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A Holistic Way to Sustainability: Zero Budget Natural Farming (ZBNF)

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Introduction

Zero Budget Natural Farming (ZBNF) is a farming practice that believes in the natural growth of crops without adding any fertilizers and pesticides or any other foreign elements. The word Zero Budget refers to the zero net cost of production of all crops (intercrops, border crops, multi crops). The inputs used for seed treatments and other inoculations are locally available in the form of cow dung and cow urine. A ZBNF practicing farmer has a lower cost of inputs and thus has a better capacity to increase incomes. At the same time, ZBNF crops help in retaining soil fertilizing and are climate change resilient. Addressing the United Nations conference on desertification (COP-14), the Indian PM told the global community that India is focusing on Zero-Budget Natural Farming (ZBNF). ZBNF was also highlighted in budget 2019 in the bid to double farmers' income by 2022.

However, scientists from the National Academy of Agricultural Sciences suggested that there is no need for the government to promote ZBNF unless there is proper scientific validation. It is a holistic alternative to the present paradigm of high-cost chemical inputs-based agriculture. It is very effective in addressing the uncertainties of climate change. ZBNF principles are in harmony with the principles of Agroecology. Its uniqueness is that it is based on the latest scientific discoveries in Agriculture and at the same time it is rooted in Indian tradition.

It was originally promoted by Maharashtrian agriculturist and Padma Shri recipient Subhash Palekar who developed it in the mid-1990 as an alternative to the green revolution method driven by chemical fertilizers pesticides and intensive irrigation. They argue that the rising cost of these external inputs was a leading cause of indebtedness and suicide among farmers while the impact of Chemicals on the environment and long-term fertility was devastating. Without the need to expend money on these inputs or take a loan to buy them the cost of production could be reduced and farming made into a zero-budget exercise breaking the debt cycle for many small farmers. The zero-budget farming aims

at pulling the farmers out of the debt trap that they found themselves in with the liberalization of the Indian economy. This is also an attempt to make small-scale farming a viable vocation.

In many states, farmers are in huge debt due to rising agriculture costs on the account of privatized seeds, farm inputs, and inaccessible markets. The high-interest rates for credit or loans that the farmers take from the easiest available lender made farming unviable.

The zero-budget farming model promises to cut down farming expenditure drastically and ends dependence on loans. It also reduces dependence on purchased inputs as it encourages the use of own seeds and locally available natural fertilizers. Farming is done in sync with nature, not through chemical fertilizers. Alternative low-input farming practices have emerged in India and across the world likely to reduce input costs and higher yields for farmers, chemical-free food for consumers, and improved soil fertility. Zero Budget Natural Farming (ZBNF) is one such low-input, climate-resilient farming that inspires farmers to use low-cost and locally-sourced and available inputs, eliminating the use of artificial/chemical fertilizers and industrial pesticides. Intercropping with leguminous crops is one of the components of Zero Budget Natural Farming (ZBNF) and it improves crop productivity and soil fertility by way of fixing atmospheric nitrogen. Further, the cow dung, urine-based formulations, and botanical extracts used in ZBNF help farmers in reducing the input cost.

Advantages of zero budget natural farming

According to National Sample Survey Office (NSSO) data, almost 70% of agricultural households spend more than they earn and more than half of all farmers are in debt.

- Toto achieve the central government’s promise to double farmers' income by 2022, one aspect being considered is natural farming methods such as the ZBNF which reduce farmers’ dependence on loans to purchase inputs they cannot afford. It reduces farming costs by reducing dependency on external inputs like seeds, fertilizer, pesticides, etc., which is a leading cause of indebtedness and suicide among farmers.
- The farmer can exercise the ZBNF without spending money on these inputs. So, the cost of production could be reduced and farming made into a "zero budget" exercise.
- ZBNF is helpful to fight against the impact of chemicals on the environment and long-term fertility.
- ZBNF is for the elimination of using chemical pesticides and the promotion of good agronomic practices. It improves soil conservation, seed diversity, and quality of produce.

An integral part of Zero budget natural farming

There are the four main components of the Zero budget natural farming which is beneficial for the improvement of the crop yield and also enhances the farmer's income.

1. Jeevamrutha: Soil inoculants

Soil nutrition is the most important factor for plant growth. The required soil health can be achieved by either using fertilizers (chemicals that affect the soil in the long run) or organic manure (a natural ingredient requiring manure preparation which is time-consuming and labor-intensive). But Zero Budget Natural Farming states the best method is to increase the microbial activity in the soil in such a way that nutrients are easily available, which is achieved by adding an inoculant made from fermented cow dung, and cow urine and jaggery.

