

## SUSTAINABLE DEVELOPMENT AS A NECESSITY FOR FOOD SECURITY IN INDIA – A SOCIOLOGICAL ANALYSIS

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### **Abstract:**

Food security means different to different people. It is context-specific. On one hand, it is the yield per acre and availability of food grains, and on the other hand, how the policy interventions have impacted the social systems, particularly in the context of 182.2 million people being undernourished in India. Food security means not only making the availability of food grains to the growing population, but also its sustainability in terms of accessibility and acceptability of food grains. The inevitable policy interventions in India have shifted the production interests from traditional crops to commercial crops and increased the need for the intervention of private companies in production and marketing. The crops produced now are more export-based and urban biased with less calorific value and high cosmetic standards. With a fragmented supply chain and increasing private monopoly over food production, the stability and sustainability of Indian food systems in the feeding 1.39 billion population is questionable. This study is to analyze how the policy interventions since independence have changed food production systems and their impact on sustaining food security.

**Keywords:** Agricultural Sustainability, Food Security, Economic Reforms, National Food Security Act.

### **Introduction**

Sustainable development encompasses economic prosperity i.e. livelihood sustainability, social and human welling, and environmental conservation. It is a process of change in which, the exploitation of resources, the direction of interest, the orientation of technological development, and the institutional change are in the harmony and enhances both the current and future potential to meet human needs and aspirations. Sustainability in agriculture means the land and resources that are used for agriculture today should be handed over to the future generation in a sustainable form so that they can continue to practice agriculture and have food security.

The world's growing population, environmental degradation, limited natural resources, and climate change are the biggest challenges to food security. Soni and Choudhury (2021) estimates shows around 870 million people are malnourished and 98 percent of them live in developing countries. In addition, 1 billion people lack adequate nutrition, and approx. 6 million children worldwide have starvation and malnourished deaths each year. According to Global Nutrition Report 2021, the environmental impact of food demand grows as much as 14%. According to the FAO report 'The State of Food Security and Nutrition in the World 2020', it is estimated that 182 million people are undernourished in India which is 14% of the

population. National Family Health Survey 2019-20, the 5th series mentions 7.7 percent of children are severely wasted and 35.5 percent of them are stunted. And, at the same time, 3.4 million children are overweight which was 2.1 million in NFHS 4<sup>th</sup> series. Anemia among children under 5 years has become significantly worse with a current prevalence of 67.1 percent compared to 58.6 percent in NFHS-4. 57 percent of women of reproductive age are anemic in the country. According to the Multidimensional Poverty Index by UNDP, India ranks 66 among 109 countries and 131 among 186 countries on Human Development Index as of 2021.

Food has diverse historical, cultural, geographical, economic, political, and social significance worldwide. And also a source of nutrition and thus allows for survival of life. Access to food is a human right. Any gap in accessing and sustaining food resources will severely affect all aspects of development. The internationally accepted definition of food security is given by FAO in the Rome Declaration of World Food Security 1996, and further refined in FAO's 'State of Food Insecurity in the World 2001' – "Food Security is a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food that meets their food preferences and dietary needs for an active and healthy life". Swaminathan (1986) has stressed the need for shifting to the concept of 'Nutrition Security' which he defined as "Physical, economic and social access to a balanced diet, clean drinking water, environmental hygiene, primary healthcare, and nutritional literacy". According to him, three dimensions of food security are food availability, accessibility, and absorption.

Swaminathan and Bhavani (2013) define availability as "the availability of food stocks in desired quantities"; access is determined by entitlements related to people's initial endowments - what they can acquire and opportunities open to them to achieve entitlements sets with enough food either through their own endeavor or through state intervention or both; and absorption is defined as the ability to biologically utilize the food consumed. India has taken several initiatives to ensure food security. The initiatives ranged from concerted efforts to boost agricultural production to far-ranging market interventions with an aim to stabilize prices. Besides the country has taken measures to improve the availability and accessibility of food to vulnerable sections through PDS, ICDS, and income-generating schemes. The food grains production has reached 316 million tonnes in 2021 from that of 69.3 million tonnes in 1960-61. Introduction of economic reforms led to a 9 percent growth in agriculture. Today, India is considered to be the fastest-growing economy in the world. In spite of significant growth in agricultural production one-third of its population is estimated to be in absolute poverty and one-half of the children are malnourished in one way or the other (Kumar 2014). Food security is increasingly affected by global economic and environmental conditions. Food prices were adversely affected due to inadequate food availability and instability in food systems, which further aggravates socio-economic and political instability, later escalating to humanitarian crises.

