

CHANGES IN CROPPING INTENSITY IN RAJASTHAN DURING POST LIBERALIZATION STUDY

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ABSTRACT

The intensity of cropping is also an indicator of land use efficiency. In other words, it indicates that how intensively the cultivable land is utilized. It is the ratio of total cropped area to net sown area expressed in term of percentage. It is one of the very important indicators of level of agricultural development. Present study is going to express the dynamics of the spatio-temporal changes in the cropping intensity in Rajasthan during post-liberalization periods. The analysis of cropping pattern has been done with reference to 1990-93 and 2009-12.

The intensity of cropping is also influenced by cropping pattern, agricultural productivity, land use efficiency and methods of cultivation. In 1991-92 intensity of cropping in Rajasthan was 116.8 percent. It increased to 137.4 percent in 2010-13. In 1991-94, a large part of the state including Tonk, Pali, Nagaur districts and western and northern part of the state except Sri Ganganagar had very low intensity of cropping whereas medium intensity of cropping was observed in Alwar, Dausa and southern parts of Rajasthan. During 2010-13, a very high change has been seen in eastern and southeastern parts of the state which is rapidly increase their intensity of cropping.

Keywords: Cropping intensity, Inter-district, Post liberalization

INTRODUCTION

Rajasthan has diverse climatic condition and it contains ten Agro-climatic Zones. In determining agricultural region of Rajasthan factors like rainfall, temperature, altitude, latitude, and soils play a very important role. Rajasthan state comprises of 61 percent desert area since climate and irrigation varies in the state, so there is fluctuation in crop intensity over districts (Nag et al. 2009). There are number of crops which are grown in the state. The intensity of cropping is also an indicator of land use efficiency. In other words, it indicates that how intensively the cultivable land is utilized. It is the ratio of total cropped area to net sown area expressed in term of percentage. It is one of the very important indicators of level of agricultural development. The cropping intensity has direct correlation with assured irrigation which enables to farmers to go

multiple cropping and use higher dose of fertilizers and High Yielding Varieties seeds. Hence, besides irrigation facilities, early maturing high yielding variety seeds, selective mechanization such as the use of tractors, pumping sets and seed drills, etc., plant protection measure through use of insecticides, pesticides do have role in effecting the intensity of cropping. The intensity of cropping is very high in the districts of Chambal valley due to irrigation facilities and high rainfall and in Dungarpur, Udaipur and Bhilwara districts due to high rainfall whereas it is very low in the districts of Bikaner, Jaisalmer, Barmer and Jodhpur which form part of the Indian desert (Sen and Abraham, 1966). The intensity of cropping refers to the number of times crops raised on a field during an agricultural year. Higher the index of the intensity of cropping, higher would be land use efficiency and lower the index, the lower would be the land use efficiency.

