

Supplementary Material for

‘Integrated land systems for sustainable food production and biodiversity conservation in the semi-arid to moist tropics: stakeholder perspectives from Andhra Pradesh, India’



Figure S1. Zero Budget Natural Farming (ZBNF) and other diversified management practices in Andhra Pradesh. **a)** Preparation of ‘Ghanajeevamrutham’ – a core pillar of ZBNF management. It is applied to the soil to enhance the soil’s fertility and nutrient content. **b)** Field-level crop diversification. **c)** Seeds for pre-monsoon dry sowing (i.e. cover cropping as part of ZBNF management). **d)** Patches of native trees and non-woody vegetation in agricultural landscapes.

Table S1. All policy recommendations (in the original articulation during the workshop) and accompanying vote count.

Policy group	Policy/action	Individual policy votes	Votes per group
Financial and infrastructural support	Redirecting subsidies harmful for biodiversity to Payments for Ecosystem Services (PES) schemes, Primary Agricultural Credit Societies, and certification	20	44
	Payment for ecosystem services (farmer friendly, transparent, clear measurement indicators)	13	
	Infrastructure development for biodiversity-friendly farming systems (seeds, water, power, biodiversity infrastructure) via taxes, incentives, subsidies	11	
Risk and insurance	Social security policy (insurance, human-wildlife conflicts, health, risk)	21	42
	Policies in resilience and risk reduction: Creating early warning systems; digital public infrastructure brought to agriculture; insurance and subsidies for loss of crops by all biotic and abiotic causes	21	
Post-harvesting structural support	Policy and technological support to reduce food waste and food loss	13	39
	Marketing and storage: Minimum Support Price for all crops; networking between markets; warehouse and cold storage unit for perishable crops based on Agri Export Zones (AEZ); Physical and financial aid, and infrastructure for value addition	13	
	Food processing for value addition	13	
Buffers and corridors	Creating agroforestry models in fringe areas for creating functional corridors for wildlife to migrate and thrive	10	33
	Non-negotiables: build transition buffers between agriculture and biodiverse habitats (via PES)	23	

Landscape planning	Context-specific policy recommendations; agroecological zone sensitive/specific	16	32
	Biodiversity concerns integrated into Gram Panchayat Development Plans (GPDP) and regional scale	16	
Nature-based Solutions	Design schemes - landscape or ecosystem-based approaches, e.g. natural farming as a Nature-based Solution (NbS)	5	10
	Convergence of policies related to Nature-based Solutions	5	
	Co-creation and research innovation and incubation of these ideas to support sustainable food systems	8	
	Community-driven approaches for indigenous biodiversity conservation and restoration	6	
	Biodiversity-agriculture accountability across scales for equitable governance	4	
	Soil health restoration through bioinoculants	3	
	Natural resource management for sustainable agriculture through technology	3	
	Integrated farming systems as One Health	3	
	Strengthen agricultural extension services with measurable impacts	3	
	Science-Policy-Civil society interface to enhance policy effectiveness and equity	3	
	Elimination of chemicals in agriculture in phase-wise manner	3	
	Incentivise transitions from now to Zero Budget Natural Farming by 2040 - who pays for what?	2	
	Food security policies: strengthen Public Distribution System (POS); crop diversification in	2	

	POS; localised food distribution using Self-Help Groups; strengthen the food distribution to Adivasis (indigenous communities)		
	Skill development for sustainable food production	1	
	Policy and support systems and governance to create evidence and data on sustainable food systems	1	

Table S2. All proposed knowledge-gaps related to food systems (in the original articulation during the workshop) and accompanying vote count.

Knowledge gap	Votes
Evidence for efficacy of nature-based farming to meet production needs	8
Evidence for scaling up of sustainable practices are weak	8
Loss of knowledge about processing traditional foods	6
Traceability of sustainable food sources	6
No data on the pesticide content of different foods	6
Chemical input-effect of residual toxicity on human wellbeing	5
Gap between field/lab developed projects vs farm performance	5
Socio-economic barriers to implementing natural farming methods	3
Ecosystem services provided by unrecognised local species are unknown	3
Loss of consumer knowledge about regionally appropriate diets	2
Best practices, what to use, how to use, when to use (farmers)	2
Standards for natural farming	1
Awareness on sustainable food systems (consumers)	1
Competitive alternative biological/natural agricultural inputs (research gap)	1
Combine real-time climate data with agricultural data	0
Standardisation/standard operating procedures for alternative input	0
Valuation of ecosystem services/models to PES	0

Tracking nutritional quality of food sources	0
How to alter power asymmetries	0
Integration among trees, crops, livestock (their share) unclear for many contexts	0

Table S3. All proposed knowledge-gaps related to biodiversity (in the original articulation during the workshop) and accompanying vote count.

Knowledge gap	Votes	Votes per group
Long-term and large-scale datasets are absent	11	20
No data on the population trends of species (and limited access to the data in grey literature; and taxa bias - more data on birds and mammals than insects)	9	
We need to identify trade-offs between biodiversity conservation and food production	7	7
Lack of knowledge on which interventions are effective (at reducing human-wildlife conflict, including natural pest control and avoiding crop raiding/damage)	6	6
Leveraging existing data by making it more accessible	5	5
No information on the impacts of climate change	4	4
Loss of knowledge and demand for consuming wild species	3	3
Shifting baseline syndrome	2	2
No information on the impacts of invasive animals	2	2
No exhaustive data on soil microbial communities	2	2
No study on assessing baseline biodiversity across all taxa and biome types	1	1
Identify priority (species and spatial) for conservation	1	1
No info on biodiversity in protected areas vs production landscapes	0	0