

## PERCEPTION OF FARMERS ON ATTRIBUTES OF ZERO BUDGET NATURAL FARMING

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### ABSTRACT

*This study was conducted in Vizianagaram district of Andhra Pradesh. In Andhra Pradesh, Zero Budget Natural Farming programme was launched in 2015-16 with the objectives of farmer and consumers welfare and conservation of environment. Andhra Pradesh ZBNF has now transcended itself into “Andhra Pradesh Community Managed Natural Farming” (APCNF) in June 2020 owing to its successful practices disseminated through communities. The results of the study revealed that most of the ZBNF farmers had medium (63.75%) perception followed by high (23.75%) on attributes of ZBNF. Whereas majority of Non-ZBNF farmers 43.33% had medium perception followed by low (41.77%) on attributes of ZBNF. In response to relative advantage, 87.50% of ZBNF farmers and 55.00% of Non-ZBNF farmers agreed and partially agreed respectively for more net profitability in ZBNF. For compatibility, 75.00% ZBNF farmers and 75.00% Non-ZBNF farmers perceived that the ZBNF practices were culturally compatible because, almost all ZBNF practices were indigenous practices in tune with their existing socio-cultural values and believes in the farming community. Majority (67.50%) of ZBNF farmers not agreed with the statement of difficulty in input application. Majority (72.50%) of ZBNF farmers partially agreed with the statement of easy to procure ZBNF inputs on small scale Majority (75.00%) of ZBNF farmers and 66.67% of Non-ZBNF farmers agreed with initial low yields and gradual increase in yields. With regard to predictability, 82.50% of ZBNF farmers agreed and 66.67% of Non-ZBNF farmers partially agreed on prediction of improvement in soil health in turn improvement in soil structure, nutrient status and increase in microbial activity in the soil.*

**Keywords :** zero budget natural farming, perception of farmers, natural farming, attributes of ZBNF

### INTRODUCTION

The Zero Budget Natural Farming can be split into two words namely Zero Budget which means minimising cost of cultivation by eliminating the purchase of off-farm resources and Natural Farming means farming with nature which eliminates the usage of chemicals like fertilizers, pesticides, fungicides and herbicides (Losira *et al.*, 2020 and Niti *et al.*, 2020). These practices saves the farmers from high cost of cultivation and help the farmers to produce best quality chemical residue free food through ZBNF. Zero Budget Natural Farming (ZBNF) practices includes crop rotation, multistoried cropping, green manuring, Preparation of kashayams, astras, biological pest control etc. beejamrutham, jeevamrutham, acchadana/mulching, waaphasa/moisture are popularly known as four pillars of ZBNF.

Andhra Pradesh ZBNF has now transcended itself into “Andhra Pradesh Community Managed Natural Farming” (APCNF) in June 2020 owing to its successful dissemination through communities. Zero Budget Natural

Farming (ZBNF) in Andhra Pradesh was implemented through Rythu Sadhikara Samstha (RySS) (corporation for farmers’ empowerment) which is located in Guntur district.

In ZBNF programme, knowledge was disseminated by using farmer to farmer strategy. Here the trainers were none other than successful ZBNF farmers called as Community Resource Persons (CRP’s). About 5,80,000 farmers were practicing ZBNF in 2,60,000 ha. in 3011 villages throughout the Andhra Pradesh. In Andhra Pradesh, Vizianagaram district was a leading district in Natural Farming which covers 38,000 hectares and about to get saturation.

Masanobu Fukuoka known as father of modern-day natural farming suggested the four basic principles (No ploughing, no chemical fertilizers, no weeding and no plant protection) of natural farming in his book ‘One straw revolution’ in 1957.

Yoshikazu Kawaguchi who was considered as the originator of second generation of natural farming, restates the following core values of natural farming in the documentary of “Final straw – Food, Earth, Happiness”.

Padma shri award winner Subash Palekar, the father of zero budget natural farming in India, started analysis on natural growth of trees and applied the forest principles on his farm in 154 research projects which provided the inspiration to the distinctive methodology of natural farming i.e., Zero Budget Natural Farming.

