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# Zero Budget Farming in Relation to Present and Future of Indian Agriculture

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## SUMMARY

Zero Budget farming is a holistic agriculture practice that counters commercial expenditure and market dependency of farmers for inputs The word ' Budget' refers to credit and expenses, thus the phrase ' Zero Budget' means without using any credit, and without spending any money on purchased inputs. It has been a matter of concern that the smallholders (includes marginal and small farmers) who have been efficient are also the ones bearing the greater burden because the low levels of absolute return questions their livelihood sustainability. It is time that policy initiatives show urgency on the fact that smallholders lives matter. Zero Budget farmers use mulching, soil protection techniques, natural pesticides and fertilizers. The principal methods of ZBNF include crop rotation, green manures and compost, biological pest control, and mechanical cultivation. There are, most popular, 4 pillars of ZBNF i.e. Jivamrita, Bijamrita, Acchadana and whapasa.

## INTRODUCTION

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 consumes and improved soil fertility. Zero budget natural farming 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 fertilisers and industrial pesticides. When Health is absent, wisdom cannot reveal itself, art cannot manifest, strength cannot fight, wealth becomes useless and intelligence cannot be applied". The above quote is self- explanatory that health comes foremost in our lives but today the issue regarding general health of humans is far more than terrible. Our daily lifestyle has worked as a fuel for the fire that is burning our body with diseases we could not possibly imagine a century ago. But far from that the food we intake to fuel our lives has become a slow poison. After witnessing the harmful effects of chemical farming, newly introduced agriculture technique among farmers is, Zero Budget natural farming , also known as Zero Budget Spiritual farming. Zero budget farming is a set of farming methods that involve zero credit for agriculture and no use of chemical fertilizers. This evolved as a farming movement in Karnataka as a result of collaboration between agriculturist Subhash Paleker and stat farmers association Karnataka Rajya Raitha Sangha (KRRS) Zero budget natural farming in India . Zero Budget farming model promises to cut down farming expenditure on loans. It also reduces dependence on purchased inputs as it encourages use of own seeds and locally available natural fertilizers. Farming is done in sync with the nature not through chemical fertilizers.

### Background of Indian Agriculture

`Agriculture in its prevailing form requires farmers to rely heavily on inorganic external chemical inputs such as fertilizers and pesticides. These contaminate groundwater and other water dependent ecosystems, reduce soil fertility over time, and contribute to biodiversity loss in farmlands . The use of such inputs exposes smallholder farmers to a high degree of credit risk, and traps them in a perpetual cycle of debt. An agricultural system with such exposure to risk favours large farming, and adversely impacts the 2.5 billion people who are involved in full- or part-time smallholder farming worldwide. Small holdings are a critical source of livelihoods, and smallholders in developing countries produce about 80 per cent of the food consumed. They are also integral to addressing the global food security challenge, which will compound multi-fold by 2050. Prevailing agricultural practices such as mono-cropping decrease soil moisture content, causing tremendous stress on water resources. Agriculture, today, accounts for almost 70 per cent of the world's freshwater consumption. The use of external inputs by adoption of uniform, hybridized, and genetically modified crop varieties erodes genetic diversity of seeds, and reduces their capacity to adapt to changing climatic conditions. These practices, coupled with widespread farmland degradation, make agriculture a major contributor to global greenhouse gas (GHG) emissions, and climate change. Alternative low-input farming practices have emerged in pockets across the world promising reduced 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 type of farming that encourages farmers to use low-cost locally-sourced inputs, eliminating the use of artificial fertilizers, and

industrial pesticides. Natural farming was first popularized by the Japanese scientist and philosopher, Masanobu Fukuoka, who practiced it on his family farm in the island of Shikoku. In India, noted agriculturist Subhash Palekar has helped popularize ZBNF practices across the country.

