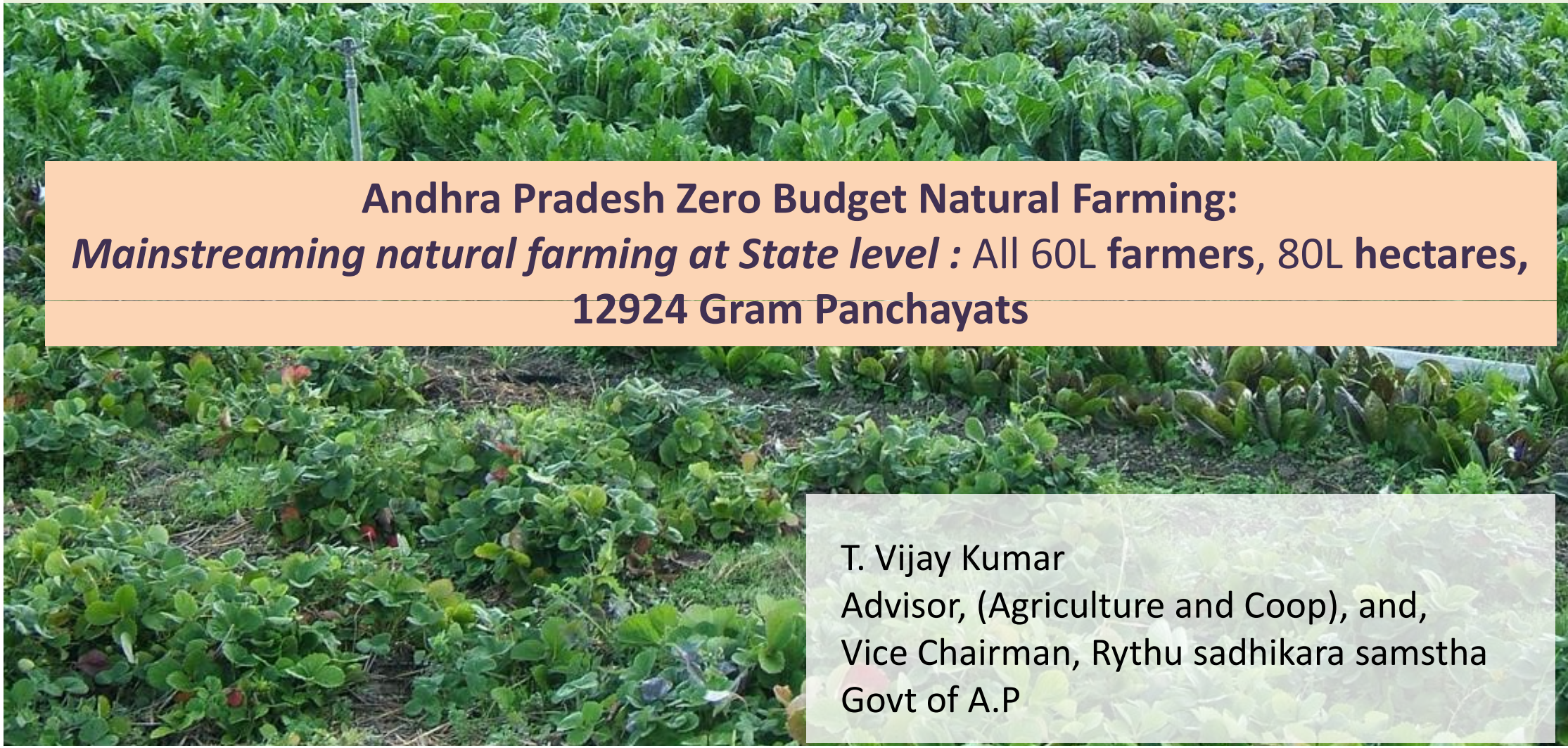
Centre for Science and Environment:

National conclave on food, March 15th, 2019



Andhra Pradesh Zero Budget Natural Farming:

Mainstreaming natural farming at State level : All 60L **farmers**, 80L **hectares, 12924 Gram Panchayats**

