensity of cropping has increased from 103.08 percent in the pre-project to 117.74 percent in the post project period.

KEYWORDS:*Intensity of Cropping , Doodhganga Irrigation Project , Spatio-Temporal Analysis.*

A SPATIO-TEMPORAL ANALYSIS

1. INTRODUCTION:

Irrigation is one of the significant inputs in the process of transformation of agriculture. It encourages farmers to adopt scientific techniques. Concerted efforts have been made for the improvement of agriculture, the backbone of the Indian economy in the post independence period. Unfortunately, the fruits of various development schemes have not been shared equally by all parts of the country.

The Kolhapur district in south Maharashtra has essentially an agrarian economy. About sixty-three percent of district's total population depends on agriculture. The district has been remained as one of the agriculturally developed districts of Maharashtra. About 23.80 percent agricultural land in the district is under irrigation. The big, medium & small irrigation projects have made a significant contribution in the development of irrigated farming in the district. The irrigation development in the district has not only changed the economy of the district but also the socio-economic conditions of the people in the command areas of such projects.

The intensity of cropping implies the degree of cropping or the number of crops grown in the same piece of land during one agricultural year. The intensity of cropping is the intensity of land utilization. It is determined by various factors but irrigation stands as the most important factor which positively affects the intensity of cropping. 'Intensity of cropping is multidimensional concept based primarily on technological advancement and organizational setup' (Ram Nivas Yadav). In the present section an attempt has been made to investigate the spatio-temporal variations in the pattern of cropping intensity in the Doodhganga Irrigation Project command area before and after

irrigation development.

The measurement of intensity of cropping has drawn the attention of agricultural scientists, economists and geographers. Intensity of cropping is a multidimensional concept based primarily on technological advancement and organizational set-up. These factors in turn affect the intensity of cropping in various regions. The regional variations in intensity of cropping and it's measurement, therefore form an important theme of studies in agricultural geography. An attempt is being made to examine the nature and characteristics of intensity of cropping imbalances in the study region. It provides an appropriate conceptual base for understanding regional imbalances in intensity of cropping and will help the planners an understanding, controlling and ultimately tacking the problem more efficiently to improve the intensity of cropping.

2. STUDY AREA :

The region under study is the command area of Doodhganga Irrigation Project in Kolhapur district. Which extends from 16^0 26' 15'' north to 16^0 43' 12''north latitudes and 74^0 01' 54''east to 74^0 39' 22''east longitudes, occupying the middle part of the district (fig-1). The command area in the district comprises 96 villages with an irrigated area of 56163 hectares and 284316 population (2011). The western part of the region is a narrow erosional plain with small hillocks and the eastern part is comparatively a broader plain. The altitude of the region ranges from 700 meters to 1000 meters. The average maxi mum temperature in the region is 30°c and minimum 14°c. The rainfall ranges from 4000 mm in the west to 600 mm. in the east. The region has laterite soil in west and black soil in the east

Doodhganga Irrigation Project:

It is one of the major irrigation projects in the Maharashtra. The dam is constructed on the river Doodhganga which is a tributary of Krishna river. The water for irrigation from this project has been made available since 1985. The command area or the benefited area (59933 hectares) as estimated, is extended in Kolhapur district of Maharashtra (46948 hectares) and in Belgaum district of Karnataka state (12985 hectares).

