

Advancing Sustainable Agroecological Systems through Natural Farming in Himachal Pradesh

Himachal Pradesh's Natural Farming (NF) movement has engaged over 2.5 lakh certified NF farmers. Additionally, 10 dedicated natural farming Farmer Producer Companies (FPCs) have been established, along with a certification system based on natural farming principles. The first ever state to announce MSP for NF maize (₹40), wheat (₹60) and turmeric (₹90) to ensure market security for farmers. In Shimla district, NF achieved 7% higher kharif yield and 147% higher rabi yields compared to chemical farming, alongside 18% to 42% lower kharif costs due to reduced labour and materials. Additionally, Dr. Yashwant Singh Parmar University of Horticulture and Forestry has launched Bachelor's degree program in Natural Farming, marking a milestone in academic support for sustainable agriculture.

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THE agricultural landscape of Himachal Pradesh has undergone a significant transformation, marked by a shift from chemical-intensive farming towards natural farming systems. Since 2018, Natural Farming (NF), introduced as a state programme under the '*Prakritik Kheti Khushhal Kisan Yojna*' has evolved into a statewide movement and a national and global model of sustainable food systems. This progress reflects the growing recognition among farmers of the long-term ecological, economic and social benefits of sustainable agriculture.

To support this transition, the Government of Himachal Pradesh (GoHP) has launched a self-certification system called the 'Certified Evaluation Tool for Agricultural Resource Analysis – Natural Farming (CETARA-NF)' to certify NF farmers. At present, more than 2.5 lakh farmers have been certified, covering 3,584 panchayats (99.14%) across all 12 districts of the state. This transition reflects a philosophy that prioritises soil health, biodiversity, climate resilience and farmer well-being.

In recent years, declining farming returns has raised concerns about income security of farmers. Introducing chemical input intensive practices during green revolution to make the nation food secured have led to several long-term adverse effects, including deterioration of soil fertility, contamination of water, human health and

greenhouses gas emission. NF provides a sustainable farming way forward, according to Niti Aayog, this practice offers both on-farm and off-farm benefits by supporting long-term soil fertility, eliminating reliance on external synthetic inputs and emphasising the use of on-farm resources.

Natural farming is based on four fundamental pillars: *Beejamrit*, *Jeevamrit*, *Acchaddan* (Mulching) and *Whapasa*. *Beejamrit* is used for seed treatment that enhances germination and protect seeds from seed borne diseases. *Jeevamrit* is a fermented microbial formulation applied to soil to stimulate biological activity and improve nutrient availability. *Acchaddan* involves covering the soil with organic residues to conserve moisture, regulate soil temperature and reduce erosion. *Whapasa* refers to the maintenance of an ideal balance of air and moisture in the soil, which improves water use efficiency, promotes root development and enhances crop resilience under drought conditions.

NF system discourages the use of synthetic fertilisers, pesticides and chemical growth regulators, advocating instead for the utilisation of locally available resources such as indigenous cow dung, cow urine, crop residues, and plant-based extracts. Preparations like *jeevamrit* and *beejamrit* form the backbone of this system, acting as microbial inoculants and seed



On-farm demonstration of natural-farming inputs for farmers

treatments, enhance soil biological activity and nutrient cycles. By strengthening the natural soil processes, natural farming aims to create a self-sustaining ecosystem that reduces external input dependency while improving crop resilience and sustainability.

Recognising the impact of the '*Prakritik Kheti Khushhal Kisan Yojana* (PK3Y),' farmers have reported that Natural Farming (NF) helps to reduce cultivation costs and enhance farm incomes by promoting sustainable farming practices. Under the PK3Y, farmers receive two days of on-field training at farmers' fields and seven days of training at recognised institutions, such as State Agricultural Universities. In addition, subsidies are provided for the purchase of indigenous cows, construction of livestock sheds and procurement of drums for preparing natural farming inputs such as *Jeevamrit*, *Beejamrit*, *Brahmastra*, and *Agniasta* etc. On-farm and off farm demonstrations, exposure visits and awareness programmes are regularly organised to build confidence among farmers transitioning from chemical systems.



Accchadan practice in an apple orchard under natural farming

A pioneering step taken by Himachal Pradesh has been the introduction of Minimum Support Prices (MSP) for selected crops grown under natural farming methods, such as maize and wheat. By ensuring remunerative prices, the government has addressed one of the primary concerns of farmers-market security. This policy not only incentivises adoption but also signals institutional recognition of natural produce as a distinct and valuable commodity. Additionally, natural farming initiatives have been integrated with cluster-based programmes like *Him-unnnati* and aligned with central schemes such as the *Paramparagat Krishi Vikas Yojana* (PKVY), further expanding outreach and technical support.

The impact of natural farming is particularly visible in districts like Shimla, where apple cultivation dominates the horticultural economy. Traditionally, apple orchards relied heavily on chemical fertilisers and pesticides, leading to concerns about soil degradation and rising input costs. Under Subhash Palekar Natural Farming (SPNF), farmers are adopting diversified cropping models that combine apple orchards with multiple intercrops. On the same land, growers cultivate between 3 to 18 crops, ensuring nearly 100% soil cover throughout the year. Common cropping combinations include apple with beans, pulses and vegetables during the *kharif* season, and apple with peas and vegetables during the *rabi* season. This diversification enhances soil organic matter, improves nutrient cycling and provides multiple income streams, reducing dependence on a single crop.