T. Vijay Kumar
Advisor, (Agriculture and Coop), and,
Vice Chairman, Rythu sadhikara samstha
Govt of A.P

Andhra Pradesh

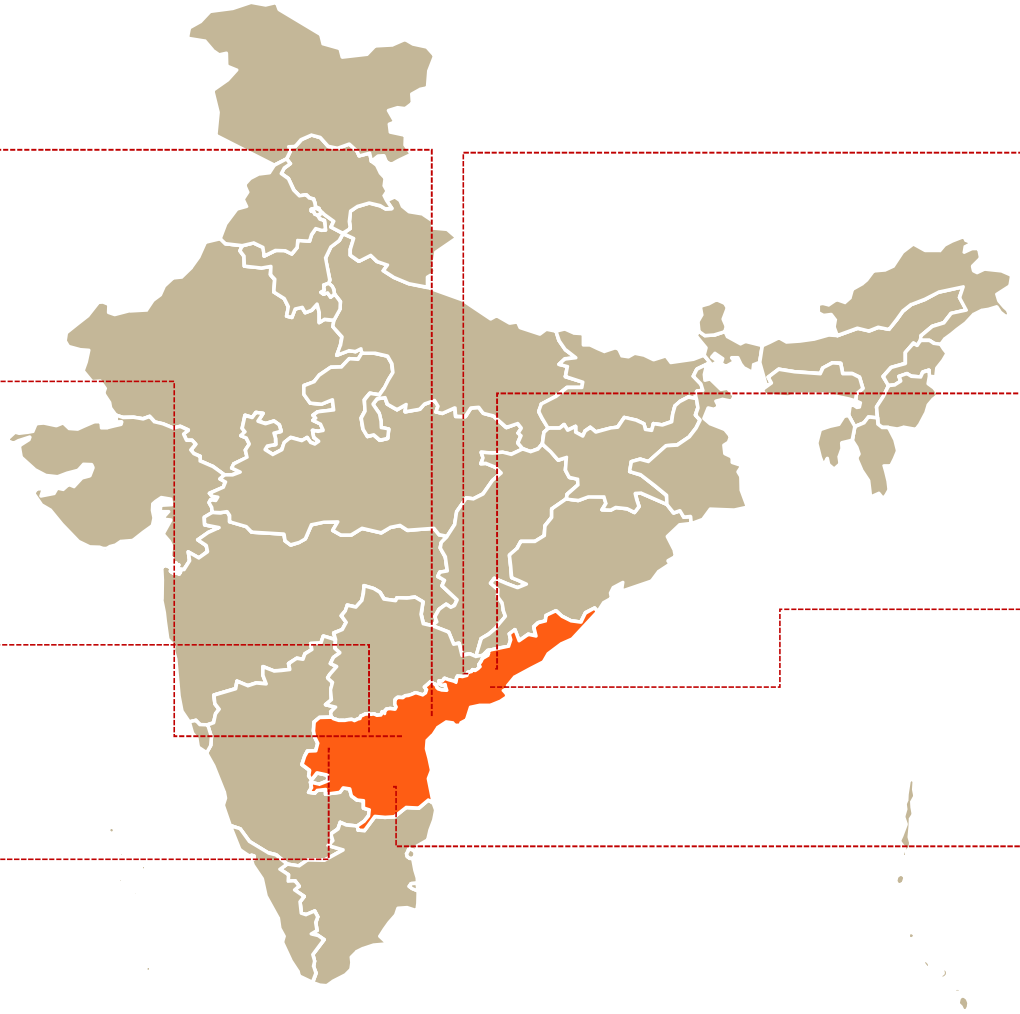
India's Leading Agrarian State

Contributes 34% to state **GSDP**

62% of population employed in agriculture & related activities

Rice Bowl of India

80 Lakh ha cropped area



Diversified cropping systems

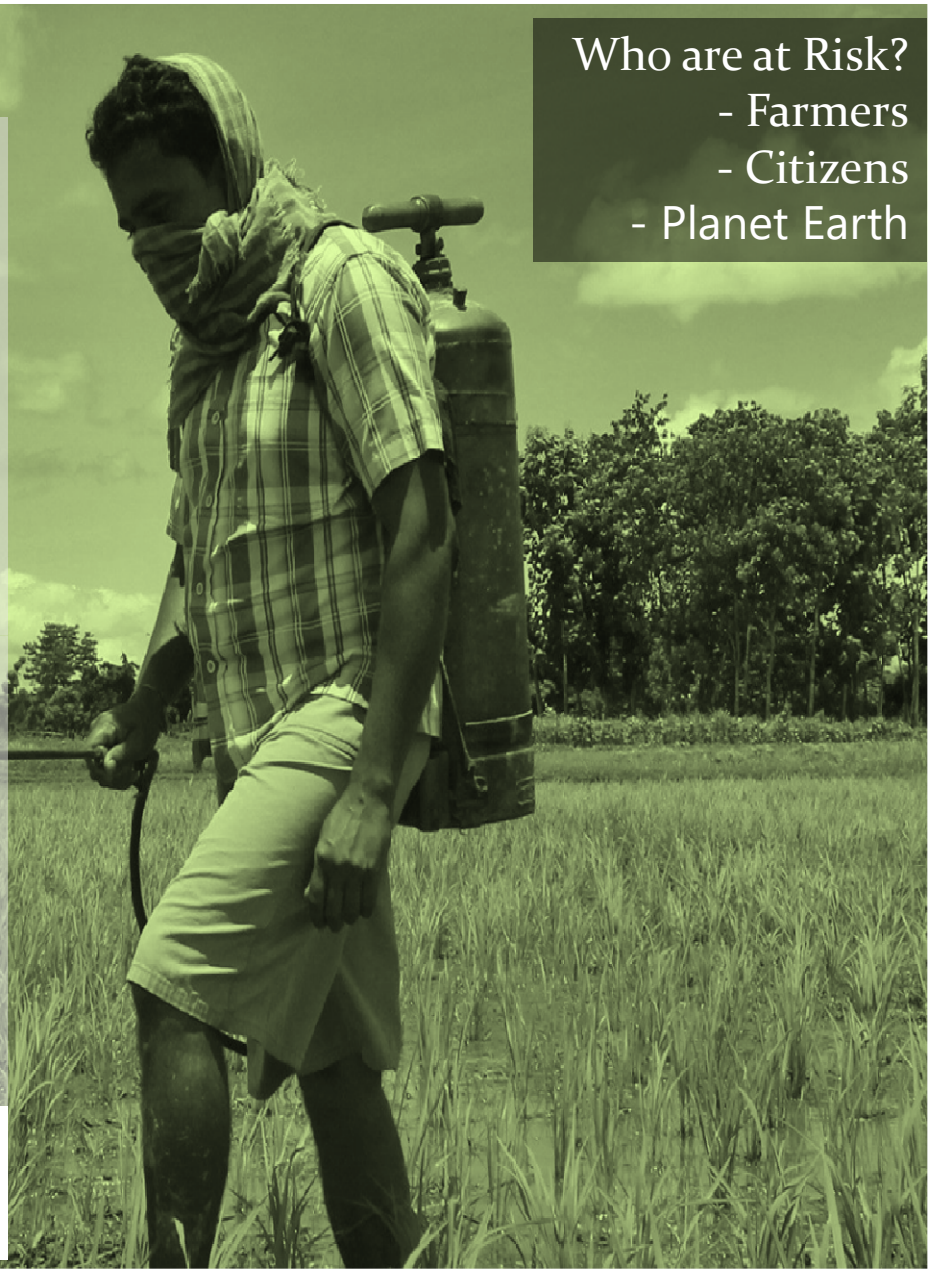
2nd longest coastline – **974 km**

India's largest producer of fruits, eggs & aquaculture products

Horticulture **17 Lakh ha**

Agriculture and Food Crisis

- **High Costs**
- **Production and Marketing Risks**
- **Food Insecurity**
- **Rural – Urban distress Migration**
- **Ecosystem Degradation**
- **Worsening Climate crisis**



Who are at Risk?
- Farmers
- Citizens
- Planet Earth

Current Agriculture system is contributing to 24% of the Green house gases


Z.B.N.F is a transformational technology
Farmers' welfare
•Reduced costs and risks, increased yields, regular income, climate change resilience
Freedom from hunger
•More food, safe food and nutritious food
Youth welfare
•Reverse migration to villages
Environment
•Enhanced soil health, water conservation, regenerated coastal ecosystem, biodiversity.
Safeguarding our collective future

Z.B.N.F is a unique contribution of Padma Shri Dr. Subhash Palekar to the farmers of our country and to all the citizens (as consumers)

Four Wheels of ZBNF

Beejamrutham | **Jeevamrutham** | **Achhadana** | **Waaphasa**

- Higher Yields, , diverse crops, Lower Costs
- Enhanced Soil Fertility, soil porosity, water infiltration
- Soil Carbon enhancement
- Reduce water requirement for crops, harnessing atmospheric water
- Resilience to Climate Shocks