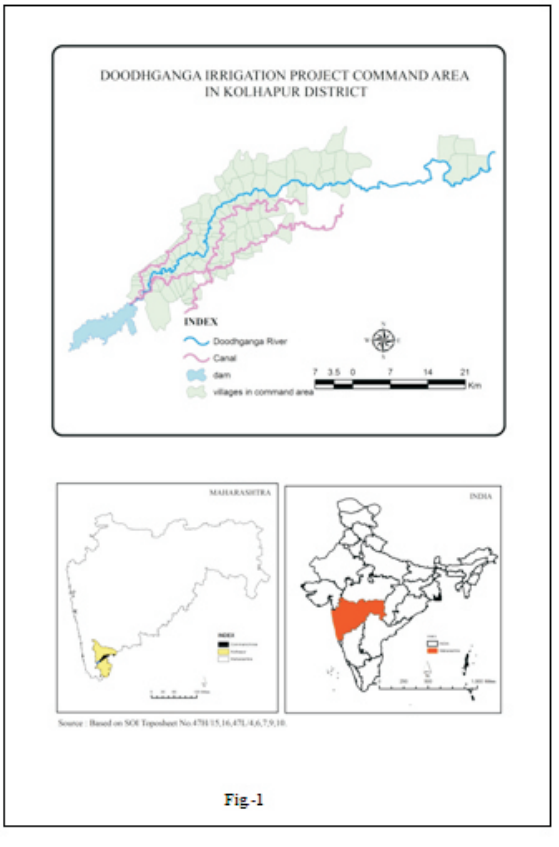

Fig.-1

3. OBJECTIVE :-

The main objective of the present work is as follows:-

i)To analyze the spatio-temporal change in cropping intensity of the Doodhganga Irrigation Project command area.

4. DATABASE AND METHODOLOGY :-

The present work is based on village level secondary source of data. The information regarding cropping intensity in its spatio-temporal perspectives, from 96 benefited villages of Doodhganga irrigation command area, in Six tahasils of Kolhapur district. To measure the change of in the cropping intensity pre and post irrigation project period. The data were first processed and subsequently were represented by suitable choropleth maps.

The intensity of cropping implies the degree of cropping or the number of crops grown in the same plot during one agricultural year. It is an indication of the total cropped area as distinguished from the net area.

Cropping intensity is defined as a ratio between net sown area and gross cropped area. It is calculated by the following formula:-

$$\text{Cropping Intensity} = \frac{Gross\ Cropped\ Area}{Net\ Sown\ Area} X\ 100$$

The intensity of cropping, therefore, is computed by the number of crops raised from the same field during one agricultural year. If one crop is grown on a field either on a kharif or rabi in a year, the index of cropping is 100 percent, if two crops a year are produced, the intensity index will be 200 percent and so on (Sigh, 1974).

5. INTENSITY OF CROPPING:

In this way the index of cropping intensity increases with the increase in the area sown more than ones which is possible with the help of irrigation. 'The cropping intensity has direct correlation with assured irrigation which enables farmers to go for multiple cropping (Alka Goutam, 2012). The village-wise development of cropping intensity in the pre and post-project period has been measured (Table 1).

Table 1: Development in Cropping Intensity during 1981-2011

Sr. No.	Categories	Deviation Index Group	Number of Villages			
			1980-1982	% to Total Villages	2010-2012	% to Total Villages
1	Very high	> 120	01	1.04	55	57.29
2	High	115 to 120	02	2.08	15	15.63
3	Moderate	110 to 115	02	2.08	16	16.67
4	Low	105 to 110	22	22.92	08	8.33
5	Very low	< 105	69	71.88	02	2.08
		Total	96	100	96	100
Regional Average			103.08		117.74	

Source: Compiled by Researcher

It is evident from the table 1 that the intensity of cropping is not uniform over the region for both periods. In the pre-project period the cropping intensity is very low whereas in the post-project period it shows the high intensity. It is found that the number of villages' increases with decreasing cropping intensity index in 1981 and reverse case is observed in 2011. On the basis of the cropping index the villages in the study region for both periods have been divided into different categories. (Table 1)

I) VERY HIGH INTENSITY OF CROPPING

The very high intensity of cropping (index above 120) is mainly found in the post-project period

obviously because of the development of irrigation. This category comprises 55 villages in post-project period when only one village is included in the same category in pre-project period. The villages in this zone are found mainly along the river course. (Fig. 2)

