



LANSA
Leveraging Agriculture for
Nutrition in South Asia

Farming Systems for Nutrition

**Brief Presentation to the members
of Technology Platform**

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Prasun Kumar Das, Ph.D
Research Director, LANSA
M S Swaminathan Research Foundation



LANSA Research Programme

How can agriculture and agri-food systems contribute to improved nutrition in the region?

Focus countries

- 🔥 Afghanistan
- 🔥 Bangladesh
- 🔥 India
- 🔥 Pakistan



Partners and donor



- ❖ MS Swaminathan Research Foundation (Lead Institution)
- ❖ BRAC, Bangladesh
- ❖ Collective for Social Science Research, Pakistan
- ❖ Institute of Development Studies, UK
- ❖ International Food Policy Research Institute, USA
- ❖ Leverhulme Centre for Integrative Research on Agriculture and Health UK

❖ Programme funded by UK government



Three research and crosscutting themes

- ❖ Enabling Environments to link Agriculture & Nutrition
- ❖ Agri-food Policies & Value Chains – Impact on nutrition
- ❖ Nutrition Sensitive Agriculture Intervention
 - ❖ Gender
 - ❖ Fragility
 - ❖ Innovation systems



Farming System for Nutrition -A pro-nutrition agriculture intervention

FSN intervention consists of a design that integrates nutritious crops (both natural and bio-fortified), livestock, poultry, fisheries and forestry, tailor made to address the nutrition needs of rural families



FSN: Prof. Swaminathan

□ *In some “hunger hot spots” of the world where agriculture is the backbone of survival, as in sub-Saharan Africa and South Asia, mainstreaming nutrition in agriculture programs is the most effective and low-cost method of eliminating malnutrition.*

□ *This requires greater attention to the net income of smallholder farmers, whose women food producers have particular needs that require specific policies and support. As an example, the MSSRF in Chennai, India, has designed a Farming System for Nutrition initiative, comprising specific steps.*

□ *This include carrying out a nutritional survey of the area and identifying the major causes of chronic and hidden hunger, and redesigning the farming system so that specific agricultural remedies are introduced for each nutritional malady, such as the cultivation of biofortified crops and crop-livestock integration.*



Goal: Every Farm a Nutri Farm

Output:

- Acceptance and adoption of nutrition-sensitive agriculture through FSN
- Yield and income enhancement
- Better intake of nutritious food and improvement in nutritional status

Outcome:

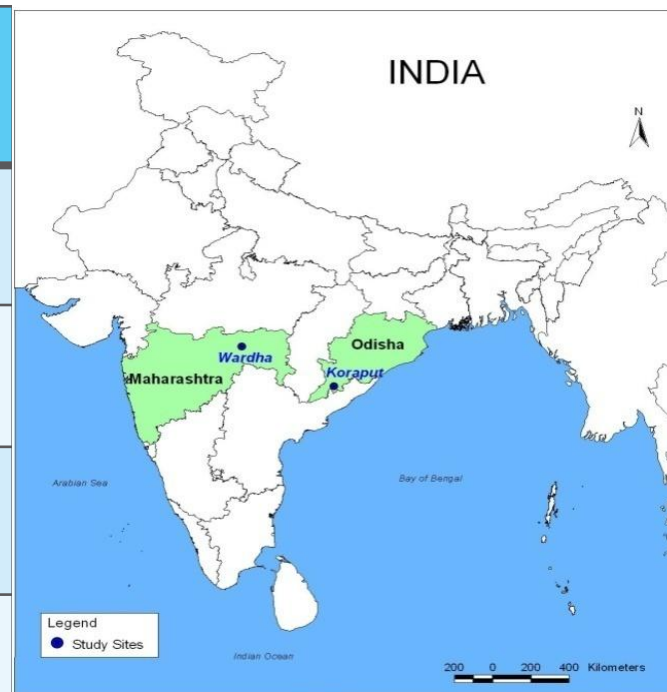
- Behaviour change to ameliorate nutritional maladies with agricultural remedies
- Model for FSN advocacy
- Uptake - harmonising nutrition-sensitive multi-sectoral policies of the Government at all levels



FSN Intervention Sites

Being implemented in villages in Koraput, Odisha & Wardha, Maharashtra

Parameters	Wardha	Koraput
Weight-for-age	52.5%	43.5%
Anemia (Children)	76.7%	49.4%
Anemia (Adolescent Girls)	36.7%	59.5%
Anemia (Pregnant Women)	88.2%	65.3%



Source: DLHS 2 (2002-04)



Steps in FSN Intervention

Step-1

- Primary survey of the treatment and control villages to understand the existing agricultural systems and socio-economic condition. Identification of key informants and village institutions.

