Sustainable Development Goals (SDGs) Fulfilment Through Natural Farming- Identifying the Synergies

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Abstract:

According to NITI Aayog, natural farming is a chemical-free, livestock-based traditional farming system rooted in agroecological principles that integrates crops, trees, livestock, and functional biodiversity. This study aims to identify key benefits and opportunities, as well as barriers and challenges, to creating synergies and jointly implementing the Sustainable Development Goals and the Nationally Determined Contributions in the case of India (Khalid, 2023). The selected Sustainable Development Goals set by the UN can be achieved by adopting natural farming practices. Goal 1: No Poverty and Goal 2: No Hunger can be achieved through low-cost natural farming. Goal 3: Good Health and Well-Being can also be achieved by getting good-quality produce. Goal 5: Gender Equality can be achieved through equal participation of men and women in the workforce. Goal 6: Clean Water and Sanitation, Goal 14: Life Under Water, and Goal 15: Life on Land can be achieved through natural farming, which avoids chemical fertilisers and pesticides. Goal 8: Decent Work and Economic Growth, and Goal 10: Reduction of Inequality, can also be achieved through natural farming. Thus, by adopting natural farming, 9 of the 17 United Nations (UN) goals can be achieved directly, while the remaining goals can be achieved indirectly.

Keeping this in mind, the present paper has studied the main challenges faced by farmers in adopting natural farming, such as the decreasing proportion of cows in relation to the population in each household, the difficulties in shifting from traditional farming, the government's subsidy for chemical fertilisers, etc., (SHARMA, 2020-21) which farmers actually face in adopting natural agriculture. The government should establish a system to ensure market access and adequate prices for farmers practising natural farming.

Introduction:

The country's agricultural sector is deteriorating rapidly due to current farming methods. In the 1960s and 1970s, the Green Revolution was adopted to achieve food security, leading to increased agricultural productivity and the commercialisation of agriculture. This has led to increased exploitation of the farming sector. Due to excessive exploitation of the agricultural sector, problems such as deforestation, land degradation, the greenhouse effect, and reduced irrigation have arisen. Today, we are forced to develop the sustainable agriculture sector. The only solution for this is to adopt natural farming methods.

According to the FAO, by 2050, the world will need to increase overall food production by 70 per cent to keep pace with the growing global population and the changes in consumption driven by the expansion of the middle class (Ranjit Kumar, 2020).

"Natural Farming is a chemical-free traditional farming method. It is considered an agroecology-based diversified farming system which integrates crops, trees, and livestock with functional biodiversity"-**NITI Aayog** (Sharma, 2022)**.**

The National Mission on Natural Farming (NMNF) was launched to shift agricultural practices toward scientifically validated approaches that promote sustainability, climate resilience, and safe food. It aims to improve soil health, restore ecosystems, and reduce input costs for farmers, thereby achieving greater climate resilience. (*Natural Farming*, n.d.)

If farmers adopt natural farming, they can reap numerous economic benefits and opportunities to produce a diverse range of commodities. Along with increasing economic profits, soil quality and the environment also improve. To maintain good health, people must eat healthy food without chemical additives.

Review of Literature:

Dzebo, A. et al. (2023), who analysed 63 national NDC submissions to explore climate action's possible connection with the SDGs, found that climate activities related to environmental SDGs such as those concerning hunger, agriculture, clean water and sanitation, biodiversity, and life on land—SDG 2, SDG 6, and SDG 15—have decreased, which is problematic as these sectors are critical towards climate action efforts aimed at emission reduction and improving resilience (Dzebo, Lacobuta, & Beaussart, 2023).

Obergassel, W. et al. (2017) show that Nationally Determined Contributions (NDC)- related activities related to SDG 2 have strong links and synergies with SDG 6 and SDG 15. For example, agriculture requires improved irrigation facilities and integrated water resource management (SDG 6), as well as enhanced soil and biodiversity management, as outlined in SDG 15 (Obergassel, Mersmann, & Wang Helmreich, 2017).

