IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# India's Sustainable Agriculture Approach: An Overview Of Government Initiatives

[1]Devang Shrivas, [2]Dhanjay Patel, [4]Ema Sawarkar and [5]Satwik Sahay Bisarya[*]

[1,2&3]Assistant Professor, Faculty of Agriculture Science and Technology, Madhyanchal Professional University, Bhopal, Madhya Pradesh

[4*]Associate Professor, Faculty of Agriculture Science and Technology, Madhyanchal Professional University, Bhopal, Madhya Pradesh

***Abstract:*** Indian agriculture faces two main obstacles: economic and ecological. The Indian economy and society are based mostly on agriculture due to its significant contribution to job creation and means of subsistence. Approximately 43% of India's land area is devoted to agriculture. The industry receives its food, feed, and raw materials from this sector. In light of these facts, the Indian government has launched a number of national and regional measures to support the sustainable expansion of agriculture. Despite this, the GDP proportion of agriculture has been gradually declining in recent years. Numerous problems plague Indian farmers, including high input costs, low profitability, declining water tables, land degradation, and climate change hazards.

Indian agriculture faces economic and ecological challenges, contributing to job creation and subsistence. Despite government measures, the GDP proportion of agriculture has declined, with high input costs, low profitability, declining water tables, land degradation, and climate change hazards affecting farmers.

The majority of socioeconomic and environmental issues that resulted from unsustainable farming practices can be resolved by sustainable agriculture. The three primary objectives of sustainable agriculture are socioeconomic equity, economic profitability, and environmental health. Being aware of this, the Indian government has introduced a number of policies and programs that address the need for essential inputs in an environmentally friendly way. This document seeks to list and evaluate important Indian efforts, including the Soil Health Card program, PM Fasal Bima Yojna, PM Krishi Sinchayi Yojna, National Mission on Sustainable Agriculture, and Parampragat Krishi Vikas Yojna.The study's goal is to examine India's initiatives and strategies for the advancement of sustainable agriculture.

Sustainable agriculture addresses socioeconomic equity, economic profitability, and environmental health. The Indian government has implemented policies and programs like the Soil Health Card program, PM Fasal Bima Yojna, PM Krishi Sinchayi Yojna, National Mission on Sustainable Agriculture, and Parampragat Krishi Vikas Yojna to promote sustainable agriculture.

***Index Terms*** **-** Sustainable Agriculture, Environment, Ecological balance, Food security, Initiatives, Degradation, Economy, Farmers‟ welfare, Strategy.

## I. INTRODUCTION

India's great geographical and cultural variety makes it a special place from an agricultural perspective. Indian agriculture is firmly founded on the country's vast expanses of level plains, fertile soils, diverse climate, and extended growing season. When considering agriculture's total performance during the past 60 years, it appears to be a respectable and successful success story. Food grain, cash crop, and related product production has multiplied many times over. Despite this, the agricultural sector's contribution to GDP has decreased from 53.1% to 14.0% over this time. One of the biggest issues facing the government is boosting agricultural production while preserving the few natural resources in a sustainable way to guarantee food security and give farmers a stable income.

The Green Revolution has significantly impacted Indian agriculture, causing land degradation and water resource depletion. With only 47% of net sown area irrigated, 60% is groundwater. Subsidies for electricity have led to wasteful use, causing water table depletion and water quality deterioration. Sustainable agriculture can help mitigate these socio-economic and environmental issues, overcoming the challenges of chemical fertilizer-based farming.

Put simply, sustainable agriculture is the production of food, fiber, or special plant or animal products by farming practices that safeguard human populations, the environment, public health, and animal welfare. The term "sustainable" has gained a lot of traction in recent years and is now used to describe a wide range of concepts.

Sustainable agriculture is a type of farming that focuses on producing long-term crops and livestock while causing the least amount of negative environmental effects possible. This type of agriculture seeks to strike a healthy balance between the need to produce food and the preservation of the natural ecosystem. Apart from providing food, sustainable agriculture aims to retain water, minimize the usage of pesticides and fertilizers, and promote biodiversity in both the ecosystem and the plants produced. Sustainable agriculture also focuses on helping farmers maintain their financial stability and enhance their methods and quality of life.

