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# Concept of Natural Farming and its Application

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## ABSTRACT

**In response to the environmental and financial toll of chemical-intensive agriculture, Natural Farming offers a cost-effective and climate-resilient alternative that prioritizes soil biology. Anchored by government initiatives like BPKP and NMNF, this framework eliminates external inputs by utilizing cow-based formulations (*Beejamrit* and *Jeevamrit*), organic mulching (*Acchadan*), and optimized soil aeration (*Whapasa*) to rejuvenate soil health and enhance microbial activity. Furthermore, it substitutes synthetic pesticides with habitat diversification and traditional botanical extracts (*astras*) for ecological pest control. While productivity may initially dip in high-demand crops, drastically lower input costs offset these losses to preserve or elevate net farming income. Concurrently, the system's ability to improve soil structure, carbon sequestration, and nutrient cycling allows India to meet escalating food demands without jeopardizing rural livelihoods or national food security.**

## INTRODUCTION

In the wake of the Green Revolution, India achieved food sovereignty but at a heavy cost to its land and its people. Decades of chemical-intensive farming have resulted in scarred landscapes and rising financial burdens for small landholders besides the environmental cost, including soil degradation, GHGs, and biodiversity loss. With the FAO projecting a need for a 70% increase in global food production by 2050, India faces a daunting challenge: securing the nutritional needs of a population expected to hit 1.51 billion by 2030. Consequently, any shift towards new large-scale production technologies must be scientifically validated to avoid compromising national food security. Emerging

from this crisis is Zero Budget Natural Farming (ZBNF): a holistic natural farming movement that seeks to heal the earth and restore the farmer's independence by working in harmony with nature rather than against it. Promoted by Padma Shri awardee Subhash Palekar, ZBNF seeks to eliminate external input costs by utilizing indigenous cow-based formulations like *Jeevamrit* and *Beejamrit* and adopting intercropping and mulching (Mishra, 2018; Niyogi, 2018 & Economic Survey, 2019). By prioritizing soil biology over synthetic chemistry, ZBNF aims to restore soil health without the heavy carbon footprint of conventional or even standard organic farming. According to Wallenstein (2017), to restore soil we need to feed the soil microbes first. The foundational philosophy of Natural Farming was pioneered by Masanobu Fukuoka, who advocated for a system synchronized with ecological cycles rather than one that disrupts them (Fukuoka, 1987). By eliminating the necessity for external, purchased inputs, this model is theorized to improve rural livelihoods. India is pivoting towards sustainable agriculture with the introduction of the BPKP and NMNF initiatives. Designed to counter agrarian distress and climate risks, these frameworks move away from synthetic chemicals in favor of farmer-led training and on-farm bio-input creation. This strategy positions India within a global movement dedicated to ecological resilience and long-term food security.

