

Green revolution in India; An experience

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Abstract:

The term 'Green Revolution' is a general one that is applied to successful agricultural experiments in many developing countries like India. The world's worst recorded food disaster happened in 1943 in British India. Known as the Bengal Famine, an estimated 4 million people died of hunger that year in eastern India. In 1947 India took independence and Indians were haunted by the memories of the Bengal Famine therefore the food security was one of the main items on free India's agenda. This awareness led to the Green Revolution. The Green Revolution took place in India from 1967 to 1978 and in 1979 India recorded the grain output of 131 million tons which established India as one of the world's biggest agricultural producers. There were three basic elements in the method of the Green Revolution : 1-Continuing expansion of farming areas. 2-Double - cropping in the existing farmland and 3-Using seeds with improved genetics. More than self-sufficient, India frequently exports its surpluses. India in 55 years has emerged from famine ridden colonial times, as a famine free Republic. Its population has nearly tripled in that period. More significantly, India in 1947 lost some of its most fertile lands. But she has managed to stand up and falsify many prophecies of doom. India was the greatest success story of the Green Revolution. Although India benefited (apart from Economic) from political and sociological point of view, but her agriculture is at a crossroads again, the Green Revolution of the sixties gained some crucial decades for India in which to rethink her way forward.

Keywords : green revolution, India,

Introduction :

The world's worst recorded food disaster happened in 1943 in British-ruled India. Known as the Bengal Famine, an estimated four million people died of hunger that year alone in eastern India (that included today's Bangladesh). The initial theory put forward to 'explain' that catastrophe was that there was an acute shortfall in food production in the area. However, Indian economist Amartya Sen (recipient of the Nobel Prize for Economics, 1998) has established that while food shortage was a contributor to the problem, a more potent factor was the result of hysteria related to World War II which made food supply a low priority for the British rulers. The hysteria was further exploited by Indian traders who hoarded food in order to sell at higher prices.

Nevertheless, when the British left India four years later in 1947, India continued to be haunted by memories of the Bengal Famine. It was therefore natural that food security was a paramount item on free India's agenda. This awareness led, on one hand, to the Green Revolution in India and, on the other, legislative measures to ensure that businessmen would never again be able to hoard food for reasons of profit.

However, the term "Green Revolution" is applied to the period from 1967 to 1978. Between 1947 and 1967, efforts at achieving food self-sufficiency were not entirely successful. Efforts until 1967 largely concentrated on expanding the farming areas. But starvation deaths were still being reported in the newspapers. In a perfect case of Malthusian economics, population

was growing at a much faster rate than food production. This called for drastic action to increase yield. The action came in the form of the Green Revolution.

Discussion :

The term "Green Revolution" is a general one that is applied to successful agricultural experiments in many Third World countries. It is NOT specific to India. But it was most successful in India.

What was the Green Revolution in India?

There were three basic elements in the method of the Green Revolution:

- 1) Continued expansion of farming areas;
- 2) Double-cropping existing farmland;
- 3) Using seeds with improved genetics.

1-Continued expansion of farming areas

As mentioned above, the area of land under cultivation was being increased right from 1947. But this was not enough in meeting with rising demand. Other methods were required. Yet, the expansion of cultivable land also had to continue. So, the Green Revolution continued with this quantitative expansion of farmlands. However, this is NOT the most striking feature of the Revolution.

2-Double-cropping existing farmland

Double-cropping was a primary feature of the Green Revolution. Instead of one crop season per year, the decision was made to have two crop seasons per year. The one-season-per-year practice was based on the fact that there is only natural monsoon per year. This was correct. So, there had to be two "monsoons" per year. One would be the natural monsoon and the other an artificial 'monsoon.' The artificial monsoon came in the form of huge irrigation facilities. Dams were built to arrest large volumes of natural monsoon water which were earlier being wasted. Simple irrigation techniques were also adopted .

