

(3) Proper programme of training of these agriculturists should be taken up to enable them to know about the use of the various mechanical devices.

(4) Gram panchayats and other institutions of local self government and planning under rural areas should be provided with resources to purchase these mechanical devices and allow their use to the farmers on reasonable charges. Through this method, the gram panchayats shall be able to earn and also help the increase of production in the village under their jurisdiction.

The progress of mechanical or mechanised farming in India— if Indian agriculture has to be made a painful employment or a trade it shall have to be more productive. This should be possible only through mechanised farming. Agriculturists and administrators of this country have realised this position and through the various Five Year Plans laid emphasis on it. They have also suggested ways and means to make the Indian agriculture mechanised. As a result of the steps taken under the Fourth Five Year Plan, a good deal of progress has been made in the field of mechanisation of agriculture. Various research and training centres have been set up and industries for production of agricultural implements and machines that can be operated through power and in a mechanical manner have been set up.

Government have also taken steps to provide the farmers with soft loans on nominal interest to purchase machines for improving the agriculture. At certain places, banks stock centres are providing the farmers with power machines and mechanically operative tools have been set up. All these things have resulted into greater mechanisation of farming. Now in most of the villages, tractors, harvesters, iron ploughs, crushers, rubber tyred carts etc. are available. Many of the machines that are used for agriculture are also used for other purposes like crushing of the sugar cane, drawing water out of the wells, irrigating field etc.

In fact, Fifth Five Year Plan has made a very wider contribution in this field. But the position cannot be said to be completely upto the mark. India has to make strenuous efforts to keep up with other countries of the world in this respect.

Q. What is Green Revolution? Has it been successful in India?

Green Revolution—its meaning and definition—The main object of India's Five Year Plan and its economic development is to achieve self-sufficiency on the food front. For this purpose several methods like use of improved seed, better means of harvest, use of insecticides and pesticides for the protection of crop against different types of pests and insects has been a part of the programme of Indian Government and various State Governments.

Agricultural production has rose the level of 13-14 crore tonnes in 1978-79. The production of rice during 1978-79 reached an all time record of 5.82 crore tonnes. The production of commercial crops have also registered substantial increase. This rise in food production was considered to be an extraordinary achievement of the efforts made in the field of increasing agricultural production. This extraordinary success in production of the agricultural goods is termed as 'Green Revolution'. Green revolution is nothing but extraordinary and unprecedented rise in food production.

Causes of green revolution—This is true that agricultural production from the period 1980-82 has gone up like anything. Almost all the varieties of food grains are now available in the market. Whether the agricultural production is actually caught the pace is still a matter of discussion. The challenges that are before the nation and which shall show their real face in next two decades are really very gigantic. The population is increasing at a pace faster than the increase in agricultural production, but the fact remains that agricultural production has certainly increased at an unprecedented pace during the last few years. This has brought about the green revolution. The causes of the green revolution be enumerated and studied under the following heads :—

- (1) Use of improved quality and variety of seeds;
- (2) Use of modern machines and methods and implements of agriculture;
- (3) Great stress on the use of fertilizers;
- (4) Use of medicines for preservation of crops;

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leaders were far from enthusiastic. They associated themselves with the Bhoodan only to enlarge or strengthen their following. Vinobaji resisted these efforts. The appeal was to the rich and landed peasants who opposed all types of land reform in their vested interests. Thus, like ceilings, Bhoodan also failed.

### The Green Revolution

The green revolution which aimed at increase in agricultural productivity, was brought about in 1966. The introduction of high-yielding varieties of wheat, rice, maize, millet, etc., benefited the larger landholder more than the small landholder. This was because it required a reliable supply of water, costly fertiliser, high quality of seed, and pesticides, and use of machinery. These could be afforded only by the richer farmers. According to P.C. Joshi (1974:33) in Punjab, Haryana and some other regions, the trend that emerged was that small landowners rented their land to big farmers who needed a larger landspread to use their machinery profitably. On the one hand, this enriched the larger landholder, on the other hand, it increased the number of landless labourers most of whom are low caste and untouchables.