## KEY PRINCIPLES OF NATURAL FARMING

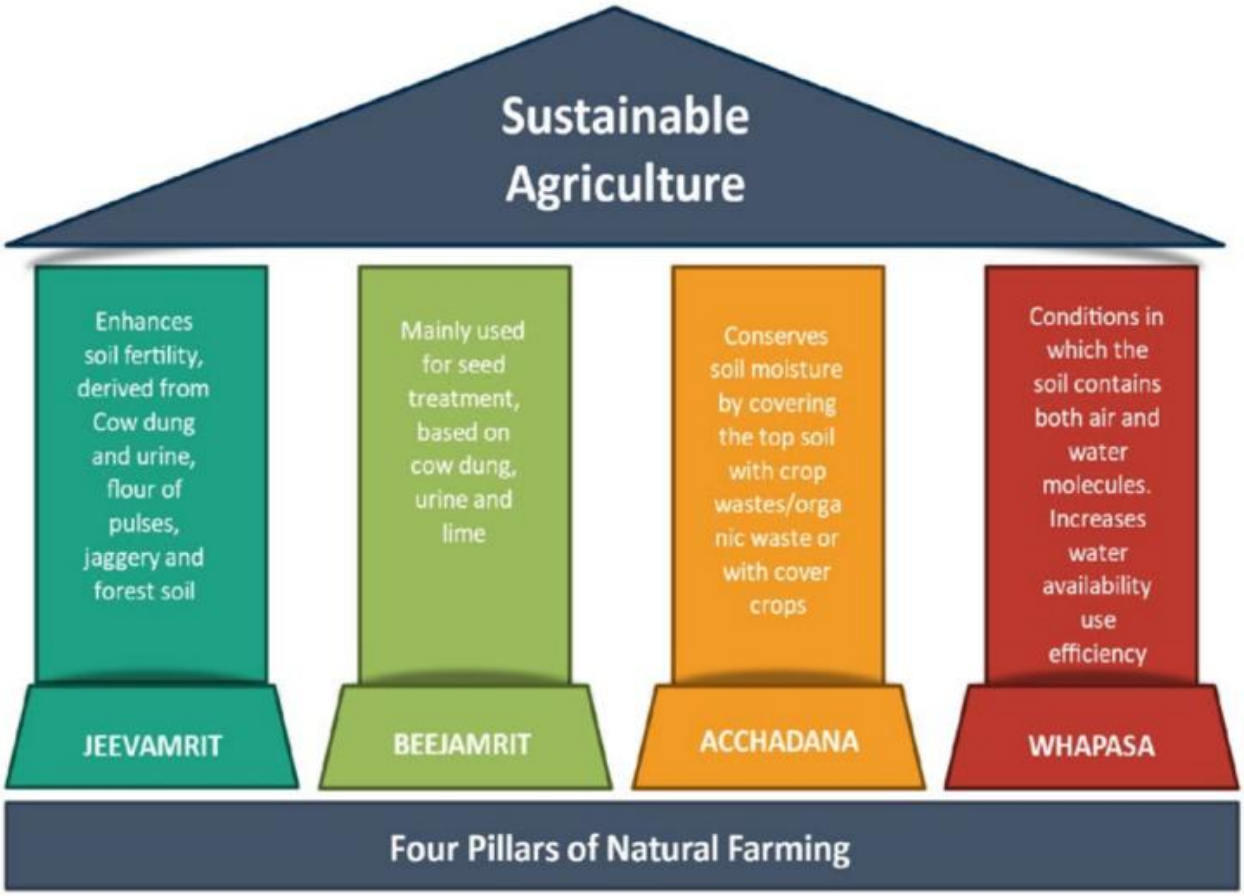
- ***No Synthetic Inputs*:** Elimination of chemical fertilizers and pesticides, replacing them with on-farm bio-stimulants.
- ***Soil Fertility Focus*:** Uses cow dung and urine formulations to enhance soil microbial activity.
- **Soil Coverage:** Continuous coverage of the soil with crops or mulch (Acchadan) to maintain moisture and prevent erosion.
- **Minimal Tillage:** Promotes soil aeration, which helps plants withstand environmental stressors.
- **Biodiversity:** Emphasizes multi-cropping, integrating trees, crops, and livestock.


## PILLARS OF NATURAL FARMING

Natural Farming is based on four key pillars that rejuvenate soil health, promote sustainability, and eliminate external inputs. These pillars are:-

1) **Beejamrit** for seed treatment.
2)**Jeevamrit** to supply of nutrient to plants through enhanced microbial activity.
3)**Acchadan** as mulching for weeds, nutrients and water management.
4)**Whapasa** for soil aeration and moisture conservation.

1) **Beejamrit:** It is a natural formulation, typically made from cow dung, urine, lime, and soil, designed to protect planting materials from seed-borne and soil-borne diseases. It acts as a biological shield for the plant's first stage of life. Bio-priming with indigenous microbial consortia has been shown to enhance seedling emergence, root growth, and enzymatic activity under low-input systems (Bhardwaj et al., 2014).




Preparation of Beejamrit- The ingredients required are 20 liters of water, 5 kg of cow dung, 5 liters of cow urine, 50 g of lime, and a handful of soil. In a plastic or cement tank, mix all the ingredients and stir the mixture with a wooden stick, rotating it clockwise. Cover the tank with a jute sack or poly net, ensuring it's positioned in a shaded area, shielded from direct sunlight and rain. After a day, the beejamrit will be ready for seed treatment. It can be stored for up to 7 days.

**2) Jeevamrit:** It acts as a fermented microbial consortium that catalyzes soil biological processes by accelerating organic matter decomposition and nutrient mineralization. Its application significantly bolsters populations of nitrogen-fixing bacteria, phosphorus-solubilizing microbes, actinomycetes, and beneficial macrofauna like earthworms. These biological shifts result in a 40–50% increase in microbial biomass carbon, alongside heightened enzymatic activity and superior nutrient bioavailability (Sharma & Chadak, 2022).

Preparation of Jeevamrit- Put 200 litres of water in a barrel and add 10 kg fresh Desi cow dung, 10 liters aged cow urine, 2 kg of Jaggery, 2 kg of pulses flour and a handful of soil from root area of big trees. Stir the solution well and let it ferment for 48 hours in the shade. It should be applied to the crops twice a month in the irrigation water or as a 10% foliar spray.

