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CORRELATES OF CROPPING PATTERN IN RAJASTHAN

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ABSTRACT

The agricultural sector is a key driver in the worldwide economic and social development. It plays a substantial role in achieving, among others, food security, economic diversification, poverty eradication, and human welfare. there is considerable spatial variation in cropping patterns in Rajasthan. Therefore, an attempt has been made to analyze quantitatively the correlates of inter-district variation in cropping patterns. To establish the functional relationship between the area under main crops and the variables given below, the statistical technique correlation has been employed. the Pearson's correlation coefficient between the dependent and independent variables for two periods of time e.g. 1991-94 and 2016-19. Correlation analysis showing the relationship between district-wise acreage of selected main crops and independent variables reveals that irrigated crops such as wheat and mustard have a positive association with the variables of modern agricultural technology.

Key Words: Cropping Pattern, Correlates, Rajasthan

Introduction

The agricultural sector is a key driver in the worldwide economic and social development. It plays a substantial role in achieving, among others, food security, economic diversification, poverty eradication, and human welfare. Agriculture is viewed as the engine of economic development and is the only activity capable of generating a surplus large enough to stimulate growth in other sectors of the economy (Singh, 2018). Agriculture and allied sectors play an important role in the economy of Rajasthan. Though its contribution to Net State Domestic Product (NSDP) has fallen from about 35 percent in 1990-91 to around 23 percent in 2011-12, yet it forms the backbone of the state economy. Around two-thirds of the state population (56.5 million) is still dependent on agricultural activities for their livelihood. Rain-fed agriculture is dominant in the state. Due to scarcity of groundwater resources and the vagaries of monsoon agriculture of state is more vulnerable to climatic variability (ingh, 2016). Water resources are

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limited to only 1 percent of total national availability. Nearly 61 percent of the area of the state falls under arid, semi-arid and desert regions. The rainfall is scanty and erratic causing scarcity of water resources, which is a formidable obstacle to agricultural development in the state. Due to scarcity of water, only 39.51 percent of the net sown area is irrigated.

As mentioned above, in view of the rather limited water resources and the surface water resources mostly confined to some parts of the State, agriculture is primarily rainfed. Due to State's geographical location, it receives monsoon at the end and, hence, the period of monsoon is short i.e., around three months only. The State experiences late onset and early withdrawal of monsoon. Ninety percent of the rainfall is received during the monsoon season. Sustaining and increasing agricultural production in the face of poor monsoon and limited water resources is a major challenge.

Correlates of Cropping Pattern

Changing cropping and diversification patterns in a region reveal the dynamics of the relative area strength of the crops and their controlling factors (Singh and Jaglan, 2018).In fact, food consumption also has become more diversified both in rural and urban households (Singh and Jaglan, 2021). Cropping pattern is a function of the combined interplay of a variety of factors including physical, social, economic and social-technological, each acquiring its specificities. But, among the physical factor rainfall is most dominating in the tropical and subtropical areas. It is responsible for variations in cropping patterns and agricultural productivity in space and time. The physical factors still exercise a significant influence on traditional agriculture. But the modern agriculture is more influenced by the innovation and diffusion of technology. The modern technology especially chemical fertilizers, newly improved seeds, insecticides and pesticides along with mechanization are major inputs for modern agriculture. Irrigation provides the base for the introduction of new technology in moisture-deficient tropical and subtropical areas and largely influences the cropping pattern and cropping intensity(Singh, 2019).

STUDY AREA

The state of Rajasthan is located in the north-west of part of the country. Its geographical location is between 23° 3' to 30° 12' North latitude and 69° 30' to 78° 17' East longitude with the tropic of cancer passing through the southernmost tip of the state. The state came into existence on November 1, 1956 by the reorganization 19 princely states, varied in size, administrative efficiency and socio-economic development. The state now has divided into 33 districts for administrative purposes. It is known as India's desert state since 61 percent of its area, covering 11 districts inhabited by 40 percent of the population, is either desert or semi-desert (the Thar) has made the state vulnerable to droughts and famines.