In India, many internal and external factors necessitated agricultural advancements such as mechanization of agriculture to boost food production and to stabilize the economy. Economic reforms also brought changes in the agrarian social system. These changes

collectively impacted the social attitudes and beliefs in the production of food, choice of crops, cropping patterns, institutional arrangements, collective interests of locals, and consumption behavior. The shift from traditional methods of production and consumption to modern/commercial methods has increased food production in many folds but caused an imbalance in nutritional and dietary values. The market-imposed Indian food system seems to be unstable to promote sustainable development as there is an increased monopoly of private players. It has also led to the use of agricultural land for non-agricultural purposes under the influence of globalization. The impact is clearly evident as India ranks 71 out of 113 nations in the Global Food Security Index of 2021.

## **Objectives**

The main objectives of this paper is to analyze the necessity of sustainable development for food security in India. The specific objectives of the present paper are as follows:

- i. To examine how India has shifted from food subsistence to food shortage during colonial period.
- ii. To analyze the increase in food grain production during the post green revolution period.
- iii. To analyze the need of sustainable development for the food security in India.

## **Methodology**

The present study is based on secondary data drawn from the research articles, books and research reports. Data has been drawn from various secondary resources related to food security and sustainable development and it has been analyzed in a scientific way. The researcher has adopted a method of qualitative analysis to draw certain generalizations related to the necessity of sustainable development for food security in India.

## **Analysis**

### ***Colonial Indian : From Food Subsistence to Food Shortages***

Prior to the colonial period, India was practicing subsistence farming i.e farmers usually grew enough food to feed themselves and others in the village. A variety of food crops was grown which were locally accessible in each village. At the end of the 18th century with the advent of British rulers, the village communities began to disband and a new agriculture system was introduced. The permanent settlement of Lord Cornwallis in 1793 introduced an intermediary class called 'Zamindar' between the peasants and colonial rulers. This system of farming largely impacted Bengal, Bihar, Odisha, and later North Madras (Dutt 1960). These Zamindars were absentee landlords who collected money from the cultivators and paid fixed amounts to the British. This system has led to many cultivators becoming landless laborers.

Changes in land ownership had led to the commercialization of agriculture and shifting cultivation from home consumption to market/ export-oriented. Cash transactions replaced the barter system. In the first half of the 19th century, India exported indigo, opium, cotton, and silk. Later jute, food grains, oilseeds, and tea replaced indigo and opium. The value of

India's exports has risen more than 500 percent from 1859 -60 to 1906-07 ( Dutt 1960; Dutt 1904). The profits generated by exports have largely benefitted the British business families, big farmers, Indian traders, and money lenders. This system of agriculture has put Indian communities at greater risk of famine. Further, the shift from food crops like jowar, bajra, and pulses to cash crops has contributed to disastrous in famine years (Davis 2001). Many scholars have argued that there is a close link between food exports and famine.

Famine commission reports of 1880, 1898, and 1901 provide enough evidence that adequate food grains were present during famine years. The reports suggest that famine in British India was caused by inadequate food supply rather than the non-availability of food grains or crop failure (Dutt 1960). Arnold (1988) distinguished two types of famines – 'Grain Famine' and 'Money Famine'. In Money famine, it is a lack of capital that makes it impossible for peasants to procure food, whereas the Grain Famine is the failure of crops. Famine is also triggered by a lack of rainfall which results in chronic poverty.

During British rule, the Indian Economy was devastated entirely by exploitation. Indian population suffered from low life expectancy, pervasive malnutrition, and a high rate of illiteracy. It was the land revenue system that forced the commercialization of agriculture and the partition of India has contributed to food crises since major food-producing states like west Punjab and Sindh went to Pakistan. India's share of world income decreased from 22 percent in 1700 AD to 3 percent in 1950 (Dutt 1904).

