

REGIONAL STUDY OF VARIATION IN CROPPING AND IRRIGATION INTENSITY IN RAJASTHAN STATE, INDIA.

ESTUDIO REGIONAL DE LA VARIACION DE LA INTENSIDAD DE IRRIGACION Y AGRICULTURA EN EL ESTADO DE RAJASTAN, INDIA.

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ABSTRACT

Agriculture is the primary activity which directly or indirectly influences the other activities. It plays a vital role to achieve the self-sufficiency in each sector of economy. Irrigation plays a crucial role in farming for those areas suffering from irregular pattern of rainfall. Rajasthan is the state of India which usually faces the drought condition as the monsoon gets fall. The farming in this state totally depends on the irrigation. This paper includes the district-wise distribution of cropping intensity and irrigation intensity including the comparison of 2013-2014 with the year 2006-2007.

Key words: Irrigation Intensity, Cropping Intensity, Net Area, Gross Area.

RESUMEN

La agricultura es una actividad primaria la cual está directa o indirectamente relacionada con otras actividades. Esta tiene un rol vital en la autosustentabilidad en cada sector de la economía. La irrigación tiene un rol importante en las granjas de

estas áreas y tiene un patrón irregular debido a las lluvias. El estado de Rajasthan en la India tiene periodos de sequía debido a la falta de lluvias. Las granjas en este estado dependen totalmente de la irrigación. El presente estudio incluye la distribución del cultivo de granos y la intensidad de irrigación incluyendo la comparación de los años 2013-2014 con los años 2006-2007.

Palabras clave: intensidad de irrigación, cultivo de granos intensivo, área neta, área bruta.

INTRODUCTION

The agriculture development over an area depends on the irrigation facility, availability of fertilisers, pesticides, favourable condition of climate etc. Rainfall plays an important role to determine the future of farming over an area (Haque, 2015). All areas are not equally served by rainfall. Some areas receive rainfall more than normal while other area faces drought condition. Farmers inhabited in areas with low rainfall reliable on irrigation for farming (Gogoi, 2016). The study shows the scenario of irrigation and farming in Rajasthan.

STUDY AREA

Rajasthan is the largest state of India with the area of 3, 42,239 km². It is located in North-Western part of India. It stretches over 23°3'N to 30°12'N Latitude and 69°30'E to 78°17'E Longitudes. The Aravalli Range and the Thar Desert are the prominent feature of Rajasthan for which it is famous in the world. The Aravalli Range divides the Rajasthan into two halves. The Eastern part Rajasthan receives rainfall in good amount and included in Humid Region. The western part is totally drought prone area as The Thar Desert lies over this area. So, Rajasthan State is divided in two halves with opposite characteristics from each-other.

The objective of study is to carry out the district-wise analysis of cropping and irrigation intensity of the state. The hypothesis for study is that the change in Cropping Intensity follows the change in Irrigation Intensity.

MATERIALS & METHODS

The study is carried with the secondary data collected from the govt. website <http://www.agriculture.rajasthan.gov.in/content/agriculture/en/Agriculture-Department-dep/agriculture-statistics.html>. The data is presented by maps. The cropping and irrigation intensity is calculated by using following formulas:

$$(1) \text{ Cropping Intensity} = \frac{\text{Gross Area}}{\text{Net Area}} \times 100$$

$$(2) \text{ Irrigation Intensity} = \frac{\text{Gross Irrigated Area}}{\text{Net Irrigated Area}} \times 100$$

RESULTS AND DISCUSSION

Cropping Intensity is refers to raising of a number of crops from the same field during one agriculture year. That means it shows the numbers of time a crop is planted per year in an agricultural area. In Year 2006-2007, the highest cropping intensity was recorded in Chittore (165%) followed by Jhalawar (161%), Alwar (160%). The lowest cropping intensity was recorded in Barmer (106%), Jodhpur (110%) and Bikaner (120%). In the year 2013-2014, The highest cropping intensity was recorded in Jhalawar (191%), Baran (187%) and Kota (186%). The lowest was recorded in Barmer (111%), Jodhpur (120%) and Bikaner (120%)(Awalat & Renu, 2016). The lowest intensity show the poor productivity of soil of district Barmer, Jodhpur and Bikaner while the highest show the high productivity of soil (Pagar, 2016).

