Bio-Science Research Bulletin
Volume 42, Number 1
January-June 2026: P.36-41
Review Article

Print version ISSN 0970 0889
Online version ISSN 2320 3161
http://www.bpasjournals.com

From Chemicals to Nature: The Growing Shift towards Natural Farming in India

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ABSTRACT
The philosophy of natural farming is working with nature to produce healthy food, to keep ourselves healthy, and to keep the land healthy. In the web of life, every natural component serves a meaningful purpose. Hence, natural farming popularly known as "Do Nothing Farming" and often described as chemical-free farming relies on nature's self-sustaining processes, where the farmer merely supports natural processes rather than controlling them. This approach emphasizes farming without tillage and the use of synthetic agrochemicals, including herbicides, fertilizers, and pesticides. Studies have shown that it can reduce manual labour and physical effort by up to 80% compared to conventional agriculture. It differs from organic farming in that it does not employ any organic manure, such as farm yard manure and vermi-compost, and instead aims to improve soil biological fertility without the use of artificial chemicals or external inputs.

KEYWORDS: Green revolution, natural farming, sustainable agriculture, botanical concoctions.

Received on 13.02.2026, Revised on 18.04.2026, Accepted on 12.06.2026

How to cite this article: Das S.K., Rai S. and Prasad S.K. (2026). From Chemicals to Nature: The Growing Shift towards Natural Farming in India. *Bio-Science Research Bulletin,* 42(1), 36-41.

INTRODUCTION

"Lack of health hinders the emergence of wisdom, the appearance of art, the ability to fight, the usefulness of wealth, and the application of intelligence." (Bhati *et al*., 2017), this quote emphasizes the basic significance of health, which is intimately related to farming methods and food quality. The most recent IPES-Food evaluations from 2024 showed that more than one-third of the world's population still experiences food insecurity, with 42% unable to effort a healthy diet, (Thapa *et al*., 2026). With an anticipated population of about 1.7 billion, India is predicted to overtake China as the world's most populated nation by 2050, which would increase the need for sustainable and nutrient-dense food production. The Green Revolution (GR) dramatically increased agricultural output in India in response to past food crises, enabling the nation to become self-sufficient in food production, we have transitioned beyond a state of immediate-consumption supply dependence by mitigating hunger and poverty, using GR technologies like use of high-yielding varieties of seeds, intensive cropping system, chemical fertilizers, irrigation, and agricultural mechanization, the country is now food self-sufficient and even exporting many agricultural commodities. However, the expansion of agricultural inputs like fertilizers, herbicides, and irrigation brought about by this quick development in agriculture has also resulted in long-term environmental problems. Certain heavy metals, such as Cd, Cu, Mn, and Zn, can contaminate soil profiles after excessive

pesticide usage and leak into groundwater. According to (Byrnes, 1990; Barabasz *et al.*, 2002), these elements are then absorbed by the plant in sink portions for a longer period of time, which results in serious health problems when consumed. Cadmium and lead are two heavy metals with a high potential for accumulation and toxicity (Wolnik *et al.*, 1983). Organic farming is practiced by 34 lakh farmers in 191 countries, making up 1.6% of all agricultural acreage worldwide efforts are underway to integrate it into mainstream agriculture, despite the fact that it has evolved into a specialized ecologically friendly agriculture its high manufacturing costs, comparatively low yield and net return considering market uncertainty, and certification expenses are its main drawbacks (Willer *et al.*, 2023). In response to these challenges, one of the popular approaches is natural farming, popularly known as Zero Budget Natural Farming (ZBNF) emerges as a ray of hope towards sustainable agriculture. Masanobu Fukuoka (1913–2008), a Japanese farmer and philosopher, introduced natural farming, which he thoroughly detailed in his well-known book "*The One-Straw Revolution*". This farming strategy is sometimes referred to as "the Fukuoka method," "the natural way of farming,". Natural farming refers to minimizing dependence on manufactured inputs and machinery rather than reducing human effort. This approach has the potential to significantly reduce production costs by utilizing low-cost, locally available resources such as Jeevamrit, Beejamrit, Acchadana (mulching), and Whapasa. Natural farming is a developing, evidence-based practice that has the ability to improve rural livelihoods, preserve biodiversity, and regenerate soils. It is neither an unproven experiment nor a sentimental return to the past.