Jeevamrutha, popularized by Shri Subhash Palekar, is considered to be a panacea for the prosperity of small farmers. It is important to provide a congenial environment to microorganisms that help in making available the essential nutrients for plant growth viz., nitrogen, phosphorus, and potassium, to the plants. It provides such an environment for beneficial microbes. Application of Jeevamrutha to soil improves the soil considerably. It also encourages microbial activity in the soil. This is an excellent culture for enabling the exponential increase of beneficial microbes. The microbes are added thru 2-3 handfuls of the local soil. Though it can be used even after 6-7 days, it’s quite a challenge getting near the mixture due to the overpowering stench, hence advisable to use this within 3-4 days of preparation.

2. Beejamrutha: The seed treatment

Beejamrutha is used for the treatment of seedlings or any planting material. It is effective in protecting young roots from fungus along with soil-borne and seed-borne illnesses that frequently affect crops after the monsoon period. Seed treatment is normally done to enhance the nutritional accessibility of seeds and to protect them from any stress to enhance their viability. The conventional way of doing that is to coat it with a chemical. But in ZBNF, the seed treatment is done using cow dung, cow urine, and soil. This adds to the advantage of protecting the soil from seed-borne diseases. Add beejmrutha to the seed of any crop as a seed treatment coat them and mix them by hand, dry well and use them for sowing. For leguminous seeds just deep them quickly and let them dry.

3. Mulching: An outer cover for the soil

Crop residue is used to cover the soil from direct sunlight hence reducing the evaporation loss and soil erosion. This, in turn, conserves soil moisture. Both earthworm activity and microbial activity increase drastically in such dark and moist conditions.

- ***Soil Mulch:*** This protects topsoil during cultivation and does not destroy it by tilling. It promotes aeration and water retention in the soil. Palekar suggests avoiding deep ploughing.
- ***Straw Mulch:*** Straw material usually refers to the dried biomass waste of previous crops, but as Palekar suggests, it can be composed of the dead material of any living being (plants, animals, etc)
- ***Live Mulch (symbiotic intercrops and mixed crops):*** According to Palekar, it is essential to develop multiple cropping patterns of monocotyledons (monocots; Monocotyledons seedlings have one seed leaf) and dicotyledons (dicots; Dicotyledons seedlings have two seed leaves) grown in the same field, to supply all essential elements to the soil and crops. For instance, legumes are off the dicot group and are nitrogen-fixing plants. Monocots such as rice and wheat supply other elements like potash, phosphate, and sulphur.

4. Waaphasa: Maintenance of soil water balance

Waaphasa is carried out by spraying water on biodegradable materials. For more yield, stem width should be higher which means root coverage should be higher. When water is given outside the canopy of the crop, the root will automatically spread. This would increase the vegetation. If a trench is done, it must be so at least a foot away from the canopy so that the root can grow until there. Once it does so, the second trench is to be dug during the next season outside the first one as now, the canopy is more. Typically, the atmosphere would contain about 35% humidity in summer, 65% humidity during the winter, and 95% during the rainy season. It is this natural moisture absorbed from the atmosphere that is used in ZBNF. Further, a multi-tier cropping system is used instead of monocropping. This provides two advantages: one preventing hot air blows during summer to withstand minimum irrigation and also withstand pest and insect attacks.

Benefits of Zero Budget Natural Farming

As both a social and environmental program, it aims to ensure that farming particularly smallholder farming is economically viable by enhancing farm biodiversity and ecosystem services.

- It reduces farmers' costs by eliminating external inputs and using in-situ resources to rejuvenate soils, whilst simultaneously increasing incomes, and restoring ecosystem health through diverse, multi-layered cropping systems.

- Cow dung from local cows has proven to be a miraculous cure to revive the fertility and nutrient value of soil. One gram of cow dung is believed to have anywhere between 300 to 500 crore beneficial micro-organisms. These micro-organisms decompose the dried biomass on the soil and convert it into ready-to-use nutrients for plants.
- Zero budget natural farming requires only 10 percent water and 10 percent electricity than what is required under chemical and organic farming. ZBNF may improve the potential of crops to adapt to and be produced for evolving climatic conditions.
- With the rising cost of external inputs (fertilizers and pesticides), which is the leading cause of indebtedness and suicide among farmers. According to the National Sample Survey Office (NSSO) data, almost 70% of agricultural households spend more than they earn and more than half of all farmers are in debt.
- Since in ZBNF there is the need to spend money or take loans for external inputs, the cost of production could be reduced and farming made into a “zero budget” exercise.
- At a time when chemical-intensive farming is resulting in soil and environmental degradation, a zero-cost environmentally-friendly farming method is a timely initiative.
- The ZBNF method promotes soil aeration, minimal watering, intercropping, bunds, and topsoil mulching and discourages intensive irrigation and deep ploughing.
- It suits all crops in all agro-climatic zones.