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Zero Budget Natural Farming (ZBNF) in India

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Abstract

Since centuries, India's economy has been based primarily on agriculture. Using traditional methods of agriculture is equivalent to spreading cancer to our soil and our health. Indian agriculture's crisis is extremely relevant right now as the green revolution's hopes are disappearing. With the vision of ensuring food security by restoring Indian agriculture in a sustainable and environment ways and releasing farmers from a cycle of debt and suicide. Therefore, Zero Budget Natural Farming (ZBNF) is the only method to address this growing issue. The word 'budget' refers to credit and expenses, thus the phrase 'Zero Budget' refers to situations in which the cost of production is zero. 'Natural farming' means farming with Nature i.e., rejuvenating soil and crop health through its own practices (Bijamrita, Jivamrita, mulching, intercropping, soil aeration, crop diversification, bunds, bio-pesticides etc.). ZBNF movement is currently the most well-known agrarian movement. It started in 2002 in Karnataka and later spread successfully to many states across the country (especially South India) through several trainings, demonstrations, and promotional activities. Farmers depend on inorganic or external chemical inputs like pesticides and fertilisers, which contaminate groundwater and other ecosystems that depend on water. It also leads to reduction in soil fertility over time. Zero budget farming promises to exorbitantly reduce production costs. Zero budget farmers relies on mulching, soil conservation techniques, natural pesticides and fertilizers. It contributes to sustaining the health of the soil because continuous crop residue retention maintains the soil's fertility. One of the most important aspects of Zero budget natural farming crop production systems is the management of pests and diseases. ZBNF allows farmers to cultivate healthy, likelihood food without the use of chemicals.

Key Words: ZBNF, food security, natural farming, mulching, soil fertility

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Introduction

In India, where more than 70% of the population depends on agriculture both directly and indirectly, it is the primary sector of the economy and contributes for 20.5% of Gross Domestic Product. After green revolution, Indian agriculture transformed from subsistence to a commercial condition, and food grain production greatly increased to satisfy the demands of the growing population. Pesticides, fertilisers, and inorganic chemicals are overused in modern agriculture. Increased use of chemicals like pesticides and fertilisers leads to high input costs, a loss of soil fertility, and a significantly increased accumulation of chemical residues in soils. In this view, there is an immediacy for sustainable development of agriculture to feed the growing population. ZBNF is perhaps the most successful agrarian movement in the world in terms of its reach. Zero Budget Natural Farming (ZBNF), the name defines itself where the cost of cultivation levied to farming is 'zero' i.e., without any credits and expenses done on required inputs till the harvest of crops. This system emphasizes on holistic spiritual farming (also called Zero Budget Spiritual Farming – ZBSF) brought to practice by Subash Palekar who is also considered as father of zero budget farming. Now, this natural farming system has been renamed as Subash Palekar Natural Farming (SPNF).There are several advantages of shifting modern day agriculture to basic or traditional approach by adopting zero budget natural farming.

Zero Budget Natural Farming (ZBNF) practices include crop rotation, green manuring, multistoried cropping, biological pest control etc. The four pillars of ZBNF are beejamrutham, jeevamrutham, acchadana (mulching), and waaphasa (moisture). With "Zero Budget Natural Farming" it may be possible to stop relying on loans, significantly reduce production costs, and free farmers from the debt cycle.(Murall, 2016). ZBNF decreases the requirement for taking loans for agricultural purposes because it completely relies on using internal or naturally present inputs. Therefore, it may be a way to minimize farmer debt and suicide, especially among small and marginal categories. Further, by eliminating chemicals such as fertilizers, pesticides from farming activities, ZBNF can check further degradation and can restore the soil health. Ecological benefits of zero budgets natural farming have been also reported (Pawar *et al.,* 2013).All crops are grown with Zero Budget Natural Farming in all agroclimatic zones.

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Principles of ZBNF

According to Paleker (2014), the ZBNF's four principles are classified into different categories.

1. **Intercropping and Crop Rotation**

   Intercropping is the simultaneous cultivation of two or more distinct crops on the same plot of land. It results in increased solar radiation harvesting, better use of land and other resources, and control of evaporation and erosion etc. When the primary crop fails, it also helps farmers maximize their profits or provide for their demands. Intercropping and crop rotation protects the soil from becoming deficient of moisture and nutrients.

2. **Use of green manures and compost**

   In addition to using FYM from desi cows, green manures and compost are used as natural sources of nutrients.

