Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 06, Issue: 01 (JAN-FEB, 2026)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

An Analysis of India's Agricultural Sustainability

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India's rapidly growing population has put a heavy load on food supply, necessitating the pursuit of sustainable agricultural growth. Therefore, it is imperative to move from production-oriented to profit-oriented sustainable farming. A thorough examination of input and output in sustainable agriculture can assist in finding a balance between economic and environmental issues. The efforts being made in this situation should be more practically balanced, even though it may be challenging. This fact is taken into consideration in the current study, which outlines the necessity of sustainable agriculture and suggests courses of action using secondary data.

Key Words: India, Sustainable Farming, Sustainable Agriculture, Challenging, Growth

Introduction

Despite some remarkable successes of international cooperation and national development stories, decades of development cooperation and national efforts have not resulted in the establishment of sustainable economic growth in the Global South or the eradication of severe poverty from significant portions of the world's population (de Vries and Jochemsen, 2019). Not only is there no one-size-fits-all method for achieving sustainable development, but there is also no magic bullet for economic expansion. Interestingly, despite the fact that agriculture dominated almost all traditional economies, the majority of emerging countries have disregarded it as a critical sector for sustainable development (Hwa 1989, Pingali et al. 2019). Due to both internal and external factors, such as a low skill base, large production volatility, and a high level of state dependency, low-income countries often have slow agricultural productivity. These issues also often result in the countries' significant sensitivity to the instability of the major commodities they export. Other aspects of agricultural land in developing countries include resource degradation and disputes over land usage (IPBES 2019). Agriculture has advanced significantly, particularly since the end of World War II. Food and fiber productivity expanded dramatically as a result of mechanization, increasing use of chemicals, specialization, new technology, and government regulations that encouraged output maximization. India's agricultural system changed as a result of independence. Our challenge was producing enough food to feed the growing population. We used fertilizers, pesticides, and high-yielding varieties to bring about the green revolution. Because of this mix of high-yielding production methods, the country currently has an excess of food (Nagar et al., 2013). India's food needs are currently exceeded by the country's agricultural sector. However, it makes a substantial contribution to the national economy and employs nearly half of the labor force. The green revolution has transformed India's situation from one of food insecurity to one of food security. However, the green revolution's advantages are already overwhelming, and its disadvantages have only now become apparent.

Procedure and Material

The following analysis is based on secondary data that was acquired from a range of sources, including reports from agencies, research journals, and publications from the government. Additionally, the conclusion has been made after considering certain empirical facts.

Results

Required for Sustainable Agriculture: With agriculture as the cornerstone of the country's economy, India is recognized as a global agricultural superpower. It farms a lot of wheat, rice, and cotton and is the world's biggest producer of milk, pulses, and spices. It is the second-largest producer of rice, sugarcane, wheat, cotton, tea, fruits, vegetables, and farm fish worldwide. However, a variety of problems plague India's agriculture, such as diminishing soil fertility, dispersed land ownership, erratic and variable rainfall in some regions, disease and insect outbreaks, inadequate financial investment, and rising input costs. Because it respects biodiversity, conserves energy, preserves and renews environmental resources, increases food chain productivity, improves human well-being and economic growth, offers resilience in the face of climate change, and supports the socioeconomic and general development of local communities, sustainable agriculture in India is therefore very helpful in resolving these issues.Sustainable agriculture is profitable, eco-friendly, and good for human wellbeing.

Sustainability of the Environment: Making decisions in life that ensure future generations have an equal, if not better, standard of living is known as environmental sustainability. Its goal is to enhance human well-being without further taxing the planet's supporting systems. Examining the following closely is necessary to comprehend environmental sustainability :

Fertility of Soils: The decline in soil fertility is one of the biggest problems facing Indian agriculture today. Surface runoff from surfaces, deforestation, high winds, excessive irrigation, excessive grazing, and misuse of chemical pesticides and fertilizers are some of the factors that contribute to soil deterioration and fertility loss. Sustainable agriculture practices are quite beneficial in this situation, particularly in terms of protecting the environment.

Sources of Water: The overuse of water resources in the residential, commercial, and agricultural sectors, contamination of surface and groundwater from inappropriate sewage and industrial effluent disposal, unequal water distribution across the country, etc. are some of the water-related issues that Indian agriculture is currently dealing with. Sustainable agriculture is favored since it ensures water conservation.

