

AN ANALYSIS OF ZERO BUDGET NATURAL FARMING IN THE CONTEXT ANDHRA PRADESH

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Abstract

Agro-ecological principles and low-input farming techniques, known as "Zero Budget Natural Farming," are said to have the potential to increase farm viability and food security. There is a worry that the social movement that is propelling ZBNF adoption has outpaced the science that explains why it performs better than other farming systems. Based on twenty field plot experiments set up across six districts in Andhra Pradesh (SE India) and managed by locally based farmer researchers, we present the first "on the ground" evaluation of ZBNF performance. We demonstrate that there is no short-term yield penalty when using ZBNF in small-scale farming systems when compared to conventional and organic alternatives. Although we noticed variations in treatment effectiveness across agro climatic zones, we are unable to suggest specific solutions adapted to these various contexts at this time..

1. INTRODUCTION

Taking care of an extended populace of 9 billion by the mid-century is quite possibly of the most major test confronting humankind. Universally, agrarian creation dramatically multiplied somewhere in the range of 1960 and 2015. This was at first worked with, to a limited extent, by Green Revolution innovations to expand yields, and benefits, contrasted with customary strategies. The subsequent concentrated, high-input agribusiness depending on substance composts, pesticides and water system, has prompted proof of natural corruption and negative wellbeing influences related with openness to engineered synthetic compounds. Thus, more earth centered arrangements have emerged, like manageable heightening and agro ecology. Such arrangements have gained prominence as optional approaches to managing agrarian creation that align even more closely with the UN Sustainable Development Goals (Bharucha, 2020).

In India, cycles such as disintegration, fermentation, and salinization caused 49% of the land surface to be corrupted in 2006. Therefore, various agrarian frameworks have been fostered that are expected to be more practical options in contrast to high-enter customary cultivating frameworks. By 2015, India had the most natural makers overall. There are approximately 843,000 ranches that have been certified as natural across the states of Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Sikkim, and Tamil Nadu. Sikkim has been named the world's most natural state. On a fundamental level, natural farming

may be able to address environmental concerns due to its potential for using fewer pesticides and compound composts than conventional methods. In any case, switching from conventional horticulture to natural horticulture may result in a decline in yield and weaker transient yield. This will have obvious effects on food security and raises the question of whether natural farming can feed everyone without converting croplands into typical biological systems. Also, natural farming in India might not have the same financial benefits as conventional farming. The potential financial benefits of natural farming over conventional methods are diminished by agribusiness organizations' role in regulating the market for natural food, manures, and seeds. Agribusiness in farming has tended to focus on larger farming ventures while also becoming organized in administrative and outsider confirmation, frequently upsetting smallholders due to access or cost. This has resulted in increased levels of rancher responsibility, which have been found to contribute to an increase in rancher suicides in India (Das, 2020).

India is a different country with a large number of climatic circumstances and regular assets, and it is for the most part a horticultural reliant nation to manage the ongoing segment emergency. There is a need to guarantee the supportability of regular assets without exhausting them, particularly in horticulture. In India after green upset, the utilization of synthetic composts and pesticides in India has expanded. This costly and over utilization of synthetics are showing influence on ranchers in lessening pay and expanding of obligations. The inordinate use of synthetic substances antagonistically affecting climate, soil, human wellbeing and virtue of ground water.

Since seeing the many unfortunate results of involving pesticides in agribusiness, ranchers are progressively going to zero-financial plan regular cultivating. It has acquired boundless fame in southern India, particularly in Karnataka, where it began. It is currently quickly spreading across India.

Mr. Subhash Palekar, a Padma Shri beneficiary, spearheaded this zero-spending plan normal cultivating technique in the Indian 1990s as a remedy to the Green Revolution (Korav et al., 2020). ZBNF is the strategy for cultivating with no venture or extremely less for outer sources of info also called as Low Budget Farming. Through expansion, microbial exercises, supplement reusing, and advantageous natural collaboration, ZBNF is building up momentum in reestablishing soil quality for long haul crop creation. Generally speaking, biofertilizers assume a significant part in plant development and creation, making them a fundamental and significant technique for natural and economical horticulture (Upadhyay et al., 2020). Elective low-input farming practices have grown up around the world, makers with lower input expenses and improved yields, substance free nourishment for shoppers, and further developed soil fruitfulness. ZBNF is a low-input, environment strong cultivating arrangement that permits ranchers to utilize minimal expense, privately obtained inputs while wiping out fake composts and pesticides for long haul agro ecosystem the executives (Khadse, 2019).