3. **Biological pest control**

   It is necessary to implement biological plant protection measures, either by using natural enemies or on-farm prepared natural formulations. Bio-pesticides ('Neemastra','Bramhastra', 'Agniastra' etc.) made through natural or organic or bio-products are only permitted to use in zero budget natural farming during the times of pest and disease outbreaks to protect the plants to reach economic injury levels. They are effective in controlling various seed, soil and air borne diseases and insects such as jassids, aphids, white flies, mealy bugs etc.

4. **Mechanical cultivation**

Difference between ZBNF and Organic farming

ZBNF	Organic farming
Chemical-free inputs and other methods like intercropping and multi-cropping used	Only on chemical free inputs used
using the natural resources that are commonly available locally	Organic farming is more expensive
On the soil's surface, microorganisms and earthworms are encouraged to decompose organic matter.	Organic farming requires activities such as vermicompost preparation

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Homemade pest control methods	Bio pesticides used for pest control

Pillars of ZBNF

Four main pillars of zero budget natural farming are given by Palekar, 2014.

1. **Jivamrita/ Jeevamrutha**

   Jivamrita = Cow-dung (20 kg) + Jaggery (20 kg) +Urine (5-10 L) + Dicot flour (2 kg) + live forest soil (1 kg) + 200 L water.

   The mixture is regularly stirred three times a day while fermenting for 5 to 7 days.This supplies as irrigation water for 1 acre. It is essentially a type of bio-fertilizer that enriches the soil with nutrients for plants to absorb.It provides nutrients, but most importantly, acts as a catalytic agent that promotes the activity of microorganisms in the soil, as well as increases earthworm activity. The method becomes self-sustaining after the first 3 years of the transition from chemical to natural farming.

2. **Bijamrita**

   Bijamrita = Urine (5 L) + Cow dung (5 kg) + Lime (50 g) + Water (20 L)

   It is a seed treatment that can protect emerging roots against fungi as well as diseases that are soil- and seed-borne. Research studies showed that inoculation with bijamrita produces IAA and GA_3 (Sreenivasa *et al.*, 2010).

3. **Acchadana/mulching**

   Mulching can be done by using live, straw, or soil mulch. Mulching has a number of benefits, including as preserving soil moisture by minimising evaporation, weed control, and enhancing the soil's organic matter content.It covers the top soil from degradation and provides the soil's microorganisms a favourable environment.

4. **Whapasa/Moisture**

   ZBNF includes water conservation and precise water application based on crop water requirements. Whapasa focuses on increasing water use efficiency by reducing the quantity and frequency of irrigation water applications because crop growth only requires a small amount of water (in the form of vapour). Irrigation in alternate furrows at noon is one way to maintain water and air molecules in the soil. When air and water molecules are mixed properly, the soil is properly aerated and 90% less water is used, which is advantageous for rain-fed agriculture (Palekar, 2006).

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Benefits of ZBNF

- In ZBNF, there is no need for farmers to purchase inputs, hence there is no cost of production.
- Improves growth, yield and quality of the farm produce.
- ZBNF farms were able to survive long periods of drought and flooding.
- Improves soils' physico-chemical and biological properties and fertility status.
- The same plot of land can be used as a supply of nutrients by planting more crops and border crops.
- Effective pest control in ZBNF avoids harmful chemicals therefore decreasing the risk of biomagnifications, food poisoning, and pollution.

Future prospects

To know the potential of ZBNF, advanced research and farmer training programmes must be implemented. The results of ZBNF should be well documented and presented to the scientific community for future fine-tuning to increase their benefits. Applications and simulation models must be developed for better farm hood exploitation.

Conclusion

In order to ensure future food security, it is crucial to provide nutritional security, increase productivity while using less resources, and build the resilience of smallholder farmers. There is nothing to contradict the fact that ZBNF has been formed with a very positive mentality to help the farming community, regardless of the controversies and critics' points of view. Zero budget farming is both economical and environmentally friendly. Crop residues are continuously retained, which helps to protect the soil's health. The control of pests and diseases is another important aspect of zero budget natural farming crop production systems. However, it needs a strong research study or validation of its claim before its recommendation. To study the effects of ZBNF on the health of the soil, land, and environment, the socioeconomic status of farmers, and the nation's food security, multi-locational trials by unbiased, autonomous bodies like ICAR are essential. For the new farming system to be mobilised and effectively implemented, support from the government and various organisations is required.

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