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A Spatial Pattern Of Crop Intensity And Irrigation Intensity Of Haveri District: A Geographical Analysis

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ABSTRACT

This study examines the regional distribution of crop intensity and irrigation intensity in Haveri district in 2018-19. The study area is located in the western part of Karnataka stateand falls within the Semi-Malnadu region, which makes this land excellent for crop cultivation. Statistical methods were used to investigate the correlation between cropping intensity and irrigation intensity. Cropping intensity in Haveri district is 115.82%, with irrigation intensity of 26.39%. Hangal taluka has the maximum intensity, whereas Byadagi, Haveri, and Hirekerur talukas have medium levels. The key conclusion is that Shiggaon and Savanur talukas have a high cropping intensity but low irrigation intensity.

Keywords: Croping intensity, irrigation intensity, Agriculture, Haveri district.

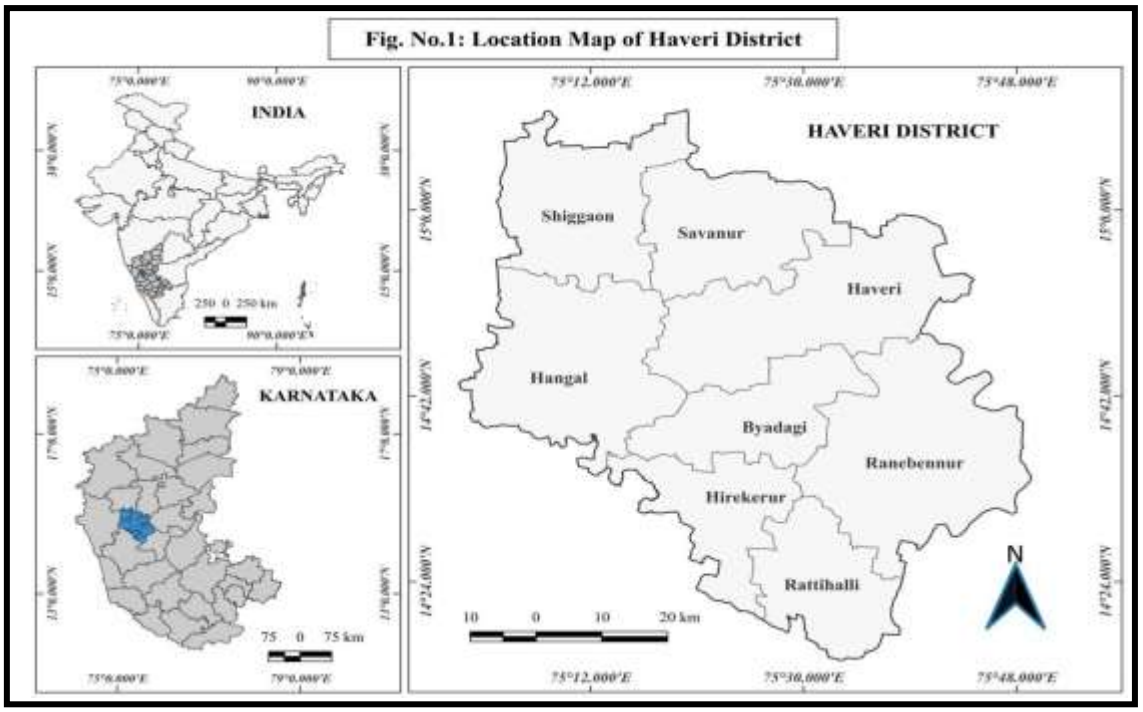
INTRODUCTION

Cropping intensity and irrigation intensity are two key indicators for determining agricultural growth in a region. Greater cropping intensity indicates intense use of land for harvesting. Cropping intensity largely impacts crop productivity and cropping patterns. The availability and proper use of irrigation water have a significant impact on cropping intensity.“The concept of intensity has been used extensively in the literature to explain the spatial organization of agriculture” (Dayal 1978, p. 289). “Cropping intensity is considered a significant measure of food security, and net production in a region is largely dependent on it” (Jain et al. 2013). The intensity of irrigation is determined as the percentage of net irrigated area to net sown area. Irrigation facilities provide farmers to use the land more effectively over the year, resulting in increased cropping intensity, which is not achievable onun-irrigated land. According to Biradar and Xiao (2011, p. 368), “irrigation and multiple- cropping agriculture in India has been a key component of economic development and poverty alleviation”.

