

Green Revolution in India

[UPSC Notes]

The Green Revolution was a venture undertaken by Norman Borlaug in the 1960s. Known as the 'Father of Green Revolution' to everyone in the world, he won the Nobel Peace Prize in 1970 for his work and contribution to the development of High Yielding Varieties (HYVs) of wheat.

In India, M.S. Swaminathan spearheaded the Green Revolution predominantly. The Green Revolution resulted in a great increase in the production of food grains (especially wheat and rice) due to the introduction into developing countries of new, high-yielding variety seeds, beginning in the mid-20th century. Its early dramatic successes were in Mexico and the Indian subcontinent.

India's status from a country of food deficiency was changed to a leading agricultural nation because of the Green Revolution. The topic is important under the environmental issues and hence an important topic for your UPSC exam preparation. This article explains the important details of the Green Revolution, its meaning and salient features, its impact and its importance on the Indian economy. You will also know about various schemes under the Green Revolution in India.

What is the Green Revolution?

The Green Revolution was brought to India by the visionary MS Swaminathan. This was a method to increase the agricultural production of the country by the incorporation of modern techniques and tools. Some of the popular techniques developed under this program were the use of high-yielding variety seeds, tractors, irrigational facilities, pesticides, and fertilizers. There was a desperate need to shift the focus from the expansion of the farming areas, as our government had been doing, to the development of the agricultural sector. This was because there was a population boom which left food production behind. There was a need for immediate action for increasing the total yield. This was fixed by the introduction of the Green Revolution in India.

Background: Green Revolution in India

The conception of the Green Revolution in India has an interesting history. Below, the points have been listed chronologically for a better understanding of the concept;

- The year 1943 saw India struggling immensely as the country recorded its worst ever; the Bengal Famine. This calamity resulted in the death of nearly 4 million people in the eastern parts of India due to starvation.
- Independence in 1947 did not bring much respite as till 1967, the government majorly focused on increasing the farming areas. However, with the population growing at a rapid scale, the production rate of food was unable to keep up with it causing a deficit. This was very alarming.

- This needed immediate and swift intervention. The Green revolution came into the picture as a relief to aid the country from falling into a state of inflation and starvation.
- The green revolution in India came as a period of reform in Indian Agricultural practices. The practice changed into a more result-oriented industrial system by its adoption of modern methods and techniques that focused on increasing yield. Some of the important practices under this were the use of HYV seeds, tractors, irrigation facilities, pesticides and fertilizers.
- This program was aided by the Governments of India and the USA along with the Ford and Rockefeller Foundations.
- The Green Revolution in India has been largely called the Wheat Revolution because of the hike in the production of wheat. The production increased by three times between the years 1967-68 and 2003-04.

Objectives of the Green Revolution

The objectives of the Green Revolution are as follows;

- During the second Five Year Plan, this revolution was introduced with a fixed goal, to resolve India's hunger crisis, which was its short-term objective.
- The revolutions' long-term objective was to target the overall picture of agricultural modernisation backed by rural development, industrial development and infrastructure, raw material etc.
- Generation of employment for agricultural and industrial workers.
- The production of stronger plants that could survive extreme weather climates and diseases.
- Increasing the spread of technology to non-industrialised regions and establishing corporations in major agricultural areas.

Basic Elements of the Green Revolution in India

There are three main basic elements of the Green Revolution in India. They have been discussed briefly below;

- **Expansion of Farming Areas:** The expansion of the farming areas had been a point of focus for the Indian Government since 1947, the demand was still rising rapidly with the production not being able to keep up. The Green Revolution proved to be helpful by providing assistance by quantitatively expanding the area of farmlands.
- **Double-cropping System:** This was one of the primary features of the Green Revolution. Traditionally, each season saw one crop season. The aim was to have two crop seasons per year instead of just one. The original one-season-per-year exercise was based on the rain happening once a year. The water for the second cycle came from the new irrigation projects. Dams being built along with other simple irrigation techniques being adopted handled the water crisis.
- **Using seeds with improved genetics:** This formed to be the scientific aspect of the Green Revolution. New versions of high-yield variety seeds were developed by the Indian Council for Agricultural Research. This practice was mainly adopted for crops like wheat, rice, millet and corn.

- Important Crops in the Revolution:
 - The main crops were Wheat, Rice, Jowar, Bajra and Maize.
 - The new strategy did not include non-food grains.
 - Wheat became the focal point of the Green Revolution for years.

The Impact of the Green Revolution on India

The Green Revolution impacted India in great ways that were both positive and negative. These points have been discussed below in detail.

Positive Impacts of Green Revolution

This movement impacted the country in great ways that were not just limited to the increased food production.

- **Great Increase in Crop Produce:** There were 131 million tonnes of food production in the year 1978-79 alone which successfully made India into one of the biggest agricultural producers in the world.
 - The crop area allotted to the high-yielding varieties of wheat and rice grew immensely during the Green Revolution.
- **Reduction in Import of Food Grains:** From a struggling country, India finally became self-sufficient in terms of food grains with stock that is more than sufficient. Sometimes, India produced enough food grains.
- **Beneficial for the Farmers:** The Green Revolution's introduction has helped the farmers greatly by raising their level of income and subsequently improving their living standards.
 - Farmers with more than 10 hectares of land particularly benefited from this revolution as they were able to invest large amounts of money into HYV seeds, fertilizers, machines, etc. This also encouraged capitalist farming.
- **Increased Industrial Growth:** Large-scale farm industrialisation and mechanisation were brought about by the Revolution. This created the demand for different types of machines like tractors, harvesters, pumping sets, threshers, diesel engines, combines, electric motors, etc. that were not there before.
 - Besides the mechanical needs, the demand for chemical fertilisers, pesticides, insecticides, weedicides, etc. increased greatly as well.
- **Creation of Rural Employment:** Since there were larger areas for cultivation and increased opportunity, there was a good increase in the demand for labour.
 - The Green Revolution created numerous jobs which was not just limited to the agricultural workers but also extended to the industrial workforce as it created related facilities like hydroelectric power stations and factories.