SUBHASH PALEKAR'S ZBNF

In India, Padma Shri recipient Mr. Subhash Palekar became the first to adopt the ZBNF system in the 1990s. He was driven to promote the use of low-input agricultural technologies that should be accessible within farmlands because he was concerned about the rising debt and suicide rates among Indian farmers as a result of the rising costs of pesticides and fertilizers and their long-term detrimental effects on the environment. Natural farming started as a grassroots movement in India that spread across the country by allowing farmers to give up costly, chemically intensive farming. It is marketed all around the world as a way to create safe, high-quality products that can coexist with the environment. provides a solution to a number of issues, including food insecurity, the suffering of farmers, health issues brought on by pesticide, fungicide, and fertilizer residue in food and water, climate change, and natural disasters. In the last few years, the Government of India has been actively promoting chemical-free farming through various natural farming programmes. During the budget speech, the finance minister highlighted the need to "go back to basics" and spread this unique farming approach to help increase farmers' income. Schemes such as the *National Mission on Natural Farming, Bharatiya Prakritik Krishi Paddhati* (BPKP) under *Paramparagat Krishi Vikas Yojana* (PKVY), and *Mission Organic Value Chain Development for North Eastern Region* (MOVCDNER) are encouraging farmers across the country to adopt natural farming practices.

PRINCIPLES OF NATURAL FARMING

- 365-days crop cover
- Bio-stimulants as catalyst
- Use of indigenous seeds
- Diverse crops and trees
- Integration of livestock
- Minimal disturbance to soil
- Multi-variate cropping
- Poly/ intercropping
- No synthetic fertilisers, pesticides, herbicides, weedicides etc
- Pest management through better agronomic practices and botanical extracts

CORE FOUR PILLARS OF NATURAL FARMING

1. Ghanjeevamrit
2. Beejamrit/ Beejamruth
3. Jeevamrit / Jivamrita
4. Acchadana / Mulching

Ghanjeevamrit (Nectar for microbes): Ghanjeevamrit, a solid or dry version of

Jeevamrit, improves long-term sustainability, aggregation, and moisture retention by acting as a slow-release soil conditioner. It is prepared by mixing 150kg desi cow dung, 1kg jaggery, 2kg pulse flour, 3 L of native/desi cow urine and 50-100g virgin soil for as it provides rich source of indigenous microbes and organic matter. The preparation will take 30 to 35 days. After being broken up into little pieces, it can be applied directly to the soil especially during sowing or top dressing. The recommended basal dose is typically 800–1000 kg per acre of land. However, depending on the duration of the crop, this can also be used as a top dressing and can be stored upto 6months.

Beejamrit/ Beejamruta (Nectar for seeds): It is a fermented cow-based product used to shield seeds from soil-borne and seed-borne diseases during the early stages of their development. Ingredients required for making this microbial paste are 5 kg of fresh cow dung, 5 liters of desi cow urine, 50 - 100 g of virgin soil (ideally from termite mounds or forests), 50 g of calcium chloride, and 20 liters of water. Before being planted, the seed or seedling is immersed in beejamrit. Following seed treatment with Beejamrit, the microbial population grew, according to Devakumar *et al.,* (2014). It also promotes root growth and development, which enhanced crop plants' capacity to take up nitrogen, minerals, and water.

Jeevamrit / Jeevamruta: It is a microbial solution prepared by fermenting the locally available on-farm inputs such as- 10 kg of fresh dung from *desi* cows, 10 liters of desi cow urine, 1.5 kg of cane jaggery (sugar) or sweet fruit pulp, and 1.5 kg of pulse flour mixed in a barrel with 180 liters of water. Handful (50-100 g) of virgin soil from forests (undisturbed areas) etc, is added as a local microflora inoculant. The mixture is stirred daily and fermented for 48 hours in the shade. Jaggery enhances fermentation, and pulse flour provides protein energy. *Jeevamrit* acts as a catalyst, promoting soil microorganism activity, including earthworms, and making nutrients available to crops. Indigenous cow dung and urine produce the best *Jeevamrit* due to higher beneficial microbial populations.

Acchadana / Mulching: Mulching is the practice of covering the top soil with a layer of organic material like as paddy straw, previous crop residue, hay or wood chips. This helps to keep the soil moist, reduce erosion, weed suppression, and protect plants from extreme temperatures. Generally depending upon the crop residues, 5-7 tonnes are required to cover 1 ha area. Polyethene mulching maybe recommended depending upon requirement and soil conditions. By managing soil temperature, maintaining soil moisture and lowering soil evaporation, mulching is an effective means of manipulating the crop growing environment to boost crop productivity and quality (Chakraborty *et al*., 2008).