2. LITERATURE REVIEW

In India, fodder sorghum [*Sorghum bicolor* (L.) Moench] covers 5.65 million ha (Anonymous 2018b), but it only covers 20,000 ha in Himachal Pradesh (Anonymous 2017a). It grows quickly,

is adaptable to various environmental circumstances, is tasty, nutritious, drought tolerant, and has a high production potential. Because this crop is a heavy eater of nutrients, soils with low fertility and organic matter content are severe restrictions to its development. In India, pearl millet is also referred to as bajra and is a significant fodder crop. According to Anonymous 2018b, it covers 6.98 million ha in India, including 6,250 ha in Himachal Pradesh (Anonymous 2017a). This crop has the capacity to produce a high yield even in conditions of moisture stress and a wide range of soil pH. Experimentation at CSK HPKV, Palampur, has demonstrated the superior performance of sorghum + pearl millet hybrids in terms of increased fodder yields and better seasonal dispersion.

Among the various Rabi fodders, oat (*Avena sativa* L.) can be introduced successfully in places with inadequate irrigation facilities. It spans around one million hectares in India, with a fodder production of 30-45 t/ha (Anonymous 2013). Because of its luxuriant growth, good palatability, and extremely nutritious quality, it is commonly planted for green fodder. Given the demand for green forage, mixed cropping of oat with fodder sarson (*Brassica rapa* L.) may be a viable option for increasing overall herbage yield, utilizing land more efficiently, and ensuring production stability.

Wheat (*Triticum aestivum* L.) is the second most significant cereal crop in India after rice, and it was a key crop during the green revolution and afterward. Wheat is grown on 30.23 million ha of land in India (Anonymous 2018b), and on 318.87 thousand ha in Himachal Pradesh (Anonymous 2019b). In a wheat-based cropping system, fodder crops can be planted before, after, or alongside wheat to increase forage availability without reducing food crop productivity (Kumar et al. 2012).

These cereal-cereal farming systems require a lot of nutrients and are mostly grown under inorganic nutrition conditions. However, on the one hand, the low income of small and marginal farmers restricts the use of pricey chemical fertilizers, and on the other, worries about soil depletion, environmental degradation, and nutritional imbalance brought on by continuous use of inorganic fertilizers call for research into and use of alternate sources of nutrition.

In this case, the application of organic manures has been proven to be promising in halting the fall in production through correction of secondary and micronutrient deficiencies, as well as enhancing the physical and biological health of the soil. Although organics are environmentally beneficial and sustain productivity, their restricted availability and inferior nutrient status are key barriers to their application in the agricultural production system. These limits can be solved by judicious application of manures and fertilizers in an integrated way to preserve long-term economic crop output and soil fertility. An integrated nutrient management strategy that makes use of both organic manure and inorganic fertilizer has been suggested as a logical solution. It is widely believed that judicious mixing of organic and inorganic fertilizer increases synchrony and decreases losses by converting inorganic nitrogen into organic forms. This is significant not only for improving fertilizer efficiency but also for lowering potential environmental issues that may result from their use. Organic materials, like farmyard manure, not only supply nutrients but also

growth-regulating compounds and enhance the soil's physical, chemical, and microbiological qualities.

2.1 STATEMENT OF PROBLEM

“AN ANALYSIS OF ZERO BUDGET NATURAL FARMING IN THE CONTEXT ANDHRA PRADESH”

2.2 OBJECTIVES

1. To investigate the impact of various nutrition sources on crop output and quality.
2. To examine the crop production in different fields.