Microbial seed coating through cow urine and dung -based formulations

Enhance soil microbiome through an 'inoculum' of cow dung, cow urine and other ingredients

Ground to be kept **covered with crops** and crop residues as **mulching**

Fast buildup of soil humus through ZBNF leading to **soil aeration** and **water vapor harnessing**

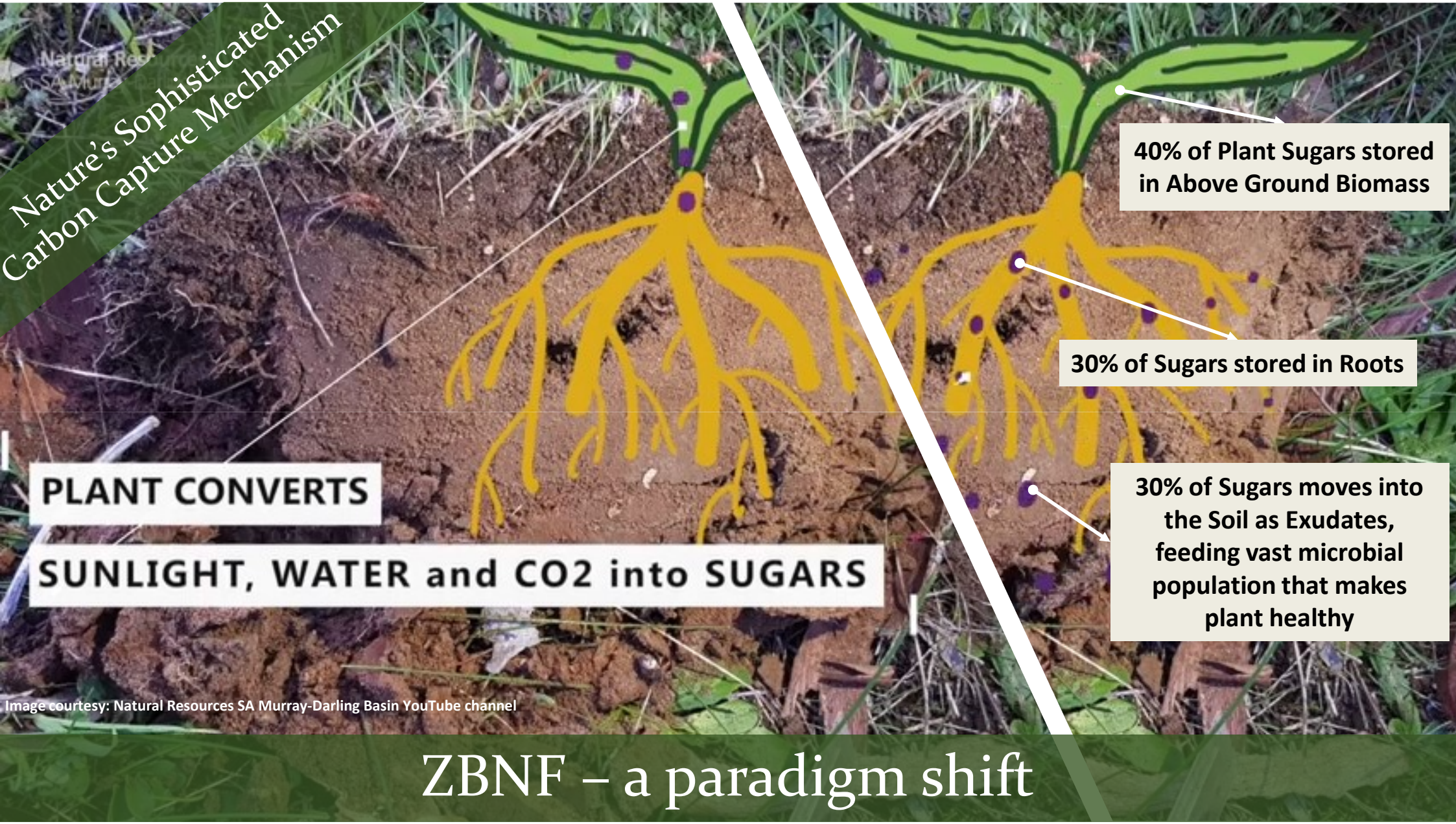
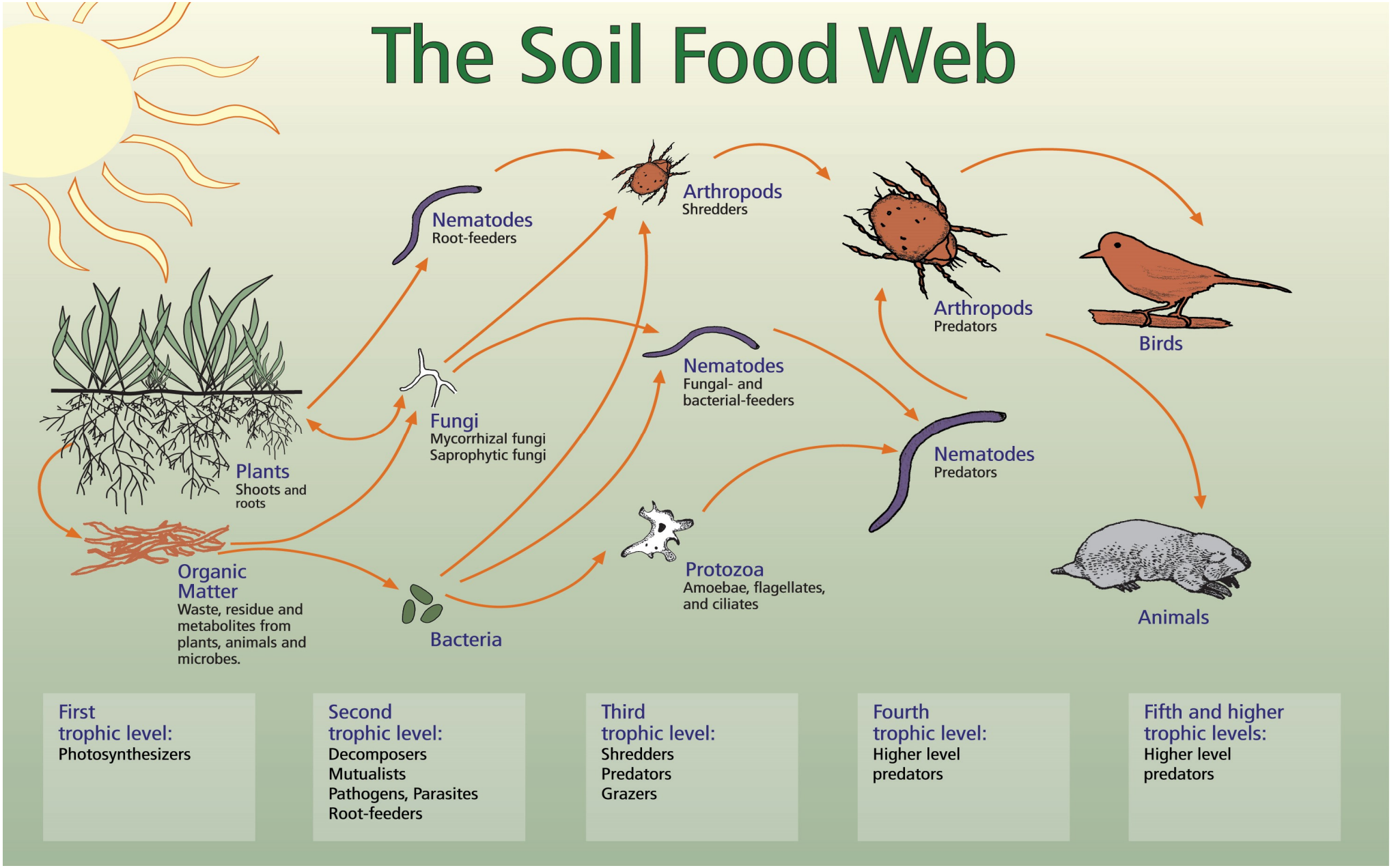


