



Modern-Day Challenges and Solutions in Indian Agriculture

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ABSTRACT- Agriculture forms the foundation of human life; it is essential for fulfilling the basic and vital needs of people across the globe. The existence and development of the Indian people have been inextricably linked to the agricultural sector since ancient times. Evidence from ancient civilizations reveals that agriculture has served as the livelihood for the inhabitants of India since the distant past. There is abundant archaeological evidence of agricultural activity dating back to the Indus Valley Civilization (3000–5000 BCE). The bond between agriculture and human civilization is historical and inseparable; indeed, it is accurate to say that the history of agriculture is the history of human civilization itself. For this reason, agriculture is regarded as the mother of all civilizations—encapsulated in the idea that "agriculture is the culture of all cultures." India is an agrarian nation, with 67% of its population relying on farming for their livelihood. The country's climate, agricultural conditions, and resources have made agriculture the primary driver of its economic development.

Keywords: Agriculture, Gross Domestic product, Economic



I. INTRODUCTION

Due to India's climate being favorable for agriculture, people first discovered a way of life by cultivating the land. In India, agriculture is not merely an occupation; it has evolved into a distinct way of life. It is the most important industry in the country, providing food for the population and supplying raw materials that fuel large-scale industries. Furthermore, it plays a crucial role in generating employment. Foreign exchange earnings, the success of various government schemes, and political stability also depend on agriculture. Thus, the value of agricultural output is immense in the context of national income. Agriculture is the backbone of the Indian economy, supporting it in various ways. It is considered the foundation of the country, serving as the basis of Indian life, a primary source of employment, and a means of earning foreign exchange. Agricultural activities are carried out on approximately 51% of India's total land area. While agriculture once contributed 56.46% to the Gross Domestic Product (GDP), this figure declined to 17.4% during 2016–17. Within the Gross Value Added (GVA) of the agriculture and allied sectors, the share of livestock has been steadily rising since 2011–12, whereas the share of crops has been declining [1]. The continuous drop in agriculture's contribution is attributed to the growth of the service and industrial sectors within the GDP. Regarding crop classification in the Indian agricultural system, three main types of crops are cultivated annually:

1. **Rabi Crops:** These are generally sown in October–November and harvested by April. Cultivated with the help of irrigation, these crops primarily include wheat, barley, gram (chickpea), peas, mustard, and rapeseed.
2. **Kharif Crops:** These are crops grown during the monsoon season. These crops are sown in June–July and harvested by September–October. Crops cultivated under this category include rice, jowar, bajra, ragi, maize, jute, groundnut, cotton, hemp, tobacco, moong, urad, and cowpea [2].
3. **Zaid crops:-** These crops are sown in the interval between the Rabi and Kharif seasons and harvested by June. Crops such as vegetables, watermelons, muskmelons, cucumbers, bitter gourd, etc., are cultivated during this period using irrigation. Pulse crops like moong, urad, and horse gram (kulthi) are also grown at this time. India's agricultural year is considered to run from July 1st to June 30th.[3]

2. NATURAL, SOCIAL, AND ECONOMIC PROBLEMS OF INDIAN AGRICULTURE

The problems facing Indian agriculture stem primarily from natural, social, and economic factors, as detailed below:

1. **Rainfall and Irrigation:** Agricultural operations require water at the right time. This need is met through rainfall and irrigation facilities. Rainfall patterns in India are highly irregular, and precipitation occurs during only four months of the year. Despite continuous efforts, there remains a significant shortage of irrigation facilities, rendering Indian agriculture uncertain.
2. **Defective Land Ownership System:** A major issue in Indian agriculture is the flawed land ownership system. This system has created an atmosphere of uncertainty and failed to foster an environment conducive to increasing agricultural productivity.[4]
3. **Technological Backwardness:** Agricultural production techniques in India are outdated and backward. Indian farmers do not utilize the latest scientific production methods, partly due to a lack of comprehensive knowledge regarding the proper application of fertilizers, seeds, and techniques for ploughing and sowing specific crops. Most farmers also lack technical knowledge regarding appropriate crop rotation and cultivating crops suited to soil quality.[5]
4. **Soil Nutrient Deficiency:** Indian soils generally lack essential nutrients. The country also faces increasing threats from soil erosion and water logging. Furthermore, continuous agricultural production over the past thousand years has also contributed to the depletion of the Indian soil's fertility.
- 5: **Lack of capital and farmers' indebtedness:** A critical issue facing Indian farmers is their indebtedness. A major portion of their income goes towards repaying old debts and the associated interest. It is precisely because of this debt that farmers are losing their land to moneylenders and becoming landless. Similarly, due to small landholdings, low income, and poverty,



Indian farmers constantly face a shortage of capital. They encounter difficulties in securing adequate funds from sources like banks; consequently, the lack of capital hinders the proper development of agriculture.[6]

6: Shortage of manure and fertilizers: In India, the methods used to prepare manure and apply it to fields are often flawed, resulting in the loss of many vital nutrients. Domestic production of chemical fertilizers falls far short of demand, and they are also quite expensive. As a result, the soil does not receive adequate amounts of fertilizers and manure, preventing farmers from achieving optimal crop yields.[7]

7:- Defective Agricultural Marketing System: In our country, insufficient attention is paid to the commercial aspects of agriculture. Consequently, farmers are unable to sell their produce at fair prices, and the actual profit from agricultural produce goes to middlemen rather than the farmers themselves.