### ***Post Independence: From 1947 to Mid 60's***

Agriculture in post-independence is characterized by small and fragmented land holdings, outdated technology and inefficient use of fertilizers, excessive dependence on rainfall, and low yields. The first five-year plan prioritized improving the agriculture sector with an aim to an expansion of an area and increased productivity (Adams 970). This period is termed 'trial and doubt' by Hopper (1976). This period witnessed tremendous agrarian reforms, institutional changes, the development of major irrigation projects, and the strengthening of cooperative credit intuitions. The most important change observed was the abolition of intermediaries and the giving away titles to the actual cultivators. Land reforms brought increased agricultural production during this phase (Tripathi and Prasad 2009).

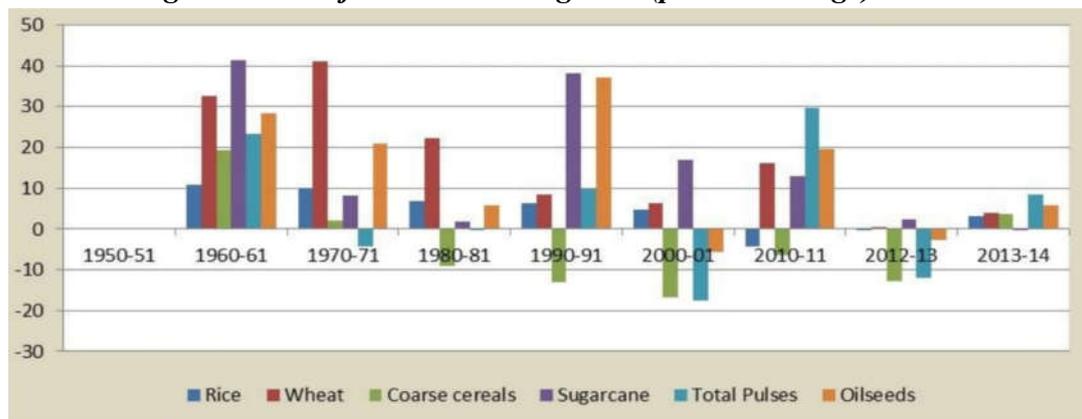
Hopper (1976) In the second five-year plan, the government of India entered into a long-term PL 480 agreement with the US to obtain a regular supply of US surplus grains. India has imported 8 million tonnes of food per year by the mid-'60s. This continuous import of food grains which was initially meant for emergency aid has lowered the farm prices in India. It has become a disincentive for the farmers to produce. But the Indian planners believed that it was cheaper and more efficient to import the food grains rather than to invest in agriculture in India. This has also resulted a drop in Indian private investments as wheat prices fell from 1959 to 63. After the end of the Pakistan war in 1965, the withdrawal of emergency aid by the USA exacerbated the famine situation with the failure of monsoons in the second half of 1960. The food grain output fell to 72.3 million tonnes in 1965-66, a drop of 20 percent from the previous year.

### ***Green Revolution, Commercialization of Agriculture and Diversification of Crop : From Mid 1960s to 1990s***

In the Third Five Year Plan, India adopted the new technology of High Yielding Varieties (HYV) in the agriculture sector. As a result, the productivity of agricultural lands had increased and public investment in the irrigation sector was stepped up (Gohain 2019). The significant achievement of the adoption of HYV is the attainment of self-sufficiency in food grain production. Similarly, research extension input supply, credit marketing, price support, and the spread of technology were given greater emphasis. This period resulted in the fast growth of non-food grains like milk, fishery, poultry, vegetables, fruits, etc. This resulted in accelerated growth in agriculture GDP (Rao 1996).

However, the growth in coarse cereals, pulses, and oil seeds was not satisfactory. But the growth in sugarcane was at a faster rate than all other crops (Gohain 2019). The figure below shows a high rate of area expansion for wheat, oil seeds, and sugar; less or stagnant for pulses and negative for coarse cereals. The traditional rice varieties have become nonexistent and local varieties have been reduced to 7000 varieties. India has lost more than 1 Lakh of indigenous rice varieties after 1970 ( Nelson et. all 2019).

