NGJI, An International Peer Reviewed Journal
NGSI-BHU, ISSN: 0027-9374/2019/1715
Vol. 65, No. 3, September, 2019

Green Revolution and Food Security in India: A Review

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Abstract

India suffered from food shortage with occasional drought, famines which compelled to import. A rapidly growing population was creating more and more pressure on the agriculture sector and the country was suffering from lack of food grains in 1950. That time population was more, and food production and productivity were less. The Green Revolution which has helped in boosting self-confidence in our agricultural capability and balance between population growth and food grains production. The most remarkable achievement of the Green Revolution is the significant increase in the production of two major crops, rice and wheat. This first Green Revolution recorded both positive and negative implications on society and the environment. Present impacts are very alarming for human health. In spite of the huge agricultural production, there are some questions about the status of food security in the country. There is dire need to frame the second Green Revolution for the country. The intensification and food production diversification by promoting and providing a nutrient-dense improved variety of seeds of predominant crops are needed. This paper reviews the features of agricultural policies and the impact of the initial phase of the Green Revolution, and food security challenges in India.

Keywords : Green revolution, achievements, environmental impact, food security, policies .

Introduction

India is essentially an agricultural country majority of population lives within the area that directly or indirectly depends on the agricultural sector. In terms of the human population and firms output India ranks second in the world. Indian agriculture is known for its diversity (Chand et al, 2009). Agriculture sector still has a significant contribution towards the gross domestic product (GDP), it was about 51 per cent in 1950-51, which is at present about 15 per cent only. This sector also provides huge employment opportunities for the Indian population. Almost half the entire populations in India are engaged in agriculture (India Brand Equity Foundation, 2013). India has been able to increase its agricultural output very late. This has been possible due to improved means of cultivation, use of sophisticated technology, use of fertilizers etc. India's growing population in geometric means has broadened the challenges for food production, which still continues to grow in an arithmetic means. A significant part is increasing the agricultural output in India through the use of fertilizers.

India experienced unprecedented agriculture growth after independence. At the time of

independence, the country was dependent upon other countries for the food grains, but due to implementation of Green Revolution, a country not only fulfilling its domestic demands but started to export some quantities to different countries. The whole credit goes to the first green revolution. In the decade of 1960s, new agricultural strategies were applied mainly between during the third five-year plan of India (1961-66). It was a revolution in Indian agriculture, known as Green Revolution which helped the country to achieve self-sufficiency in food production (Singh, 2000). The Green Revolution included many components such as enhancing irrigation facilities, using of fertilisers, introduction to high yielding varieties of seeds, pesticides, insecticides, mechanisation and institutional reforms so on. As the new high yielding varieties of seeds shorter duration to grow thus it paved the way for the introduction of multiple cropping(have two or even three crops)during agriculture year in the country. The present paper aimed to assess the first Green Revolution and its implications together with the food security challenges in India.

Data base and methodology

The study is based on secondary data and compiled from the publications of the Ministry of Agriculture and Farmers Welfare (MOA&FW), Government of India (GOI); Department of Food & Public Distribution System, Ministry of Consumer Affairs, Government of India and related organisations and websites. Simple tabular analysis is used for data analysis to elaborate and explain the impact of green revolution on food production as well as food security challenges in India.

Achievements and curse of Green Revolution

The first time term "Green Revolution" was used in 1968 by William Gaud (Kumar, 2007). Green Revolution is a term to indicate improvements in crop production in Asian countries. In general, crop production has increased but certain environmental issues emerged due to intensive farming. However, where population density is high, we don't leave with any option but to grow more food crops. We have to increase productivity, but in ways which are environmentally safe, economically viable and socially sustainable. This is called the Evergreen Revolution (Swaminathan, 2000). About 51 per cent of India's geographical area is used for agriculture while China 11 per cent and the USA 20 per cent but the cultivable area of India is more than China. Indian agriculture has covered a long journey from the stage of food shortages and import to food secure and exports. Today, India ranks second in rice and wheat production after China. After the implementation of various components of the green revolution, the production and productivity of Indian agriculture increased many times but it is still very low as compared to developed nations.

