Effect of Green Revolution on The Agricultural Sector of India

INTRODUCTION

I study the impact of Green Revolution which was done in India in 1967/68 and 1977/78. The aim of this study is to find out whether Green Revolution had a positive impact on the agricultural sector of India or not. I have used the data of area under cultivation of food grains and the data of agricultural production from 1950 to 2021.

Literature Review

The **Green Revolution in India** began in the mid-1960s marking a transition from traditional agriculture in India and the introduction of high-yielding varieties of seeds and the associated agricultural techniques. The need for introducing the Green Revolution in India arose due to a shortage of food-grains in part due to the legacy of colonial regime. The government of India post-independence wanted to make India self-dependent in terms of food-grain production and these efforts coincided with the development of high-yielding varieties of seeds of wheat developed by Norman Borlung and his associates in Mexico. These seeds also necessitated changes in farming techniques such as the addition of fertilizers and pesticides and greater use of irrigation. High yielding varieties of seeds were first introduced in India in the states of Punjab, Haryana and parts of western Uttar Pradesh.
The green revolution did effectively solve India's problem of food-grain shortage after it was introduced in India, although in the second wave of the Green Revolution in the 1980s, there was however, a slight reduction in production as compared to the first wave. Although many scholars are in favour of the Green Revolution as a boon to India's agricultural production, some scholars also take opposing views against the Green Revolution. These scholars often cite the adverse ecological effects of the resources employed in growing high-yielding varieties of seeds such as fertilizers and pesticides for instance as well as criticise certain socio-economic effects of the Green Revolution in India such as social conflict due to a growing socio-economic divide. Although the Green Revolution in India started with great promise and made immense contributions in boosting agricultural productivity with high-yielding seeds and the introduction of new methods of agriculture in India, its aura is somewhat disappearing in contemporary times.

AGRICULTURE SECTOR PRE AND DURING INDEPENDENCE AND PARTITION

- **Agrarian Economy** – Indian economy under the British rule was fundamentally **agrarian**. **about 85 per cent** of the country's population lived **mostly in villages** and **derived livelihood directly or indirectly from AGRICULTURE**.
- **Stagnated agriculture sector** – Reason being **over-crowded** with involvement of maximum population leading to a **very low agricultural productivity,** in absolute terms.
- However, the sector experienced some growth due to the **expansion of the aggregate area under cultivation.**
- Pertaining to systems of land settlement, the profit accruing out of the agriculture sector went to the **zamindars** instead of the cultivators with no zamindars initiating to strive for the development of agriculture.
- **Lack of agricultural inputs** – Low levels of technology, lack of irrigation facilities and negligible use of fertilisers resulted **in a dismal level of agricultural productivity and efficiency.**
- India's agriculture was starved of investment in terracing, flood-control, drainage and desalination of soil.

- **The commercialisation of agriculture** – could hardly help farmers in improving their economic condition as they were producing cash crops which were to be ultimately used by British industries back home.
- **Partition of the country**: A sizeable portion of the undivided country's **highly irrigated and fertile land went to Pakistan** leading to an adverse impact upon India's output from the agriculture sector especially, Jute industry (the whole of the area went away to East Pakistan)

AGRICULTURE SECTOR AFTER GREEN REVOLUTION

- **Increase in food grain production**: It helped the Indian Government to become independent and self-sufficient in producing food grains in the country instead of relying on import. Its food crops' output increased by tens of millions of extra tonnes per year. ***In 1979, it allowed the country to produce a record grain output of 131 million tonnes***.
- **Increase in farmers' earnings**: The earning of farmers was increased due to the increase in farm production. However, it helped only those farmers who have more than 10 hectares of land.
- **Less dependency on Imports**: Import of food grains from other countries was reduced to a greater extent. Sometimes, the country was in a position to export food grains. Besides this, sufficient stock of food grains was also available to deal with the shortage of food. Furthermore, it also increased the per capita net availability of food-grains from 395 grams per day to 436 grams despite the increase in population.
- **Promoted capitalistic farming**: It promoted capitalistic farming in which farmers with large agricultural land were able to get maximum profit by using green revolution technology. Thus, it enabled farmers to increase their level of income and live a prosperous life.
- **Employment**: The growth in the agriculture industry due to commercial farming created new jobs for the workforce.

