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# Agriculture Impact and Developments in India. A New Setup

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**Abstract:** *Agriculture plays a vital role in the Indian economy by contributing significantly to employment, food security, and rural development. Over the years, the agricultural sector in India has undergone major transformations due to technological advancements, government reforms, modernization, and globalization. The present study titled "Agriculture Impact and Developments in India" aims to examine the major developments in the agricultural sector and their impact on the economic and social conditions of the country. The study highlights various initiatives introduced by the government such as digital farming, crop insurance schemes, irrigation projects, minimum support price policies, and the promotion of organic farming. It also analyzes the role of modern technologies including artificial intelligence, drone farming, biotechnology, and mechanization in improving agricultural productivity and efficiency. Further, the research discusses the challenges faced by Indian agriculture such as climate change, farmer indebtedness, lack of infrastructure, market fluctuations, and declining land holdings. The study emphasizes the need for sustainable agricultural practices and effective policy implementation to ensure balanced rural and agricultural development. The findings of the study reveal that although significant progress has been made in the agricultural sector, there is still a strong need for innovation, financial support, and improved market access for farmers. The study concludes that agriculture remains the backbone of the Indian economy and continuous development in this sector is essential for achieving inclusive economic growth and national prosperity..*

**Keywords:** India; agriculture; GDP; foreign incomes; Vacation industry policies

## I. INTRODUCTION

Agriculture is one of the oldest and most important occupations in India. It plays a crucial role in the economic, social, and cultural development of the country. Even after rapid industrialization and technological advancement, agriculture continues to be the backbone of the Indian economy because a large portion of the population depends directly or indirectly on it for livelihood. Agriculture not only provides food to the growing population but also supplies raw materials to many industries and contributes significantly to exports and employment generation. The growth of agricultural income is therefore essential for the overall development of India, especially in rural areas. Agricultural income refers to the earnings generated from agricultural activities such as cultivation of crops, dairy farming, poultry farming, fisheries, horticulture, and other allied activities. In India, millions of farmers depend on agriculture as their primary source of income. According to recent estimates, nearly 45–50% of India's workforce is engaged in agriculture and allied sectors. Although the contribution of agriculture to the country's Gross Domestic Product (GDP) has declined over the years due to the expansion of industrial and service sectors, agriculture still contributes around 15–18% to India's GDP. This shows that agriculture remains a major pillar of the Indian economy.

Since independence, India has witnessed remarkable growth in agricultural production and income. In 1950–51, India's food grain production was only about 51 million tonnes. Due to population growth and increasing demand for food, the government introduced various reforms and development programs to strengthen the agricultural sector. One of the most important developments was the Green Revolution during the 1960s and 1970s. The Green Revolution introduced high-yielding variety seeds, chemical fertilizers, pesticides, modern irrigation systems, and mechanized farming

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techniques. As a result, agricultural productivity increased rapidly, especially in states such as Punjab, Haryana, and Uttar Pradesh. Today, India produces more than 330 million tonnes of food grains annually and has become self-sufficient in food production. The growth of agriculture has also improved farmers' income in many parts of the country. India is now among the world's leading producers of rice, wheat, sugarcane, cotton, milk, fruits, vegetables, and pulses. States like Madhya Pradesh are known for soybean and pulse production, while Maharashtra is famous for sugarcane and cotton cultivation. Agricultural diversification has allowed farmers to earn income from multiple sources such as horticulture, floriculture, dairy farming, poultry, and fisheries. The dairy sector, especially under the White Revolution, has significantly contributed to rural income and employment generation. In recent years, the Government of India has launched several schemes and policies to increase farmers' income and promote sustainable agricultural growth. One of the major schemes is PM-KISAN, under which eligible farmers receive financial assistance of ₹6,000 annually in three installments. This scheme helps farmers manage agricultural expenses and improve their economic condition. Another important initiative is the Pradhan Mantri Fasal Bima Yojana (PMFBY), which provides crop insurance against natural disasters, floods, droughts, and pest attacks. This reduces financial risk for farmers and protects their income. The government has also promoted irrigation development through schemes like Pradhan Mantri Krishi Sinchai Yojana (PMKSY), which aims to provide water to every farm and increase irrigation efficiency. Irrigation facilities are extremely important because a large portion of Indian agriculture still depends on monsoon rainfall. Irregular rainfall and climate change often affect agricultural productivity and farmers' income. Therefore, improved irrigation systems such as drip irrigation and sprinkler irrigation help farmers increase crop yield and conserve water.

