CROPPING PATTERN, GROWTH AND INSTABILITY IN AGRICULTURE IN RAJASTHAN

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ABSTRACT

In this study an effort was made to analyze situation of agriculture in Rajasthan from 1956-57 to 2010-11 through various aspects as land utilization pattern, cropping intensity change in cropping pattern, composition of growth and instability in production in agricultural output. Secondary time series data from published source were used with suitable statistical tools and it has been observed that Among food grain except Bajara and Jowar all crop are gainer and wheat was highest gainer in respect of area under the crop in absolute term. In proportion wise only wheat was significant gainer. In the oilseed and cash crops category all crops were gaining proportionate share in total area under the crop among them Rape & mustard was the main gainer in TE 60-61 share was only 1.51 percent which became 10.83 percent in TE 2010-11. CGR was found positive for production in cereals and mainly because of growth in yield. Wheat and maize were having significant positive CGR in area under the crop during the study period. All case crops except Sugarcane were having positive growth in production mainly induced by area under the crop. Instability was lower in cereals except rice and higher in crops which were has lower share in total area under crop production. On the basis of these facts it can be said that cropping pattern was shifting toward cash crops and oilseeds were replacing cereals except wheat.

PART-I INTRODUCTION

Geographically Rajasthan is largest state of India with having 10.41 percent of area with having wide ago-climatic regional diversity. Agriculture is still very important in Rajasthan it can said on the basis of fact emerged from Economic review of Rajasthan 2012-13, Contribution of agricultural and allied sector was 27.97 percent in Net State Domestic Product at current prices in 2012-13. As per census 2011
[1]

in Rajasthan 75.10 percent population was living in rural area. Percentage of Agricultural Labourers to Total Workers in rural 19.4 and total cultivators to Total Workers were 54.8 percent in rural area. In this way agriculture provides livelihood to 74.2 percent working population. Cereals and pulses constitute food grain crops. Average size of holding is 3.07 Hectar and 36.46 percent holding were marginal (less than 1 Hactar) in 2010-11.

Percentage distribution of area under the crops which is also know as cropping pattern as it can be demonstrated with the help of data of Agricultural statistics 2010-11. As presented in table 1 to understand broader picture about cropping pattern and to find out major crops for the study. Crops were divided season-wise as kharif and rabi. The crops that are seeded at the beginning of the first monsoon rains in July are called kharif and the crops that are sown in the winter season from November to April are called Rabi crops. Foodgrain crops were further divided in Cereals and Pulses. As it can be observed that in cropping pattern food crops were in dominating position in Rajasthan with having 60.22 percent area out of total Gross Cropped Area (GCA) of state. Out

of these foodgrain Kharif crops were still getting more priority then Rabi crops as Kharif pulses were got 11.21 percent and Kharif cereals 29.00 percent area out of total gross cropped area, it means two third of foodgrains were from kharif crops. Bajara was the single largest food crop which accounted 21.23 percent area of total GCA. Jowar, Bajra, Maize and Wheat were main crops among cereals and among pulses Gram was main crop. Oilseeds were the second largest group in the cropping pattern with having 21.22 area out of total GCA and among these Rabi crops were more important and specially Rapseeds & mustard found as a largest crop and oilseed crops were Groundnut Sesamum, Castorseed, Soyabean and Taramira. Fodder crops were third largest cultivated segment in the state with 12.64 percent GCA of the state. Rest crops other then these three categories can have less area out of total state.