**Figure 1: Trend growth rate of area under irrigation (percent change)**



Source : (Gohain 2009 ; Agriculture statistics at glance 2015)

Even though there is an increase in productivity during that period, the family income remained low. Consumption expenditure is focused on caloric value rather than a balanced diet (Adams 1970). Diversification of crops has not responded to the targeted consumption expenditure. But the production of commercial crops for exports and raw materials for the domestic industry has shown growth of 3.6 percent per year and the food availability was 417 grams/day/person. Many farmers went into debt and they became landless laborers (John and Babu 2021). The green revolution has benefited certain states like Punjab, Haryana, Western Uttar Pradesh, and in some districts of Karnataka, Tamil Nadu, and Andhra Pradesh, while the backward states failed to make any progress. More emphasis was given to the production of rice and wheat, hence the other crops could not reap the benefits. This period has made farmers market-oriented and thus they adopted intensive farming (Yadav and Anand 2019).

### ***Economic Reforms and Post Reform Period : From 1990- 2015***

The economic reforms of 1991 brought radical changes in all sectors of the economy altering the goals of Indian development policy such as growth with equity, social responsibility, social justice, and self-reliance. The basic thrust of public policy of subsidies, poverty alleviation, safety net programs, and unemployment schemes was also altered. New concepts such as liberalization, privatization, and globalization have emerged. The role of the state with reference to the market was redefined with a renewed commitment to the market, as an instrument to bring out social change and as an agency for social security.

In 1994, the government extended the liberalization to agriculture by lifting restrictions on imports and reducing public interventions in domestic markets. Due to the liberalization of exports, the prices of food grains have raised declining food accessibility to the poor. The import liberalization has destroyed the domestic markets and small farmers. With the decline of state intervention in the procurement and distribution of food grains, multinational companies are engaging in the marketing of fast foods (Bijukumar 2017). He further added under economic liberalization, the central government reduced the allocation of food grains under PDS due to pressure from IMF and World Bank. Thus the government has introduced Targeted Public Distribution System (TPDS) in the place of PDS targeting the benefits to the BPL families only. Thomas and Chittedi (2019) mention the TPDS could however achieve a low incidence of poverty in some states, it has led to the high prevalence of food insecurity in other states causing regional imbalances among states. They observed a negative correlation existed between the incidence of poverty and alternative measures of cereal deprivation in the states of Maharashtra, Uttar Pradesh, Madhya Pradesh, West Bengal, Odisha, Bihar, and rural Assam.

Chakravarthy and Dand (2005) highlighted the reasons for TPDS failure as - 1) Improper identification of BPL families, 2) Targeting of BPL families has affected the distribution system itself, and 3) Instead of improving the production, the government has procured grains from agriculturally rich regions to distribute to hunger prone regions. Thomas and Chittedi (2019) added there was an unwillingness of the beneficiaries to purchase from fair-price shops due to the supply of poor-quality rice and wheat. According to Balani(2013), though the food grain production in 1989-99 was lower than the increase in population during the same period, there is a decline in consumption or purchasing power of the poor. He assumed this has happened because of structural imbalances in the economy with raising capital intensity, lack of land reforms, and failure of poverty alleviation programs. He concluded that if the demand does not increase there would be serious constraints on the growth of agriculture targeted at 4.5 percent per annum.

The economic reforms resulted in cuts in farm subsidies like irrigation, electricity, fertilizers, pesticides, etc. Institutional credits to farmers were also affected and the farmers were forced to approach informal credit networks. Since 1990 the reduced growth rate in agriculture due to the failure of public investment resulted in a decline in food production and availability of food (Bijukumar 2017). He states that the average daily intake of protein decreased from 60.2 grams to 57 grams in rural India between 1993-94 and 2004-05. This has caused food

insecurity among women, children, and socially marginalized sections. The entry of corporate business into agriculture resulted in an increase in the prices of food grains affecting access to food (Bijukumar 2017; Arora and Rawat 2017). Further, Inadequate remunerative prices to the farmers led to the incidence of farmers' suicide.

