Green Revolution

It is the introduction of new techniques of agriculture, which became popular by the name of Green Revolution (GR) in early 1960s—at first for wheat and by the next decade for rice, too. It revolutionised the very traditional idea of food production by giving a boost by more than 250 per cent to the productivity level. The Green Revolution was centred around the use of the High Yielding Variety (HYV) seeds developed by the US agro-scientist Norman Borlaug doing research on a Rockefeller Foundation Scholarship in Mexico by the early 1960s. The new wheat seeds which he developed in vivo claimed to increase its productivity by more than 200 per cent. By 1965, the seeds were successfully tested and were being used by farmers in food deficient countries such as Mexico, Taiwan.

Components of the Green Revolution

The Green Revolution was based on the timely and adequate supply of many inputs/components.

1. The HYV Seeds- These seeds were popularly called the 'dwarf' variety of seeds. With the help of repeated mutations, Mr Borlaug had been able to develop a seed which was raised in its nature of nutrients supplied to the different parts of the wheat plant—against the leaves, stem and in favour of the grain. This made the plant dwarf and the grain heavier—resulting in high yield. These seeds were non-photosynthetic, hence non-dependent on sun rays for targeted yields.

2. The Chemical Fertilizers- The seeds were to increase productivity provided they got sufficient level of nutrients from the land. The level of nutrients they required could not be supplied with the traditional composts because they have low concentration of nutrients content and required bigger area while sowing—it meant it will be shared by more than one seed. That is why a high concentration fertilisers, were required, which could be given to the targeted seed only—the only option was the chemical fertilisers—urea (N), phosphate (P) and potash (K).

3. The Irrigation- For controlled growth of crops and adequate dilution of fertilizers, a controlled means of water supply was required. It made two important compulsions—firstly, the area of such crops should be at least free of flooding and secondly, artificial water supply should be developed.

4. Chemical Pesticides and Germicides- As the new seeds were new and non-acclimatised to local pests, germs and diseases than the established indigenous varieties, use of pesticides and germicides became compulsory for result-oriented and secured yields.

5. Chemical Herbicides and Weedicides- To prevent costlier inputs of fertilisers not being consumed by the herbs and the weeds in the farmlands, herbicides and weedicides were used while sowing the HYV seeds.

6. Credit, Storage, Marketing/Distribution- For farmers to be capable of using the new and the costlier inputs of the Green Revolution, availability of easy and cheaper credit was a must. As the farmlands suitable for this new kind of farming was region-specific (as it was only Haryana, Punjab and western Uttar Pradesh in India) storage of the harvested crops was to be done in the region itself till they were distributed throughout the country. Again, the countries which went for the Green Revolution were food-deficient and needed the new yield to be distributed throughout the country and a proper chain of marketing, distribution and transport connectivity was necessary. All these peripheral infrastructure were developed by the countries going for the Green Revolution with softer loans coming from the World Bank—India being the biggest beneficiary.

Impact of the Green Revolution

The Green Revolution had its positive as well as negative socio-economic and ecological impacts on the countries around the world, we will specially study India here.

1. Socio-economic Impact- Food production increased in such a way (wheat in 1960s and rice, by 1970s) that many countries became self-sufficient (self sufficiency of food must not be confused with the idea of food security) and some even emerged as food exporting countries. But the discrepancy in farmers' income, it brought with itself increased the inter-personal as well as

inter-regional disparities/inequalities in India. Rise in the incidence of malaria due to water-logging, a swing in the balanced cropping patterns in favour of wheat and rice, putting pulses, oilseeds, maize, barley on the margins, etc., were negative impacts.

2. Ecological Impact- The most devastating negative impact of the Green Revolution was ecological. When the issues related with it were raised by the media, scholars, experts and environmentalists, neither the governments nor the masses were convinced. But a time came when the government and other government agencies started doing studies and surveys focused around the ecological and environmental issues. The major ones among them are:

(i) Critical Ecological Crisis: On the basis of on-field studies it was found that critical ecological crises in the GR region are showing up—

(a) Soil fertility being degraded: Due to the repetitive kind of cropping pattern being followed by the farmers as well as the excessive exploitation of the land; lack of a suitable crop combination and the crop intensity, etc led to soil degradation.

(b) Water table falling down: As the new HYV seeds required comparatively very high amount of water for irrigation—5 tonnes of water needed to produce 1 kg of rice.

(c) Environmental degradation: Due to excessive and uncontrolled use of chemical fertilizers, pesticides and herbicides have degraded the environment by increasing pollution levels in land, water and air. In India it is more due to deforestation and extension of cultivation in ecologically fragile areas. At the same time, there is an excessive pressure of animals on forests—mainly by goats and sheep.

(ii) Toxic Level in Food Chain: Toxic level in the food chain of India has increased to a high level. Basically, unbridled use of chemical pesticides and weedicides and their industrial production combined together have polluted the land, water and air to such an alarmingly high level that the whole food chain has been a prey of high toxicity.