Table 1: CROPPING PATTERN IN RAJASTHAN IN 2010-11

S. No	CROPS	% to Gross area	S. No	CROPS	% to Gross area
1	(A) Foodgrain	60.22	31	(C) Fibres	1.29
2	I. Cereals	41.95	32	1. Cotton	1.29
3	(a) Kharif Cereals	29.00	33	2. Sanhemp	0.00
4	1. Rice	0.50	34	3. Mesta	0.00
5	2. Jowar	2.80	35	(D) Sugarcane	0.02
6	3. Bajara	21.23	36	(E) Condimen & Spices	2.77
7	4. Maize	4.41	37	1. Dry Chilies	0.05
8	5. Small millets	0.06	38	2. Ginger	0.00
9	(b) Rabi cerels	12.94	39	3. Turmeric	0.00
10	1. Wheat	11.68	40	4. Coriander	0.76
11	2. Barley	1.26	41	5. Cuminseed	1.27
12	3. Small millets	0.01	42	6. Ajwain	0.06
13	II. Pulses	18.27	43	7. Garlic	0.12
14	(a) Kharif Pulses	11.21	44	8. Saunf	0.10
15	1. Tur	0.08	45	9. Methi	0.31
16	2. Other Kharif Pulses	11.13	46	10. Others	0.08
17	(b) Rabi Pulses	7.06	47	(F) Fruits	0.12
18	1. Gram	6.86	48	(G) Vegetables	0.55
19	2. Other Rabi Pulses	0.20	49	1. Potato	0.04
20	(B) Oilseeds	21.22	50	2. Onion	0.20

21	(a) Kharif Oilseeds	7.04	51	3. Sweet Potato	0.00
22	1. Groundnut	1.34	52	4. Others	0.31
23	2. Sesamum	2.11	53	(H) Drug & Narcotics	0.92
24	3. Castorseed	0.64	54	1. Tobacco	0.00
25	4. Soyabean	2.94	55	2. Others	0.92
26	(b) Rabi Oilseeds	14.19	56	(I) Fodder crops	12.64
27	1. Rape & Mustard	9.58	57	1. Guarseed	11.46
28	2. Linseed	0.01	58	2. Others	1.18
29	3. Taramira	4.57	59	(J) Other Crops	0.24
30	4. Others	0.03	60	Total Cropped Area	100.00

SOURCE:- Agricultural statistics 2010-11

ORGANIZATION OF STUDY:

The paper is divided into five part first one is introductory in second part comprising with literature review, research gap, objectives of the study, in the third part data source and methodology will be discussed, forth part having results and discussion and finally in fifth part summary and conclusion will be discussed.

PART-II REVIEW OF LITERATURE

Sawant, S. D. and Achuthan, C. V. (1995) In the analysis of agricultural growth in India across crops and regions after green revolution it was claimed that positive trends and patterns were emerged during 1980s. It was stated that this significant upsurge in production and productivity was because of technological improvement not only because of favorable weather conditions. Fact emerged from the study that more improvement in yield then area expansion highlighted the role of technological growth then other factors. Another good feature of growth was observed that growth was found with its wider dispersal in terms of crops and regions coverage, which made it more broad-based in the 1980s. Western regions performed poorly in 1980's even with own performance during last decade.

Chand Ramesh and Raju S.S.(2009) In the study with objective to find instability in agriculture found that production arises due to adoption of new technology with taking longer period and large study area. Entire period was divided into two phases (a) two decades from 1968 to 1988, treated as initial phase and (b) two decades after 1988, treated as wider technology dissemination. This study proved that instability caused by improved technology at country level disappeared when a longer period is taken into consideration and also argued that agriculture in India now became more flexible to bear various shocks arises due to climate and other factors. Authors found that food grain production was more unstable as compared to non food grain crops. Instability in yield of cereal and pulses found declined over time. Yield instability was the major source of instability in food grain production in most of the states. On the basis of instability in production it was observed that most stability was in the "state of Punjab followed

by Kerala. Haryana, Uttar Pradesh and West Bengal. Food grain production is highly unstable in the states of Maharashtra, Tamil Nadu, Orissa, Madhya Pradesh, Rajasthan and Gujarat"

G.S.Bhalla, Gurmail Singh (2010) undertaken a study in order to observe the variations in the growth of agricultural output and productivity of worker in agricultural sector from 1990-93 to 2003-06. If was reflected by state wise comparison that, the growth rates of total crop output and yields slow down in all the states from 1990-93 to 2003-06 as compared with the 1980's except for Gujarat and to some extent Maharashtra same was confirmed at district level. It was also observed that low value coarse cereals were being replaced by high value oilseeds. Yield of rice and wheat has improved across the nation.

