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Scaling Up Natural Farming Practices in Vegetable Production – Lessons from Successful Stories

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ABSTRACT

Natural farming, an ecological method that forgoes synthetic inputs, is attracting worldwide interest as a sustainable option for vegetable cultivation. This research investigates successful initiatives that have expanded natural farming methods, pinpointing key insights and strategies for wider implementation. Case examples from different areas underscore the significance of farmer-driven innovations, organic materials, soil health management, and integrated pest management in enhancing yields and resilience. Elements such as supportive policies, market incentives, educational programs, and community involvement have been vital in scaling these efforts. Issues like yield inconsistencies and knowledge deficits are tackled through adaptive learning frameworks and participatory strategies. The results indicate that a comprehensive, multi-stakeholder approach that blends traditional knowledge with scientific validation is critical for integrating natural farming into vegetable production. These findings offer guidance for policymakers, researchers, and farmers who aim to shift towards sustainable agricultural practices.

Keywords: *Natural farming, Policy support, Market incentives, Sustainable agriculture*

1. Introduction

Natural farming is an agroecological method that focuses on agricultural practices without chemicals, utilizing natural processes and resources found on the farm to grow crops sustainably. It combines crops, livestock, and biodiversity into a cohesive system that reduces reliance on external inputs while enhancing ecological equilibrium. India is unique in the globe in that it can cultivate a vast variety of vegetables crops all around year because of its varied agroclimatic conditions. Vegetable grows more quickly, yield more, fetch higher prices in the market than cereals, and are crucial to achieving nutritional security (Thakur et al., 2023). One of the main components of human nutrition is vegetables, which are abundant in vitamins, minerals, dietary fiber, and biochemical components. This approach is increasingly recognized worldwide as a

sustainable alternative to traditional farming, tackling environmental issues and supporting rural economies (NMNF Portal). The principle of natural farming is grounded in traditional methods supplemented by modern ecological insights. It steers clear of synthetic fertilizers, pesticides, and intensive irrigation, instead employing techniques such as:

- Biomass mulching
- Home-created mixtures like Jivamrit and Beejamrit (made from cow dung, urine, and other organic materials)
- Intercropping and recycling of crop residues
- Soil aeration without the need for tillage

This method was brought to prominence by Japanese researcher Masanobu Fukuoka with his "do-nothing" philosophy in the 1970s and was later adapted in India by Subhash Palekar through the Zero Budget Natural Farming (ZBNF) framework (Badiyal et al., 2024).

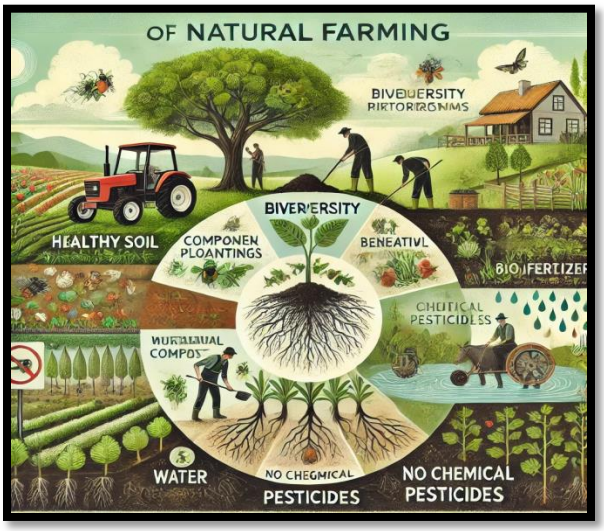

Figure-1 Future Scope of Natural Farming.

1.1. Scope of Vegetable Production through Natural Farming.

Natural farming has tremendous potential to change the agricultural landscape and tackle environmental issues. Key aspects of its scope include:

1. Environmental Sustainability- Natural farming restores soil vitality by boosting microbial activity and raising the organic carbon levels. It conserves water through methods such as mulching and intercropping, which help reduce evaporation. Moreover, it lowers greenhouse gas emissions by eliminating the need for synthetic fertilizers and pesticides (PIB).

2. Economic Benefits- Farmers engaged in natural farming often experience notable cost savings due to a reduced dependence on external inputs. For example, farmers in Andhra Pradesh can save up to $2,000 per season by using biological materials instead of chemicals. Additionally, natural farming opens avenues for value addition, local sales, and job creation within rural areas.