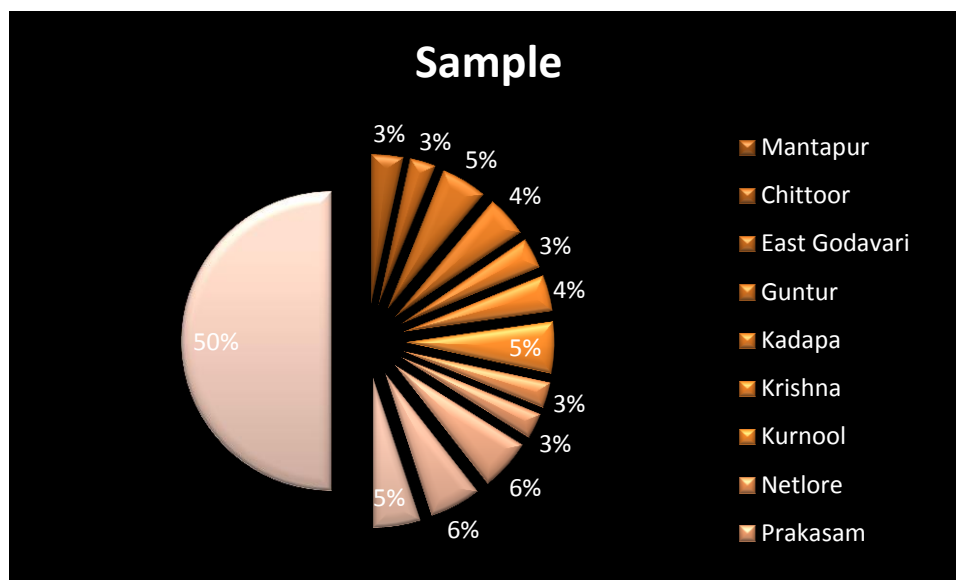
3. METHODOLOGY

The determination of mandals at area level depends on the sources of info given by Joint Director of Agriculture (JDA) and one town from each mandal was chosen with the assistance of Mandal Agricultural Officer (MAO). Adopter's rundown of ZBNF is gotten from MAO and ranchers are chosen haphazardly.

The underlying review test designated 60 respondents, five ZBNF ranchers each from 12 regions in Andhra Pradesh; in any case, n extra 30 respondents were remembered for the example given its reaction, bringing the absolute example size to 98.

Table 1 the total number of respondents in each district

District	Sample
Mantapur	6
Chittoor	5
East Godavari	9
Guntur	8
Kadapa	6
Krishna	7
Kurnool	10
Netlore	5
Prakasam	5
Srikakulam	10
Vizranagaram	10
Vishakhapatnam	9
Total	90



The significant focal point of the review evaluates the effect of Jeevamrutham/Ghanamrutham on yield, cost of development, lastly, the net returns.

The four examples of Ghanamrutham (two each from East Godavari and West Godavari regions) and two examples of Jeevamrutham (one each from East Godavari and West Godavari locale) are gathered to break down their synthetic properties.

Essentially, four soil tests from treated plots and four from control plots where the chief harvest is paddy and where Ghanamrutham has been applied were chosen for examining the compound properties. The dirt is gathered from similar towns of East and West Godavari where Ghanamrutham was gathered and applied.