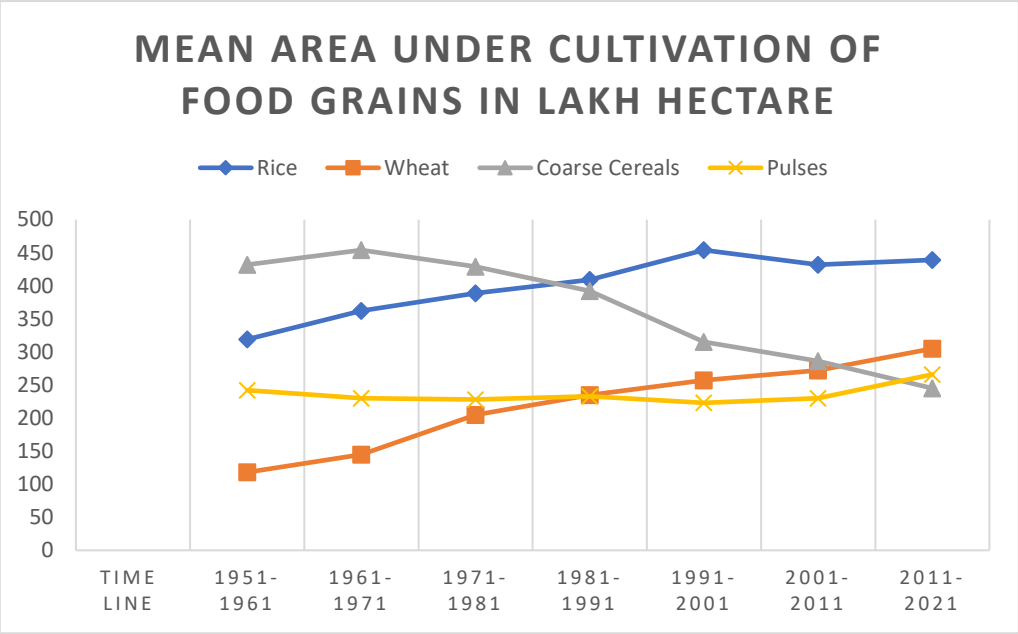
Data description and tools and concept used

I have collected data from RBI's database on production of food grains from 1951 to 2021 which include wheat, rice, coarse cereals and pulses. I have used data of area under cultivation as well. I have used AVERAGE function to estimate the production of food grains and area under cultivation of food grains to graphically represent them in each decade and also to make it easier to compare the data in different decades.

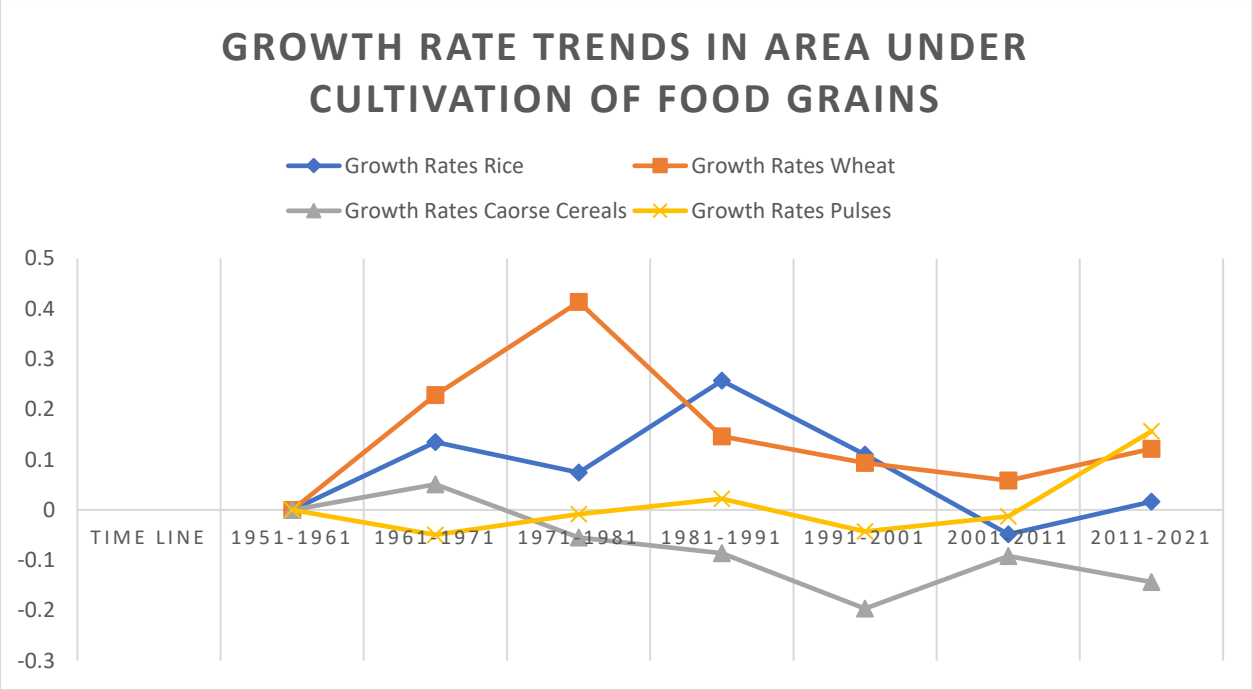
I have also used excel to find the growth rates of area under cultivation and production of food grains to find whether the increase/decrease in them were similar throughout the time line or were different during different courses of time.