• Ramesh Chand, Shinoj Parappurathu (2012) Used data from 1960-61 to 2010-11 and divide this entire period into six phases and on the bases of detailed analysis it was argued that growth of the sector has been highly uneven across time and regions. "The green revolution played an active role in lifting the growth trajectory from below 1% to 3% in a short time and helped the sector maintain steady growth for more than two decades. Subsequent years saw growth becoming broad based with faster diversification of production towards horticultural and cash crops".

Elumalai Kannan(2012) Undertaken study using secondary data from periods 1967-1968 to 2007-2008 at national level and concluded that, the cropping pattern in India has shifted significantly over time towards commercial crops from the foodgrains. The area for coarse cereals declined by 13.3 percent between triennium ending (TE) 1970-1971 and TE 2007-2008. Performance of pulses in terms of area and output was observed not impressive during the study period it was further argued that technological success as witnessed in other crops was not visible in pulses. Growth of rice was less then wheat in northwest India. It was observed wheat area almost doubled in the study periods. As a result of this expansion of area in these two crops further resulted in shrinking of area in coarse cereals, oilseeds pulses.

RESEARCH GAP

It was observed that there were too much work in the field of agriculture at national level but if we talk about the Rajasthan then only few very limited study were found. Most of the researchers were chosen few categories like food grain, oilseeds or few crops. Many researchers chosen shorter period or most of the time period of study was divided into sub parts period without any logical base. In this study effort was made to include every major crop and possible longest period so long term trend can be observed. In this way this study will be a significant addition in this field.

OBJECTIVES OF THE STUDY:

In such a scenario where agriculture has very supportive role in state's income and having several backward and forward linkages so it is an effort to observe the change in agricultural situation through these small steps

1. To analyze the land utilization and cropping intensity in Rajasthan.
2. To find change in cropping pattern in Rajasthan.
3. To find composition of growth of output in Rajasthan from 1956-57 to 2010-11.
4. To find out instability in production in agricultural output from 1956-57 to 2010-11.

PART-III DATA SOURCE AND METHODOLOGY

Data and data Source:

Data in the study were secondary mainly published sources as "50 Years of Agricultural Statistics of Rajasthan (1956-57 - 2005-06)", Agricultural Statistics Rajasthan various issues, Statistical Abstract, Rajasthan, 2012, Some Facts about Rajasthan 2013 all are from Directorate of Economics and Statistics, Department of Planning, Rajasthan, Yojana Bhawan, Jaipur, Government of Rajasthan.

Period and Coverage of study:

Period of study was from 1956-57 to 2010-11 using time series data of agricultural production. Selection of crops for the study was chosen after the careful study of agricultural abstract of Rajasthan 2010-11. It was tried to cover all major crops which at-least having half percent area under the crop out of total cropped area of Rajasthan avoiding repetition of facts with keeping in mind to incorporate every representative category and its major crops. From foodgrain both cereals and pulses were incorporated among cereals Rice, Jowar, Bajra ,Maize Wheat and Barley were selected. From pulses only grem was selected. From Oilseeds category Groundnut, Sesamum, Castorseed Soyabean, Rape & mustard, and Taramira were taken. From Fodder crop category only Guarseed was the prominent crop and it was chosen. Rest crop categories were having less then 6 percent area under the crop so only categories were taken and their crops were ignored.

Tools and Techniques

In order to meet objectives of the study following tools and techniques were used

Three year moving average

Agriculture production in Rajasthan is highly unstable and uncertain, and it is frequently faced by famines and scarcity. To examine cropping pattern three years moving average was taken for area under the crop and production of the crop and term which was used by several researcher "Triennium Ending [TE]" as recently used (Elumalai Kannan 2012), itit was indicating end period of three years average of the desired variable such as area under the crop, production of the individual crop and yield. Individual variable of any year may be abnormal then nearby and conclusion based on these can mislead.

Percentage change

Percentage Change in Y

$(Y_{t+1} - Y_t)/Y_t) \times 100$

Y_{t+1} = Value of variable at next level

Y_t = Value of variable at present level

Proportion

Share of variable out of total has been used to demonstrate relative change

Proportion = (ValueofVariable TotalVale) x100

Crop Yield

Crop yield can be define as amount of agricultural production harvested per hectare piece of land

Crop Yield = (TotalProduction AreaUnderCrop) x100

Cropping Intensity

Cropping Intensity is simply a the ratio of gross cropped area to net cropped area and it denotes the intensification of use of land under cultivation. It is one of the measure to increase output using same land more then once.

