

A Study of Trends in Agricultural Production and Productivity in India

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Orcid Id: <https://orcid.org/0009-0002-6874-8210>**Abstract:**

Improving productivity in the agricultural sector must remain a central priority for achieving food and nutritional security. Agricultural development contributes significantly to ensuring household access to adequate food and proper nutrition, creating employment opportunities, raising rural incomes, and reducing poverty in farming communities. Despite these benefits, the Food and Agriculture Organization reports that hunger and malnutrition continue to affect large populations across many regions of the world. If current trends persist, the global goal of ending hunger by 2030 is unlikely to be achieved, and the challenge may continue well beyond 2050. At the same time, progress in agricultural productivity has shown signs of slowing. With the global population increasing at an annual rate of approximately 1.2%, the average yearly productivity growth of major food crops remains only slightly higher at around 1.3%, which is insufficient to comfortably meet future demand. Feeding the rapidly expanding world population therefore remains one of the most pressing challenges facing global agriculture. Sustained growth in agricultural production and overall output is essential for meeting basic human needs, combating hunger, reducing reliance on food imports, strengthening economic resilience, improving trade balances, and reinforcing food and nutritional security. In this context, strategies such as crop diversification, production intensification, and more efficient use of agricultural inputs and natural resources are critical for long-term sustainability and food system resilience.

Keywords: Agricultural, Production, Productivity, Food and Nutrition Security.**Introduction:**

The development of the agricultural sector plays a vital role in strengthening food and nutritional security. It contributes by increasing the availability and diversity of food, driving broader economic transformation, and serving as the main livelihood source for many of the world's poorest populations. Research consistently indicates that improvements in food security and nutrition depend on progress in both agricultural and overall economic growth, as agriculture often acts as the foundation for wider economic expansion. According to India's Economic Survey 2020–21, agriculture emerged as a particularly resilient sector, with its contribution to GDP rising to nearly 20% for the first time in 17 years. The sector's share increased from 17.8% in 2019–20 to 19.9% in 2020–21, making it the only major sector to show strong growth momentum during that period. In addition, food grain distribution under the National Food Security Act (NFSA) expanded significantly, increasing by 56% between 2019 and 2020. By December 2020, the government had supplied 943.53 lakh tonnes of food grains to States and Union Territories. Rising agricultural output has strengthened national food self-sufficiency, transforming the country from a food-deficit nation in the post-independence period into a net exporter of agricultural and allied products. More broadly, investment in agriculture remains one of the most effective pathways for reducing extreme poverty, improving shared prosperity, and ensuring food availability for the projected global population of 9.7 billion by 2050. Growth in agriculture is often estimated to be two to four times more effective than growth in other sectors in raising the incomes of vulnerable populations.

However, the contributions of agriculture to food security, poverty reduction, and economic growth remain increasingly threatened by climate change. In regions already facing severe food insecurity, declining crop yields may further intensify vulnerability. At the same time, agriculture, forestry, and land-use change together account for nearly one-quarter of global greenhouse gas emissions. For this reason, adopting climate-smart agricultural practices and mitigation strategies is essential not only for protecting productivity but also for addressing the broader challenge of climate change.

Definitions:

- 1. Agricultural production:** The term "agricultural production" describes the process of using adapted plants and animals to produce goods that strengthen or sustain human life. Agricultural output is measured in terms of volume and it is the crop's total yield from a farm, either seasonally or annually.
- 2. Agricultural productivity:** Agriculture productivity is a crucial idea that not only explains the situation of the land and its yield but also aids in the formulation of policies. Agricultural land productivity refers to the output per unit of land. It not only describes the strength of the land but also the role of factors in increasing the productivity. Various production factors, such as the use of high-quality seeds, appropriate and high-quality fertilizers, and sources of irrigation, are involved in the production process. As a result, there are many factors which can affect the output per unit of land. It measures the outcome relative to the input. It makes hazy reference to the rate of output.
- 3. Food security:** In 1986, the World Bank further elaborated on the activity level dimension and characterised food security as "secure access at all times to sufficient food for a healthy and active life". The concept of appropriate food is taken into account at the household and individual levels in both quantitative terms (i.e., caloric adequacy) and, even more so, in qualitative terms (i.e., variety, safety and cultural acceptability).
- 4. Nutrition security:** The term "nutrition security" first arose in the early 1990s. It emphasizes on how food is consumed by a household or an individual as well as how that food is used by the body, so in concept it goes beyond food security. In terms of nutrition, the body's ability to absorb and process food is referred to as sufficient utilisation.
- 5. Food and nutrition security:** "Food and nutrition security exists when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life." - FAO definition (1996, 2009).