**3) Acchadan:** Organic mulching serves as a critical practice for soil management, facilitating moisture conservation, thermal regulation, and weed suppression while simultaneously augmenting soil organic matter. There are three mulching types:

a. *Soil mulch*: This technique protects the topsoil during cultivation to enhance aeration and water retention within the upper 10–15 cm. Aligning with natural farming principles, it emphasizes shallow management over deep plowing to preserve soil integrity.

b. *Straw mulch*: Utilizing dried biomass or crop residues, this method leverages microbial activity to decompose organic matter, directly contributing to long-term soil fertility.

c. *Live mulch*: By integrating cover crops like legumes, this approach creates a biological shield that suppresses weeds and improves water infiltration. Beyond protection, live mulch fixes atmospheric nitrogen and produces surface residues that accelerate nutrient release and optimize seed germination.

**4) Whapasa:** It describes a specific soil microclimate characterized by a balanced equilibrium of 50% air and 50% water vapor within the soil pores. As a foundational pillar of natural farming, this state significantly optimizes water-use efficiency and reduces total irrigation requirements. The practice emphasizes precise application specifically through alternate furrow irrigation during midday to maintain this delicate atmospheric balance. By avoiding saturation, Waaphasa ensures adequate soil aeration and prevents oxygen deficiency, which can otherwise impede root respiration. This method leverages the superior absorption capabilities of active young roots, promoting robust plant growth while advancing large-scale water conservation.

## PEST MANAGEMENT IN NATURAL FARMING

Rather than relying on synthetic pesticides, natural farming adopts a holistic ecological approach to pest control. This involves creating a diverse farm habitat where intercropping and trap cropping serve as sanctuaries for beneficial insects, which naturally keep pest populations in check (Pretty et al., 2018). To supplement these biological defenses, farmers use traditional botanical extracts known as astras. These formulations, including Neemastra, Agniastra, and Brahmastra, provide targeted protection while maintaining the farm's ecological balance.

**(A) Neemastra:** For preparation of 100 liters of Neemastra, mix 5 kg fresh neem leaves (chopped) + 5 kg fresh cow dung + 5 L cow urine + water in a plastic drum. Stir well with wooden stick and soak for 3 days (stir twice dailyclockwise/anticlockwise). When the solution turns dark brown, filter it through muslin cloth. Make volume to 100 L with water and add 200 g detergent as sticker. Spray @ 500-1000 L/ha to control sucking pest and mealy bug, repeat 2-3 times at 10-day intervals.

**(B) Agniastra:** Add 200 litres of cow urine to a container. Then add 2 kg neem leaves paste, 500-gram tobacco powder, 500 gram green chilli paste, 250 gram garlic paste and 200 grams turmeric powder. Stir the solution in clockwise direction and cover it with a lid and allow it for boiling till we get foam. Remove from fire and keep the vessel under shade, away from direct sunlight for cooling for 48 hours. During this fermentation period stir the components twice a day. After 48 hours, filter with a thin muslin cloth and store it. It can be stored for 3 months. For spraying, 6-8 litres of agniastra should be taken and diluted in 200 litres of water.

**(C) Brahmastra:** Take 20 litre of cow urine in a vessel and add 2 kg of fine paste of neem leaves, 2 kg of paste prepared from leaves of karanj, 2 kg paste Boil it on a small flame, till one or two foams (overflow level). Stir in clockwise direction, then cover the vessel with a lid and keep on boiling it. of custard apple leaves, 2 kg paste of castor leaves, and 2 kg paste of datura leaves into it. After

formation of second foam, stop boiling and allow it to cool for 48 hours so that the alkaloids present in the leaves are released into the urine. After 48 hours, filter solution using a muslin cloth and store it. It is better to store in pots (earthen pots) or plastic drums under shade. The solution may be stored for use up to 6 months. It can be used as foliar spray by mixing 6-8 litre of Brahmastra in 200 litre of water.

## CONCLUSION

Natural farming offers a cost-effective, biologically driven alternative to chemical agriculture by prioritizing soil health and ecological synergy. While yields may vary by region and crop type, the system significantly improves soil structure, carbon sequestration, and nutrient cycling. Although high-demand crops may see an initial dip in productivity, the drastic reduction in input costs typically maintains or boosts net income. At the same time, we should not forget about food security of the populous country like India which in the long term can be supported by targeted policies, region-specific strategies, and continued research.

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