Comparative studies between Natural Farming (NF) and chemical Farming (CF) systems in Shimla district demonstrate the economic viability of the natural approach. A study was conducted in Shimla district in 2022 which highlights the effectiveness of Natural Farming (NF) under the Subhash Palekar Natural Farming (SPNF) system in apple-based cropping systems. Thirty farmers from two blocks namely Jubbil, Kotkhail and Choupal were selected randomly. The sample of 60 farmers was taken for this study. The integration of multiple crops ensured complete soil cover and better resource utilisation. Natural farming recorded higher yields compared to Conventional farming (CF), with a 7.01% increase in *kharif* and a significant 147.62% increase in *rabi* season. These improvements are likely due to enhanced soil health, moisture retention and biological activity. Additionally, diversified cropping reduced input costs and increased profitability. Overall, Natural Farming proves to be a sustainable and economically viable alternative for hill agriculture and long-term farming resilience. The increase in *rabi* productivity is particularly significant due to diversified intercrops cultivated under natural systems. In terms of costs, chemical farming incurred substantially higher labour, material and total costs during *kharif* which were 18%, 42% and 20% higher, respectively, than natural farming. Although *rabi* costs were slightly higher under natural farming due to the cultivation of multiple intercrops in the absence of a major apple harvest, the diversified output compensated for these expenses through enhanced overall returns.

Beyond statistical comparisons, the field-level experiences of farmers highlight the transformative potential of natural farming. Progressive farmers across Himachal Pradesh have demonstrated that sustainable agriculture can be both ecologically sound and economically rewarding. For instance, Mohan Singh significantly improved his financial condition after adopting natural farming practices. By reducing chemical input costs and focusing on soil health management, he now earns an annual profit of approximately ₹15 lakh. His success story has inspired neighbouring farmers to reconsider their dependence on chemical-based agriculture and explore



Crop diversification with nine crops under a natural farming system

natural alternatives.

Similarly, in Solan district, natural farming has shown promising results in commercial vegetable cultivation, particularly in coloured capsicum grown under protected conditions. In villages such as Dyarag Bukhar and Jaunaji, farmers observed severe thrips infestation in chemically managed polyhouses. However, growers practicing natural farming reported comparatively lower pest intensity and healthier plant growth. The use of botanical extracts, mulching, *jeevamrit* applications and improved soil microbial activity appear to create a balanced ecosystem within the polyhouses. Healthier plants exhibited better tolerance to pest attacks, reducing the need for repeated chemical sprays. These experiences reinforced the understanding that ecological balance plays a crucial role in integrated pest management.

To further institutionalise this transition, academic support has also been strengthened. Dr Yashwant Singh Parmar University of Horticulture and Forestry, a leading State Agricultural University, has initiated formal academic training by introducing a bachelor's degree programme in natural farming. This represents a critical shift from extension driven promotion to structured capacity building through higher education.

One of the defining strengths of natural farming in Himachal Pradesh is its emphasis on indigenous knowledge and locally available resources. The reliance on native cow dung and urine reduces external input dependency and keeps production costs manageable. Farmers are encouraged to prepare their own inputs, fostering self-reliance and strengthening community networks. Training sessions conducted at village levels not only disseminate technical knowledge but also build a sense of collective ownership over the movement. Women farmers, in particular, have actively participated in preparing natural formulations and managing diversified cropping systems, contributing to household income and empowerment.

Environmental benefits are equally noteworthy. Natural farming enhances soil structure, increases organic carbon content, and improves moisture retention capacity—An essential factor in hill agriculture where water availability can be irregular. By avoiding chemical residues, the system protects groundwater quality and promotes biodiversity in agricultural landscapes. Pollinators, earthworms and beneficial microorganisms thrive under reduced chemical



Indigenous cattle as the backbone of natural farming system

stress, contributing to long-term ecosystem stability. As climate variability intensifies, natural farming's emphasis on diversified cropping and soil health strengthens resilience against erratic rainfall and temperature fluctuations.

The declaration of specific areas as natural farming zones further reflects institutional support. For example, the Pangi sub-division in Chamba district has been recognised for its efforts to transition toward chemical-free

cultivation. Such initiatives demonstrate the state's intent to create model regions that can serve as learning centres for others. Through continuous monitoring, capacity building and policy backing, Himachal Pradesh aims to consolidate its position as a leader in sustainable mountain agriculture.

Despite its progress, the transition to natural farming is not without challenges. Initial yield fluctuations during the conversion phase, limited market awareness about premium pricing and the need for robust certification mechanisms require ongoing attention. However, the steady increase in farmer participation and government backing indicates strong momentum. With assured MSP for selected crops, financial allocations and integration with broader agricultural development programmes, the state is systematically addressing these constraints.

SUMMARY

Overall, natural farming in Himachal Pradesh represents a holistic shift toward ecological balance, economic sustainability and social well-being. It has moved beyond isolated experiments to become a statewide movement supported by policy, research and grassroots participation. By reducing cultivation costs, enhancing yields in diversified systems, improving soil health and promoting market incentives, the state is demonstrating that sustainable agriculture is both practical and profitable. As more farmers share their success stories and adopt climate-resilient practices, Himachal Pradesh continues to strengthen its identity as a pioneer in natural and chemical-free farming in India.

For further correspondence, contact:

²Shraddha, Assistant Professor, University School of Agriculture Sciences, Rayat Bahra University, Punjab 140 104, India. Email: shraddhapundeer@gmail.com; ¹ICAR-Indian Agricultural Research Institute, New Delhi 110 012, India; ³Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh 173 230, India.