

Community Managed Sustainable Agriculture – Adaptation and mitigation to climate change



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Nested Federation Model

District Federation or Zilla Samakhya

300,000– 500,000 members on average

Roles and Responsibilities: Conducts market interface,
Maintains MIS/IT system

Sub-district Federation or Mandal Samakhya

4000-6000 members on average; Young professional staff

Roles and Responsibilities: Support to VOs, Secure linkage with
Govt. Depts., Auditing of the groups, Microfinance functions

Village Organization (VO)

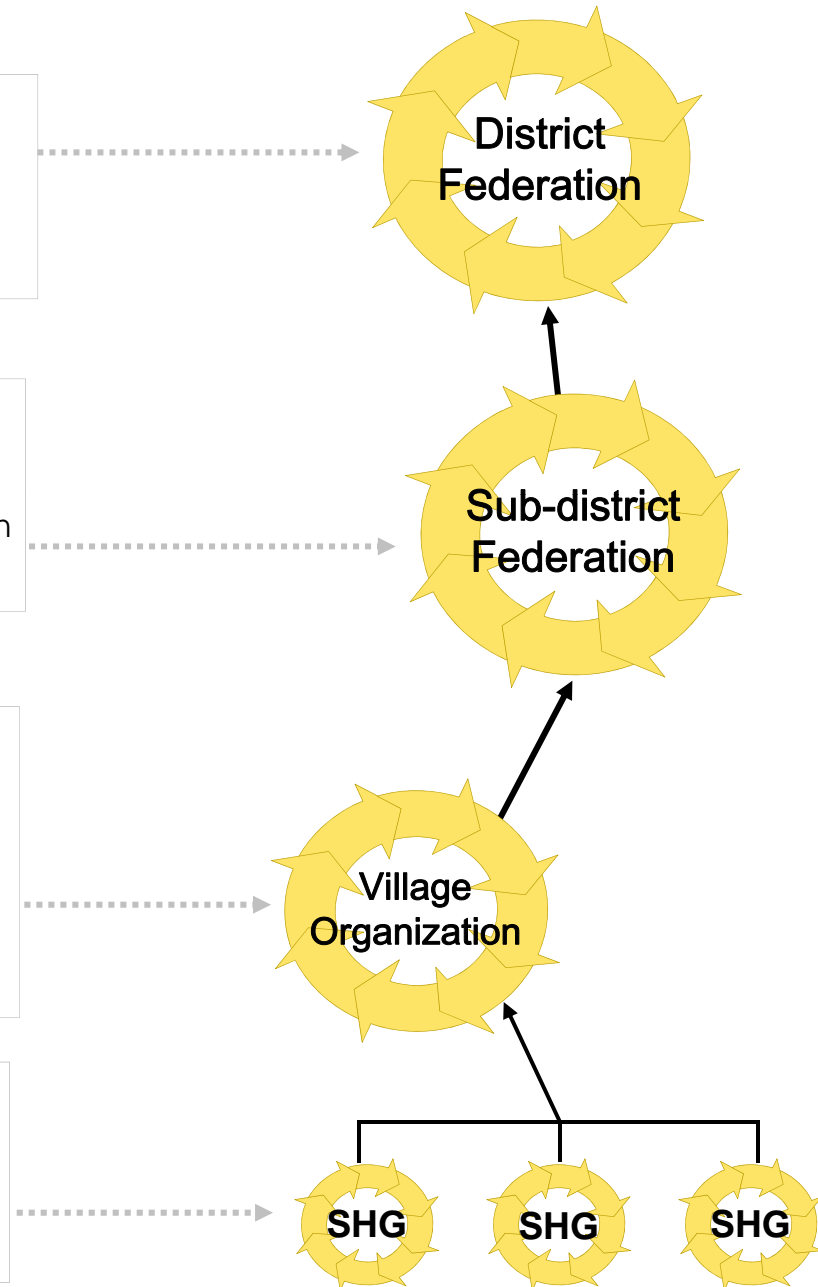
150–200 members on average; Activists, Book Keepers and,
Para professionals

Roles and Responsibilities: Strengthening SHGs, Arrange lines
of credit to SHGs, Social action and Support activists, Village
development

Self-Help Groups (SHGs)

10–15 members per SHG

Roles and Responsibilities: Thrift and credit, Participatory
monitoring, poverty reduction plans, household investment
plans



