



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(1): 1208-1210
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www.thepharmajournal.com
Received: 01-11-2022
Accepted: 05-12-2022

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Zero budget natural farming in Assam

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Abstract

Green Revolution (GR) with the introduction of high yielding varieties and advancement of technology in agriculture able to transform India from food scarce country to food sufficient country by 1990s. But soon the ill effects of modern agriculture has realised on soil, environment as well as on human health resulting in stagnating/declining crop productivity (Rahman, 2015) [9]. Chemical fertilizers and pesticides affects soil health by killing millions of microbes present in soil which are important for sustaining crop yield (Jayashree and Vasudevan, 2007) [6]. The intensive agricultural practices accompanied with indiscriminate use of agrochemicals and plant growth regulators increases the cost of production and lower the profitability of farming. Moreover, the uncertain market conditions and climate change effects makes agriculture an unremunerative occupation to the small and marginal farmers of Assam. Under such condition, the phenomenon of natural Farming is the only solution to nurture the land and regenerate the soil by going back to our traditional methods of farming with the four pillars of Zero Budget Natural Farming (ZBNF) i.e. Jeevamrit, Beejamrit, Acchadana or Mulching and Whapasa (Khadse *et al.* 2018) [7] This is a possible step for sustainable growth of agriculture to produce nutritious food in sufficient quantity with ecosystem sustainability.

Keywords: Natural farming, ZBNF, green revolution, sustainability, Beejamrit, Jeevamrit

Introduction

India is the second largest populating country in the world after china where more than 75% people are dependent on agriculture for livelihood security. Hence agricultural sector is considered to be the backbone of Indian economy. However, the increasing population pressure and fragmentation of land holding forcing the farmers to use chemical fertilizers and pesticides injudiciously. This resulting in serious damage to the ecosystem and causing human health problems like cancer, reproductive health problems, mental retardation and kidney ailments (Kaur and Sinha, 2013) [10]. Thus pesticide poisoning is a significant problem in Indian states with intensive agricultural production. Moreover, rising expenses of external inputs (seeds, fertilizers, pesticides and herbicides) is the primary reason for debt and suicide amongst Indian farmers. The answer to these problems lies within the principles of Zero Budget Natural Farming (ZBNF). Under ZBNF, there is no need of spending money or taking loan for purchase of external inputs. These practices address a broad range of goals, including stimulating microbial activity, increasing soil carbon, adding nitrogen through green mulching and accelerating the availability of existing nitrogen in the top soil (Smith *et al.* 2020) [11]. Thus cost of production could be decreased and agriculture could turn into a Zero Budget endeavour.

Zero Budget Natural Farming (ZBNF)

According to NITI Ayog, Natural farming is a chemical free alias traditional farming method considered as agroecology based diversified farming system which integrates crops, trees and livestock with functional biodiversity. The term Natural farming was coined by Masanobu Fukuoka, a Japanese farmer and philosopher, in his book "The One Straw Revolution" in (1975). In India, Subhas Palekar (Maharastrian Agriculturist and Padma Shri Recipient) is considered as father of Zero Budget Natural Farming who developed it in mid-1990s as an alternative to the Green Revolution Methods. The phrase "Zero Budget" refers to growing crops with zero production cost. Hence Zero Budget Natural Farming (ZBNF) is the practice of growing crops without the use of any external inputs such as chemical fertilizers and pesticides to maintain harmony with nature by increasing microbial and earthworm population in soil. ZBNF ensures a cheap cost of production (zero cost) by utilizing the farm biomass recycling with major stress on biomass mulching, use of on farm cow dung- urine formulation, periodic soil aeration etc and help the small and marginal farmers to overcome the credit burdens.

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The government of India has been promoting organic farming in the country through two of their initiatives: 1. Paramparagat Krishi Vikas Yojana (PKVY) and 2. Rastriya Krishi Vikas Yojana (RKVY). These two programmes support all different types of chemical free agricultural methods including Zero Budget Natural Farming (ZBNF) since 2018 in India. But the topic ZBNF gained prominence when Finance Minister Nirmala Sitharaman mentioned it in her 2019 budget speech, speaking of it as a source of doubling farmers' income. In India, Natural Farming is promoting as Bharatiya Prakritik Krishi Paddhati Programme (BPKP) in states of Andhra Pradesh, Karnataka, Himachal Pradesh, Gujarat, Uttar Pradesh, Kerala and recently in Assam.

Principles of Zero Budget Natural Farming

The principles of Natural Farming, as advocated by Mokichi Okada, a Japanese philosopher in 1935 must fulfil five requirements (Anonymous, 1993; INFRFC, 1988; Matsumoto, 1993) [2, 5, 8]

- It must produce high quality food to enhance human health.
- It must be economically and spiritually beneficial to both farmers and consumers.
- It must be sustainable and easily applied.
- It must conform to nature and protect the environment.
- It must produce enough food for the world population.

