

# ANALYSIS OF CONTROVERSIES AND CRITICISMS ON ZERO BUDGET NATURAL FARMING FOR SUSTAINABLE AGRICULTURE

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## ABSTRACT

In India after green revolution, the use of chemical fertilizers and pesticides in India has increased. The excessive application of chemicals having adverse impact on environment, soil, human health and purity of ground water. In this situation, ZBNF system was adopted to reduce the use of chemical fertilizers and pesticides. Zero Budget Natural Farming (ZBNF) was practiced and promoted by Subhash Palekar in India. ZBNF is expected to remain an ideal farming strategy. It has been proposed that residue-free farming may be a good middle ground between organic and chemical intensive farming. Natural farming has the potential to mitigate pollution from our agroecosystems as well as maintaining production/income and efficiency.

**KEYWORDS:** ZBNF, Jeevamruth, Beejamruth, Sustainable agriculture

## INTRODUCTION:

India is a diverse country with a wide range of climatic conditions and natural resources, and it is mainly an agriculturally dependent country in order to deal with the current demographic crisis (Pinipilli, 2019). There is a need to ensure the sustainability of natural resources without depleting them, especially in agriculture. In India after green revolution, the use of chemical fertilizers and pesticides in India has increased. These expensive and over use of chemicals are showing impact on farmers in reducing income and increasing of debts. The excessive application of chemicals having adverse impact on environment, soil, human health and purity of ground water. Since seeing the many negative consequences of using pesticides in agriculture, farmers are increasingly turning to zero-budget natural farming (ZBNF). It has gained widespread popularity in southern India, especially in Karnataka, where it originated (Kumar, 2012). It is now rapidly spreading across India. Mr. Subhash Palekar, a Padma Shri recipient, pioneered this zero-budget natural farming method in the Indian 1990s as an antidote to the Green Revolution (Korav et al., 2020). ZBNF is the method of farming without any investment or very less for external inputs Also called as Low Budget Farming. Via diversification, microbial activities, nutrient recycling, and beneficial biological interaction, ZBNF is gaining traction in restoring soil quality for long-term

crop production. Overall, biofertilizers play a major role in plant growth and production, making them an essential and important method for organic and sustainable agriculture (Upadhyay et al., 2020). Alternative low-input agricultural practices have sprouted up around the world, providing producers with lower input costs and better yields, chemical-free food for consumers, and improved soil fertility. ZBNF is a low-input, climate-resilient farming solution that allows farmers to use low-cost, locally sourced inputs while eliminating artificial fertilizers and pesticides for long-term agroecosystem management (Upadhyay et.al., 2019 & 2020) The 4 pillars of ZBNF:

1. Beejamruth
2. Jeevamruth
3. Mulching
4. Whapasa

### **1. Beejamruth:**

This is the one of the traditional methods and also a totally scientific method to treat the seeds before sowing. Farmers have been treating their seeds with local cow urine, cow dung, and a small amount of soil from the farm's bund or land since time immemorial (as stated even in our textbooks and other ancient literature, such as the Vedas). For preparation of Beejamruth we need 20 l water, 5 kg desi cow dung, 5 l desi cow urine, 50 gm of lime and one handful of soil from bund. As a result, in Natural Farming (ZBNF), seeds are prepared with a combination of cow manure, cow dung, and other locally available products that are equally good at avoiding seed-borne diseases (Sreenivasa et al., 2010).

### **2. Jeevamruth**

It is a microbial liquid that has been distilled. It encourages rapid biological activity and earthworm activity in the soil, thus making nutrients available to the crop (Devarinti SR ,2016). Jeevamruth is a 200-liter mixture of 10 kg of desi cow dung, 10 liters of desi cow urine, 2 kg of jaggery, and 2 kg of gram flour. Keep the jar in the shade for 48 hours to enable fermentation to occur. Jeevamruth is ready to use after 48 hours. One acre of land needs 200 liters of jeevamruth. For best results, apply twice a month at 15-day intervals. Jeevamrutha also helps to avoid bacterial and fungal plant diseases. Palekar claims that Jeevamrutha is only needed for the first three years of the transition, after which the system will be self-sufficient. These are cheaper, productive method of fertilizer application. It is essential to understand the valuable parts of bio fertilizers and execute its application to present day farming practices (Elisetty et al.,2020).

### 3. Mulching

Mulching is the process of coating the top layer of soil with mulch. A definite microclimate is needed for the proper growth, multiplication, and activity of beneficial microorganisms introduced by Jivamrut, there are 3 types of mulching methods.