Atapattu Anjana J. et al. (2024). This chapter analyses the linkages between sustainable agriculture practices and specific SDGs, examining the potential of eco-friendly farming techniques to address socioeconomic and environmental issues. It provides an overview of prominent goals directly influenced by agriculture, like zero hunger, climate action, and responsible production and consumption (Atapattu, Ranasinghe, & Udumann, 2024).

Raghuvanshi & Gaur (2023). The article examines the potential of ZBNF for addressing Sustainable Development Goals (SDGs), including zero hunger, responsible consumption and production, climate action, life on land, no poverty, decent work, economic growth, and clean water and sanitation. ZBNF can help achieve these goals by putting a strong emphasis on

organic farming, biodiversity preservation, and minimal environmental impact (Raguvanshi & Gaur, 2023).

Objectives of the Study:

The main objectives of the study are as follows:

- To know the challenges facing natural farming
- To know the opportunities in natural farming
- To know what steps can be taken in the future for natural farming
- To understand how many Sustainable Development Goals can be achieved by practising natural farming

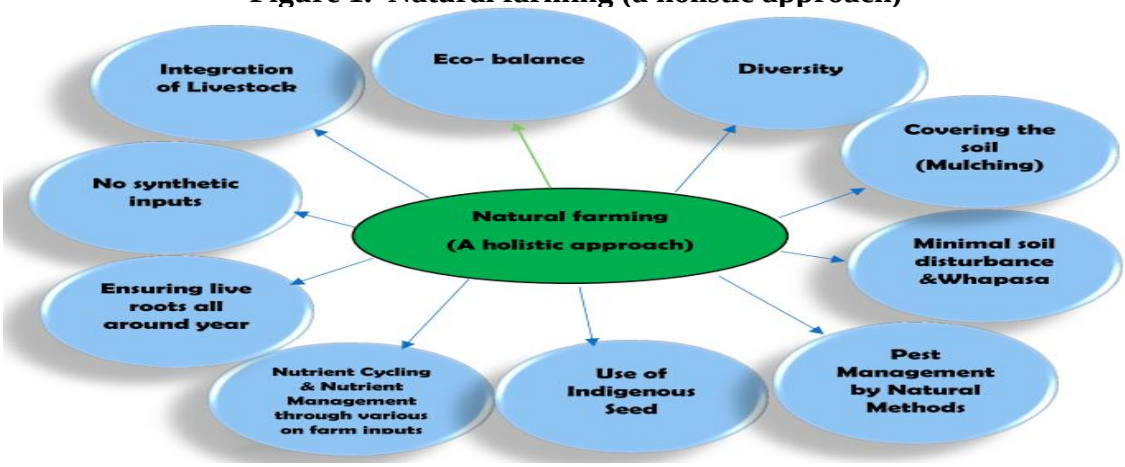
Research Methodology:

This study on natural farming is mainly based on secondary data. This study uses primary qualitative data. Some observational issues have been included from the case study of Dahod district. In addition, secondary data have been taken from various government publications and various studies. This is a conceptual study in which qualitative concepts based on empirical matters have been analysed. The research gap in this study is that it can measure various goals in detail using primary data, which could not be explored in this study.

Components of Natural Farming:

The components of natural farming focus on eliminating artificial inputs such as chemical fertilisers and pesticides by using indigenous resources, particularly cow dung- and urine-based ones. Instead, they include formulations such as Jivamrut and Beejamrut that promote soil health through mulching, cover crops, biodiversity and multi-cropping, integrate livestock, especially local cows, and use plant extracts for pest control, creating a self-sufficient, low-cost, sustainable system. Key practices include year-round soil cover, minimal soil disturbance, and recycling biomass on the farm. (*Natural Farming*, n.d.)

