

Natural Farming: A Sustainable Agricultural Approach

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Abstract

Natural Farming (NF) is an ecological and sustainable agricultural approach that eliminates synthetic agrochemicals and emphasizes the enhancement of soil microbiota through organic inputs. This method integrates principles of agroecology, permaculture, and regenerative agriculture to optimize nutrient cycling and soil health. NF promotes minimal soil disturbance through no-till or shallow-till practices, year-round crop cover, and biodiversity through polycropping systems with at least eight crop varieties annually. It relies on biostimulants such as Beejamrit (seed inoculant) and Jeevamrit (microbial consortium) to augment rhizosphere microbial activity, thereby enhancing both soil fertility and organic matter accumulation. A critical sub-component of NF is Zero Budget Natural Farming (ZBNF), pioneered by Subhash Palekar, which advocates for resource-efficient, climate-resilient agricultural practices. ZBNF minimizes external inputs through in situ nutrient recycling via cow dung-based biofertilizers, mulching, and Whapasa (optimal soil moisture management).

It significantly reduces production costs by eliminating synthetic fertilizers and pesticides while maintaining competitive yield levels. Government initiatives, such as Bharatiya Prakritik Krishi Paddhati (BPKP) and National Mission on Natural Farming (NMNF) aim to scale NF adoption across India, enhancing agronomic sustainability, environmental resilience, and economic viability for smallholder farmers.

Keywords: Soil Health, Agroecology, Regenerative Agriculture Natural Farming

Introduction

Natural farming, also known as "do-nothing farming," represents a sustainable cultivation method rooted in ecological principles. It encompasses various approaches, including organic farming, agroecology, and permaculture. Although not entirely effortless, natural farming prioritizes avoiding manufactured inputs and relying on natural processes. Natural farming operates in conjunction with local ecosystems, leveraging plant-animal relationships and adapting to

climate conditions. Its goal is to produce food and medicinal products that possess aesthetic and spiritual qualities, contributing to human flourishing. The underlying philosophy focuses on maximizing nutrient quality and minimizing the reliance on chemical interventions. In addition to providing healthy, sufficient amounts of food or nutraceuticals, it is a reliable strategy to stop soil erosion, environmental loss, and water contamination (Anderson et al., 2005).

Principles of Natural Farming

A healthy and productive soil microbiome is the cornerstone of optimal soil health, profoundly impacting the well-being of plants, animals, and humans alike. To promote optimal health, soils should ideally be covered with crops throughout the majority of the year. Crop diversification is also key, with farms encouraged to cultivate at least eight different crop varieties annually across their fields. Minimizing soil disturbance is paramount; therefore, no-till or shallow tillage practices are highly recommended. The integration of livestock into farming systems further contributes to improved soil health. These integrated approaches are crucial for promoting natural farming practices. A flourishing soil microbiome is essential for retaining and building soil organic matter, which is fundamental for sustainable agriculture. To stimulate microbial activity, biostimulants are vital, and in India, these are often produced through the fermentation of animal dung, urine, and healthy soil. Equally important is increasing both the volume and variety of organic residues returned to the soil, including crop residues, cow dung, compost, and other organic materials. For pest management, prioritizing robust agronomic practices, as outlined in Integrated Pest Management (IPM), is essential. Botanical pesticides should only be considered as a last resort. The use of synthetic fertilizers, chemical pesticides hinders natural soil regeneration and is strongly discouraged. (Singh et al., 2022).

Farmers who consistently practice natural farming consider the following components as essential (Palekar et al., 2016):

1. Beejamrit – A seed treatment to protect seeds from pests and diseases.

- **Ingredients:** 5 kg cow dung, 5 liters cow urine, 50 g lime, 1 liter cow milk, 20 liters water, and a handful of soil (preferably from under a banyan tree).
- **Process:** Soak cow dung in water for 12 hours, squeeze it out, and mix the extract with cow urine, lime water, and milk. Stir well and use within 24 hours to treat seeds

2. Jeevamrit – A microbial culture that enhances soil fertility and microbial diversity.

- **Ingredients:** 10 kg cow dung, 10 liters cow urine, 2 kg jaggery, 2 kg pulse flour, 200 liters water, and a handful of soil.
- **Process:** Mix all ingredients in water and ferment for 5-7 days, stirring twice daily. Apply to soil or crops every fortnight.

3. Mulching – Covering the soil with organic materials to minimize moisture loss and suppress weeds.

- **Materials:** Organic (straw, leaves, compost) or inorganic (plastic sheets).
- **Process:** Spread mulch evenly over the soil surface to conserve moisture, regulate temperature, and suppress weeds

4. Whapasa – Managing soil moisture efficiently to reduce water stress and enhance plant growth.

- **Principle:** Maintain soil moisture at an optimal level by minimizing irrigation frequency and ensuring soil aeration. This minimizes water stress and promotes microbial activity

Characteristic features of Natural Farming

Natural farming has characteristic features like;

- Natural Farming is environment friendly
- It respects the life and opposes human exploitation
- Natural Farming products have good quality, yield and taste
- Natural Farming does not use pesticide
- Natural Farming does not use herbicide

- Natural Farming uses the native weeds rather than killing them
- Natural Farming doesn't use chemical fertilizers
- Natural Farming minimizes waste water emissions
- Natural Farming cares nutritive cycle theory
- Natural farming maintains the growth of native soil microorganisms

Components of Natural Farming: Natural Farming primarily relies on these key elements

- 1) Organic pest and weed management
- 2) Organic compost and leaf-applied nutrients
- 3) Biological methods for pest control.

