

## Case Study on Demo Plots

### Background

India is exposed to various climate variability such as drought, floods, cyclones, increased temperatures, heat waves, and cold waves. Among them, drought is causing a huge crop and livestock losses.

A total of 121 districts are considered to be climate-vulnerable in India. Of which, Ananthapur district located in Andhra Pradesh state is categorized under high/very high vulnerability to climate change due to the frequent occurrence of droughts.

Around 69% of the farmers are smallholders in Ananthapur. Groundnut continues to be the major crop, while pulses (Bengal gram, horse gram, and red gram), sorghum, and maize account for a considerable share in the total cultivated crops. The net sown area accounts for 58% of the total geographical area (i.e. out of 19.13 million ha, 11.1 million ha are under agriculture). However, three-fourths (75%) of the net sown area is under rainfed agriculture.

The main factors that limit the productivity of smallholder agriculture is majorly land degradation and poor soil fertility; climate variability; crop pests and diseases; low adoption of improved agronomic practices as a result of inadequate access to information, unreliable agro-input supply systems, and institutional barriers such as poor markets for inputs and farm products; and poor farmer organization.

### Climate Smart Villages Project



Because of a series of severe and devastating climate-related events, **APMAS** with its funding partner **AEIN, Luxemburg** is implementing a project “**Climate Smart Villages (CSV)**” for three years from 2019 onwards. The project aims to promote affordable and replicable adaptation and mitigation practices to enhance livelihoods of vulnerable communities in ten villages in five-gram panchayats of Nallamada and Gudibandla mandals, Ananthapur district with 5 important components such as ‘**Climate Smart Agriculture**’, ‘**Climate Smart Energy**’, ‘**Climate Smart Institutions**’, ‘**Climate Smart Nutrition**’ and ‘**Climate Smart Knowledge**’.

### Demonstration Plots

Under the SMART agriculture component, APMAS is promoting **demonstration plots** for the promotion of climate resilient agriculture in two mandals, Nallamada and Gudibanda of Ananthapur district. The major focus of establishing demo plots is to promote ecological sustainability, maintain the fertility of the ground and protect the soil from rain and erosion while reducing the dependency on chemical fertilizers and pesticides through the use of dung based inoculants. This includes the promotion of activities that can cope with current climate challenges and educating the significance of handling the soil as an important resource to achieve optimum fertility levels.

Demos are learning sites that provide a platform to get introduced to new ideas and allow farmers to experience and adopt innovative practices in their own fields.

Initially awareness programs such as group meetings, night meetings and farmer interest group meetings were organized in the project area for introducing the project design to the community in both the mandals. Through these group meetings identification of active farmers were done based on the criteria developed.

### **Selection criteria of the demo farmer:**

- Farmer practicing various crop cultivation (agriculture, Horticulture and Floriculture)
- Minimum land holding capacity of 2.5 acres
- Beneficiary farmer should be a member of the FPO
- Farmer should be active in sharing the knowledge with neighbouring farmers
- Farmer land should have irrigation facility
- Demo plot should be nearer to the road and project village
- Farmer should attend all the training programs provided the project
- Demo farmers need to continue practicing all the best practices

After the selection of demo plots, the farmers attended the farmer field schools (FFS), an informal field level learning organized by the project staff. After the awareness sessions, 20 active famers, including 30% women farmers and 20% young farmers were identified from the group and detailed seasonal crop planning was developed in discussion with the farmer groups.

FFS sessions were organized in the demo plots twice in a month and continued for a three-month cropping period with 25 neighbouring farmers. These sessions were repeated twice in a year. At the end of three month FFS period, field day was organized by the project to recollect and share the learnings. The farmers who attended the FFS sessions are now practicing the best practices in their fields.





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### List of 12 best practices developed in the demo plots:

1. Tank silt application to increase storage capacities of the tanks; enhance soil fertility, crop productivity and income to farmers. This activity is promoted in 1 acre of land.
2. Soil and water conservation works such as establishment of farm ponds (minimum with 2.5 cents) and boundary trenches on the borders of the field to collect the rain water and reduce the soil erosion for enhancing the water availability throughout the year
3. Bund plantation by planting fruit plants of eight varieties (Guava, Sapota, Mango, Moringa, Coconut, Acid Lime, Tamarind, Jamun) on the field bunds of demo farmers to meet the nutritional needs and encourage them to grow more of horticulture trees along with field crops
4. Fodder cultivation (Super Napier, Avisa, Hedge Lucern, Multi Cut Bajra) in 2 acres of land to promote integrated farming systems, combining both agriculture and livestock for sustainability and manage the crop losses
5. Navadhanya cultivation in 1 acre land promoting 9 varieties of millets and pulses with groundnut as the major crop while jowar and bajra as the border crops to shift the from mono cropping to multi cropping systems to cope with the crop losses and enhance the crop yield
6. Kitchen Gardens in each demo plot in at least 2 cents of land growing 13 varieties of vegetables. These kitchen gardens are now providing fresh vegetables to the farmer family as they are grown natural and completely free of chemical residues
7. Sprinkler irrigation systems to reduce over utilization of the water for irrigation purpose. By the use of these sprinkler irrigation system about 90% of the water has been conserved in the area.
8. Adoption of ZBNF practices such as use of Neem oil, Neem cake, Yellow sticky traps, Blue sticky traps, Pheromone traps, Mulching with groundnut husk, Waste decomposure, Jeevaamrutam, Vaavilaaku kashayam in the demo plots to reduce the dependency on the chemical fertilizers and pesticides in cultivating the crops
9. Promotion of Living soils is a form of composting units using animal waste materials (dung and urine from cow/ sheep/ goat), and crop residues. This compost is being applied to the soil during the land preparation to increase the soil health and humus
10. Bio dynamic composting units is an innovative composting process using the animal wastes (bone meal/ horn meal of cattle) to enhance the carbon content of the soil
11. Solar insect traps in the demo plots to control the pest population in the field naturally. This has reduced use of chemical pesticides
12. Solar sprayers to increase dependency on the renewable resources





**Pheromone, Blue and Yellow sticky traps**



**Navadhanya Plot**



**Farmer Field School**



**Fodder Bajra**



**Tank silt and FYM**



**Bund Plantation**



**Bio dynamic**



**Living soil compost**



A total 16 members were selected for establishment of demonstration plots 12 in Gudibanda mandal and 4 in Nallamada mandal.

Sl. No	Farmer Name	Mandal
1	KT Yanjarappa	Gudibanda
2	Murkannappa	
3	Shivanna	
4	Bojanna	
5	Shivamma	
6	Padmavathi	
7	Umadevi	
8	Lakshamma	
9	Roja	
10	Siddagangamma	
11	Jayamma	
12	Sarojamma	
13	M.Ramulu	Nallamada
14	Cheruvu Lakshmi	
15	T. Vijayamma	
16	Ramakrishna Reddy	
17	G. Gangulaiah	
18	Jayachandra	
19	Nagamuni	
20	G. Sudhakara	

#### Feedback from farmers:

**Ms. Uma devi** from Konkallu gram panchayat, Gudibanda mandal is a demo farmer practicing all 12 best practices since 2019 in her 2.5 acres of land out of 4 acres. Earlier she used to practice monocropping (groundnut) using chemical fertilizers.

After adopting all the activities, in her demo plot she adopted soil and water conservation activities. This has reduced leaching losses and enhanced land health improving the soil structure and water holding capacities. Cost of cultivation is reduced by 25% through practice of multicropping (navadhanya system) and use of bio products made from dung based inoculants and neem based pest repellents has reduced crop investments by 70% while improved crop yield enhancing the soil carbon content. She is now able to reap profits by 30% on Red gram (drought resistant varieties), which has increased





yield by 3 quintals per acre of land. Kitchen gardens have supported in harvesting vegetables from her own land meeting the nutritional needs of the family.



**Mr. Ramulu** is from Nallamada mandal, practicing 12 best practices since 2019. Initially the farmer used to cultivate only seasonal crops such as Cucumber, Ragi, and Groundnut. The demo farmer says “I have attended all the awareness programs organized by the CSV project and learnt about climate resilient activities and the importance of adopting demo plots. FFS was organized in my plot, that educated 25 farmers on 12 best farming practices and all 25 farmers have adopted a minimum of 5 best practices in their fields.

Fodder cultivation, Horticulture, living soil composting, NADEP compost pits, ZBNF practices are successfully being implemented in my plot and currently I am supplying dung based inoculants to 20 farmers (Jeevamrutham, Panchagavya, Beejamrutham, Vavilaku decoction) to other farmers at free of cost”.