**Four Pillers/ Wheels of ZBNF**

**1 Jeevamrutham:** It was prepared by mixing dung and urine of an indigenous cow, jaggary, pulse flour, water, and soil to provide nutrients and acts as a catalytic agent that promotes the activity of micro-organisms and earthworms in the soil.

**2 Bijamritam :** It was prepared by mixing indigenous cow dung, urine, lime, a small quantity of forest soil and water for seed treatment and to protect the young seedlings from the soil and seed-borne diseases.

**3 Acchadana/Mulching:** Soil mulching, straw mulching, and live mulching were seen in ZBNF which avoided the loss of moisture from soil by reducing evaporation. In ZBNF, tillage was avoided to ensure crop residues to act as a mulching material and enhance the moisture content of the soil.

**4 Whapasa/Moisture:** Whapasa was the condition where exist both air molecules and water molecules present in the soil to reduced over-dependence on irrigation and to improve the soil aeration and soil moisture profile.

This study will helps to know the attributes of ZBNF, which allure the farmers to adopt ZBNF The findings of the study would help to understand the factors, which are contributing to large scale adoption of the ZBNF in Andhra Pradesh and other states of the country also.

**OBJECTIVE**

To study the perception on the attributes of ZBNF practices by ZBNF and non- ZBNF farmers

**METHODOLOGY**

The present research study was conducted in Vizianagaram district of Andhra Pradesh. Because it is the prime district for ZBNF having highest area i.e., 38000 hectares in A.P. Four mandals from Vizianagaram district viz, Gumma Lakshmi puram (G.L. Puram), Vepada, Kurupam and Garugubilli were selected purposively based on maximum number of ZBNF farmers. Total eight villages from four mandals (Tadikonda, Kedari puram, Gumma, D.L. Puram, Gollivalasa, Chilakam, Ballanki, Boddam) were selected randomly. A total of 140 farmers, 80 ZBNF practicing farmers at the rate of 10 from each village and 60 conventional farmers were selected randomly from eight villages. Ex-post facto research design was taken for the investigation. A structured interview schedule was developed for the investigation. The data collected through the schedule was analysed and computed by applying suitable statistical tools.

