Endline Survey Report of Farming System for Nutrition Study

(Undertaken as part of Leveraging Agriculture for Nutrition in South Asia)

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About the Report

This report is a documentation of endline survey results of the Farming System for Nutrition (FSN) study under LANSA in Wardha, Maharashtra and Koraput, Odisha in 2017-18.

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1. Introduction

Nutrition-sensitive agriculture is a food-based approach that seeks to ensure availability of nutritionally rich foods and dietary diversity in a sustainable manner as a solution for addressing micronutrient deficiencies and overcoming malnutrition. The overall objective of nutrition-sensitive agriculture according to FAO is to make the global food system better equipped to produce good nutritional outcomes. Family farming, home gardens and homestead food production can make a wider variety of crops available at the local level. Nutrition-sensitive agricultural approach can be implemented by increasing agricultural production to make more food available and affordable and improve both the health and economic status of the community (FAO, 2014).

A large section of the population in developing countries, depend on agriculture for their livelihood. For instance, agriculture is the main source of food, employment and income for 58 percent of rural households in India. Food and nutrition security at household level is unlikely to be achieved without considerable attention to the food and agriculture sector. Ruel et al., (2018) reviewed the evidence from researches on nutrition–sensitive agriculture and reported that agricultural development programs that promote production diversity, micronutrient-rich crops (including biofortified crops), dairy, or small animal rearing can improve the production and consumption of targeted commodities, and such improvements lead to increase in dietary diversity at the household level. In the recent past, several studies have focused on leveraging or modifying agriculture to enhance nutrition; however, no conclusive evidence exists on the impact of these interventions on nutritional outcomes (Pandey et al., 2016 and Meeker and Haddad, 2013). The inclusion of a strong behaviour change communication (BCC) intervention to promote optimal diets and empowerment through agriculture, are consistently reported as key to enhancing the potential impacts of agriculture on diets and other nutrition outcomes (Ruel et al 2018).

In 2013, afeasibility study on a Farming System for Nutrition (FSN) approach was initiated to address the problem of undernutrition, under the research programme on Leveraging Agriculture for Nutrition in South Asia (LANSA). FSN is an intervention approach that includes a combination of sustainable measures based on local resource availability, 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 fishery, combined with nutrition awareness, as stimulant for rendering consistent higher output and better nutrition. This report presents the endline esults of the FSN study in two locations

in India, Wardha and Koraput, from 2013-2018.The baseline survey findings of the FSN study have been discussed in Bhaskar et al. (2017) and Nithya et al. (2018). Location specific interventions were planned based on the baseline survey results.

Farming System for Nutrition Intervention

The core strategies of the farming system design to address nutritional concerns in the two locations were:

1. Increase the availability of cereals, millets and pulses for household food requirement by enhancing production at the farm level
2. Widen the on-farm crop diversity to improve household dietary diversity
3. Promote vegetable cultivation through household and community level gardens with naturally bio-fortified fruits and vegetables species and nutri-dense varieties especially green leafy vegetables to address micronutrient malnutrition.

Nutrition awareness was undertaken across the board. Figure 1 gives a schematic representation.

