



## Transitioning to Green: Scope and Challenges of Natural Farming in Vegetable Cultivation

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Agriculture being backbone of the civilization is currently facing several challenges like climate change, depletion of water sources, ecological degradation, loss of soil fertility and food security issues which needs to be addressed for a better future. Natural farming, which is based on co-existence with nature, i.e., minimum disturbance to the natural ecosystem as possible, in such a scenario natural farming has emerged as a holistic substitute for chemical-based farming. The concept of natural farming was first figured out by Masanobu Fukuoka in Japan as a do-nothing farming, supporting reverence for soil and respect for all the cycles in nature. It was later conceptualized by Subhash Palekar in India as Zero Budget Natural Farming (ZBNF), suitable for the small holder farmers. Vegetable crops, being short duration and highly nutritious are found to respond well in this system, with enhanced nutritional value, taste and freedom from chemical residues, thus ensuring better profit to the farmers.

### Concept Of Natural Farming In Vegetables

Natural farming is based on synchronization with natural cycle, taking care of soil fertility, biodiversity and ecological balance. It is based on certain principles to enhance sustainability as well as reduce the cost of cultivation like:

1. Nourishing the soil: Use of inputs like Jeevamrit, which is beneficial for microbial population in the soil, thereby enhancing soil fertility
2. Little or no tilling of soil: Preserves the natural structure of soil and growth of useful fungi.
3. Use of local seeds: Open-pollinated seeds are cheaper and also have better adaptation potential compared to hybrids.
4. Use of biofertilizers and botanicals: Preparation using cow dung, cow urine, jaggery, and agricultural/forest products helps in enhancing microbial population and controlling pest populations.
5. Integrated crop-livestock system: Grazing animals in a controlled manner helps in improving the soil fertility and reduces the need for tilling.
6. Diversified cropping system: Intercropping and crop rotation helps in improving soil structure, suppressing soil borne diseases as well as better usage of water resources and ecological sustainability.

In contrast to organic farming, inputs used are not purchased as external input and are based on resources available locally in natural farming. It is actually based on eliminating external inputs and using in-situ resources, and is based on four pillars:

1. Beejamrit: It is fermented microbial solution used in seed treatment that protects seedlings from soil-borne and seed-borne diseases, enhances germination and provides vigour.
2. Jeevamrit: It is liquid microbial inoculant that enhances beneficial microbial population in the soil, thus improving nutrients availability and plant growth.

3. Mulching (Acchadana): Covering of soil with crop residues or partial/complete live mulch for conserving soils, checking weed growth and preventing soil loss.
4. Waaphasa (soil aeration or moisture balance): Maintaining ideal soil moisture and aeration condition.

### Scope of Natural Farming in Vegetables

- Economic potential: With zero dependence on external input costs and scope of premium pricing for naturally grown chemical-free vegetables, natural farming is helpful for small holder farmers and vegetables being short duration crops provides quicker returns.
- Environmental sustainability: Natural farming helps in build-up of soil organic matter, conservation of water resources by mulching and zero tillage, with zero chance of contamination of natural resources with toxic chemicals. It helps in mitigation of GHGs by totally eliminating application of synthetic fertilizers.
- Food safety and nutrition: Since no chemicals are used in natural farming, vegetables do not contain harmful chemical residues and are found to contain higher levels of vitamins, minerals, and anti-oxidants, and thus have higher nutritional value.
- Social and cultural value: Natural farming encourages pride among farmers and unity among communities taking up natural farming together, including participation from women and youth.

### Government Initiatives Supporting Natural Farming

1. Paramparagat Krishi Vikas Yojana (PKVY): Under this scheme, cluster-based organic farming is encouraged with financial assistance for certification of organic produce, training, preparation of biofertilizers and biopesticides, marketing and branding under the Participatory Guarantee System (PGS) for India.
2. National Mission on Sustainable Agriculture (NMSA): It encourages climate-resilient farming, including agroforestry, efficient use of water resources and integrated farming systems.
3. Rashtriya Krishi Vikas Yojana (RKVY): Under this scheme, funds are allotted to states for research and on-farm demonstration programmes on organic farming, construction of cow dung and compost units, encouragement of farmer entrepreneurship, start-ups on organic input preparation, etc.

### Challenges in Natural Farming

- Low yield of vegetables during conversion period: Shifting from conventional to natural farming is reported result in lower yield of vegetables, which is discouraging to farmers adopting this method of farming.
- Lack of awareness: Lack of awareness among farmers regarding preparation and application of biofertilizers, biopesticides and other practices in natural farming, and among consumers about importance of naturally grown chemical free vegetables.
- Poor market linkage: Vegetables being highly perishable commodities need proper storage and market linkage, which is often unavailable resulting in natural farming not being profitable to vegetable growers.

### Future Prospects

These practices are based on use of low-cost inputs like cow dung, urine, botanicals, and green manure, which are locally available and are reported to improve soil health and water use efficiency making this system climate resilient. By adopting the practices of natural farming, the small farmers can provide premium chemical free vegetables to the market with lesser cultivation cost. Natural farming encourages diversified cropping system, reduces risk of pests and improves soil quality which provides a stable production system for vegetable cultivation. Integration of agri-tech for natural farming, including precision irrigation, weather forecasting can further enhance productivity and resource management. Particularly in case of vegetable cultivation natural farming can be considered as a sustainable and

alternative approach towards conservation of soil, natural resources and for production of chemical free healthy produce. With various benefits provided by government schemes and research institutions, natural farming is a way towards a chemo-resilient, low-cost farming system ensuring healthy future for smallholder farmers in Indian agriculture.

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