Before independence, though about 70 per cent of the rural population was engaged in agriculture yet agricultural production was so low that we were dependent on foreign countries for our food supply. The low agricultural production was the result of British policy of collecting land revenue, lack of use of modern technology in agriculture, lack of credit facilities to small owners of land, exploitation of small cultivators by zamindars and jagirdars, and lack of interest on the part of cultivators to accept new models of cropping. The result of the British policy of land revenue was that many cultivators who were unable to pay taxes had either to sell or mortgage their land or turn for help to money lenders. Because of this, the proportion of landless and land labourers increased from 13 per cent of the rural population in 1891 to 38 per cent in 1951 (Patel, 1952). When population of the country in the early 1950s was growing at the rate of 0.67 per cent, the agricultural output was growing at the rate of 0.5 per cent. The land reforms introduced after independence further led to the concentration of land in the hands of the larger landowners. The principle of land reform was 'land to the tiller'. The large landowners, anticipating this type of legislation, had got evicted long-term tenants prior to the enactment of legislation. Many tenants had voluntarily given up their land rights to the owners out of fear. Thereafter, the large landowner rented out his land to short-term or seasonal tenants, or cultivated

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it himself with the help of casual labour. By 1953-54, the upper 10 per cent of landowners owned more than half of the land, 47 per cent owned less than 1 acre per household, and 23 per cent were landless. The agricultural production which was growing at the rate of 3 per cent per year in 1951-52 increased to 6 per cent in 1994-95, 10 per cent in 1996-97, but decreased to 6 per cent in 1998-99 (*India Today*, March 8, 1999: 18-19). It is estimated that using high-yield techniques, the upper 10 per cent of landholders could produce enough food to feed urban and other non-agricultural population of India. This means that about 48 million cultivators' families would be pushed off the land. This is a wrong assumption. Commercialisation of agriculture and the green revolution of last three decades would neither affect the cultivators adversely nor spell the demise of patronage system in the villages.

### PLANNED RURAL DEVELOPMENT

Two types of policies affect rural life: (i) production-oriented activities targeting production and services, e.g., subsidised fertilisers, providing irrigation, credit, locating village industries, and so on; and (ii) non-production oriented activities targeting living standards. The first type of activities are defined as rural development measures. These activities may affect either the whole community or a particular section of the community. Examples of the former type of activities are: community development projects (1952), Panchayati Raj (1962), land reforms (1950s), poverty alleviation programmes (PAPs) like Integrated Rural Development Programme (1978) etc., while of the latter type of activities are Tribal Development Programme (1959), Drought-prone Area Programme (1979), Desert Development Programme (1977), Food for Work Programme (1977), National Rural Employment Programme (1980), TRYCEM, etc. (Sagar, 1990:251-261). Some programmes aimed at increasing assets (including increasing production) and benefitting people economically, e.g., IRDP, Minimum Agricultural Wage, Rural Employment Programme, etc., while others aimed at social uplift of people, e.g., zamindari abolition, land reforms, Panchayati Raj, TRYSEM, etc. Some programmes indeed aimed at poverty alleviation (e.g., self-employment programmes of NREP, DPAP, training programme of TRYSEM, etc.) while some others were politically motivated, e.g., Garibi Hatao and 20-point programme. However, the basic aims of achieving community participation, removal of social evils, and improving the quality of life have yet to be achieved.

- (5) Increase in means and methods of irrigation;
- (6) Reforms and land tenure;
- (7) Determination of prices;
- (8) Multi-purpose crops;
- (9) Increase in agricultural credit;
- (10) Better facilities for storage, marketing etc;
- (11) Imparting of education and training programme for increasing agricultural production.

Let us discuss each of these topics in detail :

(1) Use of improved quality and variety of seeds—In India before the period of the Five Year Plan, the seeds that were used were more or less traditional. During the First Five Year Plan and the subsequent Five Year Plan attempt was made to encourage farmers to use imported variety of seeds for better agricultural yield. Seeds were imported from the foreign countries and they were sown on various Government farms. As a result of it during the Fourth Five Year Plan a large area of land probably 10.96 crore hectares of land was given the benefit of the improved variety of seeds. Various State Governments established corporations for supplying improved varieties of seeds to the farmers. This resulted into unprecedented agricultural production.

(2) Use of modern means and methods and implements of agriculture—Before independence and for several years after independence the farmers used traditional implements for agriculture. After Third Five Year Plan, the impact of the use of modern implements of agriculture such as tractor, bulldozer, diesel engines, power operated pumps for irrigation facilities etc. which had been introduced in the First Five Year Plan was felt. As a result of all these things during Fourth Five Year Plan about 20% of the farmers resorted agriculture through modern means. This method brought about change in agriculture. In spite of the use of these modern implements of agriculture the target of agricultural production has not been fulfilled but agricultural production has certainly gone up in an unprecedented manner. This is what is termed as green revolution.

(3) Great stress on the use of fertilizers—During the various Five Year Plans, particularly the fifth five year plans, great stress was made on use of fertilizers. In 1976-77, the total consumption of fertilizers was 34.11 lakh tonnes as compared to 28.94 lakh tonnes during 1975-76. Similarly this process of use of fertilizers went on improving. This all lead to improvement in the agricultural production and green revolution was brought about.