Sustainable agriculture aims to align with natural forces and achieve environmental health, economic profitability, and social equity. It addresses constraints faced by resource-poor farmers while ensuring environmental sustainability. Sustainable development preserves and develops natural resources for future generations, balancing livelihoods with public health concerns and education standards. This approach addresses resource-poor farmers' constraints and ensures a balance between income, public health, and education standards.

## II. OBJECTIVES AND RESEARCH METHODOLOGY OF THE STUDY

The secondary sources used in this study include government reports, newspapers, magazines, journals, and online portals, among others. The following questions are the focus of the research:

1.What makes promoting sustainable agriculture necessary?

2.What strategy has the Indian government implemented to promote sustainable agriculture?

3.What significant steps have been made to advance it thus far?

## III. CONCEPT OF SUSTAINABLE AGRICULTURE

The idea of "sustainable agriculture" supports the same sustainability tenet, which states that we must satisfy our current needs without endangering the capacity of future generations to satisfy their own. The preservation of natural resources is essential for the agriculture industry as well as the continuation of life on Earth.

Producing food, fiber, plants, or animal products using farming practices that safeguard the environment, public health, and the welfare of people and animals is known as sustainable agriculture. It combines a number of environmentally safe farming techniques that preserve productivity and profitability while being the least toxic and energy-intensive. Examples of such agricultural practices include crop rotation, organic farming, mixed farming, strip farming, and diverse cropping. Organic farming is thought to be the most popular and successful of these.

Over the past forty years, there has been a growing movement to question the need for these exorbitant costs and provide creative alternatives. These days, our food production systems are accepting and supporting the sustainable agriculture movement more and more. Three primary objectives of sustainable agriculture are social equity, economic profitability, and environmental health (Figure 1). While many different ideologies, laws, and methods have helped achieve these objectives, most definitions of sustainable agriculture share a few basic ideas and concepts.

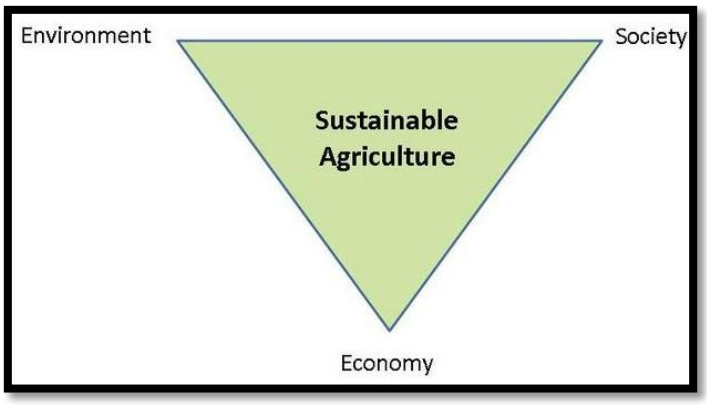


***Figure 1:*** *Environmental, social, and economic concerns are given equal weight in sustainable agriculture*

The foundation of agricultural sustainability is the idea that we must satisfy our current needs without endangering the capacity of future generations to satisfy their own. Thus, the management of natural resources for the long term is just as important as the management of human resources for the short term. In stewarding human resources, social responsibilities like the living and working conditions of laborers, the needs of rural communities, and the present and future health and safety of consumers are all taken into account. Taking care of land and natural resources entails preserving or improving their quality as well as using them in a way that permits future regeneration. Concerns regarding animal welfare in agricultural operations involving livestock must also be taken into account when evaluating stewardship.

Understanding sustainability requires a perspective on agro ecosystems and food systems. In its broadest sense, agro ecosystems include individual fields, farms, and Eco zones. Food systems extend from the farmer to the local community to the global population. They comprise agro ecosystems as well as distribution and food consumption components. A thorough understanding of our agricultural production and distribution businesses, as well as how they impact human communities and the environment, is made possible by placing a strong emphasis on a systems perspective. On the other hand, a systems approach also provides us with the means to evaluate how human society and its establishments affect agriculture and environmental sustainability.