Cropping Intensity = TotalCroppedArea NetAreaSown x100

Semi log models for Compound Growth rate

To obtained compound growth rate several researchers used semi log function as Kaushik K.K.(1993). In the study for computation of compound growth rates in Agriculture, K.P. Chandran (2005) found this formula good for calculation of growth rate

$\ln Y_t = \alpha + \beta t + \varepsilon$

where

$\alpha = \ln Y_0$

$\beta = \ln(1 + r)$

ε = Error term

r = Compound rate of growth of Y

Y_t = Value of variable at present level

Y_0 = Value of variable at begning

t = time

Instability Index:

Instability Index has been used by several researchers which was also used by "Chand R and Raju S.S. (2009)" and "Kumar Anjani and Jain Rajni, (2013)". Same tool was used to find out instability in production of various crops.

Instability index = Standard deviation of Natural Logarithm (Y_{t+1}/Y_t) x100

Y_{t+1} = Value of variable at next level

Y_t = Value of variable at present level

PART-IV

RESULTS AND DISCUSSION

UTILIZATION OF AREA & CROPPING INTENSITY

In the table 2 division of area in Net Area Sown, Total Cropped Area and Area Sown More Than Once was kept under utilization of area (area in,000 hect.), Compound Growth Rate for each and cropping intensity from 1958-59 to 2010-11 depicted for Rajasthan

It was found that there was a positive change in the net shown area and total cropped area. Area soan more then once increased significantly. Net Area Sown was 12972 Thousand Hectare (th. Hact.) in TE1960-61 in TE1970-71 14529 th. Hact. and became 17625 thousand hectare in TE2010-11 and total proportionate change in net soan area in 35.87 percent. Total Cropped Area was 14069 th. Hact. in TE1960-61 which reached in TE1990-91 at 18707 th. Hact. and in TE2010-11 it was 23506 th. Hact total change was 67.08 percent from TE1960-61 to TE2010-11. Area Soan more than once increased more than net shown area it was 1097 th. Hact in TE1960-61 which was 1352 th. Hact in TE1970-71 and finally 5881 th. Hact TE2010-11. Cropping intensity was increased from 108.46 in TE1960-61 to 116.66 in TE1990-91 and 133.37 in TE2010-11. Compound Growth Rate (CGR) from 1958-59 to 2010-11 in Net Area Sown was 0.44 percent, for Total Cropped Area was 0.86 percent and Area Sown More Than Once was 3.47 percent. Compound Growth of Area Soan More than any two remaining components which shows that rise in total cropped area is mainly because of increasing intensive use of land.

Table 2: UTILIZATION OF AREA (Area in,000 Hect.) AND GROWTH WITH CROPPING INTENSITY IN RAJASTHAN from 1958-59 to 2010-11

	Net Area Sown	Total Cropped Area	Area Sown More Than Once	Cropping Intensity
TE1960-61	12972	14069	1097	108.46
TE1970-71	14529	15881	1352	109.31
TE1980-81	14982	17072	2091	113.95
TE1990-91	16035	18707	2672	116.66
TE2000-01	15816	19972	4157	126.28
TE2010-11	17625	23506	5881	133.37
Percent change From TE1960-61to TE2010-11	35.87	67.08	435.94	22.97
CGR from 1958-59 to 2010-11	0.44	0.86	3.47	0.40

Source: Compiled data from Agricultural Statistics Rajasthan and 50 Years of Agricultural Statistics of Rajasthan (1956-57 - 2005-06) Govt of Raj, Jaipur

CROPPING PATTERN IN THE RAJASTHAN

As per the table 3 with the help of absolute area under the crop and its share out of total cropped area was use to analyze the change in cropping pattern in Rajasthan. Area under the foodgrain was seen continuously increasing except in Trienium Ended (TE) 2002-01. It was 11031 in TE 60-61 was 11031 and continuous increased upto TE 90-91 to 12364 after small contraction in TE 2000-01 to 11936 finally in TE 2010-11 it was 14181. Inspite of

inceasing in the absolute area under the foodgrain crops they were countinously loosing their share out total area under the crop.