(4) Use of medicines for preservation of crops—Farmers were not aware of the medicines that could kill the insecticides and pest

that destroyed their crops. During the third and the fourth five year plan period, a large quantity of insecticides and pesticides were used to save the crops from destruction. Agricultural departments, various agricultural Universities, and other agricultural research bureaux launched several programmes for research and use of these medicines. These things resulted into increase in agricultural production. It is said that the consumption of pesticides during 1976-77 was 42,874 tonnes as against the consumption of 44,509 tonnes during 1975-76. An area of 8.86 lakh hectares was covered by spraying.

(5) Increase in means and methods of irrigation—Indian agriculture for centuries together had been dependent on rains and nature. During various five year plans, several programmes for improving the irrigation facilities were launched and their completion resulted into improved irrigation facilities. During fifth five year plan period the rains also did not fail very much of the total 30.41 crore hectares under cultivation, 24.3 per cent has been brought under irrigation. All these things brought about increase in agricultural production and so green revolution could be enacted.

(6) Reforms and land tenure—Various measures for bringing about land reforms and in land tenure system resulted into improvement in the production of agriculture. Abolition of zamindari, change in the system of pataidari, assuring the farmers of their right of the land, improvement in holdings brought about through consolidation, giving relief to the farmers in various way and also making provision for loans etc. helped them to improve their agriculture and so the production shot up. It is expected that in the coming years, when more reforms are being suggested and carried out, the situation shall improve further.

(7) Determination of prices—The Government of India and various Governments are anxious to get to the farmers reasonable prices for their produce. They want to get them reasonable lucrative prices for wheat, paddy, maize, bajra, sugarcane etc. also the fixed the prices for all these agricultural commodities. They also made arrangement for sale and purchase of these things. Recently, the Government took over the wholesale trade of the agriculture. This also had a salutary effect on agriculture. This provided further encouragement to the farmers, and so there was increase in agricultural production. During past years the farmers had been at the mercy of the middle men in the trade of purchases and sale of grains for the price. When the Government came in the way they were assured of reasonable price and this had an encouraging effect on the production. This factor certainly contributed to the green revolution.

(8) Encouragement to multipurpose farming and production—We have already seen that in a large portion of the agricultural land in this country only one crop is produced. As a result of the



improvement in the irrigation facilities, now 22% of the irrigated land gives two crops. This process of improving the number of crops is going up. As a result of increase in the number of crops, the production has improved.

(9) Increase in agricultural credit—During the third and the fourth and the fifth five year plan period and particularly after 1980, there has been a good deal of improvement in the agricultural credit. Farmers are now getting loans and agriculture implements from various co-operatives. Land Development banks and institutions providing seed and implements to the agriculturists were established. These things encouraged the farmers to have their own system of production and so the agricultural production of the country improved. In fact during this period different types of facilities were provided to the farmers and so they improved the agricultural production.

(10) Better facilities for storage and marketing etc.—Government of India have been making all but efforts to improve the facilities for storage and marketing of the agricultural goods. They have developed machinery. Food Corporations of India and such corporations of various State Governments have helped the farmers in preservation and storage of their produce. These things have assured them that they can produce any quantity and that would be purchased by the government and also preserved. They themselves have been provided proper training and education for storage of their goods. These things have added to agricultural production.

(11) Imparting of education and training programme for increasing agricultural production—During various five year plan periods, attempt has been made to train and educate the farmers in regard to their methods of production and various other things connected with agriculture. This training and operation concerned various fields of agriculture. Because of this training and education, they learned about the methods of improved agriculture, use of insecticides and pesticides, proper storage of the foodgrains and so on. All these things added to the production and so agriculturists could really benefit.

In spite of all these causes, the fact remains to be considered whether the green revolution has really succeeded.

Has the Green revolution really succeeded? (7) —From the foregoing discussions it has become quite clear that in recent years, the production in foodgrains and commercial crops has gone up. In spite of it, it cannot be said that we have become completely self-sufficient and self-dependent so far as the foodgrains are concerned. Millions of tonnes of foodgrains have been imported during the period that is known as 'Green Revolution Period'. This import was necessitated due to floods and droughts and various unprecedented problems in various parts of the country. From this point of view it cannot be

said that the green revolution has succeeded completely. We have no doubt entered the period of green revolution and it is bound to succeed in a few years provided we are able to put a check on galloping increase in population.

The green revolution has succeeded only partially because the unprecedented increase in production is seen only in a few fields. As a result of modernized methods of agriculture, improved seeds and use of fertilizers the production of wheat, maize, millet etc. has gone up. But the production of paddy in spite of countries efforts has not increased so tremendously as the production of other things has improved. Then the improvement has been there only in certain developed areas of Punjab, Haryana, Uttar Pradesh, Bengal, Andhra, Maharashtra, Tamil Nadu etc. The impact of green revolution was not felt in the undeveloped or underdeveloped areas of the country. In fact the cultivable barren land has not been fully brought under cultivation. Still there is 2.35 crore hectares land which is barren and uncultivable. Unless it is done and undeveloped and underdeveloped areas also enjoy the benefits of green revolution, the green revolution shall not be called successful.

