

District wise Analysis of Agriculture Sector in Rajasthan, India

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Abstract

In this paper the extent and nature of inter- district disparities in productivity levels of selected agriculture crops in Rajasthan has been analysed. The analysis is based on the secondary data collected from various published sources for triennia 1990-93, 2000-03 and 2011-14. On the basis of calculated value of output of selected agriculture crops, area, production and productivity the agriculture sector in Rajasthan has been analysed in the present paper. Results of the study have shown that there were not significant changes in cropping pattern during the period under study in terms of area allocation and share in total value of output. The most important change was in the production of pulses and oil seeds by under developed districts.

KEYWORD: Productivity, Selected Crops, Farm Harvest Prices, Cropping Pattern

Introduction

Rajasthan is predominately an agriculture state where more than two-third of the population is engaged in agriculture and allied activities for their livelihood. The number of agriculture workers (both cultivators and agriculture labourers) in the state increased from 1.2 crore according to 1991 census to 1.5 crore in 2001 census and further to 1.8 crore in 2011 crore. Rajasthan's record of progress in agriculture in spite of subsequent droughts over the past few years has been quite impressive. Agriculture sector plays an important role in State's economy. Though the contribution of agriculture in NSDP of state has fallen from about 45.49 per cent in 1990-91 to around 28.99 per cent in 2014-15 at constant prices (Economic Review 1994-95 and 2014-15, Government of Rajasthan), agriculture yet forms the backbone of state economy. In this context, this paper evaluates the performance of agriculture in Rajasthan and its districts.

Data Sources

In order to calculate the value of output, land productivity and labour productivity the data on production, total cropped area at district level at three point of time, triennium 1990-93 (three years average of 1990-91, 1991-92, 1992-93) and triennium 2000-03 (average of three years 2000-01, 2001-02, 2002-03) and triennium 2011-14 (average of 2011-12, 2012-13 and 2013-14) were collected from various sources. The relevant data at district level was collected mainly from the Agriculture Statistics of Rajasthan, Statistical Abstract of Rajasthan, Basic Statistics of Rajasthan, Some Facts about Rajasthan published annually by the Directorate of Economics and Statistics (DES), Government of Rajasthan, Jaipur. The other sources were Census reports, Economic reviews, and annual publications by DES on Agricultural Statistics. The information on area, production, agriculture workers and other required for the study for six newly created districts has been merged with their respective original districts from which they were carved out.

Total 20 crops have been selected which are:

- Cereals: Wheat, Rice, Jowar, Bajra, Maize, and Barley
- Pulses: Gram, Tur and Moong
- Oilseeds: Castor seed, Groundnut, Rapeseed and Mustard, Linseed, and Sesasum

- Vegetable, Condiment and Spice: Potato, Ginger and Red Chillies
- Cotton, Sunhemp and Tabacco as commercial crops

For the years for which FHP were not available, state FHP averages has been used and for crop moong MSP has been taken as for this crop FHP is not available.

State of Agriculture in Rajasthan

Agriculture is a large contributor of the state's economy. The state falls into three of the four agro-economic zones in which the whole country is divided. The major crops in Rajasthan are bajra, jowar, maize, barley, wheat, pulses, gram, cotton, groundnut, sugarcane, rapeseed, mustard and seasmum.

Area, Production and Productivity of Different Crops in Rajasthan

Though agriculture plays an important role in the state's economy, over the years the contribution of this sector in state's NSDP has come down. This had negative impact on the overall growth of the state and thus on the growth of nation. Rajasthan, the largest state of the country, faces natural constraints which impose a great challenge on the state to sustain its agriculture growth. The following table gives a detail on area and production of all crops grown in Rajasthan except fodder and other crops to give an overall picture of Rajasthan at TE 1990-93, 2000-03 and 2011-14(Table I).