Global Agricultural Production Trend:

The average annual growth rate of agricultural production has shown fluctuations over the decades, declining from 2.9% in the 1960s to 2.1% in the 1980s, before slightly improving to 2.5% in the 2000s. Much of the growth achieved during the 1960s and 1970s was mainly driven by increased use of inputs per hectare, such as labor, capital, fertilizers, and other production resources. In more recent decades, however, the growth rate in the use of several inputs has slowed, and expansion in output has increasingly been supported by improvements in **Total Factor Productivity (TFP)**. Since the 1990s, gains in TFP have been the major force behind global agricultural productivity growth. These gains reflect more efficient combinations of production factors through improved farming practices, better technical efficiency, and the adoption of innovative yield-enhancing technologies. In particular, labor-saving technologies have contributed significantly to TFP growth.

Between 2001 and 2014, agricultural output expanded more rapidly in low- and middle-income countries than in high-income economies. Nevertheless, in low-income nations, this growth was largely driven by greater use of land and inputs rather than by productivity improvements alone. Even so, despite considerable differences across countries, TFP growth remained a stronger contributor to agricultural expansion than simple increases in input use per hectare. Looking ahead, future growth in global agricultural output is expected to rely mainly on the wider adoption of existing technologies as well as the development of new innovations and production techniques.

Data from the last fifty years reveal substantial increases in the production of major crops such as cereals, pulses, and oilseeds. Over this period, cereal production increased nearly threefold, pulse production approximately doubled, and oilseed production rose by almost eight times. However, the growth pattern of food grains has not been uniform, and significant variations can be observed across crop groups and time periods.

Cereal production stood at 876.8 million tonnes in 1961 and increased sharply to 1,192 million tonnes by 1970, representing a notable rise of about 27%. From 1980 to 2017, cereal output further expanded from 1,549 million tonnes to 2,917 million tonnes. Although production declined to 2,612 million tonnes in 2018, it recovered and reached its highest level in 2019 at 2,978 million tonnes.

Pulse production was recorded at 40.78 million tonnes in 1961 and rose to 87.82 million tonnes during the 1970–2016 period. This category experienced significant fluctuations, particularly around 1990, when a variation of nearly 31% was observed. Pulse production reached its peak in 2017 at 95.69 million tonnes, before declining slightly to 92.32 million tonnes in 2018 and 88.37 million tonnes in 2019. Oilseed production increased from 132.2 million tonnes in 1961 to 1,102 million tonnes in 2019, marking its highest recorded output. Unlike cereals and pulses, oilseed production did not experience any major deceleration during the period from 1961 to 2019.

Overall, these trends demonstrate that the production of major agricultural crops has risen considerably over time, although the rate of increase has varied from year to year. During the same period, agriculture and food systems also underwent rapid industrialization and globalization. The distance between

farms and consumers has expanded significantly, resulting in longer and more complex food supply chains. At the same time, the consumption of processed, packaged, and ready-to-eat foods has increased across almost all regions, including remote rural areas.

Despite substantial gains in production, hunger and malnutrition continue to remain major global concerns. According to the Food and Agriculture Organization, the current pace of progress is insufficient to eliminate hunger by 2030, and achieving this goal even by 2050 remains highly uncertain.

Global Agricultural Productivity Trend:

Agricultural productivity growth has shown signs of slowing in recent years. Although the global population continues to increase at an annual rate of nearly 1.2%, the average yearly productivity growth of major agricultural crops remains only about 1.3%, which is relatively modest in relation to future food demand. Since land is a finite and increasingly scarce resource, particularly in many developing countries, expanding the cultivated area is no longer a practical solution. As highlighted by earlier studies, the limited availability of arable land and essential agricultural inputs makes **intensive agricultural growth**, rather than extensive expansion, the more feasible pathway for sustaining future increases in production. Consequently, alongside crop diversification, greater emphasis must be placed on production intensification and the efficient use of inputs and natural resources. Data presented in Table 2 show a substantial rise in the per-hectare productivity of major crops over time. In the case of cereals, productivity increased from 13,532 kg per hectare in 1961 to 21,611 kg per hectare in 1980, and further to 35,505 kg per hectare in 2010. By 2019, cereal productivity had reached its highest recorded level of 41,131 kg per hectare. Overall, cereal productivity increased nearly threefold between 1961 and 2019. A similar upward trend can be observed in pulses. Productivity rose from 6,371 kg per hectare in 1961 to 8,464 kg per hectare in 2000, eventually reaching its highest level of 9,923 kg per hectare in 2019. Over the entire study period, pulse productivity also increased by almost three times. In the case of oilseeds, per-hectare productivity improved from 11,640 kg in 1961 to 34,171 kg per hectare in 2017. However, compared with cereals and pulses, the growth in oilseed productivity remained relatively slower, as it recorded only about a onefold increase from 1961 to 2019. These trends suggest that although crop productivity has improved significantly over the decades, the pace of growth varies considerably across crop categories. This reinforces the need for targeted technological innovation, better farm management practices, and improved resource-use efficiency to sustain future agricultural productivity growth.

1. An overview of Indian agriculture: For the years 2020–2021, the second advance estimates of agricultural production have been provided. A record production of 303.34 million tonnes of food grains is revealed by the second advance estimates of the production of key crops, which amply demonstrates the relentless labour of farmers, research by agricultural scientists, and farmer-friendly policies of the Central Government. Long-term gains for the nation will also come from comprehensive agriculture changes. The evaluation of production of various crops is based on data collected from States and verified with information from other sources in the 2nd Advance Estimates of Production of Principal Crops published by the Union Ministry of Agriculture and Farmers' Welfare. The following major crops' expected production for 2020–21 is based on 2nd Advance Estimates:

2. Trends of agricultural production in India: In India, the combined effects of a rise in total cultivated area and an increase in the average yield per hectare of the various crops have led to an increase in overall agricultural production. Table 3 reveals the trend in total agricultural production in India. Agricultural production has grown. Additionally, this production raised the National Food Security Act's (NFSA) allotment of food grains, which climbed by 56 per cent in 2020–21 compared to 2019–20. Up till December 2020, the government will have distributed 943.53 lakh tonnes of food grains to the states and union territories.

3. Agricultural productivity trends in India: Productivity growth is only increasing by about 2% annually. Limited land holdings, covert unemployment, poor incremental productivity, inadequate skill development, increased production costs, pricing hazards, and insufficient irrigation infrastructure sluggish land reform, ineffective provision of credit facilities, ineffective marketing of agricultural products and other factors are some of the causes of low productivity. Since India lacks landholdings suitable for agriculture, there is a need for considerable and widespread changes in agricultural methods.

Some measures that can boost productivity include:

- Enhancing the efficiency of irrigation systems
- Modernizing and introducing substantial irrigation
- Strengthen farm produce transportation and promotion
- Eliminate concerns with the APMC Act and other marketing-related challenges for farm products
- Enhancing the storage capacity, tenant safety, and seed supply with higher-quality seeds
- Encourage crop rotation and multiple cropping
- Encouragement of agricultural mechanization, which allows farmer to work independently of hired labour.

Status of Food and Nutritional Security:

A country's degree of food security needs to be evaluated on three different levels.

1. The first is the sustainable availability of food at the national level, which influences the level and expansion of agricultural production or an adequate capacity for food imports.
2. Secondly it is the households' physical and financial availability to nutrition. For the food to be physically accessible and within reaching distance of populated areas or at a suitable distance from them, an effective marketing, transport, and storage system is needed. The ability to afford food relies on its economic output and the cost of the food that is readily available.
3. The final is how people use the food that is available to them, which focuses on how food is distributed within families and how everyone's health is kept at such a level that allows them to ingest and absorb the necessary amount of food. Food security is impacted at the individual level by social issues such as healthcare system, gender bias, and the role of women in household decisions.

Concerns Vis-A-Vis Food Security in India:

1. With 195 million undernourished people, India holds the highest number in the world.
 2. India's agricultural output is incredibly low.
 3. In India, 4 out of 10 children, or almost 47 million, are chronically undernourished or stunted, which prevents them from reaching its full potential.
 4. The World Bank estimates that India's cereal productivity is 2,992 kg per hectare, while North America's productivity is 7,318.4 kg per hectare.
 5. Fish, eggs, milk, and meat are replacing grains as the high-value agricultural commodities that make up the majority of the food crop. This pattern will persist as earnings increase, and India's indirect need for food from feed will increase quickly.
 6. In 2018, India was positioned 76th out of 113 nations according to The Global Food Security Index (GFSI), which included four factors *i.e.* cost, availability, quality, and safety.
 7. Out of 119 nations that qualified, India came in 103rd on the 2018 Global Hunger Index.
 8. The FAO reports that 14.8% of the population in India is undernourished in its 2018 report, "The State of Food Security and Nutrition in the World."
- In addition, 51.4% of women between the ages of 15 and 49 are anaemic.
 - Further the report states that weight of 21 percent of Indian children under the age of five are very less as compared to their height, and 38.4 percent of children under the age of five are undersized as compared to their age.