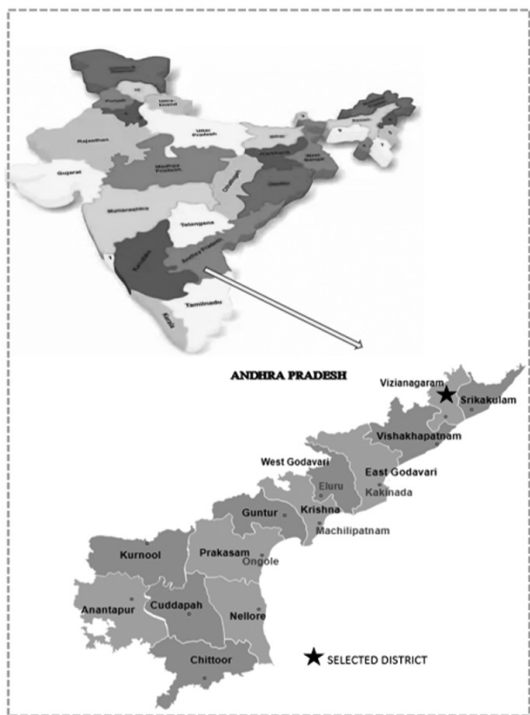


Fig. 1 : Map of India Showing Andhra Pradesh state

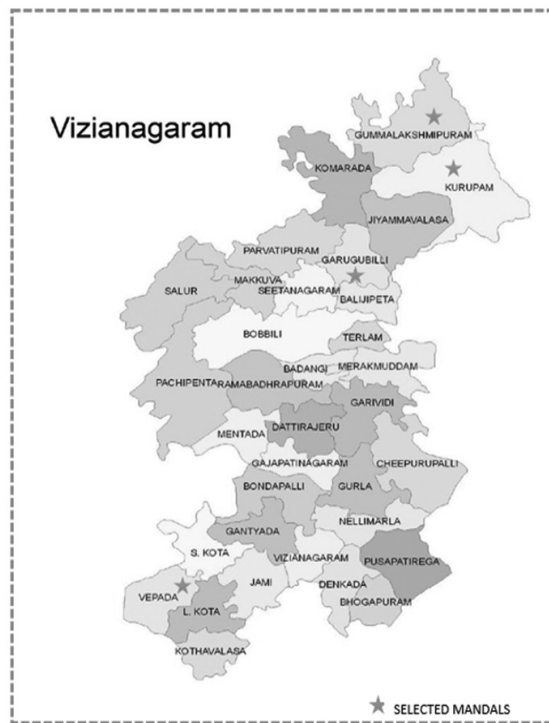


Fig. 2 : District map of Vizianagaram district with selected mandals

Attributes refer to qualities and characteristics possessed by an object. According to Rogers, any innovation has attributes viz, relative advantage, compatibility, complexity, trialability and observability.

In this study, perceived attributes of ZBNF were studied in terms of relative advantage, compatibility, complexity, trialability, observability and predictability. The schedule was developed to study perceived attributes of ZBNF based on the Scale developed by Shireesha (2015) with the suitable modifications. Three-point continuum (Agreed=3, Partially Agreed=2, Disagreed=1) was used to measure the perceived attributes of the ZBNF.

**RESULTS AND DISCUSSION**

The results of attributes of ZBNF perceived by respondents were presented in the table 1. Most of the ZBNF

farmers (63.75%) had medium perception followed by high (23.75%) and low (12.50%) on attributes of ZBNF. In case of Non-ZBNF farmers, majority of them (43.33%) had medium perception followed by low (41.67%) and high (15.00%) perception on attributes of ZBNF.

The results reflects that most of the ZBNF farmers had medium to high perception on attributes of ZBNF as these led to high interest on natural farming, its practices and benefits. They explored the information regarding ZBNF through extension agents, fellow farmers and mass media channels etc. Whereas, most of the Non-ZBNF farmers had medium to low perception, because they had less interest on it and also low extension contact. They didn't realize the actual benefits of the ZBNF due to low knowledge on ZBNF. These findings were similar to the findings of Akkamahadevi (2016) and Vanpariya *et al.* (2020).

**Table 1 : Distribution of ZBNF and NON-ZBNF farmers based on their level of perception on attributes of ZBNF**

(n = 140)

Sr. No.	Respondents category on perceived attributes	Class interval		ZBNF (n=80)		NON-ZBNF (n=60)	
		ZBNF	Non - ZBNF	F	%	F	%
1	Low	30 – 44	27 – 41	10	12.50	25	41.67
2	Medium	44 – 58	41 – 55	51	63.75	26	43.33
3	High	58 - 72	55 - 69	19	23.75	9	15.00

**Distribution of respondents according to their perceived attributes of ZBNF**

**Relative advantage**

Relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes. The relative advantage of ZBNF was expressed in following terms viz, more net profitability, use of locally available resources, chemical free manures, natural way of decomposing of farm waste and resources sharing from one enterprise as output to other enterprise as input.

In response to relative advantage, 87.50% of ZBNF farmers and 55.00% of Non-ZBNF farmers agreed and partially agreed respectively for more net profitability in ZBNF. Farmers of ZBNF realized the economic advantages of ZBNF over Non- ZBNF farmers. Majority of ZBNF farmers (82.50%) agreed and 45.00% Non-ZBNF farmers partially agreed with use of locally available resources in ZBNF because all the resources were available to the farmer either in the farm or within the village. Whereas, 93.75% ZBNF farmers and 90.00% Non-ZBNF farmers partially agreed with chemical free manures in ZBNF. Though most

of the Non-ZBNF farmers perceived the ZBNF practices as chemical free, they have not adopted ZBNF practices due to lack of skills in preparation of bio-solutions.