Digitalization and technological advancements have further transformed Indian agriculture. The introduction of e-NAM (National Agriculture Market) has connected agricultural markets electronically, enabling farmers to sell their produce at better prices. Mobile applications and digital platforms provide weather information, market prices, and farming advice to farmers. Modern technologies such as drones, artificial intelligence, precision farming, biotechnology, and mechanization are improving efficiency and productivity in agriculture. These developments are gradually increasing agricultural income and reducing dependence on traditional farming methods. Agricultural exports also contribute significantly to India's economy and farmers' income. India exports rice, tea, coffee, spices, marine products, sugar, fruits, vegetables, and other agricultural commodities to various countries. In recent years, India's agricultural exports crossed USD 50 billion, which reflects the growing importance of Indian agriculture in the global market. Export growth creates better income opportunities for farmers and strengthens the country's foreign exchange reserves. Despite these achievements, Indian agriculture still faces many challenges that affect farmers' income and agricultural growth. One of the biggest problems is small and fragmented land holdings. Most Indian farmers own very small pieces of land, which limits productivity and profitability. Dependence on monsoon rainfall is another major issue because uncertain rainfall patterns caused by climate change often lead to crop failures. Rising input costs of fertilizers, seeds, pesticides, and machinery also reduce farmers' profits. In many rural areas, lack of proper storage facilities, transportation, and market infrastructure forces farmers to sell their produce at low prices. Farmer indebtedness is another serious concern in India. Many farmers borrow money from banks or private lenders to meet cultivation expenses, and crop failures often make repayment difficult. Price fluctuations in agricultural markets also create uncertainty in income. Although the government announces Minimum Support Prices (MSP) for major crops, many farmers do not receive the full benefit due to limited procurement facilities and middlemen exploitation.

To ensure sustainable agricultural growth and higher income for farmers, India needs continuous investment in rural infrastructure, irrigation, research, education, and technology. Promotion of organic farming, climate-smart agriculture, and renewable energy in farming can help improve productivity and environmental sustainability. Farmer education and skill development are also essential for adopting modern agricultural practices. Strengthening agricultural cooperatives and farmer producer organizations (FPOs) can help farmers gain better bargaining power and market access. Agriculture remains a vital sector of the Indian economy and a major source of income for millions of people. Over the years, India has achieved significant growth in agricultural production through technological advancements,

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government initiatives, and modernization. Agricultural income has improved due to diversification, better irrigation, digitalization, and increased exports. However, challenges such as climate change, small land holdings, rising costs, and market instability continue to affect the sector. Therefore, effective policies, sustainable farming methods, and modern technology are necessary to ensure long-term agricultural growth and improved income for Indian farmers. A strong agricultural sector is essential for food security, rural development, employment generation, and the overall economic progress of India.

**Agriculture Contribution in GDP in India**

Agriculture plays a significant role in the economy of India and is considered the backbone of the country's rural development. Although India has experienced rapid industrialization and growth in the service sector, agriculture continues to remain an important contributor to the national income and employment generation. The agriculture and allied sectors include farming, forestry, livestock, fisheries, dairy, and horticulture activities, all of which support millions of people across the country. The contribution of agriculture to India's Gross Domestic Product (GDP) has changed over time. At the time of independence, agriculture contributed nearly 50–55% to the GDP because India's economy was primarily agrarian. However, with the growth of industries, manufacturing, information technology, banking, and other service sectors, the share of agriculture in GDP gradually declined. At present, agriculture and allied sectors contribute around 15–18% to India's GDP. Even though the percentage contribution has decreased, the sector still remains extremely important because nearly 45–50% of the population depends on agriculture for livelihood. Agriculture contributes to the Indian economy in several ways. First, it ensures food security for the country's large population by producing food grains, fruits, vegetables, pulses, milk, and other essential products. India is one of the world's leading producers of rice, wheat, sugarcane, cotton, milk, and spices. Second, agriculture supplies raw materials to industries such as textiles, sugar, food processing, tea, jute, and dairy industries. These industries contribute further to national income and employment.