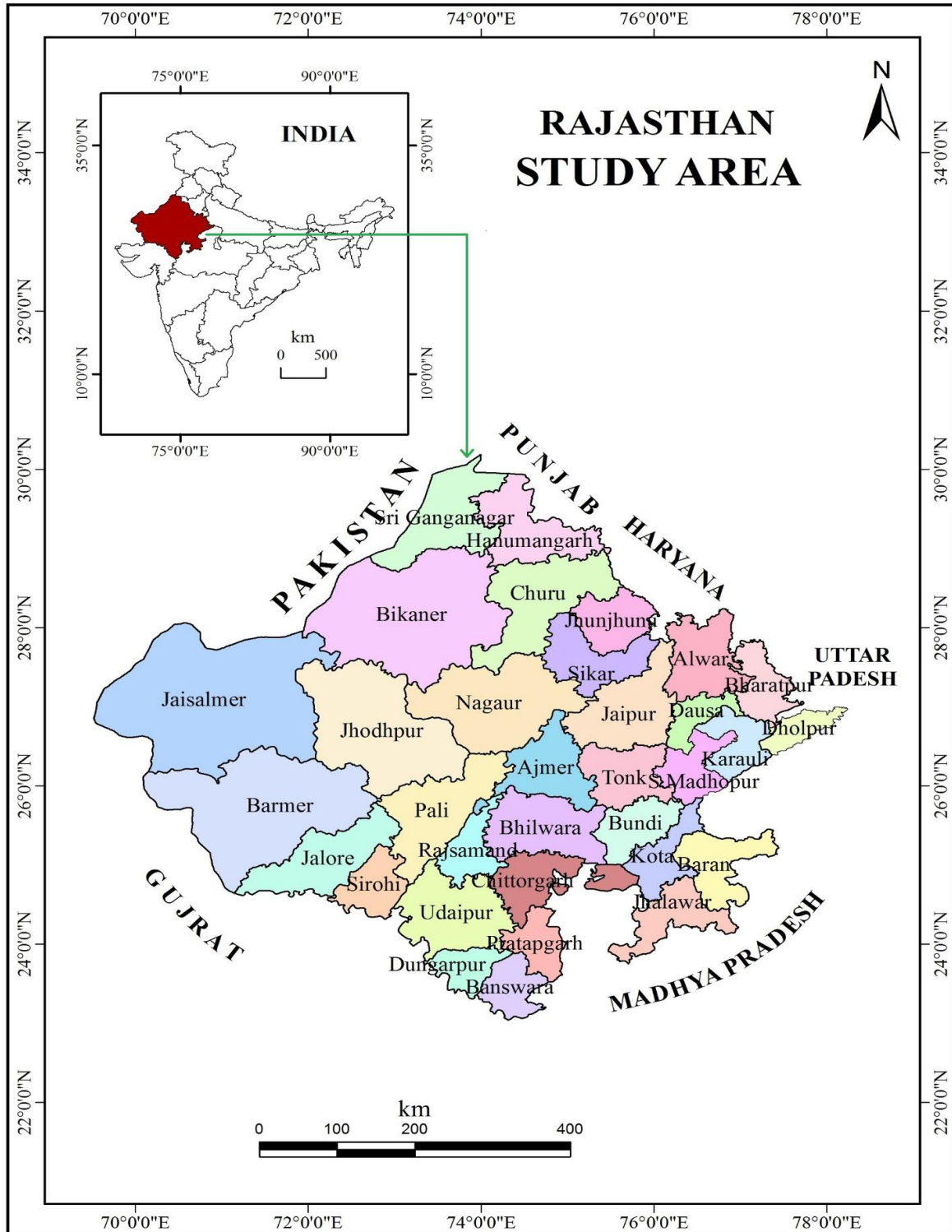
STUDY AREA

The state of Rajasthan is located in the north-west 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 of 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.

Rajasthan is the largest state of India covering 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 on the south-west by Gujarat. It is the 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.

The state has well identified 10 agro-climatic zones. The state is endowed with diverse soil and weather conditions comprising of several agro-climatic situations, warm humid in south-eastern parts to dry cool in western parts of the state. Though a large percentage of the total area is desert with little forest cover, Rajasthan has a rich and varied flora and fauna. The state enjoys a strategic geographical position wherein it is situated between Northern and Western growth hubs in the country and 40 per cent of Delhi Mumbai Industrial Corridor (DMIC) runs through it.

Figure 1



OBJECTIVE

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

- To study the dynamics of the spatio-temporal changes in the cropping intensity Rajasthan during post-liberalization periods.
- To analyze inter district variations in the level of cropping intensity.

DATA BASE

Present study pertain to two period of time, i.e. 1991-94 and 2010-13. There two periods are about two decades apart and represent the period of initiation of liberalization and latest period. Triennium average has been computed to even out rainfall fluctuation. To study change intensity of cropping in the state of Rajasthan to these two time periods has been chosen and data collected on the basis of district level. The district wise secondary sources of agricultural data of net sown area, total cropped area have been collected from Agricultural statistics of Rajasthan, Planning Department, Directorate of economics and statistics, Rajasthan.

METHODOLOGY

The Intensity of cropping refers to the ratio of total cropped area to net sown area. The intensity of cropping has been shown by choropleth maps and tables. It has been computed with the help of given formula.

$$\text{Cropping intensity} = \frac{\text{Total cropped area}}{\text{Net sown area}} * 100$$

If the index of the cropping intensity is 100 one crop has been grown in a year and it is 200 two crops are raised.

