
19. Zero Budget Natural Farming: Need of the hour

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Abstract:

Conventional agricultural practices are like cancer to our soil and our health. Not only does it leave the soil barren, but the farmer eventually falls under debt causing farmers' suicide. Therefore, Zero Budget Natural Farming (ZBNF) is the only solution to this persistent issue. ZBNF refers to chemical-free farming that uses the natural world. The ZBNF's discoverer, Subhash Palekar, provided numerous theories, tenets, and techniques. Natural pesticides, fertilisers, mulching, and soil protection methods are employed by zero budget farmers. Crop rotation, green manures and compost, biological pest management, and mechanical approaches are the main techniques of ZBNF. The Government of India is actively promoting ZBNF, as seen by the latest announcements and efforts. A few state governments have also joined the campaign, including Karnataka, Himachal Pradesh, Maharashtra, Kerala, Andhra Pradesh and Madhya Pradesh. Proponents argue that ZBNF technique will solve issues with dependency on expensive inputs, health and environmental issues, especially those pertaining to chemical use. However, critics see the ZBNF method as untested and incapable of providing any real advantages to farmers or consumers.

Keywords:

Zero Budget Natural Farming, ZBNF, Jeevamritha, Beejamritha

19.1 Introduction:

Small-scale farming is becoming an unprofitable affair for peasants in India as the access to privatised markets, inputs, and seeds are limited. Indian peasants are finding themselves in a never-ending debt cycle due to high production costs, high interest rates, fluctuating market price of crops, rising fuel cost and seed prices. Due to debt, over a quarter of a million farmers have taken their own lives. It is an issue for Indian farmers. This creates a significant issue for the agriculture sector. The long-term use of inorganic fertilizers and pesticides have detrimental impact on soil and human health. There continues usage, decreased the soil micro and macrofauna which may directly affect on C-N ratio and nitrification activity (Jenkinson, 1982; Doran et al. 1996; Shaikh & Gachande, 2015). Since India's green revolution, there has been a rise in the use of synthetic fertilisers and irrigation, which has led to an inefficient use of natural resources (Agoramoorthy, 2008), particularly in north and north-west India, where nutrient use efficiency was found to be low (Bruinsma, 2003). In the meantime, the Indian government, specifically NITI Ayog, has been searching for alternative cultivation methods that could use fewer chemical inputs and be more profitable to the small and marginal farmers. Zero Budget Natural Farming, as the name suggests, is a method of cultivation where the cost of growing of crop is zero.

Though started in Karnataka, it is currently growing quickly and energetically throughout India. By August 2019, Andhra Pradesh was 204,000 ha of land over 3,015 villages of 523,000 farmers converted had to ZBNF (RySS, 2018). Prime Minister Narendra Modi recently told the UN conference on desertification that, in the future, India will focus on ZBNF (The Hindu, 2019; GEF, 2019). No Spending of capital as the name implies, ZBNF is an approach to farming in which there are no expenses associated with planting, cultivating, or harvesting plants. This guarantees the farmers with healthy growth of their crops without having to buy fertilisers and pesticides. The technique combines traditional agricultural methods based on naturally occurring biological inputs with readily available, locally sourced, natural biodegradable materials that are saturated with current ecological and technological knowledge. Shri Subhash Palekar 1st person to bring this idea to light, and received the Padma Shri award in recognition of his efforts in 2016. In 2019 budget speech, Finance Minister Nirmala Sitharaman brought up the topic of ZBNF describing it as a way to double farmers' income.

19.2 Basic Pillars of ZBNF:

According to Subhas Palekar ZBNF has four essential components. These components are discussed below:

- A. Jeevamritha:** Jeevamritha is a microbial culture that provides nutrients, also it serves as a catalytic agent, which encourages soil microbial and earthworm activity. Cow dung and urine consists different aerobic and anaerobic bacteria that multiplies as they feed upon the organic materials (like pulse flour) throughout the 48-hour of fermentation process. It also includes a handful of bund soil that has been inoculated with natural species of microorganisms. Furthermore, Jeevamritha aids in the prevention of bacterial and fungal plant diseases. According to Palekar, Jeevamritha is only required for the first three years of the transition period, after which the system may function on its own.
- B. Preparation:** 10 kg of fresh local cow dung, 5 to 10 litres of aged cow urine, 2 kg of jaggery, 2 kg of pulse flour, and a handful of dirt from bund should all be added to the 200 litres of water in a plastic barrel. Give the mixture a good stir, then leave it to ferment in the shade for 48 hours. Jeevamritha is now prepared for use. 200 litres of jeevamritha is sufficient for 1 acre land.
- C. Application:** It could be sprayed on the crops twice a month either as a 10% foliar spray or with the irrigation water. The preparation can be kept for a maximum 15 days in storage.
- D. Beejamritha:** Beejamritha is used for treating the planting materials like seeds, seedlings etc. It aids to protect the young roots from the seed and soil borne diseases.
- E. Preparation:** Mix local cow dung, cow urine, lime juice and bund soil. The dung works as a natural fungicide and urine has anti-bacterial properties. Dung is tied in a piece of cloth and soaked in urine. After 12 hours the dung is removed, and 50 g of lime added to the urine.
- F. Application:** Any crop seed can be treated with Beejamritha by coating and manually mixing them before using them for sowing. Simply dip the leguminous seeds and air dry them before sowing.
- G. Acchadana – Mulching:** Different types of mulching have been suggested under ZBNF. Some of those are:

- H. Soil Mulch:** This means to keep the topsoil intact throughout growing season rather than destroying it through tilling. It helps the soil to retain more water and become more aerable. Deep tillage should therefore be avoided.
- I. Straw Mulch:** This usually refers to the dried stubbles of previous crops left on the field. The stubbles will decompose by the activity of the soil biota overtime and provide nutrient and organic matter to the soil.
- J. Live Mulch:** Live mulch is the growing of leguminous crops in between the main crops. This helps to protect the soil against erosion and adds nitrogen to the soil.
- K. Whapasa - moisture:** Palekar refuses the idea that plant roots require a lot of water, which counters farmers' excessive reliance on irrigation. He proposed that water vapour is what roots require. Whapasa is a condition, when the soil contains both water and air molecules, he recommends decreasing irrigation and irrigating only in alternating furrows at noon.

19.3 Pest Control in ZBNF:

Some of the formulations made from the locally available plant materials used to control the pest are:

- A. The most widely used pest control product in ZBNF is **Neemastra**. The neemastra is made from neem leaves, water, cow urine, and dung from cows. Mix 5 kg of neem leaf paste, 2-3 kg of manure, 10–20 litres of cow urine, and a little handful of soil. Kept for roughly 48 hours till the mixture ferments. Then dilute the mixture in water and spray on the standing crop.
- B. Five different kinds of bitter leaves are used to make **Brahmastra**. Neem leaves are used in combination with other bitter leaves, such as chilies, custard apple, etc. These are soaked in cow urine and boiled for two to three hours. After 12 hours, the mixture is filtered through fine cloths. For every one litre of Brahmastra, the solution is further diluted with roughly fifteen litres of water. The farmers make Brahmastra with five kilogrammes of neem leaves and ten to twenty litres of urine from cows.
- C. Five kilograms of neem paste, about one kilogram of tobacco leaves, five hundred grams of chiles, and five hundred grams of garlic paste are added to make **Aganiastra**. All ingredients are added in 25-30 litres of cow urine and kept for 24 hours. After filtering, the solution is put to use. Before being applied in the field, 500 ml of solution is diluted in 15 litres of water. Agniastra is proved to work well against insects such as fruit borer, leaf roller, pod borer, and stem borer.

19.4 Benefits of ZBNF:

- a. The cost of cultivation in ZBNF is Zero as the farmer uses the on-farm inputs only.
- b. The water requirement in ZBNF is very less, which is nearly 10% of the conventional farming only.
- c. One cow producing 10-12 kg fresh cow dung is required for a land area of about 30 acres for one month.
- d. The crops can withstand different abiotic stresses like drought and flood easily.
- e. As no chemical fertilizer and pesticides are used, so it is environmentally safe.

19.5 Constraints of ZBNF Adoption:

- A. Unacceptability in the scientific community:** It will be challenging to persuade various stakeholders to form a broad consensus for its acceptance unless the scientific proof are produced by the research institutes. Farmers and other stakeholders in such a setting will always be sceptical of its effectiveness. If a vast network of agricultural institutions, ICAR institutes, and KVKs have different opinions, farmers would undoubtedly be greatly confused by this.
- B. Adoption by large-size farm holding:** Regular field monitoring has been noted to be necessary for the ZBNF technique in order to detect weed and pest infestation as well as nutrient deficiencies. Moreover, preparing a large amount of Jeevamritha and applying it on a regular basis may increase the need for labour, raising the cost of cultivating crops. Smallholder farmers that have one or two family members working for them at home may find the technique more suitable. So, it would be an enormous undertaking to adopt by a huge farm-sized holding.
- C. Reduced mechanization:** In order to prevent soil nutrient depletion from the soil due to the need for particular nutrients, farmers must plant multiple crops as mixed crops or intercrops. Crops that are interplanted or blended can also be harvested at various times. This poses a significant obstacle to the widespread use of farm machinery for other management tasks like harvesting and seeding.
- D. Reduced yield:** It would be challenging to maintain farmers' motivation to grow crops with ZBNF practice, since it prohibits the use of improved cultivars or hybrid seeds, which reduce the crop yield in the starting years. To obtain a constant increase in production, ZBNF techniques must be experimented with using various genotypes and cultivars for a long period of time.