- a. Soil mulch
- b. Straw mulch
- c. Live mulch

Topsoil is coated in soil mulch after planting, and tilling does not kill it. It improves aeration and water preservation in the soil. Deep plowing can be stopped in these systems. Straw mulching provides a microclimate that encourages the activity of microorganisms and local earthworms. When dead matter from living organisms, such as plants and animals, is buried in soil, the organic dry material decomposes and converts into humus. In Live Mulch, there are symbiotic intercrops and mixed crops grown in the same area as monocots and dicots. Plants that fix nitrogen are referred to as legumes.

In soil mulch topsoil is covered during planting, and tilling does not destroy it. It increases soil aeration and water retention. Deep ploughing should be avoided in such type of methods. In straw mulching it creates a microclimate which activates the microorganisms and local earthworms. Burying every living organism's dead matter like plants, animals, etc. in the soil, that organic dry content decomposes and transforms into humus. In Live Mulch with symbiotic intercrops and mixed crops cultivated in the same field with monocots and dicots. Plants that fix nitrogen are known as legumes. Other elements such as potash, phosphate, and Sulphur are supplied by monocots.

### 4. Whapasa

It means mixture of air and water in the soil particles. Whapasa is the soil microclimate in which soil organisms and roots can live safely due to the availability of adequate air and necessary moisture. There are few other important principles off ZBNF like intercropping, contours& bunds, mixed cropping crop rotation, cow dung, use of local species of earthworms (Palekar, 2006).

### ZBNF MOVEMENT

ZBNF is a sustainable agricultural movement which mainly composed of and run autonomously by small and marginal farmers of rural India. Although, it was started back in 2002 in Karnataka and subsequently in other states (particularly of South India) as a collective or social movement made by rural farming community, it did not grab any attention of public and private organisations, policy makers and scientists until recent times. ZBNF movement since its debut has critically raised questions on significance of modern day, s called 'techno-

scientific' or mainstream agriculture. La Via Campesina reported that ZBNF movement has improved not only crop yield but also socio-economic status of adopters as it reduces farm expenses to a minimum and makes the farmers self-sufficient. At local level,; Article no.IJECC.59278 icultural movement which mainly composed of and run autonomously by small and marginal farmers of rural India. Although, it was started back in 2002 in Karnataka and subsequently in other states (particularly of South India) as a collective ovement made by rural farming community, it did not grab any attention of public and private organisations, policy makers and scientists until recent times. ZBNF movement since its debut has critically raised questions on significance of modern day, so scientific' or mainstream agriculture. La Via Campesina reported that ZBNF movement has improved not only crop economic status of adopters as it reduces farm expenses to a minimum and ient. At local level, ZBNF movement spreads through informal connection between farmers. Community resource person or master farmer from group trains the other farmers. At state level, ZBNF movement has networks of volunteers (leaders, political party representatives, independents, Palekar and his devotees) which organise training camps. Training covers ecology, principles, philosophy, success stories etc. Initially, in obvious case, Palekar did not have mass base and got mixed response as farmers were unsure about the efficacy of his technology. Only few farmers got inspired by him and adopted ZBNF. The successful outcomes from their ZBNF fields convinced others and as a result, more and more farmers started to adopt this technology. From 2006 onwards, ZBNF got momentum as many new allies, volunteers were coming to be a part of this movement and they started to organise many training camps in order to spread ZBNF among farming community. For instance, Palekar and his followers organised a successful training programme in Wayanad, Kerala back in 2008. Farmers of many parts of Kerala and even from other states, who were losing faith in chemical based agriculture, participated in that programme with the hope of alternative solution of green revolution (rather, suicide revolution). It is worthy to mention that many alternative forms of agriculture were already developed by many historic names. But according to Palekar, all of those were unscientific and part of foreign exploiter system. He calls himself as a prime critic of certification of organic farm and its produce and states that natural farming or its produce can be certified by nature only, not by any third party. He has cited the instance of forest as natural system where fruits are produced without any interference of organic or chemical farming and mentioned that likewise the natural system, ZBNF is self-developing, self-nourishing and self-sustaining. With the success of the training programme in Wayanad, ZBNF movement has been spread to grass-root level of farmers through collective approach between successful farmers and ZBNF promoters. Training camps in presence of Subhash Palekar as chief speaker have been organised in many states (specially, of South India) and are still going on to spread this 'back to the basics' approach to the farming community. In all the training programmes, Palekar and other ZBNF activists have severely criticised green revolution and its devotees (agricultural universities, Govt. policies, researchers etc.) and promoted ZBNF through 'seeing is believing' approach. Khadse and Rosset recognised Palekar's way of communication to the farmers in their own farming language during training programmes and consideration of simple practices rather than sophisticated ones to explain at initial stage for better understanding as some key factors behind the popularity of ZBNF among the farming community. Later, with the joining of IT