3-Using seeds with superior genetics

This was the scientific aspect of the Green Revolution. The Indian council for agricultural research (which was established by the British in 1929 but was not known to have done any significant research) was re-organized in 1965 and then again in 1973. It developed new strains of high yield value (HYV) seeds, mainly wheat and rice but also millet and corn. The most noteworthy HYV seed was the K68 variety for wheat. The credit for developing this strain goes to Dr. M.P. Singh who is also regarded as the hero of India's Green revolution. The total area under the high-yielding-varieties program was a negligible 1.9 million hectares in FY 1960. Since then growth has been spectacular, increasing to nearly 15.4 million hectares by FY 1970, 43.1 million hectares by FY 1980, and 63.9 million hectares by FY 1990. The rate of growth decreased significantly in the late 1980s, however, as additional suitable land was not available.

The major benefits of the Green Revolution in India were experienced mainly in northern and northwestern India between 1965 and the early 1980s; the program resulted in a substantial increase in the production of food grains, mainly wheat and rice. Food-grain yields continued to increase throughout the 1980s, but the dramatic changes in the years between 1965 and 1980 were not duplicated. By FY 1980, almost 75 percent of the total cropped area under wheat was sown with high-yielding varieties. For rice the comparable figure was 45 percent. In the 1980s, the area under high-yielding varieties continued to increase, but the rate of

growth overall was slower. The eighth plan aimed at making high-yielding varieties available to the whole country and developing more productive strains of other crops.

The Indian Green Revolution created wide regional and interstate disparities. The plan was implemented only in areas with assured supplies of water and the means to control it, large inputs of fertilizers, and adequate farm credit. These inputs were easily available in at least parts of the states of Punjab, Haryana, and western Uttar Pradesh; thus, yields increased most in these states. In other states, such as Andhra Pradesh and Tamil Nadu, in areas where these inputs were not assured, the results were limited or negligible, leading to considerable variation in crop yields within these states. The Green Revolution in India also increased income disparities: higher income growth and reduced incidence of poverty were found in the states where yields increased the most and lower income growth and little change in the incidence of poverty in other states.

Analysis:

Statistical Results of the Green Revolution

1-The Green Revolution resulted in a record grain output of 131 million tons in 1978-79. This established India as one of the world's biggest agricultural producers. No other country in the world which attempted the Green Revolution recorded such level of success. India also became an exporter of food grains around that time.

1) Yield per unit of farmland improved by more than 30 per cent between 1947 (when India gained political independence) and 1979 when the Green Revolution was considered to have delivered its goods.

2) The crop area under HYV varieties grew from seven per cent to 22 per cent of the total cultivated area during the 10 years of the Green Revolution. More than 70 per cent of the wheat crop area, 35 per cent of the rice crop area and 20 per cent of the millet and corn crop area, used the HYV seeds.

Economic results of the Green Revolution

1) Crop areas under high-yield varieties needed more water, more fertilizer, more pesticides, fungicides and certain other chemicals. This spurred the growth of the local manufacturing sector. Such industrial growth created new jobs and contributed to the country's GDP.

2) The increase in irrigation created need for new dams to harness monsoon water. The water stored was used to create hydro-electric power. This in turn boosted industrial growth, created jobs and improved the quality of life of the people in villages.

3) India paid back all loans it had taken from the World Bank and its affiliates for the purpose of the Green Revolution. This improved India's creditworthiness in the eyes of the lending agencies.

4) Some developed countries, especially Canada, which were facing a shortage in agricultural labour, were so impressed by the results of India's Green Revolution that they asked the Indian government to supply them with farmers experienced in the methods of the Green Revolution. Many farmers from Punjab and Haryana states in northern India were thus sent to Canada where they settled (That's why Canada today has many Punjabi-speaking citizens of Indian origin). These people remitted part of their incomes to their relatives in India. This not only helped the relatives but also added, albeit modestly, to India's foreign exchange earnings.

Sociological results of the Green Revolution

The Green Revolution created plenty of jobs not only for agricultural workers but also industrial workers by the creation of lateral facilities such as factories and hydro-electric power stations as explained above.

V Political results of the Green Revolution

- 1) India transformed itself from a starving nation to an exporter of food. This earned admiration for India in the comity of nations, especially in the Third World.
- 2) The Green Revolution was one factor that made Mrs. Indira Gandhi (1917-84) and her party, the Indian National Congress, a very powerful political force in India (it would however be wrong to say that it was the only reason).