The agricultural sector also plays an important role in export earnings. India exports agricultural commodities such as rice, tea, coffee, spices, marine products, sugar, and fruits to many countries. Agricultural exports contribute significantly to foreign exchange earnings and improve India's trade position in the global market. In recent years, agricultural exports from India crossed USD 50 billion, showing the growing importance of the sector. The Green Revolution played a major role in increasing agricultural productivity and contribution to GDP. The introduction of high-yielding variety seeds, fertilizers, pesticides, irrigation systems, and modern machinery increased food grain production significantly. States such as Punjab, Haryana, and Madhya Pradesh became important agricultural hubs in the country. In addition, the White Revolution improved milk production and strengthened the dairy industry, contributing to rural income and economic growth. The Government of India has launched several schemes to improve agricultural productivity and farmers' income. Programs such as PM-KISAN, Pradhan Mantri Fasal Bima Yojana, e-NAM, and irrigation development schemes support farmers financially and technologically. The government is also encouraging digital farming, organic farming, and agricultural mechanization to increase efficiency and production.

Despite its importance, the agricultural sector faces several challenges. Climate change, dependence on monsoon rainfall, small land holdings, rising input costs, and lack of proper storage and transportation facilities affect agricultural growth. These issues reduce farmers' income and limit the sector's contribution to GDP. Therefore, continuous investment in infrastructure, technology, irrigation, and market reforms is necessary for sustainable agricultural development. Agriculture remains a crucial sector of the Indian economy despite the decline in its percentage contribution to GDP. It supports millions of people, ensures food security, supplies raw materials to industries, and contributes to exports and rural development. The growth and modernization of agriculture are essential for achieving balanced economic development and improving the living standards of farmers in India.

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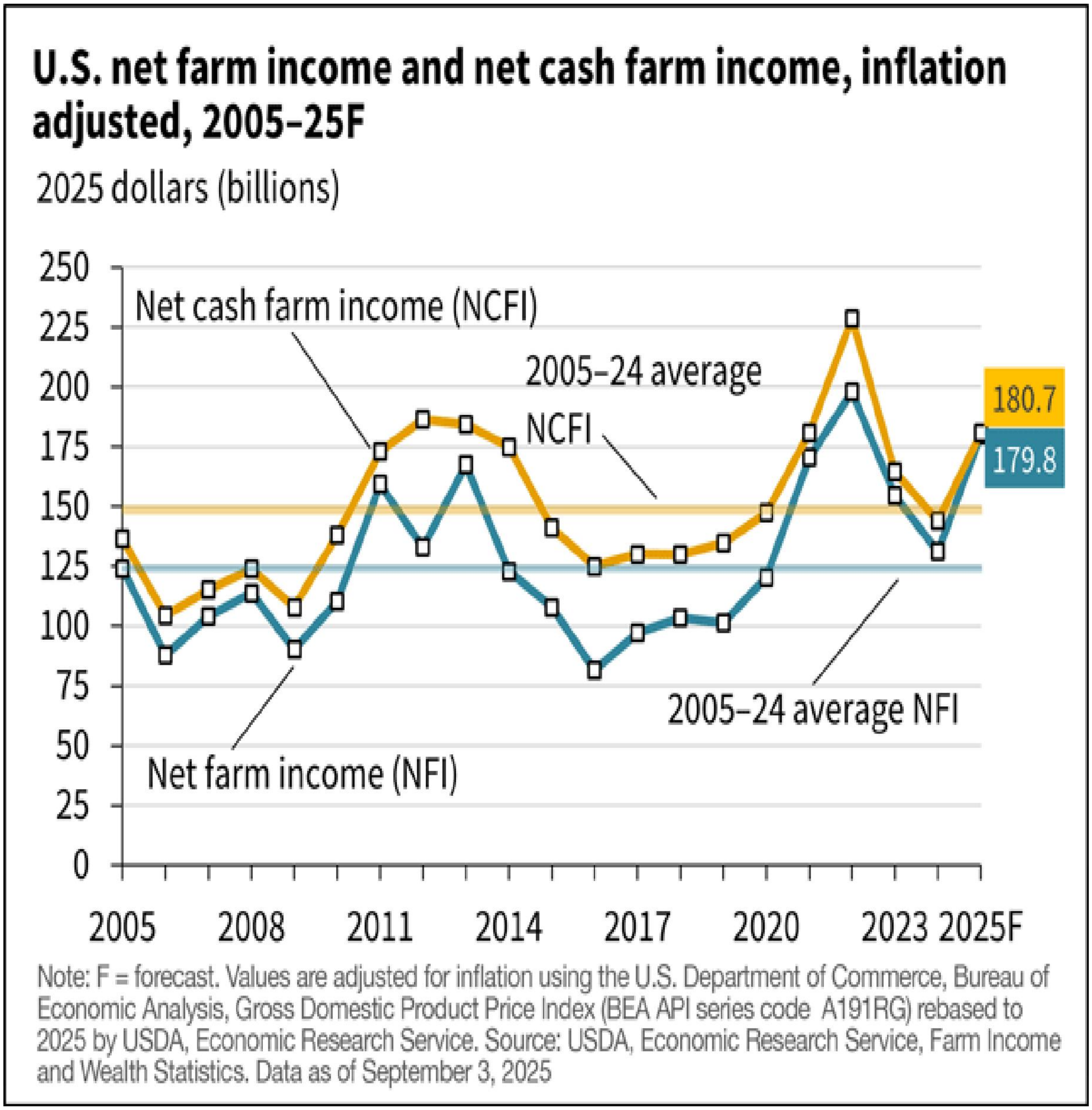


