

# Agricultural Productivity in India: Trends, Challenges and Suggestions

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**Abstract:** India is predominantly an agricultural economy. Agriculture is the backbone of Indian economy. Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India, more so in the vast rural areas. It also contributes a significant figure to the Gross Domestic Product (GDP). Generation of surplus from agricultural production will ultimately depend on increasing the agricultural productivity. Various studies have been conducted related to agricultural productivity. The present study is conducted with the objective to analyze the trend and patterns of agricultural productivity of main food grains, causes of low productivity, to put light on various schemes started by government and for providing suggestions for policy implications. Data is collected from secondary sources like reports, ministry of agriculture and farmer's welfare as well as Reserve Bank of India publications. It was observed that there is a low pace of agricultural productivity as well as there is lack of finances. Suggestions are given for further policy implications for increasing productivity after reviewing causes of low pace of productivity or downward trends in agricultural production.

**Keywords:** productivity, growth, agriculture, sustainability

## 1. Introduction

Agriculture is the core sector of Indian economy; it accounts for about 34.8 percent of the national income and provides livelihood to 66.7 percent of the working population of the country. Agriculture is commonly grouped with farming, mining, forestry and fisheries under the head of primary industries. The importance of agricultural sector of the economy, rich/poor, is borne out by the fact that it is primary sector of the economy which provides the basic ingredients necessary for the existence of mankind. History of economic development of various advanced nations shows that development of their secondary and tertiary sector to some extent was preceded by the development of agriculture. Agriculture is the backbone of our country. Major part of country's income /population earns its livelihood from agriculture. It has also been the source of raw materials to our leading industries such as sugar, cotton, jute, textiles, hydrogenated oils, soap and other agro-based industries which together accounts for 50 percent of the income generated in the manufacturing sector in India. A sustained and wide spread agricultural growth is pre condition of development of a country like India which is an agrarian economy. The slow growth in agriculture whether allied or non allied can be of great strain for the economy. While agriculture's share in India's economy has progressively declined to less than 15% due to the high growth rates of the industrial and services sectors, the sector's importance in India's economic and social fabric goes well beyond this indicator. First, nearly three-quarters of India's families depend on rural incomes. Second, the majority of India's poor (some 770 million people or about 70 percent) are found in rural areas. And third, India's food security depends on producing cereal crops, as well as increasing its production of fruits, vegetables and milk to meet the demands of a growing population with rising incomes. To do so, a productive, competitive, diversified and sustainable agricultural sector will need to emerge at an accelerated pace. India is a global agricultural powerhouse. It is the

world's largest producer of milk, pulses, and spices, and has the world's largest cattle herd (buffaloes), as well as the largest area under wheat, rice and cotton. It is the second largest producer of rice, wheat, cotton, sugarcane, farmed fish, sheep & goat meat, fruit, vegetables and tea. The country has some 195 m ha under cultivation of which some 63 percent are rain fed (roughly 125m ha) while 37 percent are irrigated (70m ha). In addition, forests cover some 65m ha of India's land (world bank report)

At present in terms of agricultural productivity India hold second position. The agricultural production in India comprises of field crop, fruit plantation crop, livestock, forestry, fishery etc. but the pace of productivity is low in recent years, even many initiatives has been led by the government. Many schemes like RKVY, NADP, were launched by government to cope up with the problem of slow pace of agricultural growth. India has wide capability to produce wide range of agricultural and allied products. Major crops of the area are paddy, wheat and maize. Manpower is also available in sufficient quantity which can be utilized properly for overall development of agricultural sector. Production of agriculture and allied sector has not been increasing over the past years which are major concerns for the authorities. Swot (strength's, weakness, opportunities and threats) analysis reveals the need and potential of implementing different extension activities and need based projects to achieve the vision for the district. The productivity of crops of has been declining which discourage the farmers from investing in the farming, there is a significant gap between actual and attainable yield. Agricultural production measured in terms of crop yield per hectare is comparatively low (census 2011).

## 2. Review of Literature

Various studies have been conducted related to challenges and problems faced in agriculture. Different authors have

different views regarding challenges, trend, and causes of low productivity.

