

Extent of Natural Farming Practices in Andhra Pradesh in 2019-20

The Verification Survey



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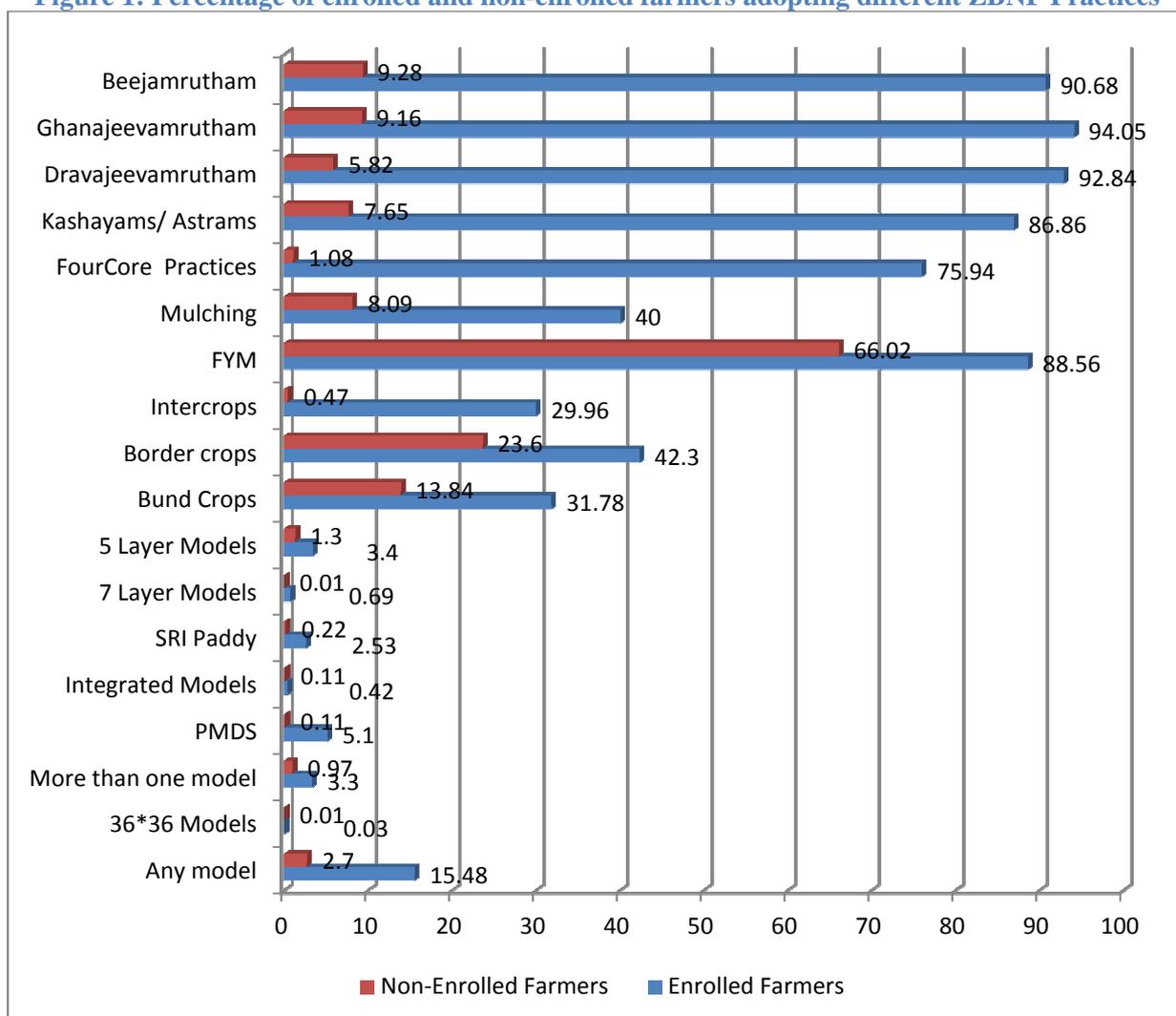
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Executive Summary

1. The Government of Andhra Pradesh (AP) has launched a radically new model of agriculture development known as Zero Budget Natural Farming (ZBNF) in 2016 and established an autonomous organization known as Rythu Sadhikara Samstha (RySS) to implement the program. The basic principle of ZBNF is that the nature, i.e. soil and atmosphere, has all the ingredients necessary for plant growth and protection and, hence, there is no need for adding any external inputs to supply nutrients. Instead, biological inputs such as Beejamrutham (treating of seeds with microbial), Jeevamrutham (culturing and incorporation of microorganism into soils in liquid and solid form), Acchadana (mulching), and Whaapsa (aeration) will convert the existing elements/ ingredients into plant nutrients and make available for the plants. Nearly 5.8 lakh farmers in all the districts of Andhra Pradesh have enrolled themselves with RySS to practice ZBNF for growing crops during Kharif Action Plan of 2019-2020.
2. RySS has engaged Institute for Development Studies, Andhra Pradesh (IDSAP) to undertake a survey of ZBNF enrolled and non-enrolled farmers. The key objectives of the survey are:
 - a. To know the proportion of the enrolled farmers adapted ZBNF practices in their farming during Kharif 2019-2020.
 - b. To learn the prevalence of the ZBNF practices among the not enrolled farmers and
 - c. To explore the geographical spread of ZBNF practices across the state
3. A total of 195 villages across 13 districts were randomly selected from the list of villages with more than 15 ZBNF farmers. Within each selected village, a sample of 15 ZBNF farmers was selected randomly from the given list of farmers enrolled with RySS. Thus, a total of 2,925 enrolled households are selected across the districts in the state. Further, a total of 975 non-enrolled farmers at the rate of 5 farmers per village were selected. After scrutiny of the quality of the data, the data of 2,892 enrolled and 928 non-enrolled was used in the analyses. These are from 187 village, 132 clusters and 119 mandals of 13 districts.
4. The average operational holding size is 3.86 acres for the ZBNF enrolled farmers and 3.74 acres for non-enrolled farmers.
5. A brief summary of the results is presented in the following table 1:

Figure 1: Percentage of enrolled and non-enrolled farmers adopting different ZBNF Practices



Sources: Field Survey, 2019-20

6. Among the core practices, mulching is issues of concern. RySS may focus on this vital issue.
7. District wise analysis indicates that:
 - a. Northern districts of Srikakulam, Vizianagaram, West Godavari, East Godavari have better performed in terms of adoption of ZBNF practices;
 - b. Rayalaseema districts have better score in improved cropping practices;
 - c. Chittoor district is top performer in almost all components and packages of ZBNF;
 - d. Anantapur, Kurnool and Kadapa have larger size holdings but the performance of enrolled farmers in these districts is lower than the State average.
8. **The ranking of mandals, clusters and villages enable RySS to locate the problem areas and resolve them.** The ranking also reflect the performances of the field teams/ professionals.

ZBNF Verification Survey of Kharif 2019-2020

1. Context

The Government of Andhra Pradesh (AP) has launched a radically new model of agriculture development, known as Zero Budget Natural Farming (ZBNF) in 2016. To implement the program effectively, an independent organization, known as Rythu Sadhikara Samstha (RySS), was established. ZBNF is an agro-ecological farming approach. The basic principle of ZBNF is that the nature, i.e. soil and atmosphere, already, has all the ingredients necessary for plant growth and protection. There is no need for adding any external inputs to supply nutrients. Instead, there is a need for the catalyst for converting the existing elements/ ingredients into plant nutrients and made available for the plants. Beejamrutham (treating of seeds with microbial), Jeevamrutham (culturing and incorporation of microorganism into soils), Acchadana (mulching), and Whaapsa (aeration) are the four core ZBNF farming practices. In order to protect crops from pests and insects, ZBNF prescribes a number of natural fungicides and pesticides, known as Kashayams and Asthrams, made from locally available ingredients like neem leaves, chillies, garlic, tobacco, sour buttermilk, etc.

Diversification of cropping pattern is another key feature of ZBNF. Under ZBNF, different crops are intensively grown in a variety of ways. These include crop rotation, mixed cropping, internal cropping, border cropping and bund cropping, Pre Monsoon Dry Sowing (PMDS) etc. One of the great innovations under this intervention is the introduction of multitier cropping, known as 5-layer and 7 layer models where different varieties of fruit trees, vegetables and seasonal crops are grown on the same plot. This model has several advantages. It optimizes the horizontal, vertical and temporal use of the land. Different layers of crops access the soil moisture and nutrients at different times and from different layers in the soil. The need for human labour is staggered and it optimizes the family labour use. Farmers get higher and stable net incomes, throughout the year.

Nearly 5.8 lakh farmers in all the 13 districts of Andhra Pradesh have enrolled themselves with Rythu Sadhikara Samstha (RySS) to practice ZBNF for growing crops during Kharif Action Plan of 2019-2020. The RySS desires to know how far the voluntarily enrolled farmers have adopted the ZBNF practices across the state and the issues and challenges the enrolled farmers are facing in practicing ZBNF. RySS also wanted to know if there is any demonstration effect of the ZBNF on non-enrolled farmers.

2. The Survey

In this context, RySS has engaged IDS-AP and CESS to undertake a survey of ZBNF enrolled and non-enrolled farmers. The objectives of the survey are given below.

2.1. Objectives of the Survey

- To know the proportion of the enrolled farmers adapted the complete package of ZBNF, in their farming, during Kharif Season of 2019-20
- To make out the proportion of enrolled farmers adapted only few ZBNF practices.
- To understand the issues and challenges in adapting the ZBNF among the enrolled farmers.
- To figure out the geographical spread of ZBNF practices across the state
- To learn the prevalence of the ZBNF practices among the non enrolled farmers.
- To comprehend the issues and challenges in adapting the ZBNF practices among non-enrolled farmers.

2.2. Methodology

- After reviewing the ZBNF project design, a simple one page survey format was prepared covering the objectives of the survey. The survey format is given as Annexure- 1. As project is being implemented across the state, a sample of 15 villages in each district was randomly selected from total project villages with more than 10 ZBNF farmers. Thus, a total of 195 villages across 13 districts were selected. Within each village, a sample of 15 ZBNF farmers was selected randomly from the given list of farmers enrolled with RySS. Thus, a total of 2,925 practices households are selected across the districts in the state. The sample is equal to 0.5 percent of the population/ universe. Further, samples of 5 farmers who have not enrolled in ZBNF have been selected from each sample village. Thus a total of 975 non-enrolled farmers are selected. This is to examine whether the adoption of ZBNF practices by the enrolled farmers has influenced the non-enrolled farmers for adopting ZBNF practices.
- A team of one supervisor and two investigators collected the data. The data was processed and analyzed through Census and Survey Processing System (CSPro) and excel software. After scrutiny of the quality of the data, total 2,892 enrolled and 928 non-enrolled farmers' data was used in the analyses. These are from 187 village, 132 clusters and 119 mandals.

2.3 Report Structure

The remaining part of this report is organized in six more sections. The third section covers a brief profile of the sample farmers. The state level and district level results of the survey are discussed in section four. The sub-district level analysis is discussed in section five. Section six covers the enrolled and non-enrolled farmers' reasons for cultivating and not-cultivating under ZBNF methods. Finally, section seven has the summary and conclusions of the report. The report has two Annexures at the end of the report. Annexure 1 has Survey format used for this survey; and Annexure 2 has ranks of study sample mandals, clusters and villages on each of the variables and packages analyzed in this report.

3. Profile of the Sample Farmers

In total 3,820 farmers (2892 enrolled and 928 non-enrolled farmers) were covered by the survey. Out of the 2,892 enrolled sample farmers, 1,627 are marginal farmers owning less than 2.5 acres. Marginal farmers include about 250 landless farmers. Another 757 are small farmers owning 2.5 to 4.99 acres, 387 are semi-medium farmers owning 5 to 9.99 acres and 121 are medium and large farmers owning 10 and above acres. Out of 928 non-enrolled sample farmers, 489 are marginal farmers who own less than 2.5 acres. These marginal farmers include about 80 landless farmers. Another 245 non-enrolled sample farmers are small farmers owning 2.5 to 4.99 acres, 153 are semi-medium farmers owning 5 to 9.99 acres and 41 are medium and large farmers owning 10 and above acres. Details are given in the following table 1:

Table 1: Land Ownership Category wise Distribution of Sample

Category of farmers	Number		Percentage	
	Enrolled	Non-enrolled	Enrolled	Non-enrolled
Marginal	1,627	489	56.26	52.69
Small	757	245	26.18	26.40
Semi Medium	387	153	13.38	16.49
Medium & Large	121	41	4.18	4.42
Total	2,892	928	100.00	100.00

Sources: Field Survey, 2019-20

The farmer category-wise distribution of enrolled and non-enrolled farmers indicates that there are minor differences in land holding of different categories of farmers. While there are just three percentage points variation between the two sets of samples in the marginal and semi-medium farmers groups, there are no such variations in other two groups. The percentage of landless farmers is about 8% in the enrolled farmers' sample and non-enrolled farmers' sample. The variations in the land owning size indicate that ZBNF program is positively biased with the marginal farmers. It also indicates that marginal farmers are positive for change and experimentations. The district-wise distribution of farmers is given in the following table 2.

Table 2: District-wise, Farmer Category-wise Sample Farmers

District	Farmer Category	Enrolled Farmers		Non-Enrolled Farmers	
		Number	%	Number	%
ANANTAPUR	Marginal	61	27.1	9	12.0
	Small	73	32.4	25	33.3
	Semi Medium	64	28.4	34	45.3
	Med&Large	27	12.0	7	9.3
	Sub-total	225	100.0	75	100.0
CHITTOOR	Marginal	163	63.4	39	52.0
	Small	83	32.3	28	37.3
	Semi Medium	10	3.9	8	10.7
	Med&Large	1	0.4		0.0
	Sub-total	257	100.0	75	100.0
EAST GODAVARI	Marginal	126	56.3	41	55.4
	Small	53	23.7	17	23.0
	Semi Medium	39	17.4	13	17.6
	Med&Large	6	2.7	3	4.1
	Sub-total	224	100.0	74	100.0
GUNTUR	Marginal	175	77.4	55	73.3
	Small	27	11.9	7	9.3
	Semi Medium	22	9.7	12	16.0
	Med&Large	2	0.9	1	1.3
	Sub-total	226	100.0	75	100.0
KADAPA	Marginal	71	30.1	28	38.4
	Small	102	43.2	29	39.7
	Semi Medium	49	20.8	15	20.5
	Med&Large	14	5.9	1	1.4
	Sub-total	236	100.0	73	100.0
KRISHNA	Marginal	180	80.0	53	69.7
	Small	25	11.1	12	15.8
	Semi Medium	12	5.3	5	6.6
	Med&Large	8	3.6	6	7.9
	Sub-total	225	100.0	76	100.0
KURNOOL	Marginal	85	40.3	15	21.4
	Small	56	26.5	24	34.3
	Semi Medium	54	25.6	17	24.3
	Med&Large	16	7.6	14	20.0
	Sub-total	211	100.0	70	100.0
NELLORE	Marginal	85	80.2	19	54.3
	Small	15	14.2	13	37.1
	Semi Medium	6	5.7	3	8.6
	Med&Large		0.0		0.0
	Sub-total	106	100.0	35	100.0
PARAKASHAM	Marginal	113	43.5	30	37.5
	Small	98	37.7	21	26.3
	Semi Medium	39	15.0	24	30.0
	Med&Large	10	3.8	5	6.3
	Sub-total	260	100.0	80	100.0
SRIKAKULAM	Marginal	129	57.3	51	68.0
	Small	64	28.4	15	20.0
	Semi Medium	27	12.0	8	10.7
	Med&Large	5	2.2	1	1.3
	Sub-total	225	100.0	75	100.0
VISHAKAPATNAM	Marginal	147	64.5	45	60.0
	Small	58	25.4	26	34.7
	Semi Medium	21	9.2	3	4.0
	Med&Large	2	0.9	1	1.3
	Sub-total	228	100.0	75	100.0
VIZIANAGARAM	Marginal	136	59.4	49	75.4

District	Farmer Category	Enrolled Farmers		Non-Enrolled Farmers	
		Number	%	Number	%
	Small	65	28.4	14	21.5
	Semi Medium	26	11.4	2	3.1
	Med&Large	2	0.9		0.0
	Sub-total	229	100.0	65	100.0
WEST GODAVARI	Marginal	149	66.2	55	73.3
	Small	34	15.1	12	16.0
	Semi Medium	17	7.6	7	9.3
	Med&Large	25	11.1	1	1.3
	Sub-total	225	100.0	75	100.0
AP	Marginal	1627	56.3	489	52.7
	Small	757	26.2	245	26.4
	Semi Medium	387	13.4	153	16.5
	Med&Large	121	4.2	41	4.4
	Sub-total	2892	100.0	928	100.0

Sources: Field Survey, 2019-20

On average, the sample farmers owned 3.00 acres, leased in 0.95 acres and leased out 0.10 acre. The average operational holding size is 3.86 acres for the enrolled farmers and 3.74 acres for non-enrolled farmers. Further, the land holding sizes of enrolled and non-enrolled farmers is almost the same for marginal, small and semi-medium farmers. The following table 3 provides details:

Table 3: Average Operational Holdings Sizes (in acres)

Ownership category of farmers	ZBNF enrolled farmers				Non-enrolled farmers			
	Average own holding size	Average leased in area	Average leased out area	Average operational holding size	Average own holding size	Average leased in area	Average leased out area	Average operational holding size
Marginal	1.13	1.03	0.02	2.14	1.07	0.93	0.03	1.98
Small	3.35	0.58	0.04	3.89	3.36	0.39	0.02	3.73
Semi Medium	6.06	1.20	0.17	7.09	6.09	1.06	0.23	6.92
Medium & Large	16.27	1.40	1.26	16.42	13.84	0.34	1.22	12.96
Total	3.00	0.95	0.10	3.86	3.07	0.78	0.11	3.74

Sources: Field Survey, 2019-20

The district-wise details of landholdings are given in the following table 4.

Table 4: District-wise Land Holdings of Enrolled Farmers (Average Acres)

District	Sample Number	Own Land	Leased in land	Leased out Land	Total Operational Land
Anantapur	225	5.66	0.56	0.09	6.12
Kurnool	211	4.36	1.79	0.30	5.85
Kadapa	236	4.11	0.65	0.05	4.71
Parakasham	260	3.18	1.25	0.07	4.35
West Godavari	225	3.67	0.71	0.10	4.28
East Godavari	224	2.78	1.49	0.23	4.04
Krishna	225	1.81	2.18	0.07	3.92
Srikakulam	225	2.56	0.90	0.17	3.29
Vizianagaram	229	2.41	0.72	0.03	3.10
Guntur	226	1.70	1.44	0.08	3.06
Vishakapatnam	228	2.31	0.22	0.01	2.53
Chittoor	257	2.13	0.05	0.01	2.17
Nellore	106	1.73	0.02	0.01	1.74
AP	2892	3.00	0.95	0.10	3.86

Sources: Field Survey, 2019-20

Anantapur district ranks first with 6.12 acres of operational land while Nellore district ranks the least with 1.74 acres of land. The district-wise land holdings of non-enrolled farmers are given in the following table 5:

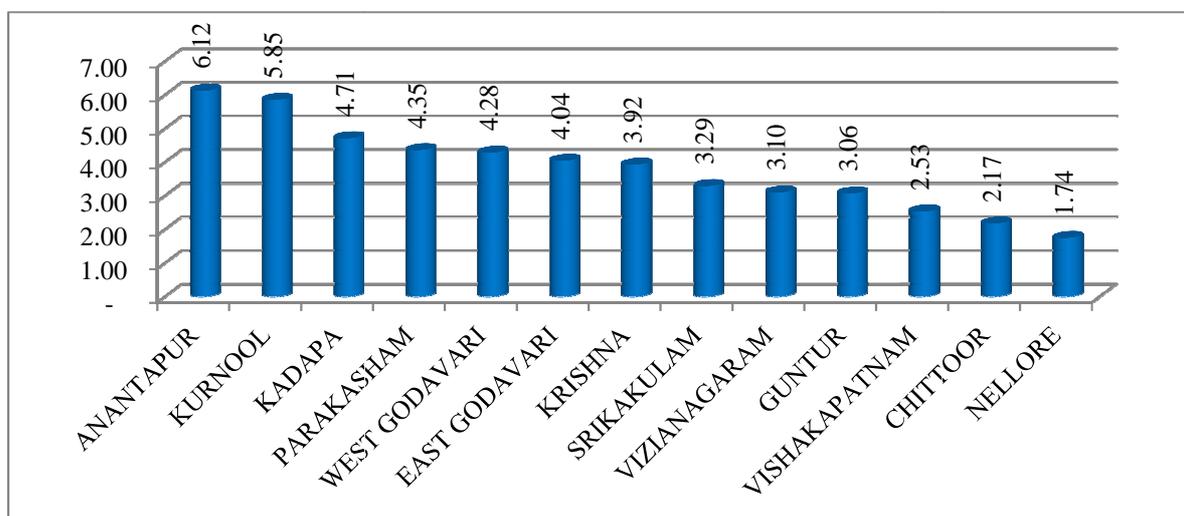
Table 5: District-wise Land Holdings of Non-Enrolled Farmers (Average Acres)

District	Sample Number	Own Land	Leased in land	Leased out Land	Total Operational Land
Kurnool	70	6.26	0.83	0.66	6.43
Parakasham	80	3.94	1.50	0.05	5.39
Anantapur	75	5.16	0.23	0.07	5.32
Krishna	76	2.53	1.76	0.01	4.28
East Godavari	74	2.90	1.11	0.04	3.96
Kadapa	73	3.52	0.33	0.10	3.75
Guntur	75	2.08	1.78	0.22	3.63
Srikakulam	75	2.24	0.97	0.10	3.10
Chittoor	75	2.47	0.01	0.00	2.49
West Godavari	75	1.99	0.54	0.16	2.36
Vishakapatnam	75	2.16	0.08	0.01	2.23
Nellore	35	2.18	0.00	0.00	2.18
Vizianagaram	65	1.66	0.20	0.00	1.86
Ap	928	3.07	0.78	0.11	3.74

Sources: Field Survey, 2019-20

Kurnool district ranks first with 6.43 acres of operational land while Vizianagaram district ranks the least with 1.86 acres of land. Out of four Rayalaseema districts, three have highest operational holdings in the state (Figure 1). Larger holding sizes appeared to be one the necessary condition for crop diversification and multiple cropping patterns. Though Chittoor has smaller operational holdings, the quality of natural resources, in the district, is conducive for horticulture and other improved cropping patterns. Godavari districts too have conducive environment for crop diversification.