Image courtesy: Natural Resources SA Murray-Darling Basin YouTube channel

ZBNF – a paradigm shift

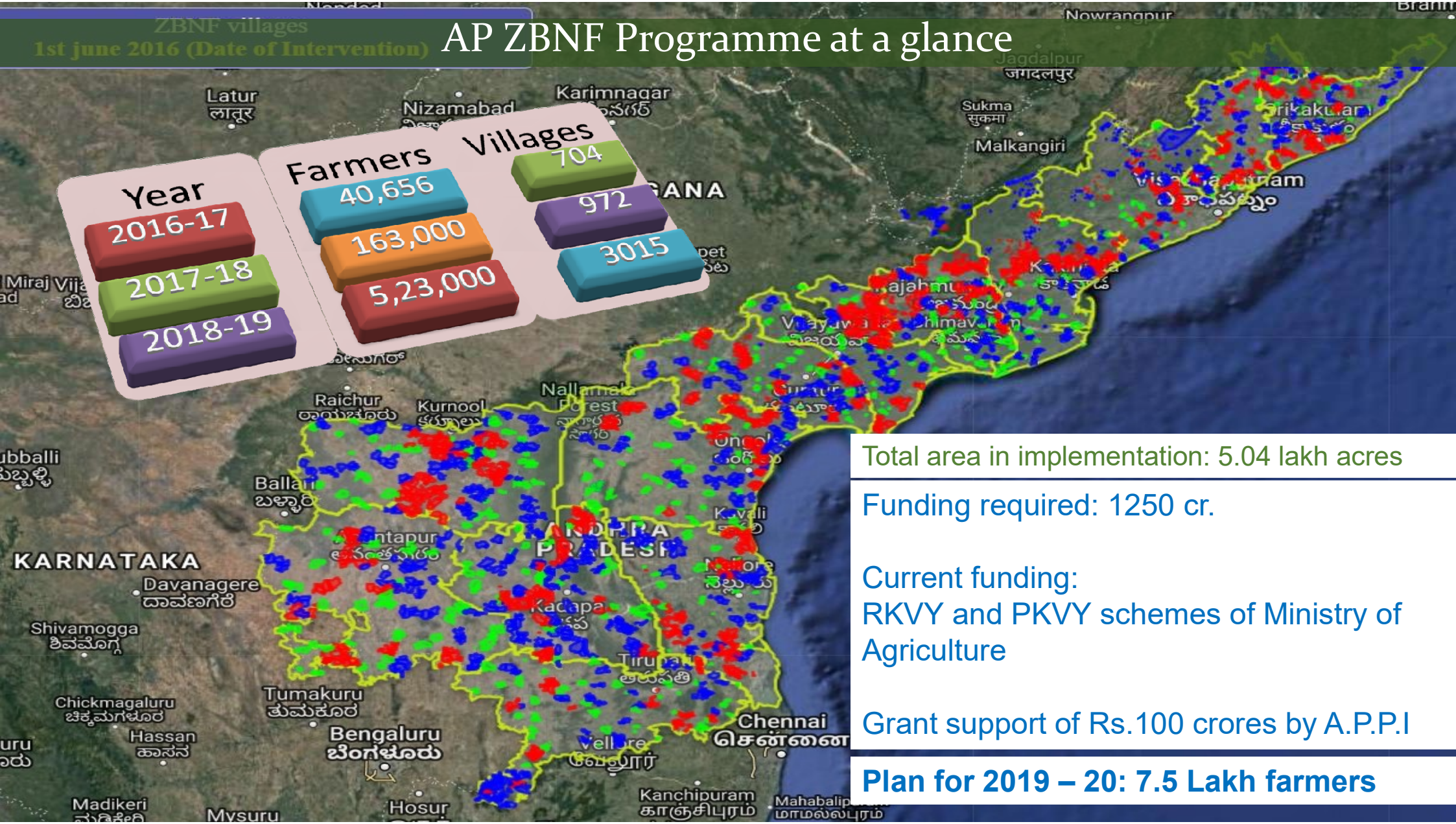
The Soil Food Web



Other critical principles and practices in Z.B.N.F

- **Use of 'indigenous' cow – for cowdung and urine. One cow is enough for cultivation of 30 acres**
- **Botanical extracts – for pest management**
- **Minimal tillage – ground becomes soft and porous with Z.B.N.F practices**
- **All inputs to be made within the village – nothing should be purchased from outside**

AP ZBNF Programme at a glance



Total area in implementation: 5.04 lakh acres

Funding required: 1250 cr.