**Lopamudra (2015)** studied the linkage between the structural technological and institutional policy reforms and sustainable agricultural development. Although India has achieved a significant growth rate but still suffers from agricultural distress. In this paper it was tried to assess the present trend of agricultural productivity and its future aspects. Secondary data used to explore the trends and various initiatives taken by government. It is observed that with the support of government and private interference the goal of sustainable agriculture can be achieved.

**Sudha Narayana (2015)** conducted a study with the objective to examine the relationship between formal agricultural credit and agricultural output in India, especially the role of formal agricultural credit in supporting agriculture using the state level panel data covering the period 1995-96 to 2011-12. It was found that over this period all the inputs are highly responsive to an increase in institutional agricultural credit, but study suggests that success of credit in enabling the increase use of purchased inputs and also changing the face of agriculture in India has not fully translate into agricultural growth.

**Singh and Paul** examine the changing pattern and sources of agricultural growth in India. It was seen that there was an increasing trend towards commercialisation and diversification of agriculture. It was observed that most of the output growth in recent years was realized through productivity growth. They also suggested that continued government support for agriculture, research and development and higher public investment in infrastructure are welcome step in increasing agricultural productivity.

**Jenifer et al.** Evaluated research led technological change in agriculture generates sufficient productivity growth to give high rate of return in Africa and Asia and has substantial impact on poverty.

**Research gap:-** various studies are conducted with the different objectives like assessing the trend of agricultural productivity, role of government in achieving goal of sustainable agriculture, put light on various government initiatives made, role of technology. But present paper deals with trend and pattern of productivity, area under cultivation of food grains, direct finances from various sources to agriculture, various ongoing plans of government related to agriculture, causes of low pace of productivity of food grains, major determinants of agricultural productivity and to give suggestions for policy implications.

### 3. Objectives and Methodology

The present study is based on secondary data. Secondary data is collected from various governments of India reports, RBI reports, Ministry Of agriculture reports, books, articles and economic survey of India. The present study is conducted with the objectives:-

- Major determinants of agricultural productivity.
- To analyze the trend and pattern of agricultural productivity of main food crops.
- To assess the causes of low productivity.
- To examine the sources of agricultural finances.
- To provide suggestions to overcome the problem faced the by the agriculture.

#### Hypothesis

Commercial banks are the major source of agricultural finances in India.

#### Status of Agriculture

Land holdings status(,000)					
Marginal farmers	Small farmers	Semi-med farmers	Medium Farmers	Large farmers	Total
No.	No.	No.	No.	No.	Area
92826	24779	13896	5875	973	138348

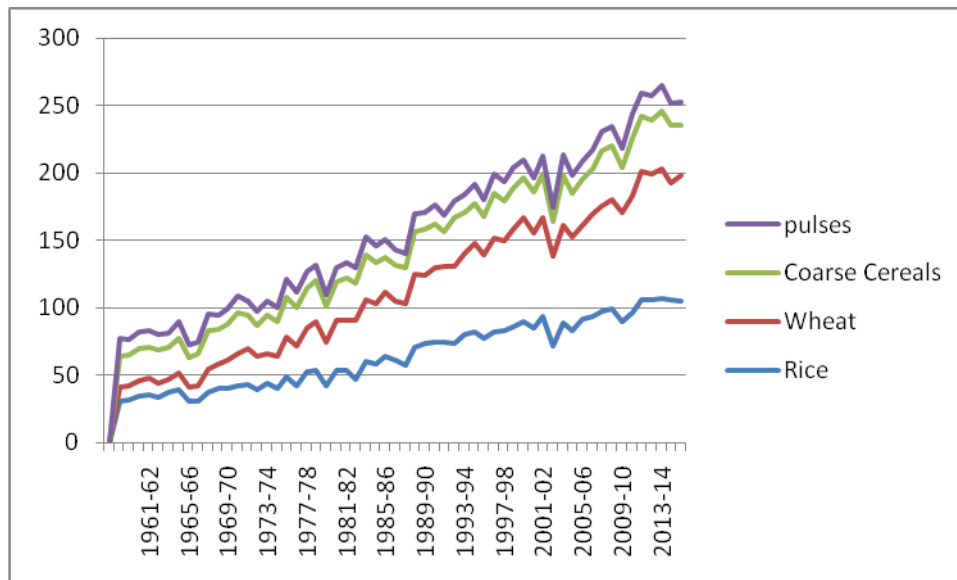
Source: Ministry of agriculture report (2010-11)