Green revolution has not benefited all the farmers alike, particularly the small farmers. Because of the small holdings and lack of resources, these farmers could neither bring about unprecedented increase in production nor could they take to completely modern methods. The facilities that were provided by the Government were taken advantage of by big farmers, landlords etc. Credit facilities and facilities for getting improved seeds, fertilizers, etc. were availed of by these big farmers. These things did lead to increase in production but cannot be said that impact of green revolution was felt all round and by all the farmers. However it is a good beginning and many things can be done to wipe out the deficiencies that still beset the path for increased production.

How can green revolution be completely successful—Green revolution shall be completely successful only when all the farmers particularly the small farmers are able to produce more and earn their livelihood from the small holdings that they have. Green agricultural workmen and labourer should not drive out the farmer from their livelihood. For this the following suggestions need to be considered:

(1) Co-ordination between various bodies that have been entrusted with the task of improving the agricultural production—village panchayats, agriculture departments, cooperative societies, block development authorities, etc., have been entrusted with the responsibilities of implementing the agriculture policy for greater production. These bodies should be specifically made responsible for certain things and co-ordination between various bodies should be

established. If they work in co-operation and co-ordination, results are bound to be heartening.

(2) **Proper arrangement for improved seed, fertilizer, irrigation facilities etc.**—Arrangement for supply of improved seeds, fertilizers and irrigation facilities should be made. These arrangements should be so made that all the farmers benefit from them.

(3) **Arrangement of capital for the farmers**—The farmers should be provided with financial assistance for improving their agriculture. Small farmers should be given better deal and encouragement. They should be given interest free loan or loan on nominal interest.

Nationalised banks and other bodies set up by the Government for the purpose have made arrangements for this and the farmers are now in a better position. Recently, as a result of the distribution of surplus land to the landless and arrangements for providing them with financial assistance, has provided further encouragement to the small farmers.

(4) **Examination of the soil by experts**—Soil of the field of the various farmers should be examined by soil scientists and seed studied, that particular soil should be provided to them. This would go a long way in increasing the production.

(5) **Fixation of reasonable price and marketing facilities**—The prices of various food grains should be fixed at a reasonable rate. They should be so fixed that the farmers are able to purchase other necessities of life that are produced in urban sectors. Proper marketing facilities should also be made available so that the farmers are freed by the middle man. Food Corporation of India and such other bodies set up by various State Governments are making efforts to do this job. The performance is not completely satisfactory but it certainly augurs well for the future.

(6) **Determination of land ceiling**—The maximum and the minimum ceiling in land should be fixed. It has already been done in certain States and Government of India in pursuance of their policy of narrowing the gaps between the rich and the poor are taking various steps in this direction. If it is done, it would go a long way in bringing about the success to green revolution.

(7) **Saving the crops from pests and crop insurance**—Through agriculture department and other departments attempt should be made to save the crops from destruction by the pests and insects. In order to save the farmers from starvation and devastation of crops, the programme of crop insurance should be implemented. These two measures would go a long way to encourage the farmer to produce more and do their best. Then green revolution shall succeed to a very great extent.

(8) **Serious efforts at Land tenure and Land reforms**—The present system of land tenure is not at all fully satisfactory. There

it need to bring about reforms in land tenure and other types of reforms in regard to agriculture land. These reforms should assure the farmers particularly the small farmers of a fair deal. Government of India and other State Governments are wedded to this policy and a good deal is being done in this direction. What is needed is expedient completion of these reforms so that the green revolution may be fully and really successful.

(9) **Researches and experiments and training of the farmers**—It is needed that researches and experiments should be made in the field of agriculture for improving production. The fielding of these researches and experiments should be made available to the farmers. The agriculturists should also be trained in regard to improved methods of farming. Then only the real success of the green revolution shall be felt and realised.

(10) **Better seeds and improved methods should be applied to the field of commercial crops**—So far the efforts in the direction of green revolution have not yielded desired and expected results in the field of commercial crops, paddy etc. Concerted and serious efforts should be made in this direction. Then only the green revolution shall be really successful.

The green revolution shall be called a success only when its results are available to all agriculturists and the alike. If it only leads to creation of a class of big farmers, grow rich every day it shall have no meaning. Its fruits should be available to the small farmers, who form bulk of Indian farmers. Efforts should be made available to the agricultural labourers brought in their own village if they so desire. Signs are visible that it shall be done but the need is to bring it about earlier.