Analysis using graphs and tables

Area under cultivation-



Mean Area Under Cultivation in Lakh Hectare				
	Rice	Wheat	Coarse Cereals	Pulses
Time line				
1951-1961	319	118	432	242
1961-1971	362	145	454	230
1971-1981	389	205	429	228
1981-1991	409	235	392	233
1991-2001	454	257	315	223
2001-2011	432	272	286	230
2011-2021	439	305	245	266

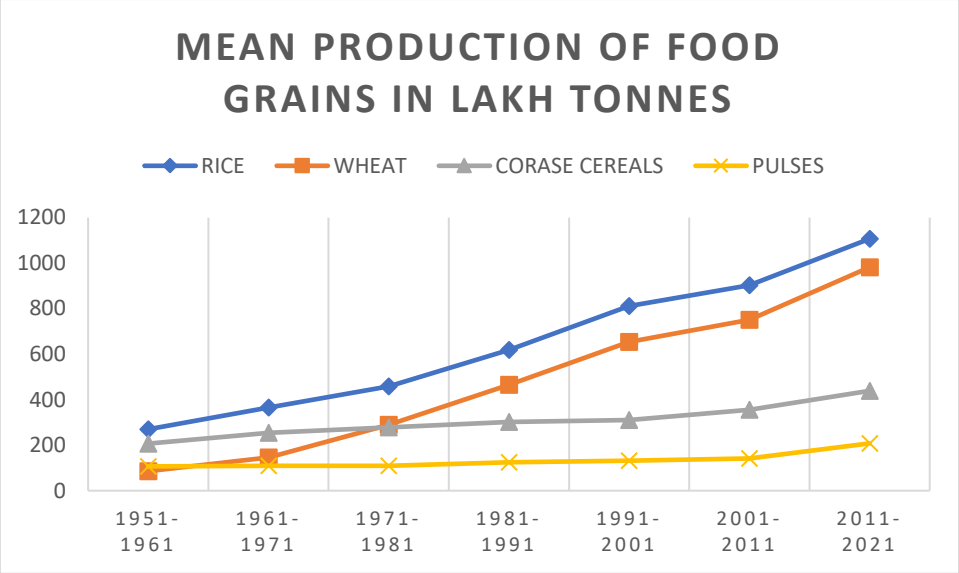


	Growth Rates			
	Rice	Wheat	Caorse Ce	Pulses
Time Line				
1951-1961	0	0	0	0
1961-1971	0.134796	0.228814	0.050926	-0.04959
1971-1981	0.074586	0.413793	-0.05507	-0.0087
1981-1991	0.257069	0.146341	-0.08625	0.02193
1991-2001	0.110024	0.093617	-0.19643	-0.04292
2001-2011	-0.04846	0.058366	-0.09206	-0.01288
2011-2021	0.016204	0.121324	-0.14336	0.156522