## Indian agriculture Before and After Independence

Agriculture has been an integral part of the Indian Economy, before and after Independence, despite its decline in share of GDP (17.2% as of 2011). Half of India's population depends on Agriculture as a livelihood. India is 2nd in farm output. Indian agriculture has witnessed wide variations in growth performance during a span of six decades after independence. The variability was particularly pronounced due to the subsistence nature of farming in India and the sector's heavy dependence on monsoon and other climatic parameters. In the initial years after the inception of planned development, it was the green revolution technologies that fired up growth in the sector for nearly three decades. The impact of green revolution tapered off gradually towards the later years of the last century. Economic reforms initiated in early nineties had a significant impact on agricultural sector, primarily due to the opening up of economy to external competition, liberalization of trade and deregulation of input and other sub-sectors. (to overcome difficulties in identifying structural breaks or secular acceleration etc due to inter year fluctuations and to capture the effects of major changes in technologies and policies on the sector in various phases, an analysis based on decadal trend growth rates was carried out . The GDP-Agriculture series (1950-51 to 2010-11) was first smoothened by taking 2-year moving averages to remove the effects of abrupt weather variations and other shocks. Further, trend growth rates were estimated by fitting semi-log trend to the smoothened data).

Five distinct phases of growth were identified:

- Phase I: Pre-green revolution Period (1950-51 to 1967-68)
- Phase II: Early green revolution period (1968-69 to 1985-86)
- Phase III: Period of wider dissemination (1986-87 to 1996-97)
- Phase IV: Post-Reform Period (1997-98 to 2005-06)
- Phase V: Period of Recovery (2006-07 to 2009-10/2010-11)

## Why Zero Budget Natural Farming

- Rising cost of Inputs.
- Volatile market price.
- Fragile ecosystem- Unpredicted monsoon extremes.
- Large suicide of Farmers
- Rising Environmental concerns
- Change in Consumers Preference toward Safety food.

## What is Zero Budget Natural Farming?

This is a form of low external input sustainable agriculture (LEISA). Rather, an extreme form that does not shy away from suggesting that there is no need to use any external inputs. All inputs are to be locally resourced from in and around the village (or perhaps within the farm) in a symbiotic way. This is a dynamic system wherein outputs are likely to be inputs to at least one of the other outputs. More importantly, as none of the inputs are sourced from outside the system then there is no cost, and it is this that is referred to as zero budget natural farming (ZBNF). The logic of the system is simple. If rainforests can have lush growth and also sustain animals then why cannot we propagate agriculture through lessons from nature without recourse to any chemicals and fertilizers. A call to nature where no external inputs need to be purchased is referred to as zero budget natural farming or naisargik sheti or jaivik kheti. This form of agriculture is being propounded by Mr. Subhash Palekar who was trained as an agricultural scientist and did begin his career with an emphasis on input-intensive cultivation that relied on chemicals and fertilizers. However, declining yield after its use for more than a decade made him question the method. This led him to examine in detail and he started experimenting in his own farm where he

learnt that the reliance on external inputs can be reduced. He also started sharing his knowledge with other farmers.

**Four pillars of ZBNF**

**1 Jeevamrutha/Jivamrita:**

This is a fermented microbial culture prepared from locally available natural resources for the purpose of being applied to the soils/plants at different stages of their growth. It is form of bio-fertilizer, a catalytic agent, promoting microorganism and earthworm activity in the soil. The 48 hour fermentation process multiplies aerobic and anaerobic bacteria present in the cow dung and urine, as they eat up organic ingredients, and a handful of undisturbed soil acts as inoculate of native species of microbes and organisms. Its application acts as a preventive measure against fungal and bacterial diseases. It can be applied through irrigation water or through foliar spray. While transiting from conventional input-intensive agriculture, the application of Jeevamrutha to the soils and plants is required only for the first three years because after that the system becomes self-sustaining.

