

Sustainable Agriculture and Rural Development : Pillars of Viksit Bharat @ 2047

Dr. Rajkumar Nagwanshee* Dr. Ashvanee Kumar**

* Associate Professor, Department of Economics, Guru Ghasidas Central University, Bilaspur (CG) INDIA

** Assistant Professor (Guest Faculty), Government Naveen College, Kera, Shaheed Nand Kumar Patel University, Raigarh (CG) INDIA

Abstract: The Indian economy was ranked fifth in the world by nominal GDP in 2024. According to the latest IMF report, India's economy is projected to grow by about 6.4 percent in 2025-26. As the country looks ahead to 2047, when it will celebrate 100 years of independence, the vision of "Vikshit Bharat @2047" (Developed India) has emerged. With this vision, we are aiming to make India a high-income economy with a GDP of over \$30 trillion. Here, among all these three sectors of the economy, agricultural development is essential. It is key to rural development, providing food, jobs, income, and supporting industries and infrastructure. Sustainable agriculture protects the environment and strengthens rural economies, making communities more resilient to climate change and market shifts. Agriculture boosts demand for goods and services by raising rural incomes, helping local economies grow, and ensuring long-term prosperity and well-being. This study discusses that the goal of Viksit Bharat can be achieved with the help of sustainable agricultural development before 2047. It also explores the importance of sustainable farming practices, managing water resources, improving soil health, and supportive government policies.

Introduction - The vision of "Viksit Bharat @2047" outlines a roadmap for national development. It aims to make India a fully developed country by focusing on economic growth, social equality, technology, and sustainability. The vision is a decisive goal to inspire a prosperous and sustainable future, where the agriculture sector is at the center of this vision. Agriculture is the basis of livelihoods for thousands of households, and it ensures the availability of food for everyone. Agriculture has always been a key pillar of the Indian economy, contributing to its national income and providing employment to a significant proportion of the workforce.

Agriculture plays a foundational role in rural development by providing food security, serving as the primary source of rural employment and income, contributing to the Gross Domestic Product (GDP), supplying raw materials for industries, and acting as a catalyst for infrastructure development and improved rural welfare. The people in India have not been changing the crop pattern on their fields due to the high market price of that crop, which is generally shown in their area. They repeat it again and again every year. Negativity reduces the natural fertility of that land; this is why farmers have started to use chemical and unnatural substitutes to increase fertility and land productivity. These practices may economically empower the farmers but lead to health problems in humans and animals. The transportation cannot be called

sustainable agriculture development. Sustainable agriculture is a system of farming that focuses on producing agricultural products that protect the environment, conserve natural resources, maintain soil fertility, and ensure long-term productivity while also supporting farmers' livelihoods and society's needs. It includes three major aspects of agricultural development: 1. Economic viability, where the farmer should always get a profit from crops. 2. Environmental health. It states that farming should not damage soil, water, air, or biodiversity. 3. Social equity, which states that agriculture should benefit the maximum amount of society. Further, it should not negatively impact future generations. Sustainable agricultural development also promotes using organic fertilizers instead of chemical ones, encouraging rainwater harvesting, agroforestry, precision farming, and renewable energy. On the other hand, sustainable development is an economic strategy that has the power to uplift rural societies, protecting them from the negative effects of climate change and market uncertainty fluctuations (Mugambiwa, S. S., 2017). Therefore, Sustainable agricultural practices are essential for long-term rural prosperity, environmental health, economic stability, and the well-being of rural communities.