4. RESULT AND DISCUSSIONS

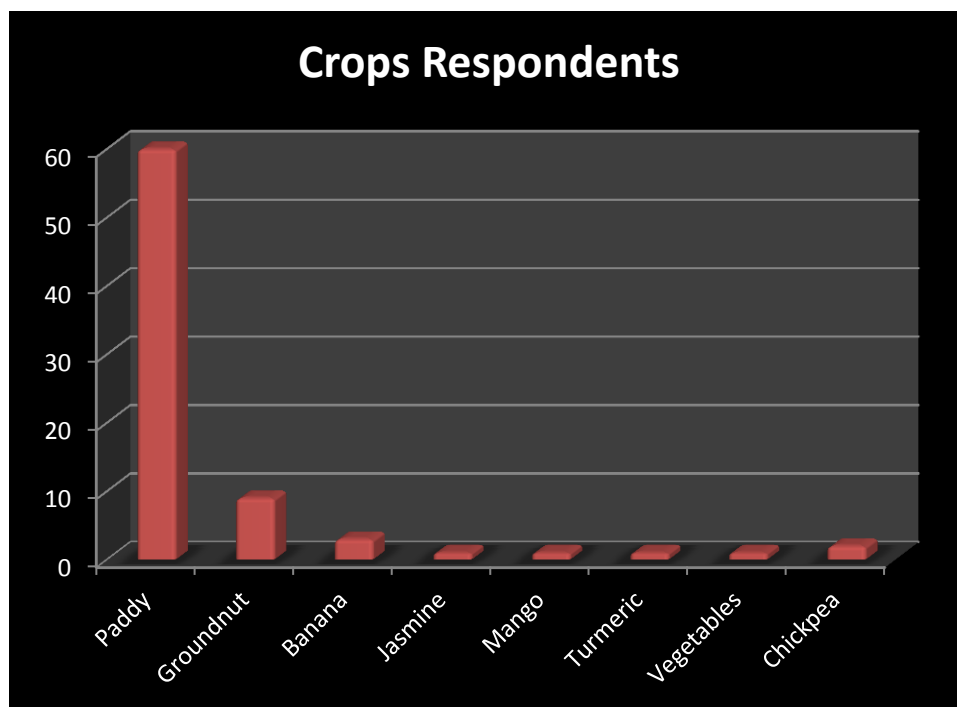
Crops grown in accordance with ZBNF

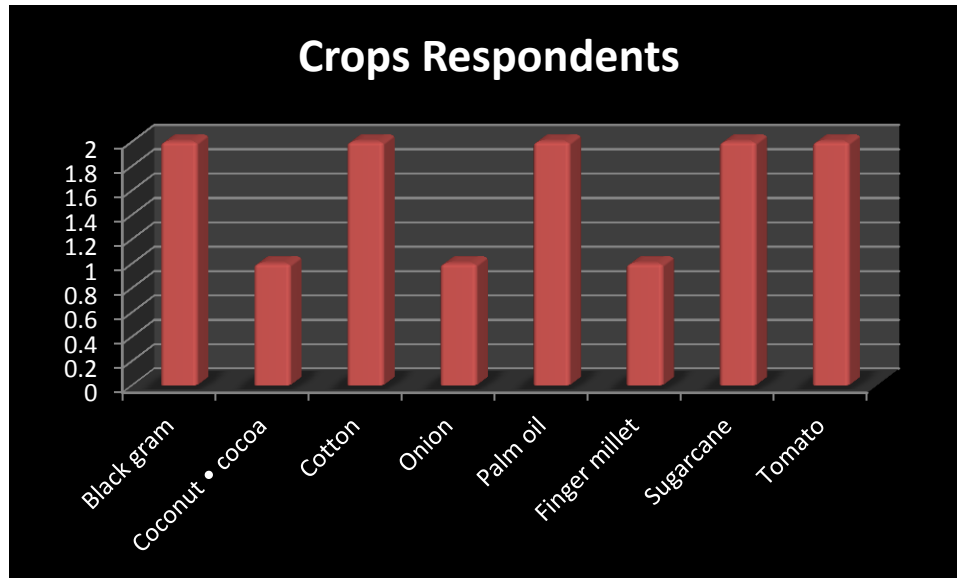
The yields developed by ranchers under ZBNF are displayed in. A greater part (68%) of the ranchers developed paddy, trailed by groundnut (10%). Nonetheless, cotton, pigeon pea, chickpea, and agricultural harvests like mango and banana were additionally seen to be developed utilizing ZBNF techniques. Since a larger part of the respondents were paddy cultivators, the review zeroed in on paddy to concentrate on the financial matters of ZBNF.

Table 2 Crops grown by ZBNF farmers

Crops	No. of Respondents
Paddy	60
Groundnut	9
Banana	3
Jasmine	1
Mango	1
Turmeric	1

Vegetables	1
Chickpea	2
Black gram	2
Coconut • cocoa	1
Cotton	2
Onion	1
Palm oil	2
Finger millet	1
Sugarcane	2
Tomato	2
Total	90





➤ **The ZBNF Scale**

A tireless discussion in the writing on agro-environmental cultivating revolves around scaling-out and increasing, significance surveying the viability of expansion frameworks in arriving at ranchers overall and more explicitly for advancing ZBNF as opposed to new advancements. It is apparent from the overview that ranchers apportioned practically 33% of their trimmed region to ZBNF cultivating.