CMISA - Context

All farmers – special vulnerability of small and marginal farmers

Risk Environment

Rainfed Agriculture

< than 30% cultivable land is irrigated

Increasing vulnerability and reducing the propensity to invest

Credit – informal sources

External input intensive agriculture

Shifted power towards suppliers

Tied sales excludes farmers from participation in markets

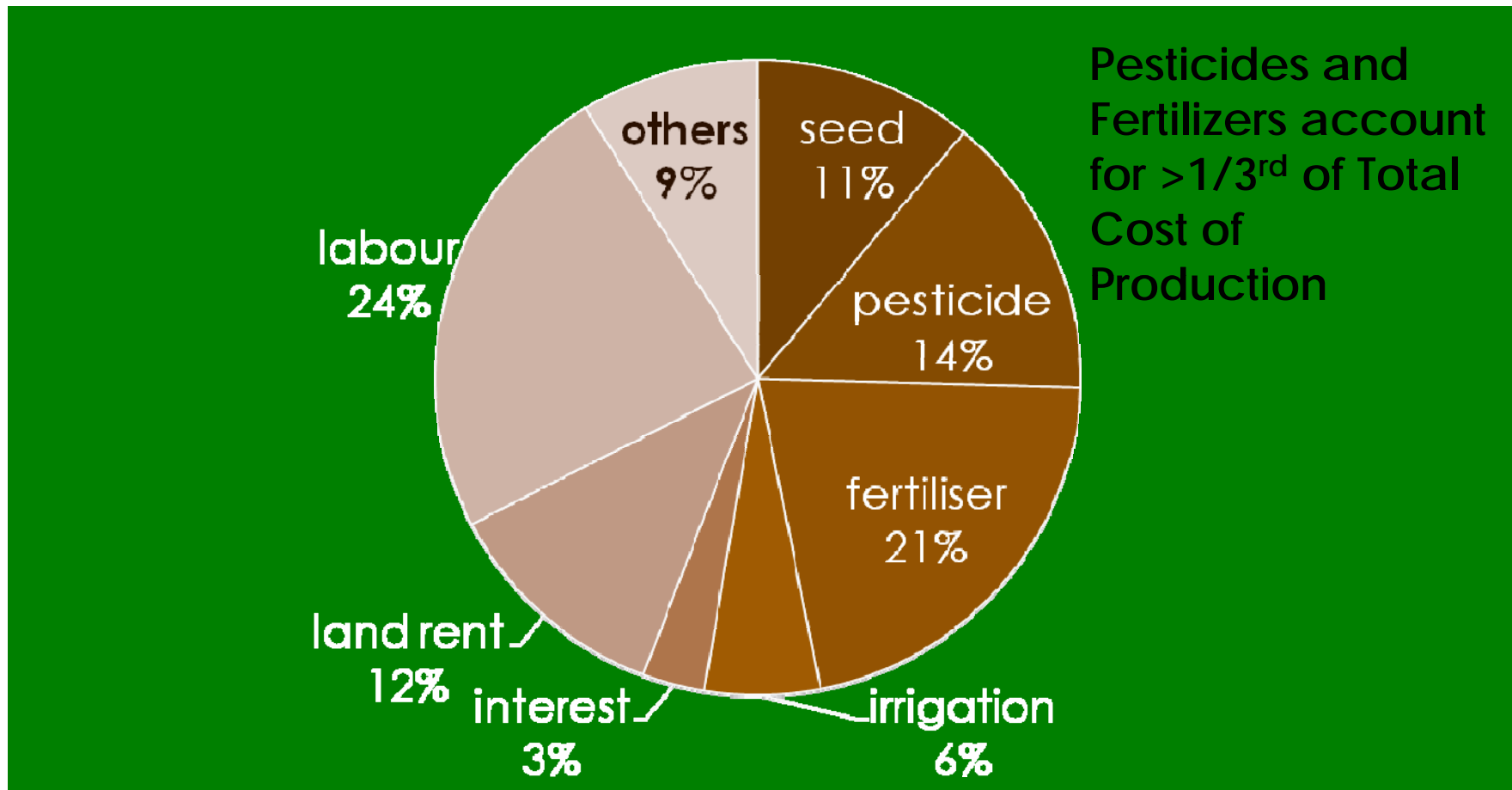
Imperfect Markets

Malpractices in market place

Price discovery only after farmers have sunk in marketing costs

Delayed payments

Cost of Production for Small & Marginal Farmers in AP



Source: *NSS Report No. 497: Income, Expenditure and Productive Assets of Farmer Households, 2003

Community Managed Sustainable Agriculture

Vision:

Sustained efforts to make agriculture as economically viable and ecologically sustainable activity, without compromising on yields and improving returns per unit of land and water, to improve the quality of farmer's life

Mission:

To improve the annual incomes of farmers in Rain fed areas in particular and agriculture in general with integrated farming systems



Main objective

- To sustain agriculture based livelihoods
- Special focus on small and marginal farmers, Women, tenants, agriculture workers
- Technology
 - Understanding **Natural Processes** – Sailing with it, synergized with scientific knowledge
 - **Local natural resource** based
 - **Knowledge centric** than product centric, hence support only in the form of knowledge
 - **Technology transfer through Community Resource Persons**
- Management
 - Community managed (SHGs)-financial and personnel

