IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, Dec 2022

CRITICAL APPRAISAL OF THE GREEN REVOLUTION IMPACTS IN INDIA

Mr. Sudarshan Narayan Sawant1 Dr. Sambhaji A.More2
[1]Research student, Department of History, Shivaji University Kolhapur.
Email: sudarshansawant1986@gmail.com
[2]Assistant Professor and Head, Department of History, M.H.Shinde Mahavidyalaya Tisangi
Email: samoresir7@gmail.com

Abstract
India's economy has been mostly dependent on agriculture from the ancient era. India experienced a catastrophic food crisis in the 1950s known as the "Bengal Famine." Relatively speaking, agricultural planning has increased crop yields throughout time. The term "The Green Revolution" refers to the phase of agricultural development in which fertilizers, chemicals, pesticides, are used to increase the foodgrain production through the High Yield Varieties (HYV) seeds. The production of rice and wheat has gone up during the green revolution period in India and India becomes self reliance in terms of foodgrains. The term "green revolution" describes the rise in agricultural output brought about by the development of high-yielding seed varieties (HYVS), better water management techniques, the application of chemical herbicides and fertilizers, and extensive technology support. India's agriculture sector has benefited greatly from the Green Revolution. For example the production of foodgrain not only increased but India becomes one of the exporters of food grain. Due to green revolution, production, productivity and farmers income has changed positively. Nonetheless, the majority of people in the country have health issues raised due to excessive use of pesticides and chemicals in agriculture sector. Likewise malnourishment is increasing because poor nutrition value of food grains and excessive fertilizer consumption. The green revolution has also adversely affected on the soil fertility and environmental resources like water and air. Under this backdrop, present study attempted to examine both positive as well as negative influence of green revolution in India.

Key Words: Green Revolution, Agriculture Development, Food Grain, High-Yield Varieties.

1. Introduction

India has the second largest agricultural area in the world with 20 agro climatic regions and 156.35 million hectares under cultivation [1]. As a result, agriculture plays an important role in the lives of 58% of the rural households, even though India has lost its agrarian economy status. Despite self-sufficiency in food production, India's food production from 1947 to 1960 was so poor that there was a risk of famine. The Green Revolution was launched in the 1960s to increase food production in India, reduce extreme poverty and malnutrition, and feed millions. Despite these efforts, India has a quarter of the world's hungry population, 195.9 million people undernourished; 58.4 percent of children under 5 years of age are anemic; 53 percent of women and 22 percent of men are anaemic; 23 percent of women and 20 percent of men are thin; 21 percent of women and 19 percent of men are obese. [2, 3].

In the period before the Green Revolution, the main crops grown were rice and millets, with sorghum being the main staple crop, followed by wheat, maize and barley [4,5]. The production of both rice and millets was higher than that of wheat, barley and maize combined. However, millet production has decreased and the crops that every household used to grow have become fodder crops within a few decades of the Green Revolution. Many of the traditional rice varieties consumed before the Green Revolution have disappeared, and the number of local rice varieties available has decreased to 7000, and not all of them are under cultivation. India has lost over 1 lakh indigenous rice varieties after the 1970s, which took several thousand years of evolution.[6]

2. Rational of the Study:

The agriculture is the main pillar of the Indian economy and almost 60 years are completed of its technological transformation. It is a proper time to evaluate the both positive and negative outcome of the green revolution. The study is also significant in knowing the future path of the agriculture development of the India.

3. Objectives:

The very first aim of the present investigation is to assess the positive and negative impact of the green revolution in India. The study has briefly reviewed the impact of green revolution based on secondary facts and figures.

4. Methodology:

The present research study is analytical type in nature. It has explored the both positive and negative influence of green revolution on the Indian economy. The entire study is based on secondary data published in various government reports and articles.

5. Discussion :

The critical appraisal of the impact of green revolution on the Indian people and economy are discussed on two heads namely positive impacts and negative impacts. These are as below.

Positive Impact

❖ **Increase in Agriculture Production**

India's agriculture has improved a lot since independence. At the time of independence, India was facing a massive famine and food shortage. The Green Revolution aims at increasing food production, especially in poor countries, by cultivating new crop varieties on larger farms with the help of machines and chemicals. India's poor condition is only solved after Green Revolution. Prof. Norman S Borlaug's team developed high yielding varieties (HYV) on short stem wheat, which is fast maturing, pest-resistant, and high yielding. As a result, wheat TPs per hectare rose to an unprecedented level. The same method was used to develop rice miracle seeds. A few years after launching advanced High-Yield varieties for agriculture in the irrigated regions of India, it became evident that average yield ratios of high-Yield varieties far exceeded the maximum possible output of native varieties. As a result, high-Yield wheat and rice HYVs rapidly replaced older varieties, leading to a massive breakthrough in wheat growth and rice growth in India.[7]

The first stage of the Green Revolution's success was its expansion of food production to meet the growing demands of population growth and the rise in income in most of the developing countries over the past two generations. With the Green Revolution, global grain production increased by over 250 percent from 1950 to 1984. In the 1960s, crop production was 51 million tonnes. By 2014-15, it had increased to 264 million tonnes. To put it another way, agriculture has not changed very much in terms of its stability and resilience.