Rancher's choices on taking on new advancements rely upon financial, institutional and ecological variables, showing that choice examples can be very territory explicit. It likewise includes asset allotment for the reception interaction.

Figure:1 provides information regarding farmers' crop-specific uptake of ZBNF A study of total area under cultivation reveals that, with the exception of chickpea, onion, and sugarcane, the majority of farmers did not devote all of their land to ZBNF. Only 31% of the area under mango, banana, and cotton was under ZBNF, whereas 38% was under paddy. Under ZBNF, Mango had the smallest area (28%).

➤ **Fields with and without ZBNF**

To accomplish higher creation it is important to further develop both soil wellbeing and the utilization productivity of nitrogenous and phosphatic composts. Shows the better soil wellbeing in a mango field, where ranchers had been rehearsing regular cultivating for the beyond 15 years. A similar examination of soil tests from ranchers' fields (ZBNF and non-ZBNF) (Table 3) uncovers that dirt natural carbon (OC) and all out N in fields of adopters were higher (42% and 71% separately) than those in non-adopters fields. There is no huge contrast in different supplements between the two treated and control plots. In any case, accessible P and Zn tended to decline under ZBNF practice (in all the four soil tests)

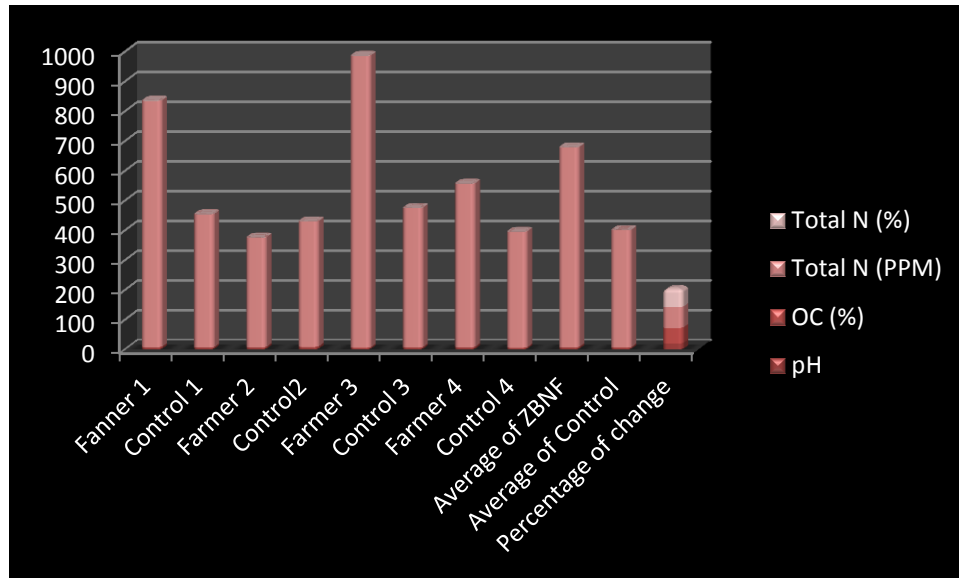
All out nitrogen which is a proportion of all natural and inorganic types of nitrogen in soil not entirely settled with soil testing. All out nitrogen must be utilized as a list of soil quality pointer and it assists in keeping up with ruining ripeness and pedo-climate. A dirt example examination showed that the N providing force of soils where ZBNF had been taken on was similarly higher

than that in no adopters' fields. This supports the hypothesis of use of manure/FYM/natural matter will work on the natural substance of the dirt, solely after deterioration or carbon sequestration.

Soil pH was marginally higher in ZBNF adopters than no adopters' fields, demonstrating that the utilization of ZBNF items prompted a decrease in soil fermentation which shows a positive reaction to higher nitrogen portions, which thus restrains digestion or capacity of soil natural matter.