8:- Lack of Transport and Communication Facilities: Most rural areas lack adequate roads and means of communication. During the rainy season, unpaved village paths become waterlogged and muddy, severing the village's connection to the city and making the transportation of crops to the market a major challenge.[8]

9:- Lack of Proper Agricultural Planning: The extensive plans formulated for agricultural reform overlooked the necessary comprehensive organizational and structural changes. The desired progress in areas such as irrigation, fertilizers, and seeds could not be achieved. There has been a failure to properly determine and implement farmers' economic activities, preventing the desired improvement in their economic condition.[9]

3. KEY CHARACTERISTICS OF MODERN AGRICULTURE

1:- High Population Dependence on Agriculture: Compared to most other countries in the world, a much larger proportion of our country's population relies on agriculture for their livelihood, as indicated by various surveys and statistics. Unlike in developed nations, a vast number of people here depend on agriculture to sustain their lives, having no other means of livelihood. For instance, the percentage of the population engaged in agriculture is 5% in Australia, 4% in Canada, 2% in Great Britain, 3% in West Germany, 9% in Japan, 8% in France, 2% in the United States, 6% in Israel, and 15% in the Soviet Union; whereas in India alone, 52% of the population is engaged in agriculture.[10]

2: Dominance of Food Crops: Food crops are grown on the majority of cultivable land in India. Food crops are sown on approximately 82% of the total sown area.

3:- Small and Large Landholdings: Small landholdings are prevalent across most regions of India. One observes holdings ranging from less than one acre to between one and five acres, and between five and ten acres.[11]

4:- Low Yield: In the context of global agriculture, India's yield remains low compared to other nations (based on 2008 data). India's total food grain production stands at 267 million tonnes, ranking third globally after China and the USA. It ranks second in wheat production (79 million tonnes) and rice production (148 million tonnes), trailing only China. India accounts for 21.6% of global production and holds the top spot in pulse production (15 million tonnes). It ranks second in groundnut production (after China), third in rapeseed (after Canada and China), and second in vegetables and fruits (after China). It holds the second position in sugarcane production (348 million tonnes, after Brazil) and tea production (0.81 billion tonnes, after China and Turkey), while ranking seventh in coffee. Given the growing population, India's yield remains low—a serious issue.

5:- Dependence on Monsoon: Due to the uncertain, irregular, and often insufficient rainfall, Indian agriculture is often described as a "gamble on the monsoon." Despite the expansion of irrigation facilities since 1951, there has been no significant reduction in the dependence on the monsoon. Currently, only 30% of the total agricultural land is irrigated, while 70% remains unirrigated.[12]

6: Lack of employment: Farmers and agricultural laborers do not find work in farming throughout the year; on average, they secure employment for only 150 to 270 days, leading to high levels of unemployment.

7: Lack of modern agricultural knowledge among Indian farmers: Indian farmers are often poor and uneducated. They continue to employ traditional farming methods and use outdated equipment; consequently, Indian agriculture is characterized by a lack of scientific farming practices. The absence of modern agricultural knowledge results in significantly lower productivity, and a lack of technical know-how leads to a very slow growth rate in crop production.[13]



8: Lack of farmers' organizations: Unlike the industrial sector, the agricultural sector lacks organized bodies.[14] Indian farmers are fragmented along lines of religion and caste; in the absence of organized unity, they face various forms of exploitation and mistreatment. Some modern solutions and suggestions for Indian agriculture:

- 1: Organic farming
- 2: Crop diversification within the agricultural structure
- 3: Horticulture within the scope of crop diversification
- 4: Sustainable farming practices
- 5: Measures to prevent soil erosion on the country's 52% cultivable fertile land
- 6: Use of modern agricultural techniques and schemes
- 7: Dependence of high-yielding crop success on irrigation facilities
- 8: Imbalance in crop support prices
- 9: Farmers' suicides due to debt
- 10: Reduction in landholding size
- 11: Adoption of food crop cultivation
- 12: Lack of quality seeds
- 13: Environmental issues
- 14: Natural disasters
- 15: Excessive soil degradation
- 16: Uncertainty of water supply
- 17: Decline in farmers' productivity
- 18: Lack of mechanization
- 19: Transportation inadequacies
- 20: Lack of storage facilities
- 21: Unequal distribution of agricultural land.

4. SOME SCHEMES TO PROMOTE AGRICULTURE

- 1: Decentralized Procurement Scheme
- 2: Kisan Credit Card Scheme
- 3: Agri-Clinic and Agribusiness Scheme
- 4: National Water Policy
- 5: Kisan Call Center Scheme
- 6: National Rainfed Area Authority
- 7: National Food Security Mission
- 8: National Minor Irrigation Mission
- 9: Weather-based Crop Insurance Scheme.

The following are several suggestions to improve Indian agriculture that could yield positive results:

- 1: Increase investment in agriculture-related sectors; investment should be boosted in agricultural communication, transportation, irrigation, research, rural markets, rural infrastructure, and on-farm activities. [15]
- 2: Reforming agricultural policy—there is a need to change existing economic policies related to agriculture.
- 3: Strengthening the Minimum Support Price (MSP) system—the scope and effectiveness of the MSP system should be enhanced.
- 4: Transporting produce to the market—supply chains should be developed to facilitate the movement of agricultural produce to markets.
- 5: Land reform—land ownership should be transferred to the farmers to abolish the Zamindari (landlord) system.
- 6: Boosting agricultural productivity—cooperative societies and mandis (agricultural markets) should be established. [16]
- 7: Promoting cottage and small-scale industries. [17]
- 8: Implementing the National Agricultural Insurance Scheme. [18]



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