



Zero Budget natural Farming Abhinav Yadav

Abstract

The farming system in India has shifted to commercial farming. Excessive use of chemical fertilizers, insecticides, pesticides etc. has not only exposed the farmer to high monetary risk and health risk but also exploited the ecosystem as well as environment in many ways. World is going to experience the severe food crisis by 2050 if it continues. Zero Budget Natural Farming (ZBNF) can be a viable solution of low input farming practices to achieve higher production with the motto of ensuring food security by reviving agriculture in environmentally safe way as well as to release farmers from debt cycle and suicides. ZBNF has its four major pillars viz., jivamrita, bijamrita, acchadana and whapasa which helps soil to rejuvenate, increases microbial population and enhances the crop yield. ZBNF include crop rotation, green manures, compost, biological pest control, mechanical cultivation mulching, soil aeration, intercropping, crop diversification, bunds, bio-pesticides etc. Here we discussed ZBNF requires low input cost, good soil health management, chemical-free healthy and safe production, challenges and opportunities to adopt ZBNF.

Keywords: Food security, green manures, bio-pesticides, zero budget, chemical-free

Introduction:

India, an agrarian economy with 1.4 billion people makes it second most populous country globally; sustaining 17.87 percent (world meter UNDESA, 2020) of the world's population always suffers the immense pressure of food security. India is projected to surpass China as the world's most populous country in 2023 (World Population Prospects 2022: Summary of Results, Department of Economics and Social Affairs. United Nations). So as to address the food shortage Increased crop production efficiency is required. Although the green revolution first increased crop productivity, which had a significant impact on the agricultural sector, from the late 1990s onward it started to lose

hope. As a result of persistent soil health deterioration brought on by extensive and unscientific chemical-based agriculture, production rates have stagnated, revealing the true nature of the green revolution. Due to a number of factors, modern chemical-based agriculture has increased production costs or decreased crop yield (Intawongse & Dean, 2006; Ayansina & Oso, 2006; Sreenivasa et al. 2010). Continuous use of chemical fertilisers, the soil's micro- and macrofauna have declined, which may have an impact on the C-N ratio and nitrification activity (Jenkinson, 1982; Shaikh & Gachande, 2015).

The majority of farmers in India have small or marginal land plots and their main issue is that if they spend more money on

inputs but don't get a good output owing to poor pest and disease management or unfavourable weather conditions, the cost of production will rise. Capital-less farmers are compelled to borrow money from private money lenders, and not only in years when crops fail due to the whims of the weather, but also on regular days when production plateaus are imposed from poor mother soil by the spread of chemical and mechanised farming practises, the return they receive is significantly less than their outlay. Furthermore, there is a glaring discrepancy between consumer buying prices and farmer selling prices due of middlemen's enthusiasm in the agriculture market. Farmers have little choice but to commit suicide in order to escape the grip of money lenders.

Shri Subhash Palekar developed the idea of zero budget natural farming (ZBNF), for which he was conferred the Padma Shri. Zero Budget refers to not using credit or spending any money on input purchases like insecticides and fertiliser. It is a sustainable method of farming that requires no financial outlay. It basically goes back to using just abundant natural resources, which were the sole basis of ancient agriculture. In this method, expenditures on purchased inputs are entirely disregarded. If some expenses are incurred, they are covered by the successful production. "ZBNF is self-nourishing and

symbiotic in nature."- Subash Palekar (Palekar, 2014). Through diversification, microbial activities, nutrient recycling, and the interaction of beneficial microbes, ZBNF is gaining pace as it preserves soil health for sustained crop production (Khadse et al., 2019). Even the Indian government is investigating these farming methods. However, before drawing any conclusions about the promotion or demotion of any of these farming technologies, it is necessary to conduct a thorough study of their opportunities, problems, and potential impacts on the nation's food security.

Zero Budget Natural Farming:

The ZBNF is arguably the most widespread agrarian movement in the world. By implementing natural farming on a zero budget, it is possible to transition contemporary agriculture to a basic or traditional method with a number of benefits. Ecological benefits of zero budgets natural farming have been also reported (Pawar et al., 2013). Palekar revealed in his research that, only the local Indian cow's excrement can successfully re-enrich the depleted soil. It is less effective to use the dung from Jersey and Holstein cows due to the presence of more pathogens in imported cow dung and urine and the 300-500 billion beneficial bacteria found in desi cow dung. You can even use the dung from bullocks or buffaloes if the local cows' dung runs out. The

black-colored Kapila cow's dung and urine are thought to have supernatural properties. Make sure that the cow dung and pee are as fresh and as stale as possible to gain the most benefit from them. 10 kg of local cow dung are needed for an acre of soil each month. One cow may help fertilise 30 acres of land each month because they produce an average of 11 kg of manure every day. Jaggery, dicot flour, and urine are all acceptable additives. The cow's excrement is more beneficial to rejuvenating the soil the less milk it produces (Babu, 2008).