Step-2

- Constitute Technology Platform for interaction with Academics, Research Institutions, KVKs, and Stakeholders platform with government line department, local self government, farmers, women representatives and NGOs.

Step-3

- Frontline demonstration in Farmers plot on cropping, livestock and horticultural systems to showcase the scientific and technological advancement in farming.

Step-4

- Identify the nutritional disorders / deficiencies prevailing in the area (both protein-energy malnutrition and hidden hunger) through range of surveys. Collection of household level anthropometric and gender disaggregated information

Step-5

- Focus group discussions to understand nutrition sensitivity among the population in control group, gender role in decision making and access to resources.

Step-6

- Based on the agro-ecological and socio-economic conditions, design farming systems which can provide agricultural remedies to the prevailing nutritional maladies.

Step-7

- Develop in association with the farming families a Nutrition-Smart Farming System. Major components of such a Farming System will be the following. Crop-livestock-integration – large and small ruminants, poultry, trees, fish etc.

Step-8

- Content development for dissemination of improved agriculture practices; exposure trips and training programmes

Step-9

- Content development for nutrition education/literacy for all levels to improve awareness on dietary diversity, storage & cooking practices, health and hygiene etc.

Step-10

- Integrate the existing government program and entitlements with the intervention to achieve greater impact.

Strategies of FSN Intervention

Locations		Wardha District of Maharashtra	Koraput District of Odisha
Farm Sector intervention	Cropping System	<ol style="list-style-type: none"> Improved crop & cropping system + technology Re-Introduction of iron rich pearl millet & sorghum <p>Intervention will address sustainable crop intensification , income enhancement & Iron deficiency at household</p> <p>Introduction of scientific cropping system and agronomic best practices will be a common intervention across the categories of farmers through soil health testing, FLDs, FFS, other extension materials e.g. IEC materials etc.</p>	<ol style="list-style-type: none"> Improved cultivation practices+ technology Introduction of beta-carotene rich sweet potato <p>Intervention will address sustainable crop intensification , income enhancement & Vit A deficiency at household</p>
	Livestock System	<ol style="list-style-type: none"> Backyard Goat/Sheep and Poultry farming Silvipastoral development for fodder supplement <p>The intervention will address the animal protein & milk requirement of at household level</p> <p>Breed improvement and access to veterinary services (e.g. De-worming, Vaccination, Artificial Insemination etc.) made available to the livestock growers and ensure availability of fodder in the villages by fodder cultivation and silage making etc.</p>	<ol style="list-style-type: none"> Backyard Goat/Sheep/Pig, Poultry and Fish farming Silvipastoral development for fodder supplement <p>The intervention will address the animal protein requirement at household level</p>
	Nutri-garden System	<ol style="list-style-type: none"> Vegetables rich in Iron & Pro-Vitamin A Fruits rich in Vitamin C & Pro-Vitamin A <p>The intervention will address Iron & Vitamin-A deficiency at household level</p> <p>Best practices for vegetable & Fruit cultivation will be demonstrated through community Nutri-Garden, FLDs, FFSs, ICT and IEC materials. Ensure availability of quality seeds at a reasonable cost. Linking the growers with the market</p>	<ol style="list-style-type: none"> Vegetables rich in Iron & Pro-Vitamin A Fruits rich in Vitamin C & Pro-Vitamin A <p>The intervention will address Iron & Vitamin-A deficiency at household level</p>
Non-farm intervention	<ol style="list-style-type: none"> Nutrition education campaign designed to address all levels Capacity strengthening of the farm and non-farm families Campaign on water, sanitation and health related issues Facilitation to access to resources (credit, water, common land etc) and entitlements Value chain and market facilitation for farm & non-farm products 		
Cross Cuts	<ol style="list-style-type: none"> Gender: Gender roles and relations in farming system will be documented to streamline intervention design and implementation of nutrition sensitive agriculture Fragility: The two sites were selected based on the levels of socio-economic and agro climatic fragility. Endeavour will be made to document the magnitude Innovation systems: Innovations and it's systems will be documented in all levels of implementation of FSN 		

