

## Natural Farming to Sustain Soil Health

Frank Notes



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It is not exaggerated to make a mention at the outset that modern agriculture, driven by the Green Revolution, has transformed India from a food-deficient nation to one of the world's leading producer of food grains, even opening up avenues for export of agricultural produce including rice and wheat. The prevailing mineral-intensive farming practices have led to degradation of natural resources, raising concerns about the sustainability of the existing agricultural paradigm. Soil degradation which can be defined by a significant loss of soil organic matter, disrupted microbial balance (lower biodiversity), and weakened structural stability (compaction/erosion), resulting in decreased productivity and increased vulnerability to climate change. Soils have reached a critical saturation point in many regions, causing a considerable decline in crop response to applied nutrients, consequently plateauing of farm factor productivity.

Water-table depletion due to excessive irrigation in intensive cropping systems, particularly in north-western India, has compounded the problems further. Simultaneously, climate change threats such as erratic rainfall patterns, prolonged dry/wet spells, and unseasonal extreme weather events have caused unpredictable crop losses, making farming more risky. Excessive and imbalanced use of nitrogenous fertilisers along with injudicious pesticide applications has led to environmental pollution, pest resistance and health hazards. In addition, there are issues of crop diversification, residue management, increasing biotic and abiotic stresses, etc.

Agriculture is considered the foundation of settled human civilization. As long soil use was in

harmony with its inborn attributes and carrying capacity, it was able to perform its innate functions sustaining native productivity and provisioning ecosystem services. Microbial biodiversity – a vital ecosystem service, was secured and flourishing. However, in recent times, the quest to raise increasingly more food to satisfy the needs of growing population that balance stands disturbed.

Natural farming is gaining importance as a sustainable alternative to input-intensive agriculture that has led to soil degradation, biodiversity loss, and rising production costs. Based on locally available bio-resources such as cow dung, cow urine, crop residues, botanical extracts and concoctions, natural farming is being adopted in certain areas with ecologically aligned practices. Evidence shows that natural farming improves soil physical, chemical, and biological properties by enhancing organic carbon, microbial activity, and nutrient cycling, while fostering greater biodiversity both above and below ground. Crop performance under natural farming varies by system as yield uncertainties commonly observed in cereals during the transition phase, whereas legumes, vegetables, fruits, and commercial crops like cotton often record yield gains or comparable productivity. Importantly, natural farming consistently lowers the cost of cultivation.

The 17 Sustainable Development Goals (SDGs) announced by the United Nations in 2015 highlight agriculture's central role in eradicating poverty, ensuring food security, protecting ecosystems, and advancing climate resilience. For India, home to the world's largest population, aligning agriculture with the SDGs is both a responsibility and a necessity.

Natural farming is an agro-ecological approach that minimizes external inputs and builds on local bio-resources. Rooted in the vedic agriculture philosophy, natural farming emphasizes working with ecological processes rather than opposing them. Farmers use on-farm resources such as cow dung, cow urine, crop residues, and bio-formulations. Core natural farming practices include *Jeevamrita* - a microbial-rich fermented solution that enhances soil microbial activity, *Beejamrita* - a bio-coating for seeds that supports healthy germination, *Ghanjivamrita* or *Ghan Jeevaamrita* - a nutrient-rich, solid organic fertiliser

**Natural farming is vital for improving physical, chemical and biological properties of the soil on sustainable basis. It should be given more impetus, wherever, feasible.**

and bio-enhancer made from fermented cow dung, cow urine, jaggery, pulse flour, and soil. Further, the steps like mulching (*Achhadana*) to conserve soil moisture and build soil organic matter, intercropping and indigenous seeds to enhance biodiversity and resilience and botanical extracts such as *neemastra*, *agniastra* etc. for natural pest management are also necessary. Evidence shows that natural farming improves soil biological health, increases soil organic carbon, enhances nutrient cycling, and strengthens resilience to biotic and abiotic stresses. By eliminating agrochemicals, it reduces risks to human health, animal health and ecosystem services. While some studies report yield dips during transition, others highlight stable yields over the years with reduced input costs, resulting in better profitability for the farmers.

The Government takes a big leap on sustainable agriculture with the launching of National Mission on Natural Farming (NMNF) in 2024 with an outlay of Rs. 2481 crore having share of Government of India share as Rs.1584 crore and States share as Rs. 897 crore. The Mission is a shift to strengthen agriculture practices with scientifically backed approaches towards sustainability, climate resilience and safe food. The key objectives of the Mission includes promotion of nature based sustainable systems of farming, enhancing usage of on-farm made natural farming bio-inputs to reduce dependency on externally purchased inputs and input cost reduction, improve soil health and have sustainable agriculture practices.

Knowledge of natural farming, which is being practiced by farmers across the country, is traditionally built within the farmers and their communities. To leverage this, NMNF enables a decentralized cross learning ecosystem blending the traditional natural farming knowledge of practicing farmers and the communities with the scientific approaches evolved in the Agricultural Universities (AUs) / Krishi Vigyan Kendras (KVKs) / ICAR

Institutions, etc. NMNF is implemented in 15,000 clusters in willing Gram Panchayats covering more than 18 lakh farmers in 0.75 million ha area. The Mission identifies priority districts such as *Namami Gange* regions of 5 km corridor along river Ganga; districts on the banks of major rivers as decided by the state; districts with high fertiliser input sale in states; districts with low fertiliser input sale in states; districts with tribal areas - blocks from the tribal sub-plan; and districts with strong SRLM / PACS / FPOs and other Community-based Organizations. Government of India has kept the Budget of Rs. 750 crore for 2026-27 financial year for the Mission.

Policy support for natural farming has also grown. Initiatives such as the *Paramparagat Krishi Vikas Yojana*, Andhra Pradesh Community Managed Natural Farming, and Mission Organic Value Chain Development for the North Eastern Region along with NMNF are encouraging adoption through cluster formation, capacity building, certification, and financial support. Already, around a million ha is under natural farming with ambitious plans for rapid expansion. The leading states are Andhra Pradesh, Gujarat, Himachal Pradesh and Madhya Pradesh. Natural farming represents more than an agronomic technique as it is a socio-ecological movement. Its success will depend on farmer-led innovation, supportive policies, fair markets, and active participation of civil society. As India strives to achieve food security while safeguarding its natural resources, natural farming offers a viable strategy to restore soil health, conserve biodiversity, reduce input dependency, and ensure long-term agricultural sustainability. Recognizing the need for evidence-based validation, the Indian Council of Agricultural Research (ICAR) initiated systematic evaluation of natural farming under the All India Network Programme on Organic Farming in 2020, coordinated by ICAR-Indian Institute of Farming Systems Research, Modipuram. The program assesses productivity, soil health, input efficiency, and farmer profitability under natural farming systems. Further, adoption of comparable and standard practices under natural farming research trials and demonstration, generic protocols of practices for natural farming is developed and shared with National Agricultural Research System. Natural farming needs to be promoted in areas, wherever, possible. ■