Agro ecosystem and food system approaches also entail multifaceted initiatives in action, education, and research. Moving toward more agricultural sustainability will require the participation of researchers from many fields as well as farmers, laborers, retailers, consumers, legislators, and other stakeholders in our food and agriculture systems.

And last, achieving sustainable agriculture involves more than one specific end goal. The scientific community's understanding of what environmental, social, and economic sustainability is is always changing due to the influence of current events, viewpoints, and values. For instance, twenty years ago, the ability of agriculture to adapt to climate change was not thought to be a critical issue, but it is currently garnering more attention. Furthermore, the definition of a sustainable system can vary depending on the environment (soil types, climate, labor costs, etc.), as well as cultural and ideological viewpoints. As a result, the term "sustainable" itself is contested. Therefore, rather than placing agricultural systems in a sustainable/unsustainable dichotomy, it is more helpful and relevant to think of them as ranging along a continuum from unsustainable to very sustainable.

### 3.1 Natural Resource Management and Sustainable Agriculture

Future generations will be less able to produce and thrive if the natural resource base is weakened by the production of food and fiber. The depletion of natural resources resulting from unsustainable farming and forestry practices is thought to have had a significant impact on the decline of ancient civilizations in Mesopotamia, the Mediterranean region, the Pre-Columbian southwest United States, and Central America. The goal of sustainable agriculture is to minimize negative effects on ecosystems located beyond a field's edge while simultaneously maximizing the productive potential of natural resources. Considering how to make the most of already-existing natural processes or how to build their farming systems to incorporate

essential functions of natural ecosystems are two ways farmers attempt to accomplish these goals. Maintaining an economically viable production system with fewer potentially toxic interventions can often be achieved by designing biologically-integrated agro ecosystems that rely more on the internal cycling of nutrients and energy. For instance, farmers who want to achieve a higher standard of environmental sustainability might think about how using natural processes to control pest populations can help them use fewer toxic pesticides. This could occur, for instance, from planting ground covers or hedgerows between rows to provide habitat for insects and birds that eat pests, or from planting more varied crop blends that confuse or deter pests. In addition to providing more genetic resources for breeding resistance to diseases and pests, maintaining a high degree of genetic diversity can be achieved by conserving as many crop varieties and animal breeds as possible.

Taking care of the soil to preserve its integrity as a complex and highly structured entity made up of mineral particles, organic matter, air, water, and living things is another way to conserve resources that are essential for agricultural productivity. Soil health is a top priority for farmers who are interested in long-term sustainability because they understand that healthy soil supports healthy crops and livestock. Sustaining or even growing soil organic matter is frequently necessary to keep the soil functioning. In addition to serving as a substrate for microbial activity and a buffer against changes in acidity, water content, pollutants, etc., soil organic matter also plays an important role as a source and sink of nutrients. Moreover, the accumulation of organic matter in the soil can aid in reducing the rise in atmospheric CO2 and consequently the effects of climate change. Enhancing the soil's structure through improved water penetration, reduced runoff, improved drainage, and enhanced stability is another crucial role of soil organic matter, which lowers erosion from wind and water.

### 3.2 Sustainable Agriculture and Society

Long-term sustainability of agro ecosystems depends on having the technical know-how, labor skills, and expertise necessary to manage them well. A broad and flexible body of knowledge is needed for sustainability because agriculture is a dynamic and site-specific industry that draws from both formal, experimental science and farmers' own first-hand local knowledge. Social institutions that support farmer-scientist collaboration, foster innovation, and educate both farmers and scientists can boost agricultural output and long-term sustainability.

Discussions about sustainable agriculture frequently touch on issues of social justice. Most industrialized nations' agricultural sectors heavily rely on migrant labor from less developed countries due to the extremely low wages for farm labor. This makes farmers susceptible to changes in immigration laws and increases the demand on government social services. Many of these workers' dubious legal statuses also play a role in their generally low incomes and standards of living, as well as their lack of job security, opportunities for advancement, and exemptions from occupational safety regulations that are standard in other industries.

The consolidation of food manufacturers and suppliers has limited farmers' economic power, limiting their ability to negotiate better prices and improve environmental conditions. To increase their economic power, farmers can form cooperatives, perform processing functions, produce specialty crops, build direct marketing opportunities, and explore niche markets.

