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A STUDY ON SUSTAINABILITY OF AGRICULTURE IN INDIA

AshwaniKumar¹

Research Scholar, Magadh University, Bodhgaya

Dr.Bhola ShankarBarnwal²

Assistant Professor, T.S.College, Hisua, Nawada

Abstract

Our need to pursue sustainable agricultural development stems from India's rapidly increasing population, which has placed a significant burden on food production. The transition from production-oriented to profit-oriented sustainable farming is therefore critically needed. When it comes to sustainable agriculture, a careful analysis of input and output can help strike a balance between environmental concerns and economic return. Even if it's somewhat difficult, the efforts being made in this situation ought to be more practically balanced. This fact is taken into account in the current study, which uses secondary data to outline the need for sustainable agriculture and recommend actions to take.

Keywords: India, Sustainable, Food Security, Agriculture

Introduction

Decades of development cooperation and national efforts have not produced the establishment of sustainable economic growth in the Global South, nor the eradication of severe poverty from significant portions of the world's population, despite some impressive successes of international cooperation and national development stories (de Vries and Jochemsen, 2019). Not only is there no surefire way to achieve sustainable development, but there is also no magic bullet when it comes to economic growth. It's interesting to note that most developing nations have overlooked agriculture as a crucial sector for sustainable development, despite the fact that it dominated practically all traditional economies (Hwa 1989, Pingali et al. 2019). Low-income nations frequently experience slow agricultural production because of both internal and external challenges, including a low skill base, high production fluctuations, and a high degree of state dependency. These challenges also often result in the countries' high vulnerability to the instability of the primary commodities they

export. Conflicts over land use and degradation of natural resources are other features of agricultural land in developing nations (IPBES 2019). Especially after the Second World War ended, agriculture has seen significant development. Mechanisation, increased use of chemicals, specialisation, new technology, and government policies that promoted maximising production all contributed to the dramatic growth in food and fibre productivity. With independence, the agricultural system in India saw a transformation as well. Making enough food to feed the expanding population was our challenge. In order to achieve the green revolution, we adopted insecticides, fertilisers, and high-yielding cultivars. The nation now enjoys a surplus of food thanks to this combination of high-yielding production techniques (Nagar et al., 2013). India's agricultural sector now provides more than the nation's food needs. Nonetheless, it employs close to half of the workforce and contributes significantly to the national economy. India's condition has changed from one of food insecurity to one of food security thanks to the green

revolution. But these days, the benefits of the green revolution are becoming overwhelming, and its drawbacks have recently come to light.

Materials and Procedures

The current analysis is based on secondary data that was gathered from a variety of sources, including reports from agencies, research journals, and publications from the government. The conclusion has also been reached after taking into account some empirical findings.

Results

Required for Sustainable Agriculture

India is regarded as a global agricultural superpower, with agriculture serving as the foundation of the national economy. It grows a lot of wheat, rice, and cotton and is the world's biggest producer of milk, pulses, and spices. It is the world's second-largest producer of fruits, farm fish, vegetables, sugarcane, wheat, cotton, tea, and rice. However, India's agriculture is beset with a number of issues, including declining soil fertility, fragmented land holdings, unpredictable and inconsistent rainfall in some areas, insect and disease outbreaks, poor financial investment, and growing input costs. Therefore, sustainable agriculture in India is a great help in resolving these issues because it respects biodiversity, conserves energy, protects and renews environmental resources, boosts food chain productivity, enhances human well-being and economic growth, provides resilience in the face of climate change, and aids in the socio-economic and general development of local communities. Profitable, environmentally friendly, and beneficial to human welfare is sustainable agriculture.

Sustainability of the Environment

Environmental sustainability comprises making life choices that secure an equal, if not better, way of living for future generations and it is aimed at improving the quality of human existence without putting additional strain on the earth's supporting systems. Understanding environmental sustainability requires taking a close look at the following:

Fertility of Soils

One of the main issues facing Indian agriculture today is the loss of soil fertility. Among the causes of soil degradation and fertility loss include surface runoff from surfaces, deforestation, strong winds, excessive irrigation, excessive grazing, and overuse of chemical pesticides and fertilisers. In this context, sustainable agriculture techniques are quite helpful, especially when it comes to conserving environmental resources.

Sources of Water

Among the problems with water that Indian agriculture is currently facing are the overuse of water resources in the home, industrial, and agricultural sectors, contamination of surface and groundwater from improper disposal of sewage and industrial effluents, uneven distribution of water throughout the nation, etc. Because it guarantees water conservation, sustainable agriculture is preferred.