One of the most remarkable achievements of the Green Revolution is the significant increase in the production of two major crops, i.e. rice and wheat. The production of rice has increased from 34.48 million tonnes in Triennium Endings (TE) 1962-63 to 112.47 million tonnes in TE 2018-19. The rice yield per hectare has also improved from 1013 kilogram (kg) in 1960 to 2578 kilogram in 2017-18. Same time, the wheat production also increased substantially from 11.28 million tonnes in TE 1962-63 to 99.18 million tonnes in TE 2018-19 (GOI, 2019). During this period, the wheat yield per hectare also increased five times (663 kg in 1950-51 to 3371 kg per hectare in 2017-18). During the period of1949-50 to 1983-84, the agriculture sector recorded an annual growth rate of 2.7 per cent. Apart from these, much other food and non-food crops production also increased differently (Figure 1).

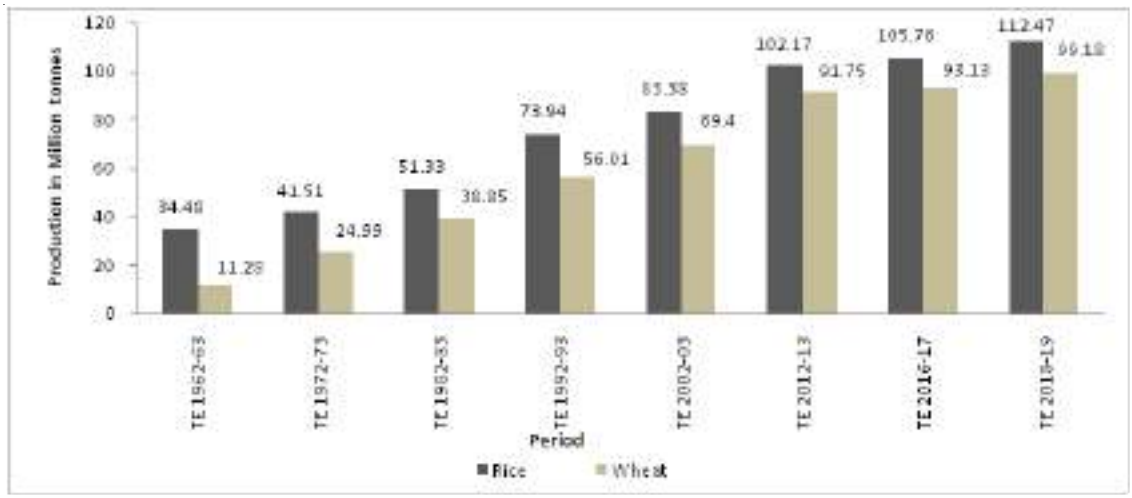

Figure 1: All India Rice and Wheat Production

Source: Computed from Agricultural Statistics at a Glance 2018, Government of India and www.pib.gov.in,4th advance estimates released on August 19, 2019.

Still today, Indian agriculture is dependent upon the monsoon as about 51 per cent agriculture areas is rain fed. In spite of the monsoons uncertainty conditions, total food grains production reached to 284.95 million tonnes in 2018-19 from merely 82 million tonnes in 1960-61 (GOI, 2019) recorded 3.5 times increase in food grains in last seven decades. The new commercial crops like sugarcane, cotton, jute, oilseeds also achieved a significant increase in its production relatively later than food grains. It has been found that the production of sugarcane, cotton, jute &mesta and oilseeds recorded a significant increase during the period of 1950-51 to 2018-

Table 1: Production of Commercial Crops before and after Green Revolution

Year	Sugarcane (Million tonnes)	Cotton (Million bales*)	Jute & Mesta (Million bales**)	Oilseeds (Million tonnes)
1950-51	57.05	3.04	3.31	5.16
1960-61	110.00	5.6	5.26	6.98
1970-71	126.37	4.76	6.19	9.63
1980-81	154.25	7.01	8.16	9.37
1990-91	241.05	9.84	9.23	18.61
2000-01	295.96	9.52	10.56	18.44
2010-11	342.38	33.00	10.62	32.48
2017-18	376.90	34.89	10.14	31.31
2018-19	400.16	28.71	9.77	32.26

Notes: *bale of 170 kg each; **bale of 180 kg each

Sources: Computed from GOI (2019, Agricultural Statistics at a Glance 2018) and www.pib.gov.in , 4th advance estimates released on August 19, 2019.

19. Since 1960-61 sugarcane production has been increased more than 3.5 times while cotton production recorded about 5 times increase (Table 1).