Rural communities are experiencing poverty due to economic pressures on farmers. Economic development policies and tax structures can promote diversified agricultural production on family farms, while consumers can influence producers, retailers, and the system.

Economic pressures on farms have led to social equity concerns for low-income communities, who often lack access to healthy food. To address this, community food security is bolstered through community gardens, farmers markets, and local food cooperatives. A food systems approach considers farming practices' impact on safety and nutritional quality.

## IV. India’s Approach and Initiatives

Global issues such as climate change, global warming, environmental degradation, population growth, and widespread food insecurity are of concern to the entire world. Given this context, India has adopted a comprehensive strategy for both environmental protection and the welfare of its people in order to fulfill its obligations under international agreements such as the 2015 Paris Climate Change Agreement. India has embraced a multifaceted approach that will, either directly or indirectly, contribute to the development of sustainable agriculture as well as the revitalization of the agricultural sector.

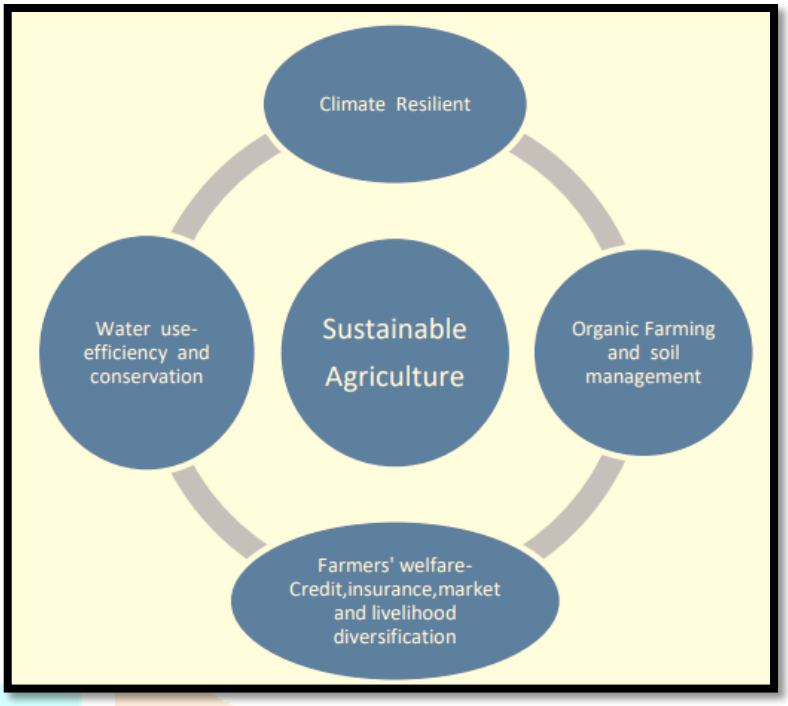


***Figure 2: Key Areas of India's Approach***

India's approach centers on important factors such as the region's physiography, local climate, accessibility to technology, and the availability of water resources. Its main goal is to develop climate-resilient agriculture, which is appropriate for the country's climate and revives traditional farming practices like crop rotation, organic farming, and mixed farming. It also aims to maximize the potential of dry land or rainfed agriculture in India. Aside from this, the Indian government has placed a greater emphasis on the promotion of micro-irrigation techniques and the sustainable development of irrigation facilities with efficient water use. In addition, the government encourages farmers to diversify their operations and take up new ones like goat farming, chicken raising, and animal husbandry, beekeeping, and timber plantations. Financial assistance is given to farmers in hilly areas, particularly in North-Eastern India and the Western Himalayan states, to enable them to engage in sustainable horticultural practices. Farmers' reliance on agriculture is lessened through programs pertaining to infrastructure development, food processing, and dairy farming.