Structural adjustment programs led to the devaluation of the national currency, privatization of public enterprises, and encouraging foreign investments. This deteriorated health, education, and nutritional conditions, particularly among the poor. The scholar has opined that after 5 years of SAP implementation, the economic reforms failed to bring recovery and turned out to be socially and environmentally harmful (Weber 2012). Weber observed, post-reform period witnessed a rise in the unemployment rate among the rural workers while unemployment has fallen in urban areas. On the whole Indian economy did not generate enough jobs during this period as needed.

Integration of the domestic economy with the global economy has worsened the agrarian situation. As per the WTO agreement to which India is a signatory in 1995, it has to enforce free market access to foreign countries, removal of restrictions on the free import of agricultural products to Indian markets has adversely affected the domestic food production (Bijukumar 2017). In order to counter the negative impacts of LPG and WTO agreements, India launched a National Agricultural Policy in 2000 with an aim to attain a 4 percent growth rate in the agriculture sector ( Tripathi and Prasad 2009).

Open market reforms have led to urbanization with large-scale migration from rural to urban. According to the 2001 census, 28 percent of the population lives in urban areas which is equal to 290 million people, who do not uniformly enjoy the benefits of urbanization, and only the top 10 percent of the population enjoys it. The census also says that 67 percent of the Indian workforce still depends on agriculture, and suffers from persistent poverty and food insecurity in rural areas. This factor also resulted in distress migration and urbanization with the development of slums and scattered settlements characterized by unsanitary living conditions and high food insecurity (Chakravarthy and Dand 2005). He mentioned that the main factor that influenced urban food insecurity is the dependence on casual wage employment.

Upadhyay and Palanivell (2014) states poverty limit the availability of food, and overpopulation is linked to malnutrition among children particularly in rural areas. Lack of knowledge among mothers regarding nutrition, breastfeeding, and parenting are the areas of concern. Though many poverty alleviation programs have been launched in the country, they were not properly implemented. Lack of coherence in nutrition and food policies, and absence of coordination between various ministries have added to the problems.

Ruchi (2017) states that in the period from 2001 to 2015 agricultural sector has become unsustainable due to 1)Decreased size of land holdings of small, marginal, and medium farmers, 2)Transfer of agricultural land to non-agricultural purposes, 3)Shortage of farm labor, 4)Shift from traditional crops to commercial crops, and 5) Increased cost of cultivation associated with uncertainties of prices.

The share of agriculture in GDP over the last 50 years is quite small but it is a vital sector and its neglect can cause food inflation and political instability. It is predicted that the total food grain demand would increase from 201 million tonnes in 2000 to 291 and 377 million tonnes by 2025 and 2050 respectively. Therefore, an increase in production with a sustainable supply of food grains to meet the growing population demand, should be the primary goal of sustainable development (Chitra and Malarvizhi 2020).

### ***National Food Security Act and from 2015 onwards***

The government of India enacted National Food Security Act 2013 to provide food grains at highly subsidized prices. This program covers 75 percent of the population in rural areas and 50 percent in urban and is implemented across India covering 81.35 crore persons with the allocation of 610 Lakh Metric Tonnes of food grains per annum (Pib 2019).

Under the 12th Five Year Plan (2012-17) the priority of the Government of India was to ensure 'Faster, More Inclusive and Sustainable Growth. Sengupta and Mukhopadhyay (2016) suggested in order to achieve this goal the performance in agriculture needs to be enhanced by diversifying produce and reducing the vulnerabilities of small and marginal farmers with a focus on women and disadvantaged groups. The author further adds an increase in food production should be supported by growth in related sectors of the economy such as chemical products, mineral fuels, livestock products, and other oil seeds and crops to ensure a balanced diet for the consumer. Sawarkar and Hanumantappa (2018), on the other hand, expressed challenges and constraints in implementation of the act in the backdrop of a struggling economy, political and bureaucratic environment, will of executives, and awareness among the people about the act.