3.Resilience to Climate Change- Natural farming systems possess a natural resilience to environmental challenges such as drought, salinity, and extreme temperatures. Techniques like crop diversification and soil health management aid in alleviating the effects of climate change while maintaining sustainable yields (Juroszek et al., 2008).

4.Health Benefits- By removing synthetic chemicals from the growing process, natural farming leads to a higher nutritional value in food crops. This results in improved health benefits for consumers and lessens the dangers associated with chemical exposure (Tuck et al., 2014).

5. Culture and culinary customs- Ecological agronomy supports wholesome, sustainable practices that support ecosystem health while

also assisting with food security and nutrition. Also varied diets that are suitable for different cultures (Vashishat et al., 2023).

2. Government Regulation to Encourage Natural Farming

Given that natural farming has the potential to increase sustainability, lessen reliance on chemicals, and improve farmers' livelihoods, the Indian government has launched a number of measures to support it. The National Mission on Natural Farming (NMNF), which was established to support a national shift to chemical-free farming methods, is the most important of these programs. The National Mission on Natural Farming (NMNF) overview

The Ministry of Agriculture & Farmers' Welfare oversees the NMNF, a stand-alone Centrally Sponsored Scheme that was introduced in November 2024. Promoting natural farming nationwide, especially in areas with high fertilizer consumption, is the goal of this program. The program aims to upgrade the previous Bhartiya Prakritik Krishi Paddhti (BPKP) program's implementation in a mission style (NMNF Portal).

2.1 Key **Objectives**:

Encourage Chemical-Free Agriculture: The NMNF promotes the adoption of natural farming techniques by farmers, which leverage locally sourced materials and livestock, thereby eliminating the necessity for synthetic fertilizers and pesticides (Ryschawy et al., 2019).

Enhance Farmer Engagement: The initiative aims to involve one crore farmers within a span of two years, equipping them with the training and resources needed to transition to natural farming methods (Varaprasad and Rao, 2024).

Create Bio-Input Resource Centres: The NMNF intends to establish 10,000 demand-driven Bio-input Resource Centres (BRCs) that will provide readily available inputs like Jeevamrit and Beejamrit to assist farmers.

- Model Demonstration Agricultural Fields: About 2,000 model farms will be created at Krishi Vigyan Kendras (KVKs) and Agricultural Universities (AUs) to effectively showcase natural farming practices.

2.2.Financial Allocation and Execution

The NMNF's overall budget amounts to ₹2,481 crore for its execution through the 15th Finance Commission period (2025-26), with ₹1,584 crore financed by the central government and ₹897 crore by state governments. The mission aims not only to decrease farmers' input costs but also to restore soil health and enhance resilience against climate challenges such as droughts and floods (NMNF Portal).

2.3.Priority Areas

The NMNF focuses on regions with high fertilizer consumption, pinpointing 228 districts across 16 states where fertilizer utilization surpasses the national average. This strategic approach aims to transform areas that heavily depend on chemical inputs into models of sustainable agricultural practices.

2.4.Education and Skill Development

A key component of the NMNF is its focus on educating farmers. The program is set to train around 18.75 lakh farmers in creating natural farming inputs and adopting eco-friendly methods. Additionally, approximately 30,000 Krishi Sakhis (farmers' friends) will be appointed to help mobilize farmers and raise awareness about the advantages of natural farming.

3.Case Study

3.1.Production and Marketing of Vegetable crops grown under Natural Farming: A Case study of Mandi district of Himachal Pradesh. A Thesis by Ajay Kumar, 2020

The current research titled “Production and marketing of vegetable crops grown under