Irrigation Biodiversity: It is exceedingly debatable as to whether farmers in numerous sections of the country employ the practice of monoculture farming. Soil biodiversity and efficiency have decreased as a result of this type of farming. Monoculture farming may result in a pest and disease outbreak. Increased biodiversity and higher agricultural output are the benefits of sustainable agriculture, which broadens the range of flora, animals, and microbes.

Pollution of the Environment: The excessive and inappropriate use of chemicals as fertilizers, pesticides, weed killers, fungicides, and herbicides is the main cause of air, water, and soil pollution in Indian agriculture. Using organic manure as a key priority in sustainable agriculture is a good approach to prevent the environmental damage that occurs in the agriculture business.

Current Terrain: Deforestation and poor farming practices have a detrimental effect on the rural environment and reduce the soil resources' carrying capacity. People from these areas often relocate to cities in search of employment. Because they cannot afford the cost of housing in cities, this group prefers to live in slums, which negatively impacts the urban environment. On the other hand, sustainable agriculture reduces rural-to-urban migration and enhances the quality of life for local residents.

Environment: Conventional agriculture significantly increases the emissions of greenhouse gases, including carbon dioxide, methane, sulfur dioxide, nitrous oxide, and others. Conversely, sustainable agriculture promotes the use of unconventional energy sources and

makes a substantial contribution to the prevention of climate change caused by global warming by reducing greenhouse gas emissions.

Stability of Economy: The phrase "economic sustainability" refers to measures that support sustained economic expansion without negatively impacting the social, environmental, or cultural aspects of the community. Sustainable agriculture encourages ethical business practices to protect the long-term development of the agricultural sector.

Policies that prioritise exports: The government regularly promotes the export of agricultural goods in order to give farmers a fair price for their output. But it comes with unstated maintenance and transportation fees. Alternatively, maintenance and transportation expenses will be lower if the agricultural output is sold at the local market. As a result, the local populace will be able to buy agricultural products at fair pricing. In this context, sustainable agriculture helps the locals by focusing on their needs and development.

Debt from agriculture: The cost of agricultural inputs like seeds, fertilizer, insecticides, labor, and transportation has significantly increased. Modern technology has the potential to boost yield, particularly in irrigated agriculture. However, there have been detrimental effects on small and marginal farmers. Sustainable agriculture has the ability to lower input costs and break the debt cycle for small and marginal farmers while also being an environmentally friendly approach.

Risk Associated with Agriculture: The price of agricultural produce fluctuates and frequently drops, posing a serious risk of financial loss. A large crop is produced by farmers with favorable weather, which drives down market prices. On the other hand, poor crop production during adverse weather conditions reduces agricultural productivity and, as a result, farmers' income and pushes them into the cobweb phenomenon. Sustainable agriculture guarantees robust returns and stabilizes agricultural product prices.

Employment: Nowadays, a large percentage of Indians are employed in agriculture. However, since mechanization and modernization of agriculture have reduced the need for both skilled and unskilled laborers, it is imperative to safeguard these unemployed people. Sustainable agriculture could be able to sustain some of this population by promoting labor-intensive enterprises.

Inclusivity: The inclusive strategy employed in sustainable agriculture may lead to the overall development of society. It could reduce rural poverty by finding suitable solutions.

Support from Government: The success of sustainable agriculture depends on government support. The purpose of the government's economic policies should be to remove all obstacles that farmers have while putting sustainable agriculture into practice. Having minimal savings to fall back on is one of these issues, as the majority of Indian farmers are impoverished. Therefore, the government can try to establish new institutions and strengthen those that already exist in order to provide farmers with easier financial options for embracing the changes brought about by sustainable agriculture.Another major obstacle is inadequate agricultural marketing.If the government can strengthen the ties within the marketing channels and build a well-connected marketing infrastructure, both farmers and consumers may benefit from sustainable agriculture and the role of middlemen can be decreased.

Regional acceptability: Science and technology have developed rapidly in recent years and are now used in many different fields. However, utilizing technology calls for the appropriate knowledge and skills. Additionally, people are hesitant to accept scientific and technical developments due to the impact of religion, customs, and traditions, particularly in the country's rural parts. Sustainable development promotes the use of agricultural technologies made domestically in an effort to gain more recognition.