Review of literature

Kumar et al. (2024) state that agricultural biotechnology's impact in India focuses on productivity and sustainable

development. There is a need for continued research in this field and for training farmers. Ashoor et al. (2024) analyze the role of AI and IoT in modernizing Indian agriculture through smart tools like drones, robotics, and irrigation systems. He says that the use of Artificial intelligence and drones can really help farmers. Sharma et al. (2024) say that traditional, chemical-free methods of agriculture support food security, small farmers, and climate resilience, and with policy support, organic farming can significantly benefit India's agriculture sector. Rimpika et al. (2023) compare precision farming with traditional methods, especially on small and scattered landholdings in India. Dr. Manoj Kumar (2023) highlights the potential of India's traditional knowledge systems and biodiversity in developing eco-friendly pest solutions. Biopesticides, such as neem-based sprays, have been increasing as sustainable alternatives to chemical pesticides. Bordoloi (2023) evaluates the impact of biofertilizers on soil health and finds that biofertilizer-based organic farming with traditional methods is significantly improving soil nutrients. Therefore, we can say that biofertilizers can improve both productivity and sustainability in agriculture. Smith et al., (2019) state that due to specialization, crop diversity has declined significantly in many regions of India after the Green Revolution. Sustainable agriculture plays a vital role in enhancing productivity, ensuring food security, protecting the environment, and empowering small farmers through eco-friendly practices and modern technologies. It balances traditional knowledge and innovations such as biotechnology, AI, and bio-inputs, promoting long-term resilience in farming.

Besides the above-mentioned benefits, there are many challenges in the agriculture sector, such as affordable and accessible farming tools for small and marginal farmers, especially for those who have landholdings less than one hectare. Therefore, Further research is needed to expand the use of biopesticides and biofertilizers by improving their availability, awareness, and adaptability to different agro-climatic conditions. Moreover, the absence of integrated policy frameworks and adequate farmer training programs limits the effective adoption of sustainable agricultural practices.

Objective of the Study: This article is primarily based on information obtained from secondary data sources, including research papers, newspapers, and other published reports. And it also includes the author's opinion. This study focuses on the following objectives:

1. To understand the effectiveness of traditional practices and support eco-friendly and inclusive agricultural development.
2. To understand the importance of sustainable agricultural practices.
3. To explore pathways to overcome challenges of sustainable agriculture and how to meet the development rate for Vikshit Bharat-2047.

The Importance of Sustainable Agriculture for the Economic Development of The Society: Sustainable agriculture has been emerging as an opportunity for rural economies nowadays, protecting against environmental degradation and economically empowering farmers in rural areas. For most rural farmers, agriculture is the primary dependency of income and food. The practices of farming a single crop multiple times, extra use of pesticides, and over-tilling of the soil are reducing the soil quality and fertility and damaging the farming ecosystem. Not changing the crop ultimately damages the quality of the yield and the income of the farmers. On the other hand, the income from agriculture is highly dependent on unpredictable climate conditions and diseases. Hence, when farmers do not receive a good amount of crop, rural families face limited access to basic food, leading to an imbalance in health conditions and education. Thus, Sustainable agriculture helps to solve the above problems by strengthening farms and assisting farmers to spend less money, grow more crops, and earn a steady income over time.

Sustainable agriculture takes care of the quality and fertility of the land, and reduces damage to the environment. It helps people in rural areas. Methods of changing crops each season, and using natural farming, keep the soil healthy. There is a high demand for organic food and vegetables nowadays. Practicing sustainable agriculture can help farmers feed their families better and sell extra crops to earn money. Practicing organic farming also reduces the need for expensive chemical fertilizers.

Further, to practice sustainable agriculture farming, farmers use local raw materials (resources) such as home-saved seeds, vermin compost, and goobers fertilizer, which they may not need to purchase from the agriculture market. It reduces the cost of production in agriculture. Spending less helps farmers to keep increasing their income. On the other hand, the crops are generally water-saving due to local seed and home-made fertilizer, which means they do not require much water for irrigation. This also protects different kinds of plants and animals.

Several sustainable agricultural practices help alleviate poverty in rural areas by improving soil health, increasing crop yields, and providing extra income sources. **In Agroforestry**, we combine the trees with crops or animals to prevent erosion, hold more water in the soil, and offer products like fruit or timber for extra income. This practice supports long-term farm productivity and revenue.

