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Challenges and Problems Faced by Rajasthan in Attaining Self - Reliant Agrarian Economic System

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Abstract: ***Agriculture plays the vital role in India's social security and overall economic development. It plays dual role in the abolition of hunger – it produces the food and also produces a great number of jobs needed to earn livelihood. Agriculture is a strong option for spurring growth, overcoming poverty and enhancing food security. The present study tries to trace out the trends in the production and productivity of food grain in Rajasthan over the last 36 years with the help of five year moving averages. It was found that the trend is more or less constant which clearly indicates the over the last 36 years agriculture sectors remains stagnant in Rajasthan. The impact of technological and scientific advancement is of no or limited use in the agricultural sector. As the growth rate of production of foodgrain in the state lagged far behind the population growth rate. This is a challenge and warning for the future. In order to attain a self - reliant economy strong agrarian economy is needed.***

Keywords: Agriculture, productivity, foodgrains, moving average, trend, self - reliant economy.

1. Introduction

Agriculture plays the vital role in India's social security and overall economic development. It plays dual role in the abolition of hunger – it produces the food and also produces a great number of jobs needed to earn livelihood. Since agriculture is the single largest employer, raising productivity can immediately place an additional purchasing power in the hands of the rural poor, who will in turn helps in the development of the overall market of the goods and services. Apart from this it also helps in the development of the overall market of the goods and services. This also helps in the development of agro – based industries and services. Thus agriculture sector has strong backward and forward linkages. [1]the same is the scenario with the Rajasthan, the largest state in the country having a unique combination of geographical and cultural diversity. Agriculture forms the backbone of the Rajasthan economy by contributing around 26% in the GSDP, and providing livelihood to around two – third population. It has been considered as one of the most important attribute for the rural development and without agriculture growth we cannot even think of an economic development of a state like Rajasthan.

Agriculture is a strong option for spurring growth, overcoming poverty and enhancing food security. Economic understanding of the process of agriculture development has made substantial advances over the last half century over the world. In the early post world war - II literature, agriculture was viewed as a sector from which resources could be extracted to fund development in other sector (Lewis, 1954; Rostow, 1956; Rannis& Fie, 1961). Growth in agriculture sector was considered as a precondition of growth but the process by which agriculture growth was generated remained outside the concern of most of the development economists. Later the *Environmental pessimists* have proved that environmental factor provide a base and determine the agricultural productivity. This dependence of agricultural sector on the natural factor resulted in low productivity and also the inverse relationship between the farm size and output per acre (Brown, 1994).

In order to overcome the environmental productivity constraints a package of technological measures like irrigation, fertilizers, High Yield Variety Seeds (HYVS) and mechanization has been adopted. This has increased the farm productivity. This was the approach of new modernists according to whom the growth in the productivity is a result of transition of agriculture sector from natural resource based to science based system of production (Borlaug, 1992). India as well as Rajasthan has witnessed the same transition after mid 1960's which is well known as the 'Era of Green Revolution. ' The so - called green revolution of the 1960s and 1970s helped boost agricultural productivity, but did not conduce to a sustainable management of natural resources, and neither to food security for many of the regions. This has made the present agriculture system unsustainable and this problem is very severe in Rajasthan. The impact of scientific green revolution in Rajasthan is passable but we cannot say confidently that we have achieved an absolute self - sufficiency in terms of food grain production due to existence of poverty, malnutrition and hunger. The policy reform alone cannot raise the agriculture growth. As in the arid zone, rainfall is the most important factor determining the agriculture activities, thus nearly more than 65% of the Rajasthan depends directly on the mercy of monsoon. Thus mere adaptation of green revolution techniques cannot solve our problem, but should be accompanied by proper budgetary allocation and right kind of public investment (Robert E. Evenson et al.1999).

Objective of Study

i) To trace out the production and productivity trends of agricultural output especially in case of food grains in Rajasthan and general trends of the per hectare consumption of fertilizers; irrigation pattern and the average rainfall.