19.6 Policy Recommendations:

ZBNF procedures cover a far wider range of viewpoints than are typically represented in common parlance. Real practices unquestionably result in a major decrease in the reliance on the market for agricultural supplies. If implemented with sincerity, the ZBNF practice can be sustained, since soil microbiologists highlight the critical responsibilities, these invisible microorganisms play in healthy soil. It is well known that millions of fungi, bacteria, actinomycetes, and other microorganisms present in soil fix, solubilize, and mineralize all the nutrients required for the plants and help to increase moisture in soil and reduce erosion. Despite the fact that ZBNF methods increase farm profitability, it is extremely difficult to implement those practices in big farms because polycropping can interfere with farm mechanisation, especially when it comes to sowing and harvesting.

For smallholders with sufficient family work, it could be relatively possible to maintain the field and employ these inputs on a regular basis.

- A. Removing negativity around ZBNF:** At present, the society is divided into two powerful and contradictory schools of thought. The critics of ZBNF are sowing a number of doubt in an effort to tarnish the reputation of the agricultural scientific community. In addition, they blame the green revolution's technologies and related agricultural institutions for the increasing number of farmer suicides and distress.

The scientific community, which is strongly opposed to ZBNF practices and views them as unscientific and unverified, is agitated by this. Truly, the Prime Minister Office (PMO) received a request from the National Academy of Agricultural Sciences (NAAS), asking them to stop supporting ZBNF methods. Indian farmers, who are the primary targets in this dispute, are perplexed regarding the accuracy of the information provided by both sides. There are currently very few systematic research papers available to back up or refuse the claims made. In such cases, it is critical to produce scientific proof by conducting systematic research in SAUs and other ICAR institutes to verify if ZBNF techniques may raise farmers' incomes by lowering cultivation costs and/or raising crop output.

- B. Capacity building and awareness creation:** The new method recommended under ZBNF differs significantly from the methods used in conventional farming today. Semi-literate farmers make almost 85% of India's farming population. To adopt the new practices, they therefore require a steady stream of the same information. Numerous farmers have been spotted using Jeevamritha as a supplementary input but at the moment, they do not fully believe in its effectiveness. Large-scale capacity building initiatives must be planned locally as soon as the scientific evidence supporting the assertion is produced. By teaching a group of forward-thinking farmers from each village, the KVKs may be able to encourage other farmers through their own field practices.
- C. Recognition as niche products and certification:** Without scientific proof, farmers might not implement ZBNF techniques. On the other hand, produce may be classified as a niche product and FPO development for ZBNF activities may be promoted. Since ZBNF procedures don't involve the use of chemicals, the cultivation could fall under the purview of the Participatory Guarantee System (PGS) and be eligible for PGS-Green certification. Adopter farmers would benefit from being able to charge higher prices to customers.
- D. Establishing demonstration plot:** One of the most effective tactics for farmers to believe is to see a productive and successful model. Therefore, to ensure that ZBNF practices are successful, one demonstration plot may be set up in each village through local NGOs or at the fields of progressive farmers to show the local farmers. Peer-to-peer communication and word-of-mouth would facilitate the practice's rapid expansion.

19.7 Conclusion:

The foundation of Zero Budget Natural Farming (ZBNF) is agroecology, which is based on cultural creativity and promotes ecological biodiversity. It can be achieved through strengthening ties between communities, mutual aid, giving people more control over their live. It is the exact antithesis of industrial agriculture, which uses a one-size-fits-all approach and places a monoculture and sustainable intensification at its core.

Compared to traditional farming, the crop output in ZBNF is less. Still, crop output greatly increased with the use of FYM, Jeevamritha. Due to the lack of costly agrochemicals, it was clearly clear that ZBNF had significantly lower input costs than conventional. Improved profitability (B:C ratio) has been the outcome for farmers in ZBNF.

Consequently, even while zero budget natural farming techniques don't seem to improve production, they do cut costs, which boosts farmers' income.

19.8 References:

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