Limitations of the Green Revolution

- 1) Even today, India's agricultural output sometimes falls short of demand. The Green Revolution, howsoever impressive, has thus NOT succeeded in making India totally and permanently self-sufficient in food. In 1979 and 1987, India faced severe drought conditions due to poor monsoon; this raised questions about whether the Green Revolution was really a long-term achievement. In 1998, India had to import onions. Last year, India imported sugar. However, in today's globalised economic scenario, 100 per cent self-sufficiency is not considered as vital a target as it was when the world political climate was more dangerous due to the Cold War.
- 2) India has failed to extend the concept of high-yield value seeds to all crops or all regions. In terms of crops, it remains largely confined to foodgrains only, not to all kinds of agricultural produce. In regional terms, only Punjab and Haryana states showed the best results of the Green Revolution. The eastern plains of the River Ganges in West Bengal state also showed reasonably good results. But results were less impressive in other parts of India.
- 3) Nothing like the Bengal Famine can happen in India again. But it is disturbing to note that even today, there are places like Kalahandi (in India's eastern state of Orissa) where famine-like conditions have been existing for many years and where some starvation deaths have also been reported. Of course, this is due to reasons other than availability of food in India, but the very fact that some people are still starving in India (whatever the reason may be), brings into question whether the Green Revolution has failed in its overall social objectives though it has been a resounding success in terms of agricultural production.
- 4) The Green Revolution cannot therefore be considered to be a 100 percent success

Shortcomings

In spite of this, India's agricultural output sometimes falls short of demand even today. India has failed to extend the concept of high yield value seeds to all crops or all regions. In terms of crops, it remains largely confined to foodgrains only, not to all kinds of agricultural produce. The Green Revolution has created some problems mainly to adverse impacts on the environment. The increasing use of agrochemical-based pest and weed control in some crops has affected the surrounding environment as well as human health. Increase in the area under irrigation has led to rise in the salinity of the land. Although high yielding varieties had their plus points, it has led to significant genetic erosion. Since the beginning of agriculture, people have been working to improving seed quality and variety. But the term 'Green Revolution' was coined in the 1960s after improved varieties of wheat dramatically increased yields in test plots in northwest Mexico. The reason why these 'modern varieties' produced more than traditional varieties was that they were more responsive to controlled irrigation and to petrochemical fertilizers. With a big boost from the international agricultural research centres created by the Rockefeller and Ford Foundations, the 'miracle' seeds quickly spread to Asia, and soon new strains of rice and corn were developed as well. By the 1970s the new seeds, accompanied by chemical fertilizers, pesticides, and, for the most part, irrigation, had replaced the traditional farming practices of millions of farmers in developing countries. By the 1990s, almost 75% of the area under rice cultivation in Asia was growing these new varieties. The same was true for almost half of the wheat planted in Africa

and more than half of that in Latin America and Asia, and more than 50% of the world's corn as well. Overall, a very large percentage of farmers in For more information on Green Revolution link to the developing world were using Green Revolution seeds, with the greatest use found in Asia, followed by Latin America .

Conclusion:

So let's put the Green Revolution in context again . It is undoubtedly a great Indian success story . but its unspoken mission may have been to give us a fresh breath with which to codify Indian farmers ' traditional wisdom . In the 1960's India was desperate for a breakthrough. The nation's self-confidence was at an ebb. The Chinese had delivered a military lesson Food crises were endemic. Total food production hung around about 50 million tonnes. Marginal increases were only through bringing more land area under cultivation and not through increases in productivity. Food reserves were nil. India was just about meeting its deficit with imports .India's food-grains production has hovered around a fifth of a billion tonnes mark in recent years. More than self-sufficient, India frequently exports its surpluses. India in 55 years has emerged from famine ridden colonial times, as a famine free Republic. Its population has nearly tripled in that period. More significantly, India in 1947,lost some of its most fertile lands. But she has managed to stand up and falsify many prophesies of doom. India was the greatest success story of the Green Revolution .

Today technologies and Indian tecnologiists are availabel – as was not the case in the sixties - - to compile 'best practices' and disseminate them widely. It is in the nature of revolutions that they are never 'final solutions' but place-holders till the next one comes along.

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