Figure 2: District wise agriculture operational holding sizes of enrolled farmers (in acres)



Sources: Field Survey, 2019-20

District-wise farmer category-wise land holdings status of enrolled farmers and the status of non-enrolled farmers is given in Annexure -2.

4. ZBNF Practices at the State and District Level

4.1 Adoption of ZBNF Practices

The core practices of ZBNF include Beejamrutham, Ghanajeevamrutham, Dravajeevamrutham, and Kashayams and Asthrams. Over 94% farmers are applying Ghanajeevamrutham. Dravajeevamrutham is practiced by 92.84%, followed by Beejamrutham (90.68%), and Kashayams & Asthrams (86.86%). As mentioned above these four components, viz. Beejamrutham, Ghanajeevamrutham, Dravajeevamrutham, Kashayams & Asthrams, are core practices of ZBNF and less influenced by the external constraints, such as availability of inputs. Hence, these four components, together, are called as “*Core Package*”. These four components are also known as the *non-negotiable*. **About 76% of total enrolled farmers are practicing all the four crucial comment.** Though mulching is also very important, its usage is dependent on the changes in the cropping pattern, cultivation of biomass crops and availability of biomass such as crop byproducts, straw, husk, leaves, twigs, etc. Only 40% of enrolled farmers are practicing the mulching in their field.

Among four categories of farmers considered in the analyses, there are fewer variations in ZBNF practices. However, the performance of semi-medium farmers is a slightly lower than other three categories in each component. The marginal and small farmers have performed better in adoption of the core components. This has demonstrated the efficacy of ZBNF in serving the real poor farmers. One often hears the comments like that ‘natural farming is the big farmers’ passion’; ‘rich people’s business’; ‘meant for the rich’, etc. ZBNF proved that it is a better option to the marginal and small farmers. Details are provided below at Table 6:

Table 6: Enrolled Farmers Practicing ZBNF Practices (in percentage)

Category of farmers	Beejamrutham	Ghanajeevamrutham	Dravajeevamrutham	Kashayams & Asthrams	Mulching	FYM	Core Package
1	2	3	4	5	6	7	8=2+3+4+5
Marginal	92.56	94.28	92.74	87.83	40.52	82.90	78.49
Small	89.68	94.05	93.40	87.32	41.22	83.73	74.90
Semi-medium	84.97	92.76	91.47	82.95	34.55	85.53	68.73
Medium & Large	89.92	95.04	95.04	83.47	42.98	85.12	71.90
Total	90.68	94.05	92.84	86.86	40.00	83.56	75.97

Sources: Field Survey, 2019-20

Across the State, around 76 percent of enrolled farmers are using all the core practices of ZBNF. This percentage varies among the farmers of various districts. The district-wise use of different combinations of ZBNF practices by enrolled farmers is given in the following table 7:

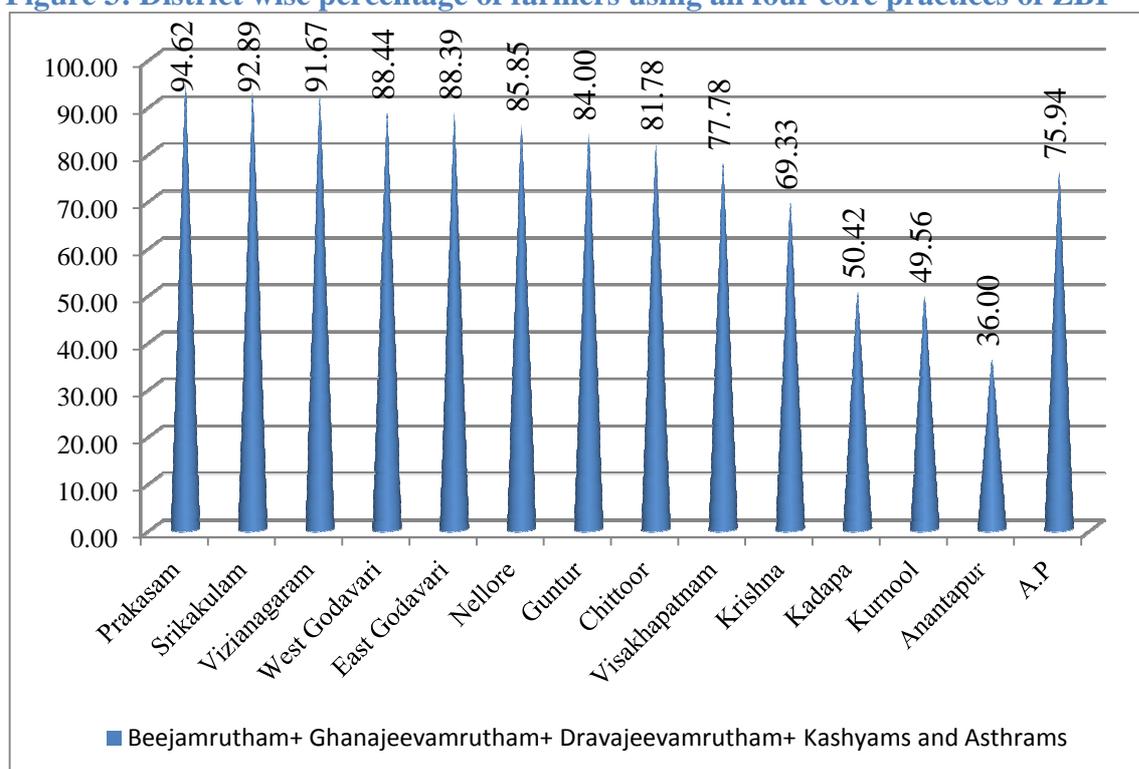
Table 7: Adoption of Different Combinations of ZBNF Practices by Enrolled Farmers

District	Sample Size	Beejamrutham	Beejamrutham+ Ghanajeevamrutham	Beejamrutham+ Ghanajeevamrutham+ Dravajeevamrutham	Beejamrutham+ Ghanajeevamrutham+ Dravajeevamrutham+ Kashyams and Asthrams
Prakasam	260	99.62	97.69	97.31	94.62
Srikakulam	225	97.33	96.44	96.00	92.89
Vizianagaram	229	97.81	97.37	96.05	91.67
West Godavari	225	100.00	98.22	88.89	88.44
East Godavari	224	94.20	92.41	91.96	88.39
Nellore	106	100.00	99.06	90.57	85.85
Guntur	226	95.56	86.22	85.78	84.00
Chittoor	257	100.00	99.56	92.89	81.78
Visakhapatnam	228	90.67	88.44	84.89	77.78
Krishna	225	82.22	78.67	78.22	69.33
Kadapa	236	80.93	70.34	58.47	50.42
Kurnool	226	67.70	64.60	64.16	49.56
Anantapur	225	73.33	63.11	49.78	36.00
A.P	2892	90.40	86.65	82.45	75.94

Sources: Field Survey, 2019-20

With 94.62 per cent of the enrolled farmers using all core practices of ZBNF, Prakasam is at the top position while Anantapur is at the bottom with only 36.0 per cent of the enrolled farmers using all the core ZBNF practices (Figure 3).

Figure 3: District wise percentage of farmers using all four core practices of ZBF



Sources: Field Survey, 2019-20

An effort was made to assess the influence of ZBNF practices on non-enrolled farmers. It is found that non-enrolled farmers also used ZBNF practices, albeit to a lesser extent compared to ZBNF farmers. 9.28 per cent of the non-enrolled farmers use Beejamrutham, 9.16 per cent used Ghanajeevamrutham, 8.09 per cent used mulching, 7.65 per cent used Kashayams, 5.82 per cent used Dravajeevamrutham. Being traditional practice, FYM was used by more than 66 per cent of non-enrolled farmers. The percentage of non-enrolled farmers using ZBNF practices is very low but it shows that awareness is being created on the use of these practices because of the presence of ZBNF. Further details of farmer class-wise usage of non-enrolled farmers is given in the following table 8:

Table 8: Non-enrolled Farmers Practicing ZBNF Practices (in percentage)

Category of farmers	Beejamrutham	Ghanajeevamrutham	Dravajeevamrutham	Kashyams & Asthrams	Mulching	FYM	Core Package
1	2	3	4	5	6	7	8=2+3+4+5
Marginal	9.61	9.41	5.32	7.98	7.16	62.91	0.61
Small	11.89	11.43	7.35	8.57	11.43	67.76	1.63
Semi-medium	6.54	6.54	5.88	5.23	5.23	70.59	1.96
Medium & Large	-	2.44	2.44	7.32	10	75.61	-
Total	9.28	9.16	5.82	7.65	8.09	66.02	1.08

Sources: Field Survey, 2019-20

The usage of different combinations of ZBNF practices by non-enrolled farmers in the districts is given in the following table. When it comes to the practicing of all core ZBNF farmers by non-enrolled farmers, East Godavari district stands on top with 8.11 per cent of the enrolled farmers following all the ZBNF core practices (Table 9).

Table 9: Use of Different Combinations of ZBNF Practices by Non- ZBNF Farmers

District	Sample Size	Beejamrutham	Beejamrutham +Ghanajeevamrutham	Beejamrutham +Ghanajeevamrutham+ Dravajeevamrutham	Beejamrutham+ Ghanajeevamrutham+ Dravajeevamrutham +Kashayams that include Asthrams
East Godavari	74	24.32	17.57	14.86	8.11
Prakasam	80	10.00	2.50	2.50	2.50
Vizianagaram	65	7.69	7.69	6.15	1.54
Kadapa	73	19.18	5.48	4.11	1.37
Anantapur	75	1.33	1.33	1.33	0.00
Chittoor	75	0.00	0.00	0.00	0.00
Guntur	75	6.67	0.00	0.00	0.00
Krishna	76	0.00	0.00	0.00	0.00
Kurnool	75	2.67	0.00	0.00	0.00
Nellore	35	0.00	0.00	0.00	0.00
Srikakulam	75	0.00	0.00	0.00	0.00
Visakhapatnam	75	12.00	5.33	4.00	0.00
West Godavari	75	32.00	22.67	1.33	0.00
A.P	928	9.27	4.96	2.69	1.08

Sources: Field Survey, 2019-20

District wise rankings of enrolled farmers in the use of ZBNF practices are analyzed. As expected some districts are performing exceptionally well on each of the components. In three districts viz. West Godavari, Nellore and Chittoor, 100 percent enrolled farmers are using the Beejamrutham. In nine out of total 13 districts, about 98 % of enrolled farmers are using Ghanajeevamrutham. In Chittoor district, 92% of enrolled farmers are applying mulching. Interestingly, Prakasam district, which is bordering Rayalaseema, tops all the districts in implementation of ZBNF practices. The north eastern districts of Srikakulam, Vizianagaram and two Godavari districts are top performing districts in ZBNF practices (Table 10).

The performance of bottom districts is a matter of concern. Only 66.35% of enrolled farmers in Kurnool are applying the Beejamrutham. Anantapur district is at bottom in application of three components, viz. Ghanajeevamrutham (83.56%), Dravajeevamrutham (77.78%) and Kashayams & Asthrams (65.78%). Only 11.86% farmers in Kadapa are mulching their fields. Four districts viz. Anantapur, Kurnool, Kadapa and Krishna have lower value than state average (76%). Out of four poorly performing districts, three are from Rayalaseema.

Table 10: District wise Enrolled Farmers' Performance ZBNF Practices and Ranks

District	Beejamrutham		Ghanajeevamrutham		Dravajeevamrutham		Kashyams & Asthrams		Mulching		FYM		Core Package	
	% of farmer	Rank	% of farmer	Rank	% of farmers	Rank	% of farmers	Rank	% of farmers	Rank	% of farmers	Rank	% of farmers	Rank
<i>I</i>	2	3	4	5	6	7	8	9	10	11	12	13	$14=2+4+6+8$	15
Anantapur	73.33	12	83.56	13	77.78	13	65.78	13	24.44	8	87.56	7	36	13
Chittoor	100.00	1	99.61	1	94.16	7	81.32	10	92.22	1	100	1	80.93	8
East Godavari	94.20	8	97.77	7	98.66	2	94.64	5	59.18	4	92.38	5	88.39	5
Guntur	95.58	7	87.61	11	92.48	9	92.48	6	38.05	5	82.74	9	84.07	7
Kadapa	82.34	10	85.59	12	80.51	12	78.39	11	11.86	13	79.66	10	50.42	11
Krishna	82.22	11	89.78	9	94.67	6	84.89	9	15.56	12	96.44	3	69.33	10
Kurnool	66.35	13	89.10	10	93.84	8	65.88	12	32.7	6	65.22	11	47.87	12
Nellore	100.00	1	99.06	4	92.4	10	92.45	7	20.96	10	29.25	13	85.85	6
Prakasam	99.62	4	97.69	8	98.46	3	96.15	2	22.19	9	90.77	6	94.62	1
Srikakulam	97.33	6	99.11	3	99.56	1	95.11	4	18.67	11	93.78	4	92.89	2
Vishakhapatnam	91.21	9	97.81	6	94.74	5	89.91	8	61.40	3	98.68	2	78.07	9
Vizianagaram	97.82	5	99.13	2	98.25	4	95.2	3	30.13	7	51.97	12	91.7	3
West Godavari	100.00	1	98.22	5	90.67	11	98.67	1	78.22	2	85.78	8	88.44	4
State	90.68		94.05		92.84		86.86		40.00		83.56		75.97	

Sources: Field Survey, 2019-20

In a few districts, even the non-enrolled farmers have performed well on different practices of ZBNF. For example, about one-third of non-enrolled farmers of West Godavari have used Beejamrutham, Ghanajeevamrutham and Dravajeevamrutham. All the four key practices of ZBNF are used only in four districts, viz. East Godavari, Prakasam, Visakhapatnam and Kadapa. Details are available in the following table 11:

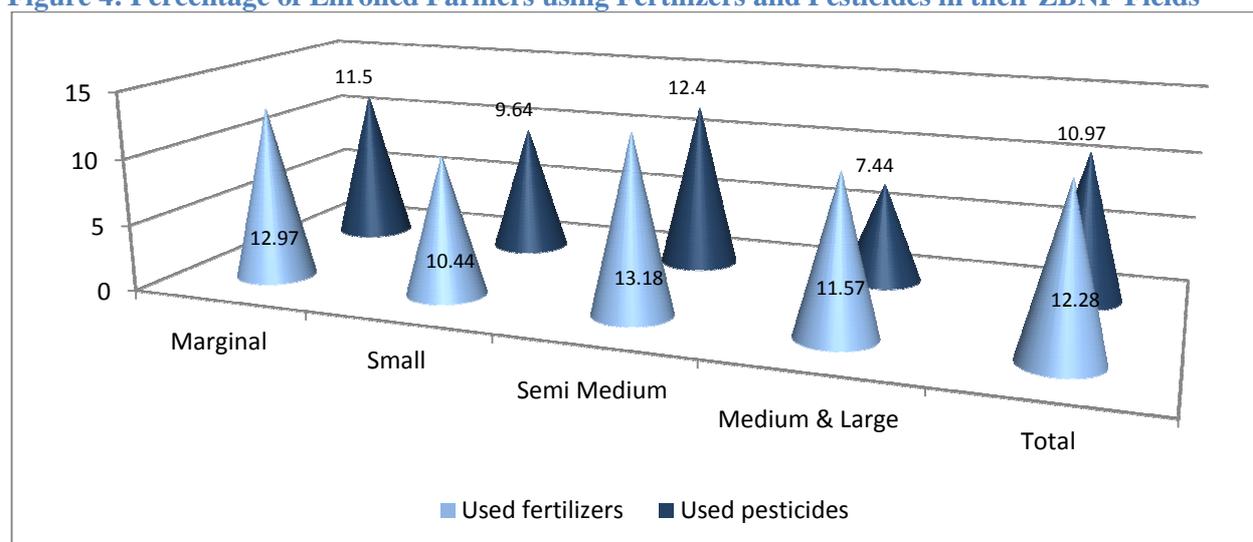
Table 11: District wise Non- Enrolled Farmers' Performance ZBNF Components & Ranks

District	Beejamrutham		Ghanajeev amrutham		Dravajeevamrutham		Kashyams & Asthrams		Mulching		FYM		Core Package	
	% of farmers	Rank	% of farmers	Rank	% of farmer	Rank	% of farmers	Rank	% of farmers	Rank	% of farmers	Rank	% of farmers	Rank
1	2	3	4	5	6	7	8	9	10	11	12	13	14=2+4+6+8	15
Anantapur	1.33	9	2.67	6	2.67	7	-	9	4	7	61.33	8	-	5
Chittoor	-	10	-	8	-	9	-	9	-	10	69.33	6	-	5
East Godavari	24.92	2	29.73	2	21.62	1	9.46	4	13.51	2	68.92	7	8.11	1
Guntur	6.67	7	-	8	1.33	8	5.33	6	1.33	9	50.67	10	-	5
Kadapa	19.18	3	8.22	5	6.85	5	12.33	3	1.37	8	79.45	4	1.37	4
Krishna	-	10	-	8	-	9	1.32	8	-	10	75	5	-	5
Kurnool	2.86	8	-	8	-	9	-	9	8.57	6	58.57	9	-	5
Nellore	-	10	-	8	-	9	-	9	11.43	3	34.29	11	-	5
Prakasam	10	5	2.5	7	3.75	6	7.5	5	10	4	92.46	2	2.5	2
Srikakulam	-	10	-	8	-	9	-	9	-	10	85.33	3	-	5
Vishakhapatnam	12	4	28	3	20	2	24	2	45.33	1	100	1	-	5
Vizianagaram	7.69	6	10.77	4	7.69	4	1.54	7	-	10	29.23	12	1.54	3
West Godavari	32	1	33.33	1	9.33	3	33.33	1	9.33	5	28	13	-	5
State	9.28		9.16		5.82		7.65		8.09		66.02		1.08	

Sources: Field Survey, 2019-20

With regard to the usage of chemical fertilizers and pesticides, 12% of enrolled farmers have used chemical fertilizers and 11% of enrolled farmers have used pesticides in their ZBNF fields. Relatively a little higher percentage of semi-medium and marginal farmers used the fertilizers and pesticides in their ZBNF plots. The reasons cited by enrolled farmers for application of agro-chemicals include normal practice of application of excess doses of plant nutrients and plant protection inputs¹, anxiety about the crop returns, doubts about efficacy of Kashayams and Asthrams in controlling the pests and plant diseases, inadequate extension services, etc. Details are given in the following (Figure 4).

Figure 4: Percentage of Enrolled Farmers using Fertilizers and Pesticides in their ZBNF Fields



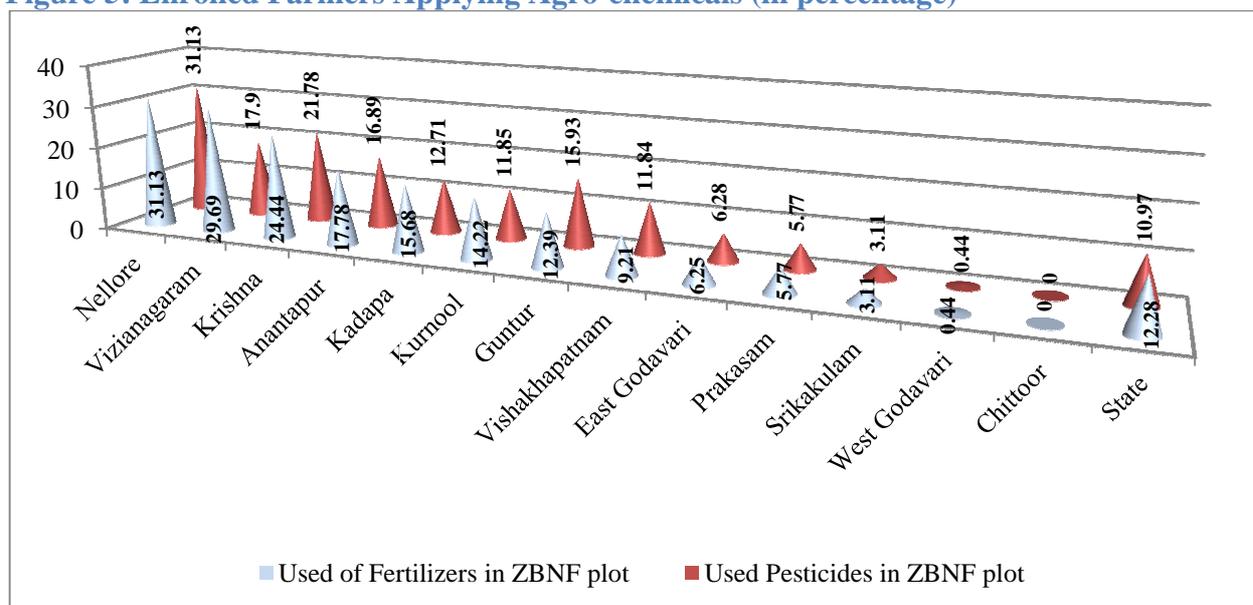
Sources: Field Survey, 2019-20

¹ It is well known that Andhra farmers apply about 50 per cent excess fertilisers and pesticides than recommended doses. See, for example, Chand, Ramesh and Pavithra S, 2015: "Fertilizer Use and Imbalance in India: Analysis of States", *Economic and Political Weekly*, OCTOBER 31, 2015, vol. L no. 44

With regard to non-negotiable four items of ZBNF viz. Beejamrutham, Ghanajeevamrutham, Dravajeevamrutham and Kashayams & Asthrams, overwhelming majority of enrolled farmers have followed the project guidelines. The gap between enrolled and non-enrolled farmers in application of these four crucial inputs is about 80 percentage points. However, in the other components such as diversified cropping pattern the gaps between the project participants and non-enrolled farmers are quite lower.