Current funding:
RKVY and PKVY schemes of Ministry of Agriculture

Grant support of Rs.100 crores by A.P.P.I

Plan for 2019 – 20: 7.5 Lakh farmers

ZBNF IMPACTS

CCE Results:
Major Crops - Kharif 2018

Crop	Irrigated/ Rainfed	Yield ZBNF in kgs/ha	Yield Non ZBNF in kgs/ha	% Change
Paddy	Irrigated	5643	4932	14%
Groundnut	Rainfed	2109	1573	34%
Cotton	Rainfed	995	906	10%
Maize	Irrigated	5962	4929	21%
Ragi	Rainfed	2710	2091	34%
Sugarcane (Tonnes)	Irrigated	147	97	51%

Kharif 2018 CCEs: Yields and Net Incomes

Crop	I/RF	Net Income ZBNF	Net Income Non-ZBNF	%increase in yields	%Increase in ZBNF Net Income Over non-ZBNF
Paddy	Irrigated	59448	39457	14%	51%
Groundnut	Rainfed	61077	33437	34%	83%
Cotton	Rainfed	39239	13222	10%	197%
Maize	Irrigated	26005	17844	21%	46%
Ragi	Rainfed	59200	26294	34%	125%
Sugarcane	Irrigated	302948	180615	51%	68%

Best Cases in 2018

Crop	ZBNF Yield (Kgs/acre)	Non-ZBNF Yield (Kgs/acre)	Percentage Change	Notes
SRI Paddy	**2350**	**1550**	**52 %**	**Farmer: Paradani Jogi Raju (farmer), G. Madugula mandal, Vishakapatanam**
Coffee	103	67	54 %	Farmer in D Gonduru, Kadagaputu, Vishakapatanam
Guli Ragi	**1250**	**450**	**178 %**	**Farmer: Trimurthulu, Ananthagiri Mandal, Vishakapatanam**
SRI Ragi	**1320**	**450**	**193 %**	**Farmer: K Pandanna, Paderu, Vishakapatanam**
Sama	**717**	**350**	**104 %**	**Farmer: P Sonnu, Araku, Vishakapatanam**
Cotton	557	360	54 %	Farmer: K Ganapathi, Duddukhallu, Vizianagaram
Cashew	900	600	50 %	Farmer: K Santa Kumari, Rampachodavaram, East Godavari

ZBNF IMPACTS

Drought resilience through ZBNF

Pre monsoon dry sowing (Drought Resilience)

ZBNF IMPACTS

Drought resilience through ZBNF

Pre monsoon dry sowing (Drought Resilience)

Growth timeline of the pre monsoon Navdhanya over the months

Premonsoon dry sowing crops

Bajra

ZBNF IMPACTS

Resilience to cyclones in 2018

ZBNF

Non ZBNF

ZBNF

Non ZBNF

Bio-diversity

Case of Pattabhi Rami Reddi

District – Kurnool || Land – 4 acres (Irrigated) || Crops – Paddy, Redgram

Conventional Farming

Land under cultivation- 2 acres

Cost of Cultivation- **Rs. 20,000**

Selling Price- Rs. 1500/ Bag

Produce - **22 bags** per acre

Net Income - Rs.46,000

ZBNF Farming

Land under cultivation- 2 acres

Cost of Cultivation- **Rs. 8,800**

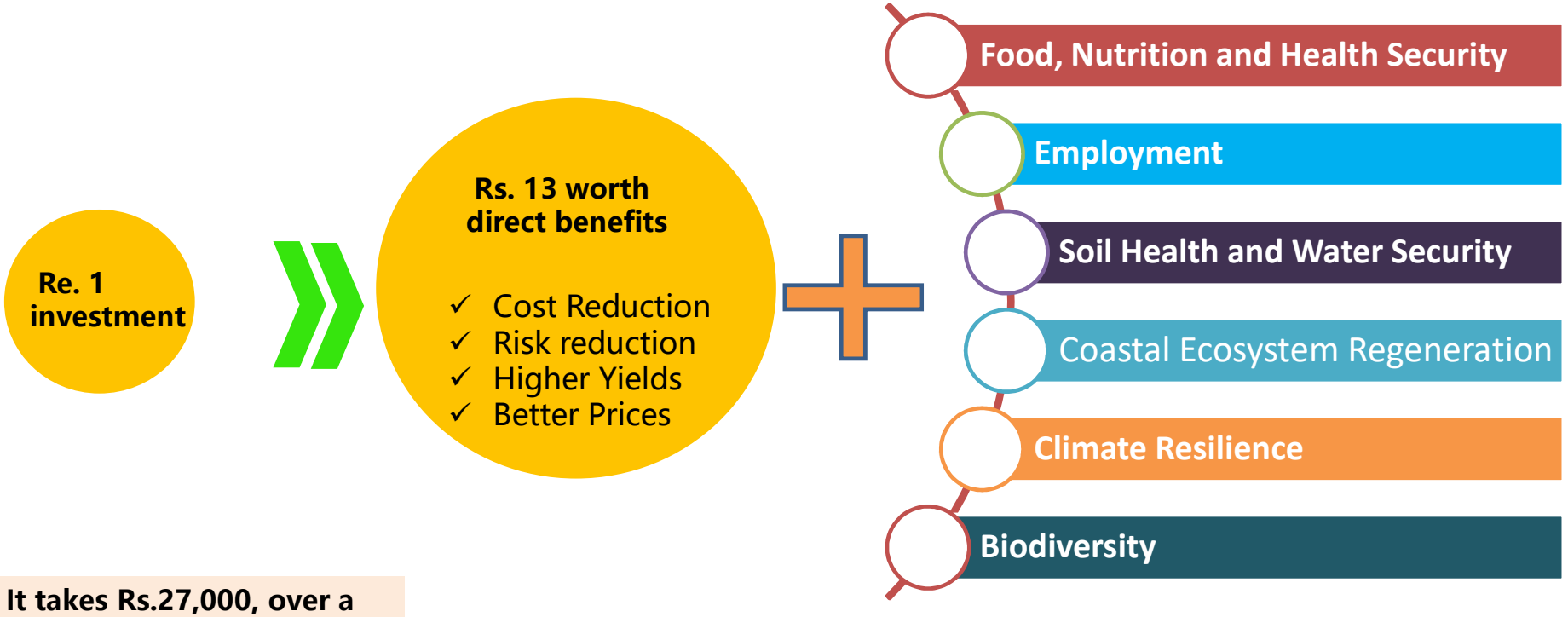
Selling Price- Rs. 2200/ Bag

Produce - **30 bags** per acre

Net Income - Rs. 1,23,200
(2.7 times higher)

"I am very happy with the grain weight,
next year I am going to transfer my whole land to ZBNF"