[1]Swaminathan, M.S. 1995. Population, environment and food security.*CGIAR Issues in Agriculture 7*.CGIAR, Washington, DC.

ii) To draw the attention on the major challenges and problems facing by the Rajasthan in attaining self - reliant agriculture system.

2. Data and Methodology

The present study is completely based on the secondary data which has been collected from different sources like - Agriculture Statistics of Rajasthan; Statistical Abstract of Rajasthan and Basic Statistics of Rajasthan.
The whole study is based on the time series data covering a period of 1984 - 2020 i. e.36 years which includes both pre - reform and post reform period of the Rajasthan.

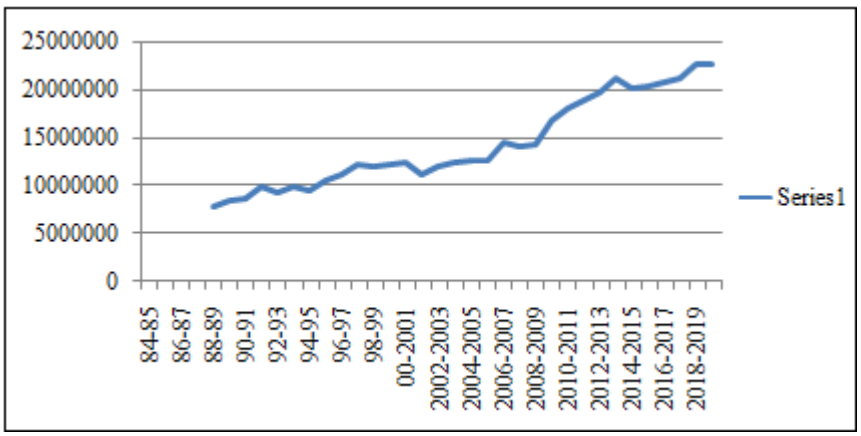
In order to find out the agriculture productivity yield per hectare has been taken, irrigation intensity is calculated as net irrigated area upon net sown area. To analyze the impact of rainfall on agriculture average annual rainfall has been taken in the present study.

In order to analyze the trends of agriculture production and productivity Moving Averages has been calculated with an interval of five years.

Trend Analysis
Any change in the agriculture sector positive or negative has a multiplier effect on the entire economy. Agriculture sector acts as a bulwark in maintaining food security and in process provide national/state security as well. After remaining a food deficit country for about two decades after independence India has not only become self - sufficient in food grains but now has a surplus of food grains. This all happened due to adoption of improved production technologies like irrigation facilities, fertilizers etc. But still the position of Rajasthan in the agriculture sector is not good. The main reason for such weak position is both ecological and infrastructural bottlenecks. After 1970's in Rajasthan also agricultural reforms took place. The results of such reforms are satisfactory but not sufficient to solve the existing problem.

In the present study by applying moving averages with five year interval an attempt has been made to trace out general trends of food grain production and productivity and also the trends of major inputs like irrigation facilities, fertilizer consumption and average rainfall. The main findings of the study are as follows:

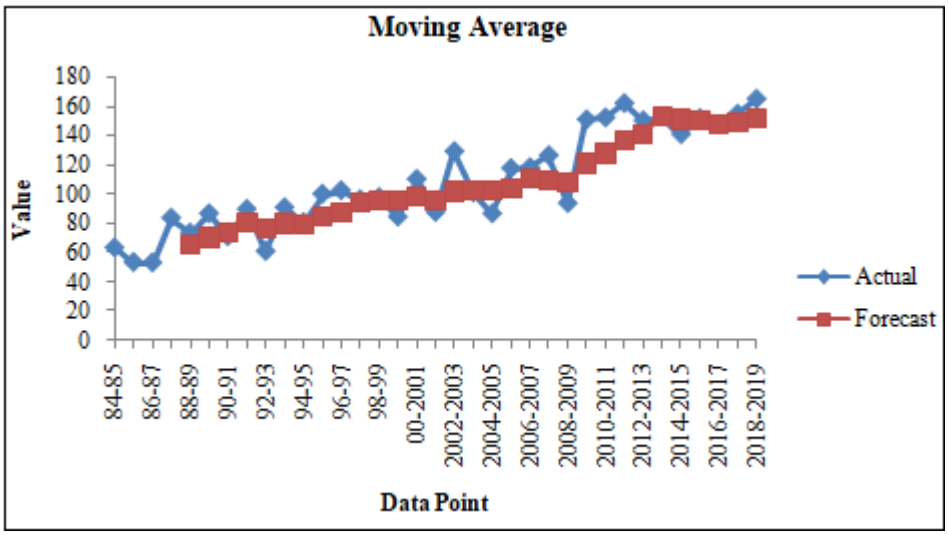
Total Production: The food grain production for the period 1984 - 2020 in Rajasthan follows a general increasing trend with slight fluctuations (as shown in fig (i)). Initially from 1984 - 85 to 1988 - 89 the food grain production dips down but after 1989 there was a general increasing trend in the food grain production.2013 - 14 shows the highest growth than with a slight dip after 2015 - 16 there is again an increasing trend in the production level.



Source: computed

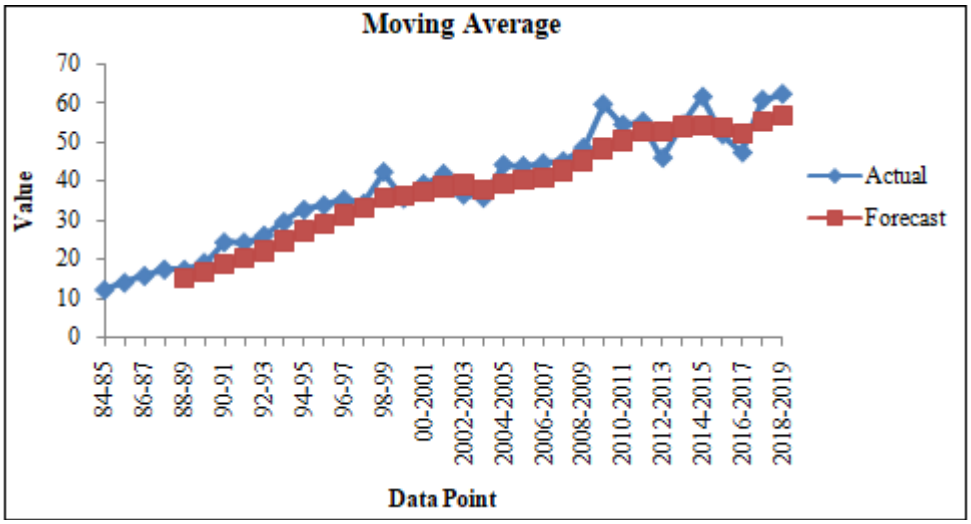
On an average the production level of food grain in Rajasthan for the last 36 years show a very nominal growth rate of 3.45% per annum.

Yield: over the past 36 years in Rajasthan the general trend in the yield of production shows a very stable graph. The five year moving average trend shows that from 1984 to 2010 there is a constant slope in the trend line. In the year 2010 - 11 the trend line has shown a slight increasing trend which later in the year 2014 - 15 again becomes constant.