The way for Sustainable Agriculture development in India: The vision of "Vikshit Bharat-2047" can only be achieved with the use of advanced technology in a sustainable manner. It ensures long-term growth in every sector of the economy and agriculture, creating a strong and efficient farming system. The agricultural sector needs improvement in technologies such as precision farming, biotechnology, and digital agriculture. The Gross Capital Formation (GCF) in agriculture should be improved,

like agricultural equipment, infrastructure, and land development. Furthermore, biotechnology plays a vital role in agricultural development by using scientific methods and tools to modify plants for enhanced yield, resistance, and utility. The digital agriculture, which provides innovative solutions to long-standing agricultural challenges, need improvement. Mobile applications and platforms like the E-Kisan Portal have become essential tools in this transformation, giving farmers access to crucial information such as market prices, weather forecasts, modern farming techniques, and government schemes, enabling them to make informed decisions that improve their productivity and livelihoods. Integrating Internet of Things (IoT) devices into farming is also a key feature of digital agriculture need to be taken in practice. It allows precise monitoring of crops and efficient resource utilization.

These technologies enhance the income of the farmers and ensure national food security. Additionally, the shift towards organic practices improves soil health, reduces chemical dependency, and allows farmers to access advanced markets by increasing real earnings. The Indian government has introduced many programs such as the Paramparagat Krishi Vikas Yojana (PKVY- 2015) and the Mission Organic Value Chain Development for North Eastern Region (MOVCDNER- 2015-16) and others to promote sustainable agriculture. The technological and sustainable approaches of a modernized agriculture will help to achieve India's goal of becoming a developed nation by 2047.

What Is Needed to Promote Sustainable Agriculture?

It is well understood that Sustainable agriculture is very important in the present way of development. However, it's not easy to accept in the present. To follow these practices, the Farmers should be trained, educated, and supported. Learning about methods of organic farming or soil-saving techniques, Training on how to use these methods in ways that work best for their local area. There is a need to align farmers' groups and cooperatives to help each other. The farmers should receive Training in using tools, buying seeds more cheaply, and selling their crops at better prices. To help farmers and practitioners of sustainable agriculture, the governments should offer some support through funding, discounts, or rewards. Building better roads and storage facilities can help farmers reach markets faster, keep food from spoiling, and help them earn more. Also, creating fair-trade programs and promoting local and global markets for sustainable goods can ensure farmers get fair prices and are encouraged to keep using eco-friendly methods.

Sustainable Agriculture and Rural Development: The foundation of rural India is agriculture, and the growth of this sector is essential to the ultimate development of rural areas. The majority of rural families are associated with agriculture directly or indirectly. When agricultural production rises due to sustainable practices, farmers make more money. Higher incomes translate into greater investment in healthcare, education, and nutrition, higher living

standards, and decreased rural poverty. Moreover, the challenges like poverty, environmental degradation, migration, and the problem of inadequate infrastructure are also decreased. Farmers become able to transport their produce more easily. The modernization and organization of agriculture create non-farm jobs, particularly for women and young people, in sectors including food processing, packaging, agrotourism, and agro-industries.

The sustainable agricultural practices can significantly improve livelihoods and environmental health. In the long term, this will ensure that rural communities become more self-reliant, resilient to climate change, and better connected to markets, enabling them to become active contributors to India's overall growth and development by 2047. At present, sustainable agriculture is offering a transformative solution for food security and economic and ecological revival in rural areas. It is Crucial for Rural Development, such as the Economic Empowerment of Farmers. It is reducing dependence on expensive chemical inputs and reducing the costs. It is promoting high-value crops, agroforestry, and allied sectors (dairy, fisheries). It is enabling farmers and consumers to access special markets. For example, Sikkim has become India's first fully organic state and saw growth in Agri-tourism and farmer incomes. Sustainable agriculture has also been generating Employment by developing rural enterprises and entrepreneurship, especially among youth and women, which ultimately can reduce rural-urban migration by creating local opportunities. Sustainable agriculture will be a cornerstone of rural development in India as the country is working towards becoming a developed nation by 2047. India is highly vulnerable to climate change; therefore, awareness of adopting sustainable agriculture is increasing among rural farmers because they are becoming aware that it stops soil degradation, conserves water and promotes biodiversity. Digital India is also working in rural areas for farm-to-market linkage. Zero-budget natural farming is being adopted through the Grassroots training. Soil health cards, regular testing, and rejuvenation techniques are helping people to know how to deal with natural calamities before they come. India's dream of becoming a developed country by 2047 hinges largely on how well we transform our rural heartland.