❖ **Reduction in Food Grain Import**

India's agriculture sector has undergone tremendous transformation over the past six decades. At the time of independence, the agricultural sector faced a severe food crisis that at times led to famine. Many farmers, who had fed their families using sustainable methods for centuries, had to become buyers, and those who were poor were unable to buy imported food. In order to cope with this, India had to rely entirely on food grain imports at that time. In the mid-1960's, soon after the Green Revolution, innovative technology was introduced to support farming that can significantly improve productivity. By the mid-1970's, India was self-sufficient in food, and in the mid-1990's, it had a huge stock of food crops and was able to export it to many countries. Today, India is a significant producer and exporter of food. This is largely due to the introduction of high-yield cultivations, innovations in irrigation, increased use of fertilisers, and the provision of institutional finance, supported by a well-priced regime and assured markets.[8]

❖ **Income of the Farmers**

The Green Revolution had a direct impact on the non-agricultural economy. Its benefits in terms of poverty eradication and overall economic development continue to flow. The Green Revolution strengthened the economic growth throughout the country. It lifted countless farmers and other workers from poverty and hunger. The Green Revolution has led to various developments such as increased income, nutritious food and standard of living for both large and small farmers as well as landless poor people. Millions of people were saved because of the Green Revolution. The Green Revolution also led to an increase in food crop yield. It had a huge impact on the farmers' financial situation and their way of life. As the farm production increased, the farmers' incomes rose and they became prosperous.[11]

❖ **Agro based and Agro Processing Industrial Development**

As agricultural productivity increases, so do many changes. For instance, in the 1980's, yield-generating technology became the dominant driver of agricultural growth. The shift from low-yield crops to high-yield crops was a major factor in the agricultural sector's growth in the 1990's. Mechanized harvester and other machinery weren't new to agriculture either. The agro processing and agro based industries were drastically increased in India after the green revolution.[11]

The Green Revolution created jobs not only for the farmers but also for the industrial workers by setting up industries and hydro power plants. To lift millions of rural people out of poverty and deprivation in these countries within a certain period of time, a strong public policy is needed that promotes agricultural development and creates more employment opportunities.

❖ **Rural Employment Generation**

Agriculture is the main source of livelihood for a large portion of the rural population. Over the past 50 years, rural poverty has decreased significantly. In the 1980s, the top crop-producing states in India were Uttar Pradesh (UP), Punjab (Punjab), West Bengal (West Bengal), Bihar, Maharashtra (Maharashtra), Andhra Pradesh (Andhra Pradesh) and Tamil Nadu. These states account for more than 70 percent of the sector's growth. Maharashtra contributed the most to the nation's agricultural growth in the 1990s. Uttar Pradesh followed, followed by West Bengal, followed by Rajasthan and Gujarat.[11]

Negative Impacts

❖ **Excess Use of Fertilizers, Chemicals and Pesticides**

The Green revolution took fertilizers to a new level of use. Pesticides have several adverse health effects on workers who spray pesticides, especially on those living near or downstream of the application region. Consumers who eat pesticides that remain on food are also at risk. The chemicals sprayed in the field can wash off and contaminate rivers and lakes or drain into groundwater sources that are dangerous for humans. To put it another way, the fertilizers can seep into the soil, spread to other areas if there's rain. Finally, it lowers soil quality by relying more on synthetic fertilizers as opposed to natural or organic fertilizers which help replenish nutrients.

Mono-cropping has damaged soil quality. The nutrients in the soil cannot be removed by mono-cropping. The use of large-scale machinery compacts soils. Pesticides accumulate in higher organisms after the food chain. Pesticides can cross the food chain and develop in higher organisms. Pesticides may remain in soil and air, groundwater and surface water for long periods of time and contaminate them. Pesticide exposure over long periods of time sometimes promotes cancer. Environmental degradation is why the Green Revolution is a short-term solution to food insecurity. Today, only 11 modified rice types are in use. If climate continues to deteriorate, the disease will spread, the epidemic will spread, and the entire system will be crippled.[12]

❖ **Impact of Green Revolution on Health and Environment**

The Green Revolution's high agricultural outputs have also had a serious impact on the environment and on human health. For example, pesticides and nitrates found in drinkable water are verified to be toxic to both human and animal health, pesticides and herbicides continue to be a major source of pollution, and are the primary cause of water pollution, despite the fact that the toxic chemical causes cancer. Some critics argue that the Green Revolution has degraded soil quality over the long term. This is due to a variety of factors, including increased soil salinity, which leads to increased salt in the soil; increased salinity of irrigated fields; the use of nitrous oxide, methane, and other toxic chemicals that cause global climate change; and the use of pests and viruses that are resistant to available control techniques; and some of these negative effects eventually lead to serious and damaging effects on agricultural production. Land fertility loss due to the over-utilization of fertilizers; Rapid depletion of groundwater levels due to over-consumption of underground reservoirs; Sterilization of soil as a result of agricultural production; Poor drains as a result of poor drainage; Biodiversity loss as a result of mono cropping; and increased agrochemicals.[9]