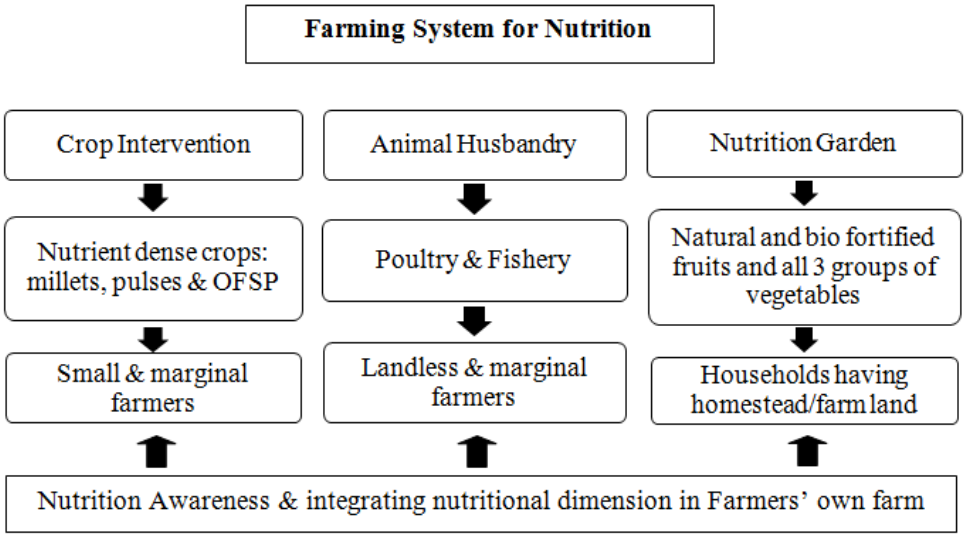

Figure 1: Farming System for Nutrition Model

The protocol of Participatory Varietal Selection (PVS) was adopted to select locally suitable varieties. Men and women farmers were involved in the design, implementation and assessment stages; this process itself served as a sensitization and training phase. Tables 1 and 2 give details of the crop and animal husbandry interventions undertaken at Koraput and Wardha respectively. Table 3 lists the vegetables in nutrition gardens promoted at the two locations. While households in Koraput have the practice of retaining seeds, community seed banks of vegetable and legume seeds were promoted in Wardha for sustainability.

Details on the methods and results of FSN interventions undertaken in Wardha and Koraput have been discussed in Pradhan et al. (2017a) and Pradhan et al. (2017b) respectively.

Table 1: Details of FSN interventions in Koraput

Components of FSN	Details	Cropping system	
		Kharif	***Rabi***
Crop	[c]Low land and medium land	Paddy	[a]Black gram/ green gram
		Paddy/vegetable	[b]Finger millet
	[c]Upland	[a]Maize + [b]Pigeon pea	Fallow
		[a]Finger millet	Fallow
		[b]Orange fleshed sweet potato	
	Homestead land	[b]Household nutrition garden	
Animal husbandry	Landless & marginal farmers	[b]Community Fishery	

[a] indicates interventions where varietal replacement in combination with improved package and practices were followed for improved production; [b] indicates interventions introduced for nutrient rich diversified production.[c] Upland indicates lands of higher elevation where there is no retention of water after 24 hrs of a rainfall; medium land indicates levelled fields and lowland refers to lands at lower elevation where water stagnation is commonly seen after 24 hrs of a rainfall.

Table 2: Details of FSN interventions in Wardha

Components of FSN	Details	Cropping system	
		Kharif	***Rabi***
Crop	Irrigated	Intercropping of cotton or soybean with [a]pigeon pea/[b]green gram/[b]black gram	Fallow
		Sole cropping of [a]pigeon pea or intercropping with [a]sorghum	Fallow
		Sole/mixed cropping of [a]sorghum/ [b]green gram/[b]black gram	[a]Wheat/ [a]bengal gram
	Rainfed	Intercropping of cotton or soybean with [a]pigeon pea/[b]green gram/[b]black gram	Fallow
		Sole cropping of [a]pigeon pea or intercropping with [a]sorghum	Fallow
		Sole/mixed cropping of [a]sorghum/ [b]green gram/[b]black gram	[a]Bengal gram
	Homestead land	[b]Household nutrition garden	
Animal husbandry	Landless/Marginal farmer	[b]Backyard poultry	

[a] indicates interventions where varietal replacement in combination with improved package and practices were followed for improved production; [b] indicates interventions introduced for nutrient rich diversified production.