STUDY AREA

Haveri and Gadag districts were previously part of the entire Dharwad district. Haveri district was formed on August 24, 1997, when it was separated from Old-Dharwad district in response to popular demand. The Haveri district is situated in Karnataka's western geographicregion. The district encompasses 485156 hectares between the latitudes of 14° 17' North and 15° 04' North and the longitudes of 75° 01' East and 75° 50' East. The district is bordered on the north by the districts of Dharwad and Gadag, on the south by the districts of Davanagere and Shimoga, and on the west by the district of Uttar Kannada. All of the adjacent districtsare part of Karnataka state.

The Varada River flows from west to east direction and the Tungabhadra River flows through Haveri, Gadag and Davanagere districts. The district consists of 8 talukas: Bydagi, Hangal, Haveri, Hirekerur, Ranebennur, Savanur, Shiggaon and Rattihalli. The research area is made up of highly metamorphosed crystalline rocks and is located on part of the Deccan Plateau, which is one of the most stable landmasses on Earth. The study region has been divided into two major divisions based on relief and structure: the semi-malnad and the maidan region. These classifications are supported by the district climatic and terrain conditions that are typical of each of these regions. The study area, which is a portion of the Deccan Plateau, is distinguished by an undulating plain with steep topography on the westernmost portion that joins the district of Uttar Kannada. The mean elevation of the study region varies between 520 to 680 meters above mean sea level and the general slope of the area extends from south west to north eastward.



DATABASE AND METHODOLOGY

The present investigation is concentrated on mainly secondary sources of information and accordingly to be collected. The historical background of Haveri district has been collected from Dharwad district Gazetteer. The extensive major resources and data for present researchhave been obtained from district Statistical Office, Haveri.

i. Cropping intensity has been calculated following the formula;

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

ii. Irrigation intensity has been calculated following the formula;

$$Irrigation\ Intensity = \frac{Net\ Irrigated\ Area}{Net\ Sown\ Area} \times 100$$

OBJECTIVES

1. To analyze the Cropping Intensity of Haveri District.
2. To study the taluka wise cropping Intensity of the study region.
3. To determine the Irrigation Intensity of Haveri District.
4. To find out the taluka wise Irrigation Intensity of the study region.

RESULTS AND DISCUSSION

i. **Cropping Intensity:** Crop intensity indicates crop quality or the amount of crops sown in the same area over a specific time period. The high cropping intensity areas have a high percentage of crop production and a large area under cultivation. In simple terms, it represents the gross cropped area divided by the net cropped area. If a single crop is sown ina given year, the cropping intensity will be equal to one 100 percent. If the same location is cultivated multiple times, the cropping intensity will automatically increase by over 100 percent.

The Cropping Intensity is statistically calculated by following formula.

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

In this situation, crop intensity increases in proportion to the increased area sown more than once. As a result, a high index number indicates that land usage is efficient, whereas a low index value indicates the opposite.

Table No. 1: Taluka wise Crop Intensity of Haveri District (2018-19).

Sl. No	Name of the Taluka	Gross Cropped Area	Net Sown Area	Cropping Intensity in %
1	Bydagai	37287	33394	111.66
2	Hangal	64282	52041	123.52
3	Haveri	71478	63854	111.94
4	Hirekerur	69605	60206	115.61

5	Ranebennur	65828	60158	109.43
6	Savanur	53859	45718	117.81
7	Shiggaon	51430	41866	122.84
	Total	**413769**	**357237**	**115.82**

Source: District at a Glance (2018-19) and Personal Computation

The present study of cropping intensity is expose the spatial and temporal distribution pattern of the study region. The cropping intensity of entire region was observed 115.82 percent. Table no. 1 shows that talukas wise cropping intensity of Haveri district in the periodof 2018-19. The table indicates that cropping intensity is high in Hangal (123.52%) & Shiggaon (122.84%) respectively. The medium cropping intensity in Savanur (117.81%), Hirekerur (115.61%), Haveri (111.94%) and Bydagi (111.66%) respectively. Besides Ranebennur (109.43%) have a low cropping intensity. The cropping intensity shows great spatial variation in Haveri district with high level in west region and low level identify in eastregion.

