

An Overview of Agriculture in India



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Introduction

“Agriculture is our wisest pursuit, because it will in the end contribute most to real wealth, good morals, and happiness,” said Thomas Jefferson in a letter to George Washington in 1787. Jefferson’s words hold true for a country like India where agriculture sector employs 52 per cent¹ of the country’s workforce and contributes minimum 17-18 per cent to the country’s GDP.

The signs of agriculture in India can be traced to at least 9000 BCE. Archaeological records of that era prove that cultivation of plants and domestication of animals was practiced in the north-western parts of India. With the growth of civilisation, agriculture became more sophisticated with the development of new tools and techniques. Irrigation channels and various other water and land management techniques were introduced later that became the backbone of India’s economic growth. The discovery of new trade routes meant that Indian goods like spices, cotton, indigo, opium, were finding their way to the global market.

For millenniums, self-sufficiency and sustainability remained at the core of Indian economy. The situation changed with the advent of the European colonialism where the focus was changed to commercialization of agriculture. As a result, self-sustained rural economy of India got badly exploited and damaged. Even after more than seven decades of freedom from the colonial rule and several changes introduced in Indian agriculture, the sector still has many challenges to overcome and has an enormous potential waiting to be tapped.

¹ Economic Survey 2018

CHAPTER I

The Era of Land Reforms

The primary characteristic of the Indian economy was agrarian during as well as prior to the British rule. Rough estimates state that 85 per cent of the population was either directly or indirectly dependent on agriculture during the British era. Rice and wheat were the two staple crops that were being grown in India. Deterioration of the sector started when British forced Indians to grow cash crops instead of food crops. With the focus on imports, cash crops like cotton, jute, oilseeds, sugarcane and tobacco started dominating Indian agriculture. While maximisation of profits became the sole motto of the British, it had adverse effects on agricultural productivity and food security. India was no longer self-sufficient and the policy apathy of the British meant that the country saw millions of deaths due to starvation during the colonial rule. What made the matters worse was the land settlement systems of the British which took the form of zamindari/ryotwari/mahalwari systems which gave rise to inequality in society.

The Zamindari system was introduced by Lord Cornwallis in 1793 through permanent settlement. It fixed the land rights of zamindars/land owners in perpetuity and completely ignored the rights of the actual cultivators. With a system that completely favoured the landed gentry, the focus was on increasing rents than finding new methods of agricultural production. When the ill effects of the Zamindari system came to be known, the British government through Regulation VII of 1822 Act made provisions for temporary settlement. In the provinces of

Madras and Bombay, Sir Thomas Munro, Governor of Madras had introduced the ryotwari system which recognised the peasants as the owners of the land. But often the revenue imposed on them was not proportional to the yields and they were eventually evicted from their land. The Mahalwari system that was introduced by Holt Mackenzie in 1822 and was instituted through Regulation VII of 1822 Act and Regulation IX of 1833 Act. It required each cultivator to contribute to the revenue demand of the village on the basis of the size of landholding. The state share of the revenue was fixed at 66 per cent which became a burden for the peasants. Moreover, all these three systems demanded that the tenants or farmers pay their dues on cash which went against the existing practice of most of the farmers being allowed to pay the landlord in kind. This forced the peasants to go to moneylenders who ensnared them in a vicious cycle of debt and eventually took control of their lands.

The dire situation led to widespread peasant revolts in the country and the British government was forced to look into the issue of peasant rights. In 1885, the Bengal Tenancy Act was passed which conferred occupancy rights upon peasants who were in continuous possession of land for 12 years. Correspondingly, the Bihar Tenancy Act of 1885 and Orissa Tenancy Act of 1914 granted occupancy rights to tenants while, the Madras Tenancy Act of 1908 provided for protection of ryots from eviction as long as they paid the rents. But these measures could not provide any relief as most of the cultivators in the absence of any documents could not prove their tenancy and the landlords took advantage of the many loopholes in the law to maintain their rights over the land.