Table 3: CROPPING PATTERN IN THE RAJASTHAN FROM 1960-61 TO 2010-11

	Area under the crop in Hectare						Proportionate Change in Area under the Total crop to total area					
CROPS	TE 60-61	TE 70-71	TE 80-81	TE 90-91	TE 2000-01	TE 2010 - 11	TE 60-61	TE 70-71	TE 80-81	TE 90-91	TE 2000-01	TE 2010-11
(A) FOODGRAIN CROPS	11031	11777	12177	12364	11936	14181	78.41	74.16	71.33	66.09	59.76	59.93
I. CEREALS	7710	8520	8917	9178	8770	10083	54.80	53.65	52.23	49.06	43.91	42.62
1. RICE	93	121	189	123	178	131	0.66	0.76	1.11	0.66	0.89	0.55
2. JOWAR	1070	1086	892	938	588	643	7.61	6.84	5.23	5.01	2.95	2.72
3. BAJRA	4173	4673	4610	5164	4255	5278	29.66	29.43	27.00	27.61	21.31	22.31
4. MAIZE	613	778	863	940	950	1086	4.36	4.90	5.05	5.02	4.76	4.59
1. WHEAT	1160	1292	1899	1745	2575	2641	8.25	8.14	11.13	9.33	12.89	11.16
2. BARLEY	522	498	413	230	207	288	3.71	3.13	2.42	1.23	1.04	1.22
II. PULSES	3321	3257	3260	3186	3166	4097	23.60	20.51	19.10	17.03	15.85	17.32
1. GRAM	1560	1297	1450	1359	1488	1425	11.09	8.17	8.49	7.27	7.45	6.02
(B) OILSEEDS	895	967	1390	2628	3529	4733	6.36	6.09	8.14	14.05	17.67	20.01
1.GROUNDNUT	85	237	296	248	267	318	0.61	1.49	1.73	1.32	1.34	1.34
2. SESAMUM	489	484	390	448	229	461	3.48	3.05	2.28	2.39	1.15	1.95
3. CASTORSEED	0	0	4	18	80	147	0.00	0.00	0.02	0.10	0.40	0.62
4. SOYABEAN	0	0	0	140	611	798	0.00	0.00	0.00	0.75	3.06	3.37
1. RAPE & MUSTARD	212	186	342	1584	2073	2562	1.51	1.17	2.00	8.47	10.38	10.83
2. LINSEED	108	60	73	49	11	2	0.77	0.38	0.43	0.26	0.05	0.01
3. TARAMIRA	0	0	272	132	259	442	0.00	0.00	1.59	0.70	1.29	1.87
(C) FIBRES	230	241	396	405	582	337	1.63	1.52	2.32	2.16	2.91	1.42
(D) SUGARCANE	30	42	41	18	18	7	0.21	0.27	0.24	0.10	0.09	0.03
(E) CONDIMENTS & SPICES	0	0	254	311	421	613	0.00	0.00	1.49	1.66	2.11	2.59
(F) FRUITS	0	0	12	16	19	28	0.00	0.00	0.07	0.09	0.10	0.12
(G) VEGETABLES	0	0	40	54	78	130	0.00	0.00	0.24	0.29	0.39	0.55
(H) DRUG & NARCOTICS	0	0	21	60	99	191	0.00	0.00	0.12	0.32	0.49	0.81
(I) FODDER CROPS	0	0	2726	2823	3248	3381	0.00	0.00	15.97	15.09	16.26	14.29
1. GUARSEED	0	0	1841	2056	2439	3070	0.00	0.00	10.78	10.99	12.21	12.97
TOTAL CROPPED AREA	14069	15881	17072	18707	19972	23660	100.00	100.00	100.00	100.00	100.00	100.00

Source: Compiled data from Agricultural Statistics Rajasthan and 50 Years of Agricultural Statistics of Rajasthan (1956-57 - 2005-06) Govt of Raj, Jaipur