Whapasa / Soil Aeration: The term "whapasa" describes soil conditions in which the crop root zones have a balanced concentration of water and air molecules for plants to grow and thrive well, the soil must have adequate aeration. In order to achieve optimal soil-water-plant relations under field conditions, whapasa soil condition in the crop root zone can be achieved through the application of *Jeevamrit* using precision technologies such as micro-irrigation systems like drip irrigation and sprinkler irrigation, which include sensors, controllers, etc. Maintaining Whapasa helps crops grow with significantly reduced water requirements.

Table 1: Nutrient content in natural farming inputs

Bio-input	N (%)	P (%)	K (%)
Ghanjeevamrit	0.55	0.04	1.03
Beejamrit	0.33	0.002	0.41
Jeevamrit	0.41	0.003	0.30

Saral Compost

It is one of the most recent compost from Kota, Rajasthan, to be used in natural farming. Saral compost is made with 200 liters of water, 2 kg of jaggery, 30 kg of fresh cow dung, and 30 liters of whey milk (cow, buffalo, goat, etc.). The whey milk contains a bacteria called lactobacillus, which is essential to farm yard manure because it breaks down organic waste, reduces odour, and improves the quality of compost. After thoroughly stirring the mixture, the liquid formulation is ready to be added to ten quintals of farm yard manure. Using bamboo, create holes in the entire farm yard manure that has been stored in the vermined or pit. Then, pour

the liquid formulation into the holes and cover the compost with paddy straw, or green residual residue, once it has been thoroughly included. After 45 days, the compost will be prepared for usage.

Composition: 10 quintals of farm yard manure, 30 kg fresh cow dung, 30 L whey milk, 2kg jaggery, and 200 L of water.

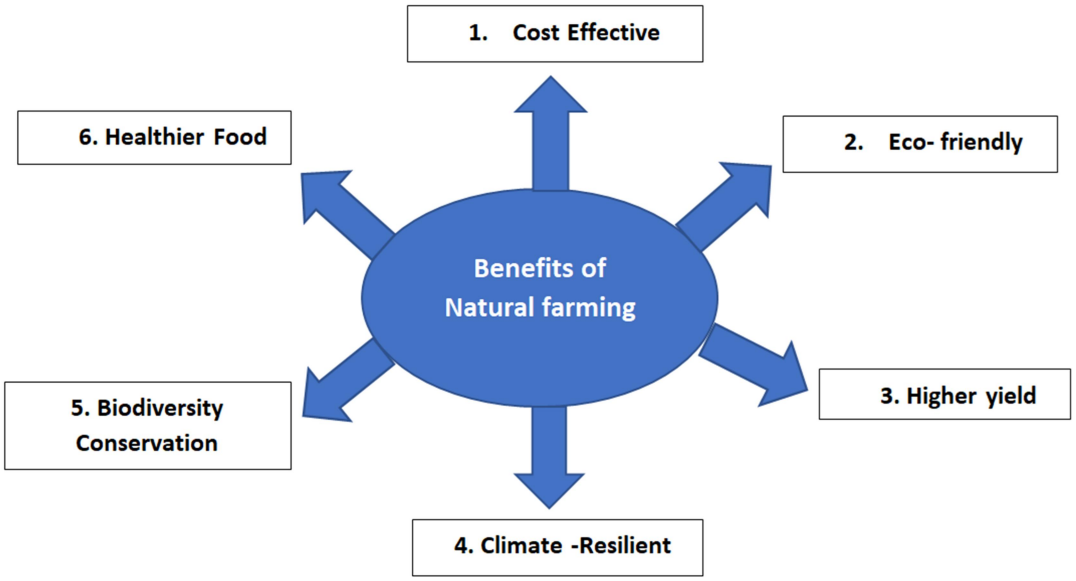

Figure 1: Benefits of natural farming

BOTANICAL CONCOCTIONS FOR INSECT PEST MANAGEMENT

***Agniastra*:** It is traditional bio-pesticide made by mixing 20 liters of cow urine with 500 g crushed tobacco powder, 0.5 kg green chilli, 0.25 kg garlic, and 5 kg neem leaves. Mix it in a pot by adding 20 liters of local cow urine, stir well, boil, cool, and ferment for 48 hours. After fermentation, filter the solution with cloth then take 6-8 liters of filtered solution and dissolve it in 200 liters of water and spray it on one-acre. *Agniastra* spray effectively controls pests like leaf roller, stem borer, fruit borer, and pod borer. It should be used within 3 months of preparation.