When India became independent, it also inherited the widespread inequalities that were a result of years of economic exploitation by the British. By then, from a self-sufficient economy, India had transformed into a country where every sector of its economy was crumbling. But before going into issues like production, the biggest challenge in front of the policy makers was to carry out land reforms. It was necessary to give the country a strong foundation to rebuild its economy.

The prominent issues that India was facing right after independence were – unequal distribution of land, absentee land ownership, exploitation of tenants by landowners with threats of eviction and high rents, fragmented land holdings, low yields and lack of investments and avenues for institutional finance which could have helped agriculture sector tide over the crisis. As pointed out in a report by the National Commission on Agriculture in 1976, the factors relating to land tenure meant that the actual cultivators never had any power to decide what to cultivate and they were constantly exploited by the land owners. By 1951, the leased-in area constituted 35 per cent of the total operated area and the rent varied from 50-70 per cent of the gross produce. In the absence of any security of tenure and mounting debts, the peasants were forced to work like bonded labourers. This system also facilitated the role of intermediaries who acted as a bridge between the cultivators and landowners and robbed the former of any benefits that may have accrued to them.

So, to restore social justice and revive a sector that many in the government believed to be the country's backbone, the Congress Agrarian Reforms Committee was constituted under the Chairmanship of J.C. Kumarappa to analyse ways to ensure growth of the agriculture sector. The

Committee submitted a comprehensive report in 1949² which became the basis for some far-reaching reforms in the sector. The major recommendations of the Committee included abolition of intermediaries between the state and the tiller, full occupancy rights, land to belong to the tiller subject to certain conditions, prohibition of subletting of land, fixation of land ceilings and redistribution of surplus land among landless labourers³. The views of the Kumarrappa Committee were echoed in the Second Five Year Plan which called for abolition of intermediary tenures and bringing the peasant in direct contact with the state which will bring the focus back on enhancing agricultural production.

Following these recommendations, all the states in India enacted legislations to abolish intermediaries between 1950 and 1960. But lack of uniform legislations stalled any progress that could have been made if they were implemented in a systematic manner. While states like West Bengal and Kerala imposed land ceilings along with abolishing intermediary tenures, there were states that allowed intermediaries to retain the land under their control. Such a step meant that large land owners continued to exist and the cultivators were evicted from the land without even tilling rights.

Ceilings on land holdings remained the focus throughout this period. Taking into consideration the prevailing conditions in India, the policy makers believed that only small farms could bring about economic development and social justice. The underlying logic was that ownership of the land will give the cultivators the drive to work more

² N.Jamal Ansari, 'On Agriculture, Land Reforms and Industrialisation,' *Mainstream*, 2007

³ 'Land Reform Policy of the Government Of India,' *UK Essays*, 2018

and increase the yield. It will also help in employment creation and equitable distribution of wealth. But some of the landlords also took recourse to benami transfer of land that defeated the purpose of the reforms.

As a result of this, several reform initiatives like the Bhoodan movement of 1951 and Gramdan movement of 1957 were launched with the goals of land redistribution and land acquisition. But these movements and the resulting policy decisions proved to be ineffective as the landlords continued to exploit the many loopholes that were available. In the Bhoodan movement, out of the total 42.6 lakh acres of land received, more than 17.3 lakh acres were rejected as they were deemed unfit for cultivation. This meant that eventually the move benefitted the landlords as they were given subsidies and other benefits to part with barren land. Under the Gramdam movement which had called for abolition of private property, only the right of the landlords to sell the land was curtailed and they were given the right to pass the land on to the next generation.

With several problems, the recommendations of Kumarappa Committee once again started gaining importance. While arguing that peasant farming through small farms should be the way ahead for Indian agriculture, the Committee suggested that small farmers should be brought under the umbrella of cooperative or collective farming. The First and Second Five Year Plans put forth similar suggestions and these were accepted in the Third Five Year Plan which also stated that cooperative farming should be done on a voluntary basis.