From the graphs we can conclude the following-

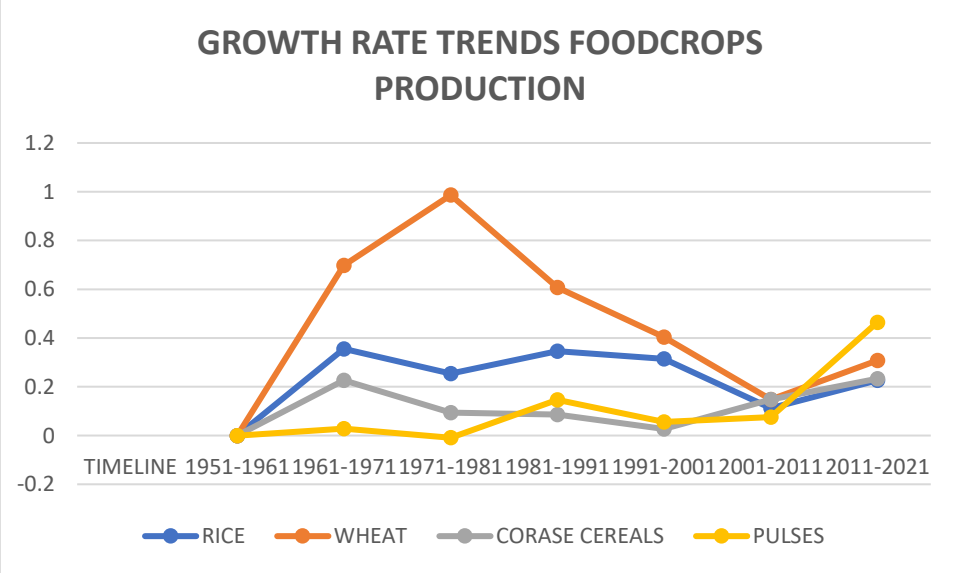
- Area under the cultivation of wheat and rice has increased throughout the timeline but area under the cultivation of rice is much more than area under the cultivation of wheat.
- On the other hand, area under the cultivation of coarse cereals has decreased throughout the timeline.
- Area under the cultivation of pulses has remained almost constant without major changes compared to the other two crops.
- If we look at the growth rate trends of the area under cultivation, they took a major change from 1961-71 to 1971-81 in wheat but then it decreased indicating that the area under cultivation is not increasing as fast as it was earlier. In case of rice, it took jump from 1971-81 to 1981-91.
- In coarse cereals and pulses, we can see that the growth rate has been negative as well indicating that area under cultivation of these crops has decreased and it was observed in the graph of area under cultivation as well.

Production in tonnes of food crops



Mean Production of Food Crops In Lakh Tonnes

	RICE	WHEAT	CORASE CEREALS	PULSES
TIMELINE				
1951-1961	270	86	207	107
1961-1971	366	146	254	110
1971-1981	459	290	278	109
1981-1991	618	466	302	125
1991-2001	812	654	310	132
2001-2011	903	751	356	142
2011-2021	1107	982	439	208



Growth Rate Trends in Food Grains Production				
	RICE	WHEAT	CORASE CEREALS	PULSES
TIMELINE				
1951-1961	0	0	0	0
1961-1971	0.355556	0.697674	0.22705314	0.028037
1971-1981	0.254098	0.986301	0.094488189	-0.00909
1981-1991	0.346405	0.606897	0.086330935	0.146789
1991-2001	0.313916	0.403433	0.026490066	0.056
2001-2011	0.112069	0.148318	0.148387097	0.075758
2011-2021	0.225914	0.30759	0.233146067	0.464789

From the graphs we can conclude the following-

- The production of rice and wheat increased dramatically from 1951 to 1981 although we cannot say the same about pulses and coarse cereals.
- The production of pulses and coarse cereals did not increase that much in comparison to wheat and rice but it is much more as in comparison to what it was in 1951-61.
- If we look at the growth rate trends, it was more just after the Green Revolution period (67-68 and 77-78 in wheat and rice which means that the increase in the production of rice and wheat was much more than previous times but it has decreased as well meaning that the production has not increased as much as earlier.
- But in case of Pulses and Coarse Cereals we see that the growth rates have not increased and it can be seen in the production graph as well that the increase in production of pulses and coarse cereals has not been as enormous as in case of wheat and rice.

If we compare the growth rate trends of area under cultivation and production of food grains, we can see that the growth rate trends of production of food crops are much more than area under cultivation.

One more point that we can observe is that the Green Revolution had more effect on rice and wheat than on pulses and coarse cereals.

Conclusion-

The points I would like to conclude about the analysis did are as follows-

- The Green Revolution was able to increase the production of food crops and it is easily through the graph. It had a very large effect on wheat and rice as compared to pulses and coarse cereals. The growth rate trends were high in the years in which the Green Revolution took place.
- We see that the increase in the area under cultivation of food grains has not increased as significantly as the production of the food grains. This means that the production was not only effect by the area of cultivation but also many other factors are there which lead to increase in the production of food grains which included improved irrigation facilities, use of fertilizers and pesticides and use of HYV seeds. We can say that all these upgrades in Green Revolution were successful. In pulses and coarse cereals, the area under the cultivation had also decreased which can be seen by the negative growth rates but still their production did not decease highlighting the fact that the facilities provided in Green Revolution were successful.

- By reading the literature review and the observations we can definitely say that the agriculture sector has improved a lot and the Green Revolution turned out to be huge success for the Indian Agriculture Sector.

Bibliography

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