Over the period, there have been significant shifts in the shares of states in the output of

Table 2: State-wise growth rate in Food grain production in India

States	Compound Growth rate (per cent per annum)					
	1966-67 to 1979-80	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-90	2000-01 to 2009-10	2010-11 to 2017-18
Andhra Pradesh	2.61	3.72	1.78	0.92	3.41	-9.10
Assam	1.05	0.82	0.96	0.96	-0.32	1.97
Bihar	2.47	0.33	4.42	2.15	-0.76	8.50
Chhattisgarh	-	-	-	-	4.34	-0.10
Goa*	-	-1.67	49.59	3.39	-2.40	-2.60
Gujarat	10.74	13.78	-12.72	1.31	8.60	-3.48
Haryana	4.32	3.41	4.12	3.47	2.35	-0.74
Himachal Pradesh	1.18	0.55	1.12	0.59	-0.17	1.72
Jammu and Kashmir	2.79	2.29	0.05	0.01	2.61	0.40
Jharkhand	-	-	-	-	5.95	15.57
Karnataka	3.39	2.74	3.28	2.73	3.83	-3.91
Kerala	0.64	-0.49	-2.66	-7.14	-2.61	-1.67
Madhya Pradesh	1.38	-1.54	2.76	1.31	2.64	14.01
Maharashtra	4.87	11.34	2.41	0.26	2.79	-1.82
Manipur	0.91	5.79	0.42	2.79	-0.12	-0.29
Meghalaya	-	2.78	-1.21	3.59	0.69	5.28
Mizoram	-	-0.81	19.41	4.12	-13.42	2.07
Nagaland	-0.79	-1.97	23.98	1.88	2.86	-1.36
Odisha	0.13	-0.18	4.65	-4.17	4.87	0.84
Punjab	6.71	5.76	4.52	2.22	1.18	1.29
Rajasthan	2.58	-0.49	1.30	2.86	3.77	0.61
Sikkim	-	-	-	-2.40	1.50	-2.14
Tamilnadu	2.02	1.12	4.15	-0.94	1.23	-1.75
Tripura	5.26	4.69	2.18	-0.48	1.87	3.61
Uttar Pradesh	2.36	1.18	4.03	2.14	0.51	0.26
Uttarakhand	-	-	-	-	0.74	0.53
West Bengal	2.24	0.83	6.58	2.34	0.74	2.36
All India	2.81	2.08	3.21	1.60	1.90	1.90

Note: *for Goa period is 1971-72 to 1979-80 (period II)

Source: Computed from the data compiled from https://eands.dacnet.nic.in (MOA& FW, GOI)

major food grains. For instance, the share of the eastern region of the country (West Bengal, Orissa, Bihar, Assam and the north-eastern States) in the total output of rice had almost stagnant/marginally increased from 32 per cent in 1966-67 to 33 per cent in 2017-18. On the other hand, the northern region comprising Punjab, Haryana, and Uttar Pradesh had increased in its share in the total output of rice from 14 per cent to 27.7 per cent during corresponding period (Table 2). In the case of wheat, the major locational shift has been from the western region to the northern region of the country. With the help of modern irrigation facility, the agriculture is now moving from rain-fed agriculture to sustainable and intensive area.

Green Revolution has had a critical impact on Indian agribusiness. India had the alternative to achieve Self-sufficiency in food production with the guide of Fertilizer Manufacturing Companies (PSUs) and Fertilizer Manufacturing Co-operates. Furthermore, Position of India in the World is third seeing production and second similar to usage. The Decision Making Body is the Department of Fertilizers, Ministry of Chemicals and Fertilizers, and Government of India (Dasgupta, 1977). In India, there is found a positive correlation between food production and the consumption of chemical fertilisers (Table 3). Apart from fertilizers, pesticides are also using in order to get more productivity. India conveys about 80 per cent of its Urea excrement needs and the fertilizer business can indigenously meet a portion of the country's phosphate manures. However, simultaneously India is strongly liable to imports for the crude components for its po-

Table 3 Comparison of production of food grains and consumption of fertilizers in India

Year	Food grain production (in million metric tons)	Fertilizers consumption in nutrients (in lakh metric tons)
2002-03	174.78	160.94
2003-04	213.19	167.99
2004-05	198.36	183.98
2005-06	208.6	203.4
2006-07	217.28	216.52
2007-08	230.78	225.7
2008-09	234.47	249.09
2009-10	218.2	260.86
2010-11	244.78	281.22
2011-12	259.32	277.4
2012-13	255.36	255.36
2013-14	257.13	244.82
2014-15	252.68	255.81
2015-16	253.16	267.52
2016-17	275.68	259.49
2017-18	283.83	265.90
2018-19	281.37	272.28
2019-20	291.95	-

Source: Agricultural Statistics at a Glance 2018 and Ministry of Agriculture & Farmers Welfare, Government of India, 2019.

tassium and phosphate fertilizers. Punjab and Haryana are the biggest or called the largest consumer of pesticides. India expends 76 per cent of insecticides as against the world (44 per cent) significant pesticide accepting crops of the country are cotton trailed by paddy and wheat (Kumar et al. 2013). Punjab and Haryana are among the leading consumer of pesticides.