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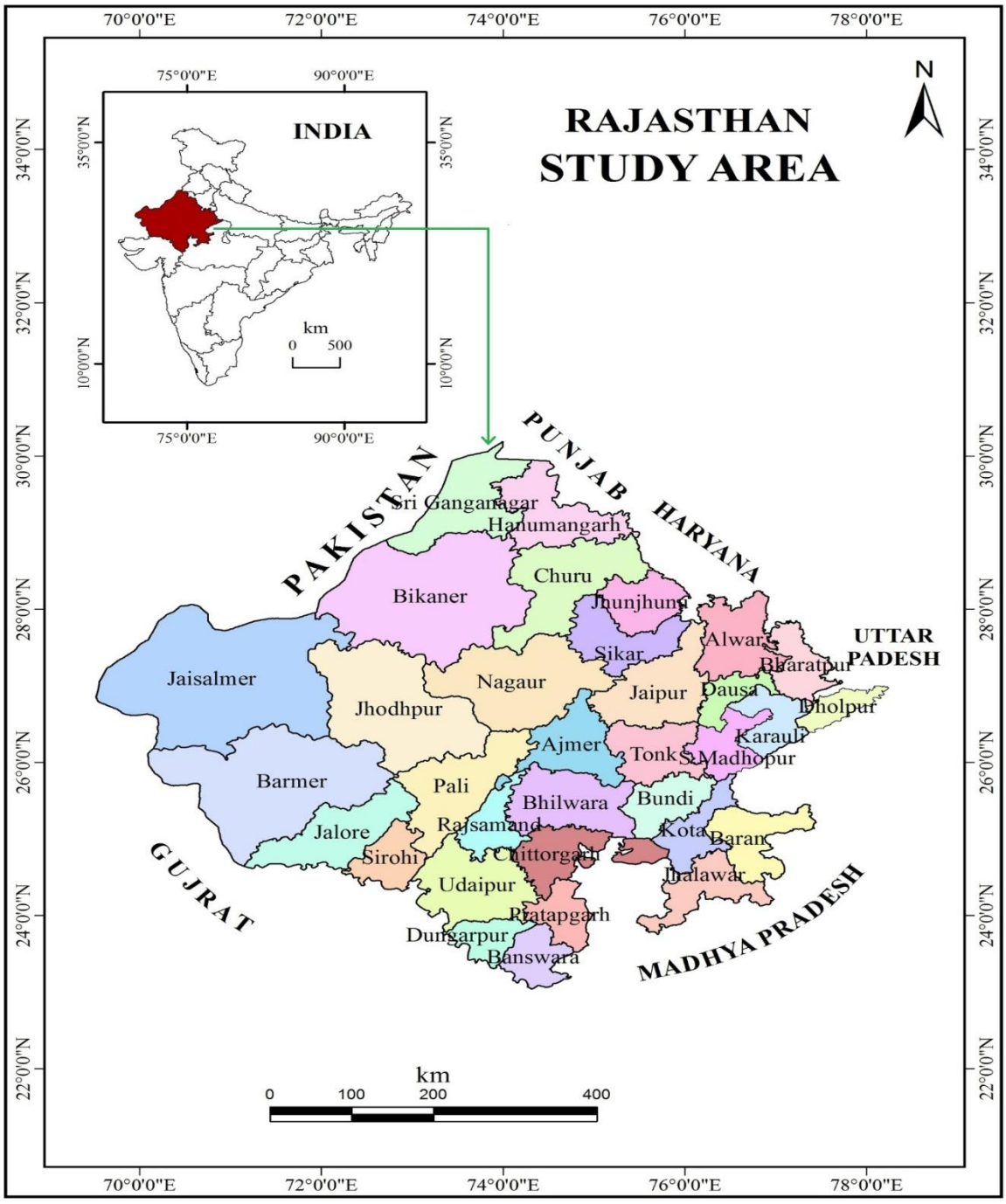

Rajasthan is the largest state of Indiacovering an area of 342,239 square kilometres. It constitutes 10.4 percent of the total geographical area of the country. It is bounded on the west and north-west by Pakistan, on the north and north-east by Punjab, Haryana and Uttar Pradesh, on the east and south-east by Uttar Pradesh and Madhya Pradesh and the south-west by Gujarat. It is the

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largest State in terms of area (342.24 thousand sq. km) but only 8th in terms of population. Its total population in 2011 is 6.86 crore (Census, 2011 Provisional data) in 2011. At present, there are 7 Divisions and 33 revenue districts in the State.

Objective

The present study pertains to spatial and temporal dimensions cropping patterns in Rajasthan. It is aimed at exploring the following objective**:**

- To examine the correlates of changing cropping pattern in in Rajasthan during post-liberalization periods.

Database

The present study pertains to two periods of time, i.e., 1991-94 and 2016-19. These two periods are about two decades apart and represent the period of initiation of liberalization and the latest period. The triennium average has been computed to even out rainfall fluctuation. The district-wise secondary sources of agricultural data have been collected from Agricultural Statistics of Rajasthan, Planning Department, Directorate of Economics and Statistics, Rajasthan.