Table 3:Vegetables that were grown in the Nutrition garden under FSN intervention

Groups	Types
Koraput	
Green leafy vegetables	Amaranthus, Red amaranthus*, Bamboo shoots, Barada Leaves*, Cabbage , Cauliflower leaves, Colocasia leaves, Coriander leaves, Curry leaves, Drumstick leaves, Indian Spinach , Spinach, Pumpkin leaves, Radish leaves, Sunusunia leaves
Other vegetables	Beans , Bitter Gourd, Bottle Gourd, Brinjal, Broad beans, Cauliflower, Cluster bean, Colocasia stem, Cow pea*, Cucumber, Drumstick, Ivy gourd, Jackfruit tender, Ladies finger , Mushroom, Papaya green, Pointed gourd, Plantain green, Pumpkin fruit, Ridge gourd, Spine gourd, Tomato ripe
Roots & tubers	Arrow root, Beetroot*, Carrot*, Colocasia, Onion big, Orange fleshed sweet potato*, Potato, Radish, Sweet potato, Tapioca , elephant yam
Wardha	
Green leafy vegetables	Coriander leaves, Curry leaves, Amaranthus (Chavali), Amaranthus (Rajgira)*, Cabbage, Chakvat, Chivad/Chau, Colocasia Leaves, Drumstick leaves , Fenugreek leaves , Ghol , Gogu, Green sorrel*, Spinach, Indian spinach*
Other vegetables	Cowpea, Cucumber , round gourd, Beans , Bitter gourd , Bottle gourd*, Brinjal, Cauliflower , Drumstick*, Capsicum, Green Chillies, Ivy gourd, Jackfruit raw, Karonda, Ladies finger, Pumpkin, Spine gourd, Tomato
Roots & tubers	Beetroot*, Carrot* , Onion, Radish, Orange fleshed sweet potato*

*introduced newly in the study location

Nutrition awareness was undertaken in two ways:

i) Individual programmes focusing on specific topics for targeted groups like adolescent girls, farmers, school children. Awareness programmes were organized at the village level around important days/events. In Wardha, events were organised around Nutrition Week, World Food Day, Global Hand Wash Day, World Toilet Day, National Vaccination Day, World Health Day and World Immunization Week. In Koraput, lectures on micronutrient deficiency were delivered for different age groups in villages and national vaccination day was observed. Different activities like lectures and demonstrations were undertaken with the help of local resource persons. Other activities like cookery demonstration (recipe on cassava, radish leaves and drumstick), awareness on addressing anaemia and vitamin A deficiency, importance of balanced diet, and awareness on pre and postnatal care were also conducted. Posters, leaflets and flash cards were developed in Marathi and Odia on different aspects. Linkage with district and block level stakeholders like NHM, UNICEF, ICDS, Education and Health Department were established for their support on awareness programme. Drawing competition was conducted for school children around the themes of sanitation, hygiene, micronutrient deficiencies, dietary diversity and balanced diet. The drawings have been used for preparing a nutritional calendar in Marathi and Odia with awareness messages for wider dissemination.

ii) Participatory action education approach to capacitate selected men and women to be 'Community hunger fighters (CHF)' or grassroot nutrition champions. The methodology of this has been discussed in Narayanan et al. (2018).The community hunger fighter programme began by sensitizing the community about their own nutritional status and asking them to identify five men and women from each village to undergo training.Twenty-five community members (13 males and 12 females in the age group of 25 to 48 years) in Koraput and fifteen (seven males and eight females in the age group of 18 to 37 years) in Wardha, were selected and trained through two three-day residential training programmes on basics of nutrition and linking agriculture to nutrition. They were helped to identify ways to improve household nutrient intake and future needs for capacity strengthening, based on which a continuous process of capacity building was undertaken.

2. Methods

The baseline survey covered eight villages having 822 households with a population of 3287 in Wardha and eleven villages having 921 households with a population of 3958 in Koraput. Based on logistic considerations and availability of funds, focused interventions on farming systems to improve dietary diversity were undertaken in a cluster of five villages in Wardha (556 households with a population of 2254) and seven in Koraput (658 households with a population of 2845).