**2 Beejamrutha/Bijamrita:**

This is a concoction prepared from locally available natural resources for the propose of treatment for seeds, seedlings or any planting material. It reduces the possibility of seed infestation by pests and protects young roots from fungus, soil-borne diseases, and seed-borne diseases that generally affect the plants after monsoon. In the ingredients, the dung and urine from the indigenous breed cow act as a powerful fungicide, and anti-bacterial agent, respectively.

**3 Acchadana/Mulching:**

There are three types of mulching.

**Soil mulching:** It protects topsoil by avoiding tilling. It facilitates aeration, and promotes water retention. If not zero tillage, avoid deep ploughing.

**Straw/Biomass mulching:** Application of dry organic matter (dead material of any living being) along with Jeevamrutha will lead to decomposition and humus formation that will improve soil fertility.

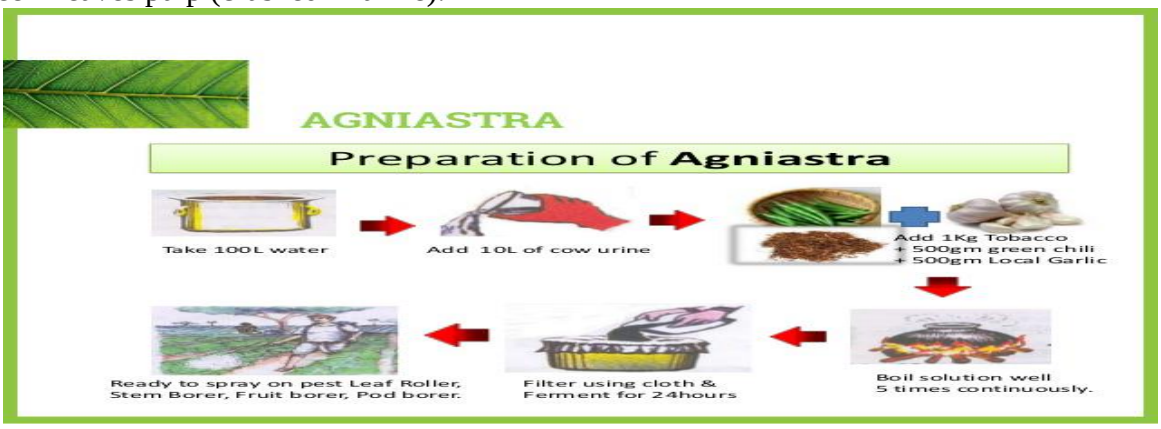
**Live mulching:** This suggests inter-cropping or mixed-cropping by combining monocots (those seedlings with one seed leaf like rice and wheat) with dicots (those seedlings with two seed leaves like legumes) in the same plot of land. This will create a symbiotic relationship because monocots will supply elements like potash, phosphate, and sulphur, while dicots will work towards nitrogen-fixation.

**4 Whapasa/Moisture:**

This calls for an appropriate mix of water and air in the soil or the relevance of soil moisture. It questions the thinking that plants need more water and irrigation is the way out. Rather, it calls for a reduction in water usage and resonates with the saying "more crop per drop."