Initially foodgrains were having 78.41 percent share in TE 60-61 and finally become 59.93 percent in TE 2010-11. Same situation was observed in total cereals, rice and bajara also where absolute area under the crop was increased but percentage share in total area was decreased. In

case of jowar area under the crop in absolute as well as percentage both were found decreasing. In case of maize it can be seen that area under the crop was increasing during all periods and percentage share was also increased slightly till TE 90-91 . Area under jowar was 613 in TE 60-61 with 4.36 percent share and became 778 in TE 70-71 with 4.9 percent share and 940 in TE 90-91 with 5.02 percent. After it maize area under maize is increasing but percentage share was shrieked n TE 2010-11 it area was 1086 with 4.59 percent share in total cropped area. Area under the wheat has gained significantly in both the terms as in absolute terms and in percent wise share in total cropped area. Area under wheat was 1160 TE 60-61 with 8.25 percent share in TE 70-71 it was 1292 with8.14 percent share, in TE 2000-01 it was 2575 with 12.89 percent share finally reach in TE 2010-11 to 2641 with 11.16 percent share. Barley was the one of the main looser in both term very sharply in TE 60-61 it grown on area 522 with 3.71 percent share and became 288 in TE 2010-11with 1.22 percent share. Total pulses gain in absolute terms but share was shown contraction in the observation period. As a major crop gram loose in both terms which was a sign of diversification towards the other pulses. Area under the crop was in TE 60-61 with total pulses 3321 with 23.60 percent share in total cropped area in the same time 1560 was with gram having 11.09 percent share in total cropped area which became in TE 2010-11 for pulses 4097 with 17.32 percent in the same period gram has 1425 and 6.02 percent share in total area.

Oil-seeds as in composite form had good story in both front in terms of area in TE 60-61 895 with only 6.36 percent share which increased around five times in TE 2010-11 area 4733 percentage share was also increased around three times and it became 20.01 percent. Sesamum waslosing share and groundnut, castor seed, soyabean, rape & mustard and taramira were gainers among them rape & mustard and soyabean were on lead roll. Rape seeds & mustard gain in area around 12 times in this period having in TE 60-61 area 212 with 1.51 percent share in total cropped area it shown very slow positive change upto TE 80-81 with area 342 and 2.00 percent share then sudden heavy jump was seen in TE 90-91and area covered by it was 1584 having 8.47 percent and in TE 2010-11 area 2562 with 10.83 percent share. Condiments & Spices, Drug & Narcotics, fruits and vegetables were getting attention and got more than double area and percentage share out of total was also increased. After starting of the program operation flood fodder crops got attention as data were available after 1973-74. Area under the fodder crops were increasing continuously in TE 80-81 it was 2726 with 15.97 percent out of total cropped area it became in TE 2010-11 with area 3381 and 14.29 percent share. Guarseed was found one of the single largest fodder crop and its area and proportionate share were increasing without any fail.

GROWTH RATES AND INSTABILITY

Compound Growth Rates for area under the crop, production and for yield was computed for different crops along with Instability Index for Production 1956-57 to 2010-11. There are two main factors of change in the production either change in the area under the crop or change in the productivity of land. As per the table 4 it can be seen that as an category foodgrain production was one of them which has lowest instability index (3.83) in this segment Compound Growth Rate (CGR) was found 2.46 percent and it mainly because of growth in yield having CGR 2.21 percent and lowest positive growth in area with CGR 0.25 percent. Growth of cereals in overall was found larger than and pulses in all three criteria. Jowar and Barley both showing negative growth in production for Jowar CGR was -0.73percent and for Barley CGR was -0.47 percent in both the cases contraction in area was the main reason. In the Bajra and Rice main factor

influencing was observed was growth in productivity with Rice CGR 1.52 percent Bajra 2.43 percent and contribution of area was lesser then productivity and CGR of area was CGR 0.57 percent and CGR 0.23 percent respectively. Instability in Rice was 14.50 and highest among the food grain and in Bajara it was 12.81. Performance of pulses was not as good as foodgrain and cereals it was relatively under performing in all the areas. CGR of production of pulses was 0.41 percent and this was mainly because of yield with CGR .04 percent. Main pulse crop was gram was found to performing negative growth with CGR -.07 percent in production with 7.51 instability.

