India’s Push for Natural Farming

This editorial is based on “Farming naturally” which was published in The Hindu Business Line on 19/03/2025. The article brings into picture the potential of natural farming as a sustainable alternative to chemical-intensive agriculture while highlighting India's efforts through the National Mission on Natural Farming.

For Prelims: Natural farming, Green Revolution, National Mission on Natural Farming, Zero Budget Natural Farming, Agroforestry, CETARA-NF certification model, Krishi Vigyan Kendras, Soil Health Card Scheme, Farmer Producer Organizations, Sub-Mission on Agricultural Mechanization .

For Mains: Key Benefits of Natural Farming for India, Key Issues Associated with Natural Farming in India.

Natural farming has emerged as a promising alternative to **chemical-intensive agriculture,** which despite ensuring food security through the Green Revolution, has degraded soil health and increased costs for small farmers. The Indian government's National Mission on Natural Farming aims to support **1 crore farmers across 7.5 lakh hectares,** establishing bio-resource centers. India needs to work hard to address **certification challenges, gather conclusive evidence on environmental benefits, and ensure economic viability for farmers** transitioning to natural farming practices.

COMPONENTS OF

NATURAL FARMING

Beejamrit

The process includes treatment of seed using cow dung, urine and lime based formulations.

Jivamrit

The process enhances the fertility of soil using cow urine, dung, flour of pulses and jaggery concotion.

Whapasa

The process involves activating earthworms in the soil in order to create water vapor condensation.

Mulching

The process involves creating micro climate using different mulches with trees, crop biomass to conserve soil moisture.

Plant Protection

The process involves spraying of biological concoctions which prevents pest, disease and weed problems and protects the plant and improves their soil fertility.

What is Natural Farming?

- **About**: **Natural farming** is a **sustainable agricultural method** that **avoids chemical fertilizers, pesticides, and intensive tillage,** relying on ecological processes and indigenous resources for soil fertility and crop growth.
- **Key Principles**
  - **No Chemical Inputs**: Avoids synthetic fertilizers and pesticides.
  - **Use of Bio-Inputs**: Utilizes **Jeevamrut, Beejamrut, and Panchagavya for soil enrichment.**
  - **Minimal Soil Disturbance**: No plowing or tilling to maintain soil biodiversity.
  - **Intercropping & Crop Rotation**: Enhances soil fertility and pest control.
  - **Mulching & Cover Cropping**: Retains soil moisture and prevents erosion.

What are the Key Benefits of Natural Farming for India?

- **Enhances Soil Health and Reduces Land Degradation:** Natural farming eliminates synthetic fertilizers and pesticides, promoting **microbial activity, improving soil structure, and enhancing nutrient availability.**
  - It prevents land degradation, which is critical as **30% of India's land is already degraded** due to intensive chemical use.
  - By restoring organic matter, natural farming ensures **long-term soil fertility**, reducing dependence on external inputs.
  - **For instance, Andhra Pradesh Community-Managed Natural Farming (APCNF)** has

shown **improvement in soil organic carbon** in just 3-5 years.