#### Various ongoing plans:

- 1) District plan for demonstration of scientific technology in agriculture
- 2) Upgrading animal husbandry sector
- 3) Irrigation schemes
- 4) Soil conservation schemes
- 5) NWDPPRA
- 6) Seed village programme
- 7) Bamboo mission
- 8) ISOPOM
- 9) MGNREGA
- 10) National saffron mission
- 11) Horticulture technology mission
- 12) Macro management mode(MMM)

#### Schemes launched with the objectives:

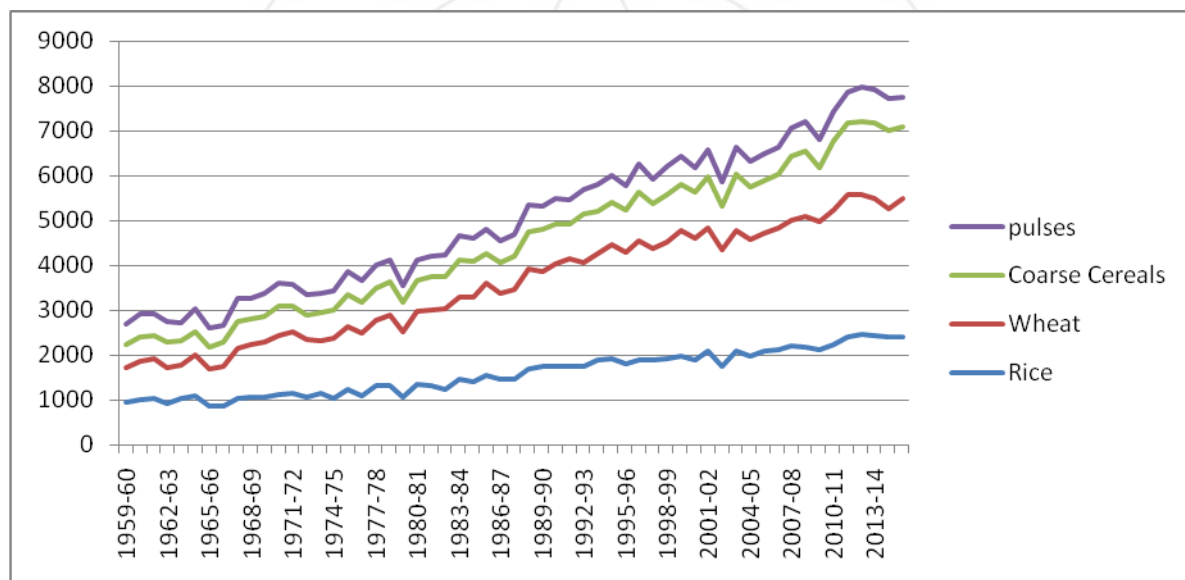
- To incentivize state for increasing public investment in agriculture and allied sector
- To ensure that plans are prepared and are based on agro-climatic conditions, availability of technology and natural resources.
- To reduce the yield gap in main crops.
- To increase production and productivity.
- To ensure the local needs, crops / priorities are better reflected in the agricultural plans.
- To provide flexibility and autonomy to states in planning and implementation of agriculture and allied sector schemes
- To maximise income of farmers.