Total cropped area in the state under various crops is fluctuating on year to year basis depending on uncertain monsoon. During the time period under study the lowest total cropped area was in 2002-03 (132.17 lakh hectare) and highest total cropped area in Rajasthan was in year 2013-14 (261.19). During TE 2011-14, there was fall in total cropped area for all crops in 2012-13 and 2013-14 over 2011-12 except for oilseeds. Moreover production falls for all crops except cotton (lint) in 2012-13 over 2011-12. In 2013-14 the situation improved for pulses, oilseeds and fruits but for rest of the crops production comes down.

Area under foodgrain production was almost stagnant for 1990-91 to 1991-92 but the production of foodgrain fall by 27 percent in 1991-92 over 1990-91. Similarly for the pulses total area increased in 1991-92 over 1990-91 but production come down by 47 percent and increased back by 59 percent in 1992-93. Production of other crops increased marginally during the period 1990 to 1993. Area and production under condiment and spices increased for this period. In 2002-03 the area under cereals for the state falls down by 32.29 percent whereas the production during same year and same crop fall down by 46.19 percent.

As it can be seen from table I that area under foodgrain, pulses, oilseeds, fibres has shown negative growth during TE 2000-03 over 1990-93. This is due to the fact that total cropped area comes down and actual rainfall was much less than normal rainfall in Rajasthan during 2002-03. Production of fibres, fruits, drugs and narcotis also come down during same TE, whereas the growth was positive for all other crops during TE 2011-14.

Cereals production in 2010-11 was 203.22 lakh tones which come down to 196.98 in 2011-12 and further to 157.06 in 2012-13. Foodgrain production falls by 19.10 per cent from 2011-12 to 2012-13 in Rajasthan. Likewise cereals production has also shown negative growth. Pulses, sugarcane, oilseeds and cotton also have shown negative growth, which had a negative impact on the per capita income of farmers in Rajasthan.

Agriculture Productivity and Changes during TE 1990-93, 2000-03 and 2011-14

On the basis of selected 20 crops selected for present study, the table II gives detail on performance of agriculture in Rajasthan in terms of total cropped area, value of output, total production and total number of agriculture workers which includes both cultivators and agriculture labourers for TE 1990-93, 2000-03 and 2011-14.

Table II gives the picture on changes in agriculture productivity in selected indicators during TE 1990-93, 2000-03 and 2011-14 in the state. The increase in value of output of selected crops was much higher in TE 2011-14 as compared to TE 2000-03 so was the increase in production. Speedily rise in value of output was due to high rise in prices in TE 2011-14. The percentage change in prices were 69.96 for all the selected crops for TE 2000-03 over TE 1990-93, whereas this percentage change was almost double (137.18 per cent) during TE 2011-14 over TE 2000-03. Changes in prices have been discussed in length in the last section of this paper.

Change in state average labour productivity was not impressive during TE 2000-03 over TE 1990-93. It increased by 1.53 percent during TE 2000-03 whereas this increase is 339.49 percent for TE 2011-14. Change in land productivity is 90.69 percent inspite of the fact that total cropped area in TE 2000-03 fall down by 18.62 percent, though the increase in land productivity (286.19) is comparatively less than the increase in labour productivity during same TE. Total cropped area showed a decline (18.62 percent) as well as total irrigated area under selected crops by 13.38 percent during TE 2000-03 over TE 1990-93. On the contrary total cropped area and total irrigated are rise by 41.58 per cent and 99.01% during TE 2011-14 over TE 2000-03 respectively. Fertilizer consumption kg per hectare increased from 19.44 to 39.47 to 52.94 in TE 1990-93, 2000-03 and 2011-14 respectively. Increase in area under HYV seeds was also higher in TE 2011-14. Whereas number of Agriculture workers rise more rapidly during TE 2000-03 over TE 1990-93 as compared to TE 2011-14. However, in order to reach any valid conclusion, other measures of disparity must be computed which has been done in the next chapter.