RESULT AND DISCUSSION

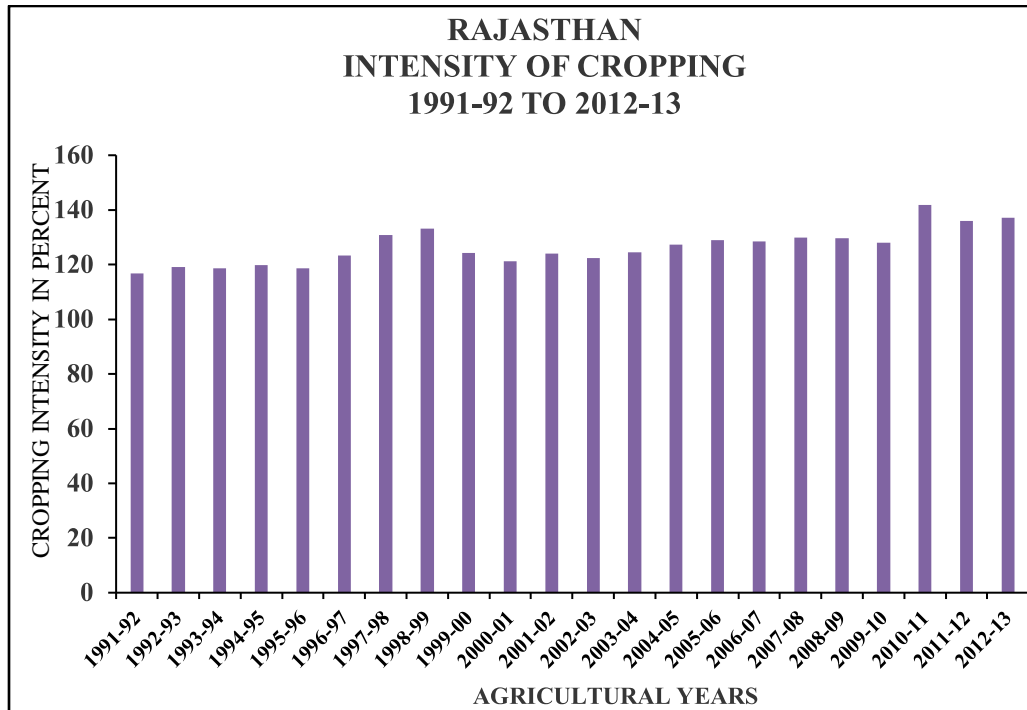
The temporal behavior of cropping intensity changes at state level can be seen from the figure 2 and table 1. It is evident that cropping intensity has increased during last two decades in Rajasthan. The intensity of cropping fluctuates highly from year to year because of factors such as monsoon behavior, rainfall, development of irrigational facilities, fertility of land, application of fertilizers and insecticides and pesticides. The intensity of cropping is also influenced by cropping pattern, agricultural productivity, land use efficiency and methods of cultivation.

Table 1: Trends of Intensity of Cropping in Rajasthan

Years	Cropping Intensity	Years	Cropping Intensity
1991-92	116.81	2002-03	122.30
1992-93	119.06	2003-04	124.55
1993-94	118.62	2004-05	127.28
1994-95	119.73	2005-06	128.88
1995-96	118.69	2006-07	128.45
1996-97	123.25	2007-08	129.91
1997-98	130.75	2008-09	129.74
1998-99	133.15	2009-10	128.10
1999-00	124.35	2010-11	141.71
2000-01	121.21	2011-12	135.88
2001-02	124.06	2012-13	137.04

Source: Agricultural statistics of Rajasthan

Figure 2



In 1991-92 intensity of cropping in Rajasthan was 116.8 percent. It increased to 137.4 percent in 2010-13.