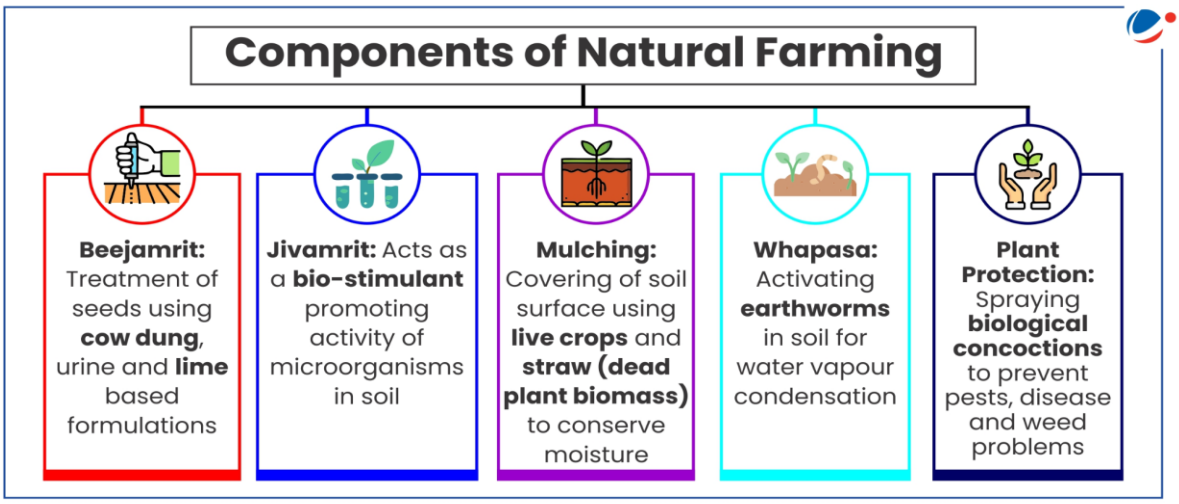
Figure 1. Natural farming (a holistic approach)



Source: https://naturalfarming.dac.gov.in/AboutUs/

Natural farming is a traditional livestock-based farming system, with its main principles grounded in Jivamrit, Ghanjivamrit, Beejamrit, mulching, whapasa, and related practices. Natural farming based on these components is done.

Figure 2. Components of natural farming



Source: Natural Farming | Current Affairs | Vision IAS

Natural Farming and Sustainable Development Goals (SDGS):

Natural farming practices - Socio-economically and environmentally friendly farming will support the achievement of the UN Sustainable Development Goals by 2030. Agroecological practices, such as Natural Farming, offer a cost-effective and ecologically compatible alternative, enabling the achievement of the Sustainable Development Goals (Sustainable Development Goals, 2021).

Some of the 17 Sustainable Development Goals set by the United Nations (UN) can be achieved by adopting natural farming, such as increasing self-employment and profitability in the agricultural sector through low farming costs. By embracing natural farming, we can achieve the following Sustainable Development Goals (SDGs). (ICAR, 2025). Thus, most of the goals can be achieved by doing natural farming (Sustainable Development Goals, 2021).

Here's how Natural Farming aligns with key SDGs:

SDG 1: No Poverty

Natural farming does not require farmers to spend on expensive synthetic inputs (fertilisers, pesticides), thereby reducing costs and debt. In addition, natural farming increases farmers' income and self-reliance, boosts the rural economy and reduces poverty. Natural farming reduces poverty in India by reducing input costs and increasing farmers' income through chemical-free methods.

SDG 2: No Hunger

Natural farming increases soil fertility and biodiversity, thereby enhancing the nutritional quality and safety of the food supply. Natural farming also promotes food production and nutria gardens, thereby improving dietary diversity and quality. It increases the productivity of the agricultural sector, producing more commodities available to the people.

Practices like Zero Budget Natural Farming (ZBNF) produce pesticide-free food rich in micronutrients, which directly supports SDG 2 (Zero Hunger). Diverse crops like pulses, grains, and vegetables increase dietary diversity and resilience to climate change, such as drought (Natural Farming, Zero-Budget Natural Farming (ZBNF), 2025).

SDG 3: Good Health and Well-Being

Natural farming eliminates the use of harmful agricultural chemicals and produces food free from chemicals. It creates a safe working environment for farmers, reduces exposure to toxins, maintains soil biodiversity, which in turn preserves nutrients, resulting in improved human health. Natural farming supports SDG 3 (Good Health and Well-being) by producing chemical-free, nutrient-rich food in India. This reduces the risks of chronic diseases and increases overall well-being.