- **Reduces Water Consumption and Enhances Drought Resilience:** By promoting techniques like **mulching, cover cropping, and microbial soil conditioning**, natural farming reduces irrigation needs and enhances water retention.
    - Given **India's over-extraction of groundwater (25% of global groundwater usage)**, water-efficient farming is crucial for sustainability.
    - Rainfed farmers practicing **Pre-Monsoon Dry Sowing (PMDS) in Andhra Pradesh** reported **significant reduction in irrigation needs**
    - According to the **Central Groundwater Board (2023)**, groundwater levels are critical in **256 out of 700 districts**, making water-efficient farming urgent.
- **Lowers Cost of Cultivation and Improves Farmers' Profitability:** Natural farming significantly reduces input costs as farmers rely on on-farm resources like **Jeevamrit, Beejamrit, and mulching** instead of expensive chemical fertilizers and pesticides.
    - This is crucial for small and marginal farmers, who make up **86% of India's farming population** and struggle with rising input costs.
    - For instance**, Zero Budget Natural Farming** processes require **50–60% less water and less electricity (than non-ZBNF) for all the selected crops.**
- **Enhances Climate Resilience and Reduces Greenhouse Gas Emissions:** Natural farming minimizes methane and nitrous oxide emissions by maintaining **aerobic soil conditions** and avoiding synthetic fertilizers.
    - Also, they are significant for climate adaptation. For instance, **in Andhra Pradesh, during the Pethai and Titli cyclones in 2018,** the crops cultivated through natural farming showed greater resilience to heavy winds than conventional crops.
    - At the **Indian Agricultural Research Institute site in New Delhi,** SRI methods were found to reduce CHy emissions by **62%.**
- **Promotes Food and Nutritional Security with Diverse Cropping:** Unlike monoculture-based chemical farming, natural farming encourages **multi-cropping, agroforestry, and intercropping**, enhancing food diversity and nutritional security.
    - This is crucial as the **FAO report** finds **74.1%** of Indians unable to afford a healthy diet; **16.6% of population undernourished.**
    - By 2025 the **Indian Organic food** business is likely to be Rs 75,000 crores, a manyfold growth from the current level.
        - Additionally, **e-commerce** platforms like **Amazon and BigBasket** have started dedicated natural farming sections, expanding market access for farmers.
- **Strengthens Rural Livelihoods and Generates Employment:** Natural farming is **knowledge- and labor-intensive**, requiring farmers to engage in techniques like composting, mulching, and crop rotation, generating rural employment.
    - As farm mechanization grows, leading to **job losses for agricultural laborers (casual farm labour shrinks by 40% since 2011-12, total job loss nearly 3 crore: NSSO)**, NF offers an alternative livelihood.
    - The **National Mission on Natural Farming (2023)** is deploying **30,000 Krishi Sakhis** to train rural women farmers, creating **direct employment opportunities**.

What are the Key Issues Associated with Natural Farming in India?

- **Lack of Scientific Validation and Long-Term Studies:** Despite its environmental benefits, NF lacks **large-scale, long-term scientific studies** proving its sustainability across different agro-climatic zones.
    - Most studies focus on small-scale pilots, creating skepticism about its viability for **large-scale food production**.
    - Without rigorous research, NF remains an **alternative practice rather than a mainstream solution**.
    - The **Food and Land Use Coalition (FOLU, 2023)** highlights that only **5 out of 16 Sustainable Agriculture Practices (SAPs)** have scaled beyond **5% of India's net sown area**.
        - The **Indian Council of Agricultural Research** has urged for **more empirical research** before large-scale promotion.
- **Uncertainty in Crop Yields and Productivity Risks:** Natural farming often faces **initial yield declines**, especially in **high-input crops like rice, wheat, and sugarcane**, leading to lower

short-term returns for farmers.
    - Unlike conventional farming, which ensures higher output with chemical inputs, NF depends on **biological soil enhancement**, which takes time to show results.
    - This uncertainty discourages farmers from transitioning, particularly in **food security-dependent regions**.
- **Absence of Well-Defined Certification Standards:** Unlike organic farming, which has **clear certification mechanisms (PGS-India, NPOP)**, NF lacks standardized certification, making it difficult to differentiate NF produce in the market.
    - This limits farmers' access to **premium pricing** and consumer trust in naturally grown food.
    - Without proper labeling, NF products often compete with **chemically grown produce** without any price advantage.
        - Himachal Pradesh's **CETARA-NF certification model (2023)** offers a possible self-certification framework, **but it is yet to be adopted nationally.**
- **Limited Market Linkages and Value Chain Development:** NF lacks **organized value chains**, making it difficult for farmers to sell their produce at fair prices.
    - The prices of organic food are the real price reflecting the **true cost without subsidies,** which **farmers struggle to sell in the market.**
    - A recent report also raised concerns about high commissions on organic products, suggesting that reducing margins to normal levels could lower prices **by 25-30% or more.**
- **High Labor Requirements and Limited Mechanization:** Natural farming is **labor-intensive**, requiring manual weed removal, compost preparation, and mulching, which increases workload and costs for farmers.
    - Mechanized solutions for large-scale NF are **still underdeveloped**, making it **less attractive for medium and large farmers.**
    - This discourages adoption, especially as rural labor availability declines due to **urban migration**.
    - A recent report stated that **labor costs were significantly higher (7–13%) with organic farming practices.**
- **Climate Sensitivity and Regional Suitability Issues:** NF's success depends heavily on **local agro-climatic conditions**, making it unsuitable for certain regions with extreme weather variability or fragile ecosystems.
    - Farmers in **low-rainfall areas** may struggle with compost-based soil improvement, while **humid regions** face pest and disease challenges without chemical interventions.
    - While natural farming offers benefits, it can be less effective in semi-arid regions due to water scarcity, unreliable rainfall, and other climate-related challenges.
    - In contrast, **Himachal Pradesh's NF** project under **Prakritik Kheti Khushhal Kisan Yojana** showed an **increase in farm incomes**, **highlighting regional disparities.**

What are the Key Global and Indian Best Practices in Natural Farming?