Source: computed

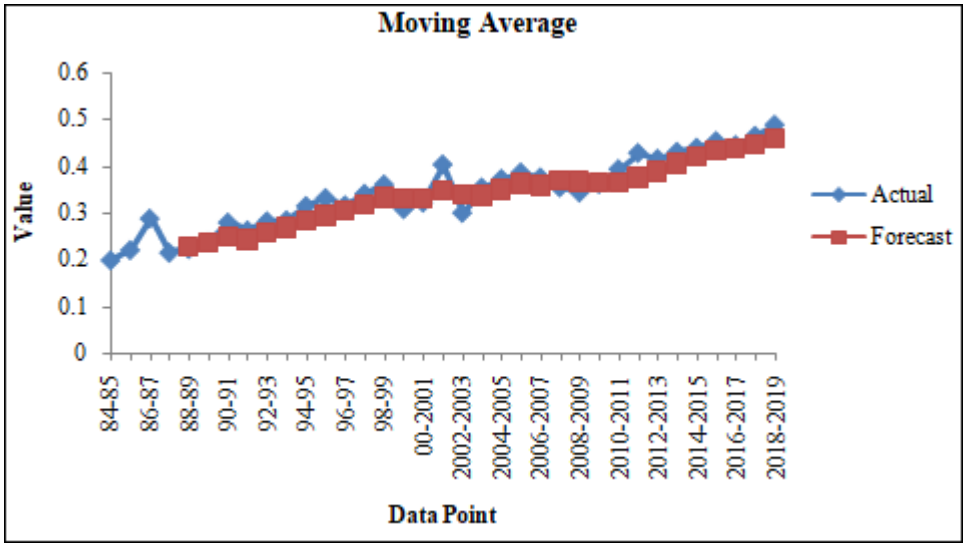
Fertilizer consumption: It is clearly visible from the chart below that there is general rising trend in the fertilizer consumption pattern in Rajasthan from the last 36 years.



Source: computed

Irrigation: Changes take place in the development of total and source wise irrigation over the years. The major sources of irrigation in Rajasthan are canals, tanks, tube - wells & wells. The wells and tube - wells alone contribute around 70% of the total irrigation. The rate of expansion of ground water irrigated area are phenomenally high than rest of the sources. Canals, tanks and other source of irrigation in Rajasthan have more or less constant trends. Net irrigated area to the net sown area has an increasing trend due to expansion in wells and tube - wells over the years

Irrigation Intensity Trends



Source: computed

Challenges in the path of Self Reliant Agraian System

High demographic growth and rapid development of economic activities have resulted in an agriculture intensification process to increase food production. Much has been achieved in the agriculture sector as a result of green revolution and other programmes undertaken by the state for increasing agriculture production particularly in relation to foodgrains. The state has proceeded towards modernization of agriculture to some extent. As a result the state showed an impressive gain in crop productivity during the last three decades. The growth in the foodgrain production during the period 1984 - 2020 was contributed mostly by the growth in crop productivity as area under foodgrain has not shown any significant increase. But still the growth rate of production of food grain in the state lagged far behind the population growth rate. This is a challenge and warning for the future.

The agricultural economy of Rajasthan is highly unstable and should be stabilized. In the years of good crops, poverty - levels automatically go down in rural areas. Rural welfare and standard of living depends largely on agriculture performance in rural areas. So it is very important to develop and stabilize the agriculture sector. For doing this development of irrigation system is must. Many studies have proved that in arid & semi - arid regions better irrigation can improve economic returns & can boost production by up to 400 percent. On the other hand some studies have also showed that around 1/3rd of the world's irrigated lands have reduced the productivity as a consequence of poorly managed irrigation system. This mostly happened in water scarce environment where water resources are accessed through the desalination of sea water & highly brackish ground water; harvesting of rainwater; and use of marginal quality water resources for irrigation which consists of waste water, agriculture drainage water and groundwater containing different types of salts. The introduction of irrigation in arid and semi - arid environments inevitably leads to water table variations and often to the problems of water logging & Salinization.

In Rajasthan the impact of irrigation is insignificant on agriculture productivity and production. Though there is an increasing trend in the irrigation facility but there is still great pressure to increase irrigation facilities in both semi - arid and arid regions. From the trends obtained it is clear that Rajasthan's irrigation system is dominated by wells and tube - wells. Due to this underground depletion is increasing significantly (Jaipur, Jodhpur &Bharatpur region). For small and marginal farmers this situation is more crucial as their affordability for electric pumps are less.