The fundamental utilization of pesticides is in agribusiness to ensure crops and away of food grains, moderately limited quantities are utilized in general wellbeing programs. Other than this, pesticides are additionally utilized for local cleanliness and other farming employments. The farming uses represent 75 per cent utilization and different uses are liable for the staying 25 per cent utilization (Banerji and Dixit, 2003). The creation of pesticides in the nation from just 200 tons in 1952, has reached more than 50,000 tons constantly in 1979. The expanded utilization of pesticides has been found to cause both environmentally and human wellbeing concerns (Anwar, 1997). Pesticides are broadly utilized in serious agribusiness to improve the creation, ensure put away harvests and control disease vectors. In spite of the fact that pesticides use has benefits, the wellbeing dangers have been related to non-target subjects including people who are occupationally and additionally environmentally presented to these agrochemicals (Agrawal and Sharma, 2010). These mixes are known to create toxicity to various frameworks in the human body coming about into haematological and biochemical annoyances. In the north Indian population, the introduction of field labourers to the pesticides, for example, organophosphorus, carbamates, organochlorines and pyrethroids is extremely normal. Occupational presentation of farmers specifically to these pesticides happens by means of dermal absorption and inhalation (Bharti and Taneja, 2007).

The utilization of present-day substance pesticides in India returns to 1947-48 when a few amounts of DDT plans were imported. Presently, more than 100 pesticides are utilized in our nation for the control of pests and diseases of monetary criticalness. Toward the start of the First Five Year Plan, pesticides utilization was around 3750 tons of specialized material. It expanded to 25,000 tons before the finish of the IInd Five Year Plan and to 45,000 tonnes toward the finish of the IVth Five Year Plan (Sharma and Parisi, 2017). Regardless of the way that the reliance on hazardous pesticides compounds in Green Revolution farming has added to the striking increments in the production of grains in the world, especially in developing countries, on the other hand, the wide use of manures and pesticides has caused general prosperity and natural issues (Bull, 1982; Pimentel, 1989; Dinham, 1996). These pesticides are so far preferred by the small farmers since they are pragmatic, adequately open, and show a wide scope of bioactivity. Pesticides have an outstanding circumstance among the various chemical compounds mixes to which man can be revealed, in that they are purposefully diffused into the environment to kill or to harm a few sorts of life.

Impact of Green Revolution on Agriculture

The Green Revolution has helped in boosting self-confidence in our agricultural capability and balance between population growth and food production (Chand, 2010). This Green Revolution has both positive and negative implications of society and the environment. Today the country is enjoying the status of food self-reliant, it is because of the Green Revolution. Due to the implementation of mechanization and institutional reforms the production and productivity increased significantly. After the implementation of the Green Revolution, the total production of food grains in India has increased by almost 3.5 times during the period from 1960-61 to 2018-19. Because of Norman Borlaug's dwarf wheat

varieties seeds, the country made the self-sustaining in cereal production in the year of 1974 while the Green Revolution started in 1966. In terms of self-sufficiency in food grains, the whole credit goes to only the Green Revolution. Apart from this benefits, there has been recorded the good expansion of employment as well as income from non-farming activities through the linkage effect (Chadha 1986, Bhalla et.al. 1990; Chand, 2010). Today, we all are getting sufficient food because of the implemented component of the Green Revolution. Inter-linkages between agriculture and industry has been boosting up as both interdependent to each other. Therefore, it is evident, that the Green Revolution proved more favourable to India.