### ***Food Insecurity: During and Post Pandemic***

In 2019, the COVID 19 pandemic has exposed the weakness of the global food system. India took a leadership role in ensuring food security through a technology partnership with developing countries in Asia and Africa by providing food supplies. The country deployed two the Indian Navy Ships (INS) – (i) INS 'Kesari' on a special relief mission (Mission Sagar) to deliver essential medical and 580 tonnes of food supplied to the Maldives, Mauritius, Madagascar, Comoros Islands, and Seychelles, and (ii) INS 'Airavat' to South Sudan, Djibouti and Eritrea. And also food and medical aid were provided to Nepal and Afghanistan. The country contributed US\$10 million to the South Asian Association for Regional Cooperation COVID-19 emergency fund.

In an article published by Observer Research Foundation, Rampal (2021) mentions while India helped the other countries during the pandemic, its own position is critical particularly in the farm sector as millions of people being undernourished. The highest levels of underweight and stunted are observed in Jharkhand, Bihar, Uttar Pradesh, Madhya Pradesh, Gujarat, and Maharashtra. And starvation deaths were also common in some parts of Bihar and Jharkhand during this period. Paradoxically undernutrition coexists with overflowing food stocks of 70 million tonnes of rice and wheat available in September 2020 enough to ensure zero hunger in the country. Lockdown during the pandemic led to disruption in the

food supply chain heightening the food accessibility problem. Informal workers experienced the loss of livelihoods, uncertainty, and disrupted income flow which directly affected the food security.

A study by Thomas (2020) estimated that income lost by the informal sector workforce during the first two months of lockdown accounted for about INR 4 trillion was nearly 2% of the country's annual GDP. Another study by Mangal (2020) says that despite the government's initiative of the 'Take Home Ration' program, the dependence on Mid Day Meal, ICDS could not meet their food and nutritional needs due to a shortage of food manufacturing units. Also, there were many slips in the implementation of grain and allowances in lieu of the MDM scheme for the school children. In another study on Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Agarwal (2020) states that works were suspended in the early weeks of lockdown added to the decline in purchasing power of the labor.

Dreze and Somanchi (2021) highlighted the devastating impact of a pandemic on food security. With the collapse of purchasing power of the poor and continued restrictions on movement after the lockdown, the public services were severely disturbed so-all-so the nutrition-related services. Dalberg's survey indicates that 80 percent of Households (HH) across 15 states have been affected by income reductions and nearly one-fourth of the HHs earned no income at all. Similarly, a report by Action Aid presents that 35 percent of migrant workers were eating less than two meals a day. Returning migrants in Bihar were found close to 60 percent were unable to get two square meals a day. A study by the Right to Food Campaign 'Hunger Watch' also shows that two-thirds of the respondents were eating less nutritious food than before lockdown.

The Covid-19 Pandemic exposed the challenges of food and nutrition security, and also the opportunity to address them. Therefore, it is necessary to find suitable solutions to overcome current crises and ameliorate millions of people from hunger and poverty.

### ***The Question of Sustainable Food Security***

Sustainable food security is dependent on sustainable production and supply. Sustainable production is dependent on natural resources like soil, water, and climate. If the fast-emerging ecological imbalance is left unchecked, will cause irreversible damage to the natural resources and the productivity, resulting from floods, drought, soil salinization, rising temperature, unpredictable rainfall, crop diseases, pests like locust etc. The raising of water-intensive crops like paddy and wheat has led to groundwater depletion, and stubble burning has deteriorated the air quality. Wheat, rice, and sugarcane are grown in nearly 40 percent of the crop area but they consume 80 percent of the irrigation water. Across the country, large farmlands have become barren lands due to imbalanced use of fertilizers and excessive use of single fertilizer causing degradation of soil. Desertification and land degradation are major threats to agriculture productivity.

Desertification and Land Degradation Atlas of India by the Indian Space Research Organization reveal that there's an increase of 1.87Mha of area under the process of Desertification which is 0.57 percent of the Total Geographical Area (TGA). Around 3.63Mha of productive land has been degraded and 0.47Mha of land has been converted from low severity to high severity degradation class. And also currently, the biggest challenge is water management. According to Food Sustainability Index, India scores lowest among 25 countries in mitigation of climate change including afforestation and conservation programs.

Apart from challenges like rising cost of labor and other inputs, depletion of the groundwater table and soil salinization, climate change contributes to 19.9 percent of GDP. Between 2017 and 2019, 18Mha crop was lost to floods, and 40 percent of food was lost in post-harvest. Therefore, agriculture and its allied activities need to be given a top priority. The impact of climate change on India's food system is to be taken seriously note as 194 million people (2019) are struggling for food and nutritional security.