In effect, only the states of Punjab, Haryana and western Uttar Pradesh were benefitted from the land reforms during this period due to consolidation of holdings. In all the other states, agrarian structure remained unequal. According to

estimates, nearly eight per cent of the ownership holdings in 1953-54 accounted for 54 per cent of the total land. During this period, even though 310 million acres of land were owned by rural households, it was essentially held by just 66 million households and the average size of the land holding was only 4.72 acres. A breakdown of these figures revealed that 47 per cent of the rural households did not hold any land or held land that was less than one acre in area. 16 per cent of the cultivable area was owned by less than per cent of rural households and size of each of these holdings were estimated to be 50 acres and above. The inequality was the starkest in South India where the concentration ratio was 0.74 as opposed to the 0.64 ratios in North and West India⁴. Lack of political will also had a major role to play in rendering the land ceiling legislation ineffective.

The inequalities as a result of the landed class taking advantage of the loopholes in the existing laws widened in the late 1960s and early 1970s, which led to the constitution of a Central Land Reforms Committee. According to the recommendations of this Committee, the family of five was made one unit, the focus was once again on land distribution and the land ceiling was decided according to the crop pattern because of which for inferior dry land, the ceiling was brought down to 54 acres. For redistribution, the government acquired land under the Land Acquisition Act of 1894. This law was later replaced by the Right to Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act of 2013 to meet the demands of the changing times. Later in

⁴ 'Operational Land Holdings in India' Ministry of Planning & Programme Implementation, Government of India, 1992

2015, the Right to Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement (Amendment) Bill, proposed by the government was passed by the Lok Sabha but got stuck in the Rajya Sabha.

Unfortunately, even with all the land reform measures, the 2011 census has stated that 55 per cent of total agricultural workforce is landless. This means that from 1951 to 2011 where the numbers stood at 144.3 million, as against 118.8 million farmers, there has been a five-fold increase in landless farmers. Prior to this, in 2009, a report by the rural development ministry titled, 'State Agrarian Relations and Unfinished Task of Land Reforms,' had warned that industrialisation, migration, urbanisation etc. could stall the progress expected from land reforms.

In 2012, Lok Sabha member Sumitra Mahajan in a Parliamentary Standing Committee had questioned the role of the state in acquiring land. But in the 2013 draft National Land Reform Policy, this issue was not given due importance and the government once again went back to focussing on land acquisition and distribution.

In 2017, The Ashok Dalwai Committee had suggested that the landless farmers should be considered at par with the landed class and given all benefits. The Committee pointed out that small and marginal farmers constitute 86 per cent of all farmers and that they should be given incentives. It endorsed a 2016 "Report of the Expert Committee on Land Leasing" led by T Haque, which had proposed a model land leasing law which was circulated to all states. The report put forth the idea that farmers should be allowed to participate in contract farming, be part of farmer producer organisations etc. to ensure that landlessness do not act as a hindrance. The following year, Niti Aayog in its report, 'Doubling Famers' Income' brought out the prevailing

inequalities in agriculture where in states like Jharkhand and Odisha, the percentage of farm households living below the poverty line is 45.3 per cent and 32 per cent respectively as against the national average of 22.5 per cent⁵. This was a clear indication of the failure of land reform laws in the country till that time.

⁵Prasanna Mohanty, 'Rebooting Economy 52: The unfinished agenda of land reforms nobody talks about,' *Business Today*

CHAPTER II

Post Green Revolution Crisis

The stagnation of Indian agriculture was evident in the 1950s when the growth in crop and grain production stood at just 0.4 and 0.1 per cent per annum⁶ and food grain production stood at 59.3 MT in 1952-53 with a yield of 579.8 kg/hectare.⁷ By the 1960s with increasing population growth, India was facing a food security crisis and there was an urgent need to introduce reforms in order for the government to save the country from another famine. So, it was decided to take recourse to technology to bring about far-reaching reforms in the agricultural sector and ‘Green Revolution’ was initiated.