Some of the enrolled farmers in almost all districts used chemical fertilizers and / or pesticides in their ZBNF plots. Only Chittoor district is absolutely free from this contamination, if usage of chemical fertilizers or pesticides is considered as contamination practice, West Godavari, Srikakulam, Prakasam and East Godavari almost free from the contaminated practices. On the other hand Nellore, Vizianagaram and Krishna have experienced larger contamination practices. More than 20% of enrolled farmers in these districts have applied chemical fertilizers or pesticides in their ZBNF fields (Figure 5). Inadequate extension, timely non-availability of biological inputs and challenges in preparing own biological inputs are important identified reasons for the contaminated practices.

Figure 5: Enrolled Farmers Applying Agro-chemicals (in percentage)



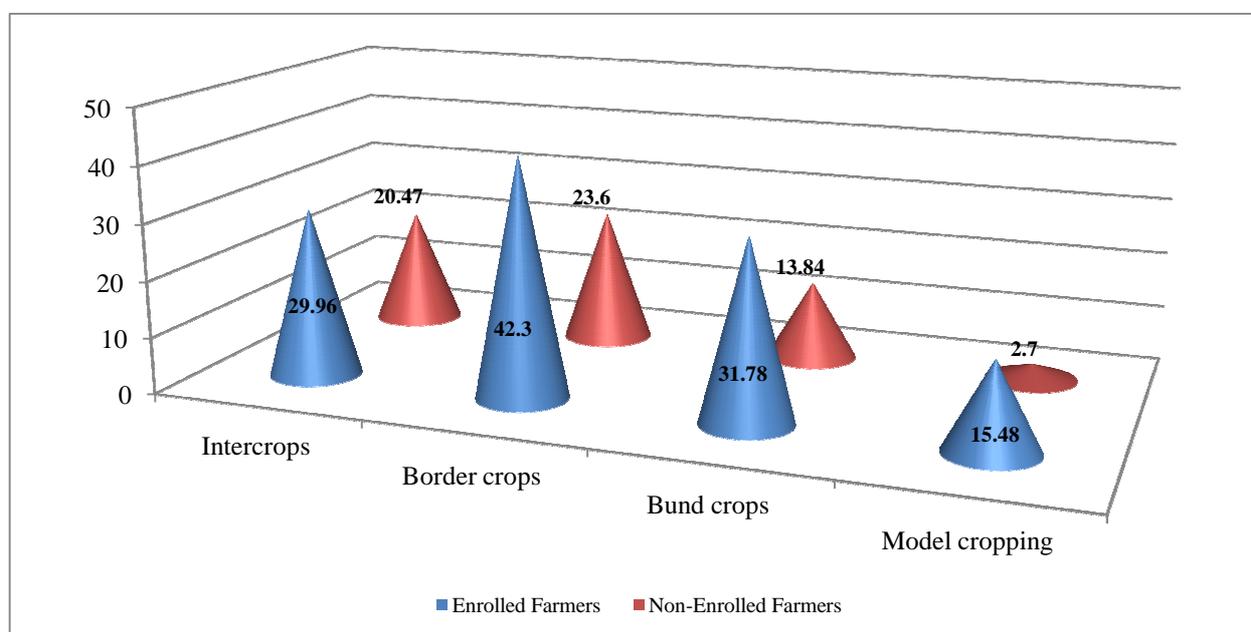
Sources: Field Survey, 2019-20

4.2 Adoption of ZBNF Cropping Pattern

The second set of practices, under ZBNF, is related to changes in the cropping pattern. It includes rotation of crops, intercrops, border crops, bund crops, and new models of cropping. The models of cropping include 5 layers, 7 layers, System of Rice Intensification (SRI), Pre-Monsoon Dry Sowing (PMDS), integrated cropping, 36*36 models. RySS brought in the scientific designs in these age-old practices to get the larger benefits. The perceived benefits

include the environmental and ecological benefits such as the spread of plant infections and harmful insects, repel of harmful insects, attracting the friendly insects, withstanding the weather abnormalities, optimization of land use etc.

Figure 6: Percentage of enrolled and non-enrolled farmers adopting improved cropping patterns



Source: Field Survey, 2019-20

The cropping patterns, promoted under ZBNF, are grouped into four broad categories, viz. intercroops, border crops, bund crops and model crops in our survey. Among these four, the most prevalent is the border crops, which is practiced by 42.3% of enrolled farmers. The bund crops and intercroops are second and third most prevalent among the enrolled farmers and the model crops are yet to pick up on a large scale among both enrolled and non-enrolled farmers (Figure 6 and Table 15). Among the four categories of the farmers, relatively higher proportions of semi-medium farmers practice variety of cropping patterns and the marginal farmers practice the least. These patterns are common in both enrolled and non-enrolled farmers although the proportions vary. The details are given in the following table 12:

Table 12: Cropping Pattern-wise Distribution of Farmers (in percentages)

Category of farmers	Enrolled farmers				Non-enrolled farmers			
	Intercrops	Border crops	Bund crops	Model cropping	Intercrops	Border crops	Bund crops	Model cropping
Marginal	22.61	36.29	34.32	15.70	11.25	19.84	14.81	2.05
Small	38.46	50.33	31.08	16.56	25.71	23.67	14.29	2.47
Semi Medium	41.97	50.90	25.65	12.04	35.29	32.68	9.80	5.23
Medium & Large	37.19	45.45	21.49	16.67	43.90	34.15	14.63	2.44
Total	29.96	42.30	31.78	15.48	20.47	23.60	13.84	2.70

Sources: Field Survey, 2019-20

Though only 15.48% enrolled farmers have ventured into model crops, at this stage, these crops have great potential to improve and stabilize the farm incomes, in coming years. Hence a little

more detailed analysis of the prevalence of the model crops is very useful. In total, almost same percentage of four categories of farmers are involved in the model cropping. PMDS is the most popular, followed by the multi-layer crops and multiple models. However, there are marked variations among the four groups of farmers, in the cultivation of different models. While the medium & large farmers focused on multi-layer crops, the other three categories of farmers have focused on PMDS. Details are given in the following table 13.

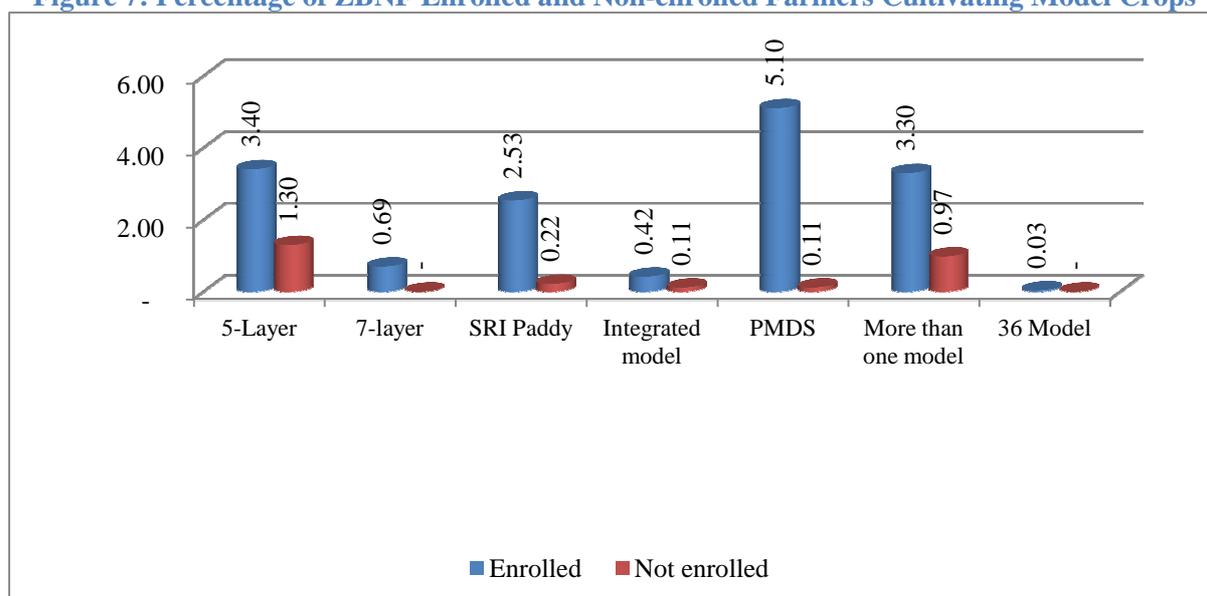
Table 13: Enrolled Farmers Practicing Different Models of Cropping (in percentage)

	5-Layer	7-layer	SRI Paddy	Integrated model	PMDS	More than one model	36X36 Model	Total
Marginal	3.14	0.49	3.45	0.43	4.74	3.39	0.06	15.70
Small	3.71	0.93	1.59	0.53	6.62	3.18	-	16.56
Semi Medium	2.36	0.52	1.05	-	4.45	3.66	-	12.04
Medium & Large	8.33	2.50	0.83	0.83	2.50	1.67	-	16.67
Total	3.40	0.69	2.53	0.42	5.10	3.30	0.03	15.48

Sources: Field Survey, 2019-20

Compared to over 15% ZBNF enrolled farmers, only 2.7% non-enrolled sample farmers are involved in the model crops. Highest gap, between ZBNF enrolled farmers and non-enrolled farmers, is in the cultivation of PMDS, which is scientifically needed to improve the soil quality and provide conducive environment for the survival and multiplication of the microorganism in the soil (Figure 2). While the ZBNF enrolled farmers involved in the cultivation of 4-5 varieties of models, the non-enrolled sample farmers are confined to two models, viz. multi-layers and multi-models. The following figure (7) gives details.

Figure 7: Percentage of ZBNF Enrolled and Non-enrolled Farmers Cultivating Model Crops



Source: Field Survey, 2019-20

The district wise analysis indicates that there are wide variations across the districts in crop diversification models. The differences vary from 2.23% in Srikakulam to 72.99% in Kurnool in intercrops, 8.49% in Nellore to 91.83% in Chittoor in border crops, from 5.99% in Kadapa to

73.54% in Chittoor for bund crops and from 1.34% in Krishna to 63.81% in Chittoor in models. Rayalaseema districts in general, and Chittoor district in particular, have fared very well with respect to adaptation of the new and improved cropping patterns and models.

The results of the study also show that some of the non-enrolled farmers have also adopted ZBNF practices. The details of ZBNF practices and their combinations adopted by enrolled and non-enrolled farmers are given in the following table 14.

Table 14: District-wise Performance of Cropping Patterns (in percentage)

District	Intercrops		Border crops		Bund crops		Model crops	
	% of farmers	Rank						
ZBNF enrolled farmers								
Anantapur	65.78	2	67.56	4	23.56	7	20.95	3
Chittoor	53.31	4	91.83	1	73.54	1	63.81	1
East Godavari	41.83	5	55.15	5	20.37	8	18.87	5
Guntur	15.93	7	31.86	7	15.04	9	6.70	7
Kadapa	9.92	9	69.92	3	5.99	13	4.82	9
Krishna	8.00	10	27.11	8	31.11	6	1.34	13
Kurnool	72.99	1	70.14	2	7.11	11	20.62	4
Nellore	6.60	11	8.49	13	7.55	10	8.49	6
Prakasam	25.90	6	20.38	10	6.15	12	1.92	11
Srikakulam	2.23	13	11.56	12	59.56	3	6.22	8
Vishakhapatnam	59.65	3	33.33	6	48.90	4	36.40	2
Vizianagaram	6.11	12	21.83	9	61.14	2	2.18	10
West Godavari	10.22	8	18.67	11	39.11	5	1.78	12
State	29.96		42.30		31.78		15.48	
Non-enrolled farmers								
Anantapur	54.67	2	34.67	5	8.00	7	2.67	4
Chittoor	22.67	5	41.33	3	42.67	1	-	9
East Godavari	31.08	4	35.14	4	6.97	8	14.86	1
Guntur	12.00	7	25.33	6	5.33	9	-	9
Kadapa	4.11	9	43.84	1	1.37	11	1.37	7
Krishna	3.95	10	21.05	8	9.21	6	-	9
Kurnool	42.86	3	42.86	2	1.43	10	5.71	2
Nellore	-	13	-	13	-	13	-	9
Prakasam	15.00	6	6.25	10	1.25	12	2.50	6
Srikakulam	1.33	12	2.67	11	17.33	4	-	9
Vishakhapatnam	57.33	1	24.00	7	33.33	2	2.67	5
Vizianagaram	1.54	11	1.54	12	16.92	5	3.08	3
West Godavari	5.33	8	14.67	9	29.33	3	1.33	8
AP	20.47		23.60		13.84		2.70	

Sources: Field Survey, 2019-20

5. ZBNF Practices at Sub-district Level

The data was collected at the rate of 15 ZBNF enrolled farmers and 5 non-enrolled farmers per village. Hence it is possible to analyse the enrolled farmers' data at village level, cluster level and mandal. In total, data from 187 villages, 132 clusters and 119 mandals are analyzed in this section. Because of insufficient data, the non-enrolled sample data is not analyzed here.

5.1. ZBNF at Mandal Level

Mandals are distributed as per percentage of enrolled farmers practicing each component of ZBNF and shown at Table 18. Out of total 119 mandals, in 60 (50.42%) mandals, 100% of ZBNF enrolled farmers have been applying the Beejamrutham. The same is 65 mandals in case of Ghanajeevamrutham, 63 mandals in Dravajeevamrutham, 39 mandals in Kashayams & Asthrams, just 13 mandals in Mulching and 45 mandals in FYM. Out of 119 mandals, in 94 (78.99%) Mandals less than 75% enrolled farmers are practicing the Mulching; it is the lowest category (table 15).

Table 15: Distribution of Mandals as per Enrolled Farmers Practicing ZBNF Practices

ZBNF components and packages	Mandals in numbers					Mandals in percentage			
	Up to 74%	75 to 89%	90 to 99%	100%	Total	Up to 74%	75 to 89%	90 to 99%	100%
Beejamrutham	21	18	20	60	119	17.65	15.13	16.81	50.42
Ghanajeevamrutham	7	23	24	65	119	5.88	19.33	20.17	54.62
Dravajeevamrutham	12	21	23	63	119	10.08	17.65	19.33	52.94
Kashyams & Asthrams	27	17	36	39	119	22.69	14.29	30.25	32.77
Mulching	94	9	3	13	119	78.99	7.56	2.52	10.92
FYM	26	16	32	45	119	21.85	13.45	26.89	37.82
Core Package	48	20	23	28	119	40.34	16.81	19.33	23.53

Sources: Field Survey, 2019-20

District wise enrolled farmers' performance in mandals is analysed. Out of 119 total mandals, in 6 mandals, less than 25% of enrolled farmers have applied all four components, viz. Beejamrutham, Ghanajeevamrutham, Dravajeevamrutham and Kashayams & Asthrams. 25 to 49.99% farmers have applied all ingredients, of course, as per need in 18 mandals; 50 to 74.99% farmers applied in 24 mandals; and 75 to 99.99% farmers have applied in 43 mandals. In 28 mandals, 100% of enrolled farmers have applied the complete ZBNF core practices as per the need. Out of 28 top performing mandals, 7 are in Srikakulam, 5 are in Prakasam, 4 each in West Godavari and Chittoor. On the other hand, out of 6 low performing mandals, five are in Rayalaseema (Table 16).

Table 16: Distribution of Mandals as per Enrolled Farmers' Performance on Core ZBNF Practices

District \ (% of farmers)	% of farmers practicing all core ZBNF practices					Total
	0.01 to 24.99%	25 to 49.99%	50 to 74.99%	75 to 99.99%	100%	
Anantapur	1	9	2			12
Chittoor		2	3		4	9
East Godavari			1	8		9
Guntur			4	3	3	10
Kadapa	2	4	3		1	10
Krishna	1	1	3	4		9
Kurnool	2	2	3	1		8
Nellore				3	1	4
Prakasam				4	5	9
Srikakulam			1	4	7	12
Vishakhapatnam			2	7	1	10

District \ (% of farmers)	% of farmers practicing all core ZBNF practices					Total
	0.01 to 24.99%	25 to 49.99%	50 to 74.99%	75 to 99.99%	100%	
Vizianagaram			1	5	2	8
West Godavari			1	4	4	9
Grand total	6	18	24	43	28	119

Sources: Field Survey, 2019-20

Complete 100% enrolled farmers are cultivating the model crops in 1 Mandal, bund crops in 6 Mandals, border crops in 10 Mandals, inter crops in 10 mandals. On the other hand, none of the enrolled farmers have cultivated model crops in 48 mandals, bund crops 20 mandals, border crops 17 mandals for broader crops and intercropping in 31 mandals. Further details are given in the following table 17.

Table 17: Distribution of Mandals as per Cropping Patterns

Cropping patterns	0%	1 to 24%	25 to 49%	50 to 74%	75 to 99%	100%	Total
Intercrops	31 (26.1)	35 (29.4)	24 (20.2)	10 (8.4)	9 (7.6)	10 (8.4)	119 (110)
Border crops	17 (14.3)	29 (24.4)	23 (9.3)	24 (20.2)	16 (13.5)	10 (8.4)	119 (100)
Bund crops	20 (16.8)	41 (34.5)	26 (21.9)	16 (13.5)	10 (8.4)	6 (5.0)	119 (100)
Model crops	48 (10.4)	43 (36.13)	18 (15.1)	6 (5.0)	3 (2.5)	1 (0.8)	119 (100)

Sources: Field Survey, 2019-20

Note: Figures in brackets are % of Mandals

The ranks of the mandals in implementation of each components of ZBNF are given at Appendix. The Appendix also has the data and ranks on use of fertilisers and pesticides in each mandal.

5.2. ZBNF practices at Cluster level

As mentioned earlier, our study covers 132 clusters in 13 districts. Cluster wise enrolled farmers' performance on ZBNF components is shown at Table 15. All enrolled farmers have applied Beejamrutham in 65 (49.24%) clusters, Ghanajeevamrutham in 73 (55.30%) clusters, Dravajeevamrutham in 71 (53.79%) clusters, Kashayams & Asthrams in 44 (33.33%) and Mulching in 15 (11.36) clusters. 100% enrolled farmers applied all four components of ZBNF in 31 (23.48%) clusters (Table 18).

Table 18: Distribution of Clusters as per Enrolled Farmers Practicing ZBNF Practices

Indicator \ (% of Farmers)	Up to 74.99%	75 to 89.99 %	90 to 99.99%	100%	Total	Up to 74.99%	75 to 89.99 %	90 to 99.99%	100%
	Number of Mandals					Percentage of Mandals			
Beejamrutham	25	22	20	65	132	18.94	16.67	15.15	49.24
Ghanajeevamrutham	9	25	25	73	132	6.82	18.94	18.94	55.30
Dravajeevamrutham	13	24	24	71	132	9.85	18.18	18.18	53.79
Kashyams & Asthrams	30	20	38	44	132	22.73	15.15	28.79	33.33
Mulching	103	11	3	15	132	78.03	8.33	2.27	11.36
FYM	31	19	31	51	132	23.48	14.39	23.48	38.64
Core Package	56	22	23	31	132	42.42	16.67	17.42	23.48

Sources: Field Survey, 2019-20

Out of total 132 clusters, less than 25% farmers have applied all four components in seven clusters, 25 to 50% farmers applied all four components in 20 clusters and 100% farmers have

applied the complete package in 31 clusters. Out of 31 top performing clusters, seven are in Srikakulam, five are in Prakasam, four each are in Chittoor, Guntur, and West Godavari, two each are in Visakhapatnam and Vizianagaram; and one each is in Kadapa, Kurnool and Nellore. Most of the underperforming clusters are packed in three Rayalaseema districts. As many of the clusters crowded in the least category, i.e. below 75%, the clusters were re-categorized and further analysed district wise in the following table 19:

Table 19: Distribution of Clusters as per Enrolled Farmers' Performance on Core ZBNF Practices

Districts\ (% of Farmers)	1 to 24.99%	25 to 49.99%	50 to 74.99%	75 to 99.99%	100%	Total
Anantapur	1	9	3			13
Chittoor		2	3	1	4	10
East Godavari			1	8		9
Guntur			4	3	4	11
Kadapa	2	4	3		1	10
Krishna	1	1	5	4		11
Kurnool	3	3	6	1	1	14
Nellore				3	1	4
Prakasam				4	5	9
Srikakulam			1	4	7	12
Visakhapatnam		1	1	8	2	12
Vizianagaram			1	5	2	8
West Godavari			1	4	4	9
Total	7	20	29	45	31	132

Sources: Field Survey, 2019-20

Distribution of clusters, as per the proportions of the farmers cultivating different recommended models and improved cropping patterns is analysed. Out of total 132 study clusters, 100% farmers have cultivated intercrops in 13 (9.85%) clusters, broader crops in 14 (10.61%) clusters, bund crops in 8 (6.06%) clusters and model crops in 2 (1.52%) clusters. On the other hand, none of the farmers have cultivated intercrops in 33 (25%) clusters, border crops in 17 (12.88%) clusters, bund crops in 26 (19.7%) and model crops in 54 (40.91%) clusters. Model crops and intercrops are less prevalent, compared to boarder and bund crops across the clusters (Table 20).

