ROLE OF NATURAL FARMING PRACTICES IN ENVIRONMENTAL SUSTAINABILITY

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INTRODUCTION

Natural farming (NF) is regarded as an agroecology-based, diversified farming system that integrates crops, trees, and livestock. By using locally produced goods like Jeevamritham, Beejamritham, Neemastra, etc. in place of chemical fertilizers and pesticides and by implementing intercropping and mulching, functional biodiversity is able to significantly reduce production costs. It's "livestock and farming based on chemical-free practises," to use a common description. It is a diverse agricultural system that integrates crops, trees, and livestock, allowing for the best possible utilization of functional biodiversity. It is based strongly on agro-ecology. While offering a variety of benefits, such as the reduction or moderation of greenhouse gas emissions, the restoration of soil fertility, and environmental health, it has the potential to boost farmers' revenue.

This farming technique was made famous by Japanese farmer and philosopher Masanobu Fukuoka in his 1975 book "The One-Straw Revolution", which upholds the principle of utilizing the natural cycles and activities of the environment. The campaign to promote ZBNF in India, spearheaded by **Shri Subhash Palekar**, has resulted in broad acceptance at different levels in several states, including Andhra Pradesh, Karnataka, Maharashtra, and Himachal Pradesh.

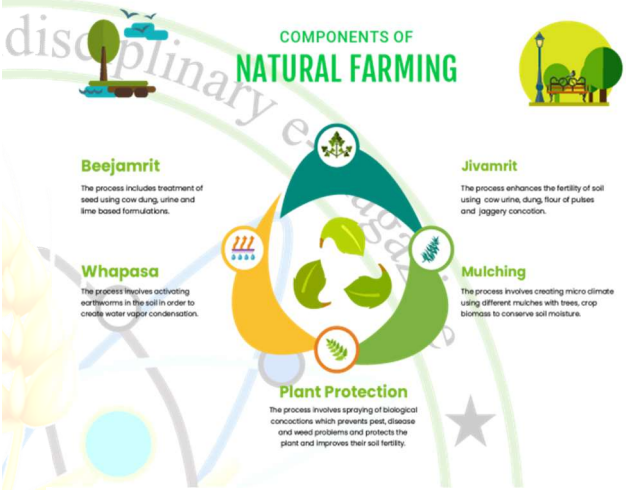
It expands on ecological or natural phenomena that occur on or around farms. Internationally, natural farming is recognised as a form of regenerative agriculture—a well-known technique for protecting the environment. It has the power to control how much land is used and to store atmospheric carbon in soils and plants, where it will be helpful rather than destructive. The Bhartiya Prakritik Krishi Paddhati Programme (BPKP) of the Paramparagat Krishi Vikas Yojana encourages natural farming in India (PKVY). The BPKP seeks to advance conventional indigenous methods that rely less on outside resources. Natural farming, as the name suggests, is the art, practise, and—increasingly—science of working in tandem with nature to achieve much more with less.

What sets natural farming apart from other methods?

The foundation of **contemporary agriculture** is the idea that, depending on the amount a crop consumes, the soil must be supplied with chemical fertilisers like nitrogen and phosphorus. Chemical inputs decrease the number of microbes and obstruct this natural process. Similar to **conventional farming**, organic manure like cow dung is used to restore the soil in organic farming. However, because cow dung contains so little nitrogen, enormous volumes must be administered, which may be challenging for a farmer to set up. **Natural farming** is based on the idea that there is never a lack of nutrients in the soil, the air, or the water, and that these nutrients can be released by healthy soil biology.