Technology frame work

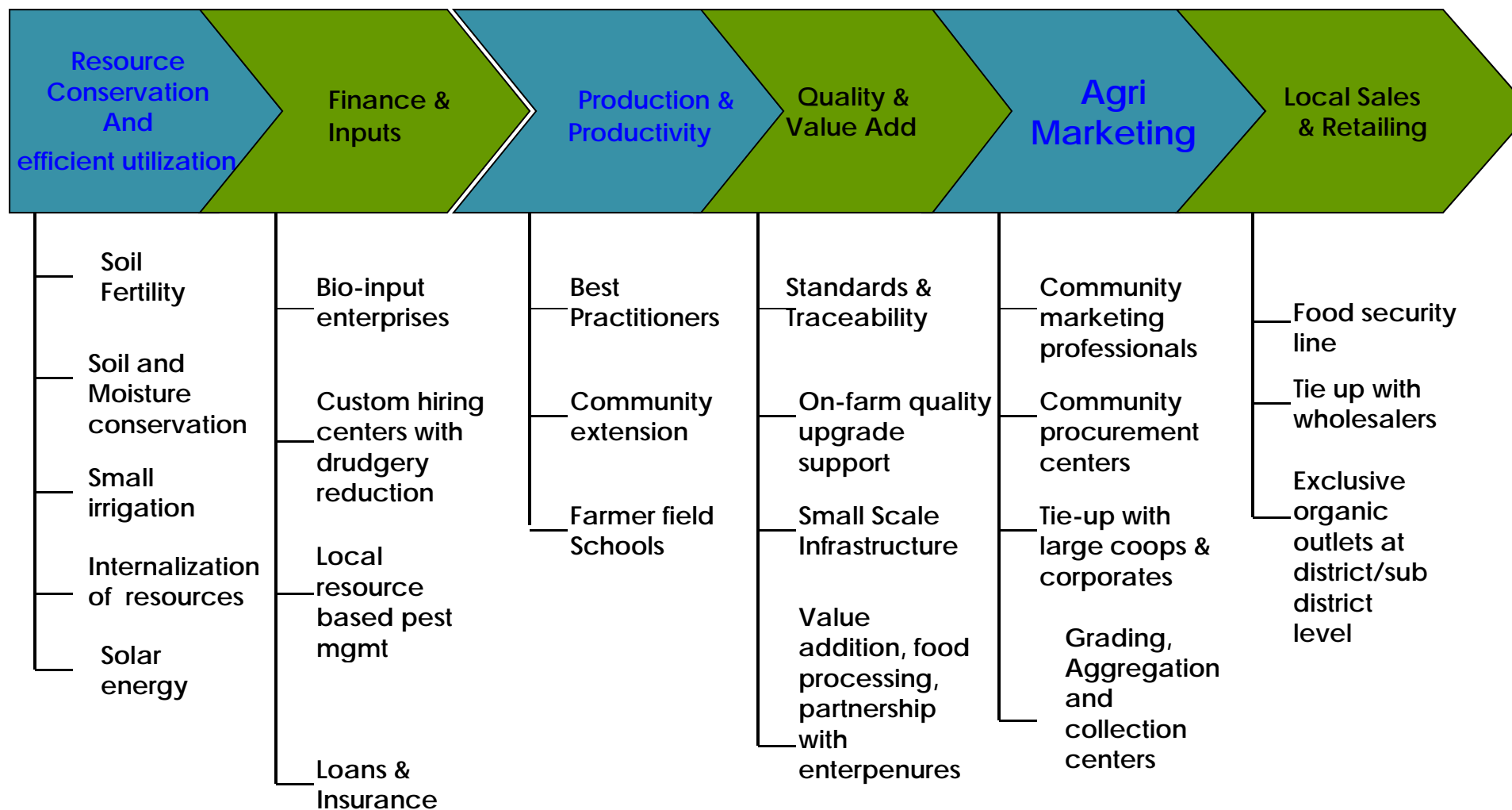
- Understanding **Natural Processes** – Sailing with it, synergized with scientific knowledge
- Understanding pest life cycle
- Soil is treated as living medium
- **Blend of cutting edge technology with traditional wisdom**
- **Local natural resource** based
- **Knowledge centric** than product centric
- **Technology transfer through Community Resource Persons**
- Farmers are encouraged to take-up experiments



Program strategies

- Reducing cost of cultivation (by adopting practices which involve low or no expenditure), **improve net incomes without yield reduction**
- **Decentralized Extension System:** Resource persons to provide regular technical support in the village
 - Best practicing farmer in the village identified as **village activist**
 - **Weekly group meetings (FFS)** in the fields for reviewing, researching, trouble shooting and capacity building
 - Paid **cluster activist** for 5 villages
 - Partnership with select **NGOs**
 - Variety of resource material
 - **Best practising farmers** as CRPs
- Program anchored and **regularly reviewed** by the Federation of SHGs at village, mandal and district level

Interventions along eco-agri value chains – Business opportunities

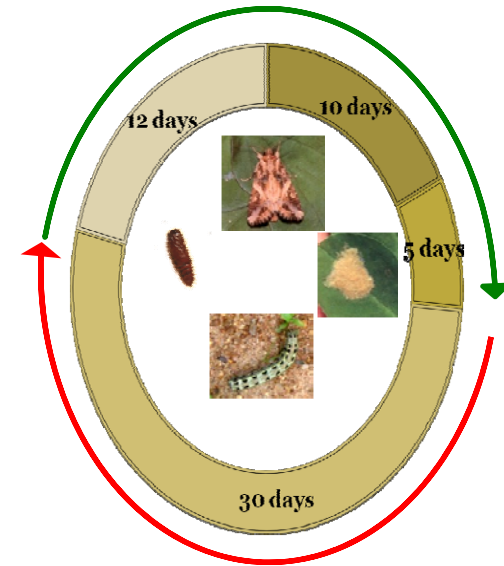


Decentralized Extension System – Institutional Strengthening

- **NPM sub-committees** at Village, Mandal, Zilla formed.
- Meetings / Discussions every month.
- **Performance** of CA/VA (NGO) **reviewed**.
- **Payment of salaries** of VA/CA and facilitation fees of NGOs by Samakhyas.
- **Field inspection** by members of SHGs
- Budget provision for monitoring, **field visits**, reviews by Samakhyas
- **Video conferences** - Every Fortnight
- **CUG phone** connections used to monitor progress of FFS/subcommittee meetings
- Alerts through **“Way to SMS”** to the cell phones
- **E-mail** connectivity upto Mandal Samkhyas, NGOs, DPMs - Separate group mails
- Review at DCC level – **Every first and third Saturday**
- Wireless set conference: PD/Addl.Pd with samakhyas and VA/CA
- MANA TV – **Every fourth Saturday**