Initially, we noted its positive effects but after two decades, its negative effects started to expose. But effects are not uniform across the country but it varies as per Spatio-temporal context. As far as the environmental implications of the green revolution are concerned, these are very serious. High doses of fertilizers, insecticides, pesticides; irrigation facilities also have negative environmental impacts. Newly adopted seeds of different crops were found more responsive to the inputs but this has increased fertiliser consumption and use of irrigation water resulting in the problem of water contamination by nitrate and phosphate and changes in the groundwater table (Singh, 2000). In order to get more productivity, the farmers are using more agricultural inputs at the cost of natural resource degradation which is totally opposite of sustainable development concept. Presently, the country is facing severe degradation in terms of water, soil, land and vegetation. The north-western part of the country facing acute problems such as Punjab is facing the acute problem of water depletion, soil poison. In Rajasthan, salinity, alkalinity and water logging problems have emerged drastically. Haryana has resulted in continuous environmental degradation, and the soil organic matter levels are declining and the use of chemical inputs is intensifying (Singh, 2000). Widespread contamination or nearness of pesticides residue in food items from different nations everywhere throughout the world has been accounted for by the International Agency for Research on Cancer (1974). Due to using high doses of chemical fertilizers and pesticides, the soil becomes highly poisonous mainly in Punjab. Fertilizer and pesticides are now entering into the human body and causing cancer. Running cancer train is a hot example. Singh et al. (2013) examined the audit the deaths identified with poisoning in Malwa locale of Punjab. They found that more youthful male patients prevailed more. Winter and summer months were having a higher occurrence of poisoning cases. Aluminium phosphate and organophosphate mixes were the commonest operators causing toxicity. The consequences of the examination are contrasted with those from India and around the globe represented most of the mortality with known pesticides in 2002. As compared to other parts of the country, north-western regions are being affected badly in terms of land degradation. The government should give subsidies to promote organic farming mainly in highly populated states and urban areas.

Green Revolution leads into the regional, societal and crop disparities increased. Due to green revolution, regional societal and crop disparities have increased as mainly Punjab, Haryana, western Uttar Pradesh, some districts of Karnataka, Tamil Nadu and Andhra Pradesh have benefitted a lot, backward states not benefitted at large. More emphasis was given on increase to the production of rice and wheat while other crops could reap the benefits in the same ration. Also, the introduction of new technology has transformed the farmers to become market-oriented. However, they are now relying more on the market for obtaining the inputs (seed, fertiliser, insecticides, pesticides, machines

and bank loan) as well as for selling their output mostly after harvest and conjointly dependent on institutional credit available within the market to meet the cost of adoption of the latest technology. Large and suitcase farmers were benefitted most and small and marginal farmers could not get the benefitted as per targets as they were not in the position to apply mechanization and inputs in their small size of landholdings. As richer farmers become richer and poor become poorer. Everywhere thousands of farmers commit suicides in various states which is a matter of grave concern before the government and policymakers in the country.

Food Security in India

Food security is greater accessibility of sufficient food at all times by all people (Krishna et al., 2015) Out of the all 17 Sustainable Development Goals (SDGs), goal second is zero hunger which means complete eradication of hunger to achieve food security for every person on earth. And this is possible only if we adopt sustainable agriculture practices. Agriculture is the only occupation which provides 40 per cent employment to the global population (Kumar et al., 2018). As per the United National Development Programme(UNDP) in 2017, the Asia continent accounted for about 63 per cent hungry of the world. The issue of food security is not specific to any country rather a big problem of today's modern world where food grain production is in surplus but distribution is not equal and creates a situation of food insecurity. The increasing population and to feed it with nutritious food is a great challenge. Crop failure due to flood and drought, decreasing water resources, soil erosion, climate anomalies also lead to an unprecedented situation of food grain production. Lack of awareness in farmers about government policies and what to do in case of crop damage are also some reasons for the agrarian crisis. Poor implementation of schemes like PDS, ill management of food resources, very limited use of technology, lack of investment in research to find out alternate sources of food and lack of will power in leaders etc. are the challenges which requires the proper attention of the political class, bureaucracy, civil society in integration with the marginal and poor people of the land. From the very beginning, food security has remained one of the top priorities of Indian planners and policymakers.To attain food security in the country is a great success where about one-third of the population is poor and half of its children are malnourished. The initiative of the Green Revolution in the late 1960s was major reform which transformed the food security situation in India. It is not only increased food grain production for the three to four decades rather gave a push to economic growth as well. It reduced the food insecurity and poverty by 50 per cent despite the high population rate which was almost doubled in that period. And consequently, the country succeeds to become a sufficient food nation. At present, India has 1394 million population which continues increasing, it needs a huge amount of food grains. As compared to the situation before the Green Revolution in terms of food security the present conditions are satisfactory in terms of food available, accessible and approachable.