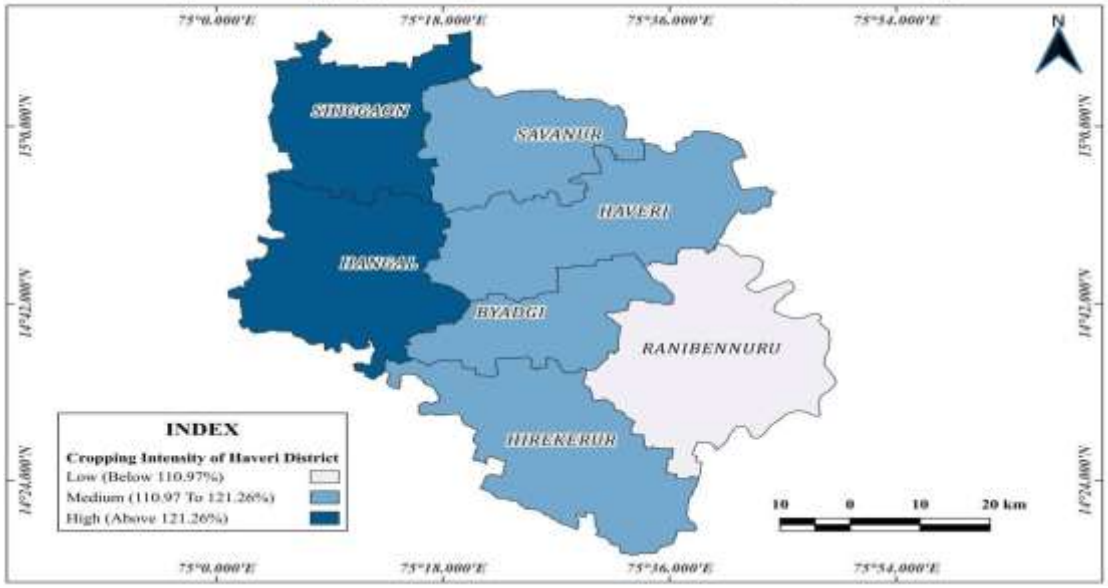
The cropping intensity index has been categorized with the help of standard deviationmethod, which is show in table no.2 (Fig No.2).

Table No.2: Crop Intensity Index of Haveri District

Sl. No	Index	Range	Name of the Talukas
1	High	**Above 121.26**	Hangal & Shiggaon
2	Medium	**110.97 To 121.26**	Bydagi, Haveri, Hirekerur & Savanur
3	Low	**Below 110.97**	Ranebennur

Source: Personal Computation

Fig. No.2: Cropping Intensity of Haveri District (2018-19) (In Percentage)



i. **Irrigation Intensity:** Irrigation is one of the most important requirements for agricultural development. Irrigation is an ancient method for supporting agricultural production. It is because, in today's advanced agricultural pattern, the increasing application of modern agricultural inputs, as well as the more effective use of various chemicals for soil conservation, necessitates the use of additional irrigation water. Irrigation refers to the artificial application of water to compensate for rainfall shortages in agricultural production. Irrigation has long been used as a protective technique to supplement rainfall to avoid crop failure in various regions of the world. Irrigation is key to solving agriculture's essential problems. Irregular, uncertain, and unevenly distributed rainfall in time and place is insufficient for cultivating some crops. These factors make irrigation necessary and crucialfor good crop production. The intensity of irrigation is the percentage ratio of net areas irrigated to net areas sown.