Cropping Pattern in State

This section analyses the change in regional disparities in terms of changes in cropping pattern of selected crops. The section also analyses the cropping pattern in terms of output per acre and output per capita. The interconnections between these two measures are examined across districts of Rajasthan for TE 1990-93, 2000-03 and 2011-14. The table III gives the detail on percentage share of each group of group in total value of output, total cropped area and total irrigated area of the state (of selected crops).

Cropping Pattern in Rajasthan has undergone significant changes during the time period under study. It can be seen from the table that percentage share of coarse cereals in total value of output eventually comes down from 61.23 percent in TE 2000-03 and come back almost same level 50 percent in TE 2011-14 as was in TE 1990-93. With 58.31 percent of total cropped area under coarse cereals, this group of crops contributed 50.40 percent in value of output for the state at a whole during TE 2011-14. Whereas on the other hand with just 22.80 per cent share in total cropped area of selected crops, oilseeds contributed 34.41 percent share in value of output during same TE.

The table III clearly shows that there was marginal change in percentage share of each group of crops in total value of output during TE 2011-14 over TE 1990-93, whereas this change seems to be considerable in TE 2011-14 over TE 2000-03. The percentage share of coarse cereal and cotton and tobacco come down from 68.74 percent to 58.31 percent and 4.15 to 3.05 percent. For other group of crops the percentage share was positive. Though the change in TE 2011-14 over TE 2000-03 seems to be considerable but compared with TE 1990-93 this change was not that substantial.

Relative Crops shares in value of output, Total Cropped Area and Irrigated area

Table III also shows changes in cropping pattern reflected by changes in the share of various groups of crops in total value of output in TE 1990-93, 2000-03, and 2011-14. With small fluctuations the percentage share of coarse cereal in value of output and total cropped area in TE 2011-14 was almost same as was in TE 1990-93. Per cent share in irrigated area for state has increased for oilseeds and pulses in TE 2011-4 over TE 1990-93. Whereas percentage share of irrigated area under coarse cereal, vegetable, condiment spices, cotton and tobacco declined. The percentage share of oilseeds in value of output and total cropped area was almost same for TE 2011-14 over TE 1990-93, though its share in total irrigated area increased. In case of pulses the percentage share in total cropped area, irrigated area and in value of output increased for TE 2011-14 over TE 1990-93. This clearly shows that the changes in cropping pattern in terms of percentage contribution for Rajasthan during the time period under study were not considerable.

Crop yield

Crop yield for various groups of crops represents the average yield of total crops under that group. Following table shows the changes in average yield during TE 1990-93, 2000-03 and 2011-14 (Table IV).

The average yield of all group of crops increased during TE 2000-03 over TE 1990-93 except for pulses and cotton and Tobacco. For cotton and tobacco group the reason is that in this group of crop share of cotton is higher than tobacco. Moreover total cropped area under cotton increased marginally from 2000-01 to 2001-02 whereas it falls down drastically by 25 percent in year 2002-03. Total irrigated area under cotton falls down by 21 percent in 2002-03 over 1992-93.

In case of pulses there was fall in total cropped area under tur and gram. The cropped area under tur fell down by 17.73 percent and this fall was considerable amount in case of gram by 69 percent. Moreover 2002-03 was also not a normal year in terms of rainfall.

Table V gives information on weighted average of FHP for the state. For Moong weighted average of MSP is taken as FHP is not available for this crop. So far as the increase in value of the agricultural output is concerned, it is noteworthy that the prices of agricultural commodities have increased successively over the years in the state resulting in the rise in the value of output. However, FHP is not uniform for all the districts. This is one of the major reasons for widening regional disparities in Rajasthan.

Among coarse cereals the percentage change (146 per cent) in prices is highest for Barley during TE 2011-14 over 2000-03. Among Pulses moong has shown highest increase in price (187.61 per cent) during same time period. The percentage change in prices of seasm (317) is highest amongst oilseeds crops. Prices of cotton increase by 162.58 per cent.

Conclusion

To sum up there was not significant changes in cropping pattern during the period under study in terms of area allocation and share in total value of output. Because of changes in relative prices and productivity, the most important change was in the production of pulses and oil seeds by under developed districts.