Demographic Profile of Intervention Villages in Koraput

Boipariguda Block			
Panchayat(s)	Village (s)	Households	Population
Chandrapada	1. Banuaguda	137	519
	2. Bhejaguda	91	421
	3. Atlaguda	80	364
Bodaput	4. Rauligula	28	115
	5. Chikima	64	269
	6. Kurkuti	186	801
	7. Maliguda	90	400
Total		676	2889



Categorization of Farm Families in Study areas

Land Classification Particulars	Koraput				
	No land	<2 acre	2-10 acre	>10 acre	Total
1. Operational Land Holding	223	270	178	5	676
2. Homestead Land	116	206	158	5	485
3. Livestock					
3.1 Cattle	39	81	64	1	185
3.2 Buffaloes	19	23	14	0	56
3.3 Goat	40	76	58	4	178
3.4 Poultry Birds	30	60	55	2	147
3.5 Bullocks	31	77	65	4	177
3.6 Piggery	7	23	10	0	40
3.7 Duckery	0	2	9	0	11



Major Crops Grown in Study Villages

Koraput		
Major Crops	Net Sown Area (Acre)	Share (%)
Kharif season		
Rice	779.75	72.48
Finger Millet	88.70	8.25
Vegetables	85.12	7.91
Maize	63.30	5.88
Black gram	35.16	3.27
Little millet	8.56	0.80
Others	15.26	1.42
Rabi Season		
Green Gram	107.89	10.03
Groundnut	113.34	10.54
Vegetables	194.37	18.07



Consumption Pattern

Items consumed	Koraput			
	Avg Qty Consumed per HH*	Sources (%)		
		Home grown	Market	PDS
Rice	13.40	31.52	34.94	33.54
Wheat	0.01	0	100.00	0
Sugar	0.45	0	96.00	4.00
Salt	0.37	0	97.40	2.59
Coarse Cereals	2.40	10.33	89.67	
Pulses	0.91	2.78	97.22	
Green Leafy Veg	0.78	12.48	87.52	
Roots & Tubers	3.99	6.17	93.83	
Other Veg	2.87	8.53	91.47	
Milk & Milk products	0.13	15.09	84.91	
Animal products	2.88	0.84	99.16	

* Based on weekly recall in Kg & Liter as applicable



Measurement Indicators of FSN

<i>Output Indicators</i>	<i>Outcome Indicators</i>	<i>Impact Indicators</i>
1. Farm Indicators		
Access to resources by women and men farmers	Change in Income and time use pattern	Resources allocation & empowerment
Adoption of new techniques/technology by women & men farmers	Reduction in drudgery; Change in time use pattern	Changes in lifestyle
2. Non-farm Indicators		
Penetration of nutrition literacy among women and men	Informed decision making	Health & nutrition status; Behavioural change
Access to WASH among women & men	Change in morbidity and time use pattern	
No. of gender sensitive IEC materials (e.g. IYCF)	KAP (Knowledge Attitude Practice)	
3. Nutrition Indicators		
Food intake pattern of women and men a) Calorie b) Protein c) Micronutrient	Change in nutritional status of women and men: a) Anthropometry indices, b) Anemia status, c) Vit A status d) Seasonal variation	Dietary Diversification; Nutritional adequacy
4. Capacity Building Indicators		
No. of men and women farmers trained in FSN	KAP	Behavioural Change
5. Research Uptake Indicators		
Evidence dissemination	Gender sensitization of Stakeholders and Policy elite	Policy Change



On-Farm Demonstrations undertaken - Trial on Urea Deep Placement in Rice

Sl. No.	Land Category	Variety	Methods	Area (acre)
1	Upland	<i>Jyotirmayee</i> (90-100 days)	Modified method (Direct sowing through two row seeder)	0.5
2			Application of Urea Super Granules (Direct sowing through two row seeder)	0.5
3	Medium Land	<i>Hiranmayee</i> (120-130 days)	Modified method (Direct sowing through drum seeder)	0.5
4			Application of Urea Super Granules (Direct sowing through two row seeder)	0.5
5	Low Land	<i>Hiranmayee</i> (120-130 days)	Modified method (Line transplanting)	0.5
6			Application of Urea Super Granules (Line transplanting)	0.5