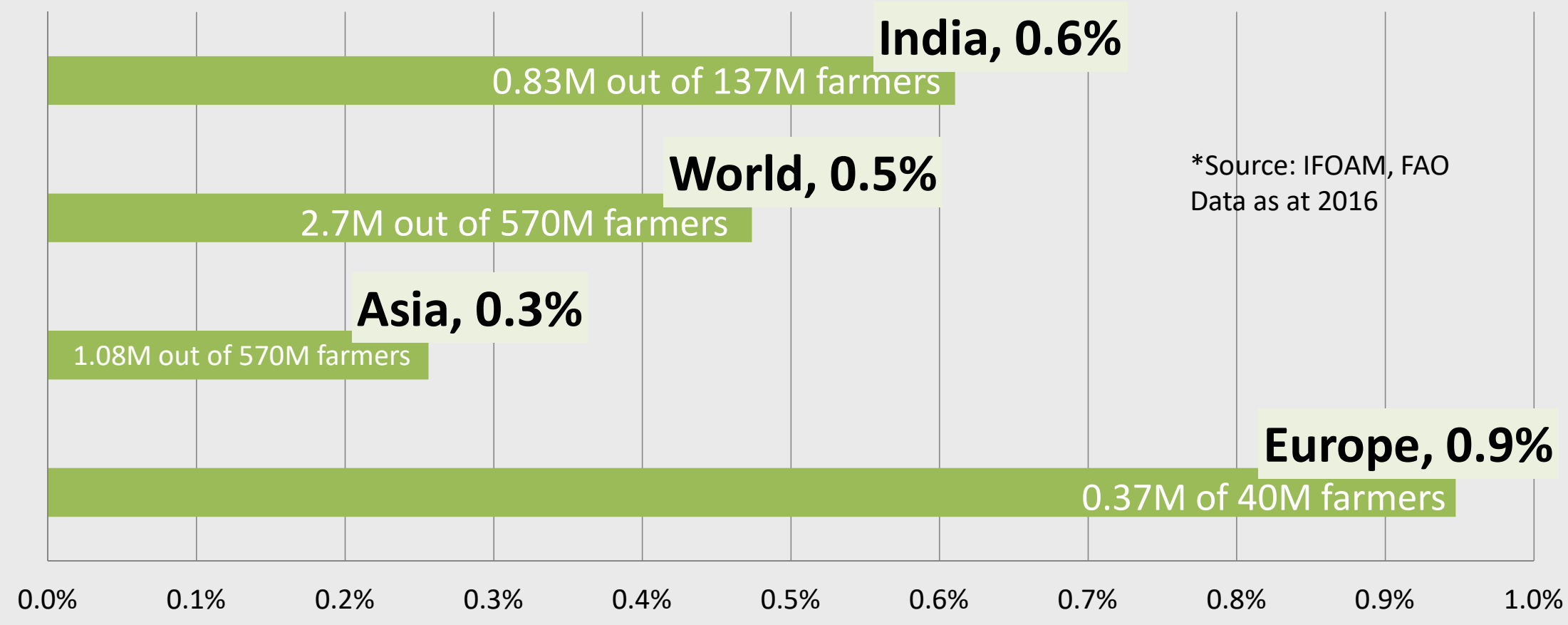
ZBNF Benefits



It takes Rs.27,000, over a five-year period for a farmer household to adopt Z.B.N.F and cover their entire farm (1 ha/family)

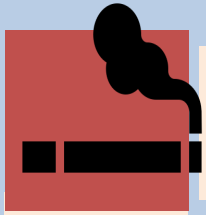
Ecosystem & Health Benefits to citizens

However Organic farming is not scaling up



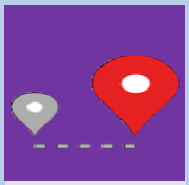
Even after two decades, a negligible proportion of farmers are practicing it .

OBSTACLES TO SCALING UP



Changing the ' CHEMICAL ADDICTION' of the last 60 years - FARMERS, SCIENTISTS, AGRI DEPT

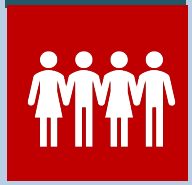
Tackling VESTED INTERESTS



Taking it to the last mile

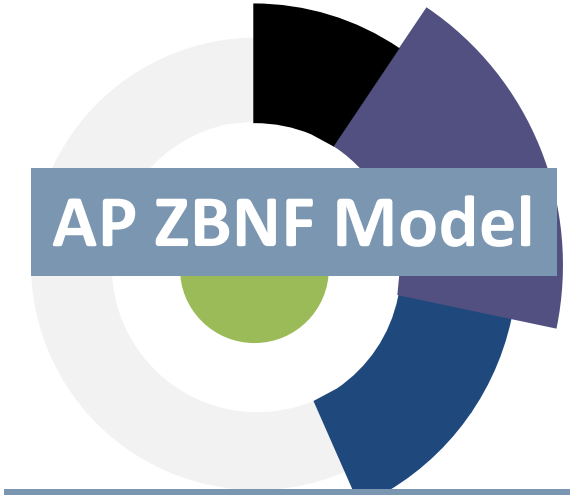
Handholding each farmer to make a permanent transition *in the context of broken agri extension system*

Are the costs affordable ? Gestation period ?



How to make it Self sustaining, long-lasting

APZBNF - overcoming critical obstacles to scaling



Farmers' Coverage

•2016-18 •**8%** enrolled	•2024 •100%

At least 5 years handholding to each farmer

Pillars of APZBNF Model

Commitment
State Government

Knowledge
Subhash Palekar

Extension
Champion Farmers

Ownership
Women SHGs

ICT for Knowledge, Tracking, Traceability

Collective Action for Inputs, Models, Marketing

Saturation: Farmers » Farms » Practices

AP Programme implementation : structure

Dedicated entity for implementation – the Rythu sadhikara samstha

- Agriculture Department taking up implementation at state and district level
- Technical support grants from APPI

Robust State and District Teams

- Blend of Agri dept officials, development professionals (as consultants), best practitioners (as SRPs), Thematic Leads across various themes and Young Professionals,
- Complemented by Community cadres in managerial positions - District and divisional leads – technical and institution building
- Ownership of Agriculture dept functionaries

