

ANALYSIS OF TREND IN PRODUCTION OF MAJOR CROPS IN RAJASTHAN

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ABSTRACT

Rajasthan is the largest state of India constituting 10.40 percent of total geo-graphical area and 5.67 percent of total population of India. The state is divided into seven division and 33 districts. Agriculture and allied activities play an important role in state's economy. Though it's contributing in NSDP has significantly fallen in recent years, yet it forms the backbone of state economy. Shifting from one crop to another crop is also a strong tool to minimize the risk and maximize the profit of farmers. However the changes in the cropping pattern has significant impact on the livelihood of labor and farmers economy. To study the diversification in crops the cropping pattern has to be studied scientifically. Cropping pattern has been defined as the proportion of area under different crops at a particular period of time. A change in cropping pattern means changes in the proportion of area under different crops. In current study, the systematic effort has been tried to analysed the cropping pattern through time series data of production of major crops in Rajasthan. The change in pattern is analysed through graphically as well as statistically. The trend chart has been drawn to understand the pattern of production. Also the trend is compared in major crops through regression analysis.

Keywords: Cropping Pattern, Major Crops, Trend, Time Series Data, Regression, NSDP, Oilseeds.

Introduction

Agricultural sector has been the cornerstone of Indian economy. Its growth and development across the regions and crops is of crucial importance in ensuring food security, achieving self-reliance, supplying raw materials to industries and generating effective demand in the economy through linkages. However, despite concerted efforts by the government at the Centre through planned outlay, there has been little structural transformation of the Indian agricultural sector. Even today, about 55 percent workforce belongs to agricultural sector and contributes only about 17 percent to the Gross Domestic Product. Green Revolution during the mid-sixties gave a significant breakthrough in terms of increased productivity of agricultural crops, though it did not have an immediate impact across all crops, regions and farm size. Rajasthan, the prevalent state, is gifted with assorted soil & meteorological conditions containing of numerous agro-climatic state of affairs that supports the state to implement a specialized cropping pattern. "The state has India's prevalent production for crops namely mustard, pearl millet (bajra), and three spices (coriander, cumin, and fenugreek), cluster beans, isabgol and it is the second biggest producer of maize". The state has an extensive production capacity of vegetable crops as well. It is likewise partaking 11nd biggest masses of cattle amid Indian states subsidising approximately 10 percent of the nation's milk and 30 percent of mutton production. Varied cropping pattern & existence of cattle as a chief living cause has facilitated the state in handling the extensivesort of risks allied with arid land farming.

Cropping Pattern

The cropping pattern is a component of a few factors like climatic conditions, nature of soil, accessibility of water system offices, horticultural innovation, advancement of transportation, promoting and agro-based businesses. An adjustment in a few or these factors prompts an adjustment in the editing design. For the sane utilization of land and expanding the efficiency per unit of time by changing the means cultivating into market-arranged, change in editing design is important to tackle the food issues and give crude material to the agro-businesses (Sethi, 1989).The study of cropping pattern comprises a critical perspective inside the spatial element of horticultural topography as it gives a decent based to local arranging (Ali, 1985). Subsequently to attract a far reaching picture of trimming design Rajasthan it is beneficial to contemplate the region, creation and efficiency of significant harvests. It helps in arranging future systems for more creation it likewise assists with contrasting genuine present execution.