Zero Budget Natural Farming (ZBNF)

Zero Budget Natural Farming (ZBNF) is a sustainable and climate-resilient agricultural practice that enables farmers to grow crops using entirely natural inputs, eliminating the reliance on expensive and harmful chemical fertilizers and pesticides. Developed by Subhash Palekar, often referred to as "Krishi ka Rishi," ZBNF addresses critical challenges such as rising labour costs, environmental degradation, erratic monsoons, and food security. Its success lies in its eco-friendly methods, low input costs, and reduced usage of water and electricity. Additionally, it promotes the production of high-quality, healthy food, minimizes the need for external labour, and incorporates multi-cropping techniques to enhance income under bio-entrepreneurship. To minimize reliance on external labour, bio-entrepreneurship can utilize multi-cultivation techniques to enhance net income. Zero Budget Natural Farming (ZBNF) presents a valuable opportunity for bio-entrepreneurship, particularly given that 70% of agricultural land is dryland farmed by resource-limited farmers. With a relatively low national average pesticide usage of 0.6 kg/ha compared to China (13 kg/ha) and Korea (16.56 kg/ha), ZBNF is readily implementable. It can achieve 80% of conventional yields while also allowing farmers to command premium prices, ranging from 22-35% higher than conventional produce. Furthermore, diversified cropping within ZBNF ensures year-round income and provides a buffer against crop failure. The resulting farm income is high due to low input costs.

ZBNF is based on four pillars (Fig 1): Beejamrita (seed treatment), Jeevamrita (soil inoculant), Mulching, and Waaphasa (soil aeration) (Thakur et al., 2020 and Sharma et al., 2023).

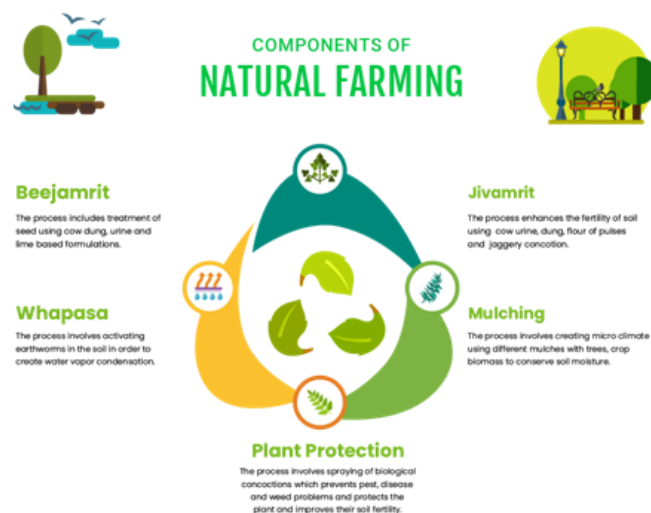


Fig. 1. Components of ZBNF (Source: MoA & FW, GoI. 2024)

Current Scenario of Natural Farming in India

Sustainable agricultural practices such as Zero Budget Natural Farming (ZBNF) are gaining traction in India as a cost-effective alternative that reduces dependency on chemical inputs while promoting sustainable practices (Palekar et al., 2016). India is playing significant role in promoting natural farming by integrating local ecological principles and indigenous knowledge

Government Support

In 2020-21, the Central Government introduced the Bharatiya Prakritik Krishi Paddhati (BPKP) scheme under the Paramparagat Krishi Vikas Yojana (PKVY). By 2023, this initiative had expanded to encompass 6.1 lakh hectares with an allocated budget of Rs 49.8 crore. Currently, natural farming practices are implemented across more than one million hectares in India, with Andhra Pradesh, Madhya Pradesh, Chhattisgarh, Kerala, Odisha, Himachal Pradesh, Jharkhand, and Tamil Nadu at the forefront of this agricultural shift. One of the significant economic advantages of natural farming is the substantial reduction in cultivation costs, ranging from 60-70%, achieved by eliminating the need for costly

chemical fertilizers and pesticides. This approach also prioritizes sustainability by maximizing the efficient use of resources like soil, labour, and equipment, which in turn boosts crop productivity. Natural farming promotes the rapid growth of soil microbiota and enhances soil aeration through the application of natural inputs. Globally, increasing awareness of environmental issues and health concerns has led to a surge in demand for sustainable and organic agricultural products. To support this trend, the government has been actively promoting organic farming through schemes such as the Paramparagat Krishi Vikas Yojana (PKVY). Specific initiatives include the establishment of a five-kilometers natural farming corridor along the Ganges River, targeting 960,000 hectares. Furthermore, the National Mission on Natural Farming has set ambitious goals, aiming to create 15,000 clusters in Gram Panchayats, involve 1 crore farmers, and bring 750,000 hectares under natural farming practices (MoA & FW, Gol, 2023).

Conclusion

Climate and environment is changing at an alarming rate due to anthropogenic activities. Within a few years we will be on the edge of extinction if we will not go back to the nature. The degradation of natural resources will continue if sustainable practices are not adopted. To reduce the negative impacts and to improve the health of human beings, Natural farming is essential in modern ways. The techniques discussed in the present paper could also provide ample opportunity in livelihood sectors under bio-entrepreneurship. Hence, the sustainability of the environment, ecology and human activities, the global implementation of Natural farming is essential.

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