2.1. Sample selection

For endline survey, a sample of around 30% of the study population was selected, i.e. a sample of 190 households was drawn at each sitefor ensuring statistical analysis at 90 per cent confidence level. Among the 190 sample households, 156 households in Koraput and 158 households in Wardha, i.e., 82 to 83% of the selected households had participated in one or more of the FSN interventions, viz. crop, animal husbandry and nutrition garden. Baseline details of the same 190 households were extracted from the baseline survey data, for comparison. Table 4 lists the surveys administered and the period of data collection. Care was taken to ensure that the surveys were conducted during the same months as the baseline. In addition, evaluation was undertaken of the nutrition awareness initiatives and Focus Group Discussions (FGD) were conducted. The set of survey schedules and checklists (evaluation of nutrition awareness and FGD) are given in annexure 2.

Table 4:List of Endline surveys

Sl. No:	Particulars	Purpose	Administered on	Period of collection*
1	Household characteristics	To document the occupation, socio-economic profile of household of the sample population	190 households	Koraput: June - July 2017; Wardha: July - August 2017
2	Agriculture, Animal husbandry and home garden	To capture the impact of FSN intervention	190 households	Koraput: June - July 2017; Wardha: July - August 2017
3	Household food consumptionpattern	To capture change in food consumption after FSN intervention	190 households	Koraput: October 2017 Wardha: September - October 2017
4	24 hour recall	To capture intra-household food consumption pattern after FSN intervention	150 households	Wardha: May-June 2017; Koraput: August – September 2017
5	Nutrition assessment	To see the changes in the nutritional status of members of selected households-anthropometry	190 households	Koraput: June - July 2017; Wardha: July - August 2017
Evaluation of nutrition awareness initiative		Qualitative assessment to evaluate the impact of nutrition awareness programme in the community	Stakeholders at various levels	Koraput: December 2017; Wardha: December 2017, January 2018
Focus group discussion		i. To understand the changes that the community experienced due to their choice of the interventions as also the changes in production, consumption, and nutrition due to the intervention ii. Understand the market side; whether they sell the produce or use it for self-consumption	Separate FGDs for men and women; Group of men and women with 8-12 members each	Wardha: January 2018; Koraput: February 2018

*Surveys were conducted at the same period of baseline surveys

2.2. Data Collected

2.2.1. Socio-economic and demographic profile

Similar to the baseline survey parameters discussed in Nithya et al. (2018) and Bhaskar et al. (2017), data on age, sex, occupation of head of the household, family size, education of head of household, dwelling house type, cooking fuel, toilet facility, land holding size were collected.

2.2.2. Agriculture and home garden

Details on cropping pattern, homestead/backyard garden and livestock owned were collected from the farmer or the head of the household or whoever was the decision making authority on what to cultivate.

2.2.3. Food consumption pattern

1. *Frequency of food consumption*: Food frequency survey was done to understand information on the different foods consumed, their frequency, quantity, value and sourcing pattern. 30 days recall period was done to gather information on the foods consumed in that particular season.

2. *24-hour diet recall*: The intra-household food intake was collected using 24 hours diet recall method. The survey was administered on a sub-sample of 150 households selected randomly from the sample of 190 households in each location, keeping the number for this survey the same as at baseline. The food and nutrient intake was calculated similar to the baseline survey. Household dietary diversity score (HDD) and individual dietary diversity score (IDD) was calculated by simple counting of food groups with the scores ranging from 1 to 7namely cereals and millets, pulses and legumes, vegetables, fruits, animal foods, fats and sugars.

2.2.4. Nutrition status assessment

Height and weight of all members of the selected households were measured. The classification and methodology of analysis are discussed in detail in baseline survey report (Nithya et al. 2018).

2.2.5. Evaluation of nutrition awareness programme

External and internal qualitative evaluation was conducted in 2018 to understand the impact of nutrition awareness and community hunger fighter initiatives in the study locations. Checklist used for internal evaluation is given in annexure 2.