Capacity building on

- **Life cycles of pests** and enabling climatic condition for disease prevalence and spreading
- Farming systems
- **Sustainable use of resources**
- **Maximizing output** from a unit land
- **Effective utilization** of inputs like Seed, organic fertilizers, **sunlight**, water, land etc,
- **Conservation** of Renewable Natural Resources & Genetic bio diversity both flora and fauna – SRI in Paddy
- Program management



Concept – I: No Pesticide Usage even as last resort

- Community Managed **decentralized extension** system enables adoption of all Cultural, Mechanical, biological methods (Non-Negotiables) **hence no chemical pesticides at all not even as a last resort - IPM becomes NPM**
- Integrating management practices **to prevent** insects from reaching damaging stage / proportion
- **a natural ecological balance** will ensure that pests do not reach a critical number in the field that endangers the yield
- nature can restore such a balance **if it is not meddled** with too much, hence no chemical pesticides at all.
- **understanding the insect biology and crop ecology** is important to manage pests – it is not enough if reactive sprays are taken up during outbreak.



Concept – II: Soil health – Key for plant health

- Soil to be treated as **living media**
- Returning crop residues to soil through animal route / directly
- Promoting **tank silt application** through **NPM-NR EGS**
- Neem cake application – Controls Nematodes and soil borne pests and diseases
- Promoting **Azolla** in Paddy on large scale – **Slow release of Nitrogen – reduces succulence and pest incidence**
- Application of **dung based inoculants**
- Crop diversification including **legumes – less congenial for pests**
- Neem cake application
- **Mulching** – (earth worms appear)



Concept -3: Radical Soil and Moisture conservation

Tree based agriculture for sustainability (**One good rain captures 5 Lakh Its of water**)



Components include Trench, Conservation furrows, Farm Pond, compost pit , tank silt application.
Rs. 48,000 per acre - **MGNREGS**



•**Rs.185.18crores** worth works were executed in the **61,247** acres of the SC/ST farmers



Concept-4: 36 X36 Models

Small plot intensive cultivation with irrigation

- **Seven tier** intensive cropping model.
- To harvest **maximum sunlight**
- Model developed based on principles of photo candle requirement and companion crops
- Tool to achieve nutritional security at the households level

Achievements:

- So far 80,000 models established across state
- The incomes from this model range from **Rs.4,000-Rs.12,000**
- The highest income so far is **Rs.19,000.**



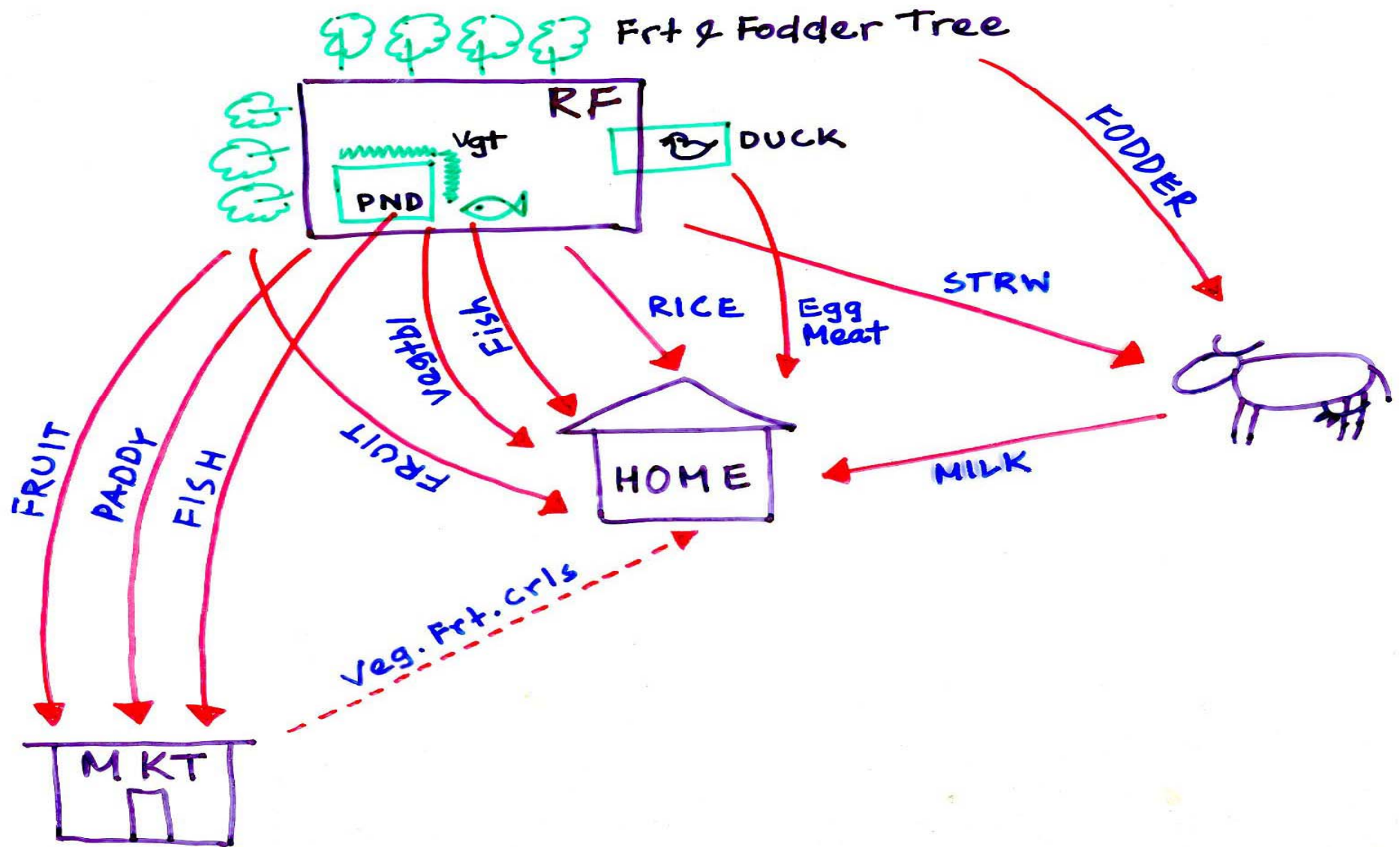
- 1 Bulbous root plants : Onion & Turmeric
- 2 Creepers : Cucumber
- 3 Leafy vegetables : Kenalf
- 4 Vegetables : Lady's finger
- 5 Trap and Border crops : Maize, Castor
- 6 Short branches plants : Papaya
- 7 Fruit plants : Guava etc...