On-Farm Demonstrations - Trial on Urea Deep Placement in Rice



On-Farm Demonstrations - Trial on Mixed Cropping

Sl.	Crop	Variety	Spacing	Area
Trial 1. FM+BG+PS (60:25:15), Trial 2. FM+BG+PS (60:25:15)				1 acre
1	Finger Millet	GPU-67	20cm X 10cm	0.3 acre
	Finger Millet	GPU-45		0.3 acre
2	Black gram	Nirmal No.7	30cm X 15cm	0.25 acre
3	Pop Sorghum	Traditional	50cm X 20cm	0.15 acre
Trial 3. Rice+Maize+PP (40:40:20)				0.35 acre
4	Rice	Jyotirmayee	15cm X 10cm	0.14 acre
5	Maize	HQPM-1	60cm X 25cm	0.14 acre
6	Pigeon pea	Durga 30	45cm X 20cm	0.07acre
Trial 4. Rice + Maize + BG (40:40:20)				0.35 acre
7	Rice	Jyotirmayee	15cm X 10cm	0.14 acre
8	Maize	Pusa Composite-4	60cm X 25cm	0.14 acre
9	Black gram	Nirmal No.7	30cm X 15cm	0.07acre



On-Farm Demonstrations - Trial on Sweet Potato

Sl. No.	Variety	Type	Methods	Area
1	ST-14	(Orange flesh)	Modified method with line transplanting (Spacing: 60 cm X 20 cm)	0.20 acre
2	Kamala Sundari	(Orange flesh)		
3	CIP-440127	(Orange flesh)		
4	Kishan	Normal		



On-Farm Demonstrations – Nutri Garden

- ❑ Establishment of 2 community nutrition garden in 2 villages managed by the community.
- ❑ The same structure has also been established on MSSRF campus.
- ❑ Fruit bearing plants like: papaya, banana, guava, lemon, custard apple, pomegranate, and other tree species like: drumstick, curry leaf and *Bauhinia purpurea* were planted in the fence as per the space availability.



Fish Farming

- ❑ 3 Ponds in three villages treated with lime and raw cow dung.
- ❑ Fingerlings of *catla*, *rohu* and *grass carp* (totaling 6000 in number) were released in these ponds
- ❑ Locally suited recommended practices employed

Backyard Poultry

- ❑ 15 households in 7 villages identified by the respective village committee to take up the activity.
- ❑ Collaboration with Special Poultry Breeding Farm, Semilguda to provide the chicks.
- ❑ Each household provided with 10 poultry chicks in November.



Proposed On-Farm Demonstrations: Rabi Season

Sl.	Activity	Variety & Trial	
1	Rice trial	Khandagiri	Modified practice with line transplanting
			Modified practice with line transplanting and application of Urea Super Granules (USG)
2	Mix cropping	Trial 1	Finger millet (GPU-45)+ Black gram (NUL-7)
		Trial 2	Finger millet (GPU-67)+ Green gram (NVL-1)
3	Pulses trial	Trial 1	Black gram (NUL-7)
		Trial 2	Green gram (NVL-1)
		Trial 3	Horse gram (Local)
		Trial 4	Pea
4	Pulses	Over lapping	Horse gram (Local)
			Pea
5	Sweet potato	4 varieties	Line transplanting
6	Potato		

Forthcoming Surveys from Jan, 2014



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- Household survey to collect information on water access, sanitation, socio-eco aspects
- Baseline survey on household consumption pattern (every quarter to understand seasonal variation)
- Baseline survey on employment status and migration
- Baseline survey on Agriculture, Animal Husbandry and Home garden details
- Baseline input, cost and income survey
- Baseline survey on Health & Nutrition assessment
- 24 hour recall-Diet survey
- Midterm survey to evaluate progress
- End line surveys to assess impact of the project



Areas of Support Required

- Policy support for nutrition-sensitive agriculture and promotion of dietary diversity among rural population
- Conservation and promotion of naturally fortified crops
- Incentives for adoption of micronutrient dense biofortified crops
- Policies to strengthen food supply chain & reduce losses and wastages
- Agro-biodiversity conservation for sustainable development
- Nutrition literacy movement for improved food safety and consumption practices
- 'Agriculture for Nutrition' on the agenda of agriculture university and research systems



Guidance/Suggestions requested from the Technology Platform

- Interventions
- Support
- Effectively address gender, social inclusion
- Impact measurement Indicators



Thank you



Further details are available in our websites:
www.mssrf.org and www.lansasouthasia.org