Table 20: Distribution of the Clusters as per Farmers Adapting Various Cropping Patterns

Cropping patterns\ (% of Farmers)	0%	1 to 24.99%	25 to 49.99%	50 to 74.99%	75 to 99.99%	100%	Total
Intercrops	33(25.0)	40(30.3)	23(17.42)	14(10.6)	9(6.8)	13(9.9)	132(100)
Border crops	17(12.9)	30(22.7)	30(22.73)	24(18.2)	17(12.9)	14(10.6)	132(100)
Bund crops	26(19.7)	41(31.1)	30(22.73)	17(12.9)	10(7.6)	8(6.1)	132(100)
Model crops	54(40.9)	46(34.85)	18(13.64)	8(6.1)	4(3.0)	2(1.5)	132(100)

Sources: Field Survey, 2019-20

Notes: Figures in parentheses are percentages

5.3. ZBNF practices at village level

Out of total 187 villages, 100% of the farmers applied Beejamrutham in 109 villages. This is 120 villages for Ghanajeevamrutham, 111 villages for Dravajeevamrutham, 85 villages for

Kashayams & Asthrams and 26 villages for mulching. Out of 187 total villages under the study, 100% of the ZBNF enrolled farmers have applied the four ‘non-negotiable’ inputs in 61 (32.62%) villages; 90 to 99% farmers have applied the four components together in 21 (11.23%) villages, 75 to 89% farmers applied in 33 (17.65%) villages; and less than 75% farmers have applied in 72 (38.50%) villages (Table 21).

Table 21: Distribution of Villages as per Enrolled Farmers Applying ZBNF components

Indicator \ (Percentage of farmers)	Number of villages					Percentage of villages			
	Up to 74.99%	75 to 89.99%	90 to 99.99%	100%	Total	Up to 74.99%	75 to 89.99%	90 to 99.99%	100%
Beejamrutham	29	27	22	109	187	15.51	14.44	11.76	58.29
Ghanajeevamrutham	15	27	25	120	187	8.02	14.44	13.37	64.17
Dravajeevamrutham	19	32	25	111	187	10.16	17.11	13.37	59.36
Kashyams & Asthrams	41	27	34	85	187	21.93	14.44	18.18	45.45
Mulching	146	11	4	26	187	78.07	5.88	2.14	13.90
FYM	44	32	28	83	187	23.53	17.11	14.97	44.39
Core Package	72	33	21	61	187	38.50	17.65	11.23	32.62

Sources: Field Survey, 2019-20

Out of total 187 villages, 100% enrolled farmers have applied the total Core Package in 61 villages; 75 to 99.99% farmers have used the entire package in 54 villages; 50 to 75% farmers followed the entire package in 37 villages; 25 to 50% farmers adapted the Core Package in 26 villages; and less than 25% are adhering the Core Package in nine villages. No village in Krishna and Anantapur districts have 100% farmers applying all the four components of the Core Package. Majority of villages in Srikakulam, Chittoor, Vizianagaram and West Godavari have exceptional performance. Most of the least performing villages are concentrated in three Rayalaseema districts (Table 22).

Table 22: Distribution of Villages as per Enrolled Farmers' Performance on Core ZBNF Practices

Districts \ (% of Farmers)	0.01 to 24.99 %	25 to 49.99%	50 to 74.99%	75 to 99.99%	100%	Total
Anantapur	1	11	3			15
Chittoor		2	3	1	9	15
East Godavari			1	11	3	15
Guntur			6	2	7	15
Kadapa	2	6	3	3	1	15
Krishna	1	2	5	7		15
Kurnool	4	3	6	1	1	15
Nellore			1	4	2	7
Prakasam			1	5	9	15
Srikakulam			2	3	10	15
Vishakhapatnam	1	1	1	9	3	15
Vizianagaram			2	5	8	15
West Godavari		1	3	3	8	15
State	9	26	37	54	61	187

Sources: Field Survey, 2019-20

Out of a total 187 sample villages farmers have adapted model crops only in three villages. In another 6 villages, 75 to 99.99% farmers have cultivated the model crops. There are very few villages in the top performing two categories in each of cropping pattern/ models. RySS may

study the reasons for the underperformance on recommended cropping patterns/ models. Further details are given in the following table 23.

Table 23: Distribution of Villages as per the Performance of the Enrolled Farmers on Cropping patterns

Indicator\ (% of farmers)	0%	1 to 24.99%	25 to 49.99%	50 to 74.99%	75 to 99.99%	100%	Total
Intercrops	62(33.2)	47(25.1)	29(15.5)	19(10.2)	11(5.9)	19(10.2)	187(100)
Border crops	37(19.8)	37(19.8)	41(21.9)	27(14.4)	26(13.9)	19(10.2)	187(100)
Bund crops	42(22.5)	53(28.3)	41(21.9)	27(14.4)	15(8.0)	9(4.8)	187(100)
Model crops	94(50.27)	53(28.3)	19(10.2)	12(6.42)	6(3.2)	3(1.6)	187(100)

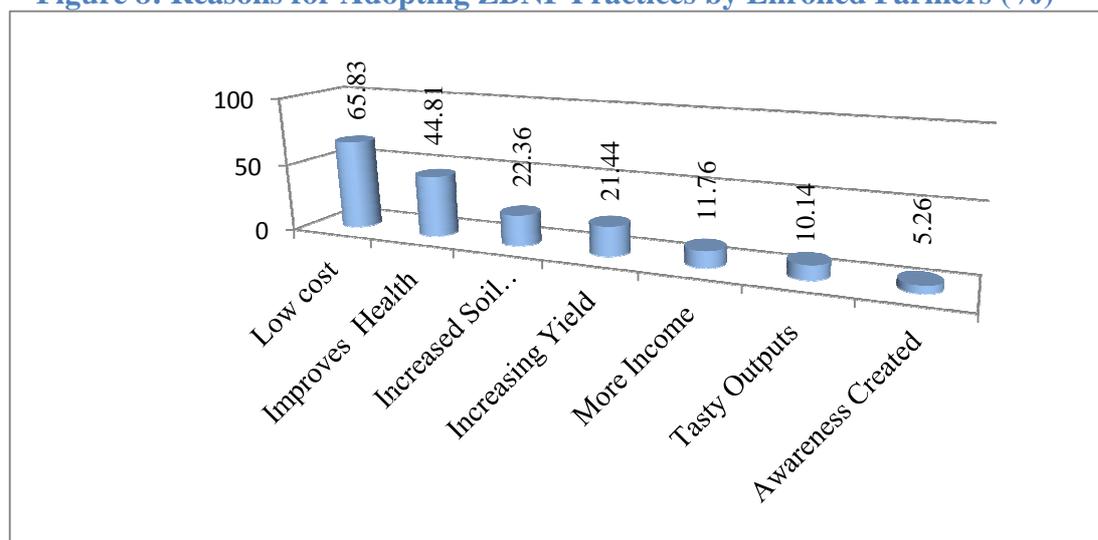
Sources: Field Survey, 2019-20 Notes: Figures in parentheses are percentages

6. Drivers and Impediments of ZBNF

The enrolled farmers were asked the reason for their adaption of ZBNF Practices. They have given many responses and reasons. As one would expect, most of the responses were inter connected and same reasons were articulated in different ways. All those responses with regard to the enrolled farmers were synthesized into a few broad themes:

1. Less expenditure/low cost
2. Improves health
3. Increase in soil fertility
4. Increasing yield
5. More profit/ more income benefits
6. Crop outputs are tasty
7. Creation of Awareness by RDT/RySS / Art of Living/Palekar meetings

Figure 8: Reasons for Adopting ZBNF Practices by Enrolled Farmers (%)



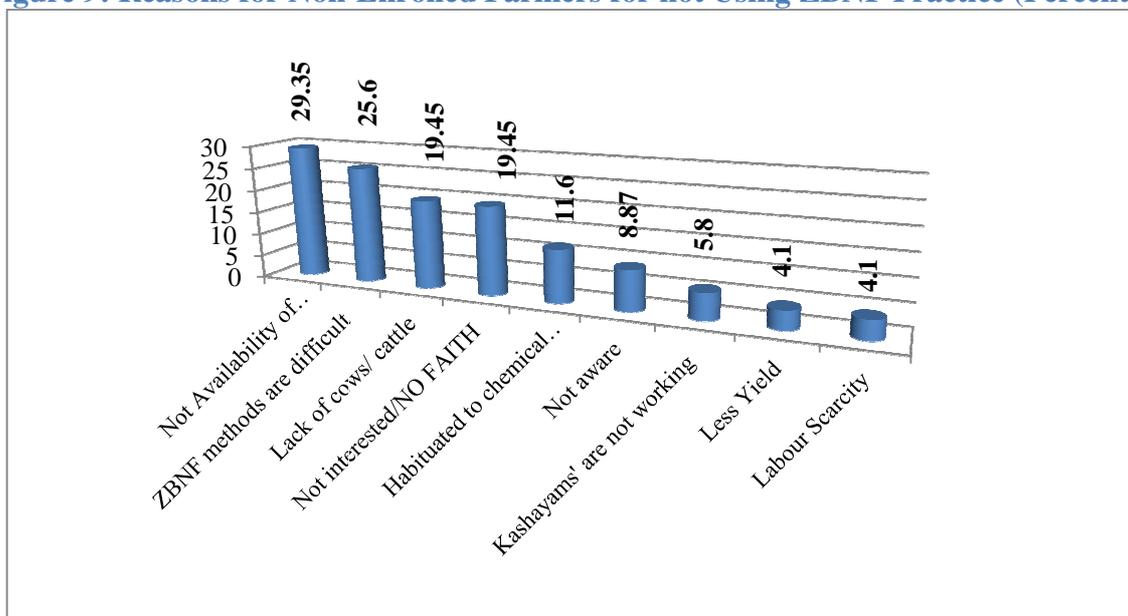
Source: Field Survey

The most important factors for adoption of ZBNF are lower cost, perception of improved health and perception of increase in soil health. Similarly, the non-enrolled farmers were asked the reasons for not-enrolling and not applying the ZBNF practices. They have given many responses

and reasons. Most of the responses were interconnected and same reasons were articulated in different ways. All those responses with regard to the non-enrolled farmers were synthesized into a few broad themes.

1. Non availability of input/ Lack of NPM shops
2. Very difficult to make ZBNF method because it takes long time to prepare inputs
3. Lack of cows/ cattle
4. Not aware
5. 'Kashayams' are not effective in pests control; hence using pesticides and fertilizers
6. Lack of cows/ cattle's
7. Less Yield
8. Habituated to chemical methods
9. No interest / No faith in ZBNF
10. Labour Scarcity

Figure 9: Reasons for Non-Enrolled Farmers for not Using ZBNF Practice (Percentage)



Source: Field Survey

Non-availability of inputs, time required to prepare ZBNF inputs, lack of cow etc., are the main reasons for non-adoption of ZBNF by non-ZBNF farmers.

7. Summary and Conclusions

At this moment, all the practices of ZBNF could be divided into two sets of practices, viz. (1) natural measures for soil quality, productivity improvement and plant protection and (2) changes in cropping pattern and intensity for which RySS brought in the scientific designs to get the larger benefits. The perceived benefits include the environmental/ ecological benefits such as control of plant infections and harmful insects, attracting friendly insects, improved productivity,

improved quality of soil, improved quality of food, optimization of land use, improved green cover, and withstanding power of plants to weather abnormalities.

About 76% of enrolled farmers have adapted ZBNF practices fully or partially. Individually, 90.68% of enrolled farmers have applied Beejamrutham, 94.05% used for Ghanajeevamrutham, 92.84% used Dravajeevamrutham, 86.86% used Kashayams & Asthrams and 40% used Mulching. Further, 29.96% of the enrolled farmers adopted Intercrops, 42.3% adopted Border crops, 31.78% adopted Bund crops and 15.48% adopted Models. On the other hand, 9.28% of non-enrolled farmers have applied Beejamrutham, 9.16% used Ghanajeevamrutham, 5.82% used Dravajeevamrutham, 7.65% used Kashayams & Asthrams, 8.09% used Mulching. 0.47% adopted for Intercrops, 23.6% adopted Border crops, 13.84% adopted Bund crops and 2.70% adopted Models.

About 1% of non-enrolled farmers also used these ZBNF practices. Relatively lower percentage of enrolled farmers has used mulching (40%). It is an area of concern. RySS may focus on this critical issue. All the four improved cropping practices are used by just 3% of enrolled farmers. About 63% enrolled farmers and 44% non-enrolled farmers have cultivated a few of the recommended cropping models.

Land holding size wise analyses indicate that there is not much difference across the different holding sizes. In fact the marginal farmers, including the landless, have better performance in the first four practices of ZBNF. Medium and large farmers have slight edge in the improved cropping practices. While medium and large farmers are focused on multilayer cropping, other three categories are focused on PMDS.

District wise analyses indicate that northern districts of Srikakulam and Vizianagaram, two Godavari districts and Chittoor district have performed better. Chittoor district is top performer in almost all components and packages of ZBNF. Anantapur, Kurnool and Kadapa have larger size holdings. These three districts have good record in adaption of the improved cropping patterns but least performers in adoption of core practices of ZBNF. Except Chittoor, fertilizers and pesticides are used on ZBNF fields in all remaining 12 districts. However, the problem is severe in Nellore, Vizianagaram and Krishna districts.

The mandal wise, cluster wise and village wise analyses confirm the district level trends. ***The ranking of mandals, clusters and villages enable RySS to locate the problem areas and resolve them.*** The ranking also reflect the performances of the field teams/ professionals.

Annexure-1: Questionnaire used in Verification Survey of ZBNF Farmers

Sl. No	Description / Questions	Answers
1	District	
2	Mandal	
3	Cluster	
4	Village	
5	Name of the Farmer	
6	Name of farmer's Father/ Husband	
7	Type of farmer (1=S2S, 2=Partial, 3=Non-ZBNF)	
8	Total land owned in this village (Acres and cents)	
9	Leased in land in this village (Acres and cents)	
10	Leased out land in this village (Acres and cents)	
11	Total land being cultivated in this village (Acres and cents)	
12	Do you use Beejamrutham? (1=Yes; 2=No)	
13	Do you use Ghanajeevamrutham? (1=Yes; 2=No)	
14	Do you use Dravajeevamrutham? (1=Yes; 2=No)	
15	Do you use Mulching? (1=Yes; 2=No)	
16	Do you use Kashayams that include Asthrams? (1=Yes; 2=No)	
17	Do you use FYM? (1=Yes; 2=No)	
18	Do you use Chemical Fertilizers on ZBNF plot? (1=Yes; 2=No)	
19	Do you use Pesticides on ZBNF plot? (1=Yes; 2=No)	
20	Do you cultivate intercrops? (1=Yes;2=No)	
21	Do you cultivate border crops? (1=Yes;2=No)	
22	Do you cultivate bund crops? (1=Yes;2=No)	
23	Do you cultivate any models? (1=No; 2=5 layer; 3=7 layer model, 4= SRI Paddy; 5= Integrated model; 6=PMDS, 7= More than one model)	
24	Reasons for cultivating/ not cultivating of ZBNF	

Annexure -2: District wise sample distribution and land holding pattern of enrolled farmers

Table A-1: District-wise, Farmer Category-wise Land Holdings of Enrolled Farmers (in Acres)

Table – A2.1:							
District	Farmer Category	Sample Number	% in the District	Own Land	Leased in land	Leased out Land	Total Operational Land
ANANTAPUR	Marginal	61	27.11	1.64	0.91	0.00	2.55
	Small	73	32.44	3.35	0.33	0.00	3.68
	Semi Medium	64	28.44	6.07	0.62	0.00	6.69
	Med&Large	27	12.00	20.00	0.22	0.78	19.44
	Sub-total	225	100.00	5.66	0.56	0.09	6.12
CHITTOOR	Marginal	163	63.42	1.30	0.08	0.02	1.37
	Small	83	32.30	3.29	0.00	0.00	3.29
	Semi Medium	10	3.89	5.00	0.00	0.00	5.00
	Med&Large	1	0.39	12.00	0.00	0.00	12.00
	Sub-total	257	100.00	2.13	0.05	0.01	2.17
EAST GODAVARI	Marginal	126	56.25	0.91	2.21	0.10	3.02
	Small	53	23.66	3.43	0.60	0.09	3.94
	Semi Medium	39	17.41	6.10	0.49	0.13	6.46
	Med&Large	6	2.68	15.00	0.50	5.00	10.50
	Sub-total	224	100.00	2.78	1.49	0.23	4.04
GUNTUR	Marginal	175	77.43	0.82	1.54	0.00	2.35
	Small	27	11.95	3.30	0.81	0.13	3.98
	Semi Medium	22	9.73	5.91	1.45	0.63	6.73
	Med&Large	2	0.88	11.00	1.50	0.00	12.50
	Sub-total	226	100.00	1.70	1.44	0.08	3.06
KADAPA	Marginal	71	30.08	1.49	0.40	0.00	1.89
	Small	102	43.22	3.39	0.66	0.04	4.01
	Semi Medium	49	20.76	6.37	0.73	0.14	6.96
	Med&Large	14	5.93	14.73	1.57	0.07	16.23
	Sub-total	236	100.00	4.11	0.65	0.05	4.71
KRISHNA	Marginal	180	80.00	0.75	2.06	0.05	2.77
	Small	25	11.11	3.24	2.70	0.08	5.86
	Semi Medium	12	5.33	6.25	2.63	0.00	8.88
	Med&Large	8	3.56	14.38	2.63	0.63	16.38
	Sub-total	225	100.00	1.81	2.18	0.07	3.92
KURNOOL	Marginal	85	40.28	1.27	1.42	0.00	2.69
	Small	56	26.54	3.60	1.18	0.21	4.57
	Semi Medium	54	25.59	6.30	3.09	0.15	9.25
	Med&Large	16	7.58	16.88	1.50	2.75	15.63
	Sub-total	211	100.00	4.36	1.79	0.30	5.85
NELLORE	Marginal	85	80.19	1.23	0.02	0.01	1.24
	Small	15	14.15	3.20	0.00	0.00	3.20
	Semi Medium	6	5.66	5.17	0.00	0.00	5.17
	Med&Large		0.00				
	Sub-total	106	100.00	1.73	0.02	0.01	1.74
PARAKASHAM	Marginal	113	43.46	1.25	1.29	0.00	2.53
	Small	98	37.69	3.41	0.88	0.01	4.28
	Semi Medium	39	15.00	6.38	2.21	0.23	8.36
	Med&Large	10	3.85	10.20	0.70	0.90	10.00
	Sub-total	260	100.00	3.18	1.25	0.07	4.35
SRIKAKULAM	Marginal	129	57.33	1.08	0.99	0.00	2.07
	Small	64	28.44	3.13	0.63	0.03	3.74
	Semi Medium	27	12.00	5.66	0.37	0.52	5.51
	Med&Large	5	2.22	16.40	5.00	4.60	16.80
	Sub-total	225	100.00	2.56	0.90	0.17	3.29
VISHAKAPATNAM	Marginal	147	64.47	1.24	0.29	0.01	1.51
	Small	58	25.44	3.40	0.11	0.00	3.52
	Semi Medium	21	9.21	6.10	0.00	0.00	6.10
	Med&Large	2	0.88	10.00	1.00	0.00	11.00
	Sub-total	228	100.00	2.31	0.22	0.01	2.53
VIZIANAGARAM	Marginal	136	59.39	1.26	0.84	0.00	2.10
	Small	65	28.38	3.24	0.37	0.03	3.59
	Semi Medium	26	11.35	5.71	1.08	0.23	6.56
	Med&Large	2	0.87	10.00	0.00	0.00	10.00
	Sub-total	229	100.00	2.41	0.72	0.03	3.10
WEST GODAVARI	Marginal	149	66.22	1.12	0.67	0.01	1.78
	Small	34	15.11	3.28	0.15	0.03	3.40
	Semi Medium	17	7.56	5.74	0.53	0.12	6.15
	Med&Large	25	11.11	18.00	1.84	0.76	19.08
	Sub-total	225	100.00	3.67	0.71	0.10	4.28
AP	Marginal	1627	56.26	1.13	1.03	0.02	2.14
	Small	757	26.18	3.35	0.58	0.04	3.89
	Semi Medium	387	13.38	6.06	1.20	0.17	7.09
	Med&Large	121	4.18	16.27	1.40	1.26	16.42
	Sub-total	2892	100.00	3.00	0.95	0.10	3.86

Table A-2: District-wise, Farmer Category-wise Land Holdings of Non- enrolled Farmers(Acres)