Concept-5: Bio diversity and Tree based farming

- **Diversified crop models** with emphasis on **monocot-dicots**, leguminous and non leguminous.
- Fruit crop/perennial Redgram and Castor based **vegetables** models
- For building sustainability crop husbandry **around perennials** is essential
- **Multi tier structure to harvest maximum sun light / photosynthesis**



Concept-6: Integrated Farming Systems



Concept-7: Integrated Farming Systems

- With primacy to dung-based inoculants livestock/dairy/poultry/small ruminants, getting integrated with crop husbandry
- **Fishes making appearance** in paddy fields following the withdrawal of pesticides
 - Pisciculture can be practiced in farm ponds
- **With Biodiversity**
 - horticulture and **silvi pasture** getting integrated
 - With year round flowering, convergence with **APIARY**
 - With castor and mulberry part of the system, **ericulture** and **sericulture**



Concept – 8: Seed banks for seed sovereignty

- Identifying high yield genome with the farmers – local and improved
- Organizing seed production plots with 2 – 3 farmers initially
- Soon after harvest and drying needy farmers lift their own seed, preserve
- Seeds to meet production to biodiversity ensured
- Graduation from monetary transaction to payment in kind with premium (i.e., 50% more seeds at harvesting time)
- Access to Foundation Seed Chain periodically by communities



Branding of NPM products for Premium prices

Name of the district	Brand	Commodities	Turnover in Rs.
Srikakulam	Sahaja Thrupthi	Rice Pickles	20lakh 50 lakhs
Khammam	Kinnera	Rice, Redgram,Chillie powder	30 lakhs 20 lakhs
Guntur	Amaravathi	Dry Chillies, Chilli powder, Green chillies, Vegetables	6.00 crores
Ranga Reddy	Prakruthi	Vegetables	3.50 crores
Adilabad	Susthira	Rice	50 lakhs
Total			11.20 Crores

Through “**Mobile Bazaar**” everyday mandi price information through sms (free) to farmers.

Comprehensive strategy to produce export quality pesticide free Chillies

- Internationally recognized lab checking quality
- **International buyers paid Rs.1650 -1850/qtl additional amount to market price**
- **1550 tonnes of chillies exported to Germany, Holland etc :**
- **ITC – 450tones, Bharath agency – 950 tonnes, Anand&Co – 150 tones**
- **Chillies producers and traders** are connected facilitated by Samakhyas - Initial hand holding by SERP for two years for the last three years it is totally self managed by Samakhyas
- Initial quality check is done by samakhyas – village level quality centers – charge Rs.100 / sample
- Pre/mid season trainings organized to staff, farmers and samakhyas on Chillies
- **All NPM methods including border crops, white and yellow plates from nursery stage are achieved in 100% fields**

Accessing better price through Market intelligence

- Free SMS based service is provided by Fasal, Intuit for farmers connecting them to **local mandi agents and potential buyers with their mobile nos**
- Pilot is done **in five districts**
- Now we reached 12 districts and more than **26,032 farmers**
- Crops covered include **vegetables, redchillies, cotton and onion**
- Enabled the **farmers to access better price, Reduced transaction time in mandi** and Increased bargaining power
- **Plan: To connect 22 districts with 5 lakh SHG women farmers**

S.No	Name of the district	Number of farmers enrolled
1	Adilabad	2228
2	Ananthapur	3858
3	Chittor	2348
4	Guntur	1804
5	Karimnagar	5482
6	Krishna	667
7	Kurnool	2019
8	Mahabubnagar	1775
9	Medak	569
10	Nalgonda	172
11	Ranga reddy	580
12	Warangal	4530
	Total	26,032

Organic Certification through PGS

- 300 farmers in 129 groups are eligible for organic certification
- The crops covered under PGS are Paddy, Ground nut, vegetables, maize, black gram etc.
- To access better prices registering brand at state level - **KRuSHE**
- Efforts are on to establish **retail outlets at district and mandal levels** for selling PGS products
- This year scaling up in 2,240 villages in all districts with 20,000 farmers

S.No	Name of the District	No.of groups eligible for PGS certification
1	Medak	13
2	Prakasham	4
3	Ananthapur	4
4	Srikakulam	6
5	Nellore	5
6	Karimnagar	13
7	Mahabubnagar	6
8	Chittor	4
9	West Godavari	2
10	Krishna	1
11	Khammam	2
12	Rangareddy	6
13	Viziayanagaram	8
14	Warangal	3
15	East Godavari	1
16	Vishakapatnam	1
17	Nalgonda	1
18	Nizamabad	6
19	Adilbad	6
20	Kadapa	19
21	Kurnool	10
22	Guntur	8
Total:		129