The Government of India had introduced the strategy of the Green Revolution to raise the production by increasing yield and area of food grains in the country. The introduction of new seed-fertilizer technology during the mid-sixties led to large increases in the yield levels of wheat, rice and later oilseeds and cotton (Bhalla, 2007). Total food grains production has increased more than five times from 50.82 million tonnes in 1950-51 to about 284.95 million tonnes in 2018-19. Further, the share of cereals in total production of food grains has increased from 83.5per cent in 1950-51 to91.8per cent in 2018-19 and that of pulses has declined from 16.54per cent to 8.19per cent during the corresponding period.

The share of rice and wheat together in total cereals has increased from 53.20per cent in 1950-51 to 76.51per cent in 2018-19(in which share of rice was almost constant), while the share of coarse cereals has declined from 30.3per cent to 15.3 per cent during the same period, showing a change in consumption pattern of the poorer section of the society from nutri-cereals towards rice and wheat.

As the states of Punjab and Haryana having highest agriculture productivity and food surplus states, both have been greatly benefitted by the Green Revolution. Haryana emerged as major food grain producing state along with the Green Revolution particularly in rice and wheat but other side pulses and other coarse grain production has declined. Surplus production is generally transferred to food-deficit states in the form of trade and increase the agriculture contribution to state gross domestic product. As per 2009 India State Hunger Index, Haryana is on 5th place. Punjab, Kerala, Andhra Pradesh and Assam are ahead of Haryana (Kumar et al. 2018). India is self-reliant in food grains, but there is a question, if there is food security, why there was a need to introduce the food security bill in the parliament it means the country is not food secure. Public distribution system (PDS) is not functioning fairly which has a big role in food security. Reality is that thousands of people who are a beggar or live at the roadside in cities, get one-time food in a day and suffer from hunger and malnutrition.

The need for Food Policy

Currently, the Indian Government is giving more importance to the welfare of farmers. The implementation of several farmers' welfare schemes to improve their economic conditions and to revitalize the agriculture sector. Therefore, the government has come out with new schemes, initiatives, programs and plans to benefit all the farmers of India. Like causes for low productivity in small holdings of land with farmers, effective irrigation and optimum usage of fertilizers for crops becomes difficult, owning a fragmented land, thus resulting in lower yields. India faced a grave food shortage at the time of Independence. To meet the shortage in the supply of food grains, the central government had made the short run provisions to (a) extend the rationing system to cover villages as well as cities; (b) easing the situation by importing food grains, and (c) announced subsidy for the distribution of food grains which was imported as it was expensive as compared to produce in the country. Thus, since independence, policymakers had targeted to meet and reach to the condition of adequate availability of food grains. In view of favourable results of planning, planners became very much confident and assumed that problem of food shortage is solved. However, said the situation could not prevail long as achieved success was due to favourable climatic conditions and adequate and timely arrival of rains during those years.

The food grains crisis situation got exposed during the Second Five Year Plan due to drought, floods and cyclone, and various parts of the country again experienced a serious food crisis especially in 1958-59. In order to distribute imported food grains, the public distribution system was introduced. Through the network of fair price shops, food grains were distributed at a price lower than the prevailing market price. In view of said situation, Government had targeted to produce 100 million tonnes of food grains during Third Five Year plan but could not achieve the same which again forced the Government to go for import as was endorsed by the food grains Enquiry Committee in 1957. In order to make the situation more stable, heavy imports of food grains were adopted. India has signed an agreement with the United States of America for importing 16 million tonnes of wheat and 1 million tonnes of rice for the next 4 years. Thus, food policy during a decade com-

prised of second and third plan period was based on imports when about 6 million tonnes of food grains were imported every year. However, despite import, food prices were going high and thus, the government realised the failure of policy deepening on imports and came out with the Integrated Food Policy in 1966.

Various studies documented the limitations and impacts of the first Green Revolution on society and ecosystem. Keeping in minds, these issues, now it has been realised that there should be second Green Revolution securing food and nutritional security for the Indian masses along with the increasing the farm incomes and employment focusing on agriculture sustainability (Figure 2). Diversification of food production by promoting and providing a nutrient-dense improved variety of seeds of predominant crops (Swaminathan,2020) can be part of the policy matter. On the one hand, the human population is increasing and on the other hand, the fertility of the soil is decreasing and more uses of chemical fertilizers and pesticides are very harmful to the environment and human health. There should not be further negative impacts on socio-economic and environmental aspects of agriculture development across the country. Land and environmental degradation should also be key in the next policy intervention.