Horticultural Crop Production:

Over the past five years *i.e.* from 2012–13 to 2017–18, India has seen a shift in agricultural acreage from food grains to horticulture crops. Since 2012–2013, the output of fruits and vegetables has overtaken that of food grains. Over the recent years, India has seen a surge in horticultural production. Area expansion has made huge progress, increasing productivity. The acreage under horticulture increased by 2.6 percent annually during the past decade, and average production rose by 4.8 percent annually. Horticulture crops were produced in 2017–18 on an area of 25.43 million hectares, producing 311.71 million tonnes. During 2004–05 and 2017–18, vegetable production climbed from 101.2 million tonnes to 184.40 million tonnes. Over same year, fruit production rose from 50.9 million tonnes to 97.35 million tonnes.

Foodgrain Production Vs Population Growth:

The world population during 1961 was 3 billion which was increased to 7.8 billion in 2020 while the foodgrain production was 917 million tons which was further increased to 3067 million tons in 2019. The total population was 0.45 billion in 1961 and increased to 1.38 billion in 2020 while the foodgrain production was 94.87 million tons and 301 million tons in 1961 and 2019 respectively. From the above trend of foodgrain production and population growth we can see that the total world population growth rate is 1.1% while production growth rate is 2.5%. So, 10.6% of total population is still in hungry state. The population

growth rate of India is 1% while the production growth rate is 2.68%. Even though the foodgrain production growth rate is higher than the population growth rate, 13.8% of total population accounts for hungry people in India till 2020.

From the figure, it is shown that the total number of undernourished persons in 2005 was found to be 825.6 millions but it has been declined to 687.8 million in 2019. So, the percentage of undernourished people in the world was 12.6% in 2005 while it is 8.9% in 2019.

Ensuring Food and Nutrition Security:

1. Given its enormous population, high rates of poverty, and widespread malnutrition, India faces a difficulty in ensuring food and nutrition security.
2. Depleting water supplies and the consequences of climate change are threatening food supply.
3. It is difficult for the 1/3-4/4 of the people that lives below the poverty line to access food economically.
4. Despite recent years of remarkable economic expansion, there has been little progress in improving food distribution and absorption.
5. About half of pregnant women and children are anaemic, and around 44 percent of children under the age of five are underweight.

Challenges to Food Security:

1. Climate change- Farming is more challenging by rising temperatures and unpredictable rainfall. Change in climatic condition affects crops as well as animals, forests, fisheries, and aquaculture, and it has serious socio-economic repercussions such as decreased earnings, destroyed livelihoods, disruption of trade, and negative health effects.
2. Limited access to rural areas- The severe economic backwardness indigenous communities are a result of their subsistence farming practices and residence in remote, challenging terrain.
3. A rise in rural-to-urban migration, a sizable share of unorganized workers, and inadequate housing and food security have all contributed to the unplanned growth of slums.
4. Gender disparity, poverty, overpopulation, and lack of access to education.
5. Insufficient food delivery by governmental distribution channels like Public Distribution System (PDS).
6. Biofuels- As the market for biofuels has expanded, less land is now being used to cultivate food crops.
7. Conflict- Enemies may cut off food supply to gain an advantage by using them as a weapon. The battle may also result in the destruction of crops.
8. Unmonitored nutrition programmes- Although the country has several plans for programmes that include improving nutrition as their key component, these are not properly carried out.
9. Lack of intersectoral cooperation between several ministries as well as incoherent food and nutrition policies.
10. Corruption- Selling low-quality grains in ration shops, diverting grain supplies to the open market for a larger profit margin, and irregular store openings all contribute to the problem of food insecurity.