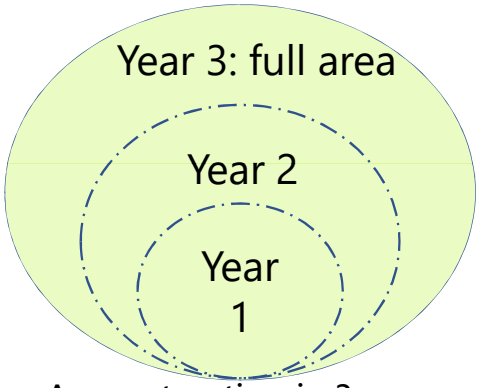
NFF Strategy

- Young Agri Graduates, through campus recruitment, as Farmers, Trainers, Researchers and Integrators
- 284 positioned in various villages (@ 1 per cluster)

Process: longterm handholding support to each farmer

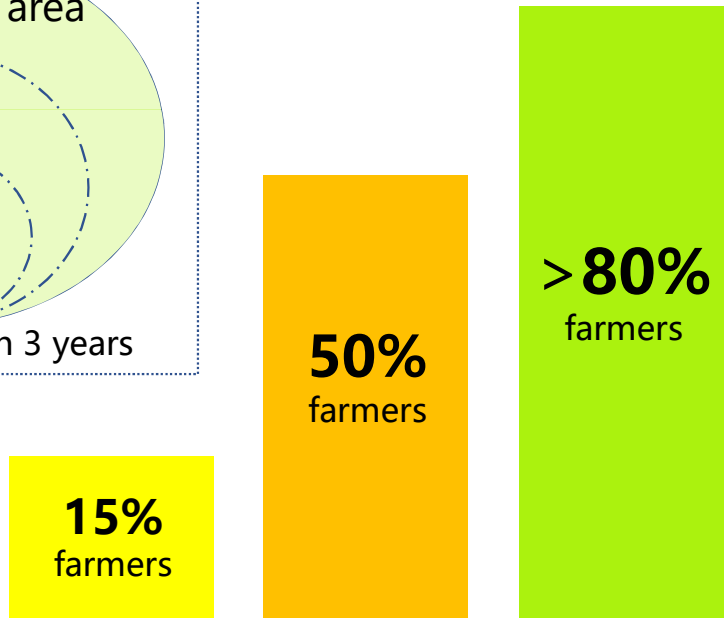
Covering all farmers and all cultivable area in a village in **5 years**

Each farmer takes 3 years to cover the entire holding.



Area saturation in 3 years

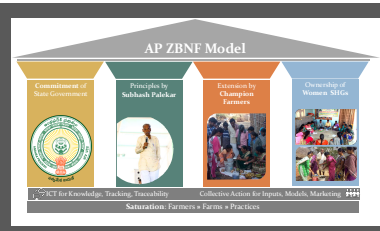
ZBNF Adoption rate



Year 1 **Year 2** **Year 3**

Year 5

Champion Farmers



5,900 **Community Resource Persons**
@ 1 per 100 famers

284 **Young Agriculture Graduates**
as Natural Farming Fellows

- Inspiration
- Knowledge Transfer
- Handholding
- Video Dissemination
- Farmer Field Schools

Farmer to farmer knowledge dissemination

CRP Strategy : 5000 strong

CRP: Important Pillar of AP Model

- Best practicing farmers
- Identified (through rigorous verification process), trained and deployed as Community Resource Persons
- Farmer-to-farmer dissemination, handholding support to farmers

Building Capacities of CRPs

- Multiple rounds of training at district and state level in three spells (pre kharif,, kharif and rabi) for 15 days
- Additionally, trained by Sr CRPs for 2-3 days every month
- Apprenticeship with Sr CRP for six months

CRPs activities

- Farming Plans (in a campaign mode and in collaboration with Women SHGs)
- Weekly Farmer Field Schools
- Human mediated video disseminations

Social capital of Women – mobilization of women in A.P

A Programme since 1995

No of SHGs Credit Facilitated:
332,594

Credit Amount Facilitated Dec' 18-19:
Rs.10,750 cr

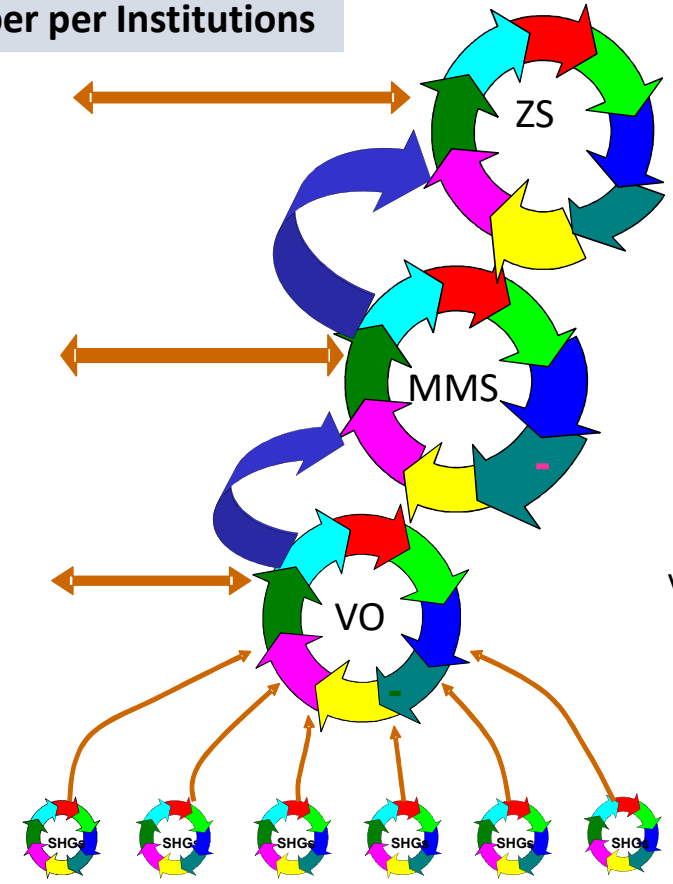
Average Number per Institutions

45 – 55 MMS

35 – 45 VOs

10 - 20 SHGS

8 – 12 Members



Total Numbers

Zilla Samakhyas
13

Mahila Mandal Samakhyas
662

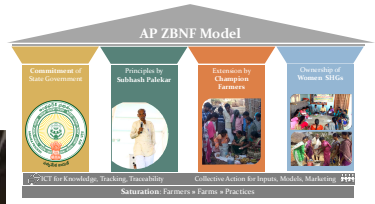
Village Organisations:
27,771

Number of SHGs:
7,37,341

Hundreds of thousands of women leaders, and community professionals (men and women) in various disciplines