**Figure 1<sup>st</sup>:** Trend of production major food grains (million tonnes)

**Source:** Fourth revised estimates for 2015-16, handbook of statistics and Indian economy

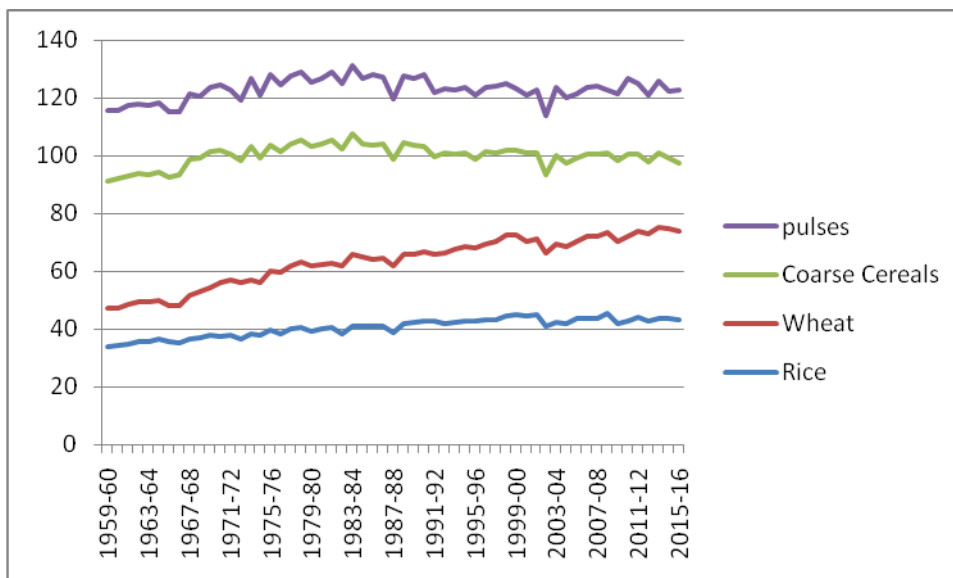
**Figure 1<sup>st</sup>** suggests that there is increase in production of food grains but increasing at a low pace which is one of the problem of agriculture these days , especially of rice from 1961- 2014 as compare to pulses and coarse cereals .



**Figure 2<sup>nd</sup>:** Trend in yield per hectare of major food grains (kg/hectare)

**Source:** Fourth revised estimates for 2015-16, handbook of statistics and Indian economy

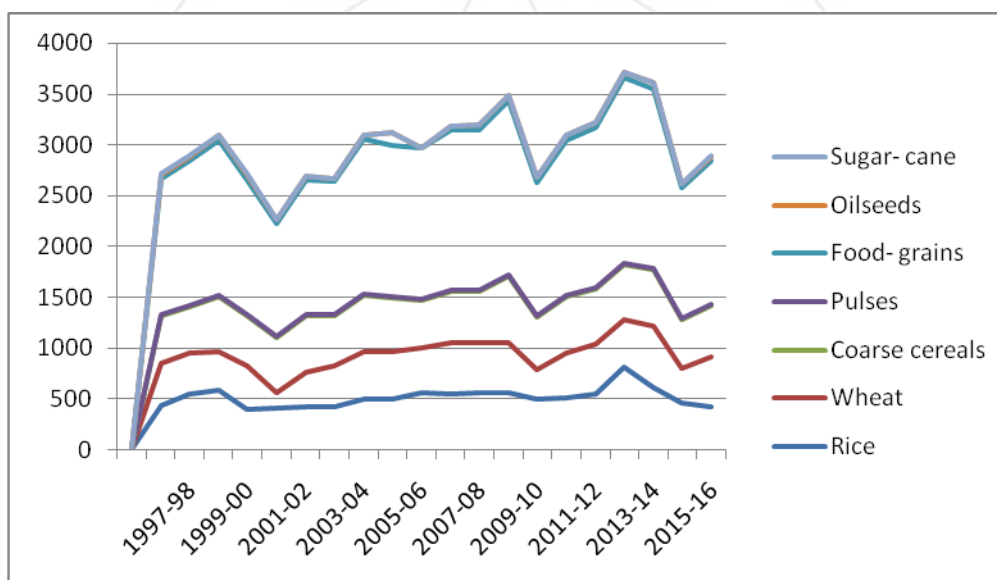
**Figure 2<sup>nd</sup>** suggests that yield per hectare of major food grains has increased from 1960's to 2014 but increasing at a low pace, that is productivity is low again one of the challenge that Indian economy is facing . As India is agricultural economy, for growth there is need of more production there is need of high productivity. As we can asses from the trend graph that there is low productivity of crops which is in need to tackle/ enhanced with suitable policy or initiatives by the government and support of farmers.