India ranks 94th out of 107 countries on Global Hunger Index. Tanksale and Jha (2014) predict food needs by 2025 and 2050. If the allocation of food needs from present 5kg/person/month to 7kg/person/month then the total annual food grain requirement will be 99.7 million tonnes and 116.63 million tonnes for the years 2025 and 2050 which is about 44 percent and 40 percent for the respective years. The study by Hinz et. al (2020) mentions socioeconomic factors like population and economic growth as the main drivers for increasing future food demands. It is estimated that crop production will be from 43 percent to 55 percent between 2010 to 2030. Similarly, livestock production will also be doubled. It is suggested that India will face similar problems to that of China. Hence, Agriculture sector requires significant changes in policies and production practices more sustainably.

A report released by World Resource Institute 'Food System at Risk' highlighted India's innovative methods in agriculture. In Himachal Pradesh, the cultivation of apples is being taken up at higher altitudes because of the rise in temperatures at the lower altitude, and vegetables are grown at lower altitudes. In Maharashtra, the drought-prone region has shifted to pomegranate from grapes because of falling groundwater levels. In south Gujarat, the farmers shifted to aquaculture in place of paddy. New technologies have emerged where storm-resistant greenhouses are on the rise. Though wealthier farmers could adopt transformative practices, the small and more vulnerable farmers lack access to resources such as capital, credit, and information. This poses the question of who can adopt such sustainable practices.

Sustainable innovative practices also require complementary efforts to shift cultural and behavioral preferences to encourage and create market demand for the new crops. The 'Millet Mission' in India is an example. The revival of millet production is helping farmers of dry land areas and is encouraging a shift away from water-intensive crops across the country. By including millets in PDS, can bring change in consumers' dietary patterns and support local centers to create millet-based products.

## Conclusion and A Way Forward

India's growth story started with deep agrarian crises. With the advent of British rule, from subsistence to shortages, from grave famines and later to the Green revolution, commercialization of agriculture at the cost of regional disparities and loss of traditional crops, economic reforms with increasing urbanization and growing casual labor, state interventions with implementation leakages, right to food and decreasing workforce in the agriculture sector, Covid-19 pandemic and fragmented supply chains, and finally the question of sustainability at the midst of climate crises. Food insecurity and poverty are observed to be constant throughout history. Over the years, India has seen starvation deaths in contrast to impeccable economic growth. Thus, India's growth history has a lot to offer in terms of insights into the future and reflections on what went wrong to change ways both in its policy and practice.

With this analysis, it is concluded that the current system of agriculture production may not respond to future demands. Future food security can only be achieved by closing yield gaps, diversifying crop and consumption choices, reducing waste in the supply chain, crop and livestock integration, conservation of natural resources like water and soil, and shifting focus towards sustainable production enhancement technologies in agricultural sector. The application of these measures together could double food production with available resources without increasing environmental impact.

As India grows through a rapid process of urbanization, both with the expansion of mega cities and district towns, the availability and supply chain will increasingly become a challenge to vulnerable populations especially in urban areas. Concerning future safety nets, it is essential to take into the account changing nature of the economic structure, demography, future livelihood pattern, etc. Current policies have not taken into account the fact that India would be more urban than rural by 2050. Most of the existing food-based policies have a greater rural presence. Public works program like MGNREGA has only been designed for rural areas, assuming rural employment is the only concern. With rising urbanization, urban inequality, and unemployment, there's a real challenge for Indian food supply chain systems ahead.

As a way forward, to secure the agricultural sector, India needs transformation of rural spaces and food supply chains to be more inclusive and growth-oriented. Through organized upstream and downstream networks of activities, by encouraging agribusiness through credit incentives at the local level, food value chains could absorb agricultural labor and provide them with jobs. Employment in logistics, like segregation, storage, processing, and so on along the supply chain could potentially be leveraged as the channel of employment generation. Such inclusive transformation of rural spaces by including those who are left out is essential to remove rural poverty and improve their purchasing power to secure food needs.

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