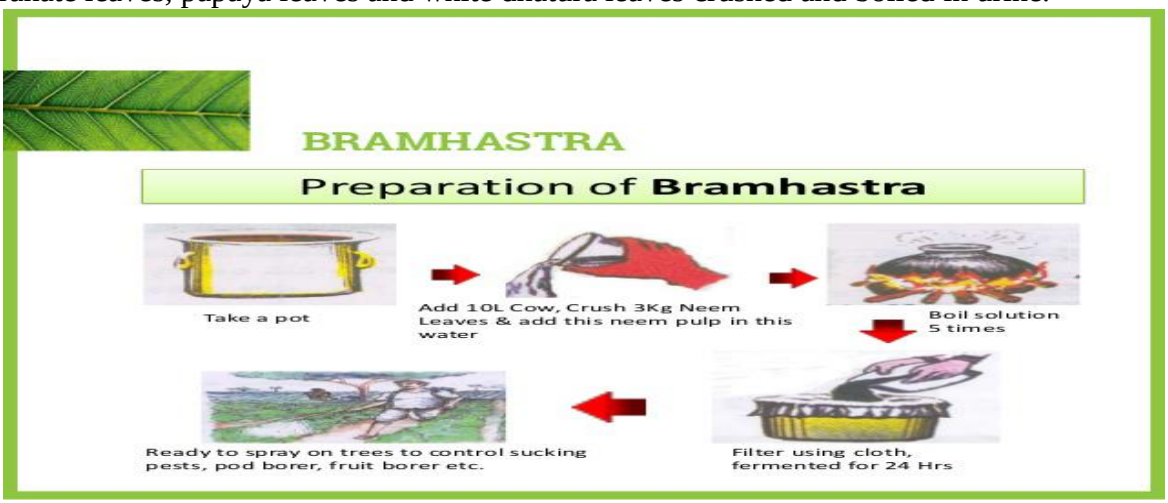
**PEST Mangement in ZBNF**

**Agniastra :** It composed of 10 L local cow urine, 1 kg Tobacco, 500gm of Green Chilli, 500gm of Local Garlic, 5 kg Neem leaves pulp (crushed in urine).



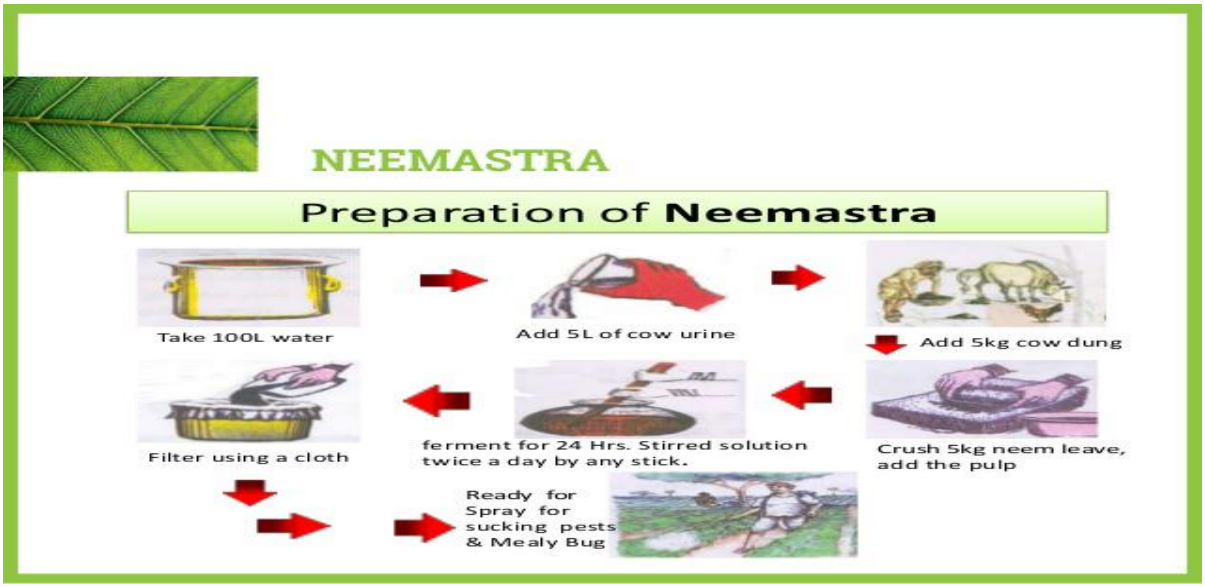
**Benefits:** It is effective against the pests like leaf roller, stem borer, fruit borer, pod borer.

**Brahmastra :** It is prepared by neem leaves, custard apple leaves, guava leaves, lantern camellia leaves, pomegranate leaves, papaya leaves and white dhatura leaves crushed and boiled in urine.