Various Natural Farming Elements

Locally produced bio-stimulants made from cow dung are produced by fermenting the dung with cow urine, jaggery, and pulse flour. When compared to organic farming, the amount of manure needed is quite minimal—only 400 kilogrammes for an acre of land. When the fermented solution is put to fields, the number of microbes in the soil rises, providing the plants with vital nutrients **(Jivamrit)**. Numerous additional treatments are also used in this agricultural technique. Young roots are shielded against fungus and other soil- and seed-borne illnesses by a stimulant made from cow dung that is applied to seeds **(Beejamrit)**. In order to encourage soil-based carbon sequestration and help plants trap carbon from the air, the fields are maintained to have some green cover throughout the year. Additionally, doing so keeps earthworms and other creatures alive, which helps the soil grow porous and hold onto more water **(Whapsa)**. Crop remnants are utilised as mulch (also known as acchadana or mulching) when growing major crops to keep the soil wet and control weed development. Increased soil fertility is another benefit of growing many crops on one plot of land.



What benefits might switching to natural farming provide?

1. Increasing farmer income: Locally made stimulants can substitute chemical fertilisers and pesticides while retaining equivalent yields. This will lower cultivation costs by 60 to 70%. Additionally, natural farming softens the soil and improves the flavour of the produce. Farmers may thus see a rise in their net income as a result.

2. Increases output: By increasing production variables like labour, soil, and equipment and minimising the use of artificial inputs like fertilisers, herbicides, and pesticides, natural farming tries to boost yields.

3. Reduce production costs as much as possible and boost farmer earnings:

Natural farming encourages farmers to create vital nutrients and plant protection substances with locally accessible resources, eliminating the need for external and commercial inputs like fertilisers and other chemicals. This dramatically reduces production costs. The cost of agriculture is being greatly reduced by inputs like Jivamrit and Beejamrit.

4. Make health a priority: Pesticides and fertilisers have been demonstrated to have negative effects on both farmers and consumers. When farmers use chemical inputs, they are exposed to pollutants. NF can lower the incidence of non-communicable diseases associated with the use and application of inorganic chemicals in agriculture, such as acute and chronic neurotoxicity, respiratory diseases, and even cancer, by substituting such external inputs with locally made natural concoctions, inoculums, and decoctions. Endocrine-disrupting chemicals (EDCs), which are found in pesticides and are ingested by people through food, can have detrimental effects on health, including breast cancer, reproductive problems, and slower intellectual growth in children. By stopping the use of chemical pesticides and fertilisers in fields, runoff into water sources will be prevented, thus lowering the exposure of nearby communities to these substances. Products from natural farming include substantially more nourishment. About 300% more protein, amino acids, crude fat, and other critical nutrients were present than in typical goods. Nitrate residue from chemical farming is essentially undetectable in natural farming products.

5. Employer Generation: Natural farming promotes the financial sustainability of small farms and creates jobs in rural areas. Through the production, distribution, and sale of natural mixes as well as market connections for such goods, NF has the potential to create job possibilities along the agricultural value chain. More readily available natural inputs would promote gender equality in the industry. Natural farming can help India's persistent difficulties with both overt and covert unemployment.

6. Stop using chemical inputs in your applications: Chemical pesticides and fertilisers shouldn't be used carelessly since they endanger the ecosystem and soil. The crop response ratio has been negatively influenced by this, and the soil's nitrogen balance has been upset. In the past six decades, the crop response ratio has decreased from 58 percent. Nitrogen, phosphorus, and potassium are the three main plant nutrients, and their optimal ratio of 4:2:1 is disturbed.

7. Environmental Protection: GHG emissions from "agriculture, forestry, and other land use" have roughly quadrupled over the previous 50 years, and predictions indicate they will rise much more by 2050. According to research by the FAO, agriculture is responsible for a considerable portion of the world's methane and nitrous oxide emissions. Global greenhouse gas (GHG) emissions and climate change have been severely impacted by the excessive use of fertilisers in conventional farming. Global food security will be impacted by climate change, which might also have an influence on some crops' nutritive qualities. The quantities of minerals in some crops (such as wheat, rice, and soybeans) can be up to 8% lower than usual when carbon dioxide levels are high. It's possible that protein concentrations are lower and carbs are more

abundant. According to a meta-analysis of 1090 research on yields (mainly for wheat, maize, rice, and soybeans) under various climate change scenarios, yields may become much lower over time as a result of climate change. By encouraging the use of an agroecology framework, natural farming seeks to lower the risks related to the uncertainties of climate change. It encourages farmers to forego the use of commercial pesticides and artificial fertilisers in favour of inexpensive indigenous alternatives. Because natural farming increases the fertility and tenacity of the soil, it has been demonstrated that farmlands are more resilient and that crops are better protected against harsh weather.