Table 3 Soil sample chemical properties

Particulars	pH	OC	Total	Total	Available	Available
		(%)	(PPM)	(%)	P (PPM)	P (%)
Fanner 1	6.46	0.85	827	0.08	40.9	0.002
Control 1	5.62	0.36	447	0.05	45.3	0.005
Farmer 2	6.3	0.32	368	0.04	17.3	0.002
Control2	7.76	0.27	421	0.04	30.2	0.003
Farmer 3	4.54	0.66	980	0.08	50.4	0.004
Control 3	5.36	0.5	468	0.06	62.5	0.005
Farmer 4	6.35	0.42	549	0.05	35.0	0.003
Control 4	4.78	0.27	389	0.04	37.0	0.004
Average of ZBNF	6.14	0.53	671	0.07	30.5	0.0
Average of Control	5.12	0.35	394	0.04	35.7	0.0
Percentage of change	19.8	52.1	70	62.5	-15.86	0.0



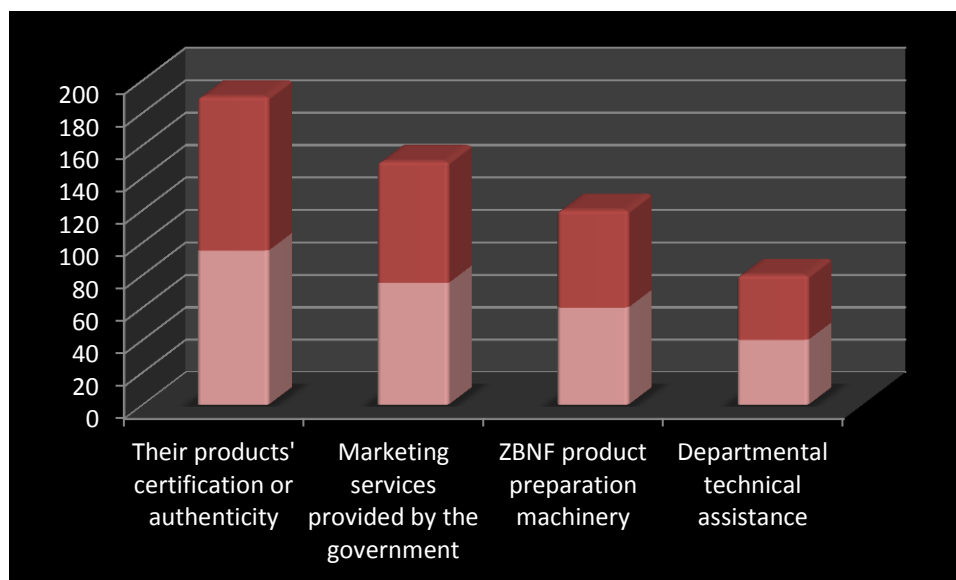
In any case, more soil tests should be gathered and broke down to get an all encompassing comprehension of soil supplement status as well as supplement elements in the dirt plant framework, especially in ZBNF ranches. This will assist in better supplement the board with further developing harvest yield, a significant analysis of the non-adopters.

4.1 SUGGESTIONS

Among the ideas, ranchers concocted (Table 4) for a more extensive spread of regular cultivating rehearses included confirmation by a capable power (100 percent) trailed by the arrangement of showcasing offices (86%).

TABLE 4 ADOPTER SUGGESTIONS

Parameter	Percentages of responses
Their products' certification or authenticity	95
Marketing services provided by the government	75
ZBNF product preparation machinery	60
Departmental technical assistance	40



Overall, the farmers believe that if the government so desires, it may promote ZBNF farming on a larger scale. It should start by developing certification guidelines. They mentioned examples of ZBNF products failing to control pests and illnesses (especially in fruit crops), causing them to resort to chemical control. Farmers also requested technical assistance, particularly in the management of pests and diseases.

5. CONCLUSION

There are a few benefits of moving cutting edge horticulture to 'straightforward methodology through zero spending plan regular cultivating. ZBNF has been advanced with extremely certain mindset to help cultivating local area. ZBNF development has further developed crop yield as well as financial status of adopters as it decreases ranch costs to a base and makes the ranchers independent. It's chopped down the need of accepting credits for cultivating exercises as it totally depends on utilization of interior sources of info. Hence it limits obligation and self destruction among the little and minor cultivating local area. The Union Budget 2022-23 has proposed to advance chemical free normal cultivating all through the nation, starting with 5km wide land hallways along the Ganga. The Budget likewise proposed updating educational plans in agrarian colleges to remember courses for ZBNF.

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