Table – A2.2:							
District	Farmer Category	Sample Number	% in the District	Own Land	Leased in land	Leased out Land	Total Operational Land
Anantapur	Marginal	9	12.00	1.74	0.56	0.00	2.30
	Small	25	33.33	3.50	0.08	0.00	3.58
	Semi Medium	34	45.33	5.85	0.29	0.00	6.15
	Med&Large	7	9.33	12.14	0.00	0.71	11.43
	Sub-total	75	100.00	5.16	0.23	0.07	5.32
CHITTOOR	Marginal	39	52.00	1.22	0.03	0.00	1.25
	Small	28	37.33	3.39	0.00	0.00	3.39
	Semi Medium	8	10.67	5.38	0.00	0.00	5.38
	Med&Large		0.00				
	Sub-total	75	100.00	2.47	0.01	0.00	2.49
EAST GODAVARI	Marginal	41	55.41	0.90	1.73	0.07	2.56
	Small	17	22.97	3.41	0.65	0.00	4.05
	Semi Medium	13	17.57	5.86	0.00	0.00	5.86
	Med&Large	3	4.05	14.50	0.00	0.00	14.50
	Sub-total	74	100.00	2.90	1.11	0.04	3.96
GUNTUR	Marginal	55	73.33	0.69	1.93	0.00	2.62
	Small	7	9.33	3.21	1.57	0.00	4.79
	Semi Medium	12	16.00	7.04	1.33	1.38	7.00
	Med&Large	1	1.33	11.00	0.00	0.00	11.00
	Sub-total	75	100.00	2.08	1.78	0.22	3.63
KADAPA	Marginal	28	38.36	1.45	0.28	0.25	1.48
	Small	29	39.73	3.63	0.43	0.00	4.06
	Semi Medium	15	20.55	6.75	0.27	0.03	6.98
	Med&Large	1	1.37	10.02	0.00	0.00	10.02
	Sub-total	73	100.00	3.52	0.33	0.10	3.75
KRISHNA	Marginal	53	69.74	0.85	1.61	0.01	2.45
	Small	12	15.79	3.31	0.25	0.00	3.56
	Semi Medium	5	6.58	7.40	8.20	0.00	15.60
	Med&Large	6	7.89	11.67	0.83	0.00	12.50
	Sub-total	76	100.00	2.53	1.76	0.01	4.28
KURNOOL	Marginal	15	21.43	1.10	1.33	0.07	2.37
	Small	24	34.29	3.38	0.42	0.21	3.58
	Semi Medium	17	24.29	6.03	1.12	0.00	7.15
	Med&Large	14	20.00	17.00	0.64	2.86	14.79
	Sub-total	70	100.00	6.26	0.83	0.66	6.43
NELLORE	Marginal	19	54.29	0.83	0.00	0.00	0.83
	Small	13	37.14	3.27	0.00	0.00	3.27
	Semi Medium	3	8.57	6.00	0.00	0.00	6.00
	Med&Large		0.00				
	Sub-total	35	100.00	2.18	0.00	0.00	2.18
PARAKASHAM	Marginal	30	37.50	1.26	1.83	0.00	3.09
	Small	21	26.25	3.54	1.33	0.00	4.87
	Semi Medium	24	30.00	5.88	1.54	0.17	7.25
	Med&Large	5	6.25	12.40	0.00	0.00	12.40
	Sub-total	80	100.00	3.94	1.50	0.05	5.39
SRIKAKULAM	Marginal	51	68.00	1.16	1.05	0.02	2.19
	Small	15	20.00	3.10	0.33	0.00	3.43
	Semi Medium	8	10.67	6.50	1.75	0.81	7.44
	Med&Large	1	1.33	10.00	0.00	0.00	10.00
	Sub-total	75	100.00	2.24	0.97	0.10	3.10
VISHAKAPATNAM	Marginal	45	60.00	1.20	0.11	0.02	1.29
	Small	26	34.67	3.18	0.06	0.00	3.24
	Semi Medium	3	4.00	5.00	0.00	0.00	5.00
	Med&Large	1	1.33	10.00	0.00	0.00	10.00
	Sub-total	75	100.00	2.16	0.08	0.01	2.23
VIZIANAGARAM	Marginal	49	75.38	1.08	0.26	0.00	1.34
	Small	14	21.54	3.21	0.00	0.00	3.21
	Semi Medium	2	3.08	5.00	0.00	0.00	5.00
	Med&Large		0.00				
	Sub-total	65	100.00	1.66	0.20	0.00	1.86
WEST GODAVARI	Marginal	55	73.33	1.15	0.62	0.00	1.77
	Small	12	16.00	3.08	0.33	0.00	3.42
	Semi Medium	7	9.33	5.57	0.29	1.00	4.86
	Med&Large	1	1.33	10.00	0.00	5.00	5.00
	Sub-total	75	100.00	1.99	0.54	0.16	2.36
AP	Marginal	489	52.69	1.07	0.93	0.03	1.98
	Small	245	26.40	3.36	0.39	0.02	3.73
	Semi Medium	153	16.49	6.09	1.06	0.23	6.92
	Med&Large	41	4.42	13.84	0.34	1.22	12.96
	Sub-total	928	100.00	3.07	0.78	0.11	3.74

Annexure 3: Ranks of mandals, clusters and villages on each indicator and package

Table A-3: Ranking of the mandals on use of different components of ZBNF

Dist.	Mandal	Beejamrutham		Ghanajeevamrutham		Dravajeevamrutham		Mulching		Kashyams & Asthrams		FYM		Core Package	
		Value	Rank/119	Value	Rank/119	Value	Rank/117	Value	Rank/109	Value	Rank/117	Value	Rank/118	Value	Rank/117
Anantapur	Bukkarayasamudram	80.0	92	86.7	92	86.7	88	6.7	94	66.7	99	80.0	90	60.0	86
	C k palli	86.7	82	93.3	72	80.0	101	40.0	45	86.7	79	86.7	78	53.3	91
	Chilamathur	73.3	99	53.3	117	46.7	117	13.3	73	40.0	113	73.3	96	26.7	104
	Gooty	66.7	107	73.3	113	73.3	108	33.3	52	73.3	93	100.0	1	26.7	104
	Kalaynadurgam	86.7	82	100.0	1	60.0	114	13.3	73	46.7	110	86.7	78	26.7	104
	Narpala	46.7	113	93.3	72	86.7	88	13.3	73	46.7	110	93.3	53	26.7	104
	Raptadu	73.3	99	83.3	102	83.3	99	13.3	73	90.0	73	80.0	90	46.7	96
	Rayadurgam	73.3	99	80.0	108	86.7	88	80.0	21	53.3	108	93.3	53	26.7	104
	Settur	60.0	110	93.3	72	73.3	108	26.7	59	60.0	105	100.0	1	13.3	117
	Somandepalli	80.0	92	80.0	108	80.0	101	13.3	73	43.3	112	96.7	47	30.0	103
Tadipatri	73.3	99	83.3	102	86.7	88	30.0	57	80.0	88	90.0	73	43.3	99	
Vajrakarur	73.3	99	86.7	92	73.3	108	26.7	59	86.7	79	66.7	101	40.0	100	
Chittoor	Bangarupalem	100.0	1	100.0	1	100.0	1	100.0	1	70.6	98	100.0	1	70.6	77
	Byreddypalli	100.0	1	100.0	1	100.0	1	100.0	1	62.1	104	100.0	1	62.1	85
	G d Nellore	100.0	1	93.3	72	46.7	117	53.3	35	26.7	117	100.0	1	26.7	104
	Gudipalli	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Nagalapuram	100.0	1	100.0	1	100.0	1	100.0	1	71.8	97	100.0	1	71.8	74
	Penumuru	100.0	1	100.0	1	53.3	116	13.3	73	33.3	116	100.0	1	26.7	104
	Ramachandra puram	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Thottambedu	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Vayalpad	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Devipatnam	100.0	1	93.3	72	100.0	1	86.7	17	100.0	1	100.0	1	93.3	35
East Godavari	Gangavaram	100.0	1	100.0	1	100.0	1	80.0	21	93.3	51	86.7	78	93.3	35
	Prathipadu	96.7	66	90.0	89	90.0	85	46.7	40	90.0	73	90.0	73	83.3	59
	Rampa chodavaram	82.2	91	100.0	1	100.0	1	53.3	35	95.6	48	95.6	51	82.2	64
	Samalakota	100.0	1	100.0	1	100.0	1	73.3	26	93.3	51	93.3	53	93.3	35
	Shankhavaram	100.0	1	96.7	69	100.0	1	36.7	49	100.0	1	86.7	78	96.7	33
	Tuni	78.6	97	100.0	1	100.0	1	42.9	44	92.9	68	92.9	69	71.4	75
	Y ramavaram	96.7	66	100.0	1	100.0	1	86.7	17	96.7	44	96.6	50	93.3	35
	Yeleswaram	100.0	1	100.0	1	100.0	1	51.7	38	90.0	73	90.0	73	90.0	51
	Bellamkonda	96.7	66	83.3	102	86.7	88	16.7	71	86.7	79	83.3	87	70.0	78
	Bhattiprolu	93.3	73	100.0	1	100.0	1	6.7	94	100.0	1	6.7	117	93.3	35
Guntur	Bollapalli	93.3	73	66.7	115	93.3	69	13.3	73	93.3	51	93.3	53	66.7	81
	Dacepalli	93.8	72	87.5	91	93.8	68	12.5	90	87.5	77	100.0	1	81.3	65
	Duggirala	100.0	1	100.0	1	100.0	1	66.7	29	100.0	1	100.0	1	100.0	1
	Durgi	86.7	82	73.3	113	80.0	101	13.3	73	73.3	93	80.0	90	60.0	86
	Kollipara	98.7	61	93.3	72	97.3	66	70.7	27	96.0	47	92.0	71	93.3	35
	Kollur	80.0	92	53.3	117	60.0	114	46.7	40	80.0	88	93.3	53	53.3	91
	Nakarikallu	100.0	1	100.0	1	100.0	1	26.7	59	100.0	1	86.7	78	100.0	1
	Rajupalem	100.0	1	100.0	1	100.0	1	-	109	100.0	1	53.3	106	100.0	1
	B kodur	100.0	1	86.7	92	46.7	117	-	109	26.7	117	86.7	78	13.3	117
	Chinnamandem	53.3	112	80.0	108	100.0	1	-	109	60.0	105	93.3	53	26.7	104
Kadapa	Galeveedu	73.3	99	66.7	115	80.0	101	26.7	59	86.7	79	33.3	113	26.7	104
	Kalasadapu	91.8	79	85.7	100	79.6	107	6.1	105	81.6	87	73.5	95	55.1	90
	Mydukuru	96.8	64	90.3	88	83.9	98	35.5	51	87.1	78	74.2	94	67.7	80
	Mylavaram	100.0	1	100.0	1	100.0	1	-	109	100.0	1	83.3	87	100.0	1
	Pendli marri	83.0	90	83.0	106	80.9	100	4.3	106	97.9	41	80.9	89	59.6	89
	Sambapally	80.0	92	86.7	92	73.3	108	6.7	94	86.7	79	93.3	53	46.7	96
	Vempalli	30.8	118	81.3	107	62.5	113	6.3	103	56.3	107	100.0	1	18.8	115
	Vemula	64.3	109	93.3	72	93.3	69	40.0	45	40.0	113	93.3	53	33.3	101
	Agiripalli	33.3	116	86.7	92	86.7	88	60.0	32	93.3	51	100.0	1	33.3	101
	Bantumilli	86.7	82	100.0	1	100.0	1	46.7	40	93.3	51	93.3	53	86.7	53
Krishna	Bapulupadu	95.0	70	88.3	90	91.7	83	13.3	73	88.3	76	96.7	47	75.0	71
	Chatrai	26.7	119	26.7	119	73.3	108	-	109	66.7	99	100.0	1	20.0	114
	Musunuru	86.7	82	93.3	72	100.0	1	6.7	94	73.3	93	100.0	1	73.3	72
	Nuziveedu	84.4	87	100.0	1	100.0	1	11.1	91	93.3	51	97.8	46	77.8	69
	Unguturu	96.7	66	96.7	69	100.0	1	3.3	107	76.7	91	90.0	73	73.3	72
	Vatsavai	100.0	1	100.0	1	100.0	1	13.3	73	93.3	51	100.0	1	93.3	35
	Veerullapadu	73.3	99	93.3	72	93.3	69	13.3	73	66.7	99	93.3	53	53.3	91
	Allagadda	90.0	80	93.3	72	100.0	1	33.3	52	96.7	44	43.3	111	86.7	53
	Aspari	33.3	116	93.3	72	93.3	69	40.0	45	26.7	117	93.3	53	13.3	117
	Chagalamarri	77.4	98	77.4	112	90.3	84	67.7	28	93.6	50	33.3	113	71.0	76
Kurnool	Kalluru	46.7	113	86.7	92	90.0	85	6.7	94	36.7	115	90.0	73	26.7	104
	Miduthuru	73.3	99	80.0	108	93.3	69	13.3	73	66.7	99	53.3	106	53.3	91
	Orvakal	46.7	113	100.0	1	100.0	1	35.6	50	48.9	109	62.2	102	17.8	116
	Panyam	93.3	73	83.3	102	86.7	88	33.3	52	76.7	91	73.3	96	66.7	81
	Peapally	66.7	107	93.3	72	93.3	69	13.3	73	73.3	93	100.0	1	46.7	96

Dis t.	Mandal	Beejamrutham		Ghanajeevamr utham		Dravajeevamrut ham		Mulching		Kashyams & Asthrams		FYM		Core Package	
		Value	Rank/ 119	Value	Ran k/ 119	Value	Rank / 117	Value	Ran k/ 109	Value	Rank/ 117	Value	Ran k/ 118	Value	Ra nk/ 117
Nellore	Chilumuru	100.0	1	100.0	1	93.3	69	6.7	94	93.3	51	-	118	93.3	35
	Doravarisatram	100.0	1	96.8	68	100.0	1	46.7	40	96.8	43	51.6	108	90.3	50
	Kavali	100.0	1	100.0	1	84.4	97	6.7	94	86.7	79	-	118	75.6	70
	Ojili	100.0	1	100.0	1	100.0	1	26.7	59	100.0	1	100.0	1	100.0	1
Parakasham	Kanigiri	100.0	1	100.0	1	100.0	1	-	109	100.0	1	100.0	1	100.0	1
	Korisapadu	100.0	1	100.0	1	100.0	1	-	109	100.0	1	100.0	1	100.0	1
	Marturu	100.0	1	100.0	1	100.0	1	-	109	100.0	1	100.0	1	100.0	1
	Mundlamuru	100.0	1	100.0	1	100.0	1	15.2	72	97.0	42	90.9	72	97.0	30
	Naguluppalapadu	98.2	62	98.2	67	98.2	64	49.0	39	90.7	72	92.6	70	90.7	49
	Pedda dornala	100.0	1	100.0	1	100.0	1	93.8	14	100.0	1	100.0	1	100.0	1
	Singaraikonda	100.0	1	100.0	1	100.0	1	6.3	103	93.8	49	93.8	52	93.8	34
	Sontamaguluru	100.0	1	100.0	1	100.0	1	2.8	108	100.0	1	100.0	1	100.0	1
	Yeragondapalem	100.0	1	86.5	99	91.9	82	27.0	58	91.9	69	56.8	104	81.1	66
	Amudalavalasa	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
Srikakulam	Etcherla	100.0	1	100.0	1	100.0	1	6.7	94	100.0	1	100.0	1	100.0	1
	Gara	100.0	1	100.0	1	100.0	1	13.3	73	93.3	51	100.0	1	93.3	35
	Kothuru	88.9	81	100.0	1	100.0	1	8.9	93	91.1	70	100.0	1	84.4	58
	Narasannapeta	100.0	1	100.0	1	100.0	1	53.3	35	100.0	1	93.3	53	100.0	1
	Pathapatnam	100.0	1	100.0	1	100.0	1	-	109	100.0	1	93.3	53	100.0	1
	Ponduru	100.0	1	100.0	1	100.0	1	13.3	73	100.0	1	100.0	1	100.0	1
	Ranasthalam	100.0	1	100.0	1	100.0	1	33.3	52	100.0	1	80.0	90	100.0	1
	Regadiamudalavalasa	100.0	1	100.0	1	100.0	1	-	109	100.0	1	100.0	1	100.0	1
	Savarakota	100.0	1	100.0	1	100.0	1	10.0	92	93.3	51	86.7	78	93.3	35
	Srikakulam	100.0	1	100.0	1	100.0	1	-	109	93.3	51	73.3	96	93.3	35
	Veeraghattam	93.3	73	85.7	100	93.3	69	13.3	73	80.0	88	93.3	53	66.7	81
	Anakapalli	100.0	1	100.0	1	93.3	69	20.0	68	100.0	1	100.0	1	86.7	53
	Vishakapatnam	Anantagiri	83.3	88	100.0	1	100.0	1	93.3	15	100.0	1	100.0	1	83.3
Cheedikada		97.8	63	93.3	72	80.0	101	22.2	66	66.7	99	93.3	53	51.1	95
Chintapalli		93.9	71	100.0	1	100.0	1	100.0	1	90.9	71	100.0	1	87.9	52
Chodavaram		100.0	1	86.7	92	86.7	88	13.3	73	93.3	51	100.0	1	80.0	67
G madugula		60.0	110	100.0	1	100.0	1	60.0	32	100.0	1	100.0	1	60.0	86
Paderu		83.3	88	100.0	1	100.0	1	100.0	1	93.3	51	100.0	1	83.3	59
Padmanabham		100.0	1	100.0	1	100.0	1	6.7	94	86.7	79	100.0	1	86.7	53
V madugula		93.3	73	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	93.3	35
Yalamanchili		100.0	1	100.0	1	100.0	1	60.0	32	100.0	1	100.0	1	100.0	1
Bobbili		100.0	1	100.0	1	97.8	65	39.1	48	82.6	86	54.4	105	82.6	63
Vizianagaram	Bondapally	100.0	1	100.0	1	96.8	67	19.4	70	100.0	1	67.7	100	96.8	31
	Denkada	93.3	73	93.3	72	93.3	69	20.0	68	93.3	51	46.7	110	80.0	67
	Garugubilli	100.0	1	100.0	1	100.0	1	26.7	59	100.0	1	20.0	116	100.0	1
	Kurupam	100.0	1	100.0	1	100.0	1	21.7	67	98.3	40	43.3	111	98.3	29
	Makkuva	100.0	1	100.0	1	100.0	1	81.3	20	100.0	1	100.0	1	100.0	1
	Mentada	96.8	64	100.0	1	100.0	1	22.6	65	100.0	1	51.6	108	96.8	31
	Vizianagaram	80.0	92	93.3	72	93.3	69	33.3	52	93.3	51	33.3	113	66.7	81
	Buttaigudem	100.0	1	98.7	66	88.0	87	65.3	31	100.0	1	84.0	86	86.7	53
	Chintalapudi	100.0	1	100.0	1	100.0	1	93.3	15	100.0	1	100.0	1	100.0	1
West godavari	Devrapalli	100.0	1	93.3	72	80.0	101	80.0	21	96.7	44	60.0	103	70.0	78
	Dwarakatirumala	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Gopalapuram	100.0	1	100.0	1	93.3	69	80.0	21	93.3	51	93.3	53	93.3	35
	Jeelugumilli	100.0	1	100.0	1	100.0	1	66.7	29	100.0	1	86.7	78	100.0	1
	Kovvuru	100.0	1	100.0	1	93.3	69	86.7	17	93.3	51	73.3	96	93.3	35
	Polavaram	100.0	1	96.7	69	86.7	88	80.0	21	100.0	1	96.7	47	83.3	59
	Unguturu	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1