PGS – local groups

- Women farmers who are adopting organic/Pesticide free farming are grouped in local groups
- These groups will develop into producer cooperatives/commodity interest groups.
- All these groups were trained on Organic farming methods, farm appraisals etc
- All these groups are meeting regularly

S.No	Name of the district	No of local groups formed
1	Srikakulam	6
2	Vizianagaram	8
3	Vizag	7
4	East Godavari	1
5	West Godavari	2
6	Krishna	1
7	Guntur	8
8	Prakasam	4
9	Nellore	5
10	Kurnool	10
11	Kadapa	19
12	Ananthapur	4
13	Chittor	4
14	Ranga reddy	6
15	Mahabubnagar	6
16	Nalgonda	13
17	Karimnagar	13
18	Warangal	7
19	Khammam	2
20	Medak	13
21	Nizamabad	13
22	Adilabad	10
	Total	152

Aggregation of Pesticide free produce

- **Pilot** done in Warangal district
- 16 livelihood groups formed with 12-15 members in each group in one cluster and **overall 40 groups in the district – started savings on monthly basis @100 per family**
- Pesticide free produce is supplied to Ontimamadi collection center – 50 kmts from Hyderabad
- **Production plans** are in place to meet the demand; next **month supply will be every day @4tons/week**
- Farmers able to **realize 25-30% more** price with: Premium prices – 12-15 %, Savings on Commission, hamali, Transportation and opportunity cost
- Net premium achieved **is Rs.24 lakhs in 4 months for 60 farmers**

Outlets in Rythu bazars

- Convergence **with Marketing and cooperative department**
- One or two stalls are marked for CMSA farmers
- NPM villages close to rythubazars are mapped – 47 Rythubazars mapped
- **Stalls in 19 rythubazars are established in 16 districts**
- **Fair prices (Rs.1-2/Kg as premium)** is allowed for CMSA farmers



Status of pesticide utilization in different states**

Sno	State	2005-06	2006-07	2007-08	2008-09	2009-10
1	Andhra Pradesh	1997	1394	1541	1381	1015
2	Gujarat	2700	2670	2660	2650	2750
3	Haryana	4560	4600	4390	4288	4070
4	Jammu & Kashmir	1433	829	1248	2679.27	1640
5	Karnataka	1638	1362	1588	1675	1647
6	Kerala	571	545	780	272.69	631
7	Madhya Pradesh	787	957	696	663	645
8	Maharashtra	3198	3193	3050	2400	4639
9	Orissa	963	778	N/A	1155.75	1588
10	Punjab	5610	5975	6080	5760	5810
11	Rajasthan	1008	3567	3804	3333	3527
12	Tamil Nadu	2211	3940	2048	2317	2335
13	Uttar Pradesh	6671	7414	7332	8968	9563
14	West Bengal	4250	3830	3945	4100	NA
	Total	39773	41515	43630	43860	41822

****Source:**

S.No	Convergence department	Importance of convergence	Outcomes of the convergence
1	Nedcap	Establishment of Bio digesters	A. Convergence meetings done in all 22 districts B. So far 5,001 bio digesters were established
2	Integrated watershed Management Program (IWMP)	A. Productivity enhancement B. Entrepreneur promotion	A. Rs.3.7 crores funds were leveraged for entrepreneur promotion B. 2,804 Nadep compost pits were constructed for productivity enhancement C. 493 NPM shops and 72 custom hiring centers were established for drudgery reduction
3	Convergence with MGNREGS	A. Construction of Nadep compost pits B. Seed banks for 36X36 models	A. Proposals were submitted for 3.17 lakh nadep compost pits B. Proposals were submitted for 1486 seed banks.
4	Department of Marketing and cooperation	Marketing of pesticide free/organic products with nominal premium prices	A. 19 stalls in rythubazars were established 13 districts
5	Convergence with NCOF	PGS	300 farmers will get certificates
6	Convergence with SGSY	Drudgery reduction infrastructure at Village level	A. Rs.10 Crores were leveraged for NPM shops and Rs.7 Crores were leveraged for Custom hiring centers

NPM shops

- To supply “Green inputs”
- Provided financial support Rs.5,000 to Rs.10,000/-
- Established 6,156 NPM shops providing employment
- Supplying 20 green inputs at right time at affordable prices
- These shops reduced drudgery in preparation of botanical extracts



Custom hiring centers

- The main objective of custom hiring centers is to supply of farm implements to small and marginal farmers at nominal rates on hire
- This enables the small and marginal farmers to take up farm operations on time.
- Equipment with 1-12 HP are preferred
- Small equipment like weeders, markers, sprayers, drum seeder etc are available in custom hiring centers.
- Rs.64,000/- is provided as loan
- Established 565 custom hiring centers



CMISA and Climate change

- Tool for Adaptation to climate change
- It also work towards mitigation of climate change

Adaptation to climate change

Effect of climate change	CMSA adaptation methods
Increased droughts and floods	Mulching Conservative / dead furrow Crop diversity Improved drainage systems Selection of contingent crops Comprehensive drought proofing
Extreme temperatures and diurnal variations	Multistoried cropping based on photo candle light requirement
Increased incidence of pests and diseases	Building of pest ecology Managing pests by understanding them (NPM) Crop diversity

Contd...