professionals, ZBNF movement has got much bigger dimension as it has not only remained confined to physical workshops or training programmes but also got disseminated through various social media platforms (Facebook, Whatsapp, Twitter, Youtube, LinkedIn etc.), mobile phones to farming community of entire India and even to international farmers (such as Sri Lanka, Nepal etc.). It is noted that apart from Palekar's workshops, practical trainings at grass root level through local master farmers for others (farmer to farmer communications) have also resulted in massive spread of knowledge about ZBNF. Participation of farmers is therefore not only limited in Palekar's training or demonstration camps but also gets extended in their own field and successful responses in many cases have grabbed the attention of government and private organisations in recent times as they are joining hands with ZBNF approach and various initiatives are therefore now coming up. However, there is further need of suitable policy for ZBNF to take off properly. Nevertheless, Palekar's movement (ZBNF) is arguably the most popular and widespread movement so far in the context of Indian agro-ecological system.

### **Pest Management:**

Pest and diseases are major problems in cultivation of crops. And controlling of pest and diseases in natural farming by using natural methods is big challenge. Pest control is an ongoing issue for producers, and it provides an important benefit to the farming community, ZBNF plays an important role in sustainable pest management. They are Agniastra, Bramhastra, and Neemastra.

### **Agniastra:**

It is made up of 10 liters of local cow urine, 1 kilogram of tobacco, 500 grams of green chili, 500 grams of local garlic, and 5 kilograms of crushed neem leaves. 2 liters of Bramhastra are mixed with 100 liters of water for spraying. Agniastra is a very effective pesticide against leaf rollers, stem borers, fruit borers, and pod borers.

### **Bramhastra:**

Crush 3 kg of neem leaves, 2kg of custard apple leaves, 2kg of papaya leaves, 2kg of pomegranate leaves, and 2kg of guava leaves in 10 l of cow urine with some water. To spray one acre of soil, dilute 2-2.5 liters of this solution in 100 liters of water. This approach is extremely effective against sucking rodents and pod/fruit borers.

### **Neemastra:**

This solution is airtight for 24 hours after being prepared with 100 l of water, 5 kg of desi cow dung, 5 kg of neem pulp, and 5 l of desi cow urine. It is ready to use within 24 hours. It works very well against mealy bugs and sucking rodents.

## **CONTROVERSIES AND CRITICISMS ON ZBNF**

Although ZBNF has already brought a remarkable revolution in agrarian society, reports are also available regarding its missing magic as it fails to return after few years, what it has claimed earlier in many parts of India



including Palekar's native Maharashtra, where it was spontaneously adopted as an alternative of chemical based agriculture. Many ZBNF critics have already warned not to go for complete conversion of conventional farming to ZBNF without visualizing sufficient proof of its success. Also, some are in views that chemical based agriculture cannot be completely ignored and replaced by ZBNF considering the business point of view. The success of ZBNF in limited crops and in certain locations further raises questions on its uniformity in nation-wide agriculture. In fact, some already available mixed bag results of ZBNF project it as an overhyped agrarian movement. Critics have pointed out several questions as follows, which remain unanswered till date.

- Why is ZBNF to be given prime importance as an agro-ecological technique by rejecting others, since rests are also the part of regenerative agriculture like it?
- Why is not the authority totally transparent in sharing information about ZBNF activities, performance, reach etc. on public domain? Why is there so much secrecy to share information with public about agreements between organisations, studies on its feasibility? Why is there only the anecdotal success reports presented in websites of its promoters? Is ZBNF promoters biased on their technique?
- What will a farmer do if he/she does not have all the raw materials required in ZBNF as this farming approach follows strict guidelines of do's and don'ts? For example, native cow (*Bos indicus*) is not always available. In that case, is there any provision of using second best option? Clarification in this regard is inadequate and thus leads to confusion among farmers.
- Palekar always expresses his intolerance against every 'western' thing and promotes 'Indian-ness'. For example, he prefers native cow in place foreign breeds and urges others to treat it as 'God' (sacred). However, don't he and his devotees think that this idea of Indian-ness is limited to elite Hindu ideals? Although, any ZBNF training or various related statements did not openly promote a particular religion till date (For instance, many ZBNF farmers in Kerala are Christian by religion.), question may still arise in this regard.
- Is there the own charisma of ZBNF practices that works behind its adoption by the farming community or the charisma of Palekar's vision, dedication, motivational speeches, leadership behind the promotion of his brainchild? Instances are there that many farmers adopted ZBNF as they got influenced by Palekar's speech. In those cases, only biasness prevailed rather than debate before adoption.
- What has the authority done so far to resolve the matter that in many places, the master farmers (community resource persons) mostly act to impose the technique rather than to facilitate it, which ultimately leads not only to the dilution of learning process but also to confinement of knowledge within few farmers as the movement remains as a mere dissemination of ZBNF?