The possibilities of bringing more area under cultivation are marginal in the state. Only possibility to increase cropped area is through intensive cultivation. Contribution of agricultural growth to overall progress has been widespread. The decent agricultural growth is a pre-requisite for inclusive growth, reduction of poverty levels, development of the rural economy and enhancing of farm incomes and to achieve much cherished double digit GDP growth in the country. The growth with inclusiveness can be achieved only when agriculture growth accelerates and is also widely shared amongst people and regions of the country. All these factors point to just one thing that agriculture has to be kept at the centre of any reform agenda or planning process.

There is need to develop new technologically advance alternative crops which requires less water. As the new technology involves huge investment, to make farmers adopt this technology there is need to ensure fair return to the farmers on their investment and this could be done by making their product marketable.

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Table I: Crop Wise Percentage Change in Area and Production

Crop	Area(in ‘000 Hectares)					Production(in ‘000 M.Tones)				
	1990-93	2000-03	2011-14	% change In 2000-03 over 1990-93	% change in 2011-14 over 2000-03	1990-93	2000-03	2011-14	% change In 2000-03 over 1990-93	% change in 2011-14 over 2000-03
1	2	3	4	5	6	7	8	9	10	11
Foodgrain Crops	12260	10914	13559	-11	24	10132	13182	20901	30	59
Pulses	3318	2512	3964	-24	58	1365	1397	2260	2	62
Oilseeds	3334	2734	4941	-18	81	2536	2960	6059	17	105
Fibres	475	470	502	-1	7	161	71	258	-56	261
Condiment and Spices	329	585	874	78	49	262	538	763	105	42
Fruits	16	20	32	20	64	0.50	0.25	3	-50	913
Vegetables	58	81	136	40	69	153	234	723	53	209
Drugs and Narcotis	63	119	211	88	77	3	1	110	-59	9635

Source: 58 Years of Agricultural Statistics of Rajasthan (1956-57 to 2013-14) Directorate of Economics and Statistics, Department of Planning, Rajasthan Yojana Bhawan, Jaipur

Table II: Agricultural Productivity and Changes therein in Rajasthan during triennium 1990-93, 2000-03 and 2011-14

Rajasthan	1990-93	2000-03	2011-14	Total change in 2000-03 over 1990-93	Total Change in 2011-14 over 2000-03	% change In 2000-03 over 1990-93	% change 14 over 2000-03
Value of Output (in Rs.)	55333858004	91927204217	478675843462	36593346213	386748639245	66.13	420.71
Amount of Output	118683090	120818558	254591367	2135468	133772809	1.80	110.72
Labour Productivity(in Rs per agriculture worker)	4379.79	5868.78	25792.76	1489	19924	34.00	339.49
Land Productivity(in Rs per hectare)	3956	7544	29134	3588	21590	90.69	286.19
Total Cropped Area Under All Crops	19146756	16922935	24586580	-2223821	7663645	-11.61	45.29
Total Cropped area under selected Crops	14197787	12185689	16430307	-2012098	4244618	-14.17	34.83
Number of Agriculture Workers(Main only)	9558674	10468467	12040657	909793	1572190	9.52	15.02
Number of Agriculture Workers(Main+Marginal)		15663755	18558534		2894779		18.48
Cropping Intensity	117	109	138	-8	29	-6.84	26.61
Total Irrigated Area Under Selected Crops	4372153	3787274	7536916	-584879	3749642	-13.38	99.01
Total Fertilizer Consumption for Selected crops (kgs of NPK)	360326	458060	956019	97734	497959	27.12	108.71
Area Under HYV Seeds	3016848	3894777	5640694	877929	1745917	29.10	44.83
Rural Literacy Rate	30	50	61	20	11	66.67	22.80
Annual Rainfall(M.M)	66	48	89	-18	41	-27.27	85.42
% Area Under Coarse Cereals*	8632988	7795465	9580334	-837523	1784869	-9.70	22.90
% Area Under Pulses*	1769115	1277456	2581855	-491659	1304399	-27.79	102.11
% Area Under Oilseeds*	3063439	1995137	3746894	-1068302	1751757	-34.87	87.80
% Area Under Vegetable, Condiment, Spices*	44989	31324	20316	-13665	-11008	-30.37	-35.14
% Area Under Cotton and Tobacco*	470682	505488	500909	34806	-4579	7.39	-0.91