Table A-4: Ranking of the mandals on Diversified Cropping Pattern

Dist.	Mandal	Intercrops		Border crops		Bund crops		Model crops	
		Value	Rank/ 89	Value	Rank/ 103	Value	Rank/ 100	Value	Rank / 72
Anantapuramu	Bukkarayasamudram	53.33	28	66.67	28	20.00	64	-	72
	C k palli	100.00	1	93.33	14	26.67	51	33.33	18
	Chilamathur	33.33	40	53.33	43	20.00	64	6.67	49
	Gooty	93.33	13	93.33	14	6.67	87	13.33	34
	Kalaynadurgam	20.00	55	60.00	33	-	100	33.33	18
	Narpala	40.00	33	26.67	68	26.67	51	13.33	34
	Raptadu	83.33	16	96.67	13	26.67	51	3.33	66
	Rayadurgam	100.00	1	100.00	1	20.00	64	40.00	13
	Settur	100.00	1	93.33	14	53.33	27	60.00	6
	Somandepalli	70.00	20	56.67	39	33.33	45	23.33	30
Tadipatri	53.33	28	30.00	65	20.00	64	26.67	27	
Vajrakarur	33.33	40	60.00	33	20.00	64	6.67	49	
Chittoor	Bangarupalem	5.88	83	88.24	20	100.00	1	94.12	3
	Byreddypalli	13.79	62	100.00	1	100.00	1	100.00	1
	G d Nellore	-	89	93.33	14	46.67	33	6.67	49
	Gudipalli	100.00	1	100.00	1	94.44	7	38.89	17
	Nagalapuram	12.82	67	100.00	1	100.00	1	94.87	2
	Penumuru	-	89	100.00	1	53.33	27	6.67	49
	Ramachandra puram	100.00	1	100.00	1	100.00	1	33.33	18
	Thottambedu	48.28	30	44.83	52	58.62	25	27.59	26
Vayalpad	100.00	1	97.50	11	50.00	31	75.00	4	
East godavari	Devipatnam	80.00	17	80.00	25	13.33	74	-	72
	Gangavaram	46.67	31	93.33	14	13.33	74	13.33	34
	Prathipadu	37.93	38	56.67	39	22.22	61	56.67	7
	Rampa chodavaram	33.33	40	57.78	38	13.33	74	11.11	44
	Samalakota	13.33	63	40.00	58	20.00	64	-	72
	Shankhavaram	30.00	46	50.00	48	40.00	39	26.67	27
	Tuni	35.71	39	28.57	67	7.14	86	7.14	47
	Y ramavaram	68.97	21	53.33	43	10.00	83	-	72
	Yeleswaram	40.00	33	44.83	52	33.33	45	30.00	25
Guntur	Bellamkonda	6.67	73	-	103	13.33	74	6.67	49
	Bhattriprolu	6.67	73	60.00	33	-	100	-	72
	Bollapalli	26.67	49	-	103	40.00	39	6.67	49
	Dacepalli	31.25	45	43.75	54	25.00	58	31.25	24
	Duggirala	60.00	24	66.67	28	6.67	87	-	72
	Durgi	6.67	73	6.67	96	26.67	51	7.14	47
	Kollipara	10.67	68	42.67	56	10.67	82	6.67	49
	Kollur	13.33	63	13.33	87	20.00	64	-	72
	Nakarikallu	-	89	-	103	26.67	51	6.67	49
Rajupalem	26.67	49	73.33	27	-	100	-	72	
Kadapa	B kodur	26.67	49	53.33	43	33.33	45	-	72
	Chinnamandem	13.33	63	53.33	43	6.67	87	-	72
	Galeveedu	66.67	22	100.00	1	6.67	87	13.33	34
	Kalasapadu	2.04	87	63.27	32	12.24	81	-	72
	Mydukuru	19.35	61	80.65	24	-	100	-	72
	Mylavaram	-	89	83.33	23	-	100	-	72
	Pendli marri	-	89	91.49	19	2.22	99	-	72
	Sambapally	-	89	86.67	21	-	100	20.00	31
	Vempalli	-	89	31.25	63	-	100	40.00	13
Vemula	-	89	13.33	87	-	100	-	72	
Krishna	Agiripalli	6.67	73	80.00	25	20.00	64	-	72
	Bantumilli	-	89	33.33	60	26.67	51	13.33	34
	Bapulupadu	1.67	88	21.67	75	45.00	38	-	72
	Chatrai	-	89	-	103	-	100	-	72
	Musunuru	6.67	73	26.67	68	33.33	45	-	72
	Nuziveedu	8.89	70	35.56	59	22.22	61	-	72
	Unguturu	-	89	-	103	53.33	27	3.33	66
	Vatsavai	33.33	40	13.33	87	13.33	74	-	72
	Veerullapadu	40.00	33	60.00	33	20.00	64	-	72
Kurmoor	Allagadda	40.00	33	63.33	30	6.67	87	40.00	13
	Aspari	100.00	1	86.67	21	-	100	50.00	10
	Chagalamarri	93.55	12	96.77	12	22.58	60	73.33	5
	Kalluru	93.33	13	100.00	1	-	100	-	72
	Miduthuru	60.00	24	20.00	76	-	100	6.67	49
	Orvakal	80.00	17	55.56	41	8.89	85	-	72
	Panyam	40.00	33	43.33	55	6.67	87	3.33	66
Peapally	86.67	15	100.00	1	-	100	-	72	
Nellore	Chilumuru	13.33	63	20.00	76	20.00	64	13.33	34
	Doravarisatram	-	89	9.68	95	9.68	84	9.68	46
	Kavali	-	89	-	103	-	100	4.44	65

Di st.	Mandal	Intercrops		Border crops		Bund crops		Model crops	
		Value	Rank/ 89	Value	Rank/ 103	Value	Rank/ 100	Value	Rank / 72
	Ojili	33.33	40	20.00	76	13.33	74	13.33	34
Parakasham	Kanigiri	26.67	49	-	103	-	100	6.67	49
	Korisapadu	20.00	55	26.67	68	-	100	6.67	49
	Marturu	-	89	-	103	-	100	-	72
	Mundlamuru	27.27	48	30.30	64	6.06	96	3.03	70
	Naguluppalapadu	24.07	54	22.22	74	-	100	-	72
	Pedda dornala	56.25	27	50.00	48	-	100	-	72
	Singaraikonda	75.00	19	18.75	82	68.75	19	6.25	64
	Sontamaguluru	2.78	86	2.78	101	2.78	98	-	72
	Yeragondapalem	44.44	32	40.54	57	5.41	97	2.70	71
Srikakulam	Amudalavalasa	-	89	13.33	87	6.67	87	13.33	34
	Etcherla	-	89	-	103	93.33	8	-	72
	Gara	-	89	-	103	40.00	39	-	72
	Kothuru	-	89	2.22	102	71.11	18	11.11	44
	Narasannapeta	-	89	20.00	76	60.00	23	-	72
	Pathapatnam	-	89	-	103	100.00	1	-	72
	Ponduru	-	89	-	103	6.67	87	6.67	49
	Ranasthalam	7.14	72	46.67	51	46.67	33	20.00	31
	Regadiamudalavalasa	6.67	73	-	103	93.33	8	6.67	49
	Savarakota	-	89	6.67	96	53.33	27	-	72
	Srikakulam	20.00	55	60.00	33	46.67	33	13.33	34
	Veeraghattam	-	89	13.33	87	80.00	13	-	72
Vishakapatnam	Anakapalli	6.67	73	13.33	87	46.67	33	-	72
	Anantagiri	96.67	11	50.00	48	90.00	11	43.33	12
	Cheedikada	28.89	47	17.78	85	22.22	61	24.44	29
	Chintapalli	100.00	1	54.55	42	50.00	31	54.55	8
	Chodavaram	20.00	55	13.33	87	33.33	45	40.00	13
	G madugula	100.00	1	33.33	60	80.00	13	46.67	11
	Paderu	100.00	1	63.33	30	6.67	87	33.33	18
	Padmanabham	20.00	55	20.00	76	40.00	39	33.33	18
	V madugula	60.00	24	-	103	100.00	1	53.33	9
	Yalamanchili	-	89	26.67	68	73.33	17	33.33	18
	Vizianagaram	Bobbili	8.70	71	13.04	94	34.78	44	-
Bondapally		3.23	84	29.03	66	54.84	26	-	72
Denkada		-	89	-	103	26.67	51	-	72
Garugubilli		-	89	6.67	96	93.33	8	-	72
Kurupam		6.67	73	18.33	84	65.00	22	3.33	66
Makkuva		25.00	53	18.75	82	87.50	12	18.75	33
Mentada		3.23	84	51.61	47	77.42	16	-	72
Vizianagaram		-	89	26.67	68	80.00	13	-	72
West godavari	Buttaigudem	10.67	68	16.00	86	46.67	33	-	72
	Chintalapudi	6.67	73	33.33	60	66.67	20	-	72
	Devrapalli	-	89	6.67	96	23.33	59	-	72
	Dwarakaturumala	66.67	22	100.00	1	66.67	20	6.67	49
	Gopalapuram	-	89	-	103	-	100	-	72
	Jeelugumilli	20.00	55	26.67	68	40.00	39	6.67	49
	Kovvuru	6.67	73	6.67	96	13.33	74	-	72
	Polavaram	-	89	-	103	30.00	50	-	72
Unguturu	-	89	20.00	76	60.00	23	13.33	34	

Sources: Field Survey, 2018-19

Table A-5: Ranking of Clusters on ZBNF Practices

District	Cluster	Beejamrutham		Ghanajeveamrutham		Dravajeveamrutham		Mulching		Kashyams & Asthrams		FYM		Core Package	
		Value	Rank / 132	Value	Rank/ 132	Value	Rank/ 130	Value	Rank/ 121	Value	Rank/ 130	Value	Rank/ 130	Value	Rank/ 128
Anantapur	Basampalle	86.7	87	93.3	81	80.0	113	40.0	51	86.7	85	86.7	83	53.3	101
	Bondala dinne	73.3	108	83.3	113	86.7	97	30.0	65	80.0	96	90.0	77	43.3	108
	Chintralapalli	60.0	121	93.3	81	73.3	120	26.7	67	60.0	114	100.0	1	13.3	128
	Dharmapuram	66.7	116	73.3	124	73.3	120	33.3	58	73.3	103	100.0	1	26.7	114
	Gudipalli	80.0	99	80.0	118	80.0	113	13.3	84	43.3	124	96.7	52	30.0	113
	Hampapuram	80.0	99	93.3	81	80.0	113	13.3	84	93.3	55	86.7	83	53.3	101
	Mallapuram	73.3	108	80.0	118	86.7	97	80.0	24	53.3	119	93.3	58	26.7	114
	Maruru	66.7	116	73.3	124	86.7	97	13.3	84	86.7	85	73.3	104	40.0	109
	Palavoy	86.7	87	100.0	1	60.0	127	13.3	84	46.7	122	86.7	83	26.7	114
	Rangapuram	46.7	125	93.3	81	86.7	97	13.3	84	46.7	122	93.3	58	26.7	114
	Tekulodu	73.3	108	53.3	130	46.7	130	13.3	84	40.0	125	73.3	104	26.7	114
	Venkatampalli	73.3	108	86.7	101	73.3	120	26.7	67	86.7	85	66.7	110	40.0	109
Venkatapuram	80.0	99	86.7	101	86.7	97	6.7	105	66.7	108	80.0	97	60.0	94	
Chittoor	Ayyavaripalli	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Bommaipally	100.0	1	100.0	1	100.0	1	100.0	1	70.6	107	100.0	1	70.6	82
	Charvaganipalli	100.0	1	100.0	1	53.3	129	13.3	84	33.3	128	100.0	1	26.7	114
	Ganginayanipalli	100.0	1	100.0	1	100.0	1	100.0	1	62.1	113	100.0	1	62.1	93
	Nagalapuram	100.0	1	100.0	1	100.0	1	100.0	1	60.0	114	100.0	1	60.0	94
	P n kandriga	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Pedda kanaparthi	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	S s puram	100.0	1	100.0	1	100.0	1	100.0	1	79.2	101	100.0	1	79.2	74
	Sodi ganipalli	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Velkuru	100.0	1	93.3	81	46.7	130	53.3	40	26.7	130	100.0	1	26.7	114
East Godavari	Atchampeta	100.0	1	100.0	1	100.0	1	73.3	30	93.3	55	93.3	58	93.3	38
	Choppakonda	100.0	1	93.3	81	100.0	1	86.7	19	100.0	1	100.0	1	93.3	38
	Hamsavaram	78.6	107	100.0	1	100.0	1	42.9	50	92.9	75	92.9	74	71.4	81
	Pidatamamidi	100.0	1	100.0	1	100.0	1	80.0	24	93.3	55	86.7	83	93.3	38
	Shankhavaram	100.0	1	96.7	77	100.0	1	36.7	56	100.0	1	86.7	83	96.7	36
	Utlra	82.2	97	100.0	1	100.0	1	53.3	40	95.6	52	95.6	56	82.2	68
	Vommangai	96.7	70	90.0	97	90.0	94	46.7	45	90.0	80	90.0	77	83.3	63
	Y ramavaram	96.7	70	100.0	1	100.0	1	86.7	19	96.7	49	96.6	55	93.3	38
	Yeleswaram	100.0	1	100.0	1	100.0	1	51.7	43	90.0	80	90.0	77	90.0	53
	Guntur	Adigoppulla	86.7	87	73.3	124	80.0	113	13.3	84	73.3	103	80.0	97	60.0
Annavaram		97.8	67	88.9	99	95.6	76	55.6	39	93.3	55	86.7	83	88.9	55
Athota		100.0	1	100.0	1	100.0	1	93.3	17	100.0	1	100.0	1	100.0	1
Donepalli		80.0	99	53.3	130	60.0	127	46.7	45	80.0	96	93.3	58	53.3	101
Ganapavaram		100.0	1	100.0	1	100.0	1	-	121	100.0	1	53.3	118	100.0	1
Gummanampadu		93.3	78	66.7	128	93.3	79	13.3	84	93.3	55	93.3	58	66.7	86
Kothuru		93.8	77	87.5	100	93.8	77	12.5	101	87.5	83	100.0	1	81.3	69
Nakarikallu		100.0	1	100.0	1	100.0	1	26.7	67	100.0	1	86.7	83	100.0	1
Nandirajupalem		96.7	70	83.3	113	86.7	97	16.7	81	86.7	85	83.3	94	70.0	83
Revendrapadu		100.0	1	100.0	1	100.0	1	66.7	31	100.0	1	100.0	1	100.0	1
Vellaturu		93.3	78	100.0	1	100.0	1	6.7	105	100.0	1	6.7	128	93.3	38
Kadapa		Adireddypalle	96.8	68	90.3	96	83.9	111	35.5	57	87.1	84	74.2	102	67.7
	Alireddypalle	30.8	131	81.3	116	62.5	126	6.3	114	56.3	118	100.0	1	18.8	127
	Bhumayagaripalle	64.3	120	93.3	81	93.3	79	40.0	51	40.0	125	93.3	58	33.3	111
	Chennamrajupalle	83.0	96	83.0	115	80.9	112	4.3	117	97.9	46	80.9	96	59.6	99
	Chennareddypalle	91.8	85	85.7	111	79.6	119	6.1	116	81.6	95	73.5	103	55.1	100
	Galeveedu	73.3	108	66.7	128	80.0	113	26.7	67	86.7	85	33.3	125	26.7	114
	Intrampeta	100.0	1	86.7	101	46.7	130	-	121	26.7	130	86.7	83	13.3	128
	Karmalavari palle	100.0	1	100.0	1	100.0	1	-	121	100.0	1	83.3	94	100.0	1
	P n colony	80.0	99	86.7	101	73.3	120	6.7	105	86.7	85	93.3	58	46.7	106
	Paramatikona	53.3	124	80.0	118	100.0	1	-	121	60.0	114	93.3	58	26.7	114
Krishna	Agiripalli	33.3	129	86.7	101	86.7	97	60.0	35	93.3	55	100.0	1	33.3	111
	Aikuru	96.7	70	96.7	77	100.0	1	3.3	118	76.7	102	90.0	77	73.3	77
	Bommuluru	93.3	78	96.7	77	96.7	75	16.7	81	96.7	49	100.0	1	90.0	53
	Chekkapalli	86.7	87	93.3	81	100.0	1	6.7	105	73.3	103	100.0	1	73.3	77
	Chinatummidanardhanavaram	86.7	87	100.0	1	100.0	1	46.7	45	93.3	55	93.3	58	86.7	57
	anardhanavaram	26.7	132	26.7	132	73.3	120	-	121	66.7	108	100.0	1	20.0	126
	Kodurupadu	96.7	70	80.0	118	86.7	97	10.0	102	80.0	96	93.3	58	60.0	94
	Lingala	100.0	1	100.0	1	100.0	1	13.3	84	93.3	55	100.0	1	93.3	38
	ukkollupadu	93.3	78	100.0	1	100.0	1	3.3	118	90.0	80	96.7	52	83.3	63
	Ponnnavaram	73.3	108	93.3	81	93.3	79	13.3	84	66.7	108	93.3	58	53.3	101
	Sunkollu	66.7	116	100.0	1	100.0	1	26.7	67	100.0	1	100.0	1	66.7	86
	Kurnool	Ahobilam	100.0	1	100.0	1	100.0	1	-	121	100.0	1	80.0	97	100.0
Balapanuru		86.7	87	80.0	118	86.7	97	33.3	58	86.7	85	66.7	110	66.7	86
Jalakanur		73.3	108	80.0	118	93.3	79	13.3	84	66.7	108	53.3	118	53.3	101
Kethavafram		40.0	127	100.0	1	100.0	1	33.3	58	60.0	114	66.7	110	26.7	114
Marripally	80.0	99	86.7	101	100.0	1	66.7	31	93.3	55	6.7	128	73.3	77	

	Muthyalapadu	81.3	98	81.3	116	93.8	77	75.0	29	93.8	53	66.7	110	75.0	76
	Peddavangali	73.3	108	73.3	124	86.7	97	60.0	35	93.3	55	-	130	66.7	86
	Pudicherla	60.0	121	100.0	1	100.0	1	40.0	51	33.3	128	66.7	110	13.3	128
	hadakanapalle	46.7	125	86.7	101	90.0	94	6.7	105	36.7	127	90.0	77	26.7	114
	Thammaraipally	100.0	1	86.7	101	86.7	97	33.3	58	66.7	108	80.0	97	66.7	86
	Thangaradona	33.3	129	93.3	81	93.3	79	40.0	51	26.7	130	93.3	58	13.3	128
	Utakonda	66.7	116	93.3	81	93.3	79	13.3	84	73.3	103	100.0	1	46.7	106
	Uyyalawada	40.0	127	100.0	1	100.0	1	33.3	58	53.3	119	53.3	118	13.3	128
	Velugodu	86.7	87	93.3	81	93.3	79	46.7	45	80.0	96	73.3	104	73.3	77
Nellore	Armanipadu	100.0	1	100.0	1	100.0	1	26.7	67	100.0	1	100.0	1	100.0	1
	Mannangidinne	100.0	1	100.0	1	84.4	110	6.7	105	86.7	85	-	130	75.6	75
	Tallampadu	100.0	1	96.8	76	100.0	1	46.7	45	96.8	48	51.6	121	90.3	52
	Yellasiri	100.0	1	100.0	1	93.3	79	6.7	105	93.3	55	-	130	93.3	38
Parakasham	Chinna dornala	100.0	1	100.0	1	100.0	1	93.8	16	100.0	1	100.0	1	100.0	1
	Kommalapadu	100.0	1	100.0	1	100.0	1	2.8	120	100.0	1	100.0	1	100.0	1
	Mundlamuru	100.0	1	100.0	1	100.0	1	15.2	83	97.0	47	90.9	76	97.0	33
	Naguluppalapadu	98.2	66	98.2	75	98.2	72	49.0	44	90.7	79	92.6	75	90.7	51
	Punugudu	100.0	1	100.0	1	100.0	1	-	121	100.0	1	100.0	1	100.0	1
	Ravinutala	100.0	1	100.0	1	100.0	1	-	121	100.0	1	100.0	1	100.0	1
	Sanampudi	100.0	1	100.0	1	100.0	1	6.3	114	93.8	53	93.8	57	93.8	37
	Valaparla	100.0	1	100.0	1	100.0	1	-	121	100.0	1	100.0	1	100.0	1
	Yeragondapalem	100.0	1	86.5	110	91.9	93	27.0	66	91.9	76	56.8	116	81.1	70
	Srikakulam	Budithi	100.0	1	100.0	1	100.0	1	10.0	102	93.3	55	86.7	83	93.3
Cheepanipeta		100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
Etcherla		100.0	1	100.0	1	100.0	1	6.7	105	100.0	1	100.0	1	100.0	1
Ganguwava		100.0	1	100.0	1	100.0	1	-	121	100.0	1	93.3	58	100.0	1
Gullapadu		100.0	1	100.0	1	100.0	1	-	121	100.0	1	100.0	1	100.0	1
Kothuru		88.9	86	100.0	1	100.0	1	8.9	104	91.1	77	100.0	1	84.4	62
Posarlapadu		100.0	1	100.0	1	100.0	1	13.3	84	93.3	55	100.0	1	93.3	38
Ranasthalam		100.0	1	100.0	1	100.0	1	33.3	58	100.0	1	80.0	97	100.0	1
Singupuram		100.0	1	100.0	1	100.0	1	-	121	93.3	55	73.3	104	93.3	38
Sriram puram		100.0	1	100.0	1	100.0	1	53.3	40	100.0	1	93.3	58	100.0	1
Thandyam		100.0	1	100.0	1	100.0	1	13.3	84	100.0	1	100.0	1	100.0	1
Veeraghattam		93.3	78	85.7	111	93.3	79	13.3	84	80.0	96	93.3	58	66.7	86
Vishakapatnam		Cheedikada	100.0	1	100.0	1	100.0	1	20.0	77	100.0	1	100.0	1	100.0
	Chowdupalli	93.9	76	100.0	1	100.0	1	100.0	1	90.9	78	100.0	1	87.9	56
	Dibbapalem	100.0	1	100.0	1	93.3	79	20.0	77	100.0	1	100.0	1	86.7	57
	Kantipuram	86.7	87	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	86.7	57
	Korada	100.0	1	100.0	1	100.0	1	6.7	105	86.7	85	100.0	1	86.7	57
	Mukundapuram	93.3	78	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	93.3	38
	Nittaputtu	60.0	121	100.0	1	100.0	1	60.0	35	100.0	1	100.0	1	60.0	94
	Pinakota	80.0	99	100.0	1	100.0	1	86.7	19	100.0	1	100.0	1	80.0	71
	Purushottapuram	100.0	1	100.0	1	100.0	1	60.0	35	100.0	1	100.0	1	100.0	1
	R r peta	100.0	1	86.7	101	86.7	97	13.3	84	93.3	55	100.0	1	80.0	71
	Thuruvolu	96.7	70	90.0	97	70.0	125	23.3	74	50.0	121	90.0	77	26.7	114
	Vojangi	83.3	95	100.0	1	100.0	1	100.0	1	93.3	55	100.0	1	83.3	63
	Vizianagaram	Bellam	93.3	78	93.3	81	93.3	79	20.0	77	93.3	55	46.7	123	80.0
Duggeru		100.0	1	100.0	1	100.0	1	81.3	23	100.0	1	100.0	1	100.0	1
Dwarapudi		80.0	99	93.3	81	93.3	79	33.3	58	93.3	55	33.3	125	66.7	86
Kovvadapeta		100.0	1	100.0	1	96.8	74	19.4	80	100.0	1	67.7	109	96.8	34
Mantinivalasa		100.0	1	100.0	1	100.0	1	21.7	76	98.3	45	43.3	124	98.3	32
Mettavalasa		100.0	1	100.0	1	97.8	73	39.1	55	82.6	94	54.4	117	82.6	67
Pittada		96.8	68	100.0	1	100.0	1	22.6	75	100.0	1	51.6	121	96.8	34
Thotapalli		100.0	1	100.0	1	100.0	1	26.7	67	100.0	1	20.0	127	100.0	1
West Godavari	Ankannagudem	100.0	1	100.0	1	100.0	1	66.7	31	100.0	1	86.7	83	100.0	1
	Chityala	100.0	1	100.0	1	93.3	79	80.0	24	93.3	55	93.3	58	93.3	38
	Devarapalli	100.0	1	93.3	81	80.0	113	80.0	24	96.7	49	60.0	115	70.0	83
	Dharmavaram	100.0	1	100.0	1	93.3	79	86.7	19	93.3	55	73.3	104	93.3	38
	Garlagoye	100.0	1	96.7	77	86.7	97	80.0	24	100.0	1	96.7	52	83.3	63
	Nachugunta	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1
	Raghavapuram	100.0	1	100.0	1	100.0	1	93.3	17	100.0	1	100.0	1	100.0	1
	Ravvarigudem	100.0	1	98.7	74	88.0	96	65.3	34	100.0	1	84.0	93	86.7	57
	Thurumalapalem	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1	100.0	1

