

FARMING SYSTEM FOR NUTRITION

Farming is the primary source of livelihood for the majority of the population in India and South Asia. The region is also home to a large population of undernourished people.

A feasibility study to demonstrate a **Farming System for Nutrition (FSN)** approach to address the problem of undernutrition was undertaken by the M. S. Swaminathan Research Foundation under the research consortium programme on ‘Leveraging Agriculture for Nutrition in South Asia’ - LANSAs (www.lansasouthasia.org). The core research question underlying the study was: **How strong is the evidence that agricultural interventions can be pro-nutrition?**

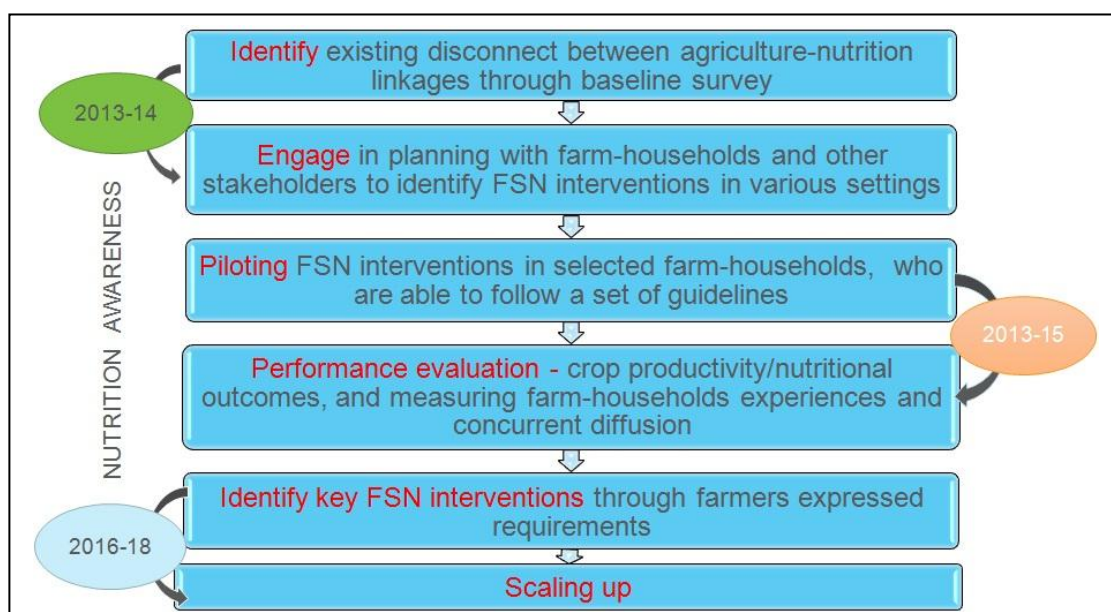
FSN as defined by Professor M S Swaminathan, envisages the introduction of location-specific agricultural remedies for nutritional maladies by mainstreaming nutritional criteria in the selection of farming system components involving crops, animals and wherever feasible fish (Das et al 2014; Nagarajan et al 2014). It is an interventional approach that includes a combination of sustainable measures including advanced crop production practices, bio-fortification, promotion of nutrition gardens of fruits and vegetables, livestock and poultry development, and setting up of small-scale fisheries, combined with nutrition awareness, as stimulant for rendering consistent output of higher income and better nutrition. The objective is to address malnutrition in all its forms, viz. calorie deprivation, protein deficiency and hidden hunger or micronutrient deficiencies.

Study Locations

The study was undertaken in a core set of seven villages (658 households with population of 2,845) in Koraput district of Odisha and five villages (556 households with population of 2,254) in Wardha district in the Vidarbha region of Maharashtra (see map). Although agro-ecologically the two study intervention locations are different, both of them are characterized by rain-fed farming and high burden of malnutrition. The starting point was a detailed baseline survey of households; Fig 1 traces the steps in the study.



Fig 1: Steps under FSN Approach



The survey revealed that at both the locations, more than 40 per cent of children under age five were underweight (low weight for age), 35 per cent stunted (low height for age) and 27 per cent wasted (low weight for height); about 33 per cent suffered from vitamin A deficiency. 39 per cent adult men and 47 per cent women were undernourished; High levels of anaemia (>60%) prevailed among children under five, adolescent girls and women (18-45 years). The diet of people was cereal dominated with consumption of all other food groups being less than the recommended levels. Based on the resource base and nutrition status, the FSN interventions were designed in discussion with the community (Bhaskar et al. 2017). Fig2 shows the FSN design that evolved

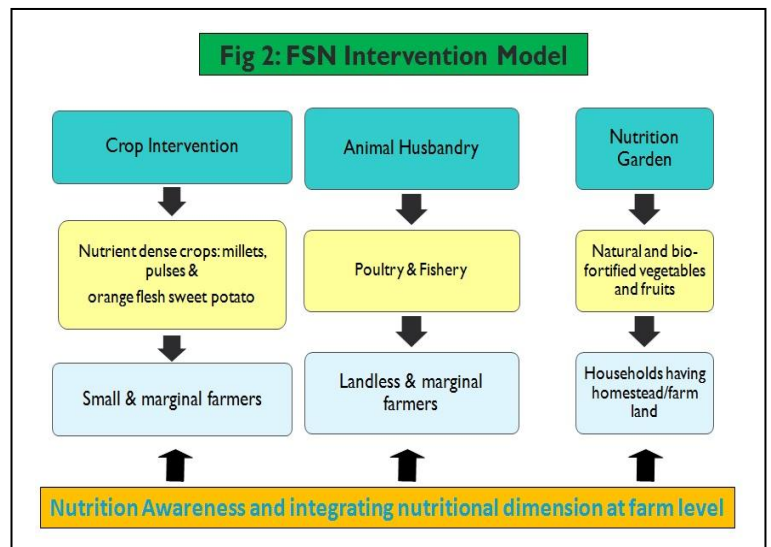


Table 1: Details of crop based FSN interventions (2015-16)