Source: Calculated

*shows percentage of total cropped area under selected 20 crops

Table III: Cropping Pattern in Rajasthan during TE 1990-93, 2000-03 and 2011-14

Crop wise % share in Value of Output						
Triennium	Coarse cereals	Pulses	Oilseeds	Veg and Cond	Cotton and Tobacco	Total
1990-93	49.08	10.76	34.91	2.41	2.84	100.00
2000-03	61.23	9.03	26.71	1.49	1.53	100.00
2011-14	50.40	11.91	34.11	0.51	3.08	100.00
Crop wise percentage share in Total Cropped Area						
Triennium	Coarse cereals	Pulses	Oilseeds	Veg and Cond	Cotton and Tobacco	Total
1990-93	62.49	12.41	21.48	0.32	3.30	100.00
2000-03	68.74	10.48	16.37	0.26	4.15	100.00
2011-14	58.31	15.71	22.80	0.12	3.05	100.00
Crop wise Percentage share in Total Irrigated Area						
Triennium	Coarse cereals	Pulses	Oilseeds	Veg and Cond	Cotton and	Total

					Tabacco	
1990-93	49.54	4.63	32.95	2.78	10.09	100.00
2000-03	52.81	7.96	28.27	1.78	9.18	100.00
2011-14	48.67	7.83	36.04	0.22	7.23	100.00

Source: Calculated

Table IV: Average Crop Yield Kg/per hectare

Group of crops	1990-93	2000-03	2011-14	Total change in 2000-03 over 1990-93	Total Change in 2011-14 over 2000-03	% change In 2000-03 over 1990-93	% change in 2011-14 over 2000-03
coarse cereal	991	1237	1947	246	710	24.82	57.39
Pulses	517	417	673	-100	256	-19.34	61.39
Oilseeds	706	888	1253	182	365	25.77	41.10
Veg	1555	1701	6333	146	4632	9.38	272.31
cotton and tobacco	338	152	514	-186	362	-55.02	238.1579

Source: Calculated

Table V: Movement in FHP of Major Crops in Rajasthan

	1990-93	2000-03	2011-14	% change in prices in 2000-03 over 1990-93	% change in prices in 2011-14 Over 2000-03
Coarse Cereals					
Rice	655	1068	2235	63.05	109.27
Jowar	275	514	1216	86.91	136.58
Bajra	287	447	1062	55.75	137.58
Maize	280	515	1122	83.93	117.86
Wheat	350	648	1400	85.14	116.05
Barley	281	485	1195	72.60	146.39
Pulses					

Gram	667	1570	3139	135.38	99.94
Tur	796	1567	3808	96.86	143.01
Moong(MSP)	557	1283	3690	130.34	187.61
Oilseed crops					
Seasum	1355	1901	7921	40.30	316.68
Groundnut	990	1387	3722	40.10	168.35
Sunhemp	626	1257	1186	100.80	-5.65
Rapeseed and Mustard	866	1580	3232	82.45	104.56
Linseed	906	1417	3526	56.40	148.84
Castorseed	622	1294	3572	108.04	176.04
Vegetable, Condiment and spices					
Potato	250	436	878	74.40	101.38
Chillies	2733	4030	7762	47.46	92.61
Ginger	912	1313	3663	43.97	178.98
Commercial Crops					
Cotton (Lint)	986	1735	4556	75.96	162.59
Tobacco	1086	1864	3521	71.64	88.89

Source: Author's Calculation