The term ‘Green Revolution’ was coined by William S. Gaud of United States Agency for International Development (USAID) and was aimed at introducing new technologies and formulating new policy measures in the developing countries with help from industrialised nations to increase the production of food crops. It involved introducing genetically improved high-yielding varieties (HYs) of wheat and rice that were developed by the International Maize and Wheat Improvement Centre (CIMMYT), Mexico, and the International Rice Research Institute (IRRI), Philippines to increase agricultural productivity in India. Regular use of chemical fertilisers and heavy irrigation had to be ensured to get the assured productivity. Under the guidance of Dr M. S. Swaminathan

⁶ India Brand Equity Foundation, ‘Agriculture,’ 2016

⁷ ibid

who is known as the Father of Green Revolution in India, high yield variety (HYV) programme was initiated in 1966.

Between the periods of 1967-68 and 1996-97, the area under the HYV plants increased from 6.07 million to 76 million hectares. The output of wheat increased from 11.39 million tonnes in 1966-67 to 51.1 million tonnes in 1990-91 and that of rice increased from 37.6 million tonnes in 1967-68 to 74.3 million tonnes in 1990-91.⁸

Along with these measures, the government also introduced Minimum Support Price (MSP) and Procurement price in the 1960s. The latter was discontinued during the period 1975-76 to streamline the process. The MSP which was announced at the start of each cropping season served as the floor price and was calculated on the basis of a pre fixed formula. It served as a long-term guarantee for producers who were assured of a fixed amount even during the period of low demand. Procurement prices which were announced after harvest began were the rates at which public agencies had to domestically procure the kharif and rabi cereals.

With increased production and reduced import of food grains, the country was well on the path of achieving food security. Green Revolution had contributed significantly to poverty alleviation and encouraged farmers to cultivate more. But even with such marked gains, in the decades that followed the initial success of Green Revolution, negative effects of the policy were being visible. The rapid intensification had given rise to inequalities in society and also sounded the death knell to traditional agriculture. By

⁸Tripathi, Amarnath & Prasad, Anubhuti. 'Agricultural Development in India since Independence: A Study on Progress, Performance, and Determinants,' Journal of Emerging Knowledge on Emerging Markets, 2009

focussing on short-term goals, all the successive governments had clearly failed to safeguard Indian agriculture and the interests of the farmers and to sustain the hereditary culture of the country. The small and marginal farmers could not compete with the increasing demands that new technologies and policies had placed on them. A stark rural-urban divide began to be visible that hindered agricultural progress and also overall economic development.

The Green Revolution with its requirements of expensive inputs and machinery incentivised those farmers who had the financial means to make big investments and who owned large acres of land. The inequalities perpetuated by Green Revolution had four important effects that defeated the very purpose of its introduction. These were – a) the rise in mono-cropping which made agriculture unsustainable; b) rise in commercial farming which robbed the livelihoods of small and marginal farmers; c) the end of cooperative or community farming and d) the rise in the suicide rates of small farmers.⁹

It needs to be noted that Punjab was the first state where it was decided that Green Revolution will be introduced. It had the advantage of numerous irrigation canals that were built during the British era. This was ascertained by the Intensive Agricultural Development Program which was formed to select areas that were best suited for the new varieties of seeds which could only thrive in particular environments.

However, a survey conducted in 1967 highlighted the uneven nature in which farmers were benefitted by the

⁹Kathryn Sebby, 'The Green Revolution of the 1960's and Its Impact on Small Farmers in India,' *University of Nebraska at Lincoln*

Green Revolution. The survey found that only those farmers who owned at least twenty acres were in a position to purchase the inputs required for Green Revolution. In Punjab, during that period, 65 per cent of the farmers owned less than 15 acres of land and it constituted just 34 per cent of the total land of the state. The rest of the land was concentrated in the hands of a minority of wealthy farmers.¹⁰ By the late 1970s and early 1980s, a large number of small farms shut down as they could not withstand the competition and were cash strapped. A survey conducted in 1981 found that the number of landholdings in Punjab fell to 1,027,127 from 1,375,382.¹¹ The shift towards large farms meant that by 1984, 24 per cent of small farmers and 31 per cent of marginal farmers were living below the poverty line.¹² In 1985, the Johl Committee headed by eminent economist S.S. Johl was appointed to assess agricultural systems in India. In its report which was submitted the following year, the Johl Committee noted that farming in Punjab was seeing a decline in financial returns even though there was an increase in per hectare income from 1977-79. The introduction of credit system and the rising input costs had pushed many farmers to indebtedness. The money lenders and creditors were charging exorbitant interest rates which had further worsened the situation of small farmers. To