Total No of Members
7,514,341

Women in Natural Farming: Our biggest Strength



106,991 women SHGs and their **4,825 Federations** are in charge

- Programme Management
- Collective Action
- Peer Learning
- Farming Plans
- Verification

Knowledge + Technology + Community

*in harmony with **Nature***

Knowledge Transfer

eTracking
- Farms
- Farmers
- Practices, Parameters

eDatabase
- Farmers
- Produce
- Consumers

Traceability

APZBNF Scaling-up Plan

A systemwide transformation

IMPLEMENTATION PLAN – YEAR WISE COVERAGE OF G.P S

Year	GPs	Cumulative GPs
2016-22	691	691
2017-23	267	958
2018-24	1917	2,875
2019-25	2000	4,875
2020-26	3000	7,875
2021-27	5049	12,924
Total	**12924**	(in about 2585 Clusters)

Cost for converting one farmer household over 5 years

#	Heads	Per Farmer Cost (in Rs)	%
1	Capacity building	12700	47%
2	Institution building and funds to farmers' institutions	6550	24%
3	One time Subsidy/Support for access to inputs, tools etc., to Farmers and Farmers' Institutions	1000	4%
4	PGS Certification, Quality Assurance, Tracking and Monitoring	2900	11%
5	Marketing Capacity Building and Marketing Support	1400	5%
6	Support for Science and Restructuring Farming Curriculums	1000	4%
7	Technical Support and Overall Programme Management – district and beyond	1500	6%
	Total	27,050	100%

Benefit Stream for one GP

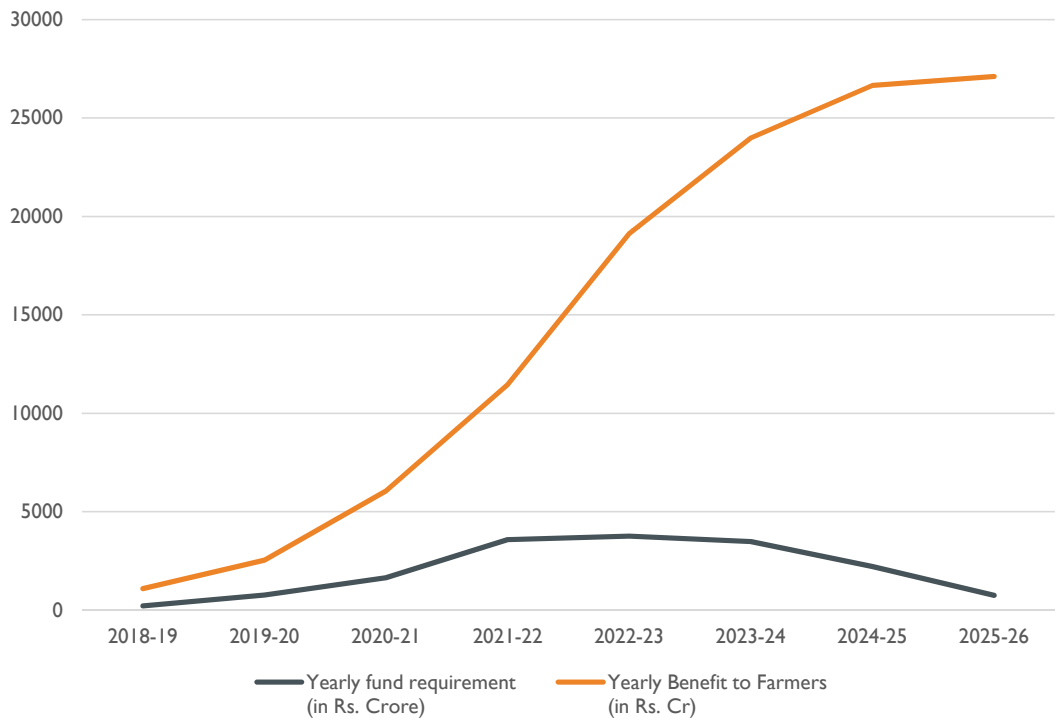
Year	1	2	3	4	5	6 to 12
Farm Families @1 ha	30	90	270	360	400	
Reduced Cost of Cultivation	13,500	14,850	16,200	18,225	20,250	Benefits from year 6 to 12 and thereafter are: 52,451 per year
Interest Savings on Borrowed Funds	1,620	1,782	1,944	2,187	2,430	
Value of Higher Yield	5,000	5,500	6,000	6,500	7,000	
Intercrop Value	12,000	14,400	14,400	15,600	16,800	
Fairer Returns	-	3,000	3,375	3,797	4,271	
Total Benefits per farmer	32,120	39,532	41,919	46,309	50,751	
Benefits for 400 members in GP (in Rs. Lakh)	9.64	35.58	113.18	166.71	203.00	1468.64

BC Ratio (7% discount rate) – for one GP

Year	1	2	3	4	5	6 to 12
Farm Families	30	90	270	360	400	
Benefits for 400 members in GP (Lakh)	9.64	35.58	113.18	166.71	203.00	1468.64
Costs (Lakh)	17.77	21.82	25.08	23.96	11.56	
NPV of Benefits (1295.31 Lakh)	9.64	33.25	98.86	136.09	154.87	1295.31
NPV of Costs (88.45 Lakh)	17.77	20.39	21.91	19.56	8.82	
B:C Ratio	13.64 times					

Funds Required and Economic Benefit Streams to farmers (in Rs. Crore)

Year	Funds/ Budget, Rs. Crore		Economic Benefit to Farmers, Rs. Crore	
	Yearly fund requirement (in Rs. Crore)	Cumulative fund requirement (in Rs. Crore)	Yearly Benefit to Farmers (in Rs. Cr)	Cumulative Benefit to Farmers (in Rs. Cr)
2018-19	216	216	1,102	1,102
2019-20	778	994	2,540	3,642
2020-21	1,648	2,642	6,058	9,700
2021-22	3,581	6,223	11,454	21,153
2022-23	3,769	9,992	19,126	40,280
2023-24	3,488	13,480	23,991	64,271
2024-25	2,218	15,698	26,654	90,925
2025-26	754	16,452	27,115	1,18,040
Total	16.452		118.040	



Annual fertilizer subsidy for A.P is around Rs.5500 cr

Our biggest reward - Happy Farmers

Our biggest reward - Happy Farmers

Our biggest reward - Happy Farmers

Our biggest reward - Happy Farmers

Our biggest reward - Happy Farmers

Our biggest reward - Happy Farmers

Our biggest reward - Happy Farmers, happy farmer families

Thank you