Irrigation Biodiversity

It is extremely contentious as to whether farmers in multiple parts of the country practice the practice of monoculture farming. Because of this kind of farming, there has been a decline in soil efficiency and biodiversity. An outbreak of illnesses and pests is a possible outcome of monoculture farming. Increased biodiversity and higher agricultural output are the results of sustainable agriculture, which broadens the range of flora, fauna, and microbes.

Pollution of the Environment

Air, water, and soil pollution in Indian agriculture is a widespread issue caused by the excessive and improper use of chemicals as fertilisers, pesticides, weed killers, fungicides, and herbicides. Using organic manure as a top priority in sustainable agriculture is a terrific way to combat the environmental damage that occurs in the agriculture industry.

Current Terrain

Inadequate farming methods and deforestation in rural areas have a negative impact on the rural environment and lower the carrying capacity of soil resources. Individuals from these regions frequently move to cities in pursuit of work. This group prefers to live in slums, which cause problems for the urban environment since they cannot pay the expense of housing in cities.

Conversely, sustainable agriculture lowers the migration of people from rural to urban regions and improves the environment for those who live there.

Environment

The emissions of greenhouse gases, such as carbon dioxide, methane, sulphur dioxide, nitrous oxide, and others, are greatly increased by conventional agriculture. Sustainable agriculture, on the other hand, encourages the use of non-conventional energy sources and, by lowering greenhouse gas emissions, contributes significantly to the mitigation of climate change brought on by global warming.

Stability of Economy

The term "economic sustainability" describes actions that promote long-term economic growth without adversely affecting the community's social, environmental, or cultural elements. To safeguard the agricultural industry's long-term prosperity, sustainable agriculture promotes morally sound business practices.

Policies that prioritise exports

In order for farmers to receive a fair price for their output, the government frequently encourages the export of agricultural products. But it comes with unstated maintenance and transportation costs. Alternatively, if the agricultural produce is sold in the neighbourhood market, upkeep and transportation costs will be reduced. The local population will be able to purchase agricultural products at reasonable prices as a consequence. Sustainable agriculture supports local people in this setting by concentrating on their needs and growth.

Debt from agriculture

Inputs used in agriculture, such as seeds, fertiliser, pesticides, labour, and transportation, are now much more expensive. The yield may be increased by the use of cutting-edge technologies, especially in irrigated agriculture. Small and marginal farmers have been negatively impacted, nevertheless. As an environmentally beneficial method, sustainable agriculture has the potential to reduce input costs and release small and marginal farmers from the debt cycle.

Risk Associated with Agriculture

There is a significant danger of financial loss due to fluctuations and frequent declines in the price of agricultural produce. Farmers that have favourable weather experience a big crop, which lowers market prices. Conversely, meagre crop output under unfavourable weather conditions lowers agricultural yield and, consequently, farmers' income and forces them into the cobweb phenomenon. The prices of agricultural products are stabilised and strong returns are guaranteed by sustainable agriculture.

Employment

A sizable portion of the Indian populace now works in agriculture. But now that the need for trained and unskilled labourers has decreased due to mechanisation and modernization of agriculture, it is crucial to protect these jobless individuals. By encouraging labor-intensive industries, sustainable agriculture may be able to support a portion of this population.

Inclusivity

The comprehensive growth of society could result from the inclusive approach used in sustainable agriculture. By identifying appropriate solutions, it could lessen rural poverty.

Support from Government

Government backing is necessary for sustainable agriculture to flourish. The government should design its economic policies with the goal of eliminating any and all barriers that farmers confront while implementing sustainable agriculture. Having little savings to fall back on is one of these challenges, as the majority of Indian farmers are impoverished. In order to give farmers easier financial choices for accepting the changes brought about by sustainable agriculture, the government can therefore attempt to build new institutions and fortify those that already exist. Inadequate agricultural marketing is a significant additional barrier. Farmers and customers alike can gain from sustainable agriculture, and the role of middlemen can be reduced, provided the government can fortify the connections within the marketing channels and construct a well-connected marketing infrastructure.

Regional acceptability

In recent years, science and technology have advanced quickly and been applied to a wide range of fields. Nonetheless, using technology requires the right information and abilities. Furthermore, people are reluctant to embrace scientific and technological advancements because of the influence of religion, customs, and traditions, especially in rural areas of the nation. As it seeks greater recognition, sustainable development encourages the use of domestically produced agricultural technologies.

