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A study on selected schemes and policies promoting natural farming in India

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Abstract

India, with the legacy of the Green Revolution, faces critical agricultural challenges including groundwater depletion, soil degradation, rising farmer indebtedness, and ecological decline due to chemical-intensive farming. Natural farming (NF), also known as zero-budget or ecological farming, has emerged as a sustainable alternative that reduces dependency on synthetic inputs while improving soil fertility, biodiversity, and farmer livelihoods. This paper examines the shift from inorganic to natural farming in India, focusing on government interventions, extension models, and state-led initiatives. Through a comprehensive literature review, policy analysis, and data synthesis across states such as Andhra Pradesh, Karnataka, Maharashtra, Himachal Pradesh, and Gujarat, the study highlights the socio-economic and ecological impacts of NF. Comparative assessment shows that, despite slight yield reductions in some crops, natural farming reduces input costs by up to 40%, enhances resilience, and secures higher price premiums through market linkages. Extension strategies like cluster-based learning, women self-help groups, incentive-linked policies, and digital advisory tools play a pivotal role in scaling natural farming. The paper concludes with actionable recommendations for policy alignment, capacity building, and integration of market ecosystems into NF promotion as a pathway to achieve resilient and sustainable agriculture.

Keywords: Natural farming, extension models, natural farming, sustainable agriculture, soil health, farmer livelihoods, India

Introduction

The Green Revolution led to extensive water consumption and aggravated groundwater loss. According to the Central Water Commission, the agriculture sector has already consumed over 83 percent of the available water resources. India's agriculture has heavily relied on inorganic farming since the Green Revolution era, characterized by the extensive use of chemical fertilizers, pesticides, and synthetic inputs. Although these practices delivered dramatic food production increases in the mid-20th century, they have led to serious long-term consequences which includes soil degradation and loss of fertility. About 30% of India's land is degraded due to chemical overuse, affecting soil health and decreasing its natural fertility and microbe diversity that plant growth depends on (NITI Aayog, 2025; Kumar *et al.*, 2024) ^[9, 6]. India accounts for 25% of global groundwater use, much of it for irrigation intensified by inorganic farming. This has critically depleted groundwater in 256 out of 700 districts, exacerbating water scarcity (NITI Aayog, 2025; Kumar *et al.*, 2024) ^[9, 6]. Environmental pollution and greenhouse gas emissions: Chemical farming contributes to water pollution through runoff and increases emissions of methane and nitrous oxide, key greenhouse gases worsening climate change (NITI Aayog, 2025) ^[9]. High input costs: Dependence on expensive chemical fertilizers, pesticides, and electricity places huge financial burdens on mostly small and marginal farmers, who constitute 86% of India's farming population (NITI Aayog, 2025; Kumar *et al.*, 2024) ^[9, 6]. Farmer indebtedness and distress: Rising costs with fluctuating yields have contributed to farmer indebtedness, leading to persistent rural distress (Kumar *et al.*, 2024; Ranjit Kumar *et al.*, 2023) ^[6, 12]. And this shift towards natural farming accelerated in introducing new extension strategies and government policies on a state-wide basis to reduce chemical dependency, improve soil

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health, and boost farmer livelihoods. (Press Information Bureau, 2023; Drishti IAS, 2025) ^[11, 3]. All the above factors created a demand to shift to sustainable natural farming systems from inorganic farming. Hence, this shift is increasingly recognized as a critical pathway toward sustainable agriculture, environmental restoration, and improved farmer livelihoods. In this regard, effort is made to compile the various extension strategies used for promotion of natural farming. And the study reveals the results based on the following objectives

1. Objectives of the study

1. Review and document extension strategies
2. Analyze state-level policy initiatives and schemes
3. Evaluate the socio-economic impacts of natural farming on farmer livelihoods
4. Compare ecological impacts such as improvements in soil organic matter, biodiversity, and water-use efficiency under natural farming systems.