As the Table 2. Shows, In year 2006-2007, the highest irrigation intensity was recorded in Jaisalmer (177%) followed by Hanumangar (175%) and Barmer (161%). The lowest irrigation intensity was recorded in Bharatpur, Dholpur, Swai-Madhopur and Karauli with the irrigation intensity of 102%. In year 2013-2014, the highest irrigation intensity was recorded in Jaisalmer (288%) followed by Hanumangarh (185%) and Ganganagar (175%). The lowest was recorded in Karauli(100%) followed by Swai-Madhopur ,Dholpur, Tonk, Banswara and Pratapgarh with the intensity of 101%. As the highest intensity in both years were recorded in Jaisalmer and Hanumangarh. The Jaisalmer is a desert prone area and have low rainfall. So, the farming totally depends on the irrigation facilities. While Hanumangarh District is facilitated by Indira Gandhi Canal. The Lowest irrigation intensity was recorded in Dholpur and Swai-Madhopur as the farming depends on the rainfall.

In This way, it is clear that Desert prone area have high Irrigation intensity due to uncertainty of rainfall while on the other side the north eastern districts like

Ganganagar & Hanumangarh due to development of the Irrigation facility. So there is persist two different aspects for the high irrigation intensity in Rajasthan, One is uncertainty of rainfall & second is high Irrigation Facilities.

Table 1: cropping intensity of Rajasthan for the years (2006-2007 & 2013-2014).

S.N.	DISTRICTS/STATE	2006-2007			2013-2014		
		Net area (hectare)	Gross area (Ha)	Cropping intensity (%)	Net area (hectare)	Gross area (Ha)	Cropping intensity (%)
1	Ajmer	416052	469809	113	457973	753794	165
2	Jaipur	621853	861411	139	666931	1109593	166
3	Dausa	214199	327869	153	229372	387287	169
4	Sikar	526834	745871	142	524082	787105	150
5	Jhunjhunu	422765	664329	157	415175	706653	170
6	Alwar	503008	803471	160	502413	866860	173
7	Bharatpur	395038	567717	144	396007	603492	152
8	Dholpur	148104	199075	134	156741	233422	149
9	S.madhopur	260892	323831	124	292091	401069	137
10	Karoli	191319	288678	151	202042	338799	168
11	Bikaner	1160186	1299558	112	1681478	2017102	120
12	Churu	1163648	1421549	122	1174265	1624577	138
13	Ganganagar	703002	926832	132	785440	1243356	158
14	Hanumangarh	792846	1121264	141	838632	1266881	151
15	Jodhpur	1159643	1270424	110	1377498	1648408	120
16	Jaisalmer	539559	621605	115	747260	961107	129
17	Jalore	661732	834676	126	690705	972807	141
18	Barmer	1690814	1791772	106	1712254	1897017	111
19	Nagaur	1232877	1421392	115	1292679	1757833	136
20	Pali	609185	698887	115	626266	819146	131
21	Sirohi	165278	231732	140	165710	239341	144
22	Kota	270751	371884	137	274444	511127	186
23	Baran	332394	466832	140	353008	659039	187
24	Bundi	253973	371313	146	264504	456516	173
25	Jhalawar	322859	520443	161	337719	646729	191
26	Tonk	413557	484100	117	478962	662004	138

Table 1. Continuation.

		Net area (hectare)	Gross area (Ha)	Cropping intensity (%)	Net area (hectare)	Gross area (Ha)	Cropping intensity (%)
27	Banswara	239229	352856	147	228373	345438	151
28	Dungarpur	127753	191883	150	134371	203072	151
29	Udaipur	268918	403849	150	235273	342229	145
30	Pratapgarh	—	—	—	182998	305372	167
31	Bhilwara	417819	609695	146	434624	679893	156
32	Chittorgarh	437415	721884	165	316494	536622	170
33	Rajsamand	100263	147318	147	91914	135837	148
34	State	16763765	21533809	128	18267698	26119527	143

Note: Pratapgarh District came into existence in 26 January 2008. It is part of Udaipur Division

Source:

http://www.agriculture.rajasthan.gov.in/content/dam/agriculture/Agriculture%20Department/ecitizen/agriculture-statistics/Agri_Statistics_2007_08.pdf

http://www.agriculture.rajasthan.gov.in/content/dam/agriculture/Agriculture%20Department/ecitizen/agriculture-statistics/agriculture_statistics_2014-15.pdf