CROPPING INTENSITY

Difference in the triennium averages also shows that the intensity of cropping has increased significantly during the past twenty-two years in Rajasthan. It has increased from 118.20 percent in 1991-94 to 138.24 percent in 2010-13. The figure 3 illustrates that the state has made an impressive progress in this regard. The changes in intensity of cropping are primarily due to improvement in irrigational facilities, increasing the use of high yielding variety of seeds and tractorisation. Given the fact that area under cultivation cannot be expanded further in state, the increase in the intensity of cropping is only way to compensate for that. For showing spatial pattern five categories of intensity are as below:

1. Very low intensity of cropping (between 100-116 percent)
2. Low intensity of cropping (between 116-132 percent)
3. Medium intensity of cropping (between 132-148 percent)
4. High intensity of cropping (between 148-164 percent)
5. Very high intensity of cropping (between 164-180 percent)

Spatial and temporal variations in the level of intensity of cropping in Rajasthan have been shown in table 2 and figure 3 for two period of time. During 1991-94, overall intensity of cropping was very low in the state. A large part of the state including Tonk, Pali, Nagaur districts and western and northern part of the state except Sri Ganganagar had very low intensity of cropping due to lack of irrigation. In this region, crops are mostly grown in Kharif season. The area under low intensity of cropping were found in extreme northern (Sri Ganganagar district), north-central (Ajmer, Jaipur, Sikar and Jhunjhunu districts), eastern and southeastern (Dholpur, Bharatpur, S.Madhopur, Kota, Bundi, Baran districts) and southwestern (Sirohi and Jalore districts) parts of the state because of comparatively high consumption of fertilizers, a good facility of tube wells and canal for irrigation. Medium intensity of cropping was observed in Alwar, Dausa and southern parts of Rajasthan (Banswara, Dungarpur, Udaipur, Chittorgarh, Rajsamand, Bhilwara and Jhalawar).

Table 2: Intensity of Cropping in Rajasthan

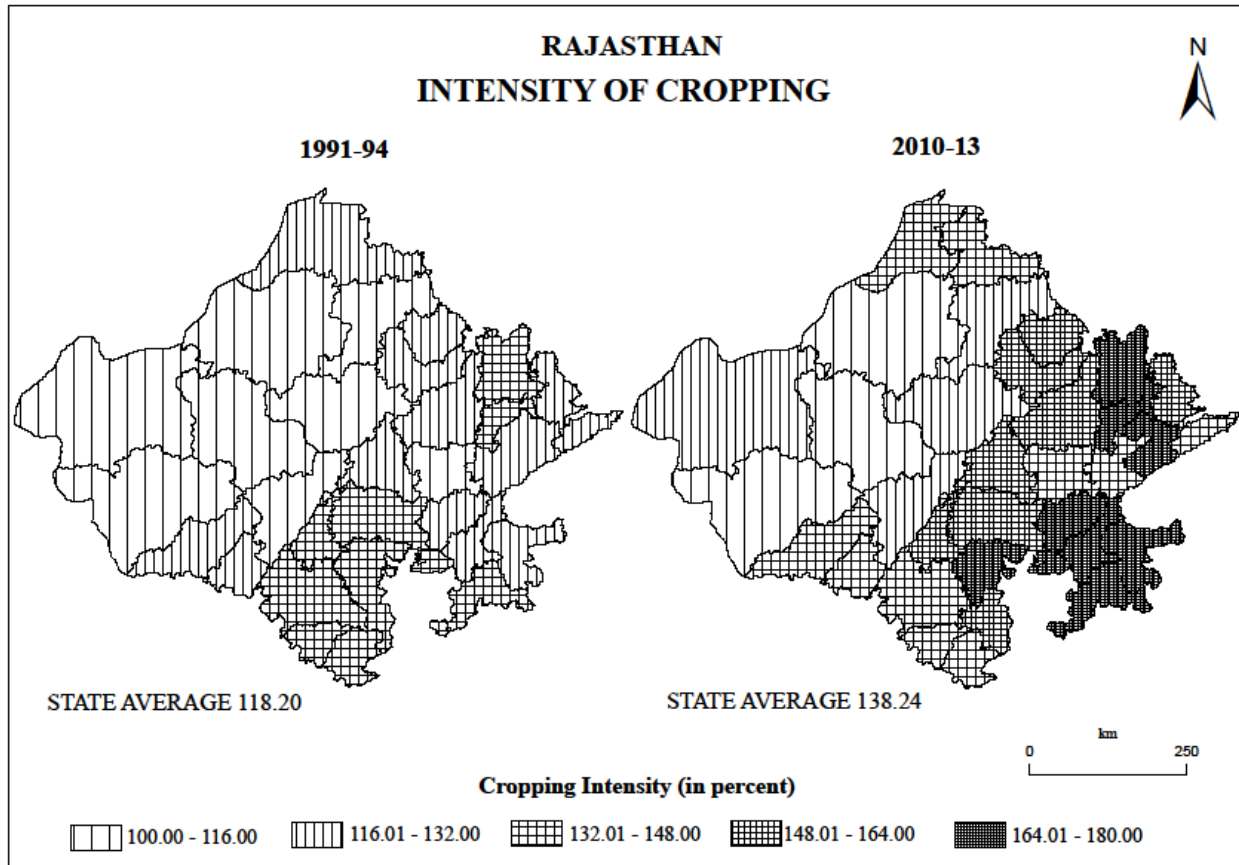
Districts	1991-94	2010-13
Ajmer	118.11	152.96
Jaipur	127.27	161.95
Dausa	140.80	167.89
Tonk	111.54	142.22
Sikar	120.04	149.88
Jhunjhunu	126.59	163.71
Nagaur	106.48	125.54
Alwar	141.79	169.24
Bharatpur	126.37	149.29
Dholpur	125.26	145.46
S.Madhopur	124.18	138.94
Karauli	NA	168.63
Bikaner	105.68	115.64
Churu	101.17	127.72