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Review of Literature

Garg, N. K., et. al (2014) have proposed a non-straight enhancement model for deficiency water system in their examination to amplify the net monetary return inside the accessible asset imperatives. The shortfall levels of water system are kept as factors in the model with an adaptability to keep the yields either at full water system or deficiency water system to augment the net monetary return. The editing design and ideal shortfall levels of various harvests changed as the surface water accessibility is diminished. Further, a reasonable ideal creation of harvests would require forcing upper and lower imperatives on the amount of the creation of yields instead of harvest zones under shortage water system. Ghosh, B. K. (2011) inspected changes in pattern of cropping of Indian horticulture during the time frame 1970-71 to 2006-07 in their examination. As far as Herfindal list and replacement and development impacts, the focus and additionally expansion uncovers that the editing design in India regarding allotment of land is slanted towards food grains. Nonetheless, not many non-food grain money yields like cotton, sugarcane, oilseeds, and vegetables have arisen as mainstream crops among the ranchers as of late. Rahaman, H. (2020) inspected crop enhancement procedures in order to guarantee manageable rural improvement across various land-size classes, with an emphasis on Malda District in West Bengal, India. Mandal, R. (2010) recognized that common floods in Assam cause insecurity in farming creation. To stay away from crop misfortunes because of successive floods numerous ranchers have embraced a danger loath methodology by a proper mix of harvests. This has prompted a decrease in the land portion of kharif food grains and a relating increment in rabi food grains and vegetables. This article investigates if such a technique is spread over the entire state or is confined to a couple of pockets. It additionally examinations how and how much flood inclination has affected the decision of trimming example of the ranchers of Assam. Rani, S. (2019) analyzed the sequential drift in cropping pattern and its effect on land & water efficiency in Haryana state of India throughout 1967–2016. “Area, production and yield data of the main crops of both kharif (monsoon) and rabi (winter) seasons were collected from the Department of Agriculture of Haryana”. Terrestrial efficiency, water output, cumulative land & water yield were figured for the study zone. The conclusions exhibited a growth in land & water yield of entirely harvests in previous 49 years, nevertheless growth rate has vanished. Foremost degeneration was set up in rice & wheat output. Cumulative land & water output (in fiscal expressions) has publicized a constructive inclination, signifying that agriculturalists are being paid more revenues out of a unit of land & water. Notwithstanding, from agronomic point of view, the arising editing design isn't economical over the long haul, particularly rice crop. Hence, an expansion in water profitability is needed, as water is turning into a scant asset nearby. The investigation would be useful for dealing with the land and water assets for an economical trimming framework.

Research Methodology

To analyze the cropping pattern, time series data of production of major crops in Rajasthan has been used. The change in pattern is analyzed through graphically as well as statistically. The trend chart has been drawn to understand the pattern of production. Also the trend is compared in major crops through regression analysis. Time series secondary data has been extracted from the published annual reports of “department of Economics and Statistics, Rajasthan” from year 1952-53 to 1915-16 of 64 years.

Results

Statistical results and inferences have been outlined as under:

Results of Descriptive Statistics

Table 1: Descriptive

Descriptives				
Year	TOTAL CEREALS	TOTAL PULSES	TOTAL FOODGRAIN	TOTAL OILSEEDS
CAGR	2.79%	2.22%	2.71%	6.08%
Mean	78.79	14.12	92.88	19.67
SD	47.37	5.84	51.35	20.40
CV%	60.12	41.35	55.29	103.75

With CAGR of 6.08%, Total Oil seeds have shown highest growth during the course of time followed by 2.79% of growth by total cereals and 2.71% of CAGR by Total food grain. Total food grain was also found well ahead than total cereals, total pulses and total oil seeds with mean production of 92.88 metric ton. Highest variance was observed in total oil seeds production (C.V., 103.75). With least standard deviation and variance, total pulses production was found most consistent.

Regression Analysis

“Linear regression model technique is used to analyze the trend of production of total cereals, total pulses, total food grain and total oilseeds during the course of time. Significance of model is tested through ANOVA”.