**Benefits:** it is used to control all of sucking pests, fruit borer, pod borer.

**Neemastra :** it is made up of local cow urine (5L ) , cow dung (5kg) and neem leaves and neem pulp (5kg) fermented for 24 hrs.




**Benefits:** it is used for sucking pests and mealy bug.

**Advantages of Zero Budget farming**

- Zero budget farming is environmentally friendly.
- Saving on cost of seeds , fertilizers and plant protection chemical has been substantial.
- Because of continuous incorporation of organic residues and replacement of soil fertility, Helps to maintain the soil health.
- Pest management is key component in zero budget natural farming crop production system.
- To successfully control pest in and zero budget natural farming it is important to understand the interactions of different component in a specific ecosystems.
- The new system of farming has forced the farmers from debt trap and it has instilled in them a renewed sense of confidence to make farming and economically viable venture often explore biodiversity than conventional farms.

**Scope Zero Budget Farming**

- 70% of land area is under dry land agriculture with marginal resource poor farmers.
- The average pesticide usage of country is 0.6 kg/ha< China (13kg/ha) <Korea (16.56kg/ha), so zero budget can be easily employed.
- 80% conventional yield can be achieved with Zero Budget Natural Farming.
- Farmer get premium price of 22-35% over conventional produce.
- Due to diversified cropping farmers get year round income and insurance against crop failures.
- The income obtained from the farm is high with low input.

**Challenges**

- A growing population with rising expectations demands increased agricultural productivity.
- A major challenge is understands how can we re-design the food system to be healthy, sustainable, and more resilient to climate change, helping to meet both the Sustainable Development Goals and the Paris Agreement.
- Appropriate policy govt-yet to be laid down by the govt.
- Setting specific standards for organic produce quality at each country level toward of challenging pest species at national or international level.
- Internalization of essential inputs resources at farmers levels to nature soil, crops and protect them from pessilence and herbivory.
- Development of package of practices for all crops.
- The name – 'Zero Budget Natural Farming' is confusing. If anyone hears the name for the first time, he/she will think that this approach requires no investment. But it requires investment to spend on labour, cow maintenance and water. The costs are very low when compared with other forms of agriculture, but it is not completely zero. To avoid this confusion, ZBNF was renamed as Subhash Palekar Natural Farming (SPNF). But, it was announced as ZBNF in budget 2019.

**Constraint**:

- While the method looks simple and easy to adopt, there are certain fundamental constraints.
- Even if the inputs are freely available in nature , farmers have to near the cost of labour for field work and cattle rearing collection of dung and urine, and in the preparation of jeevamrutha, neemastra and bramahastra.
- Besides health expensed of cattle, the cost of cattle feed is also quite high, because of reduced grazing lands and vanishing small waterbodies, fodder cost in recent years has skyrocketed making it as costly as milk.

**Zero budget farming is unsecure for present situation:**

In the 1960s, the Green revolution increased food grain production with the aim of achieving food security and prevented famines. At present India's population is increasing. So we need an abundant food supply. This may not be possible if we completely switch to natural farming.

**CONCLUSION**

Zero Budget Natural farming has been emerged as a farming model for small and marginal farmers to overcome the farming distress and sustaining the livelihood farmers to overcome the faming distress and sustaining the livelihood and keeping the health of family on top priority. It reduces farmers costs through eliminating external inputs and utilising in-situ resources to rejuvenate the soil, simultaneously increasing incomes, restoring ecosystem/ soil health and climate resilience through diverse, multi-layered cropping systems. The several natural farming methods are in use from the past few years, they weren't known to many. And as a result, many farmers are still following chemical-based agricultural-based practices. As the importance of natural farming is reiterated in the budget, it gained wide popularity. This is a very good step. There is a need to conduct training programs all over India to help farmers in switching to natural farming methods. More efforts are needed by the government to research on other natural farming methods to find alternatives to cow-based agriculture.

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