For the statement natural way of decomposition of farm waste, 70% ZBNF farmers partially agreed based on their realization of the fact that the farm waste could be used as manure after its decomposition which acts as mulch and nutrients to the soil and only 46.67% Non-ZBNF farmers partially agreed and for the statement resource sharing from one enterprise as output to other enterprise as input, 57.50% ZBNF farmers agreed and 36.67% Non-ZBNF farmers disagreed as most of the farmers growing crops only in their farms and they did not possess any other farm enterprises like dairy and poultry hence they did not realize the benefit of resource sharing from one enterprise as output to other enterprise as input.

**Compatibility**

Compatibility is the degree to which Zero Budget Natural farming is compatible and consistent with the existing value, their situation and past experiences of the respondents viz., culturally compatible, practically feasible, socially acceptable and ecologically sustainable.

(n=140)

Table:2 Distribution of respondents according to their perceived attributes of ZBNF

Attribute of ZBNF over Non -ZBNF													
Sr. No.	Components	Agree				Partially Agree				Dis Agree			
		ZBNF (n = 80)		Non-ZBNF (n = 60)		ZBNF (n = 80)		Non-ZBNF (n = 60)		ZBNF (n = 80)		Non-ZBNF (n = 60)	
		F	%	F	%	F	%	F	%	F	%	F	%
<b>1</b>	<b>Relative Advantage</b>												
a	Net profitability is more	70	87.50	15	25.00	08	10.00	33	55.00	02	02.50	12	20.00
b	Use of locally available resources	66	82.50	20	33.33	10	12.50	27	45.00	04	05.00	13	21.67
c	Chemical free manures	75	93.75	06	10.00	05	06.25	54	90.00	0	0	0	0
d	Natural way of decomposing of farm waste	24	30.00	19	31.67	56	70.00	28	46.67	0	0	13	21.67
e	resources sharing from one enterprise as output to other enterprise as input.	46	57.50	26	43.33	18	22.50	12	20.00	16	20.00	22	36.67
<b>2</b>	<b>Compatibility</b>												
a	Culturally compatible	60	75.00	45	75.00	17	21.25	10	16.67	03	03.75	5	8.33
b	Practically feasible	53	66.25	10	16.67	24	30.00	48	80.00	03	03.75	2	03.33
c	Socially acceptable	77	96.25	21	35.00	03	03.75	11	18.33	0	0	28	46.67
d	Ecologically sustainable	72	90.00	44	73.33	07	08.75	10	16.67	01	01.25	6	10.00
<b>3</b>	<b>Complexity</b>												
a	Difficulty in input application	17	21.25	40	66.67	09	11.25	16	26.67	54	67.50	4	06.67
b	Difficulty in preparation of kashayams and Ashtras	0	0.00	50	83.33	40	50.00	10	16.67	40	50.00	0	0

Attribute of ZBNF over Non -ZBNF													
Sr. No.	Components	Agree				Partially Agree				Dis Agree			
		ZBNF (n = 80)		Non-ZBNF (n = 60)		ZBNF (n = 80)		Non-ZBNF (n = 60)		ZBNF (n = 80)		Non-ZBNF (n = 60)	
		F	%	F	%	F	%	F	%	F	%	F	%
c	Difficulty in weed management	20	32.50	45	75.00	24	30.00	08	13.33	50	62.50	07	11.67
d	Difficulty in livestock management	56	70.00	42	70.00	14	17.50	13	21.67	10	12.50	05	08.33
e	Lack of availability of desi cows	51	63.75	46	76.67	25	31.25	14	23.33	04	05.00	0	0
<b>4</b>	<b>Trialability</b>												
a	Easy to procure ZBNF inputs in small scale	22	27.50	20	33.33	58	72.50	19	31.67	0	0	21	35.00
b	Easy to prepare ZBNF inputs in small scale	20	25.00	10	16.67	60	75.00	15	25.00	0	0	35	58.33
c	Easy to apply ZBNF inputs over small areas	71	88.75	12	20.00	07	08.75	18	30.00	02	02.50	30	50.00
d	Easy to monitor ZBNF fields in small scale	76	95.00	15	25.00	04	05.00	30	50.00	0	0	15	25.00
<b>5</b>	<b>Observability</b>												
a	Initial low yields and gradual increase in yields	60	75.00	40	66.67	20	25.00	20	33.33	0	0	0	0
b	Low incidence of pests and diseases	40	50.00	06	10.00	40	50.00	12	20.00	0	0	42	70.00
c	Good drought tolerance	50	62.50	05	8.33	16	20.00	06	10.00	04	05.00	49	81.67
d	Low cost of cultivation	58	72.50	13	21.67	18	22.50	13	21.67	04	05.00	34	56.67
e.	Good market price	30	37.50	09	15.00	50	62.50	12	20.00	0	0	39	65.00
<b>6</b>	<b>Predictability</b>												
a	Improvement in soil health	66	82.50	10	16.66	14	17.50	40	66.67	0	0	10	16.67
b	Improvement in human health	75	93.75	30	50.00	05	06.25	30	50.00	0	0.00	0	0
c	Good quality of produce	60	75.00	12	20.00	18	22.50	30	50.00	02	02.50	18	30.00
d	High consumer preference	57	71.25	26	43.33	17	21.25	23	38.33	06	07.50	11	18.33