SDG 5: Gender Equality

Gender equality can be achieved through equal participation of men and women in natural farming. Natural farming often involves women in preparing bio-inputs, making compost and managing kitchen gardens, which enhances their role. Natural farming promotes gender equality by empowering women farmers through lower input costs, skill development and increased decision-making roles, especially in regions like India, where women perform a significant portion of agricultural labour. Rural training, women's training, self-help groups (SHGs) and farmer networks in natural farming programs build women's confidence and leadership. (Paliath, 2022)

SDG 6: Clean Water and Sanitation

Natural farming prevents water pollution by avoiding the use of synthetic fertilisers and pesticides, which contaminate water sources. The fewer chemicals that are added to the soil, the cleaner the groundwater will be.

Natural farming reduces the flow of chemical water into water bodies. Supports clean water and sanitation (UN SDG 6) (Lakhan Singh, 2024) by increasing water retention in the soil and promoting sustainable irrigation practices. These practices reduce pollution and ensure efficient water use. Especially beneficial in water-scarce regions like India. (*Water Management*, 2022)

SDG 8: Decent work and economic development

Create new local jobs and promote youth participation in regional markets for bio-input production, seed banks and organic farming. Organic farming drives decent work and economic growth (UN SDG 8) by reducing input costs, increasing farmers' incomes through premium pricing, and creating local jobs in bio-input production and marketing. These benefits particularly benefit smallholder farmers in regions like India, where chemical farming burdens families already burdened by debt. (Alavala, 2022, #)

SDG 10: Reduction of Inequality

A significant portion of the world's wealth is held by a small group of individuals. This often leads to financial and social inequality. For nations to thrive, equality and prosperity must be available to everyone - regardless of gender, race, religious beliefs, or economic status. When everyone is self-reliant, the world as a whole prospers.

Natural farming reduces inequalities (UN SDG 10) by lowering input costs for small and marginal farmers, boosting their net incomes compared to chemical-dependent large farms, and enabling equitable access to markets through community networks. These levels the various fields in regions like India, where resource-poor households bear the brunt of debt from synthetic inputs. (*Embracing Natural Farming,* 2024)

SDG 12: Responsible Consumption and Production

The circular flow of income from natural farming boosts local economies and reduces waste through bio-inputs and regional value chains. Natural farming advances responsible consumption and production (UN SDG 12) by relying on zero-budget, on-farm inputs, which eliminate waste from chemical packaging and reduce overuse of resources. It promotes circular systems through biomass recycling and diversified cropping, ensuring sustainable yields without depleting soil or ecosystems. (Nivedha et al., 2024, #)

SDG 13: Climate Action

Natural farming improves soil health, increases carbon sequestration and builds climate resilience in farming systems. Natural farming reduces pollution of land, water, air, etc., (Lakhan Singh, 2024)thereby maintaining climate resilience. Natural farming increases soil fertility by sequestering carbon in the soil and supports climate action (UN SDG 13) by reducing greenhouse gas emissions from artificial inputs, as well as building resilience to extreme weather by increasing biodiversity and soil health. (Palekar, 2025)

SDG 14: Life Under Water

Natural farming maintains the purity of groundwater and surface water, thereby sustaining aquatic biodiversity. Natural farming supports life underwater by removing

chemical runoff that pollutes rivers and oceans, preventing algal blooms and dead zones that harm marine life (UN SDG 14). Practices such as mulching and cover cropping reduce soil erosion and sediment transport, thereby preventing damage to the sea surface and bottom.

SDG 15 - Life on Land

Natural farming promotes biodiversity and protects ecosystems by promoting natural cycles and reducing ecological disruption. Natural farming nourishes pollinators and other beneficial organisms (vermicompost), promoting harmony between agriculture and nature.