**Reasons for the Decline of Agriculture Contribution in GDP in India**

The contribution of agriculture to the Gross Domestic Product (GDP) of India has gradually declined over the years. At the time of independence, agriculture contributed nearly 50–55% to the GDP, but today its share has reduced to around 15–18%. Although agriculture still employs nearly half of the country's population, its relative contribution to national income has decreased due to several economic and structural reasons. One of the major reasons for the decline is the rapid growth of the industrial and service sectors. Sectors such as information technology, banking, telecommunications, manufacturing, tourism, education, healthcare, and e-commerce have expanded significantly and contribute a larger share to India's GDP. As these sectors grew faster than agriculture, the relative share of agriculture automatically declined. Another important reason is low agricultural productivity. In many parts of India, farming is

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still dependent on traditional methods, outdated technology, and monsoon rainfall. Small and fragmented land holdings reduce efficiency and limit the use of modern machinery. Compared to developed countries, the productivity of Indian agriculture remains relatively low, which affects its contribution to GDP. Climate change and environmental issues have also negatively affected agricultural growth. Irregular rainfall, droughts, floods, rising temperatures, and soil degradation reduce crop production and farmers' income. Since a large portion of Indian agriculture still depends on rainfall, natural disasters directly impact agricultural output and economic contribution. Lack of proper infrastructure is another major factor. Many rural areas face shortages of irrigation facilities, storage systems, transportation, cold chains, and market access. Due to inadequate storage facilities, farmers often suffer post-harvest losses and are forced to sell crops at lower prices. Poor infrastructure reduces profitability and slows agricultural growth. Increasing population pressure on land is also responsible for the decline. Over time, agricultural land has been divided into smaller units due to population growth and inheritance patterns. Small land holdings reduce economies of scale and make farming less profitable. Many farmers are unable to invest in modern technology or advanced farming methods because of limited land and financial resources. Urbanization and industrialization have further reduced the importance of agriculture in GDP. As cities expand and industries develop, agricultural land is often converted into residential, commercial, and industrial areas. Many rural workers also migrate to urban areas in search of better employment opportunities in industries and services, reducing dependence on agriculture. Another reason is price instability and low farmer income. Farmers frequently face fluctuations in crop prices, rising input costs, and exploitation by middlemen. Although the government provides Minimum Support Prices (MSP) for certain crops, many farmers do not receive adequate profits. Low income discourages investment and innovation in agriculture.

**Future of Agriculture in India**

The future of agriculture in India is expected to become more technology-driven, sustainable, and market-oriented. Although agriculture currently faces challenges such as climate change, declining land holdings, water scarcity, and fluctuating market prices, the sector still has enormous potential for growth and development. With increasing population and food demand, agriculture will continue to play a vital role in ensuring food security, employment generation, and rural development in India. One of the most important aspects of the future of Indian agriculture is the adoption of modern technology. Digital farming, artificial intelligence, drones, robotics, satellite monitoring, and precision farming are gradually transforming traditional agricultural practices. Farmers are now using mobile applications and digital platforms to access weather updates, market prices, crop information, and government schemes. Smart farming technologies can help increase productivity, reduce costs, and improve crop quality.

Irrigation and water management will also become more important in the future. Since Indian agriculture heavily depends on monsoon rainfall, efficient irrigation systems such as drip irrigation and sprinkler irrigation will help conserve water and improve agricultural production. The government is promoting schemes related to water conservation and sustainable irrigation to address future water shortages. Organic farming and sustainable agriculture are expected to grow rapidly in the coming years. Increasing awareness about health and environmental protection has increased the demand for organic food products both in India and internationally. Farmers are gradually shifting toward chemical-free farming practices, bio-fertilizers, and eco-friendly agricultural methods. Sustainable agriculture can improve soil fertility, reduce environmental damage, and provide better income opportunities for farmers. Agricultural diversification will play a major role in increasing farmers' income. In the future, farmers are likely to move beyond traditional crop cultivation and focus more on horticulture, floriculture, dairy farming, fisheries, poultry, and agro-processing industries. These allied activities can provide additional sources of income and reduce dependence on seasonal crops.