In case of canal irrigation the general trend shows a very slow growth rate and even in this situation due to improper irrigation management and lack of knowledge among the farmers; Rajasthan has to face problems of water logging, salinity and alkanity of soil (Indra Gandhi canal regions & Chambal canal region). Due to which results from irrigation facilities on agriculture productivity and production are not economically and socially favorable.

Better irrigation facilities will even raise the fertilizer use, as increase in water availability will reduce the dependency on monsoon and reduce the risk of a farmer. The results of the above study show an increasing trend of fertilizer consumption in Rajasthan, which is mostly the chemical fertilizer. The nutrients supplied by the fertilizers will increase the crop productivity; so an increase in there uses will definitely have a positive effect on our agriculture sector. But many studies indicates the harmful effects of the excessive use of chemical fertilizers on both human and soil health, because of this, there is a proverb in Japan, "Chemical fertilizer is beneficial for father but harmful for child. " Excessive and imbalance use of chemical fertilizer may decrease the organic carbon of soil; reduce its microbial flora, increase acidity and alkanity. Apart from this heavy subsidies on them also made its use unsustainable for the economy.

A popular peasant saying that "abundance of water destroy life, paucity of water destroy life" shows significant agricultural link with monsoon. As the monsoon in Rajasthan is inconsistent, the dependency of agriculture sector on the rainfall is a matter of worry. Due to this fluctuations in both production and prices are found in the market making marginal farmers more vulnerable.

So the major challenge today in front of Rajasthan to achieve the goal of self reliant agrarian economy today is the optimum utilization of the biophysical and human resources present in the society.

3. Suggestions

In a predominantly agricultural system, the objective of achieving a self reliancecan be achieved only when an integrated approach has been adopted which focus on the minimum use of external inputs, optimum use of internal resources or on the combination of both. It should be emphasized that this does not means a return to some sort of low technology or traditional practices are advocated here. It simply means that a judicious mixture of scientific innovations together with the experiences of the farmers must be taken into consideration which is both economically and ecologically profitable for the society. And it is not just about food production, but about increasing the capacity of rural people to be self - reliant and sustainable which will help in building a strong rural organization and economy.

In order to achieve the above said goal the first step is to harness the benefits of the irrigation for which a paradigm shift in the policy formation is needed which should involve sustainable water management & dry farming methods; enhancement of minor & medium irrigation system; up gradation and maintenance of traditional community irrigation system; efforts should be made to recharge the groundwater & minimizing the surface run - off; people must be trained & encouraged to adopt rain water harvesting techniques, drip irrigation techniques and the use of sprinklers. For doing so PPP (Public Private Partnership) model should be adopted.

The importance of the fertilizer on the agriculture productivity is high as is proved in the present study. So we cannot afford to neglect it. It is better to train and educate farmers about the proper application of chemical fertilizers. We can also introduce the alternatives of chemical fertilizers like organic fertilizers & manures to the farmers in order to check & control the overdose of chemical fertilizers.

In order to reduce the dependency on monsoon government should adopt the 'Climate Risk Management' at the grass root level for which Panchayati Raj Institutions must be empowered. This will also need a shift in the government expenditure policy regarding agriculture. At least 5% of the total government's outlay must be diverted towards the agriculture sector but it should not be in the form of subsidies. Instead of subsidies expenditure should be done on training centers, vigorous campaigns, research and development activities, and on the market development. Apart from this multiple cropping pattern must also be adopted.

So long term measures are needed to be drawn for improving the efficiency of resources use. On the one hand, this would require reallocation of crop area in such a way that the long term sustainability of the crop system is ensured in every agro climatic environment. On the other hand, continuous technical upgradation of the crops most suited to the agriculture environment of the state would be required. Together with this overall infrastructural development (both physical and social) is needed. By doing so we can easily achieve our target of 'Self - Reliance Sustainable Agriculture Sector'.

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