### Soil Sample reports of beneficiaries:

#### 1. Gudibanda Soil Health Card: Ms. Siddangamma

Figure 1: After Demo Plots

<b>Soil Health Card</b>		Name of Laboratory & Address		AP Mahila Abhivruddhi Society Soil Test Center 4XQH+GF Nallamada, Andhra Pradesh, India			
<b>Farmer Details</b>		<b>Soil Test Results</b>					
Name	Uma Devi	Parameter	Value	Unit	Ideal Range	Rating	Nutrient Recommendation
Address	Gudibanda, Anantapur, Andhra Pradesh	pH	8.92	-	6.5 - 7.5	Highly Alkaline	
Aadhaar Number	XXXX XXXX 5637	Organic carbon (OC)	0.80	w%	0.50 - 0.75	High	
Mobile Number	+9*****210	Organic Matter (OM)	1.38	w%	0.86 - 1.29	High	
<b>Soil Sample Details</b>		Avail. Nitrogen (N)	276	kg/ha	280 - 560	Low	30
Sample Number	apmas00001-20220119-00001	Avail. Phosphorus (PO)	23	kg/ha	22.4 - 56.0	Sufficient	72.5
Sampling Date	January 19, 2022	Avail. Potassium (KO)	300	kg/ha	135 - 336	Medium	45
Testing Date	January 19, 2022 at 3:29 PM	Avail. Sulphur (S)	10.98	mg/kg	10 - 20	Medium	
Crop to be grown	groundnut (irrigated)	Avail. Copper (Cu)	0.18	mg/kg	> 0.20	Deficient	1.00
Survey No	214	Avail. Iron (Fe)	3.50	mg/kg	> 2.50	Sufficient	
Plot GEO Location	13.942455, 77.125125	Avail. Zinc (Zn)	0.70	mg/kg	> 0.60	Sufficient	
Field size (in ha)	0.375	Avail. Boron (B)	0.31	mg/kg	> 0.50	Deficient	1.00
Water Source	Tube Well	<b>Fertilizer Recommendation</b>					
Reference Yield	500	<b>Macronutrient</b>		<b>Micronutrient</b>			
Presented By: Andhra Pradesh Mahila Abhivruddhi Society (CSV)		Fertilizer	Quantity	Fertilizer	Quantity		
Powered By: KRISHITANTRA		DAP (50 Kg/Bag)	1 bags and 45.50 kgs	Copper sulphate (1 Kg/Bag)	2 bags and 530.00 grams		
		MOP	45.50 kg	Borax (1 Kg/Bag)	5 bags and 520.00 grams		
		Urea	2.25 kg				

## 2. Nallamada Soil Health Card: Mr. Ramulu

Figure 2: After Demo Plot

<b>Soil Health Card</b>		<b>Name of Laboratory &amp; Address</b>	
<b>Farmer Details</b>		AP Mahila Abhivruddhi Society Soil Test Center	
Name	Ramulu	4XQH+GF Nallamada, Andhra Pradesh, India	
Address	Nallamada, Anantapur, Andhra Pradesh	<b>Soil Test Results</b>	
Aadhaar Number	XXXX XXXX 3060	<b>Parameter</b>	<b>Value</b>
Mobile Number	+9*****753	pH	8.1
<b>Soil Sample Details</b>			<b>Unit</b>
Sample Number	apmas00001-20220119-00004		<b>Ideal Range</b>
Sampling Date	November 2021	Organic carbon (OC)	6.5 - 7.5
Testing Date	December 2021	Organic Matter (OM)	0.50 - 0.75
Crop to be grown	groundnut (irrigated)	Avail. Nitrogen (N)	0.86 - 1.29
Survey No	173		<b>Rating</b>
Plot GEO Location		Avail. Phosphorus (P <sub>2</sub> O <sub>5</sub> )	Low
Field size (in ha)	0.2		<b>Nutrient Recommendation</b>
Water Source	Bore Well	Avail. Potassium (K <sub>2</sub> O)	75
Reference Yield	500 kgs.	Avail. Sulphur (S)	35
		Avail. Copper (Cu)	75
		Avail. Iron (Fe)	30
		Avail. Zinc (Zn)	30
		Avail. Boron (B)	1.5
<b>Fertilizer Recommendation</b>			
<b>Macronutrient</b>		<b>Micronutrient</b>	
<b>Fertilizer</b>	<b>Quantity</b>	<b>Fertilizer</b>	<b>Quantity</b>
DAP (50 Kg/Bag)	1 bags and 45.50 kgs	Copper sulphate (1 Kg/Bag)	1.5 bags and 530.00 grams
MOP	45.50 kg		
Urea	2.25 kg		

Presented By: **Andhra Pradesh Mahila Abhivruddhi Society (CSVP)**

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