Native Knowledge and Skillsets: Indian farmers have passed down their crop-growing methods and expertise from generation to generation. They have a thorough awareness of their area breeds, climate, environment, resources, wealth of animals, and people resources. As a result, they have developed their own agricultural technology, knowledge, and know-how. The sustainable growth of agriculture takes all of these aspects into consideration.

Gender Parity: It is commonly observed in the rural community that men receive significantly greater financial benefits from family income. By encouraging gender equality, equitable load sharing, and equal economic gains for both sexes, sustainable agriculture safeguards equal financial freedom for men and women.

Safety of food: Agricultural productivity is poor because most Indian states' farmers still grow crops using traditional methods. The country's low agricultural output is also caused by a number of other issues, such as ignorance, the prevalence of poverty, the influence of religion, and the non-commercialization of agriculture. Cash crops have been given priority in India due to the commercialization of agriculture. The area used for food crops has drastically decreased. A balanced diet is therefore unavailable to the general populace. Growing a variety of food crops is essential to solving this problem. Sustainable agriculture is a good way to address this.

Capturing part: The diversity of socioeconomic classes and religions among Indians is one of their most distinctive characteristics. People in higher castes and socioeconomic strata are the ones who benefit from agriculture the most.Small, marginal, and lower caste farmers continue to be cut off from the country's mainstream of development. This is where the comprehensive development strategy of sustainable agriculture would be quite helpful.

Advice and recommendations: According to a study by the Council on Energy, Environment, and Water (CEEW), less than 4% of Indian farmers have adopted sustainable farming practices (Economic Times 2021). However, if we take proactive measures and create programs that establish sustainable agriculture as the norm in India, we can reverse these trends. Here are some suggestions.

The Modification of Organic Agriculture: The introduction of organic farming was a component of a larger initiative to alleviate the environmental damage caused by chemical fertilizers and pesticides. It was developed in response to the harm that unethical farming methods were doing to the environment. This type of farming has a number of ecological benefits. It reduces soil erosion, prevents nitrates from penetrating the soil, and discourages the usage of artificial fertilizers in favor of using organic manure. Organic farming improves soil health and recycles animal excrement.

Enhancement of current agricultural practices: Growing a certain crop in a designated location is a top priority for Indian farmers. A variety of food crops will be produced in this region thanks to agricultural diversification, allowing the general populace to consume a balanced diet.Wheat, rice, jowar, bajra, soybean, barley, peas, gramme, oil seeds, ground nuts, seasonal fruits, vegetables, and fodder crops should be given priority when deciding which crops to plant.It ensures higher agricultural output, generates employment, reduces poverty, and promotes equitable and sustainable agricultural growth. A number of tactics, such as the use of drip and sprinkler irrigation, the adoption of risk management techniques, the use of renewable energy sources, the appropriate use of fertilizers and pesticides, the selection of improved crop and livestock varieties, and the adaptation of biotechnology, can be used to ensure the sustainable growth of agriculture in India.

Enhanced Preserving of Natural Resources: Natural resources like soil and water are becoming less suitable for use in agriculture due to overuse or contamination. Soil erosion is being caused by overuse of synthetic fertilizers and pesticides, deep and slope plowing, overgrazing, overwatering, and other subpar farming methods. Surface and groundwater supplies are contaminated by leachate. By employing suitable conservation strategies like reduce, reuse, and recycle, it would be possible to protect resources in this way.

Improvement in Resource Efficiency: Making efficient use of natural resources and comprehending the relationship between the benefits of using natural raw materials—also referred to as techno-economic materials—in production or consumption are key components of improving resource efficiency. Maximizing the benefits of products and services while cutting waste and consumption is the main objective of improving resource efficiency, which may help the agricultural sector.

Enhancing agricultural research: The primary focus of agricultural research in India should be on appropriate food production, food security and safety, energy demands, sustainable resource use, computer literacy, science, and education, as well as the interdependence of rural and urban areas.

Enhancement of agricultural processing: The collection of techno-economic processes used to treat and preserve agricultural goods in order to convert them into food, fiber, fuel, or industrial raw materials is known as agro-processing. It offers a number of benefits.As a result, the growth of agro-processing businesses had to come first.

Conclusion

For India's agriculture to grow sustainably, organic farming is essential. Choosing the right crop patterns, using state-of-the-art farming methods, protecting natural resources, increasing resource efficiency, supporting agricultural research, optimizing the system to reduce post-harvest losses, and developing the food processing system are all examples.

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