Conclusion:

Maintaining food security for the nation's citizens as well as self-sufficiency in the production of foodgrains places a premium on productivity and growth in the foodgrain sector. Food grain output increases by 3.3 percent in the 1960s; between 1970-1971 and 1980-1981, it declined to 2.3 percent. The period from 1980-1981 to 1990-1991 was seen as the highest growth in food grain production, which increased by 3.8 percent annually. Due to population expansion, food loss and wastage, and exports, rice, wheat, and other grain production have expanded significantly, but their productivity has not kept up. The level of productivity in the agricultural sector should be one of the primary priorities of food and nutritional security. Food is more readily available and easier to get as a result of increased agricultural output, especially in the food production sector. A sizable portion of households, particularly those in rural areas, may see their FS improve if domestic agriculture develops. The satisfaction of household food security and nutrition needs, the provision of employment possibilities, the increase in rural income levels (as a result of increased output and pricing), and the alleviation of rural poverty are some of the advantages associated with agricultural development. Urbanization and its negative consequences can be indirectly reduced by raising rural incomes in the agriculture sector. For the purpose of enabling to feed the predicted growing global population, food and nutritional security is a fundamental challenge in global agriculture. The continuing increase in agricultural production and output can support meeting basic needs, battling starvation, lowering dependency on imports, encouraging economic sustainability, balancing the trade, and enhancing food and nutritional security. Most future increases in global agricultural output are anticipated to come from expanding the use of already-existing or brand-new techniques and technology.

References:

- [1] A report by the High Level Panel of Experts on Food Security and Nutrition July (2016) "Sustainable agricultural development for food security and nutrition: What roles for livestock?"
- [2] Acharya, S.S. (2007) National food policies impacting on food security – The experience of a large populated country: India, In: Food Insecurity, Vulnerability and Human Rights Failure, Eds: Basudeb Guha–Khasnobis, Shabd S. Acharya and Benjamin Davis, Palgrave Macmillan, U.K., pp. 3-34.
- [3] Acharya, S.S. (2008) Indian Agricultural and Food Security: Current Concerns and Lessons, a Plenary paper presented at 6th International Conference of Asian Society of Agricultural Economists, held at Manila, Philippines, 28-30 August.
- [4] Akiojam.S. L (2011), "Food Security: Challenges and Issues in India", Research Journal of Economics and Business Studies, vol-01, No.:01, 2011.
- [5] Ali.M, Rehman. H and Husain. M.S, (2012), "Status of food insecurity at household level in rural India: A case study of Uttar Pradesh", International Journal of physical and social sciences, Volume 2, Issue 8.
- [6] Atherya. V, (2010), "Food insecurity in Urban India" The Hindu dated on 24th Sep, 2010.
- [7] Atherya. V, et.al (2008), "Report on the state of food insecurity in rural India", World food programme.
- [8] Department of Agriculture, Cooperation and Farmers' Welfare Annual Report 2020-2021.
- [9] Directorate of Agriculture, Chhattisgarh Raipur, 2020
- [10] FAO (Food and Agriculture Organization) (2008) Assessment of the World Food Security and Nutrition Situation, Agenda Notes for 34th Session of Committee on World Food Security, 14-17 October, Rome.
- [11] Food and Agriculture Organization Corporate Statistical Database 2020-2021.
- [12] Global Agricultural Productivity Report 2020
- [13] Horticultural Statistics at a glance 2018
- [14] India State Hunger Index, 2019
- [15] Lavlu M. (2012) "Agricultural productivity and food security in the developing world", Bangladesh J. Agric. Econs. XXXV, 1&2(2012) 53-69.
- [16] Neeru C. (2016), "Food Security in India: Issues And Challenges", BEST: International Journal of Humanities, Arts, Medicine and Sciences (BEST: IJHAMS) ISSN (P): 2348-0521, ISSN (E): 2454-4728 Vol. 4, Issue 1, Jan 2016, 79-86.
- [17] Report to the G20 Agriculture Deputies. (2018) Food security and nutrition: challenges for agriculture and the hidden potential of soil.
- [18] Shabd S. Acharya (2009) Food Security and Indian Agriculture: Policies, Production Performance and Marketing Environment, Agricultural Economics Research Review Vol. 22, pp 1-19
- [19] Pushparani, K.H., Baigya Karishma & Gairinmeilu (2022) Trends in Agricultural Production and Productivity with Respect to food and Nutritional Security", Futuristic Trends in Agriculture Engineering & Food Science, IIP Proceeding, Vol. 2, book 10, Part 3, pp-139-152.