Methodology

There is considerable spatial variation in cropping patterns in Rajasthan. Therefore, an attempt has been made to analyze quantitatively the correlates of inter-district variation in cropping patterns. To establish the functional relationship between the area under main crops and the variables given below, the statistical technique correlation has been employed. Table 1 shows the Pearson's correlation coefficient between the dependent and independent variables for two periods of time e.g. 1991-94 and 2016-19. The list of dependent and interdependent variables is mentioned as under:

Dependent Variable

Y = acreage of selected crops (bajra, guar, wheat, rapeseed and mustard and gram)

Independent Variables

X1 = Rainfall (mm)

X2 = Net Irrigated Area (percent)

X3 = Consumption of Chemical Fertilizers (kg/ha)

X4 = Consumption of Chemical Pesticides (kg/ha)

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X5 = High Yielding Verities of Seeds (percent)

X6 = Tractorisation (000'ha)

Table 1 Correlation Matrix

	Bajra		Guar		Wheat		Rape & Mustard		Gram	
Y	**1991-94**	**2016-19**	**1991-94**	**2016-19**	**1991-94**	**2016-19**	**1991-94**	**2016-19**	**1991-94**	**2016-19**
X1	-.544**	-.342	-.570**	-.720**	.562**	.583**	.073	.139	.241	-.270
X2	.249	-.179	-.088	-.541**	-.063	.790**	-.022	.653**	.055	-.398*
X3	-.397*	-.467**	-.313	-.584**	.279	.892**	.083	.405*	-.028	-.478**
X4	-.297	-.246	-.223	-.151	.401*	.216	.181	.019	-.041	-.218
X5	-.097	-.157	-.223	-.595**	.162	.752**	.074	.146	.222	-.356*
X6	-.081	.059	-.333	-.383*	.482**	.559**	.801**	.693**	.187	-.376*

*. Correlation is significant at the 0.05 level.

**. Correlation is significant at the 0.01 level.

Correlation Analyses

Bajra:

Interestingly bajra acreage did not have a significant correlation with irrigated area and variables of modern technology, i.e. HYV seeds (X^5), chemical pesticides (X^4) and tractorisation (X^6) in 1991-94. It showed that this remained largely as a rainfed crop in the state till early 1990s. On the other hand negative significant correlation of bajra acreage with rainfall (X^1) and consumption of chemical fertilizers (X^3) also shows that this crop is largely cultivated in low rainfall zone of western Rajasthan where use of fertilizers is also minimal. A similar pattern of correlation is also found in 2016-19 period as well.

Guar:

Table 1 shows that in 1991-94 guar acreage did not have significant correlation with the dependent variables except annual rainfall. Guar acreage is moderately but negatively associated with annual rainfall (-0.570). This shows that in the early 1990s guar cultivation in the state was confined to low rainfall areas. The cultivation of this crop was in the traditional mode as its

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acreage exhibited no relation with technological factors. The associations of guar acreage with independent variables become more negative in 2016-19. Guar acreage showed a significant inverse relationship with most parameters of modern agricultural technology. It also had a very high negative correlation with rainfall. It reveals that guar continues to be a rainfed crop and is concentrated in arid semi-arid regions of the state. Modern agricultural technology has almost no impact on guar cultivation.

Wheat:

The correlation between the proportion of area under wheat and independent variables during 1991-94 is shown by Table1. It shows that wheat acreage was positively correlated with annual rainfall, mechanization index and consumption of chemical pesticides. Annual rainfall and mechanization index have a high positive correlation with wheat acreage. Correlation coefficients with these two variables are 0.562 and 0.482 respectively which are significant at 1 percent level of significance. Consumption of chemical pesticides is also positive relationship with area under wheat, (0.40) is significant at 5 percent significance. Other correlates do not have a significant correlation with wheat acreage.

During the period 2016-19, as shown in Table1, wheat acreage is positively correlated with consumption of chemical fertilizers, net irrigated area, HYV of seeds, annual rainfall and mechanization index. During this period consumption of chemical fertilizers has the highest correlation (0.892) with a proportion of the area under wheat followed by net irrigated area (0.790), HYV of seeds (0.752), annual rainfall (0.583) and mechanization index (0.559) The correlation coefficients all these variables are significant at 1 percent level. However, the application of chemical pesticides does not show a significant correlation with wheat acreage.

Irrigation level, rainfall and variables of modern technology have high positive correlation with the proportion of area under wheat. Availability of irrigation and technological inputs based on irrigation such as chemical pesticides, high-yielding verities of seeds, consumption of chemical fertilizers and tractorisation are responsible for increase in wheat acreage in the state.

Rapeseed and Mustard:

It is evident from table 1 that in 1991-94 rapeseed and mustard acreage was positively associated with tractorisation (mechanization index). It has very high correlation (0.892) with proportion of the rapeseed and mustard acreage which is significant at 1 percent level of significance. There is no other variable having significant correlation with acreage of rapeseed and mustard.