¹⁰ Newman, Bryan.(2007) "A Bitter Harvest: Farmer Suicide and the Unforeseen Social, Environmental

and Economic Impacts of the Green Revolution in Punjab, India ." Development Report

No. 15 Food First: Institute for Food and Development Policy

¹¹Rafie, Jaihoon& Kumar, Raj. (2020). A Review on Scenario of Agriculture in India and Punjab 1900-2019. International Journal of Current Microbiology and Applied Sciences

¹²Gopal, Singh. Socio-Economic Basis of the Punjab Crisis, Vol. XIX, No.1 1 Jan 1984

improve the economic wellbeing of farmers, the Committee had recommended that at least 20 per cent of area under wheat and paddy should be shifted to other crops like fruits and vegetables. Following this, the second Johl Committee report which was submitted in 2002 and had made 95 recommendations had warned that if these measures are not implemented, agriculture in Punjab will be in severe crisis.¹³

In the decades that followed the Green Revolution, the decline of agriculture continued in Punjab. In a survey conducted by the National Sample Survey Organisation (NSSO) in 2012-13, Punjab was ranked 23 among 28 states in terms of agricultural growth and this has been the case since the 1990s. A 2011 paper that appeared in the *Economic and Political Weekly* argued that the crisis that Punjab is facing at present may be due to the rich farmers and the unsustainable farming practices followed by them. According to Dr Himanshu, an associate professor of economics at Jawaharlal Nehru University, the majority of private investment in Punjab is to extract groundwater for irrigation, making it one of the most water inefficient states¹⁴. The groundwater reserves are depleting rapidly because of which the farmers are forced to invest in more expensive equipment to ensure that the crops are well irrigated. Compounding these issues was the guaranteed Minimum Support Price procurements because of which the state's farmers did not have to think of innovative and sustainable solutions to protect their land.

¹³Dr.Veena Sharma, 'Need of the Hour / Diversification in Punjab,' *International Journal of Research*

¹⁴Roshan Kishore, 'Have Punjab's rich farmers created their own nemesis?' *Mint*

As stated earlier, the Minimum Support Price (MSP) was implemented in 1964 by the then Minister of Food and Agriculture C Subramaniam. Along with this, two other institutions - the Agricultural Produce Commission, now known as the Commission for Agricultural Costs and Prices (CACP) and the Food Corporation of India (FCI) were also established to ensure that MSP can be implemented in a seamless manner. While the Agricultural Produce Commission was responsible for conducting a detailed survey on cultivation costs and determine an MSP, the FCI had the responsibility of procuring grains from farmers in the APMC mandis for the Government of India. These measures which were meant to help the farmers at that time are becoming the biggest hurdles for Indian Agriculture in the present day. With the protection given by MSP, farmers kept on relying on unsustainable practices to increase their yield. As per the records published by FCI, it has purchased an astounding 90.22 metric tonnes of wheat and rice and the aggregate MSP for this was nearly Rs 2.15 lakh crore as of 2019-20. From its stipulated role as a buyer of last resort, the FCI has been transformed into the first option for farmers looking to sell their produce. By the end of June 2020, it was recorded that the FCI warehouses were overflowing with rice and wheat stocks surging to 97.27 million tonnes against its requirement of 41.12 million tonnes. The value of unused grains lying at FCI warehouses are pegged at USD 39 billion. Also, with the government unable to compensate FCI fully, it is estimated that FCI's total debt stands at USD 58.13 billion.¹⁵

Another factor that went against Green Revolution was that the methods of organic husbandry that were in use in India

¹⁵ How India's grain policies have stoked FCI's debt binge. Reuters. December 2020

for centuries were forgotten. Indian farming was more efficient in small plots of land where crop rotation was practiced and land was left fallow for long periods of time to allow soil to replenish its nutrients. In the subsistence-based farming, a large number of indigenous crops were grown and there was efficient use of land and water as other crops were also planted along with the main crop.