Decline in water resources	Rain water harvesting – Farm ponds Selection of crops Bund plantation – develops micro climate and reduces evaporation <i>In situ</i> moisture conservation Zero tillage SRI in Paddy
Increased risk	Crop diversity – Spreading risk Increased yield frequency Agro forestry

Adaptation contd.....

Soil nutrient depletion due to high temperatures	Soil fertility management by monocot/dicot crop combinations Mulching Azolla in Paddy Creating enabling atmosphere for local deep borrowing earth worm Dung based inoculants Recycling of biomass <i>In situ</i> Soil fertility management Tank silt application Green manure crops Green leaf manure
Increased weed problems	Weed as source of mulching

Mitigating climate change

Contributing factor for climatic change	Mitigation method in CMSA
GHG emissions	SRI in Paddy Using biomass for composting rather than burning Eliminating chemical fertilizer usage Aerobic composting methods like NADEP
Energy use	Low or no fossil fuels Animal power or human power No machinery using fossil fuels
Increased Co ₂ in atmosphere	Bund plantation of green leaf manure and other plants

Evaluation Report – ANGRAU

- Third party evaluation commissioned by **Department of Agril for RKVY**
- Study conducted in **18 districts funded by RKVY**
- Proportionate **Random sampling** method was used
- Study conducted in **24 Mandals, 62 clusters, 320 villages**
- **3200 farmers**, 10 farmers from each sample village

Reduction of Costs and Yield Costs/ Acre

S.No	District	Crop	Reduction in Pesticides	Reduction in fertilisers	Net amount saved on pesticides	Net Amount saved on fertilisers	Yield	Increase in yield (Quintals)
1.	Kadapa	Paddy	100%	50%	544	508	21.0	2.0
2.	Chittoor	Paddy	100%	50%	390	440	26	2.5
3.		Paddy	100%	50%	1200	246	21	2.5
4.	Vizag	Paddy	100%	50%	1200	1048	24	2
		Maize	100%	50%	1300	1080	24	2
5.		Paddy	100%	50%	1100	1949	24	2
		Maize	100%	50%	1300	1825		
6.	Medak	Paddy	100%	50%	1400	646	22	1
		Maize	100%	50%	1200	1052	23	1
		Jower	100%	50%	1200	668	14	1
7.	Karimnagar	Paddy	100%	50%	1100	896	22	2
		Cotton	100%	50%	1500	1686	11	1
8.	Nizamabad	Paddy	100%	50%	950	1690	23	1
9.	Khammam	Paddy	100%	50%	550	1051	21	2

General Observations – ANGRAU

- The crops viz paddy, **Chilly, vegetables** etc are very **healthy**
- In case of POP activities beneficiaries earned upto **Rs.40,000/- from ½ acre**
- **POP beneficiaries** were enthusiastic to cultivate SRI and NPM methods
- In some of the sample villages farmers were earning **Rs.1000 per month** through **NPM shop**
- In Sunflower **seed setting** was good with NPM practices
- Majority of the beneficiaries shifted from **Monocropping to Mixed farming**
- Increase in **Nutritional status and livelihoods** observed

Policy Impacts

S.No	GOMs.No	Importance
1	GOMs.No392	Radical Soil and Moisture Conservation Works through MGNREGS
2	GOMs.No121	Convergence with ATMA
3	GOMs.No110	Convergence with IWMP
4	Mahila Kisan Saskthikaran Pariyojanaan (MKSP)	Scaling up of CMSA at National Level

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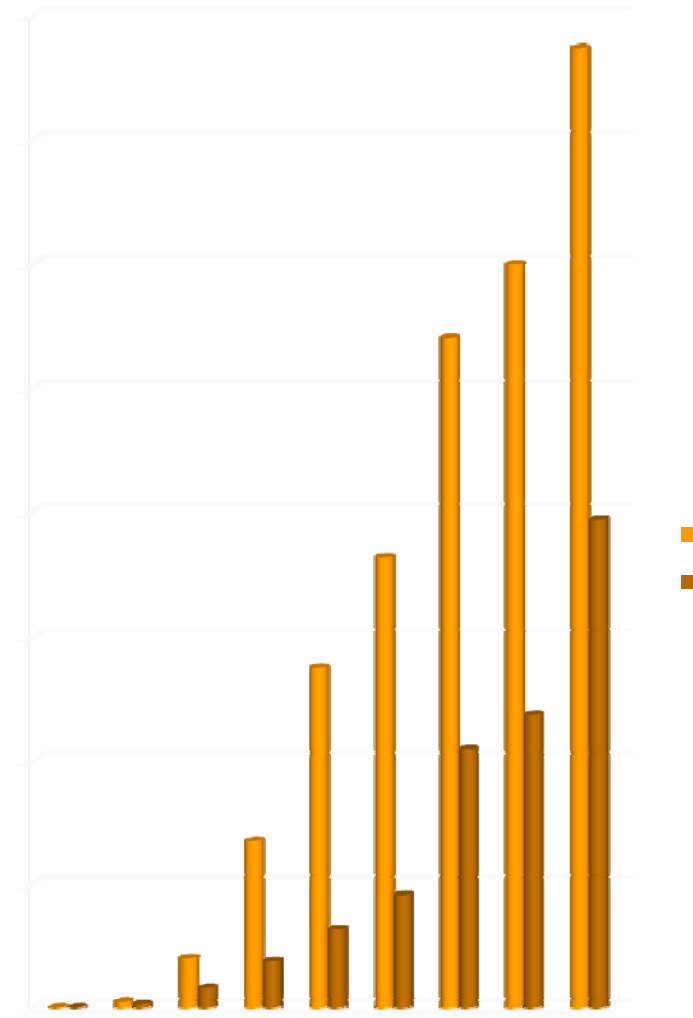
****Source:**