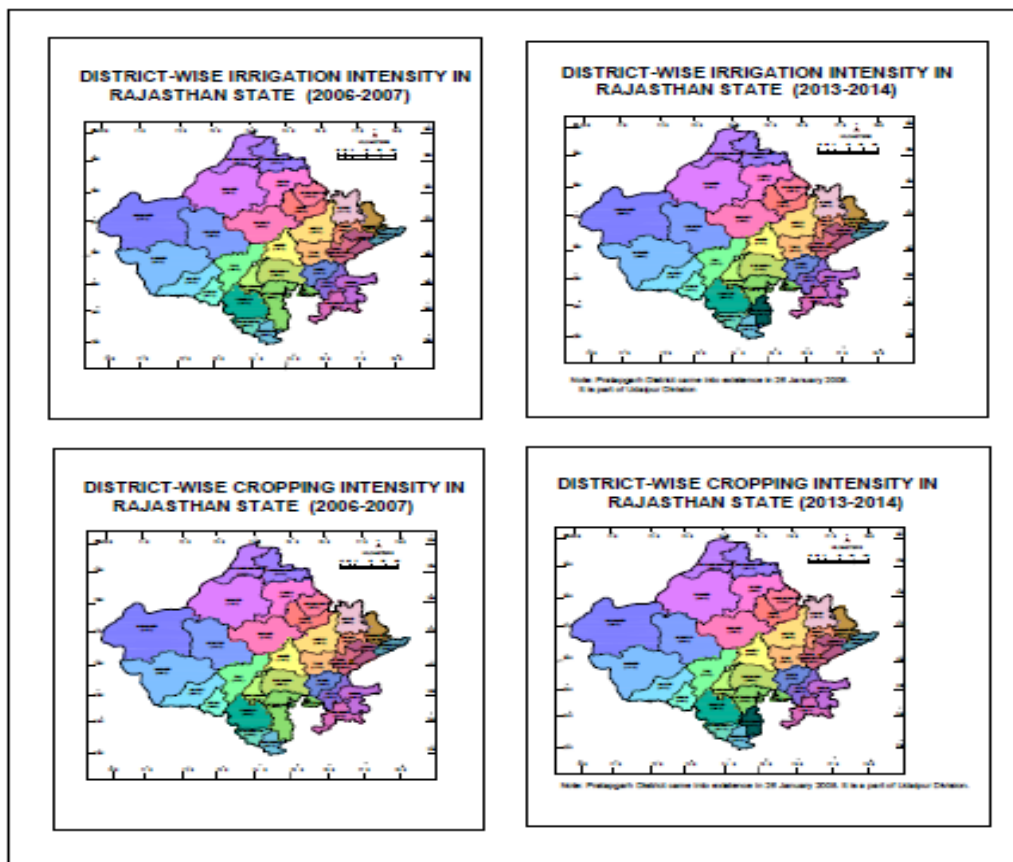


Figure 1: Irrigation and Cropping Intensity of Rajasthan.

Table 2: Irrigation Intensity of Rajasthan for the years 2006-2007 & 2013-2014

S.N.	Districts/state	2006-2007				2013-2014	
		Net irrigated area (ha)	Gross irrigated area (ha)	Irrigation intensity (%)	Net irrigated area (ha)	Gross irrigated area (ha)	Irrigation intensity (%)
1	Ajmer	68445	78476	115	138334	162417	117
2	Jaipur	299198	408752	137	309892	389558	126
3	Dausa	159992	168445	105	169600	172896	102
4	Sikar	245546	318859	130	243159	292377	120
5	Jhunjhunu	232411	275526	119	228402	244164	107
6	Alwar	452012	502565	111	456592	491062	108
7	Bharatpur	322871	328229	102	347119	355643	102
8	Dholpur	100139	102370	102	124185	125481	101

9	S.madhopur	159386	162622	102	253361	257090	101
10	Karoli	109698	111696	102	148937	149496	100
11	Bikaner	221442	341109	154	379320	656956	173
12	Churu	65125	84206	129	116428	185138	159
13	Ganganagar	586113	805352	137	602859	1053159	175
14	Hanumangarh	362828	633913	175	399816	738622	185
15	Jodhpur	184060	276278	150	371918	580604	156
16	Jaisalmer	96710	171257	177	111120	320041	288
17	Jalore	251177	286329	114	302026	361656	120
18	Barmer	104185	167512	161	198721	296091	149
19	Nagaur	274426	362601	132	245472	344128	140
20	Pali	151225	163802	108	117054	129131	110
21	Sirohi	95839	121554	127	82531	113129	137
22	Kota	240628	253377	105	259396	272117	105
23	Baran	297836	308771	104	332524	340763	102
24	Bundi	205169	247638	121	241888	278290	115
25	Jhalawar	227282	238490	105	295544	314696	106
26	Tonk	196446	201542	103	320178	322778	101
27	Banswara	95154	103460	109	108310	109675	101
28	Dungarpur	38214	40612	106	48295	50323	104
29	Udaipur	118896	127746	107	93156	97272	104
30	Pratapgarh	-	-	-	115702	117270	101
31	Bhilwara	205725	217776	106	217274	249158	115
32	Chittorgarh	276205	292740	106	226186	241236	107
33	Rajsamand	51362	54581	106	44328	52351	118
34	State	6495745	7958186	123	7649627	9864768	129

Note: Pratapgarh District came into existence in 26 January 2008. It is part of Udaipur Division

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