- **Global Best Practices**
    - **Agroecology - Latin America (Brazil, Mexico, Cuba)**
        - Integrates traditional farming with scientific approaches.
        - Emphasizes biodiversity, crop rotation, and natural pest control.
    - **Permaculture - Australia**
        - A sustainable land-use system combining agriculture with natural ecosystems.
        - Focuses on soil regeneration, rainwater harvesting, and companion planting.
    - **SRI (System of Rice Intensification) - Madagascar & All over Asia**
        - Enhances water efficiency and plant spacing to improve yields with minimal inputs.
    - **Organic and Biodynamic Farming - Europe (Germany, Switzerland)**
        - Uses composting, crop diversification, and lunar cycles to enhance soil fertility.
- **Indian Best Practices**
    - **Zero Budget Natural Farming (ZBNF) - Andhra Pradesh, Karnataka**
        - Promoted by **Subhash Palekar**, based on Jeevamrut, Beejamrut, and intercropping.
    - **Rishi Krishi & Vedic Farming - Maharashtra**
        - Uses **Panchagavya, Amrutpani, cow-based products, and Ayurvedic**

formulations for soil health.
    - **Community-Led Natural Farming - Sikkim (Fully Organic State)**
        - Sikkim became the first fully organic state, focusing on policy-driven natural farming (though recently facing concerns due to low yields).
    - **Watershed Support Services and Activities Network in Tribal Areas - Odisha**
        - Combines multi-layer cropping, agroforestry, and indigenous seed use.

What Measures can India Adopt to Integrate Natural Farming into India's Agricultural Landscape?

- **Strengthening Research and Evidence-Based Scaling:** India must invest in **long-term, multi-location trials** to establish the economic, environmental, and yield impacts of natural farming across diverse agro-climatic zones.
    - **ICAR and Krishi Vigyan Kendras (KVKs)** should collaborate with farmers to document real-world results and create **location-specific NF models**.
    - Integrating **geo-spatial mapping and AI-driven soil health monitoring** can optimize practices for different regions.
    - Encouraging **agroecology-based universities** to specialize in natural farming research will ensure scientific validation.
- **Reforming Agricultural Subsidies to Support NF Adoption:** The existing **₹71,309 crore fertilizer subsidy** needs gradual reallocation towards **bio-input production, soil health enhancement, and NF extension services**.
    - A **Direct Benefit Transfer (DBT) model** can provide farmers with financial incentives for **Jeevamrit, Beejamrit, and compost production** instead of subsidizing chemical inputs.
    - The **National Mission on Natural Farming (NMNF)** should be linked with the **Soil Health Card Scheme** to track improvements and incentivize farmers accordingly.
        - Transition funds, in the form of **interest-free credit lines**, can help small farmers overcome initial yield fluctuations.
- **Developing Market Linkages and Certification Framework:** A **national-level Natural Farming Certification System (NFCS)** should be established to differentiate NF produce in domestic and global markets.
    - **E-NAM and Agri-Export Promotion Schemes** should introduce dedicated NF categories to integrate farmers into high-value supply chains.
    - Public-private partnerships (PPPs) can help set up **Farmer Producer Organizations (FPOs) specializing in NF**, ensuring collective bargaining power.
    - Encouraging **contract farming models** with retail giants and online platforms can create assured demand for NF produce.
        - Dedicated **farm-to-fork channels**, **including NF-exclusive mandis and organic bazaars,** can improve accessibility.
- **Strengthening Farmer Training and Capacity Building:** A structured **Farmer-to-Farmer Learning Model (F2F-LM)** should be developed, where trained farmers act as **Natural Farming Ambassadors** in their communities.
    - **Bio-Resource Centers** under NMNF should serve as hands-on learning hubs for composting, mulching, and microbial soil enhancement.
    - Leveraging **Krishi Sakhis under Deendayal Antyodaya Yojana (DAY-NRLM)** can ensure women farmers actively participate in NF adoption.
        - Expanding **mobile-based advisory services**, such as through the **Kisan Suvidha App**, will provide real-time guidance on NF techniques.
- **Integrating Natural Farming with Watershed and Agroforestry Programs:** To improve resilience, NF should be blended with **Watershed Management Programs like PMKSY** to enhance soil moisture retention.
    - Promoting **Silvo-Pastoral and Agroforestry Systems** under **National Agroforestry Policy** will diversify farmer incomes while ensuring soil regeneration.
    - **Catchment-based rainwater harvesting models** can be integrated with NF to mitigate