❖ **A Nutritional Deficiency**

In terms of nutritional stability, the benefits of the Green Revolution were limited. All the food grains got benefits from this phase, such as wheat, groundnuts, rice, and corn. Some crops, such as pulses and cereals and oilseeds, were completely neglected and excluded from the scope of the Green Revolution. Pulses, a major source of protein, is not considered as a major food crop. It faces a declining mark because of the high yield of the wheat and rice crop. The pulse crop was considered uncompetitive as compared to the higher yielding rice and wheat. Per capita production of pulses declined from 25 kg per person in 1960 to 15 kilograms per person in 2014. Today, coarse cereals that are considered as higher nutritious are initially consigned to the marginal regions because they are unable to compete with wheat and rice.[10]

❖ **Declining Food grain Prices**

As a result of the sudden changes in agricultural production, food crop prices gradually decrease. The farmers got into debt because of the decrease in food grain prices and some of them even killed themselves.

6. Conclusions

The Green Revolution played a crucial role in the state's agricultural industry. The country's policies and measures to promote agricultural prosperity through the use of modern agricultural technologies in 1978-79 led to the highest record gain productivity in the country of several millions of tonnes. The Green Revolution provides much-needed respite during the crucial years of the population

growth by increasing agricultural output across the nation. The government of India was able to pay off the debt and improve its credit ratings. The value of the Green Revolution lies in its ability to provide people with an opportunity to reflect on the problem and come up with solutions to it during a crucial time of population growth.

Bhalla and Chadha argue that rapid technological progress in the 1960s increased agricultural income for all size groups in terms of number and area. Peasants at the middle level became the dominant force. To a certain extent, the fruits of the revolution were also shared among small farmers. The average daily income of agricultural laborers has generally increased. According to research on agricultural laborers in Ludhiana, labour shortages and the increased importance of their employment have improved their bargaining power.[13]

The Green Revolution also has some downsides. As food grain production productivity increased steadily, there was little emphasis on other agricultural products. The emphasis was placed on high-profit-producing wheat and rice. By the mid-70s, rice had replaced maize as a major crop in the early phases of the Green Revolution.

The Green Revolution was, on the whole, a great success for many developing countries, especially India, and gave them unprecedented levels of domestic food production. In many ways, it was a symbol of the positive growth and transfer of the same scientific development of agriculture that the industrialized nations claimed for their own. On the other hand, some aspects other than ensuring food and nutritional security were also taken into consideration. These included the environment, the health of the people, the situation of the farmers, and their training in the use of these fertilizers and pesticides.

References

1. Directorate of Economics and Statistics (DES) (2014), Ministry of Agriculture, India. 2014. Retrieved from https://eands.dacnet.nic.in/PDF/Glance-2016.pdf.
2. UNICEF. (2021). The state of food security and nutrition in the world 2021.
3. International Institute for Population Sciences (IIPS) and ICF(2015-2016). National Family Health Survey (NFHS-4), 2015-16: India. Mumbai: IIPS; 2017. Retrieved from http://rchiips.org/nfhs/NFHS-4Reports/India.pdf.
4. Hall WF.(1964), Agriculture in India. Regional Analysis Division, Economic Research Service, United States Department of Agriculture, 1964. p. 13.
5. US Department of Agriculture, Economic Research Service, Regional Analysis Division (1964). The 1964 Far East, Communist China, Oceania Agricultural Situation: Supplement No. 4 to the 1964 World Agricultural Situation. 1963. p. 49–50.
6. Anon, F. (2012). 110,000 Varieties of Rice to Only 6,000 Now. The Hindu.
7. Abraham, P. (2002), Ambedkar's Contribution for Economic Planning and Development Its Relevance. New Delhi, 2002.
8. Albert Rorabacher(2010)., J. Hunger and Poverty in South Asia. New Delhi, 2010.
9. Kinjo B. (2009). Environmental Issues in India: A Reader. Pearson Education, India, 2009.
10. Gupta, R. D., et al. (2009), Integrated Nutrient Management (INM) in a Sustainable RiceWheat Cropping System. Springer Netherlands, Germany, 2009.
11. Frankel, Francine R.(2015). India's Green Revolution: Economic Gains and Political Costs. Princeton University Press, United States, 2015.
12. John Hariss. Capitalism and Peasant Farming. Chennai, 1982.
13. Kilby, Patrick.(2019). The Green Revolution: Narratives of Politics, Technology and Gender. Routledge, United Kingdom, 2019.