2. Review of Literature

The transition to natural farming in India has been widely studied across government reports, academic journals, and policy analyses, highlighting its environmental, socio-economic, and livelihood impacts.

NITI Aayog (2025) ^[9] in its editorial on India's push for natural farming emphasizes the scale of government programs like the National Mission on Natural Farming which aims to support 1 crore farmers across 7.5 lakh hectares with methods including Zero Budget Natural Farming (ZBNF). The editorial notes improved soil health, significant water savings, cost reductions for farmers, and enhanced climate resilience as key benefits of these models (The Hindu Business Line, 2025) ^[14].

A report by the Council on Energy, Environment and Water (CEEW, 2024) ^[2] discusses Andhra Pradesh's Community-Managed Natural Farming (APCNF) initiative, documenting its rapid adoption among 580,000 farmers with demonstrated improvements in soil organic carbon and reduced input costs, contributing to socio-economic benefits especially among women's self-help groups (CEEW Research, 2024).

Khadse *et al.* (2017) ^[5] provide empirical insights from Karnataka's ZBNF pilot clusters and farm demonstration models, reporting increased farmer incomes and soil health restoration through farmer-led practices supported by Krishi Vigyan Kendras (KVKs). Their study underscores the importance of decentralized, participatory extension approaches in enhancing adoption rates (Journal of Sustainable Agriculture, 2017).

Mishra *et al.* (2024) ^[7] explore Maharashtra's Farm School Models linked through KVK networks, highlighting the wide coverage of over 300,000 farmers in 2024 with measurable gains in farm profitability and farmer knowledge. These models prioritize experiential learning and community engagement to promote sustainable agriculture techniques (Indian Journal of Agronomy, 2024).

Singh and Sharma (2025) ^[13] analyze Himachal Pradesh's PK3Y incentive-linked extension scheme, focusing on soil and ecosystem restoration through paid farmer incentives. Their findings show improved ecosystem services alongside increased farmer participation, demonstrating the efficacy of linking monetary incentives to ecological goals (Agricultural Policy Review, 2025).

Patel and Desai (2023) ^[10] evaluate Gujarat's agroforestry clusters with integrated compost centers and farmer demonstrations. Their community-based approach fosters social

cohesion and environmental sustainability, strongly supporting natural farming as a pathway to rural empowerment (Journal of Agroforestry Systems, 2023).

Kumar *et al.* (2024) ^[6] discuss Kerala's market linkage initiatives targeting urban premium channels. This strategy aids farmers in obtaining certification and branding benefits, thereby increasing market access and price realization for natural farming produce (Kerala Agricultural Review, 2024).

Collectively, these studies reinforce the pivotal role of state-led and community-centric extension models in scaling natural farming. They highlight the integration of financial incentives, capacity building, gender inclusion, and market linkages as critical factors driving impact across diverse agro-climatic zones in India.

3. Natural Farming

Natural Farming (NF) is a chemical free farming, involving livestock (preferably local breed of cow) integrated natural farming methods and diversified crop systems rooted in the Indian traditional knowledge. Natural Farming recognises the interdependence of the natural ecosystem amongst soil, water, microbiome, plants, animals, climate and human requirements (National Mission on Natural Farming).



Fig 1: Natural farming in India and its benefits

4. Methodology

The study applies a systematic review methodology, combining qualitative and quantitative data sources from:

1. Government reports (NITI Aayog, ICAR-NAARM, PIB),
2. Peer-reviewed research (2017-2025),
3. State policy documents,
4. Extension service coverage data.

State case studies (Andhra Pradesh, Karnataka, Maharashtra, Himachal Pradesh, Gujarat, Odisha, Kerala, Jharkhand) were reviewed with focus on extension approaches, input-output patterns, and ecological impacts. Comparative tables summarize socio-economic and environmental shifts before and after NF adoption. The methods used under the study align with the recommendations in recent systematic reviews of agricultural policy evaluation research (Bastidas-Orrego & Jaramillo, 2023; [PMC, 2023]) and agricultural extension impact assessments (IFPRI-ICAR, 2025) ICAR-NAARM (2021) ^[1], Ellen MacArthur Foundation (2024), and the CGIAR comprehensive analysis (2025).