Agriculture in India has shown significant growth since independence. The sector has expanded in terms of food grain production, irrigation, exports, mechanization, and farmers' income. The following data highlights the growth of Indian agriculture over the years.

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**Food Grain Production Growth**

| Year | Food Grain Production |
|---|---|
| 1950–51 | 51 million tonnes |
| 1970–71 | 108 million tonnes |
| 1990–91 | 176 million tonnes |
| 2010–11 | 245 million tonnes |
| 2023–24 | More than 330 million tonnes |

This increase reflects the success of the Green Revolution, improved irrigation, high-yielding variety seeds, fertilizers, and modern farming methods.

**Contribution to GDP**

| Year | Agriculture Share in GDP |
|---|---|
| 1950s | Around 50–55% |
| 1990s | Around 30% |
| 2010 | Around 18% |
| 2024 | Around 15–18% |

Although the percentage share declined, agriculture still remains important because a large population depends on it for livelihood.

**Employment in Agriculture**

| Period | Workforce Dependent on Agriculture |
|---|---|
| 1951 | Around 70% |
| 1991 | Around 64% |
| 2011 | Around 54% |
| 2024 | Around 45–50% |

This decline occurred because many people shifted toward industrial and service sector jobs.

**Irrigation Growth**

| Year | Net Irrigated Area |
|---|---|
| 1950–51 | Around 22 million hectares |
| 1990–91 | Around 48 million hectares |

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| Year | Net Irrigated Area |
| --- | --- |
| 2023–24 | More than 75 million hectares |

Expansion of canals, tube wells, dams, and irrigation schemes improved agricultural productivity.

**Fertilizer Consumption Growth**

| Year | Fertilizer Consumption |
| --- | --- |
| 1950–51 | Less than 1 million tonnes |
| 1990–91 | Around 12 million tonnes |
| 2023–24 | More than 30 million tonnes |

Increased fertilizer use helped improve crop yields and production.

**Agricultural Export Growth**

| Year | Agricultural Exports |
| --- | --- |
| 2000–01 | Around USD 6 billion |
| 2010–11 | Around USD 25 billion |
| 2023–24 | More than USD 50 billion |

India exports rice, tea, coffee, spices, sugar, fruits, vegetables, and marine products to many countries.

**Milk Production Growth**

| Year | Milk Production |
| --- | --- |
| 1950–51 | Around 17 million tonnes |
| 1990–91 | Around 54 million tonnes |
| 2023–24 | More than 230 million tonnes |

**Tractor and Mechanization Growth**

| Year | Tractor Production/Sales |
| --- | --- |
| 1960s | Very limited |
| 2000 | Around 250,000 units annually |
| 2024 | More than 900,000 units annually |

Mechanization improved farming efficiency and reduced dependence on manual labour.

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**Suggestions**

• The Government should increase investment in irrigation facilities to reduce dependence on monsoon rainfall and ensure stable agricultural production.

• Modern farming technologies such as drones, artificial intelligence, precision farming, and mechanization should be promoted to improve productivity and reduce labour costs.

• Farmers should be provided with proper training and education regarding scientific farming methods, organic farming, and sustainable agricultural practices.

• Better storage facilities, cold chains, and transportation systems should be developed to reduce post-harvest losses and help farmers receive fair prices for their produce.

• The government should strengthen Minimum Support Price (MSP) policies and ensure effective procurement systems so that farmers receive stable and profitable prices.

• Agricultural credit and loan facilities should be made easily accessible to small and marginal farmers at lower interest rates.

## II. CONCLUSION

Agriculture continues to play a vital role in the economic and social development of India. Over the years, the sector has achieved remarkable growth in food grain production, irrigation facilities, dairy development, mechanization, and agricultural exports. From producing only 51 million tonnes of food grains in 1950–51 to more than 330 million tonnes in recent years, Indian agriculture has shown significant progress due to technological advancements, government initiatives, and the hard work of farmers. Although the contribution of agriculture to GDP has declined from around 50% at the time of independence to nearly 15–18% today, the sector still supports nearly half of the country's population and remains the backbone of the rural economy. Agriculture ensures food security, supplies raw materials to industries, generates employment, and contributes to export earnings. Government schemes such as PM-KISAN, crop insurance programs, irrigation projects, and digital agricultural initiatives have further strengthened the sector.

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