Native Knowledge and Skillsets

The technique and knowledge of crop cultivation have been passed down from generation to generation by Indian farmers. They have a thorough understanding of their area breeds, climate, environment, resources, riches of animals, and people resources. They have therefore created their own expertise, know-how, and agricultural technology. All of these factors are taken into account in agriculture's sustainable development.

Gender Parity

In agrarian community, it is generally noted that; men are getting comparatively larger economic benefits from family revenues. Sustainable agriculture protects equal financial independence for men and women by promoting gender equality, an equal sharing of the burden, and equal economic rewards to both sexes.

Safety of food

Due to the use of traditional crop growing techniques by farmers in the majority of Indian states, agricultural production is low. In addition, a few other factors contributing to the nation's low agricultural output include ignorance, the frequency of poverty, the influence of religion, and the non-commercialization of agriculture. In India, the commercialization of agriculture has prioritised cash crops. The area planted with food crops has so shrunk. As a result, the general public does not have access to a balanced diet. To address this issue, it is imperative to grow a diversity of food crops. One suitable remedy for the same is sustainable agriculture.

Capturing part

One of the key features of the Indian people is the diversity of religions and social classes. The advantages of agriculture are felt most keenly by individuals in higher castes and social classes. Farmers who are small, marginal, and from lower castes still remain isolated from the nation's development mainstream. This is where sustainable agriculture's all-encompassing development approach will come in very handy.

Advice and recommendations

A research conducted by the Council on Energy, Environment and Water (CEEW) indicates that less than 4% of Indian farmers have implemented sustainable agriculture methods and practices (Economic Times 2021). Reversing these numbers is doable, though, provided we take proactive steps and develop plans that make sustainable agriculture the standard in India. Here are a few recommendations.

The Modification of Organic Agriculture

The practice of organic farming was introduced as a part of a broader effort to address the harm that chemical pesticides and fertilisers were causing to the environment. It was created in reaction to the damage that improper farming practices were causing to the environment. There are several ecological advantages to this kind of farming. It lessens soil erosion, stops nitrates from seeping into the earth, and discourages the overuse of chemical fertilisers in favour of applying organic manure. Animal manure is recycled and soil health is enhanced by organic farming.

Enhancement of current agricultural practices

Indian farmers prioritise growing a particular crop in a designated area. Crop diversification in this area will help to generate a range of food crops so that the general public may eat a balanced diet. When choosing which crops to sow, the following should be prioritised: wheat, rice, jowar, bajra, soybean, barley, peas, gramme, oil seeds, ground nut, seasonal fruits, vegetables, and fodder crops. It guarantees increased agricultural productivity, creates jobs, lowers poverty, and encourages fair and sustainable agricultural expansion. Several strategies can be employed to guarantee the sustainable growth of agriculture in India, including the application of drip and sprinkler irrigation, the adoption of risk management techniques, the use of renewable energy sources,

the appropriate use of fertilisers and pesticides, the selection of improved crop and livestock varieties, and the adaptation of biotechnology.

Enhanced Preserving of Natural Resources

The overuse or pollution of natural resources, such as soil and water, is causing them to lose quality for use in agriculture. An excessive amount of synthetic fertilisers and pesticides, deep ploughing, slope ploughing, overgrazing, overwatering, and other poor agricultural practices are causing soil erosion. Leachate causes contamination of ground and surface water supplies. It may be possible to safeguard resources in this way by using appropriate conservation techniques like reduce, reuse, and recycle.

Improvement in Resource Efficiency

Improving resource efficiency refers to making effective use of natural resources and understanding the connection between the advantages of using natural raw materials, also known as techno-economic materials, in production or consumption and the benefits that come with them. The primary goal of increasing resource efficiency is to maximise the advantages of goods and services while reducing waste and consumption, which could support the agriculture industry.

Enhancing agricultural research

In India, adequate food production, food security and safety, energy demands, sustainable resource use, computer literacy, science, and education, as well as the interconnectedness of rural and urban areas, should be the main areas of agricultural research.

Enhancement of agricultural processing

Agro-processing, which is defined as the collection of techno-economic operations used to handle and preserve agricultural products in order to transform them into food, fibre, fuel, or industrial raw materials, has several advantages. Therefore, the development of agro-processing enterprises had to come first.

Discussion

Organic farming holds the key to the sustainable development of agriculture in India. Appropriate crop pattern selection, application of cutting-edge farming techniques, preservation of natural resources, increased resource efficiency, bolstering agricultural research, system optimisation to lower post-harvest losses, and advancements in the food processing system.

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