**4.1Pradhan Mantri Krishi Sinchai Yojna(PMKSY)** - This scheme was introduced by the Union Government on July 1, 2015, under the slogan "Har Khet Ko Paani." The Integrated Watershed Management Program, the On Farm Water Management Program, the Accelerated Irrigation Benefit Program, and other current initiatives are to be combined under PMKSY. It seeks to offer complete irrigation supply chain solutions, including farm-level applications, distribution networks, and water resources. In addition to providing sources of guaranteed irrigation, it also focuses on producing protective irrigation by using "Jal Sanchay" and "Jal Sinchan" to collect rainfall at the micro level. The major objective of PMKSY is to achieve convergence of investments in irrigation at the field level, expand cultivable area under assured irrigation and improve on- farm water use efficiency to reduce wastage of water. It also focuses to enhance the adoption of precision irrigation and other water saving technologies (Per Drop, More Crop), enhance recharge of aquifers and introduce sustainable water use conservation practices.

**4.2The National Micro: Irrigation Mission** It was started with the goal of developing and promoting micro-irrigation systems.The area covered by micro-irrigation has nearly doubled under this program, rising from 3.09 million hectares in 2005 to 6.14 million hectares in 2012.Through the use of various techniques to improve water use efficiency and raise crop productivity while lowering labor, water, and electricity costs overall, micro-irrigation helps reduce input consumption. Among the methods of micro-irrigation are sprinklers and drip irrigation. Thus, one more method for advancing sustainable agriculture is through micro-irrigation.

**4.3 Soil Health Card Scheme:** In 2015, the government introduced the Soil Health Card nationwide program aimed at revitalizing India's depleted soils. Farmers who participate in this program receive soil health cards with crop-specific recommendations for nutrients or fertilizers. Through the prudent use of chemical fertilizers, such as secondary and micronutrients, in conjunction with organic manures and

biofertilizers, it seeks to promote integrated nutrient management (INM), which improves soil health and productivity.

**4.4 Pradhan Mantri Fasal Bima Yojna:** This flagship program was introduced by the Indian government in 2016 to assist farmers in dealing with crop losses. In the event that farmers experience crop losses due to weather-related events, natural disasters, or climate change, it aims to offer them a consistently low premium that will enable them to continue farming. By providing financial assistance to farmers who experience crop loss or damage from unanticipated events, PMFBY seeks to support sustainable production in the agriculture sector. Additionally, it pushes farmers to embrace cutting-edge and creative farming methods in order to stabilize their earnings and advance sustainable agriculture.

Role of Organic Farming: The organic farming has emerged as an alternative system of farming which not only address the quality and sustainability concerns, but also ensure profitable livelihood option for rural community of India. The rigorous reliance on chemical fertilizers and pesticides always questions the concept of sustainability in its all aspects. It harms environment and the food chain. Organic agriculture avoids all kinds of practices which damages agro -ecosystem. It provides healthy food while establishing an ecological balance to prevent soil fertility or pest problems. India is blessed with all natural and human factors essential for development of organic farming. Therefore, Government is working on organic farming as an effective way to promote sustainable agriculture.

**4.5 Parampragat Krishi Vikas Yojna (PKVY):** It is a cluster based programme to encourage the farmers for adopting organic farming. Under this project a group of fifty or more farmers having 50 acre land is formed to take up the organic farming. In this way during three years 10,000 clusters will be formed covering 5 lakh acre areas under organic farming. Organic farming will be promoted by using traditional resources in an environment friendly way.

## V. CONCLUSION

Undoubtedly, Government of India has a well- defined array of schemes to meet almost all the needs and issues related to the development of sustainable agriculture. But the solution and success lies in the seamless implementation of these programmes. Agriculture is a state subject in India which lead to politicization and fragmentation of actions and solutions related to it. On the national front there is need to develop a consensus with the states for executing a national agenda on sustainable agriculture. Further, institutions of higher education could contribute towards ecologically sustainable agriculture by educating and facilitating farmers in adopting sustainable farming practices. The progress in sustainable agriculture depend more on the development of organic farming. It‟s high time to take strategic and effective steps to overcome the constraints in the way of organic farming. There is a need for a comprehensive framework that integrates organic farming with bottom up responses. It should also address technology diffusion with reciprocal knowledge flow from farmers‟ institutions.