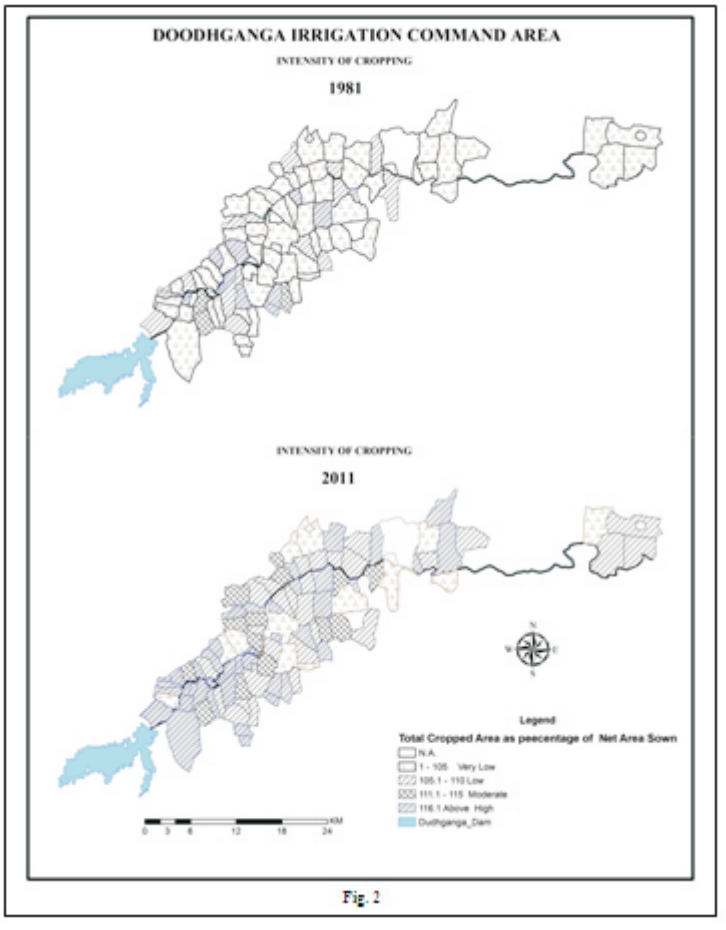

Fig. 2

II) HIGH INTENSITY OF CROPPING

The index values ranging from 115 to 120 indicate this category. Fifteen villages in the post-project period and only 02 villages in the pre-project period are included in this category. The villages in this category are located away from the river course may be due to the development of well and canal irrigation. (Fig. 2)

III) MODERATE INTENSITY OF CROPPING

This category (Index value 110 to 115) also comprises very less number of villages (02) is found in pre project period and 16 villages in post-project period. These villages are mostly found away from the river course and primarily benefited by well and canal irrigation.

IV) LOW AND VERY LOW INTENSITY OF CROPPING

This category having index value below 110 consists of 91 and 10 villages in the pre-project and post-project period respectively. It clearly points out that due to the low intensity of irrigation in 1981 there is low intensity of cropping in the pre-project period. The villages in this category in pre-project period are scattered all over the region while in the post-project period the villages are found in a middle part of the region, away from the river course having hilly background (Fig. 2).

6. CONCLUSION:

The most direct explanation of the variation in the areal distribution of cropping intensity index is of-course, found in the irrigation intensity, cultivator's density, the nature of soil, the rain fall characteristics and the size of operational holdings. All over the study area, the total cropped area exceeds the net area sown. The cropping intensity index in the study area varies from slightly above 100 to over 130 percent and show a great areal disparity due to variations in its factors. The low intensity of cropping in most of the villages, indicating that the total net area sown is not put to use fully during an agricultural year.

The intensity of cropping has increased from 103.08 percent in the pre-project to 117.74 percent in the post-project period. Similarly, the cropping intensity was low (below 105) in almost all over the region as it is significantly increased (above115) in the post-project period over the region.

The introduction of Doodhganga Irrigation Project it causes the irrigation development in the region. The intensity of cropping has increased significantly in the both site of the river Doodhganga, and also increased in the bank of the canal where substantial irrigation facilities have enhanced the agricultural mechanization and adoption of fertilizer technology.

The more than one crop produce in during an agricultural year is low in today. Because of the development of irrigation facility and the develop the sugarcane farming, it cause monoculture is found in the study region. Because of the less agricultural laborers, market price fluctuations, less size of operational land holdings, less development in agricultural technology and agricultural education, mentality of the people, traditional methods of irrigation, less in credit facility with correlate to sugarcane crop. All these obstacles in the development in increasing the intensity of cropping in the study region.

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