irrigation risks in water-scarce regions.
    - Linking **Jal Shakti Abhiyan** with NF adoption in rainfed areas can ensure better resource efficiency.
        - Encouraging plantation of **Nitrogen-fixing trees (e.g., Gliricidia, Subabul)** within NF plots can naturally replenish soil fertility.
- **Promoting Mechanization and Technology for NF Practices:** Given the labor-intensive nature of NF, **customized mechanization** solutions like **low-cost weeders, microbial sprayers, and bio-fertilizer applicators** should be developed.
    - **Startup incubators under the Agri-Tech Innovation Fund** can support innovations for NF-specific mechanization tools.
    - The **Sub-Mission on Agricultural Mechanization (SMAM)** should be expanded to include NF-friendly implements, ensuring accessibility for small and marginal farmers.
        - Leveraging **AI and IoT-based soil health monitoring** will further optimize input use in NF systems.
- **Enhancing Institutional Support through State-Level Policies:** States should develop **region-specific NF policies**, similar to **Himachal Pradesh's PK3Y and Andhra Pradesh's APCNF**, ensuring localized adoption strategies.
    - Strengthening **Gram Panchayat-level NF committees** will create decentralized decision-making and farmer participation.
    - Incentivizing **Panchayats to allocate land for community composting and bio-resource centers** will build local self-sufficiency in NF inputs.
        - Aligning state procurement policies to source NF-grown produce for **mid-day meals and PDS** can provide institutional market support.

Conclusion:

Natural farming presents a sustainable alternative to chemical-intensive agriculture, offering benefits such as improved soil health, reduced input costs, and climate resilience. Strengthening research, policy support, and farmer incentives will be crucial in making natural farming economically viable. A balanced approach **integrating scientific validation and institutional backing can ensure its long-term success in India's agricultural landscape.**

Drishti Mains Question:

"Natural farming is seen as a sustainable alternative to chemical-intensive agriculture, yet challenges related to certification, economic viability, and market accessibility persist." Discuss the potential of natural farming in India and suggest measures to overcome these challenges.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. In the context of India's preparation for Climate -Smart Agriculture, consider the following statements: (2021)

1. The 'Climate-Smart Village' approach in India is a part of a project led by the Climate Change, Agriculture and Food Security (CCAFS), an international research programme.
2. The project of CCAFS is carried out under Consultative Group on International Agricultural Research (CGIAR) headquartered in France.
3. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India is one of the CGIAR's research centres.

Which of the statements given above are correct?

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans: (d)

Q. Consider the following pairs: (2014)

Programme/Project Ministry

1. Drought-Prone Area Programme - Ministry of Agriculture
2. Desert Development Programme - Ministry of Environment and Forests
3. National Watershed Development Project for Rainfed Areas - Ministry of Rural Development

Which of the above pairs is/are correctly matched?

(a) 1 and 2 only

(b) 3 only

(c) 1, 2 and 3

(d) None

Ans: (d)

Q. In India, which of the following can be considered as public investment in agriculture? (2020)

1. Fixing Minimum Support Price for agricultural produce of all crops
2. Computerization of Primary Agricultural Credit Societies
3. Social Capital development
4. Free electricity supply to farmers
5. Waiver of agricultural loans by the banking system
6. Setting up of cold storage facilities by the governments

Select the correct answer using the code given below:

(a) 1, 2 and 5 only

(b) 1, 3, 4 and 5 only

(c) 2, 3 and 6 only

(d) 1, 2, 3, 4, 5 and 6

Ans: (c)

Mains:

Q. Given the vulnerability of Indian agriculture to vagaries of nature, discuss the need for crop insurance and bring out the salient features of the Pradhan Mantri Fasal Bima Yojana (PMFBY). (2016)

Q. Explain various types of revolutions, took place in Agriculture after Independence in India. How have these revolutions helped in poverty alleviation and food security in India? (2017)