Conclusion

The country made great achievements as it was food deficient but now it is food self-reliant. It was possible due to the adoption of the first Green Revolution which provided the self - sufficiency in food grains and development in agriculture sections but on the other hand, it left some crucial negative implications which can-

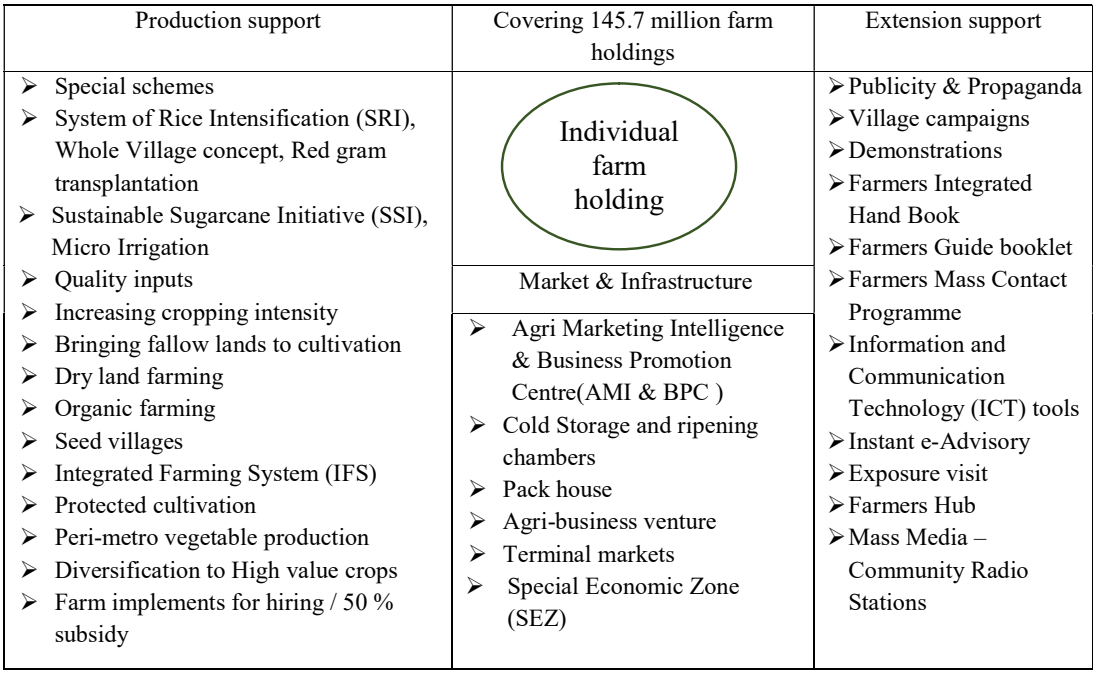

Figure 2: Approaches to Make Second Green Revolution
Source: Author.

not be avoided at the present situation. Development and enhancement of agricultural productivity should not be at the cost of environmental and human health degradation. To eradicate starvation and malnutrition, it is to be ensured that sufficient food production is available accessible and approachable at all time. Currently, state and central governments offer value of subsidies, crop insurance including pulses, sugar, rice, wheat, water, cooking gas, power, manure and kerosene. In India, price subsidies has changed a huge piece of against destitution strategies, yet have not changed the lives of the poor working conditions. As the country self-sufficient in respect of wheat and rice but the country is still deficient in pulses and vegetable oil, reflected in the import of huge quantities of oils and pulses in recent past. Similarly, production and access to vegetables, fruits, and livestock products, which also contribute to food security, need to be deserved attention. There should be the promotion of diversification of food production supplying the nutrient-dense improved variety of seeds of predominant crops to the farming community. It is a matter of intensive investigation that in spite of many special schemes and plans, why Indian farmer being committed suicides. Special focus should be given to the small, marginal and landless labourer. At the local level, food processing units should be established and take the raw materials directly from small and marginal farmers for their sustainable livelihood security. Keeping the experiences of the first Green Revolution, the government should frame and introduce another revolution based on food security and safety focusing on inclusive development and sustainable agriculture for future earth. Different stakeholders such as farmers, scientists, academicians, planners, policymakers and non-governmental organisations should include in the forming of the second Green Revolution for the country.

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