Jaisalmer	100.68	122.88
Sri Ganganagar	125.40	144.52
Hanumangarh	NA	148.42
Jodhpur	103.93	114.55
Barmer	103.23	110.01
Jalore	123.64	143.49
Pali	112.11	123.63
Sirohi	126.78	142.15
Kota	130.70	173.38
Baran	126.02	175.06
Bundi	131.41	174.19
Jhalawar	142.72	179.56
Banswara	145.66	148.27
Dungarpur	133.62	146.60
Udaipur	146.38	141.72
Pratapgarh	NA	159.82
Bhilwara	136.27	154.09
Chittorgarh	147.38	164.69
Rajsamand	140.59	151.55
Rajasthan	118.20	138.24

Source: Agricultural statistics of Rajasthan

NA – District not available

Figure 3



During 2010-13, (table 2 and figure 3), the western part of the state i.e. Bikaner, Jodhpur, Barmer districts had very low cropping intensity. Jaisalmer, Nagaur, Pali and Churu districts also had low cropping intensity. These districts also have insufficient irrigational facilities. On the other hand, moderate cropping intensity was recorded in extreme northern (Sri Ganganagar and Hanumangarh districts), southern and adjoining districts of the state (Banswara, Dungarpur, Udaipur, Sirohi and Jalore districts) and Dholpur, Tonk and S.Madhopur districts. Jhunjhunu, Sikar, Jaipur, Ajmer, Bhilwara, Rajsamand, Bharatpur and Pratapgarh districts have a high cropping intensity. This belt has good irrigational facilities which is dominantly tube well irrigated. The region recording very high cropping intensity is comprised of Alwar, Dausa, Karauli, Kota, Baran, Bundi, Jhalawar and Chittorgarh districts. These districts have excellent irrigational facilities and adequate soil moisture.

CONCLUSION

The intensity of cropping has increased significantly during the past two decades in Rajasthan. It has increased from 118 percent in 1991-94 to 138 percent in 2010-13. During 1991-94, the area under low and very low intensity of cropping were spread most of the study region. Medium intensity of cropping was observed in Alwar, Dausa and southern part of Rajasthan. But in 2010-13 there was intensive cropping in the area lying east of Aravallis. Eastern, southern and southeastern parts of Rajasthan having higher rainfall and better irrigation facilities had most intensive cropping. A very high change has been seen in eastern and southeastern parts of the state which is rapidly increase their intensity of cropping due to expansion the facility of canal and tubewell irrigation.

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