The Irrigation Intensity is statistically calculated by following formula.

ii. **Irrigation Intensity:** Irrigation is one of the most important requirements for agricultural development. Irrigation is an ancient method for supporting agricultural production. It is because, in today's advanced agricultural pattern, the increasing application of modern agricultural inputs, as well as the more effective use of various chemicals for soil conservation, necessitates the use of additional irrigation water. Irrigation refers to the artificial application of water to compensate for rainfall shortages in agricultural production. Irrigation has long been used as a protective technique to supplement rainfall to avoid crop failure in various regions of the world. Irrigation is key to solving agriculture's essential problems. Irregular, uncertain, and unevenly distributed rainfall in time and place is insufficient for cultivating some crops. These factors make irrigation necessary and crucialfor good crop production. The intensity of irrigation is the percentage ratio of net areas irrigated to net areas sown.

The Irrigation Intensity is statistically calculated by following formula.

$$Irrigation\ Intensity = \frac{Net\ Irrigated\ Area}{Net\ Sown\ Area} \times 100$$

Table No. 3: Taluka wise Irrigation Intensity of Haveri District (1018-19).

Sl. No	Name of the Taluka	Net Irrigated Area	Net Sown Area	Irrigation Intensity in %
1	Bydagai	7110	33394	21.29
2	Hangal	27893	52041	53.60
3	Haveri	18916	63854	29.62
4	Hirekerur	12264	60206	20.37
5	Ranebennur	19867	60158	33.02
6	Savanur	4182	45718	9.15
7	Shiggaon	4040	41866	9.65
	Total	**94272**	**357237**	**26.39**

Source: District at a Glance (2018-19) and Personal Computation

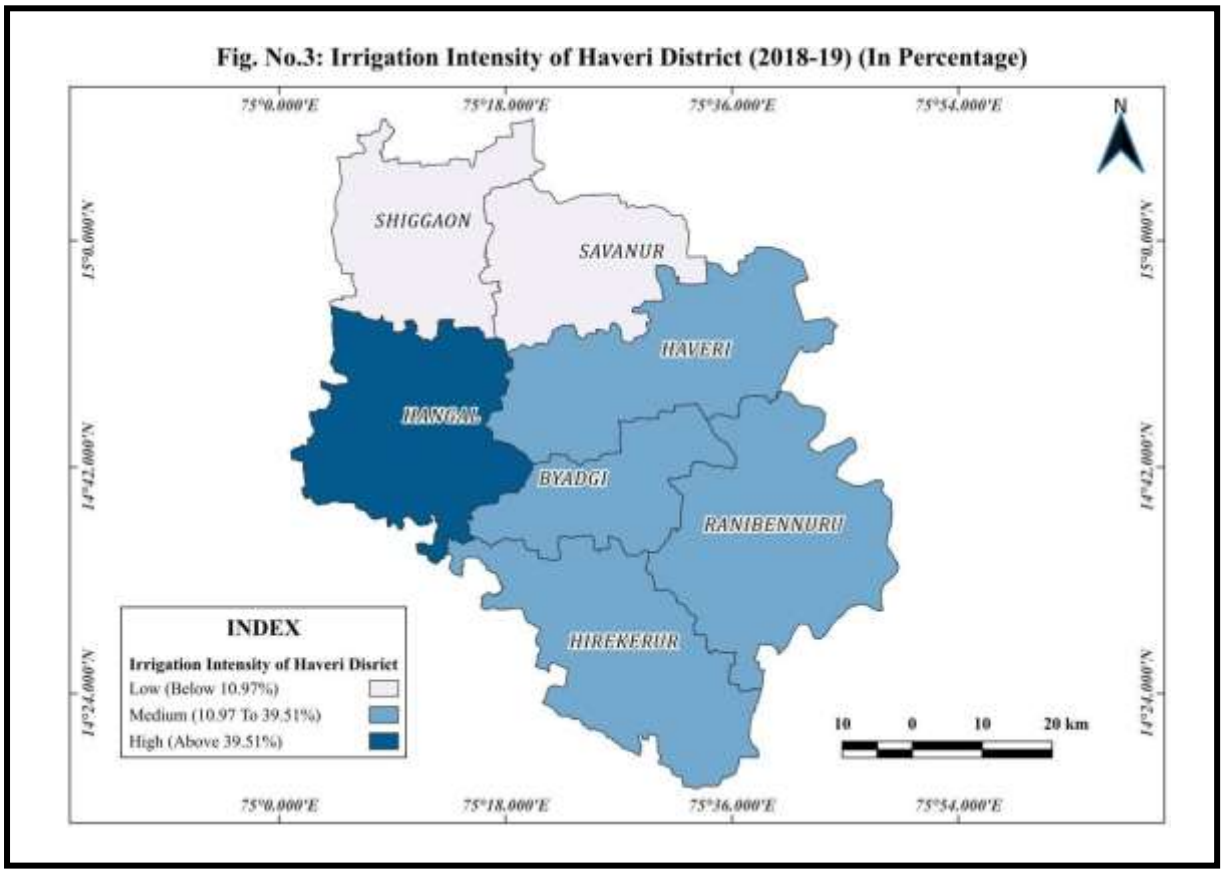
Table no.3 shows that the irrigation intensity of Haveri district in the period of 2018-19. Irrigation has played an important role in raising the cropping intensity. Irrigation helps raise the cropping intensity by enabling rising, of crops during the dry season also. During this period Haveri district irrigation intensity is 26.39 percent.The high irrigation intensity identify in Hangal (53.60%). Medium irrigation intensity in Ranebennur (33.02%), Haveri (29.62%), Bydagi (21.29%) and Hirekerur (20.37%).The lowest irrigation intensity recorded in Shiggaon (9.65%) and Savanur (9.15%) talukas (Table no.4). the highest irrigation intensity in west and lowest in north area ofthe study region.