With reference to compatibility, 75.00% ZBNF farmers and 75.00% Non-ZBNF farmers agreed that the ZBNF practices were culturally compatible because, almost all ZBNF practices were indigenous practices in tune with their existing socio-cultural values and believes in the farming community. Majority of ZBNF farmers agreed (62.20%) followed by 30.00% partially agreed on practical feasibility of ZBNF. Whereas, 80.00% of Non-ZBNF farmers partially agreed that ZBNF was practically feasible. Most of the ZBNF practices were simple and feasible to field level application. Majority (96.25%) of ZBNF farmers agreed and 46.67% of Non-ZBNF farmers did not agree on its social acceptance and 90.00% of ZBNF farmers and 73.33% of Non-ZBNF farmers completely agreed upon ecological sustainability of ZBNF practices where all agro chemicals can be avoided to maintain ecological balance, reduce soil, water and air pollution and finally decrease in chemical residues in food.

### **Complexity**

Complexity is the degree to which Zero Budget Natural farming is relatively difficult to understand and use viz., difficulty in input application, difficulty in preparation of kashayams and ashtras, difficulty in weed management, difficulty in livestock management and lack of availability of desi cows.

Majority (67.50%) of ZBNF farmers not agreed and 66.67% Non-ZBNF farmers partially agreed with the statement of difficulty in input application because, most of the ZBNF farmers felt that all ZBNF bio-solutions were easily applicable in their fields. Most of the Non-ZBNF farmers (83.33%) agreed and 50.00% ZBNF farmers partially agreed with difficulty in preparation of kashayams and ashtras due to lack of skills in preparation of kashayams and ashtras; 62.50% ZBNF farmers not agreed and 75.00% Non-ZBNF farmers agreed with the statement difficulty in weed management because there were no bio-solutions available to control weeds in ZBNF; 70.00% of ZBNF and Non-ZBNF farmers agreed on difficulty in livestock management and 63.75% ZBNF farmers and 76.67% Non-ZBNF farmers agreed with lack of availability of desi cows.

### **Trialability**

Trialability is the degree to which Zero Budget Natural farming practices can be experimentally practiced or verified in a small scale for assessing the advantage of the Zero Budget Natural farming *i.e.*, easy to procure ZBNF inputs in small scale, easy to prepare ZBNF inputs in small scale, easy to apply ZBNF inputs over small areas and easy to monitor ZBNF fields in small scale.

Majority (72.50%) of ZBNF farmers partially

agreed and only 35.00% of Non-ZBNF farmers disagreed with the statement of easy to procure ZBNF inputs on small scale because as all the ZBNF inputs were locally available in required quantities. Seventy five percent of ZBNF farmers partially agreed and 58.33% of Non-ZBNF farmers disagreed with the statement of easy to prepare ZBNF inputs on small scale. This might be because bio-solutions could be prepared even in small quantities; 88.75% of ZBNF farmers agreed and 50.00% of Non-ZBNF farmers disagreed with the statement of easy to apply ZBNF inputs over small areas and 95.00% of ZBNF farmers agreed and 50.00% of Non-ZBNF farmers disagreed with the statement of easy to monitor ZBNF fields in small scale for observing the changes.