Component	Area (ha)	Improved variety	Yield (kg ha ⁻¹)	±Additional nutrient harvested (kg ha ⁻¹)	Total expenditure (Rs. ha ⁻¹)	Gross return (Rs. ha ⁻¹)	Net return (Rs. ha ⁻¹)	B: C ratio
Koraput								
<i>Pre summer</i>								
Green gram	5	SML-668	486	15	12,587	27,360	14,773	2.17
Black gram	3	TK94-2	351	12	11,500	24,570	13,070	2.14
<i>Kharif</i>								
Finger millet	4.4	GPU-67	2067	35	20,800	34,110	13,310	1.64
Maize + Pigeon pea	4.4	NHM-51(maize) NTL-724 (pigeon pea)	7729	3669	27,600	77,303	49,703	2.80
Wardha								
<i>Kharif</i>								
Sorghum	16.4	CSV-20	330	34	17,655	6600*	-	0.37
Red gram	8.8	NTL-900	1533	16	25,070	1,22,600	97,530	4.89
<i>Rabi</i>								
Wheat	35	AKAW-4210	1560	28	22,980	28,080	5,100	1.22
Chick pea	8	Jackie-9218	898	20	23,123	49,363	26,240	2.13
Onion	2	Bhima super	6320	55	21,500	94,800	73,300	4.41

± additional nutrients harvested (mainly in terms of protein) indicates the additional amount farmers will get from cultivation of improved varieties as compared to the traditional varieties
 *crop loss due to dry spell during germination phase

Crop Husbandry:

The crop based interventions under the study focused on promotion of nutrient dense crops like millets (sorghum in Wardha and finger millet in Koraput) and pulses; crop diversification through varietal substitution and crop intensification for small and marginal landholders. Varietal substitution through introduction of nutrient dense improved varieties of predominant crops was undertaken with improved package of practices in order to increase the production and productivity, thereby increasing nutrient availability per farm household (Table 1). Likewise, crop intensification through intercropping systems such as maize and pigeon pea, aimed at increasing land use efficiency and generating higher monetary income.



Finger millet crop, Koraput



Farmer with sorghum harvest, Wardha



Household and School Nutrition Gardens

Nutrition Garden:

The basic principle of nutrition garden intervention was to create awareness about importance of consuming fruits and vegetables and ensuring their availability. Seed kits consisting of different leafy, fruit and root vegetables based on a seasonal calendar along with planting materials of tubers and fruit bearing plants were distributed at household level. Some households with limited backyard land grew the vegetables on their farm land. Among tuber crops, *Orange Flesh Sweet Potato* was specially promoted to help address vitamin A deficiency. School and community nutrition garden (CNG) models were also demonstrated. Produce from school nutrition gardens in the villages goes into the midday meal prepared for the school children; CNGs are managed by groups of landless women who share the produce.

Animal Husbandry:

Regular animal health camps to improve health and productivity of livestock and fodder for livestock were an important component of the approach. Poultry farming was introduced for landless and marginal farmer households to provide livelihood support and enhance nutrition intake in Wardha; in Koraput, household and community based fish farming was promoted based on availability of farm ponds.



Farmer with fish harvest, Koraput



Poultry Farmer, Wardha

Nutrition Awareness:

Underlying the entire approach was creating awareness in the community on leveraging their main source of livelihood, i.e. agriculture, to improve their nutrition status along with attention to aspects of WASH and health of women and children in particular. This was a continuous effort undertaken at individual, household and institutional levels. A participatory research endeavored to build capacity of selected members of the community to be champions at the village level, to ensure sustainability. Guidance and support was leveraged from agriculture and veterinary research institutes/universities in the region.



Recipe demonstration at Wardha



Residential training workshop for Community Resource Persons

Impact of FSN Approach:

The year 2017 saw the upscaling of core FSN interventions both within the initial set of villages and across neighbouring villages in both study locations, with only technical guidance and no input support. Endline survey was conducted in late 2017 to assess the impact.

The emerging evidence indicates feasibility of the FSN approach. With the introduction of improved varieties and crops in the existing cropping systems, and improved agronomic practices and nutrition gardens, the cropping intensity and food production at the farm level had increased at the field level in both the study areas. The introduction of short duration crops and improved varieties also helped to diversify the household food production basket covering cereals, pulses and vegetables. The increased food grain availability and diversity at farm level has led to improved household dietary diversity as evidenced in increased number of food groups in the diet, consumption of all three groups of vegetables, animal foods, increased frequency of consumption and increased average intake of the food consumed. Farm men and women from the core villages have emerged as spokespersons and the number of villages with farmers practising the FSN approach has increased from 5 to 20 villages in Wardha and 7 to 25 villages in Koraput.

References

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June 2018

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This study is part of research under the LANSAs Research Programme Consortium and was funded by UK Aid from the UK Government. The views expressed do not necessarily reflect the UK government's official policies.