The irrigation intensity index has been categorized with the help of standard deviation method, which is show in table no.4 (Fig No. 3).

Table No.4: Crop Intensity Index of Haveri District

Sl. No	Index	Range	Talukas
1	High	**Above 39.51**	Hangal
2	Medium	**10.97 To 39.51**	Ranebennur, Haveri, Byadagi & Hirekerur
3	Low	**Below 10.97**	Shiggaon & Savanur

Source: Personal Computation



CONCLUSION

An analysis of cropping intensity and irrigation intensity found that irrigation had a significant impact on the distribution of cropping intensity and irrigation intensity. In a regionof irrigation facilities, they enhanced their agricultural production and cropping intensity. Higher cropping intensity indicates that a greater proportion of the net area is cropped more than once during a single agricultural year. This also indicates increased productivity per unit of arable land within a single agricultural year. The taluka wise analysis of cropping intensity and irrigation intensity of Haveri district for the year of 2018-19. The results revels that the Hangal, has the highest cropping and irrigation intensity because of this is located in Semi- Malnadu region. Byadagi, Haveri, and Hirekerur taluka are medium cropping and irrigation intensity areas. The following two important observations were found from this study. First, during the study period the Shiggaon and Savanur taluka are high cropping intensity with low irrigation intensity, it show the positive agriculture growth. Secondly, Ranebennur taluka has low cropping intensity with big irrigation intensity, it represents to urban development of the area.

REFERENCES

1. Dayal, E 1978, „A measurement of cropping intensity", Professional Geographer, vol.30, no. 3, pp.289–296.
2. Jain, M, Mondal, P, DeFries, RS, Small, C & Galford, GL 2013, „Mapping cropping intensity of smallholder farms: A comparison of methods using multiple sensors", Remote Sensing of

Environment, vol. 134, pp. 210–223.

3. Biradar, CM & Xiao, X 2011, „Quantifying the area and spatial distribution of double - and triple-cropping croplands in India with multi temporal MODIS imagery in 2005“, International Journal of Remote Sensing, vol. 32, no.2, pp.367–386.
4. Haveri District At A Glance 2006-07 and 2016-17, Published by Government of Karnataka, Bangalore.