### **Observability**

Observability is the degree to which results of Zero Budget Natural farming practices were observed practically viz., initial low yields and gradual increase in yields, low incidence of pests and diseases, good drought tolerance, low cost of cultivation and good market price.

Majority (75.00%) of ZBNF farmers and 66.67% of Non-ZBNF farmers agreed with initial low yields and gradual increase in yields because the yield stability starts after three years in ZBNF; 50.00% of ZBNF farmers agreed and 70.00% of Non-ZBNF farmers disagreed with low incidence of pests and diseases because, most of the ZBNF farmers follow IPM practices which help to control the pests and diseases; 62.50% of ZBNF farmers agreed and 81.67% of Non-ZBNF farmers disagreed with good drought tolerance because, most of the ZBNF practices help to improve the soil moisture holding capacity of the soils helping the crop to tolerate the drought conditions. 72.50% of ZBNF farmers agreed and 56.67% of Non-ZBNF farmers disagreed on low cost of cultivation due to elimination of usage of off-farm resources like chemical inputs and 62.50% of ZBNF farmers partially agreed and 65.00% of Non-ZBNF farmers disagreed with good market price for ZBNF produce which might be due to the ZBNF farmers getting extra price than MSP for their produce.

### **Predictability**

Predictability is the degree to which the progress and consequences of the Zero Budget Natural farming can be anticipated viz., improvement in soil health, improvement in human health, good quality of produce and high consumer preference.

With regard to predictability, 82.50% of ZBNF farmers agreed and 66.67% of Non-ZBNF farmers partially agreed on prediction of improvement in soil health in turn improvement in soil structure, nutrient status and increase in microbial

activity in the soil ; 93.75% of ZBNF farmers agreed and 50.00% of Non-ZBNF farmers partially agreed on prediction of improvement in human health by consuming the food free from chemical residues; 75.00% of ZBNF farmers agreed and 50.00% of Non-ZBNF farmers partially agreed on prediction of good quality of produce and 71.25% of ZBNF farmers and 43.33% of Non-ZBNF farmers were agreed on prediction of high consumer preference. Above all These findings of attributes were in line with the findings of Akkamahadevi (2016) and Shankar (2020).

Almost all ZBNF practices were indigenous practices and compatible to their socio-cultural values and believes of the existing farming community. Most of the ZBNF practices were simple and feasible to field level application. Most of the farmers perceived difficulty in preparation of kashayams and asthras due to lack of skills in preparation of kashayams and asthras and also perceived difficulty in weed management because there were no bio-solutions available to control weeds in ZBNF. Farmers could able to realize the improvement in soil health in turn improvement in soil structure, nutrient status and soil microbial activity improved human health by consuming the food free from chemical residues. The government should initiate facilitating desi cow to ZBNF farmers through cattle breed policy.

## CONCLUSION

From the above overall results, it is concluded that most of the respondents both ZBNF farmers and Non-ZBNF farmers perceived the relative advantages of ZBNF, but the farmers were lacking sufficient knowledge and skills on preparation and application of kashayams and asthras due to medium extension contact. Even though most of the ZBNF farmers perceived difficult regarding the preparation of kashayams and maintenance of indigenous cows, their perception on relative advantages of ZBNF was more despite difficulties leading them to adopt ZBNF practices.

## RECOMMENDATION/POLICY IMPLICATION:

- (1) The farmers need more support from the government side by giving certification and recognition for ZBNF produce for exploring more markets and export purpose to fetch better prices.
- (2) Effective strategy implementation to strengthen the ZBNF input shops making regular availability of all ZBNF inputs as in regular input shops to help attract the Non-ZBNF farmers towards ZBNF.
- (3) Government initiation to supply indigenous seeds through ZBNF input shops as most of the HYV's, hybrid

seeds were high input-intensive raising the cost of cultivation and further government initiation to supply indigenous cows to ZBNF farmers.

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## CONFLICT OF INTEREST:

The authors of the paper declare no conflict of interest

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