Dasparni Ark (Ten - leaves extract): Dashparni ark is a fermented biopesticide that combines insecticidal and pest- repellent properties. The reason behind combining several plant extracts is compelling since each species targets a different pest species or works in a different way, the combined extract has a wider range of effects than any one botanical. Preparation involves 200 liters of water, 20 liters of native cow urine, 2 kg cow dung, leaves of ten plants (Neem, Karanj, Castor, Sitaphal, Bael, Marigold, Tulsi, Dhatura, Mango, Aak etc.) 2 kg each, turmeric, asafoetida powder 500 g, ginger chutney 500g (heeng) powder 10 gm, dry ginger powder 200 gm, tobacco powder 1 kg, hot green chilli chutney 1 kg and desi garlic chutney 1 kg. Mix 6-8 liters of extract of this solution in 200 liters of water and spray it on one-acre area. Dashparni ark is used to control borers, maggots/ caterpillars.

***Brahmastra*:** "Bharamastra" is derived from the Sanskrit words "Bhara" (meaning burden) and "Astra" (weapon). This term metaphorically refers to a powerful natural method for deterring agricultural pests prepared by mixing10 liters of desi cow urine and a paste of neem, Pongamia (karanj), custard apple, castor, and datura leaves etc. (2 kg each). It is sprayed at 6–8 L per 200 L of water for one acre and effectively controls sucking pests, fruit borer, and pod borer. After preparation, it should be used within one month.

Neemaastra: The Neem tree (*Azadirachta indica*) contains compounds like azadirachtin, nimbin, and nimbidin, which exhibit potent insecticidal and antifungal properties. When applied to crops, Neemaastra not only controls pests but also improves soil health. It is highly valued for its multifaceted benefits in natural farming. Its leaves, seeds, and oil are utilized to create Neemaastra, a natural pesticide, fungicide, and soil conditioner, made primarily by crushing neem leaves. The required ingredients are 5L cow urine, 1 kg cow dung, 5 kg neem leaf paste, 100L water, ferment it for 48-96 hrs, stir twice daily and after fermentation the solution can be diluted and used it as foliar spray apply controls soft bodied insects, and leaf eating caterpillars.

BOTANICAL CONCOCTIONS FOR DISEASE MANAGEMENT

1. Sonthastra
2. Use of cow urine
3. Saptdhanyankur ark
4. Khatti lassi (Sour butter milk)

Sonthastra (Natural Antifungal Spray): It is a non-toxic, low-cost alternative to chemical fungicides. 200g dry ginger powder, 5L cow milk, and 200L water, Boil ginger powder in water to make a concentrate, mix with boiled (and cooled) milk, then dilute in 200L of water and spray directly on leaves to control fungal diseases.

Use of cow urine: Cow urine acts as a powerful bio-formulation that serves as both a potent fungicide and immunity booster. Applying 30-40 litres per acre through irrigation neutralises soil-borne pathogens and prevents seedling wilt, while a 10–20% foliar spray shields the canopy from fungal and bacterial infections. This eco-friendly, cost-effective treatment enriches the soil and strengthens plant resistance without requiring chemical interventions

Saptdhanyankur ark: It is a potent natural growth stimulant prepared by soaking and sprouting 100-gram seeds each of sesame, moong, urd, cowpea, moth, gram, and wheat, which are then ground into a paste and mixed with 10 litres of cow urine and 200 litres of water. This hormone-rich formulation, which must be filtered and used within 48 hours, is sprayed during the flowering, budding, or milk stages to effectively prevent fruit drop and significantly enhance the weight and lustre of the final harvest.

Khatti lassi (Sour butter milk): Serves as a potent natural antifungal and antiviral solution prepared by soaking a small piece of copper in 5 litres of sour buttermilk for 3 to 5 days, which is then blended with 100 litres of water and 50 grams of turmeric powder to create a chemical-free spray for one acre of land. This cost-effective botanical concoction provides uniform protection across crop fields, effectively neutralizing viral threats and controlling fungal diseases while ensuring the produce remains free from toxic residues.

OPPORTUNITIES IN NATURAL FARMING

One of the major advantages of natural farming is the reduction in input costs due to minimal dependence on synthetic fertilizers, pesticides, and other external chemical inputs. The growing consumer preference for chemical-free produce has also created better market opportunities for farmers. In addition, natural farming encourages farmer-to-farmer interaction and knowledge sharing, which supports the adoption of sustainable agricultural practices. Natural farming further contributes to the improvement of soil fertility and soil biological activity through the application of natural inputs such as compost, biofertilizers, Jeevamruta, and Ghanjeevamrit etc. These inputs support long-term soil health and sustained crop productivity by improving microbial activity, nutrient cycling, and soil structure. Natural farming techniques have the potential to be profitable for both small and large-scale farmers since their high-quality food frequently commands higher market prices.