IT initiatives

- For information dissemination – **Group mails**, Bulk messaging (way2sms)
- For Monitoring , capacity building, decision supporting, by community – **mobile based application**
- **All practicing farmers (10 lakhs) data base** with their practices and incomes captured through mobile application
- For capacity building – Video films, Interactive CDs
- Accessing better prices – Mobile Bazar
- Budget release and utilisation through **EFMS to bring transparency**

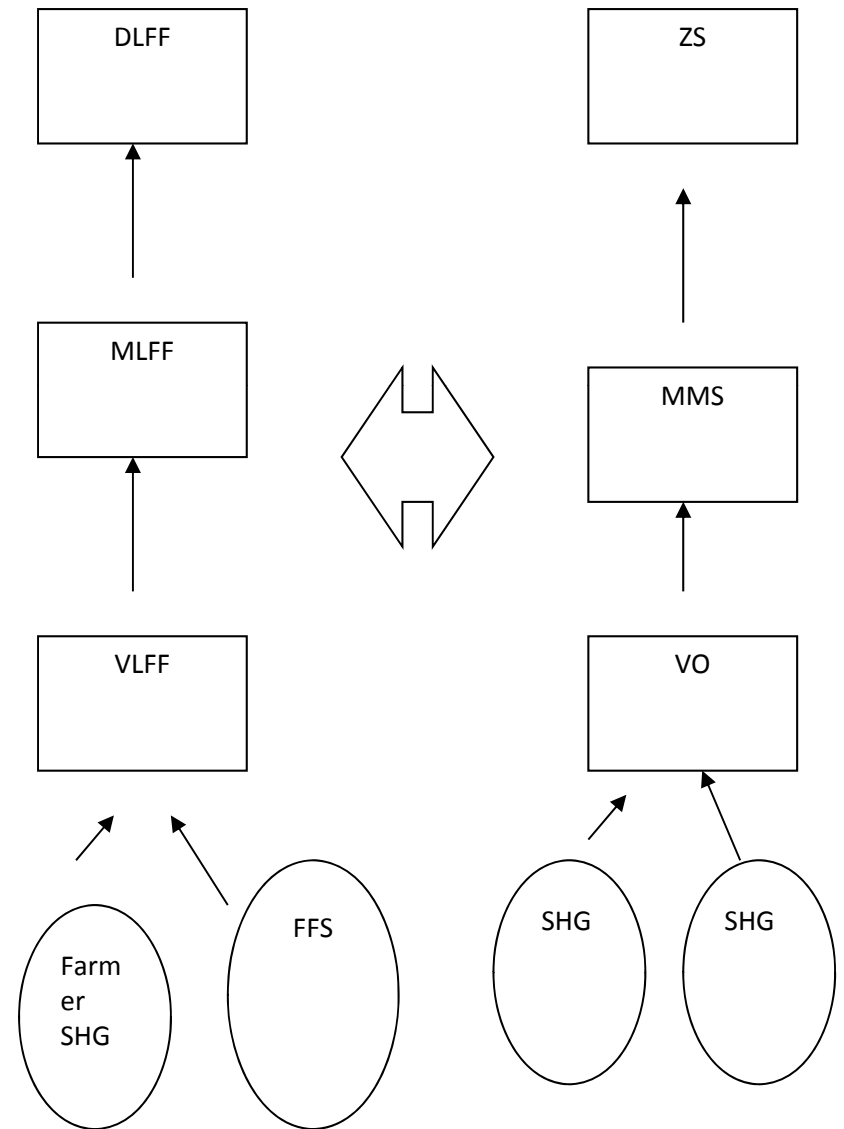
Scaling up

No of Districts	No of Mandals	No of villages	Area in Acres	No of farmers
22	653	11000	38.5 lakhs	19.7 lakhs



Steps towards Sustainability

- **Registration fee** paid by farm family @**Rs.50/year**
- Registration fee collected is **Rs.2.95crores** against Rs.5.0 crores
- Cost of decentralised extension system – **Rs.100/Acre at present scale**
- **Institutions:** Local groups formed under PGS will develop into **producer cooperatives/Commodity interest groups**



Other Achievements

- Made a presentation before HE President of India
- Program is showcased in **Satyamevjayathe**
- Success stories of Two Poorest of the Poor women were screened in **Earth summit at Rio**
- **m Billionth award** for Mobile application
- **ILETS e-world award** for Mobile application
- Gupshop rewarded **8 lakh free SMS** – Planning to using for program advisory / hand holding to Samkhyas and NPM shop owners
- **COP -11 CBD recommended** (Presentation was made by us) investments in community owned and community managed extension system



Road Ahead

- **Horizontal expansion** of the program and deepen local knowledge systems.
- By 2015/16 :
 - **1.0 crore acres** (40% of A.P's cultivable area) under CMSA
- **Piloting food security Models in 200 Villages**
- **Value chain investments:** seed banks, agri-service centers, value-addition and processing and forward linkages
- **Exploring Carbon credits** – Working with IISc, Bangalore
- **Organic certification process** through Participatory Guarantee System
- **Market and brand development** for organic and pesticide free agriculture commodities
- **Producer Companies / Farmer's organisations**

Thank You