India's agricultural sector benefits from structural advantages that offer significant opportunities for growth and investment. First, a large and expanding consumer base, a growing middle class, is driving demand for high-value agricultural products such as fruits, vegetables, and dairy items like paneer and curd. On the other hand, India has a strong advantage in crop production, as it is one of the world's leading producers of rice, sugarcane, wheat, and maize, and it grows these crops at some of the lowest costs globally. Further, India is becoming a hub for agricultural innovation, with around 2,800 tech startups emerging as farmers increasingly adopt technology-driven

solutions, supported by better internet access and a push for higher efficiency in farming practices.

The Indian Agriculture Minister, Shivraj Singh Chouhan, has said that agriculture and allied sectors need to grow at around **5% per year** to help India become a developed nation by 2047 (The Times of India, 2025). Supporting this statement, A McKinsey report projects that India's agricultural economy could grow at a **compound annual growth rate (CAGR) of about 5–7%** from 2024 to 2047 (McKinsey, 2025). India's agriculture sector boasts numerous structural advantages compared to other agricultural economies, which, if fully harnessed, could propel the sector's growth to \$1.4 trillion by 2035 and \$3.1 trillion by 2047. Agribusinesses have a chance to seize value, influence markets, and spur revolutionary growth in this new environment. With the help of the government, India's bioeconomy has expanded quickly. By 2024, it will have grown from \$10 billion in 2014 to over \$165 billion. By establishing direct relationships with businesses that provide distinctive, superior products, these farmers can expand. Additional agricultural products, such as natural fertilizers and insecticides. By 2030, the market is anticipated to have nearly doubled in size, reaching over \$600 million. Rural development can be greatly aided by agriculture when it is grown in a sustainable and inclusive manner. Incomes rise, jobs are created, infrastructure is strengthened, communities are empowered, and environmental security is guaranteed. For India to become a developed nation by 2047, agricultural development is crucial to creating resilient, self-sufficient rural communities. More funding is needed for infrastructure, research, and innovation to support rural development, particularly for biofuels and innovative applications of agricultural waste. The transformation of rural India in accordance with the nation's development goals for 2047 depends on sustainable agriculture. Through the effective use of natural resources and the preservation of environmental equilibrium, it guarantees long-term productivity.

Conclusion : We are not a small country with a population of just a few million—by 2047, our population will reach approximately 1.6 billion. Therefore, we need to create Employment for everyone and focus on the cost of creating each job. We should also invest in sectors that can generate more Employment and help strengthen local economies, such as organic farming (Gupta R. P., 2019). The vision of Vikshit Bharat @2047 presents a transformative roadmap for India's agriculture sector, centered on sustainability, innovation, and resilience. Realizing this vision requires integrating sustainable practices with emerging technologies and strong collaboration among government, farmers, researchers, and civil society. Strategic investments in technology, infrastructure, and human capital will be key, supported by effective policies. Achieving Vikshit Bharat by 2047 requires integrating advanced technologies like precision farming, biotechnology, and digital agriculture with sustainable practices such as organic farming and

efficient water management. Crop diversification and agroforestry improve soil health, biodiversity, and resilience, while preserving soil fertility is essential for long-term sustainability. Together, these strategies support a modern, efficient, and resilient agricultural system essential for India's growth and food security. Through teamwork and ongoing learning, the Indian economy can build a resilient agricultural system that will ensure food security and promote national prosperity. Infrastructure and innovations like IoT and mobile platforms empower farmers with real-time information, increasing productivity and incomes.

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