Indian agriculture faces economic and ecological challenges, contributing to job creation and subsistence. Despite government measures, the GDP proportion of agriculture has been declining. Issues include high input costs, low profitability, declining water tables, land degradation, and climate change hazards. Sustainable agriculture aims to address socioeconomic equity, economic profitability, and environmental health. The Indian government has introduced policies and programs like the Soil Health Card program, PM Fasal Bima Yojna, PM Krishi Sinchayi Yojna, National Mission on Sustainable Agriculture, and Parampragat Krishi Vikas Yojna to promote sustainable agriculture. The study aims to evaluate India's initiatives and strategies for advancing sustainable agriculture.

India's agricultural sector has seen significant growth over the past 60 years, but its contribution to GDP has decreased from 53.1% to 14.0%. The government faces challenges in boosting agricultural production while preserving natural resources for food security and stable income. The Green Revolution has led to land degradation and water resource depletion, with only 47% of net sown area irrigated. Sustainable agriculture aims to produce long-term crops and livestock while minimizing negative environmental effects. It focuses on preserving water, minimizing pesticide and fertilizer usage, and promoting biodiversity. Sustainable agriculture aligns with natural forces, achieving environmental health, economic profitability, and social equity, while addressing constraints faced by resource-poor farmers.

The National Micro Irrigation Mission aims to develop and promote micro-irrigation systems, which have nearly doubled in area from 3.09 million hectares in 2005 to 6.14 million hectares in 2012. This program uses techniques like sprinklers and drip irrigation to improve water use efficiency and crop productivity while

reducing input consumption. The Soil Health Card Scheme, introduced in 2015, revitalizes India's depleted soils by providing farmers with crop-specific recommendations for nutrients and fertilizers. The Pradhan Mantri Fasal Bima Yojna (PMFBY) supports farmers dealing with crop losses and encourages them to adopt innovative farming methods. Organic farming is an alternative system that addresses sustainability concerns and provides a profitable livelihood for rural communities. The Parampragat Krishi Vikas Yojna (PKVY) encourages farmers to adopt organic farming by forming clusters of 50 or more farmers with 50 acre land, covering 5 lakh acre areas over three years.

Recently the government of India has come up with the resolve of doubling farmers‟ income by 2022 though a seven point strategy. The strategy focuses on irrigation, quality seeds, post-harvest management, marketing, insurance and ancillary activities. This strategy has to be incorporated with the principles of sustainable agriculture which only can help in achieving the goals of environmental health, economic profitability and socio-economic equity .India must swiftly adopt climate smart agricultural practices which calls for using renewable sources such as bio-fuels and solar, nitrogen-smart nutrient management, organic farming, agro forestry, ICT based agro –advisories and so on..

## REFERENCES


1) Arora, M., Kiran, B., Rani, S., Rani, A., Kaur, B., Mittal, N. (2008): Heavy metal accumulation in vegetables irrigated with water from different sources. Food Chem., 111, pp. 811–815.
2) Brodt Sonja, Sustainable agriculture, UC Sustainable Agriculture Research and Education Program and Agricultural Sustainability Institute, 2011 Nature Education
3) FAO, (2008): World Food Security: the Challenges of Climate Change and Bioenergy. http://www.faopacific.ws/Portals/167/publications/Current%20Updates/WFD2008Global Report.pdf .
4) Ghosh, P. K., Bandopadhyay, K. K., Misra, A. K., Rao, A. S., (2004): Balanced fertilization for maintaining soil health and sustainable agriculture. Fertil. News, 494, pp. 13–35.
5) Lim Li Ching, Sustainable Agriculture: Meeting Food Security Needs, Addressing Climate Change Challenges, Third World Network
6) Narayanan, S. (2005): Organic farming in India: relevance, problems and constraints, Financing Agric., 43, 16-22.
7) Ramesh, P., Singh, M., Subbha Rao, A. (2005): Organic farming: Its relevance to the Indian context. Curr. Sci. 88, pp. 561–568
8) Agricultur Sharma V. P. and D. Jain 2011. “High-Value e in India: Past Trends and Future Prospects”. Indian Institute of Management, Ahmadabad, India. W.P. No. 2011-07-02
9) www.thehindubusinessline.com.
10) www.agricoop.nic.in
11) www.agriculture.gov.in