With Green Revolution, mono-cropping began to be widely practiced. It involved clearing large patches of land and leaving the land fallow for shorter duration which was not enough for the soil to replenish its nutrients. With absence of different crops that may have used varying nutrients from the soil, the farmers resorted to excessive use of chemical fertilisers which killed all the indigenous species and only one type of seed could be sown. This practice also made the fields vulnerable to vagaries of nature.

The father of Green Revolution, M.S. Swaminathan had admitted that Green Revolution may not have been the best strategy for India. He acknowledged that the practise of mono-cropping along with industrialisation had depleted water reserves and exhausted soil of essential nutrients. It also led to a situation where farmers had to pay more money to counter the damages caused due to heavy use of fertilisers to their land¹⁶. The increasing dependence on synthetic fertilisers, pesticides and use of heavy machines diminished the soil quality and made it unfit for any other crops. It has also been observed that the pesticides travel through the food chain and have been found to cause various health problems including cancer in human beings.

¹⁶Laidlaw, Stuart. 'Green Revolution Gets a Rethink.' *Toronto Star*, 2008

An example of such indiscriminate use of pesticides and chemicals can be found in Punjab itself where in its Fazilka district, 152 patients were detected with cancer in 2020¹⁷. Another example of the adverse effects of pesticide can be found in the use of Endosulfan in Kerala which resulted in thousands of children being born with severe extreme neurological and congenital deformities.

Due to the distressful situation many farmers died by suicide. According to the data released by the National Crime Records Bureau, the number of suicides in 1966 was 37,848 which meant the suicide rate was 7.6 per cent. Out of these, five per cent were due to poverty and other economic reasons. In 2000, the suicide rate was recorded as 10.8 per cent and out of this nine per cent was related to poverty, unemployment or bankruptcy/change in economic status. One of the major reasons that pushed farmers to take this extreme step was that they were unable to afford the expensive inputs needed for Green Revolution because of which they were forced to lease out their land to wealthier farmers. Due to their inability to pay off their debts, they ended up working as labourers in their own lands. Some of the landlords also started evicting tenants to have access to a large stretch of land needed for Green Revolution.

While the farmers were continuously forced to face unfavourable circumstances, the irony was that there never was a food shortage in the country. As pointed out by the Famine Commission that was constituted in 1880 by the British government, every province in India had a surplus of food. The real problem was that people were unable to afford the food that was being produced. This in effect meant that through the methods of Green Revolution that

¹⁷State's cancer care model to be adopted in country. *The Tribune*.3 Dec 2020

included monoculture and excessive use of chemical fertilisers among other things, the indigenous varieties of crops completely disappeared and that is what pushed Indian agriculture into a serious crisis. Green Revolution also changed the consumption pattern of Indians in a significant way because of which the focus shifted to addressing market requirements and their purses than meeting local needs.

It needs to be noted that millets formed an important part of Indian diet before the Green Revolution relegated it to the category of fodder crops. The country also lost more than one lakh varieties of indigenous rice after it started solely focussing on high-yielding varieties of crops. There are only 10 varieties of modified rice variants that are being cultivated now and these crops are unable to withstand the adverse effects of climate change.