Components of Natural Farming

According to NITI Ayog, Zero Budget Natural Farming based on four basic components/pillars as follows:

1. **Bijamrit:** The process includes treatment of seeds using cowdung, urine and lime based formulations.
2. **Jivamrit:** The process enhances the fertility of soil using cow urine, dung, pulse flour and jiggery concoction.
3. **Aachadana/Mulching:** The process involves creating microclimate using different mulches with trees, crop biomass to conserve soil moisture.
4. **Whapasa:** The process involves creating earthworms in the soil in order to create water vapour condensation.

Zero Budget Natural Farming (ZBNF) In Assam

Assam is an agrarian state of North- East India with more than 70 percent of its population rely on agriculture for livelihood security. Like other North-Eastern states practicing organic farming including Sikkim, Assam has tremendous potential to practice organic farming practices including Zero Budget Natural Farming (ZBNF) more particularly in hilly ecosystem. Assam is naturally blessed with fertile lands and diversified agro climatic conditions. Hence agriculture forms the backbone of socio economy of Assam. The state is mostly organic by default as out of net cultivable area of 4.3 million hectares, about 30.92 lakh hectare area have not seen the use of inorganic fertilizers and pesticides (Das, 2020) [3]. Rice is the staple crop in Assam producing food to more than 25 million people. Main kharif crops are autumn rice, winter rice, maize, pulses, kharif oilseeds, kharif vegetables etc. In rabi season, fields are occupied by summer rice, wheat, gram, rape and mustard, various rabi oilseeds, rabi vegetables, potato etc. Accept a few like wheat, onion and potato, rest of the crops are grown under traditional methods of farming using cow dung.

Assam is gifted by nature with plenty of rainfall and many swift flowing rivers and streams including mighty

Brahmaputra and Barak river. Hence crops are grown mostly under rainfed condition and out of total cropped area of 4.0 million hectare, only 5.4% area is irrigated (Agricultural Census, 2010-11) [1]. Moreover the diversified agro climatic condition of the state provide the scope of growing a wide range of horticultural crops like fruits, vegetables, spices, plantation crops, nuts and climate resilient tuber crops. Assamese people used to grow these crops under bari system in upland situations. Thus there is a huge potential for adopting natural farming practices in Assamese bari as ZBNF is based on producing polyculture, or short and long term (main crop) crops together so that the cost of cultivating the main crop can be recovered from the short duration crops, resulting in "Zero" spending for the main crop.

Organic Farming Vs. Natural Farming in Assam

Assam has 272 lakhs farming households out of which 85.59 farming households are small and marginal having operational land holding of less than 1-2 hectares (Agricultural Census, 2010-11) [1]. So to obtain desirable changes in socio-economic life of its esteemed farming population, there must be adoption of all sustainable and profit earning technologies for boosting production and productivity in due space and time. However, for better adoption of any technology, it must be easily available, profitable and environment friendly.

Organic farming uses bulky organic manures such as cow dung, compost vermicompost and organic fertilizers which are added to farm land from external sources. Besides these inputs are required in bulk amounts to fulfil the crops needs, thus organic farming practices are expensive and is not effortable for small and marginal farmers of Assam. On the contrary, Zero Budget Natural farming is an extremely low cost farming method moulding with local biodiversity. In Natural Farming, neither chemical nor organic fertilizers are added to the farmland from external sources and ploughing and weeding operation are not required as in organic farming system. Thus Zero Budget Natural Farming is a set of farming methods that involve zero credit for agriculture and no use of chemical fertilizers, hence increase farmers profit by maintaining harmony with nature for a sustainable production in future.

Suggestion and Recommendations

Natural farming is feasible in India with the following recommendations:

- Sensitization and motivation of the farming populations about the need to adopt Natural Farming technologies in right time and place.
- Government, KVKs, Universities and NGOs should organize workshop, seminar, conferences etc. for creating awareness among farming community.
- Universities and research organizations need to conduct research for validation of natural farming technologies for complete adoption.
- Government should provide subsidies in natural farming produces to the farmers and should avail crop loans with low interest rates.
- Government initiatives for certification and branding of natural farming products is required.

Conclusion

Assam is one of the most top five convenient states producing

variety of crops around whole India due to its fertile soil and diversified climatic conditions. Still we cannot ignore the fact that Punjab, Haryana, West Bangle, Maharashtra produces more crop than Assam. But analysing the other side we found that they use intensive agricultural techniques to produce these crops. Because of less or no use of chemical fertilizers and pesticides in production process, most of the areas in Assam are organic by default particularly fruits and plantation crop based multi-storeyed models established in bari system in this region. So these areas could be easily brought under Natural Farming system which will result in increase in productivity of crops due to application of Natural Farming component and inclusion of legumes in cropping system as against traditional system of farming prevailing in Assam. However, in the commercial vegetable and rice growing pockets, it will be difficult to change the mind set of grower farmers for adoption of complete Natural Farming practices. However, much more research and development activities are required in seed production, pest management, processing and marketing for achieving actual benefit out of the Zero Budget natural Farming in this region.

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