In 2016-19, rapeseed and mustard acreage had a high positive association with the tractorisation index and proportion of area irrigated. Correlation coefficients with these two variables are 0.693

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and 0.653 respectively which are significant at 1 percent level of significance. Consumption of chemical fertilizers also has a moderate but significant correlation (at 5 percent level of significance) with rapeseed and mustard acreage. The correlation of rapeseed and mustard with variables of irrigation and modern agricultural technology significantly increased over the period 1991-94 to 2016-19. This revealed that irrigation and modern agricultural technology exercise a significant influence on the cultivation of rapeseed and mustard.

Gram:

During 1991-94 there was not a single variable that had a significant correlation with acreage of gram. But in 2016-19, gram acreage had negative correlation with variables of irrigation, consumption of chemical fertilizers, HYV seeds and tractorization. Correlation coefficients of these variables are ranging from -0.346 to -0.398 which are significant even at 5 percent level of significance.

Gram is also a rainfed winter crop which is grown in mainly on unirrigated land. It is largely cultivated in low-rainfall areas. That is why it is not part of the cropping pattern of the areas having higher levels of irrigation and modern agricultural technology in the state.

Conclusion

Correlation analysis showing the relationship between district-wise acreage of selected main crops and independent variables reveals that irrigated crops such as wheat and mustard have positive association with the variables of modern agricultural technology. It shows that in 1991-94 wheat acreage was positively correlated with annual rainfall, mechanization index and consumption of chemical pesticides. Annual rainfall and mechanization index rather had high positive correlation with wheat acreage. In 2016-19 correlation between these variables was found to be further higher. This implies that the expansion of irrigation and technological inputs based on irrigation such as chemical pesticides, high-yielding verities of seeds, consumption of chemical fertilizers and tractorisation are responsible for the increase in wheat acreage in the state. The acreage of rapeseed and mustard had high positive association with the tractorisation index and proportion of area irrigated in 2016-19. The correlation of rapeseed and mustard with variables of irrigation and modern agricultural technology significantly increased over the period 1991-94 to 2016-19. This revealed that irrigation and modern agricultural technology exercise a significant influence on the cultivation of rapeseed and mustard.

References

Bhalla, G. S. And Singh, Gurmail (2009): “Economic Liberalizationand Indian Agriculture: A State Wise Analysis”,Economic &Political Weekly, Vol. 44, No. 52, Pp. 34-44.

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Bhat, M. H. And Salam, M. A. (2016): "An Assessment of Nature andExtent Of Crop Diversification Across Agro-Climatic Zones Of Jammu And Kashmir: Spatial And Temporal Analysis",IOSR Journal Of Agriculture And Veterinary Science, Volume 9, Issue 11, Ver. I, PP. 33-40.

Dhian Kaur (1991), Changing Patterns of Agricultural Land Use, Rawat Publications, Jaipur, Pp. 50.

Morepatil, K.S. (1995). Studies In Agricultural Land Use, Himalaya Publishing House, Bombay, Pp II.

Mandal R.B. (1982), Land Utilization: Theory and Practice, Concept Publication, New Delhi, Pp 1-21.

Sen, A.K. (1972). Agro-Climatic Regions of Rajasthan, Annals of Arid Zone, Vol. 11, Nos. 1 & 2.

Sen, A.K. &Abraham, C.T. (1966). Crop Belts and Cropping Patterns of Rajasthan, Annals of Arid Zone. Vol. 5 No.1 Pp. 105-116, Jodhpur.

Singh, S. 2018.Changes in The Cropping Pattern in India During Post Liberalization Period, Review of Research, 7 (4): 1 – 12.

Singh, S. 2016.Trend and Pattern of Oilseeds in Rajasthan: An Agro-Climatic Zones Study. Review of Research, 6 (2): 1 - 11.

Singh, S. And Jaglan, M. S. 2018. Dynamics of Cropping Pattern and Diversification in Rajasthan During Post-Liberalization Period. Annals of the Rajasthan Geographical Association, 35:1-14.

Singh, S. And Jaglan, M. S. 2019. Spatial Expansion and Growth of Horticulture in Haryana During the Post-Liberalization Period, Hill Geographer, 35 (2): 1-14.

Singh, S. 2019. Changing Land Use Pattern in Rajasthan.International Journal of Social Science and Economic Research, 04(03): 2028-2041

Singh, S. 2019Changes in Cropping Intensity in Rajasthan During Post Liberalization Study. International Journal of Social Science and Economic Research 04 (01) 632-641

Singh, S. And Jaglan, M. S. 2021. Cultivation Of Vegetable Crops in Haryana: Growth, Spatial Distribution and Concentration Pattern, Punjab Geographer, 17: 57-71.

ISSN: 2455-8834

Volume:08, Issue:11 "November 2023"

Vankatraman, L.S., and Prahaladachar, M., (1978), Study of Cropping Pattern Changes in Andhra Pradesh During 1950-1975. Indian Economic Review, Vol. 13, No. 2, pp.117-142.