**Figure 3:** Trend in area under cultivation of major food grains (million hectares)

**Source:** Fourth revised estimates for 2015-16, handbook of statistics and Indian economy

**Figure 3<sup>rd</sup>** suggest that area under cultivation of major food grains has not increased in the recent decades, which is one the cause of low production of food grains, need to be tackle down.



**Figure 4<sup>th</sup>:** Production of Jammu and Kashmir of food grains as well as non food grains

**Source:** Fourth revised estimates for 2015-16, handbook of statistics and Indian economy

Figure 4<sup>th</sup> represents that production of food grains as well as non food grains increased but at a low pace. This figure shows the trend of production of food grains as well as non food grains of Jammu and Kashmir. It is observed the there is a gap between actual production of food grains and estimated production of food grains, low productivity of crops as compare to other non food grains , commercial crops etc....

**Major constraints leading to yield gap are:**

- Low availability of quality seeds/ stocks / organic manure
- Bio pesticides, fertilizers etc
- Non standardization and non adoption of improve production practices
- Lack of technical know how
- Poor economic conditions

- Low risk bearing availability
- Slackness towards agriculture on part of farmers
- Fragmented Small land holdings
- Depleting soil fertility
- Declining water table in particularly irrigated areas.
- Rising cost and diminishing economic returns.
- Decline in factor productivity.
- Slow pace of diversification
- Lack of farm financing
- Lack of marketing awareness
- Excessive pressure of population on land
- Land degradation
- Defective land tenure system.

### Regression Results

Application of econometric model to analyze out of different sources to agriculture which is most significant one. After taking time series data (1978 to 2016) of direct finances to agricultural sector by regional rural banks, commercial banks and cooperative banks, using simple regression model results are as follows.

$$Y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \mu$$

Where  $y_i$  = total agricultural credit

$x_1$  = finances from cooperative banks

$x_2$  = finances from scheduled commercial banks

$x_3$  = finances from regional rural bank

$\mu$  = error term

Summary Output	
<i>Regression Statistics</i>	
Multiple R	0.9958478
R Square	0.9917129
Adjusted R Square	0.9909816
Standard Error	75.946895
Observations	38

- 1) It was found that finances from SCBs (scheduled commercial banks) are highly significant as 5% significant value, one unit change in finance by SCB's leads to 1.63 units change in agricultural growth or output.
- 2) Again there is a positive relation between finances from co-operatives but they are not statistically significant.
- 3) R square value is closer to 1 that is the sample data actually fits the model. It represents the goodness of fit, how well sample data fits the model.
- 4) Null hypothesis has been accepted.

### Major determinants of agricultural productivity

- Finances / credit to agricultural sector
- Input like fertilizers , pesticides
- High yielding variety of seeds
- Farm mechanization
- Rainfall
- Irrigation facilities
- Incentives to farmers
- Minimum support price
- Consolidation of land holdings
- Awareness campaign/ programme
- Proper transfer of technology/ technical knowhow

### Suggestions for policy implications

- There is need to conduct scientific demonstrations and awareness camp infrastructure facilities at block levels
- Departmental facilities in both agriculture and allied sectors need to be enhanced for better delivery of services to the farmers.
- Management of soil health and fertility is very important aspect to be paid keen attention to enhance productivity.
- Promotion of use of integrated nutrient management.
- Promotion of organic farming
- Integrated pest management

- Agriculture mechanization
- Skill development and capacity building
- Formation of self help groups
- Strengthening of transfer of technology
- Better credit facilities
- Introduction of cooperative farming and marketing
- Betterment of warehousing and distribution facilities
- Population control.

### 4. Conclusion

After assessing the secondary data related to trend of area under cultivation of major food grains, yield per hectare, and production of major food grains from reports of Ministry of agriculture and Farmers welfare, 4<sup>th</sup> revised estimates of output of Reserve Bank of India, publications, newspapers etc. It has been observed that the data is showing a slow trend of increase of production, fall in area under cultivation, low rate of yield per hectare. These are the issues that Indian agriculture is facing these days most commonly low productivity of crops. These need to be sort out with the support of government by taking new initiatives as well as investments from private sector, cooperation of farmers, awareness campaign and last but not the least spread of education related to crops, seeds, fertilizers, irrigation, diversification.....etc.

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