- Why don't ZBNF promoters give adequate attention regarding marketing of ZBNF produce as reports are available that both ZBNF and non ZBNF produces are being sold together in many places in same market in same price?
- Why is massive funding required to make success of ZBNF movement (for instance, in Andhra Pradesh, around \$2.3 billion credit) when ZBNF promoters at their start asserted that it doesn't need any external input (materials or credit)?
- Why is it called 'Zero budget natural farming' when it is not possible to do farming in zero monetary investment? In ZBNF activities, the raw materials required have some price (When raw materials used are the products of own farm, some income is sacrificed. When the raw materials are bought from others, some expenses are there.). Even, there are involvements of the farmer and his/her family in farming activities, which also have some values in terms of money. Further, expenditure is there in rearing native cow which is one of the cornerstones of this technique. Although, recently the term 'Zero budget natural farming' has been replaced by 'Subhash Palekar natural (spiritual) farming', still in most places it is popular in its former name and thus raises controversy among the farming community.
- What is the reason to give suddenly the prime importance to ZBNF in place of various other projects when they have earlier performed successfully on promotion of organic/natural farming? For instance, although 'Community managed Sustainable Agriculture' performed well in Andhra Pradesh and was popular among the farmers, government has replaced it by ZBNF.
- Why does ZBNF remain mostly as a South Indian agricultural movement rather than a Nation-wide agricultural movement till date?
- Why are the key proponents of ZBNF promoting components of conventional agriculture also? For instances, Niti Aayog, government of India, beside promoting ZBNF in nation, is also supporting the use of transgenic or genetically modified crops/seeds in agricultural activities. Andhra Pradesh government is allowing various national and international organisations to be the part of ZBNF movement in the state, and those organisations are also associated in promoting various components of chemical based agriculture and even, in some activities related to environmental degradation. The dual speaks of them are confusing and questionable.
- Who are the actual beneficiaries of ZBNF farmers or various corporate organisations?
- What are the backup plans for such big credits if ZBNF model fails due to marketing and other issues and financiers opt to relinquish their support or go to other high returning option?
- Is it possible to achieve food security of nation's enormous population using traditional varieties with half of yield potential of HYVs and hybrids?

- Why are the farmers kept only as mere consumers of this technique, not as advisers to put their own knowledge inputs?
- How will farmers keep perseverance and patience during transitional period due to lingering effect of chemical farming, if the funds allocated for ZBNF is totally used for its promotional purpose only and not mobilised to them for their survival?
- Does ZBNF provide adequate nutrition for high crop productivity as nutrient level of soil declines with intensive cropping? Is it possible enough to cover 30 acre of land with faeces of Indian cow breed providing on an average only 12 kg N per annum?
- Is it feasible to promote ZBNF without considering substantial evidences of its benefits?
- Is ZBNF really able to help farmers in doubling their income?

Apart from these, there is also controversy related to the way of digitising information by foreign organisations, which can be exploited for proprietary gains, not for the actual benefits of farmers. NAAS has concluded ZBNF as a myth and critically emphasised that although there may be some maundering instances of yield increments with ZBNF, quantum jump in the same is not possible without considering chemical based agriculture. Detailed reviews by many have also put ZBNF under question. Saldanha has mentioned that in spite of various promotional activities on ZBNF, very little communications regarding its socio-economic feasibility and environmental impacts have been actually made. Studies across India by ICAR-IIFSR (Modipuram), UAS (Dharwad) and others have already pointed out yield reductions in basmati rice-wheat (59% and 32% respectively), soybean-wheat, groundnutsorghum, maize-chickpea (30%), cotton+ groundnut (17%) systems. Reports are also available on shifting back to chemical farming from ZBNF even by the farmers of Palekar's native Maharashtra.

## CONCLUSION:

The external production cost in Zero Budget Natural Farming is zero or very low. This farming system requires no monetary commitment on the part of the farmer for the procurement of seeds, fertilizers, and plant safety chemicals. Natural Farming products are of high quality, have a pleasant flavor, and produce a higher yield. ZBNF is heavily reliant on its four wheels. It is important to understand the relationships of different components in a given environment when monitoring pests in ZBNF. This farming method would have a positive impact on all the natural resources of our environment, soil, and human health, as well as the purity of groundwater also managed. Sustainable land resource management is also a critical factor in reducing the pressures on all-natural resources and ensuring long-term crop production.



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