6. Results and Discussion

6.1 Various Extension Strategies incorporated for promotion of Natural Farming

Recent extension models included in the study combines both grassroots capacity-building and technology-driven outreach, and are explained below

Capacity Building Initiatives: Krishi Vigyan Kendras and Non Government Organizations are organizing region-specific training for farmers, agriculture and allied using demonstration plots and farmer field schools regarding natural farming practices. (Isha Outreach, 2024) ^[4]. India’s capacity-building ecosystem for natural farming includes national policy instruments, extension services, state-led models, and research collaborations, all aimed at empowering farmers through:

- Training of Master Trainers, Krishi Sakhis, and Champion Farmers
- Cluster-based approaches and awareness workshops
- On-farm demonstrations and input preparation training
- Use of ICT, community-based models, and SHG networks
- Academic integration in higher education (e.g., Northeast)

Collective action through Clusters and FPOs: Farmers are mobilized into clusters and FPOs for collective knowledge exchange and group marketing (Press Information Bureau, 2023) ^[11].

Community Resource Persons: “Krishi Sakhis” and CRPs anchor outreach, offering continuous support at the village level (Isha Outreach, 2024) ^[4].

Digital and Mobile Advisory: Mobile platforms like Kisan Suvidha App deliver natural farming advisories to geographically dispersed populations (Drishti IAS, 2025) ^[3].

Participatory Extension: NGOs, Panchayats, and progressive farmers are fully integrated into decision-making and training efforts (National Academy of Agricultural Research Management, 2024) ^[8].

6.2 Recent Policy Initiatives for promotion of Natural Farming (State-wise)

1. National Mission on Natural Farming (NMNF). The Government of India is launched in 2024. This mission provides direct incentives (up to ₹4,000/acre/year for two years), bio-input resource centres, and progressive monitoring and farmer capacity-building programs to convert their fields into Natural

Farming fields. (Press Information Bureau, 2023 (Vajirao Institute, 2024) ^[11, 15]. The NMNF expands the earlier BPKP under PKVY. It aims to cover 1 crore farmers across 7.5 lakh hectares through 15,000 clusters, offering ₹15,000/ha annually for 3 years to build on-farm infrastructure. The mission has also trained Master Trainers, ‘champion’ farmers, and practicing farmers via MANAGE and NCONF, and plans to establish 15,000 Bio-input Resource Centres (BRCs) to improve access to natural inputs(The indian Express).A dedicated web portal supports implementation and monitoring.

The objectives of the scheme are

1. To promote commercial organic production through certified organic farming
2. To produce pesticide residue-free harvests that will improve the health of the consumer
3. To raise farmer’s income and create a potential market for traders
4. To ensure long-term soil fertility, resource conservation & climate change adaptation & mitigation.

Under this scheme, 50 or more farmers will form a cluster having 50-acre land to take up organic farming. Every farmer will be provided Rs. 20,000 per acre in three years for seeds to the harvesting of crops and transporting of the produce to the market.

6.3 Bharatiya Prakritik Krishi Paddhati (BPKP)

Operates under PKVY (launched 2015), with ₹4,600+ crore allocation (2019-20 to 2024-25). It covers ~4 lakh hectares and incentivizes cluster formation, capacity building, certification, and residue testing with ₹12,200/ha support for 3 years

6.4 MANAGE (National Institute of Agricultural Extension Management)

Acts as the nodal agency and knowledge repository for BPKP. MANAGE organizes consultative meetings, capacity-building programmes, and develops Master Trainers at national, state, and district levels. It also collects best practices and success stories