natural farming: a case study of Mandi district in Himachal Pradesh" involved a sample of 120 farmers engaged in natural farming, chosen using Simple Random Design. A total of 40 farmers from each of the three blocks—Sundernagar, Karsog, and Balh—were randomly selected. Additionally, 5 traders, 5 wholesalers, and 5 retailers from Sundernagar were randomly chosen for the survey. Approximately 81.14 % of households were involved in agriculture, followed by 8.75 % in services and 0.9 % in business. The average number of workers per household was 3.71. The average landholding was 0.83 hectares, with 0.30 hectares dedicated to natural farming and 0.15 hectares to conventional farming. The cropping intensity in natural farming was measured at 204 %. On average, the number of livestock per household was 4.92, with cows representing 15.79 %, bullocks 22.72 %, and improved buffaloes 1.21 %. Agricultural income constituted 58.11 % of the total household income. Four primary crops were identified under Natural Farming: Tomato (0.02 ha), French beans (0.07 ha), Pea (0.03 ha), and Cauliflower (0.04 ha). The estimated yield per hectare for Tomato was 101 quintals, for French Beans 60 quintals, for Pea 59 quintals, and for Cauliflower 86 quintals. The yields from SPNF crops were lower compared to those of conventional crops. The estimated net returns per hectare for Tomato were Rs. 117433, for French Bean Rs. 89522, for Pea Rs. 81686, and for Cauliflower Rs. 75509. The estimated costs per hectare for Tomato were Rs. 86532, for French Bean Rs. 81164, for Pea Rs. 64188, and for Cauliflower Rs. 61620. The cumulative elasticity coefficient for all SPNF crops indicated decreasing returns to scale. The marginal factor price ratios for natural fertilizers, labour, seed, and plant protection across all SPNF crops were below one, implying that resources were being over-utilized. Three primary marketing channels were identified in the study area for the sale of vegetables grown under natural farming. Among these, channel-C, which links Producer – Local Trader – Wholesaler – Retailer – Consumer, was the most favoured, as 63.00 % of the produce was sold through this channel. Farmers in the study area reported facing several production and marketing challenges, including irrigation problems during peak times, lack of government support, insufficient training facilities, limited extension services, absence of specialized markets, lack of fair pricing in the market, and wholesalers not consulting them when selling the produce (Ajay, 2020).

Recommendation- Although the production of natural farming produce is comparatively lower than that of conventional agricultural practices, farmers can overcome this challenge with proper marketing strategies and government policy support. When it comes to sustainable agriculture, natural farming emerges as a game-changing method for mitigating climate change, addressing hidden hunger, and improving both soil and human health.

3.2.Krack-a-Dawna

In the year 1985, well before organic farming entered common discourse and sustainable living became trendy, a young couple named Julie and Vivek made the decision to escape their urban lifestyle, pack their belongings, and head to Heggadadevankote, a secluded village located 50km from Mysuru. They aimed to create their own unique world. This venture led to the creation of Krack-a-Dawna. Now, after 37 years filled with numerous challenges and experiences, they manage a farm that spans 35 acres. They cultivate nearly everything required for their daily lives – including paddy, millets, oilseeds, eggs, spices, sugarcane, and a variety of vegetables, among others. Julie and Vivek have two sons, a daughter, and a daughter-in-law. Their household is also lively with three dogs, two cats, 15 cattle, 20 goats, over 60 chickens, and a symphony of wild birds surrounding them. Julie and Vivek aimed for more than just building a farm; they sought to establish a community of free thinkers. They

engaged the local populace on their farm, chose to homeschool their children, and were the pioneers of launching a farmers' market in Mysuru. Today, Vivek and Julie are actively involved in addressing rural challenges through activism and policy advocacy. The couple endeavors to promote responsible farming within their community and has opened their farm to students eager to learn. When they reflect on their incredible journey, Vivek and Julie can only smile at the memories they have created.

4. Conclusion and Recommendations

Natural farming signifies a significant change in agriculture by emphasizing ecological sustainability, economic feasibility, and human well-being. Its expanding influence underscores its capacity to serve as a fundamental approach for achieving global food security while safeguarding natural resources for future generations. The initiatives of the Government of India, such as the NMNF, reflect a dedication to promoting sustainable agriculture that focuses on ecological equilibrium and the welfare of farmers. As this initiative develops, it holds the potential to revolutionize farming practices throughout India, while also ensuring food security and maintaining environmental integrity. Farmers in certain areas have been effectively utilizing Natural Farming in various ways for quite some time. This method inherently suggests the potential for regenerating essential nutrients for plant development through the activation of diverse microorganisms and the incorporation of organic matter into the soil. While Natural Farming might not be seen as a method for boosting yields, it serves as an alternative approach, especially in regions that rely on rainwater and have less intensive agricultural practices. Additionally, it aids farmers in increasing their income by reducing costs associated with purchasing market-based agricultural inputs. The produce from Natural Farming could be regarded as niche items, free from chemicals and characterized by superior quality and flavour (Kumar et al., 2023). This approach will enable farmers to secure higher prices for their products.

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