Table 4: Growth Rates of area production, yield and Instability Index for Production1956-57 to 2010-11

CROPS	Production	Area	Yield	Instability Index for Production
FOOD-GRAIN	2.46	0.25	2.21	3.83
CEREALS	2.86	0.33	2.50	3.59
RICE	2.09	0.57	1.52	14.50
JOWAR	-0.73	-1.27	0.54	12.81
BAJRA	2.66	0.23	2.43	11.29
MAIZE	2.01	1.05	0.96	6.47
WHEAT	4.37	1.63	2.75	2.71
BARLEY	-0.47	-2.22	1.77	3.94
PULSES	0.41	0.04	0.38	8.42
GRAM	-0.07	1.05	0.47	7.51
OILSEEDS	7.11	3.49	3.62	5.74
GROUNDNUT	3.87	1.60	2.27	7.47
SESAMUM	0.78	-0.89	1.67	28.05
CASTORSEED*	17.20	11.35	5.85	1272.46
SOYABEAN*	22.42	21.61	13.96	11.87
RAPE & MUSTARD	8.86	5.95	2.91	8.40
TARAMIRA*	11.87	-0.51	10.80	29.00
FIBRES	3.49	1.50	1.99	8.96
SUGARCANE	-0.81	-3.03	2.22	4.79
CONDIMENTS & SPICES*	4.51	2.98	1.54	6.36
FRUITS (PAPAYA)*	-0.25	2.61	-1.98	167.41
VEGETABLES*	8.73	3.90	4.82	13.21
DRUG & NARCOTICS*	3.93	6.04	-2.11	210.64
FODDER CROPS*	1.45	0.39	1.05	30.22
GUARSEED*	1.45	1.13	0.32	30.22
* calculation period was from 1973-74 to 2009-10 because of data constraints				

Source: Compiled data from Agricultural Statistics Rajasthan and 50 Years of Agricultural Statistics of Rajasthan (1956-57 - 2005-06) Govt of Raj, Jaipur

Oilseeds were found good gainer in showing positive growth with CGR in Production 7.11 percent, Area 3.49 percent Yield 3.62 percent with Instability 5.74. Rape & mustard was as major crop has positive CGR in all three criteria Production 8.86 percent Area 5.95 percent Yield 2.91 percent and Instability 8.40. All other oilseed crops Groundnut, Sesamum Castorseed and Soyabean were on gainer side in all respect except only sesamum which shown contraction in area with CGR -0.89 percent. Castorseed which was having less then one percentage share in area under the crop has highest instability in production it was 1272.46. In Taramira only contributing factor was productivity CGR was 11.87 percent for Production, was found contraction in area CGR with -0.51 percent and 10.80 percent for Yield and higher Instability 29.00. Sugercan was just like barley and jowar has contraction in area and production even rise in productivity CGR of production was -0.81 percent and of area -3.03 percent and instability was 4.79 which was lower. Fibres and Condiments & spices having positive CGR in all three segments. Fodder crops was also one of the important segment which was has positive CGR 1.45 percent and it was mainly because of yield with CGR 1.05 percent. Guarseed was main fodder crop and its production was having positive CGR 1.45 percent and in area 1.13 percent.

CONCLUSION

After detail discussion it can be concluded that among food grain only Bajara and Jowar was losing area under the crop in absolute term rest all crop are gainer and wheat was highest gainer in this segment. In proportion wise only wheat was significant gainer and maize can only holding its share other all crops including overall foodgrain, cereals and pulses are loosing continuously. In the oilseed and cash crops category all crops were gaining share in total area under the crop among them Rape & mustard was the main gainer in TE 60-61 share was only 1.51 percent which in TE 2010-11 became 10.83 percent. On the basis of these facts it can be said that cash crops and oilseeds were replacing cereals except wheat.

Decomposition of Compound Growth Rate (CGR) was supporting the same fact as emerged from cropping pattern. CGR for production was positive for those cereals was mainly because of growth in yield. Wheat and maize were having significant rise in area under the crop during the study period. Except Sugarcane all case crops were having positive growth in production mainly induced by area under the crop. Instability was lower in cereals except rise and higher in crops which were has lower share in total area under crop production.

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