Table 1: State Policy and Coverage Table of Natural Farming

State	Scheme/Policy	Extension Model	Coverage (2024)	Impact
Andhra Pradesh	APZBNF	Women SHGs, CMSA	580,000 farmers	Socio-economic, cost-saving
Karnataka	ZBNF	Model clusters, farm demos	120,000 farmers	Soil health, market prices
Maharashtra	Farm School Models	KVK network, pilot clusters	300,000 farmers	Farm profitability
Himachal Pradesh	PK3Y	Incentive linked extension	80,000 farmers	Soil & ecosystem restoration
Gujarat	Agroforestry clusters	Compost centers, demos	50,000 farmers	Community approach
Kerala	Market cluster linkage	Urban premium channels	45,000 farmers	Certification and branding
Jharkhand	Natural Farming Clusters	Bio input resources	11,000 farmers	training, certification, awareness, and market linkage support
Odisha	Block focused training	Women SHGs	15000 Farmers	Crop diversification
Rajasthan	Jaivik Kheti Mission	Bio input resources	10000 farmers	Soil & ecosystem restoration
North east India	Agricultural universities and ICAR NEH	-	-	Education on Natural Farming

(Source: ICAR-NAARM, 2021) ^[1]

The Table No. 1 concisely summarizes the key state-level natural farming and sustainable agriculture initiatives covering extension methods, farmer reach, core impact, and thematic focus areas relevant to India’s agricultural transition in natural farming

7. State Wise Promotion schemes in Andhra Pradesh

Andhra Pradesh pioneered Zero Budget Natural Farming

7.1 Promotion Schemes in Karnataka

The state boasts long-term ZBNF field trials and cluster

formation across multiple districts, with impactful demonstration farms and positive farmer feedback on income and soil quality (ICAR-NAARM, 2021) ^[1].

7.2 Promotion schemes in Maharashtra

Maharashtra's extensive extension model includes Krishi Vigyan Kendras and farm schools. State-sponsored demonstration farms create widespread awareness, while ICAR supports validation and market strategies for certified produce (ICAR-NAARM, 2021) ^[1].

7.3 Promotion Schemes in Himachal Pradesh & Gujarat

Himachal's Prayavaran Krishi Yojana provides direct incentives for chemical-free farming, including rewarding farmers for ecological practices. Gujarat follows with cluster promotion, community composting centers, and agroforestry integration (Drishti IAS, 2025) ^[3].

7.4 Promotion schemes in Kerala & Uttar Pradesh

Cluster-based extension and market linkage programs are promoted, facilitating certification and premium sales channels for natural farm produce (Vajirao Institute, 2024) ^[15].

7.5 Promotion schemes in Odisha: Tribal block-focused training via Women SHGs in 5 districts to prepare bio-inputs and promote crop diversification. Covers 3.15 lakh hectares with ₹312 crore investment over 5 years (2022-23 onwards)

7.6 Promotion schemes in Rajasthan: Jaivik Kheti Mission (2022) has ₹600 crore over 3 years to assist transition to natural farming in districts like Tonk, Sirohi, and Banswara

7.7 Promotion schemes in Northeastern India- Agricultural universities and ICAR NEH region institutes have started capacity-building campaigns and awareness programs. A B.Sc. (Hons.) in Natural Farming has recently been introduced at Central Agricultural University, Imphal, Meghalaya

7.8 Promotion schemes in Jharkhand (Natural Farming Clusters) | Under NMNF, 12 districts designated to form 88 natural farming clusters, covering 4,400 hectares and involving 11,000 farmers, supported by 176 Krishi Sakhis, 60 bio-input resource centers, and farmer-to-farmer extension. Includes training, certification, awareness, and market linkage support.

8. Implications of the study

Strengthening Market Ecosystems to ensure widespread certification, branding, and distribution channels in other states can be done. Integrating the ICT Solutions and expanding mobile-based advisories for customized natural farming support has to be done. Policy Alignment at scale incentive-linked extension beyond pilot regions to the untouched areas also. Women & Youth Inclusion through Empowering SHGs, farm schools, and academic programs in Natural farming promotion to other states. Research & Development Support to accelerate soil-health monitoring, crop-specific studies and natural farming economic modeling.

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