8. Reduce Your Water Use: Aquifers are being over-exploited and losing water due to groundwater irrigation, which accounts for 60% of all irrigated land in India. Natural farming is a noteworthy method that has been shown to increase soil's ability to retain water. It uses the least amount of water possible and is known to lessen reliance on resources like water and power. In the long run, this will help to preserve groundwater reserves, raise the water table, and lessen the financial and labour pressures on farmers. Bunds and contours keep rainfall in place and prolong the retention of soil moisture. Since there is 10 times more water in the air than in rivers, natural farming essentially contributes to making soil permeable and increasing the moisture content in the soil. Agriculture in regions of the nation that are prone to drought can change thanks to natural farming.

9. Improve Soil Health: Natural farming is organic farming with the additional component of utilising helpful microorganisms to improve soil quality and soil health. It is not merely farming without using chemical fertilisers and pesticides. In place of conventional pesticides and fertilisers, it uses natural bio-inoculums. This enhances soil health by reviving the soil microorganisms. Utilizing bio-inoculums and organic insecticides to revive the soil's microorganisms improves the plant's nutritional content and improves the bioavailability of those nutrients to people. This agro-ecological intervention demonstrates connections between soil health, plant health, and animal health and takes a nutrition-sensitive approach.

10. Sustainable Farming: The two most important ingredients in Jivamrit and Beejamrit are cow dung and pee. The population of indigenous cows among Natural Farming farmers is found to be greatest when compared to crossbred cows, bullocks, and buffaloes in Karnataka, Maharashtra, and Andhra Pradesh, according to a research by NAARM financed by NITI Aayog in February 2020. According to the report, 91% of the sample farmers in Karnataka had at least one native cow, followed by Maharashtra and Andhra Pradesh. According to the twentieth livestock census, India's livestock industry is developing at a pace of 4.6%. Low animal output, however, continues to be a key problem. In order to make agroecological agricultural approaches profitable, livestock might be included.

11. Community ownership and women's agency for expanding natural farming: By seizing control at the local level, men's and women's collectives alter natural farming in a democratic manner. SHGs and associated federations, in particular women collectives, are active in the conception, execution, and monitoring of programmes.

They are at the centre of this transformational movement because women and their collectives have a better understanding of natural farming and encourage their members to adopt it. They have a greater understanding of the harm that chemical and fertiliser use does to the environment, agriculture, and family members' health. Furthermore, a farmer and community-driven extension architecture continually offers assistance and information dissemination.

12. Resilience: The land, water, and other resources that are necessary for food production are put in danger by climate change, which also poses serious hazards to farmers. Droughts, heat waves, and cyclones have already become more intense due to rising temperatures, making agricultural growth more difficult. In this situation, crops cultivated using natural farming techniques have excellent drought and storm resistance. Even in harsh conditions, such as during severe droughts and while withstanding significant flood damage and wind damage during cyclones, plant development is being supported by changes in soil structure thanks to organic carbon, no/low tillage, and plant variety. Because NF makes crops more resistant to extreme weather, it benefits a lot of farmers.

13. Prevent erosion of soil: To replenish nutrients in the soil after the main crop has been harvested, green manure (plants produced particularly to be returned to the soil as fertiliser) is also used. Additionally, it is a fantastic technique to restore the soil's health, making it more resistant to soil erosion.

14. Maintain biodiversity: Natural farming is another method that may be used to promote and preserve biodiversity. Because it allows animals to breathe pure air that keeps them naturally healthy and disease-resistant, natural farming is a great home for a variety of species.