CHALLENGES IN NATURAL FARMING

In India, natural farming still faces a number of difficulties despite its advantages. Initially farmers frequently obtain lower yields, and managing insect pests and diseases without the use of chemicals can be challenging. Additionally, several methods call for increased labor and enough natural input availability. Its implementation is further slowed by inadequate market assistance, farmer awareness, and training. Major barriers still include limited

government support, and resistance from the chemical farming sector remain major obstacles. The lack of standard certification procedures, delays in certification can prevent farmers from getting better prices for their products, thereby affecting their income and reducing the motivation of other farmers to shift towards natural farming.

CONCLUSION

Natural farming emerges as a sustainable and ecologically sound approach to agriculture, contributing to improved soil health, enhance biodiversity, and reduced reliance on external inputs. While initial adoption may present certain challenges, its long-term benefits in terms of productivity, environmental resilience, and food safety are substantial. Integrating traditional knowledge with scientific validation, natural farming holds significant promise for developing resilient and sustainable food systems in the face of evolving climatic and ecological pressures.

REFERENCES

Badiyal, A., Mahajan, R., Rana, R.S., Sood, R., Walia, A., Rana, T., and Jayswal, D.K. (2024). Synergizing biotechnology and natural farming: pioneering agricultural sustainability through innovative interventions. *Frontiers in plant science*, *15*, 1280846.

Bana, R.S., Dawar, R., Haldhar, S.M., Godara, S., Singh, A., Bamboriya, S.D., and Choudhary, M. (2022). Natural farming: Is it safe to march ahead? *Journal of Agriculture and Ecology*, *14*, 1-11. https://doi.org/10.58628/JAE-2214-21

Barabasz W, Albińska D, Jaśkowska M, Lipiec J. Biological Effects of Mineral Nitrogen Fertilization on Soil Microorganisms. Pol Jour of Envi Stu. 2002; 11:193 198.

Behera, S. (2026). Natural Farming: Relearning to Live with the Soil, the Farmer, and the Future.

Byrnes BH. Environmental effects of N fertilizer use- An overview. Fert Res 1990; 26:209

Devakumar, N., Shubha, S., Gowder, S. B., and Rao, G.G.E. (2014). Microbial analytical studies of traditional organic preparations beejamrutha and jeevamrutha. *Building organic bridges*, *2*, 639-642.

Ravisankar, N., Prusty, A.K., Rakesh Kumar, Swarnam, T.P., Raghavendra, K. J., Raghuveer Singh, Shamim, M., Meraj Alam Ansari, Sindhuja, P.V.N., Rakshit Bhagat, Sunil Kumar, A., Velmurugan. and Nayak, A.K. (2025). Field Manual for Natural Farming Model Farms, National Mission on Natural Farming (NMNF), ICAR-Indian Institute of Farming Systems Research, Modipuram, Indian Council of Agricultural Research (ICAR) (i-46pp)

Ruchi Bishnoi, R.B., and Akshaya Bhati, A.B. (2017). An overview: Zero Budget Natural Farming.

S, Nivedha., M.S. Marichamy, and V. Kanthaswamy. 2024. "Natural Farming: Embracing Regenerative Agriculture for Sustainable Crop Production". *Journal of Experimental Agriculture International* 46 (8):855-65. https://doi.org/10.9734/jeai/2024/v46i82771

Thapa, A., Muthuprakash, S., Damani, O., and Isaac, M. E. (2026). Social-ecological outcomes of agroecological transitions: A case study from natural farming systems in central India. *PLOS Sustainability and Transformation*, *5*(1), e0000212.

Willer, H., Bernhard S. and Jan T. 2023. The World of Organic Agriculture, Statistics and Emerging Trends 2023. Research Institute of Organic Agriculture FiBL, Frick, and IFOAM – Organics International, Bonn. Online Version 2 of February 23, 2023.

Wolnik KA, Fricke FL, Capar SG, Braude GL, Meyer MW. Elements in major raw agricultural crops in the United States. Cadmium and lead in lettuce, peanuts, potatoes, soybeans, sweet corn, and wheat. JAFC. 1983; 31:1240-1244.