Basic Pillars of ZBNF:

- 1. Jivamrita/ Jeevamrutha:** It is sprayed to the crops with each irrigation cycle or straight to the crops and is made up of the following: A barrel or other container is filled with 200 litres of water. It is filled with 5–10 litres of aged cow urine and 10 kilogramme of fresh local Indian-bred cow manure. Then, 2 kg of brown sugar (jaggery) and pulse flour are added to it, along with a handful of chemical-free soil, and it is properly combined. For a further 48 hours, the mixture (Jivamrita/Jeevamrutha) is kept in the shade for fermentation. In addition to providing nutrients, it also serves as a catalytic agent that encourages earthworm activity and soil microbial activity. Jeevamrutha aids in the prevention of bacterial and fungal plant diseases. the system becomes self-sustaining during the first three years of the transition, during which Jeevamrutha is only required. 200 litres of Jivamrita/Jeevamrutha mixed with irrigation water applied to the soil twice a month on a 1-acre plot of land, or 10% solution applied topically.
- 2. Bijamrith/Beejamrutha:** A seed treatment called bijamrith/beejamrutha is capable of shielding young roots from fungus as well as against diseases that are soil- and seed-borne. Research studies shown that bijamrith/beejamrutha inoculation helps to develop IAA and GA3 and protects the crop from hazardous soil-borne pathogens and young seedling roots from fungal and soil-borne and seed-borne illnesses (Sreenivasa et al., 2010). Similar ingredients like Jivamrita/Jeevamrutha (local Indian-bred cow dung and urine, lime, water, and soil) are used in its preparation. Similar ingredients like Jivamrita/Jeevamrutha (local Indian-bred cow dung and urine, lime, water, and soil) are used in its preparation. More specifically, a container with 20 litres of water is filled with 5 litres of cow pee and 5 kilogrammes of its dung, both of which were raised locally in India. Then, 50 g of lime and a fist of native soil are added and well combined. Leguminous seeds can be

coated and mixed by hand or dipped in a Bijamrita/Beejamrutha solution before being dried in the shade and planted.

- 3. Acchadana/mulching:** It might be accomplished using live, straw, or soil mulch. The three forms of mulching that are used are straw mulch, soil mulch, and living mulch. Legumes are a good example of a cover crop that can help control weed growth and improve water penetration. By fixing air nitrogen into the soil through their roots, nodules assist in supplying crops with N. Retention of these residues on the soil's surface promotes microbial nitrification and nitrate (N) release. Additionally, it provides the soil with organic matter, which is rich in micro- and macronutrients. increases soil temperature during the winter, improves seed germination without soil ploughing, and lowers soil temperature in harsh conditions. By reducing the evaporative loss of water from the soil layer and prolonging water retention, it conserves soil moisture. Applying soil or straw as a mulch before planting seeds or cultivating crops to cover open places in the ground.
- 4. Whapasa/aeration:** By reducing irrigation volume and frequency, it is enabling soil to supply water vapour to plant roots. Water conservation and precise water application

based on crop water requirements are the key issues at hand. Because not all plant roots absorb water and nutrients equally, water must be applied in alternate furrows. Younger horizontal and vertical roots absorb more water and nutrients than older roots. There is an equal amount of water and air present in soil, out of soil mineral and organic stuff. With the exception of plants that thrive in water, like rice, plants may die if excessive water application causes the soil to retain air and causes an oxygen shortage. The treatment interval should be extended because soil aeration is a crucial factor in plant growth. Palekar disputes the notion that plant roots require large amounts of water; rather, they require water vapour, and Whapasa/aeration is the situation in which both air molecules and water molecules are present in the soil.

Other ZBNF procedures

- 1. Crop rotation and intercropping:** Intercropping is the simultaneous cultivation of two or more distinct crops on the same plot of land. It leads to greater solar radiation gathering, better use of land and other resources, less evaporation and erosion, etc. In the event that their primary crop fails, it aids farmers in increasing their revenue or ensuring their survival. Cropping system diversification is another

crucial ZBNF technique because it disrupts pest and disease habitats and prevents their accumulation.

2. Plant Protection: When pest and disease outbreaks occur, only zero budget natural farming is allowed to apply bio-pesticides (such as "Neemastra," "Agniastra," "Bramhastra," etc.) to protect the plants from reaching economic harm levels. Aphids, jassids, mealy bugs, white flies, and other insects that are airborne as well as soil- and seed-borne illnesses and pests are effectively controlled by them.

- **Agniastra**, it is made up of 10 litres of local cow urine, 1 kilogramme of tobacco, 500 grammes of green chilli, 500 grammes of local garlic, and 5 kilogrammes of pulped neem leaves (crushed in urine). 2 l of Brahmastra are dissolved in 100 l of water for spraying. Pests including Leaf Roller, Stem Borer, Fruit Borer, and Pod Borer are effectively combated by it.
- **Brahmastra**, it is made by crushing and boiling in urine neem leaves, custard apple leaves, lantern camellia leaves, guava leaves, pomegranate leaves, papaya leaves, and white dhatura leaves. It is employed to eradicate all sucking pests, including fruit and pod borer.
- **Neemastra**, it contains local cow urine (5l), cow manure (5kg), neem leaves and

neem pulp (5kg), all of which have been fermented for 24 hours. It is utilised for Mealy Bug and pest sucking.

3. Bunds & Contours: Bunds and contours are built with the intention of reducing water-borne soil erosion and preserving rainwater for crop production.

Conclusion:

Farming with no budget is environmentally friendly. Costs for seeds, fertiliser, and plant-protection chemicals have been significantly reduced. It contributes to maintaining the health of the soil since the ongoing preservation of crop leftovers replenishes soil fertility. The control of pests and illnesses is another important aspect of low-budget natural farming crop production systems. Understanding how various parts of a certain ecosystem interact is crucial for effective pest control in ZBNF. The new agricultural approach has helped farmers escape the debt trap and given them the confidence to turn farming into a financially viable endeavour. In order to succeed, policy intervention is required. The difficulties and possibilities are two parameters that highlight the systems' gaps to researchers, scientists, and extension workers as well as their benefits to adopters.

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