Sources: Field Survey, 2018-19

Table A-6: Ranking of clusters on Diversified Cropping Pattern

Dist.	Cluster	Intercrops		Border crops		Bund crops		Model crops	
		Value	Rank/ 100	Value	Rank/ 116	Value	Rank/ 107	Value	Rank/ 79
Anantapur	Basampalle	100.0	1	93.3	16	26.7	57	33.3	20
	Bondala dinne	53.3	34	30.0	75	20.0	68	26.7	29
	Chintralapalli	100.0	1	93.3	16	53.3	29	60.0	8
	Dharmapuram	93.3	15	93.3	16	6.7	95	13.3	38
	Gudipalli	70.0	24	56.7	45	33.3	51	23.3	33
	Hampapuram	66.7	26	100.0	1	40.0	42	-	79
	Mallapuram	100.0	1	100.0	1	20.0	68	40.0	16
	Maruru	100.0	1	93.3	16	13.3	79	6.7	54
	Palavoy	20.0	62	60.0	39	-	107	33.3	20
	Rangapuram	40.0	41	26.7	78	26.7	57	13.3	38
	Tekulodu	33.3	46	53.3	48	20.0	68	6.7	54
	Venkatampalli	33.3	46	60.0	39	20.0	68	6.7	54
Venkatapuram	53.3	34	66.7	34	20.0	68	-	79	
Chittoor	ayyavaripalli	100.0	1	97.5	15	50.0	34	75.0	6
	Bommaipally	5.9	93	88.2	25	100.0	1	94.1	3
	Charvaganipalli	-	100	100.0	1	53.3	29	6.7	54
	Ganginayanipalli	13.8	71	100.0	1	100.0	1	100.0	1
	Nagalapuram	-	100	100.0	1	100.0	1	86.7	5
	P n kandriga	100.0	1	100.0	1	100.0	1	33.3	20
	Pedda kanaparthi	48.3	37	44.8	58	58.6	27	27.6	28
	S s puram	20.8	61	100.0	1	100.0	1	100.0	1
	Sodi ganipalli	100.0	1	100.0	1	94.4	9	38.9	19
Velkuru	-	100	93.3	16	46.7	36	6.7	54	
East godavari	atchampeta	13.3	72	40.0	63	20.0	68	-	79
	Choppakonda	80.0	21	80.0	30	13.3	79	-	79
	Hamsavaram	35.7	45	28.6	77	7.1	94	7.1	52
	Pidatamamidi	46.7	38	93.3	16	13.3	79	13.3	38
	Shankhavaram	30.0	53	50.0	54	40.0	42	26.7	29
	Utlala	33.3	46	57.8	44	13.3	79	11.1	49
	Vommangai	37.9	44	56.7	45	22.2	67	56.7	10
	Y ramavaram	69.0	25	53.3	48	10.0	92	-	79
Yeleswaram	40.0	41	44.8	58	33.3	51	30.0	27	
Guntur	adigoppulla	6.7	81	6.7	108	26.7	57	7.1	52
	Annaram	15.6	70	44.4	60	13.3	79	6.7	54
	Athota	3.3	94	40.0	63	6.7	95	6.7	54
	Donepalli	13.3	72	13.3	97	20.0	68	-	79
	Ganapavaram	26.7	55	73.3	32	-	107	-	79
	Gummanampadu	26.7	55	-	116	40.0	42	6.7	54
	Kothuru	31.3	52	43.8	61	25.0	65	31.3	26
	Nakarikallu	-	100	-	116	26.7	57	6.7	54
	Nandirajupalem	6.7	81	-	116	13.3	79	6.7	54
	Revendrapadu	60.0	30	66.7	34	6.7	95	-	79
Vellaturu	6.7	81	60.0	39	-	107	-	79	
Kadapa	adireddypalle	19.4	69	80.7	29	-	107	-	79
	Alireddypalle	-	100	31.3	73	-	107	40.0	16
	Bhumayyagaripalle	-	100	13.3	97	-	107	-	79
	Chennamrajupalle	-	100	91.5	24	2.2	106	-	79
	Chennareddy palle	2.0	99	63.3	38	12.2	91	-	79
	Galeveedu	66.7	26	100.0	1	6.7	95	13.3	38
	Intrampeta	26.7	55	53.3	48	33.3	51	-	79
	Karmalavari palle	-	100	83.3	28	-	107	-	79
	P n colony	-	100	86.7	26	-	107	20.0	34
Paramatikona	13.3	72	53.3	48	6.7	95	-	79	
Krishna	agiripalli	6.7	81	80.0	30	20.0	68	-	79
	Aikuru	-	100	-	116	53.3	29	3.3	75
	Bommuluru	-	100	40.0	63	53.3	29	-	79
	Chekkapalli	6.7	81	26.7	78	33.3	51	-	79
	Chinatummidi	-	100	33.3	68	26.7	57	13.3	38
	Janardhanavaram	-	100	-	116	-	107	-	79
	Kodurupadu	3.3	94	3.3	113	36.7	49	-	79
	Lingala	33.3	46	13.3	97	13.3	79	-	79
	Mukkollupadu	6.7	81	36.7	67	13.3	79	-	79
	Ponnaram	40.0	41	60.0	39	20.0	68	-	79
Sunkollu	13.3	72	33.3	68	40.0	42	-	79	
Kurnoor	ahobilam	6.7	81	33.3	68	-	107	66.7	7
	Balapanuru	46.7	38	40.0	63	13.3	79	6.7	54
	Jalakanur	60.0	30	20.0	87	-	107	6.7	54

Dist.	Cluster	Intercrops		Border crops		Bund crops		Model crops	
		Value	Rank/ 100	Value	Rank/ 116	Value	Rank/ 107	Value	Rank/ 79
	Kethavafram	86.7	19	53.3	48	-	107	-	79
	Marripally	73.3	23	93.3	16	13.3	79	13.3	38
	Muthyalapadu	93.8	14	100.0	1	43.8	41	56.3	11
	Peddavangali	93.3	15	93.3	16	-	107	92.9	4
	Pudicherla	53.3	34	13.3	97	26.7	57	-	79
	Thadakanapalle	93.3	15	100.0	1	-	107	-	79
	Thammaraipally	33.3	46	46.7	56	-	107	-	79
	Thangaradona	100.0	1	86.7	26	-	107	50.0	14
	Utakonda	86.7	19	100.0	1	-	107	-	79
	Uyyalawada	100.0	1	100.0	1	-	107	-	79
	Velugodu	20.0	62	66.7	34	-	107	6.7	54
Nellore	armanipadu	33.3	46	20.0	87	13.3	79	13.3	38
	Mannangidinne	-	100	-	116	-	107	4.4	74
	Tallampadu	-	100	9.7	107	9.7	93	9.7	51
	Yellasiri	13.3	72	20.0	87	20.0	68	13.3	38
Parakasham	chinna dornala	56.3	33	50.0	54	-	107	-	79
	Kommalapadu	2.8	98	2.8	114	2.8	105	-	79
	Mundlamuru	27.3	54	30.3	74	6.1	103	3.0	77
	Naguluppapadu	24.1	60	22.2	86	-	107	-	79
	Punugudu	26.7	55	-	116	-	107	6.7	54
	Ravinutala	20.0	62	26.7	78	-	107	6.7	54
	Sanampudi	75.0	22	18.8	93	68.8	21	6.3	73
	Valaparla	-	100	-	116	-	107	-	79
Yeragondapalem	44.4	40	40.5	62	5.4	104	2.7	78	
Srikakulam	budithi	-	100	6.7	108	53.3	29	-	79
	Cheepanipeta	-	100	13.3	97	6.7	95	13.3	38
	Etcherla	-	100	-	116	93.3	10	-	79
	Ganguwava	-	100	-	116	100.0	1	-	79
	Gullapadu	6.7	81	-	116	93.3	10	6.7	54
	Kothuru	-	100	2.2	115	71.1	20	11.1	49
	Posarlapadu	-	100	-	116	40.0	42	-	79
	Ranasthalam	7.1	80	46.7	56	46.7	36	20.0	34
	Singupuram	20.0	62	60.0	39	46.7	36	13.3	38
	Sriram puram	-	100	20.0	87	60.0	25	-	79
Thandyam	-	100	-	116	6.7	95	6.7	54	
Veeraghattam	-	100	13.3	97	80.0	14	-	79	
Vishakapatnam	cheedikada	66.7	26	26.7	78	26.7	57	20.0	34
	Chowdupalli	100.0	1	54.6	47	50.0	34	54.6	12
	Dibbapalem	6.7	81	13.3	97	46.7	36	-	79
	Kantipuram	100.0	1	73.3	32	100.0	1	60.0	8
	Korada	20.0	62	20.0	87	40.0	42	33.3	20
	Mkundapuram	60.0	30	-	116	100.0	1	53.3	13
	Nittaputtu	100.0	1	33.3	68	80.0	14	46.7	15
	Pinakota	93.3	15	26.7	78	80.0	14	26.7	29
	Purushottampuram	-	100	26.7	78	73.3	19	33.3	20
	R r peta	20.0	62	13.3	97	33.3	51	40.0	16
Thuruvalu	10.0	78	13.3	97	20.0	68	26.7	29	
Vojangi	100.0	1	63.3	37	6.7	95	33.3	20	
Vizianagaram	bellam	-	100	-	116	26.7	57	-	79
	Duggeru	25.0	59	18.8	93	87.5	13	18.8	37
	Dwarapudi	-	100	26.7	78	80.0	14	-	79
	Kovvadapeta	3.2	96	29.0	76	54.8	28	-	79
	Mantiniyalasa	6.7	81	18.3	95	65.0	24	3.3	75
	Mettavalasa	8.7	79	13.0	106	34.8	50	-	79
	Pittada	3.2	96	51.6	53	77.4	18	-	79
	Thotapalli	-	100	6.7	108	93.3	10	-	79
West Godavari	ankannagudem	20.0	62	26.7	78	40.0	42	6.7	54
	Chityala	-	100	-	116	-	107	-	79
	Devarapalli	-	100	6.7	108	23.3	66	-	79
	Dharmavaram	6.7	81	6.7	108	13.3	79	-	79
	Garlagoye	-	100	-	116	30.0	56	-	79
	Nachugunta	-	100	20.0	87	60.0	25	13.3	38
	Raghavapuram	6.7	81	33.3	68	66.7	22	-	79
	Ravvarigudem	10.7	77	16.0	96	46.7	36	-	79
Thurumalapalem	66.7	26	100.0	1	66.7	22	6.7	54	

Source: Field Survey 2018-2019

Table A-7: Ranking of Study Villages on Different Practices of ZBNF and Other Indicators

Dist.	Village	Beejamrutham		Ghanajeevram		Dravajeevram		Kashyams & Asthrams		Mulching		FYM		Core Package	
		Value	Rank / 187	Value	Rank / 187	Value	Rank / 185	Value	Rank / 87	Value	Rank / 161	Value	Rank / 182	Value	Rank / 186
Anantapur	Ayyagarlapalle	60	175	93	124	73	169	60	165	27	91	100	1	13	181
	Basampalle	87	134	93	124	80	159	87	121	40	76	87	113	53	146
	Bondala dinne	80	146	80	166	87	137	73	147	40	76	100	1	40	159
	China babaiah palli	73	159	93	124	80	159	53	171	7	141	93	87	33	162
	Chinnapolamada	67	168	87	148	87	137	87	121	20	104	80	131	47	153
	Dugumarri	47	180	93	124	87	137	47	175	13	115	93	87	27	168
	Gudipalli	87	134	67	177	80	159	33	181	20	104	100	1	27	168
	Hampapuram	80	146	93	124	80	159	93	91	13	115	87	113	53	146
	Jarutla ramapuram	73	159	87	148	73	169	87	121	27	91	67	152	40	159
	Kothapeta	67	168	73	173	73	169	73	147	33	82	100	1	27	168
	Mallapuram	73	159	80	166	87	137	53	171	80	37	93	87	27	168
	Maruru	67	168	73	173	87	137	87	121	13	115	73	144	40	159
	Palavoy	87	134	100	1	60	180	47	175	13	115	87	113	27	168
Tekulodu	73	159	53	184	47	185	40	178	13	115	73	144	27	168	
Venkatapuram	80	146	87	148	87	137	67	159	7	141	80	131	60	138	
Chittoor	Ayyavaripalli	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Budidavedu	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Charvaganipalli	100	1	100	1	53	183	33	181	13	115	100	1	27	168
	Gounithimmepalli	100	1	100	1	100	1	62	164	100	1	100	1	62	137
	Krishnapuram	100	1	100	1	100	1	60	165	100	1	100	1	60	138
	Nagari madugu	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Nalagampalli	100	1	100	1	100	1	71	158	100	1	100	1	71	125
	Nethakuppam	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Pedda kanaparthi	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Pennalapadu	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Sadasiva shankara puram	100	1	100	1	100	1	79	144	100	1	100	1	79	109
	Sonnarasanapalli	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	T sakirevu palli	100	1	100	1	100	1	100	1	100	1	100	1	100	1
Velagapalli	100	1	100	1	100	1	100	1	100	1	100	1	100	1	
Velkuru	100	1	93	124	47	185	27	184	53	59	100	1	27	168	
East Godavari	Atchampeta	100	1	100	1	100	1	93	91	73	42	93	87	93	66
	Buradakota	100	1	100	1	100	1	100	1	80	37	93	87	100	1
	Choppakonda	100	1	93	124	100	1	100	1	87	31	100	1	93	66
	Dirisinapalli	80	146	100	1	100	1	93	91	60	50	100	1	80	98
	Kanatalabonda	93	114	100	1	100	1	93	91	93	28	100	1	87	83
	Marriwada	87	134	100	1	100	1	93	91	53	59	87	113	87	83
	Molleru	100	1	100	1	100	1	93	91	80	37	87	113	93	66
	N.chamavaram	79	157	100	1	100	1	93	119	43	75	93	111	71	124
	Peddipalem	93	114	93	124	93	118	87	121	53	59	87	113	87	83
	Ramannapeta	100	1	100	1	100	1	100	1	50	68	93	87	100	1
	Shankhavaram	100	1	93	124	100	1	100	1	60	50	100	1	93	66
	Utlal	80	146	100	1	100	1	100	1	47	69	100	1	80	98
	Uttarakanchi	100	1	87	148	87	137	93	91	40	76	93	87	80	98
Yarakapuram	100	1	100	1	100	1	100	1	13	115	73	144	100	1	
Yeleswaram	100	1	100	1	100	1	80	136	53	59	87	113	80	98	
Guntur	Adigoppulla	87	134	73	173	80	159	73	147	13	115	80	131	60	138
	Annaram	100	1	100	1	100	1	100	1	67	45	100	1	100	1
	Athota	100	1	100	1	100	1	100	1	87	31	100	1	100	1
	Ayyannapalem	93	114	67	177	93	118	93	91	13	115	93	87	67	126
	Bhatrapalem	94	112	88	146	94	114	88	120	13	138	100	1	81	96
	Chandrajupalem	100	1	87	148	93	118	73	147	13	115	100	1	67	126
	Davuluru	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Davuluru palem	100	1	100	1	100	1	100	1	73	42	100	1	100	1
	Donepalli	80	146	53	184	60	180	80	136	47	69	93	87	53	146
	Hanumanpalem	93	114	67	177	87	137	80	136	27	91	60	163	67	126
	Kandipalli	93	114	80	166	80	159	100	1	20	104	67	152	73	116
	Narasingapadu	100	1	100	1	100	1	100	1	27	91	87	113	100	1
	Revendrapadu	100	1	100	1	100	1	100	1	67	45	100	1	100	1
Uppalapadu	100	1	100	1	100	1	100	1	-	161	53	165	100	1	
Vellaturu	93	114	100	1	100	1	100	1	7	141	7	179	93	66	
Kadapa	Chennamrajupalle	100	1	100	1	81	157	100	1	6	156	88	112	81	96
	Galevedu	73	159	67	177	80	159	87	121	27	91	33	173	27	168
	Karmalavari palle	100	1	100	1	100	1	100	1	-	161	83	129	100	1
	Katthaluru	31	186	81	164	63	179	56	170	6	156	100	1	19	180
	Meedipentla	64	174	93	124	93	118	40	178	40	76	93	87	33	162
Mitta manu palle	94	112	94	122	81	157	94	87	19	113	63	161	75	113	

Dist.	Village	Beejamrutham		Ghanajeevamrutham		Dravajeevamrutham		Kashyams & Asthrams		Mulching		FYM		Core Package	
		Value	Rank/187	Value	Rank/187	Value	Rank/185	Value	Rank/187	Value	Rank/161	Value	Rank/182	Value	Rank/186
Munelli	Munelli	100	1	87	148	47	185	27	184	-	161	87	113	13	181
	P n colony	80	146	87	148	73	169	87	121	7	141	93	87	47	153
	Pagadalapalle	73	159	53	184	67	177	93	91	-	161	80	131	33	162
	Paramatikona	53	179	80	166	100	1	60	165	-	161	93	87	27	168
	Patha ramapuram	93	114	67	177	80	159	47	175	-	161	73	144	33	162
	Pendlimari	94	110	100	1	83	156	100	1	-	161	78	141	78	110
	Pendlimari	75	158	94	122	94	114	100	1	6	156	75	143	63	136
	Singaraya palli	88	133	88	146	75	168	94	87	19	113	69	151	50	152
	Thipireddyapalle	100	1	87	148	87	137	80	136	53	59	87	113	60	138
Krishna	Agiripalli	33	183	87	148	87	137	93	91	60	50	100	1	33	162
	Aikuru	100	1	100	1	100	1	73	147	-	161	100	1	73	116
	Ampapuram	93	114	93	124	93	118	93	91	33	82	100	1	87	83
	Balive	87	134	93	124	100	1	73	147	7	141	100	1	73	116
	Bandarugudem	93	114	60	183	73	169	73	147	13	115	87	113	33	162
	Chatrai	27	187	27	187	73	169	67	159	-	161	100	1	20	179
	Chinatummidi	87	134	100	1	100	1	93	91	47	69	93	87	87	83
	Chirivada	93	114	100	1	100	1	100	1	-	161	100	1	93	66
	Indupalli	93	114	93	124	100	1	80	136	7	141	80	131	73	116
	Kakulapadu	100	1	100	1	100	1	87	121	7	141	100	1	87	83
	Lingala	100	1	100	1	100	1	93	91	13	115	100	1	93	66
	Mukkollupadu	93	114	100	1	100	1	87	121	-	161	100	1	80	98
	Pallerlamudi	93	114	100	1	100	1	93	91	7	141	93	87	87	83
	Ponnavaram	73	159	93	124	93	118	67	159	13	115	93	87	53	146
Sunkollu	67	168	100	1	100	1	100	1	27	91	100	1	67	126	
Kurmool	Ahobilam	100	1	100	1	100	1	100	1	-	161	80	131	100	1
	Balapanuru	87	134	80	166	87	137	87	121	33	82	67	152	67	126
	Basthipadu	60	175	87	148	87	137	53	171	-	161	87	113	47	153
	Bhupanpadu	100	1	87	148	87	137	67	159	33	82	80	131	67	126
	Chowtkur	73	159	80	166	93	118	67	159	13	115	53	165	53	146
	Jaladurgam	67	168	93	124	93	118	73	147	13	115	100	1	47	153
	Kethavaram	40	181	100	1	100	1	60	165	33	82	67	152	27	168
	Lakshmiapuram	33	183	87	148	93	118	20	187	13	115	93	87	7	186
	Muthyalapadu	81	145	81	164	94	114	94	87	75	41	67	152	75	113
	N.kontalapadu	40	181	100	1	100	1	53	171	33	82	53	165	13	181
	Peddavangali	73	159	73	173	87	137	93	91	60	50	-	182	67	126
	Pudicherla	60	175	100	1	100	1	33	181	40	76	67	152	13	181
	R.krishnapuram	80	146	87	148	100	1	93	91	67	45	7	179	73	116
	Thangaradona	33	183	93	124	93	118	27	184	40	76	93	87	13	181
Velugodu	87	134	93	124	93	118	80	136	47	69	73	144	73	116	
Nellore	Akkarapaka	100	1	100	1	100	1	100	1	25	101	100	1	100	1
	Armanipadu	100	1	100	1	100	1	100	1	27	91	100	1	100	1
	Chennayyapalem	100	1	100	1	87	137	100	1	7	141	-	182	87	83
	Madurupadu	100	1	100	1	87	137	87	121	7	141	-	182	80	98
	Rudrakota	100	1	100	1	80	159	73	147	7	141	-	182	60	138
	Surapu agraharam	100	1	93	124	100	1	93	91	71	44	-	182	80	98
Yellasiri	100	1	100	1	93	118	93	91	7	141	-	182	93	66	
Prakasam	Chinna dornala	100	1	100	1	100	1	100	1	94	27	100	1	100	1
	Ganjivaripalem	100	1	100	1	95	112	100	1	45	73	82	130	95	62
	Kollapudi	100	1	100	1	100	1	100	1	-	161	100	1	100	1
	Kunduru	100	1	100	1	100	1	100	1	6	160	100	1	100	1
	Makkenavaripalem	100	1	100	1	100	1	100	1	-	161	100	1	100	1
	Naguluppapadu	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Pasupugallu	100	1	100	1	100	1	100	1	11	140	94	84	100	1
	Polavaram	100	1	100	1	100	1	93	91	20	104	87	113	93	66
	Pothavaram	94	110	94	121	94	113	78	145	12	139	78	141	78	110
	Punugudu	100	1	100	1	100	1	100	1	-	161	100	1	100	1
	Raparla	100	1	100	1	100	1	94	86	27	91	100	1	94	63
	Ravinutala	100	1	100	1	100	1	100	1	-	161	100	1	100	1
	Sanampudi	100	1	100	1	100	1	94	87	6	156	94	85	94	64
	Valaparla	100	1	100	1	100	1	100	1	-	161	100	1	100	1
Venkatadri palem	100	1	67	177	87	137	80	136	-	161	20	176	60	138	
Srikakulam	Cheepanipeta	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Chinnamallipuram	100	1	100	1	100	1	100	1	-	161	93	87	100	1
	Gopalapuram	100	1	100	1	100	1	87	121	7	141	80	131	87	83
	Gullapadu	100	1	100	1	100	1	100	1	-	161	100	1	100	1
	Kadamu	100	1	100	1	100	1	100	1	-	161	100	1	100	1
	Kuddigam	67	168	100	1	100	1	73	147	-	161	100	1	53	146
	Kushalapuram	100	1	100	1	100	1	100	1	7	141	100	1	100	1
Laxmipuram	100	1	100	1	100	1	100	1	13	115	93	87	100	1	