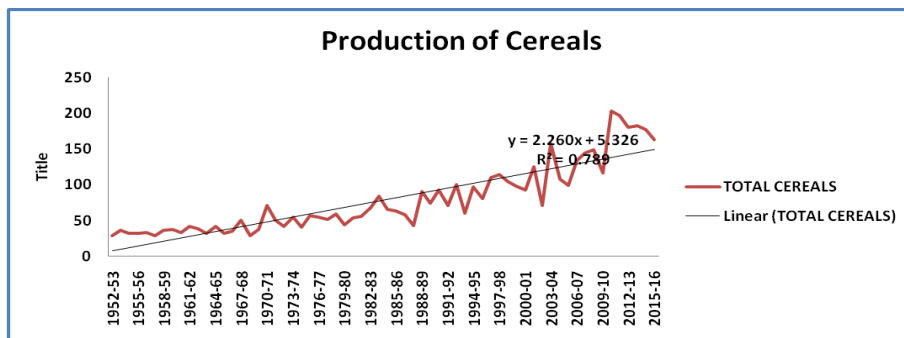
Table 2: Regression Models Summarized

Dependent Variable	Predictor	R SQ Value	ANOVA		Beta coefficient
			F value	P value	
Total Cereals	Time	.789	232.409	.000	2.260
Total Pulses	Time	.197	15.228	.000	.139
Total Food Grain	Time	.757	193.634	.000	2.401
Total Oilseeds	Time	.809	262.945	.000	.986

R² for “total cereals, total pulses, total food grain and total oilseeds” were 0.789, 0.197, 0.757 and 0.809 respectively that consequently indicates selected independent variable (Time) have 78.9%, 19.7%, 75.7% and 80.9% impact on Dependent variables i.e. “total cereals, total pulses, total food grain and total oilseeds”. ‘P’ value is less than 0.05 which reflects its significance; it means Dependent variables (“total cereals, total pulses, total food grain and total oilseeds”) are more consistent with the time. Beta for total food grain was (2.401) highest among all dependent variables showing total food grain production more consistent as compared to total cereals, total pulses and total oilseeds.

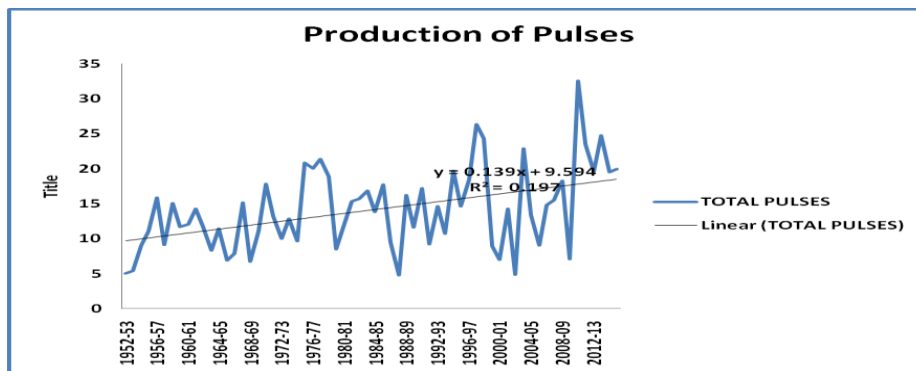
Trend Graphs with Regression

- Production of Cereals**



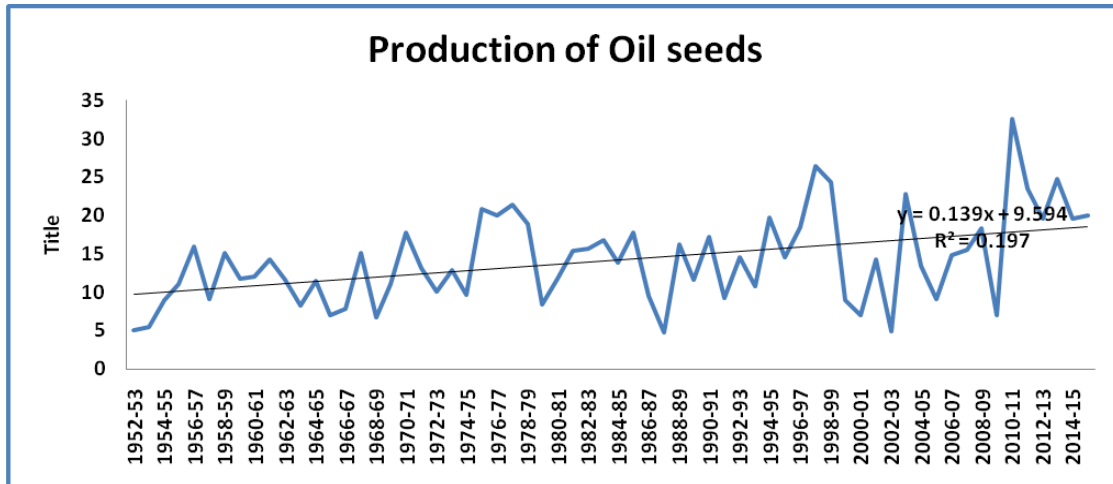
Stagnant growth was observed in the production of cereals in initial years till 1965, then with volatility in nature it has increased to a certain extent somewhere in between year 2003-04 to year 2006-07. Overall in the year 2012-13, a significant rise was observed in the production of cereals.