Negative Impacts of Green Revolution

Every coin has two faces to it. The revolution was greatly beneficial for the economy and the condition of the country in general but it also brought some newer problems.

- **Non-Food Grains:** Food grain crops like wheat, rice, jawar, bajra and maize were worked upon in the revolution extensively. However, other crops that were non-grain like pulses, coarse cereals, and oilseeds were excluded from the ambit of this revolution.
 - Commercial crops like cotton, tea, jute, and sugarcane were excluded to the extent that they remained almost untouched by the Green Revolution.
- **Limited Coverage of HYVP:** The technology of the High Yielding Variety Programme (HYVP) became restricted to only five crops: Wheat, Rice, Jowar, Bajra and Maize. The HYV seeds for the non-food grain crops were not developed in the first place and the ones that were developed were not promising enough for the farmers to risk their adoption.
- **Regional Disparities:** One major setback that the Green Revolution technology brought was the rise in disparities regarding economic development at several levels.
 - It has so far affected only 40 per cent of the total cropped area and 60 per cent is still untouched by it.
 - The areas that were affected the most were Punjab, Haryana and western parts of Uttar Pradesh in the north and Andhra Pradesh and Tamil Nadu in the south.
 - It hasn't been able to touch the Eastern region, like the states of Assam, Bihar, West Bengal and Orissa. Arid and semi-arid areas of Western and Southern India have also been neglected.
 - The Green Revolution affirmatively but exclusively affected areas which were already in a better place from an agricultural perspective.
 - Thus the problem of regional disparities has been further aggravated as a result of the Green Revolution.
- **Excessive Usage of Chemicals:** Another long-term effect that the country is struggling with after the Green Revolution is the encouraged large-scale use of pesticides and synthetic nitrogen fertilisers to improve irrigation projects and crop varieties. There were negligible efforts made toward educating the farmers about the high-risk factors that are associated with the intensive use of pesticides.
 - Proper instructions or precautions were not followed during the use of pesticides by the farmers.
 - This resulted in more harm than good to crops. This also caused great environmental and soil pollution.

- **Water Consumption:** The crops introduced during the green revolution were water-intensive crops.
 - Almost 50% of dietary water footprint was required for most of the crops that were introduced in the revolution.
 - The introduction of canal systems and irrigation pumps also hampered the groundwater levels to provide for such water-intensive crops, like sugarcane and rice.
 - Punjab is a major wheat and rice-cultivating area, and hence it is one of the highest water-depleted regions in India.
- **Impacts on Soil and Crop Production:** The soil's nutrients were depleted by the repeated crop cycle to ensure increased crop production.
 - Farmers had to increase the use of fertilisers to meet the needs for new kinds of seeds.
 - From the heavy usage of such alkaline chemicals, the soil's pH level increased as well.
 - Beneficial pathogens were destroyed by the toxic chemicals in the soil. This resulted in a further decline in the yield.
- **Unemployment:** Despite the great promises of employment, the green revolution created massive unemployment owing to its mechanisation which reduced the need for human labour. Except in Punjab, and to some extent this loss was observed among agricultural labourers in the rural areas. The poor and the landless labourers were hit the worst because of this.
- **Health Hazards:** A number of critical health illnesses including cancer, renal failure, stillborn babies and birth defects were observed due to the large-scale use of chemical fertilizers and pesticides such as Phosphamidon, Methomyl, and Phorate, Triazophos and Monocrotophos.

Government Schemes Under Green Revolution in India

Recently, Prime Minister Narendra Modi greenlit the Umbrella Scheme Green Revolution – 'Kishonnati Yojana' in the agriculture sector for the period of three years from 2017 to 2020. The Central Share equals Rs. 33,269.976 crores.

The Kishonnati Yojana has 11 schemes under it to help and facilitate the achievement of its objectives. All of these schemes have been devised to develop the agriculture and allied sector scientifically and holistically. The primary objective is to maximise farmers' income by increasing productivity, production, and returns on products along with the facilitation of production infrastructure, reduction of production costs, and marketing of agriculture and allied produce.

The 11 schemes that are part of the Umbrella Schemes under the Green revolution are:

1. Mission for Integrated Development of Horticulture (MIDH)
2. National Food Security Mission (NFSM)
3. National Mission for Sustainable Agriculture (NMSA)
4. Submission on Agriculture Extension (SMAE)
5. Sub-Mission on Seeds and Planting Material (SMSP)
6. Sub-Mission on Agricultural Mechanisation (SMAM)
7. Sub Mission on Plant Protection and Plant Quarantine (SMPPQ)
8. Integrated Scheme on Agriculture Census, Economics, and Statistics (ISACES)
9. Integrated Scheme on Agricultural Cooperation (ISAC)
10. Integrated Scheme on Agricultural Marketing (ISAM)
11. National e-Governance Plan (NeGP-A)