Di st.	Village	Beejamrutham		Ghanajeevamrutham		Dravajeevamrutham		Kashyams & Asthrams		Mulching		FYM		Core Package	
		Value	Rank / 187	Value	Rank / 187	Value	Rank / 185	Value	Rank / 87	Value	Rank / 161	Value	Rank / 182	Value	Rank / 186
	Malakam	100	1	100	1	100	1	100	1	13	115	100	1	100	1
	Nadimikella	93	114	86	163	93	118	80	136	13	115	93	87	67	126
	Ravada	100	1	100	1	100	1	100	1	33	82	80	131	100	1
	Ravulavalasa	100	1	100	1	100	1	100	1	53	59	93	87	100	1
	Sativada	100	1	100	1	100	1	93	91	13	115	100	1	93	66
	Shobhanapuram	100	1	100	1	100	1	100	1	27	91	100	1	100	1
	Singupuram	100	1	100	1	100	1	93	91	-	161	73	144	93	66
Vishakapatnam	Bharam	60	175	100	1	100	1	100	1	60	50	100	1	60	138
	Bondapalam	87	134	100	1	100	1	87	121	100	1	100	1	87	83
	Cheedikada	100	1	100	1	100	1	100	1	20	104	100	1	100	1
	Chintaluru	93	114	100	1	100	1	100	1	100	1	100	1	93	66
	Chowdupalli	89	132	100	1	100	1	83	135	100	1	100	1	78	110
	Kandepalli	100	1	87	148	87	137	93	91	13	115	100	1	80	98
	Kovvada	100	1	100	1	100	1	87	121	7	141	100	1	87	83
	Papayapalem	100	1	100	1	93	118	100	1	20	104	100	1	87	83
	Pashuvulabanda	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Pedabidda	87	134	100	1	100	1	100	1	100	1	100	1	87	83
	Pedagogada	100	1	80	166	53	183	40	178	33	82	80	131	7	186
	Pedakota	80	146	100	1	100	1	100	1	87	31	100	1	80	98
	Purushottampuram	100	1	100	1	100	1	100	1	60	50	100	1	100	1
	Tamarapalli	80	146	100	1	100	1	100	1	100	1	100	1	80	98
	Thuruvolu	93	114	100	1	87	137	60	165	13	115	100	1	47	153
	Vizianagaram	Aaguru	93	114	100	1	100	1	100	1	20	104	40	171	93
Buyyalavalasa		100	1	100	1	100	1	100	1	-	161	60	163	100	1
Darubilli		100	1	100	1	100	1	93	91	-	161	87	113	93	66
Duggeru		100	1	100	1	100	1	100	1	81	36	100	1	100	1
Dwarapudi		80	146	93	124	93	118	93	91	33	82	33	173	67	126
G p agharam		100	1	100	1	94	114	100	1	25	101	94	85	94	64
G t peta		100	1	100	1	100	1	100	1	25	101	63	161	100	1
Gorleseetampuram		100	1	100	1	100	1	75	146	44	74	44	170	75	113
Jagannadhapuram		100	1	100	1	93	118	73	147	53	59	27	175	73	116
Mantinivalasa		100	1	100	1	100	1	100	1	87	31	20	176	100	1
Maruvada kotta valasa		100	1	100	1	100	1	100	1	13	115	40	171	100	1
Mopada		93	114	93	124	93	118	93	91	20	104	47	169	80	98
Narayanapu valasa		100	1	100	1	100	1	100	1	20	104	93	87	100	1
Santoshapuram		100	1	100	1	100	1	100	1	27	91	20	176	100	1
Sivannapeta	100	1	100	1	100	1	100	1	-	161	7	179	100	1	
	Cheemalavari gudem	100	1	100	1	100	1	100	1	53	59	100	1	100	1
	Chityala	100	1	100	1	93	118	93	91	80	37	93	87	93	66
	Gowripatnam	100	1	100	1	100	1	93	91	93	28	67	152	93	66
	Gummaluur	100	1	93	124	67	177	100	1	60	50	100	1	60	138
West Godavari	Lakshampuram	100	1	87	148	60	180	100	1	67	45	53	165	47	153
	Lankapalli	100	1	100	1	100	1	100	1	53	59	67	152	100	1
	Mallyagudem	100	1	100	1	100	1	100	1	93	28	100	1	100	1
	Mulagalampalli	100	1	100	1	100	1	100	1	67	45	87	113	100	1
	Nachugunta	100	1	100	1	100	1	100	1	100	1	100	1	100	1
	Pandugudem	100	1	100	1	100	1	100	1	100	1	67	152	100	1
	Penakametta	100	1	100	1	93	118	93	91	87	31	73	144	93	66
	Rajanagaram	100	1	100	1	73	169	100	1	60	50	87	113	73	116
	Reddy nagam palem	100	1	93	124	73	169	100	1	60	50	93	87	67	126
	Thurumalapalem	100	1	100	1	100	1	100	1	100	1	100	1	100	1
Vinjaram	100	1	100	1	100	1	100	1	100	1	100	1	100	1	

Sources: Field Survey, 2018-19

Table A-8: Ranking of study villages on Diversified Cropping Pattern

District	Village	Intercrops		Border crops		Bund crops		Model crops	
		Value	Rank/126	Value	Rank/151	Value	Rank/146	Value	Rank/94
Anantapuramu	Ayyagarlapalle	100	1	93	24	53	42	60	11
Anantapuramu	Basampalle	100	1	93	24	27	79	33	29
Anantapuramu	Bondala dinne	27	69	20	114	-	146	13	51
Anantapuramu	China babaiah palli	67	34	67	50	53	42	20	42
Anantapuramu	Chinnapolamada	80	28	40	84	40	61	40	23
Anantapuramu	Dugumarri	40	55	27	104	27	79	13	51
Anantapuramu	Gudipalli	73	31	47	73	13	106	27	38
Anantapuramu	Hampapuram	67	34	100	1	40	61	-	94
Anantapuramu	Jarutla ramapuram	33	61	60	58	20	93	7	69
Anantapuramu	Kothapeta	93	21	93	24	7	121	13	51
Anantapuramu	Mallapuram	100	1	100	1	20	93	40	23
Anantapuramu	Maruru	100	1	93	24	13	106	7	69
Anantapuramu	Palavoy	20	80	60	58	-	146	33	29
Anantapuramu	Tekulodu	33	61	53	65	20	93	7	69
Anantapuramu	Venkatapuram	53	48	67	50	20	93	-	94
Chittoor	Ayyavaripalli	100	1	100	1	38	71	100	1
Chittoor	Budidavedu	100	1	94	22	44	57	94	5
Chittoor	Charvaganipalli	-	126	100	1	53	42	7	69
Chittoor	Gounithimmepalli	14	90	100	1	100	1	100	1
Chittoor	Krishnapuram	-	126	100	1	100	1	87	8
Chittoor	Nagari madugu	100	1	94	21	59	40	88	7
Chittoor	Nalagampalli	6	124	88	32	100	1	94	4
Chittoor	Nethakuppam	100	1	100	1	100	1	33	29
Chittoor	Pedda kanaparthi	36	58	29	102	50	50	21	41
Chittoor	Pennalapadu	60	42	60	58	67	29	33	29
Chittoor	Sadasiva shankara puram	21	79	100	1	100	1	100	1
Chittoor	Sonnarasanapalli	100	1	100	1	94	10	39	28
Chittoor	T sakirevu palli	100	1	100	1	53	42	13	51
Chittoor	Velagapalli	100	1	100	1	56	41	75	9
Chittoor	Velkuru	-	126	93	24	47	52	7	69
East godavari	Atchampeta	13	91	40	84	20	93	-	94
East godavari	Buradakota	67	34	67	50	13	106	-	94
East godavari	Choppakonda	80	28	80	38	13	106	-	94
East godavari	Dirisinapalli	27	69	40	84	-	146	27	38
East godavari	Kanatalabonda	71	33	40	84	7	121	-	94
East godavari	Marriwada	60	42	87	33	27	79	-	94
East godavari	Molleru	47	50	93	24	13	106	13	51
East godavari	N.chamavaram	36	58	29	102	7	120	7	67
East godavari	Peddipalem	36	58	47	73	33	72	53	16
East godavari	Ramannapeta	33	61	43	82	27	79	40	23
East godavari	Shankhavaram	13	91	60	58	47	52	33	29
East godavari	Utlā	13	91	47	73	13	106	7	69
East godavari	Uttarakanchi	40	55	67	50	8	119	60	11
East godavari	Yarakapuram	47	50	40	84	33	72	20	42
East godavari	Yeleswaram	47	50	47	73	40	61	20	42
Guntur	Adigoppulla	7	103	7	140	27	79	7	67
Guntur	Annavaram	27	69	53	65	7	121	-	94
Guntur	Athota	-	126	73	46	7	121	-	94
Guntur	Ayyannapalem	27	69	-	151	40	61	7	69
Guntur	Bhatrapalem	31	68	44	81	25	92	31	37
Guntur	Chandrajupalem	-	126	-	151	7	121	13	51
Guntur	Davuluru	7	103	7	140	7	121	13	51
Guntur	Davuluru palem	20	80	80	38	7	121	-	94
Guntur	Donepalli	13	91	13	126	20	93	-	94
Guntur	Hanumanpalem	-	126	-	151	27	79	20	42
Guntur	Kandipalli	13	91	-	151	20	93	-	94
Guntur	Narasingapadu	-	126	-	151	27	79	7	69
Guntur	Revendrapadu	60	42	67	50	7	121	-	94
Guntur	Uppalapadu	27	69	73	46	-	146	-	94
Guntur	Vellaturu	7	103	60	58	-	146	-	94
Kadapa	Chennamrajupalle	-	126	94	22	6	142	-	94
Kadapa	Galeveedu	67	34	100	1	7	121	13	51
Kadapa	Karmalavari palle	-	126	83	37	-	146	-	94
Kadapa	Katthaluru	-	126	31	101	-	146	40	23
Kadapa	Meedipentla	-	126	13	126	-	146	-	94
Kadapa	Mitta manu palle	6	120	75	45	-	146	-	94
Kadapa	Munelli	27	69	53	65	33	72	-	94
Kadapa	P n colony	-	126	87	33	-	146	20	42

District	Village	Intercrops		Border crops		Bund crops		Model crops	
		Value	Rank/ 126	Value	Rank/ 151	Value	Rank/ 146	Value	Rank/ 94
Kadapa	Pagadalapalle	-	126	80	38	-	146	-	94
Kadapa	Paramatikona	13	91	53	65	7	121	-	94
Kadapa	Patha ramapuram	-	126	27	104	7	121	-	94
Kadapa	Pendlimarri	-	126	94	20	-	146	-	94
Kadapa	Pendlimarri	-	126	100	1	-	146	-	94
Kadapa	Singaraya palli	6	120	63	57	31	78	-	94
Kadapa	Thipireddypalle	33	61	87	33	-	146	-	94
Krishna	Agiripalli	7	103	80	38	20	93	-	94
Krishna	Aikuru	-	126	-	151	80	19	7	69
Krishna	Ampapuram	-	126	-	151	100	1	-	94
Krishna	Balive	7	103	27	104	33	72	-	94
Krishna	Bandarugudem	-	126	7	140	33	72	-	94
Krishna	Chatrai	-	126	-	151	-	146	-	94
Krishna	Chinatummidi	-	126	33	93	27	79	13	51
Krishna	Chirivada	-	126	80	38	7	121	-	94
Krishna	Indupalli	-	126	-	151	27	79	-	94
Krishna	Kakulapadu	7	103	-	151	40	61	-	94
Krishna	Lingala	33	61	13	126	13	106	-	94
Krishna	Mukkollupadu	7	103	33	93	20	93	-	94
Krishna	Pallerlamudi	7	103	40	84	7	121	-	94
Krishna	Ponnavaram	40	55	60	58	20	93	-	94
Krishna	Sunkollu	13	91	33	93	40	61	-	94
Kurnool	Ahobilam	7	103	33	93	-	146	67	10
Kurnool	Balapanuru	47	50	40	84	13	106	7	69
Kurnool	Basthipadu	93	21	100	1	-	146	-	94
Kurnool	Bhupanpadu	33	61	47	73	-	146	-	94
Kurnool	Chowtkur	60	42	20	114	-	146	7	69
Kurnool	Jaladurgam	87	26	100	1	-	146	-	94
Kurnool	Kethavaram	87	26	53	65	-	146	-	94
Kurnool	Lakshnipuram	93	21	100	1	-	146	-	94
Kurnool	Muthyalapadu	94	20	100	1	44	57	56	15
Kurnool	N.kontalapadu	100	1	100	1	-	146	-	94
Kurnool	Peddavangali	93	21	93	24	-	146	93	6
Kurnool	Pudicherla	53	48	13	126	27	79	-	94
Kurnool	R.krishnapuram	73	31	93	24	13	106	13	51
Kurnool	Thangaradona	100	1	87	33	-	146	50	20
Kurnool	Velugodu	20	80	67	50	-	146	7	69
Nellore	Akkarapaka	-	126	-	151	-	146	-	94
Nellore	Armanipadu	33	61	20	114	13	106	13	51
Nellore	Chennayyapalem	-	126	-	151	-	146	7	69
Nellore	Madurupadu	-	126	-	151	-	146	-	94
Nellore	Rudrakota	-	126	-	151	-	146	7	69
Nellore	Surapu agraharam	-	126	20	114	20	93	20	42
Nellore	Yellasiri	13	91	20	114	20	93	13	51
Parakasham	Chinna dornala	56	47	50	71	-	146	-	94
Parakasham	Ganjivaripalem	67	34	41	83	5	145	5	93
Parakasham	Kollapudi	-	126	-	151	-	146	-	94
Parakasham	Kunduru	6	125	6	149	6	143	-	94
Parakasham	Makkenavaripalem	-	126	-	151	-	146	-	94
Parakasham	Naguluppalapadu	-	126	5	150	-	146	-	94
Parakasham	Pasupugallu	44	54	50	71	6	143	-	94
Parakasham	Polavaram	7	103	7	140	7	121	7	69
Parakasham	Pothavaram	11	101	-	151	-	146	-	94
Parakasham	Punugudu	27	69	-	151	-	146	7	69
Parakasham	Raparla	65	41	65	56	-	146	-	94
Parakasham	Ravinutala	20	80	27	104	-	146	7	69
Parakasham	Sanampudi	75	30	19	124	69	28	6	92
Parakasham	Valaparla	-	126	-	151	-	146	-	94
Parakasham	Venkatadri palem	13	91	40	84	7	121	-	94
Srikakulam	Cheepanipeta	-	126	13	126	7	121	13	51
Srikakulam	Chinnamallipuram	-	126	-	151	100	1	-	94
Srikakulam	Gopalapuram	-	126	-	151	53	42	-	94
Srikakulam	Gullapadu	7	103	-	151	93	11	7	69
Srikakulam	Kadamu	-	126	-	151	73	25	-	94
Srikakulam	Kuddigam	-	126	-	151	53	42	-	94
Srikakulam	Kushalapuram	-	126	-	151	93	11	-	94
Srikakulam	Laxmipuram	-	126	13	126	53	42	-	94
Srikakulam	Malakam	-	126	-	151	7	121	7	69
Srikakulam	Nadimikella	-	126	13	126	80	19	-	94
Srikakulam	Ravada	7	102	47	73	47	52	20	42
Srikakulam	Ravulavalasa	-	126	20	114	60	34	-	94
Srikakulam	Sativada	-	126	-	151	40	61	-	94

District	Village	Intercrops		Border crops		Bund crops		Model crops	
		Value	Rank/ 126	Value	Rank/ 151	Value	Rank/ 146	Value	Rank/ 94
Srikakulam	Shobhanapuram	-	126	7	140	87	17	33	29
Srikakulam	Singupuram	20	80	60	58	47	52	13	51
Vishakapatnam	Bharam	100	1	33	93	80	19	47	22
Vishakapatnam	Bondapalam	100	1	47	73	7	121	13	51
Vishakapatnam	Cheedikada	67	34	27	104	27	79	20	42
Vishakapatnam	Chintaluru	60	42	-	151	100	1	53	16
Vishakapatnam	Chowdupalli	100	1	78	44	41	60	50	20
Vishakapatnam	Kandepalli	20	80	13	126	33	72	40	23
Vishakapatnam	Kovvada	20	80	20	114	40	61	33	29
Vishakapatnam	Papayyapalem	7	103	13	126	47	52	-	94
Vishakapatnam	Pashuvulabanda	100	1	27	104	60	34	60	11
Vishakapatnam	Pedabidda	100	1	73	46	100	1	60	11
Vishakapatnam	Pedagogoda	13	91	13	126	27	79	53	16
Vishakapatnam	Pedakota	93	21	27	104	80	19	27	38
Vishakapatnam	Purushottampuram	-	126	27	104	73	25	33	29
Vishakapatnam	Tamarapalli	100	1	80	38	7	121	53	16
Vishakapatnam	Thuruvalu	7	103	13	126	13	106	-	94
Vizianagaram	Aaguru	-	126	33	93	67	29	-	94
Vizianagaram	Buyyalavalasa	-	126	53	65	93	11	-	94
Vizianagaram	Darubilli	-	126	-	151	67	29	7	69
Vizianagaram	Duggeru	25	77	19	124	88	15	19	50
Vizianagaram	Dwarapudi	-	126	27	104	80	19	-	94
Vizianagaram	G p agraharam	6	120	13	139	50	50	-	94
Vizianagaram	G t peta	6	120	69	49	88	15	-	94
Vizianagaram	Gorleseetampuram	25	77	6	148	44	57	-	94
Vizianagaram	Jagannadhapuram	-	126	-	151	7	121	-	94
Vizianagaram	Mantiniyalasa	7	103	20	114	13	106	-	94
Vizianagaram	Maruvada kotta valasa	-	126	47	73	60	34	-	94
Vizianagaram	Mopada	-	126	-	151	27	79	-	94
Vizianagaram	Narayanapu valasa	-	126	33	93	53	42	-	94
Vizianagaram	Santoshapuram	-	126	7	140	93	11	-	94
Vizianagaram	Sivannapeta	20	80	-	151	87	17	7	69
West godavari	Cheemalavari gudem	27	69	40	84	80	19	-	94
West godavari	Chityala	-	126	-	151	-	146	-	94
West godavari	Gowripatnam	-	126	13	126	40	61	-	94
West godavari	Gummaluur	-	126	-	151	-	146	-	94
West godavari	Lakshmiapuram	-	126	-	151	7	121	-	94
West godavari	Lankapalli	-	126	13	126	60	34	-	94
West godavari	Mallyagudem	7	103	33	93	67	29	-	94
West godavari	Mulagalampalli	20	80	27	104	40	61	7	69
West godavari	Nachugunta	-	126	20	114	60	34	13	51
West godavari	Pandugudem	7	103	7	140	73	25	-	94
West godavari	Penakametta	7	103	7	140	13	106	-	94
West godavari	Rajanagaram	20	80	20	114	20	93	-	94
West godavari	Reddy nagam palem	-	126	-	151	-	146	-	94
West godavari	Thurumalapalem	67	34	100	1	67	29	7	69
West godavari	Vinjarum	-	126	-	151	60	34	-	94

Sources: Field Survey, 2018-19