Natural farming enhances life on land by restoring soil biodiversity, increasing yields on existing farmland, preventing deforestation, and creating habitats for pollinators, birds, and soil organisms (UN SDG 15). These practices counteract the habitat loss caused by intensive farming, especially in biodiverse regions like India. (Cozim-Melges, F. et al., 2024, #)

Zero Budget Natural Farming (ZBNF) increases bird abundances—frugivores by 160%, vertebrates by 81%, and invertivores by 49%—while supporting earthworms, arthropods, and beneficial insects via no-till, mulching, and cover crops. Diverse polycultures mimic natural ecosystems, attracting pest predators and pollinators. (Berger, I., et al., 2025)

Significant Challenges of Conventional Agriculture:

Natural farming prioritises natural inputs and sustainable methods, whereas conventional farming relies on synthetic chemicals and advanced technologies to achieve higher yields. This has faced several challenges, which are as follows. (Spice Nest, 2024-2025)

- Dependence on Chemical Inputs in Conventional Farming
- Rising Costs of Synthetic Fertilisers and Pesticides
- Soil Degradation in Conventional Farming
- Water Scarcity and Irrigation Issues
- Market Price Fluctuations for Conventional Crops
- Health Risks from Pesticide Exposure
- Resistance to Pesticides and Herbicides
- Environmental Pollution from Conventional Farming
- Climate Change Impact on Conventional Farming
- Lack of Crop Diversification

Natural Farming - Economic Benefits for Farmers (Opportunities)

Chemical fertiliser-based farming is expensive; natural farming is highly beneficial, especially for small and marginal farmers, as follows. (WOTR, 2025)

Reduction in production costs - With natural farming, input costs can be reduced by about 60-70%, eliminating dependence on chemical fertilisers and pesticides. (WOTR, 2025)

Increase in net earnings - The total earnings of farmers practising natural farming have increased.

Resilience to market volatility - The diverse cropping systems used in natural farming help to cope with the effects of market price fluctuations by providing farmers with multiple reliable sources of income at low cost.

Building resilience to climate change

The impacts of climate change are becoming increasingly significant. The agricultural sector, being dependent on nature, faces the most critical challenges from it. The use of natural farming methods can help improve resilience in various ways:

Increased soil health: Natural farming and the use of organic matter in cultivating various crops help soil to sequester carbon effectively and benefit soil fertility over the long term.

Adaptation to climate change: Following natural farming practices promotes biodiversity, thereby increasing crop resilience to changing weather conditions, pests, and diseases. This adaptability is essential as weather patterns become increasingly erratic.

Achieved sustainable development - The criteria for sustainable development are productivity, economic viability, environmental impact, and social welfare. Natural farming does not reduce productivity, farmers do not have to spend on chemical fertilisers and pesticides, and organic agricultural products fetch comparatively higher prices. Natural farming reduces soil and other forms of pollution and improves human health. As a result, natural farming achieves the criteria for sustainable development.

The benefits of this shift towards natural farming – such as environmental sustainability, financial stability for farmers, food security for the population, and empowerment of farm-based communities – clearly outweigh the challenges. By supporting and guiding the benefits of natural farming through a well-defined capacity-building and policy framework, natural farming has the potential to lead India toward a sustainable agricultural future.

Significant Challenges to Adopting Natural Farming:

Conventional farming can yield significant benefits; however, it is not entirely free of challenges.

Proportional rate of cattle is decreased - The biggest challenge facing natural farming in the present times is the declining number of animals, as natural farming initially requires a cow for cow urine, followed by animal dung as fertiliser, which necessitates a concurrent animal

husbandry business alongside farming. In today's era, since agriculture is a means of earning a living, farmers have begun to think economically. Due to which tractors are cheaper than bullocks for farming, so they have replaced bullocks. As a result, the number of animals is decreasing day by day, and without them, natural farming is not possible.

According to the 20th livestock census (2019), there are a total of 245900 cows in Anand district, with an average of 702 cows per village across approximately 350 villages. This is low, given the size of agriculture and the population. (*20th Livestock Census*, 2021)

Resistance to change in conventional farming: Farmers who have used traditional methods for many years may be reluctant to adopt new approaches. The key to overcoming this resistance lies in demonstrating the benefits through pilot projects, demonstration plots, exposure visits, and real-life success stories.