- Production of Pulses**



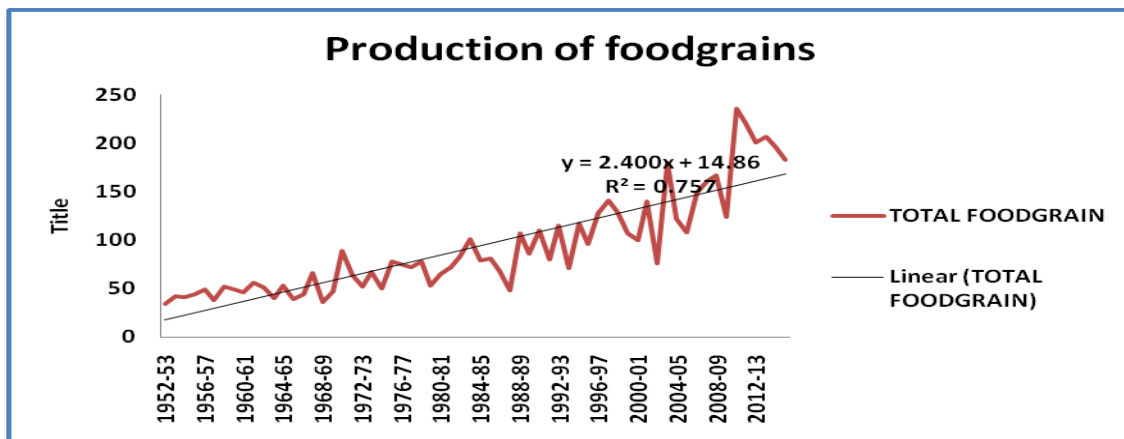
Much more ups and downs were realized in the production of pulses throughout the study period however it was observed that production of pulses has bounced back from every year when it fell to an extent. Year 1977-78, 1997-98 and 2010-11 were the exceptional years for the most production of pulses.

- **Production of Oil Seeds**



A high range of volatility was observed in the production of oil seeds during the study period. Year 1976-77, 1997-98 and 2010-11 were the years when the production of oil seeds was found at its best. Year 1987-88, year 2002-03 and 2009-10 have seen huge downfall as well.

- **Production of Food Grain**



On a brighter side production of food has shown much consistency as compared to other crops in the state during the study period. Since 1996-97 it has shown a remarkable recovery in the trend and touched new heights in year 2010-11.

Conclusion

Cropping pattern is described as a combination of agrarian harvests that are grown in a precise topographical zone. Changing cropping can be seen as the changes occurred in assessment of production beneath diverse crops to agronomic zone. "Cropping pattern" changes over years with the development of agriculture. These types of changes are mostly characterized by an increasing trend towards commercial crops. Total Oil seeds have shown highest growth with CAGR of 6.08%. Total food grain was found well ahead than total cereals, total pulses and total oil seeds with mean production of 92.88 metric ton. With least standard deviation and variance, total pulses production was found most consistent.

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