Dr Ramon De La Peña of the University of Hawaii, one of the world's leading experts on rice had predicted the outcome of Green Revolution as early as 1997 when he said that it may not be the best way to increase grain production. He had pointed out that the old varieties of rice were two meters high and were not easily susceptible to weed and insect attacks. He opined that it was possible to get 12 tons per hectare with the old cropping methods and had warned that the new varieties may in fact result in lesser yield if they are not managed correctly.¹⁸

His analysis was proved right when the area under cultivation increased from 97.32 million hectares in 1950 to 126.04 million hectares in 2014, but it came at the expense of indigenous crops and small and marginal farmers. Since

¹⁸India – Once Plentiful: Records reveal British schemes diminished crops and dismantled a native system of abundance, *Hinduism Today*, May 1997

the 1950s, the area under cultivation of coarse cereals decreased from 37.67 million hectares to 25.67 million hectares. The area under cultivation of sorghum decreased from 15.57 million hectares to 5.82 million hectares and that of pearl millet decreased from 9.02 million hectares to 7.89 million hectares¹⁹. On the other hand, the area under cultivation of rice, wheat, maize, and pulses increased from 30.81 million hectares to 43.95 million hectares, 9.75 million hectares to 31.19 million hectares, 3.18 million hectares to 9.43 million hectares, and 19.09 million hectares to 25.23 million hectares respectively.²⁰

While replacing traditional crops with hybrid ones, the impact on health was also overlooked. The indigenous varieties of rice had more nutritional content than the high yielding varieties. It is now accepted that the indigenous varieties of rice were a good source of minerals and vitamins such as niacin, thiamine, iron, riboflavin, vitamin D, calcium, and had high fibre content which could keep a number of lifestyle diseases like type II diabetes and cardiovascular diseases at bay.²¹

Over the years, various studies have found that because Green Revolution was concentrated on particular areas where conditions were favourable for production, it only resulted in widening inter-regional gaps. The areas that were dependent on rain-fed agriculture were left behind. In addition to this, it only benefitted those farmers who had

¹⁹Directorate of Economics and Statistics (DES), Ministry of Agriculture, India. 2014. <https://eands.dacnet.nic.in/PDF/Glance-2016.pdf>

²⁰Ann Raeboline Lincy Eliazzer Nelson, Kavitha Ravichandran & Usha Antony. 'The impact of the Green Revolution on indigenous crops of India.' *Journal of Ethnic Foods*

²¹Umadevi M, Pushpa R, Sampathkumar KP, Bhowmik D. Rice-traditional medicinal plant. *India J Pharmacogn Phytochem*. 2012

access to latest technologies to keep improving their yield. With the smallholders losing their land, it also led to an increase in rural unemployment.

A lesser discussed impact of Green Revolution is on Indian politics. It is by now clear that the Green Revolution facilitated the growth of a section of farmers who had the means to afford the costs required for introducing high yielding varieties. With the rise of a powerful group of farmers, agriculture became an important issue in Indian politics. The country witnessed the formation of multiple agrarian groups which consisted of people outside the political elite but had the power to sway public opinion. During the time when the transition from single party rule to coalition politics was taking place, the focus of policy makers was on appeasing this influential group of farmers which resulted in the small and marginal farmers paying a heavy price.²²

Green Revolution 2.0

According to a report²³ by the Food and Agriculture Organisation (FAO), by 2050, global population is projected to increase by about one-third, which will require a 70 per cent increase in food production. India which holds the second-largest agricultural land in the world, with 20 agro-climatic regions and 157.35 million hectares of land under cultivation has enormous potential to meet the growing needs.

²²Aditya Dasgupta. 'Game-changing Green Revolution may have led to Congress party's decline in India.' *The Print*

²³The Future of Food and Agriculture – Trends and Challenges. FAO 2017

In order to take advantage of this, the country will have to think in terms of Green Revolution 2.0²⁴ that is based on sustainable agricultural practices with modern technologies. The country will have to invest more in research on the traditional methods of farming and find ways to make them commercially viable. There are more investments required to encourage innovation so that all sections of society can gain from Green Revolution 2.0. The solutions should be region specific as different practices are being followed in each agro-climatic zone.

²⁴Prabhu L. Pingali. 'Green Revolution: Impacts, limits, and the path ahead.' *Proceedings of the National Academy of Sciences of the United States of America*

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