Government policies that support chemical farming more than natural farming - Current agricultural policies are more inclined towards supporting chemical farming than natural farming. If the government wants to achieve any transition, the policy focus should be on supporting natural agriculture. The government should shift subsidies from chemical fertilisers to organic fertilisers.

Soil health and present-day concerns with Soil - Natural farming requires many insects, such as those found in vermicompost, along with soil nutrients, which we have rendered nearly dead by overusing chemicals; reviving them is the biggest challenge for natural farming.

Future Prospects and Strategies:

To maximise the potential of organic farming, stakeholders are focusing on the following steps:

To develop dedicated markets:

'Alternative markets' should be created for the distribution of organic farming products through public distribution systems, mid-day meal programmes in schools, and dedicated farmer hats.

Supportive government policies:

Schemes such as the Pradhan Mantri Krishi Vikas Yojana (PMKVY) provide subsidies and infrastructure for bio-inputs. Farmers can be supported by establishing cooperative support systems for the sale of produce.

Community-led innovation:

Farmer-Producer Organisations (FPOs) should be empowered to handle post-harvest activities, branding, and large-scale marketing. Farmers can be supported by setting up processing systems for produce.

- **Government Schemes:**

In 2019, Zero Budget Natural Farming (ZBNF) was renamed as Bhartiya Prakritik Krishi Padhati (BPKP) and designated as a sub-scheme under the umbrella scheme of Paramparagat Krishi Vikas Yojna (PKVY) (Natural Farming | Current Affairs, 2024)

Bharatiya Prakritik Krishi Paddhati (BPKP) is a sub-mission under the Paramparagat Krishi Vikas Yojana (PKVY) and falls under the umbrella of the National Mission on Sustainable Agriculture (NMSA) (Sharma, 2022).

- National Mission on Natural Farming

- **India's Initiative:**

India's National Mission on Natural Farming (NMNF) actively promotes these practices, building on the Bharatiya Prakritik Krishi Paddhati (BPKP), to achieve chemical-free, ecosystem-based farming across vast areas, aligning directly with national and global sustainability goals (spice nest, 2024-2025).

Recommendations and Policy Implementation:

The recommendations for farmers, traders/stakeholders and consumers, and the policy recommendations for the government are as follows.

For Farmer

Farmers should adopt natural farming to improve the quality of their land and reduce costs in the agricultural sector. This will increase the profits of the farmers and also improve their standard of living. Natural farming will need to be integrated with animal husbandry, which should be considered. Considering today's demand for milk, animal husbandry, along with agriculture, has been a good option.

For Stakeholders or Consumers

The sale of any item depends on the market and the customers. Traders should insist on selling, and customers should insist on buying items produced through natural farming, so that the sale of such items can be done easily, and farmers can receive adequate prices. Today, people have become aware of health, as a result of which they have also started buying quality items. As consumers become aware of this, they will also start demanding such items.

For Government

The government subsidy on chemical fertilisers should be allocated instead for manure produced for natural farming. Additionally, farmers should be provided with assistance for animal husbandry and for purchasing indigenous cows. The assistance given to cows in the Gau Mata Poshan Yojana of Rs 30 per cow per day should be increased. Arrangements should be made to ensure that the products produced through natural farming find a market. Efforts should be made to increase the consumption of products produced based on natural farming among the people.

Conclusion:

Natural farming is an agricultural revolution that not only improves crop production at minimal cost but also increases farmers' income. Given the global pace of soil erosion, only 30 years of cropland will remain for food production. Therefore, this is the right time to effect a transition from chemical farming to natural farming by raising awareness among the farming community through various schemes and capacity-building programmes (SUGANTHY, RENUKA RANI, & Sharma, 2023). If we do not adopt natural farming today, it will become increasingly complex in the future, because soil nutrients will have been degraded to such an extent that their recovery will be difficult.

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