2.2.6. Focus Group Discussion

Focus group discussions (FGD) were conducted in all the study villages for qualitative assessment of changes, if any, particularly with regard to: i) changes that the community experienced due to their choice of the interventions as also the changes in production, consumption, and nutrition due to the intervention, and ii) whether they sell the produce or use

it for self-consumption. Checklist used for FGD is given in annexure 2. Separate FGDs were conducted for men and women participants in each village. There were 8 to 12 participants in the FGDs in Wardha and 12 to 20 participants in Koraput. The detailed methodology is given in Rampal and Wagh (2018) and Rampal and Panda (2018).

2.2.7. Statistics

Descriptive statistics, T test and chi square test were performed accordingly using statistical software like stata and SPSS.

3. Results

3.1. Socio-economic and demographic profile of selected sample

The socio economic and demographic characteristics of the sample of 190 households in Wardha and Koraput are presented in Table 5.

The number of kutcha houses in both the locations had come down and there was increase in semi pucca houses in Wardha (from 53.2 to 78.9%) and in Koraput (from 54.7 to 58.9%). This is likely tobe due to implementation of the government scheme "Pradhan MandriAwasYojana" in both the locations. Considerable change was observed in family size in Koraput with 66 per cent reporting 5-7 members per household as compared to 48 per cent in baseline and 25 per cent reporting 1 to 4 members as compared to 45 per cent in baseline. Households sourcing drinking water from piped water in Wardha increased from 56.3% to 72.1%; in Koraput, the households sourcing piped water decreased from 23.2% to 6.3% and sourcing from dug well, tube well, bore well and hand pump increased. The shift in Koraput was dueto the repair of storage tank in a village, so the households sourced shifted from piped water to other sources. Households using Liquefied Petroleum Gas (LPG) for cooking increased in both locations due to the government scheme "Pradhan Mantri Ujjwala Yojana" under which LPG connections are provided at subsidised rates. The percentage of households having closed toilets also increased in both locations due to a government scheme. An incentive in the form of subsidy is given to rural poor households for construction of toilets under a comprehensive programme called 'Swachh Bharat Mission' launched by the Prime Minister of India on 2 October 2014. However, the percentage of households practising open defecation still remained relatively high in Koraput at 84 per cent.

Landless households and households having less than 1 hectare (ha) operational land in Wardha decreased from 26.3 to 18.9% and 9.5 to 7.4% respectively and there was increase in

households having 1 to 4 ha of land. The changes were relatively less in Koraput. The landless households decreased from 8.4 to 5.8% and there was increase in households having less than 1 ha of land from 57.4 to 61.1%. The reasons were mainly due to cultivation of fallow land and shift in leased in and leased out land.

3.2. Agriculture

Table 6 shows the cultivation and production of the intervention crops, households consuming from home production and quantity consumed.

In Koraput, the percentage of households cultivating finger millet, green gram and black gram increased and the average production also increased when compared with baseline. The percentage of households consuming the finger millet produced and amount consumed per person per day also increased. About 21% of the households were found to be producing pigeon pea, promoted as an intercrop with maize, and 4% of the households consumed pigeon pea from their home production.

In Wardha, introduction of improved variety of pigeon pea resulted in twice the yield compared with baseline. 25% and 19% of sample households were cultivating green gram and black gram respectively following FSN interventions. Sorghum was observed to be produced by more households and the percentage of households consuming from home production increased. The micronutrient-dense improved varieties of wheat were grown by the same households at endline as in baseline but with twice the production that they used to get from local varieties. The percentage of households cultivating bengal gram increased and the average production also increased when compared with baseline.

3.3. Home garden/Nutrition garden[1]

Nutrition garden was promoted as a part of FSN to address the deficiency in intake of micronutrients liken calcium, folic acid, iron, vitamin C and A. The status of home garden before and after intervention is given in Table 7.

In both study areas, the average consumption of fruits, green leafy vegetables, roots & tubers and other vegetables increased in the households that participated in the intervention, when compared with the status before intervention. In Wardha, the mean consumption of fruits, other vegetables and roots and tubers significantly increased and the recommended dietary intake (RDI) of fruits (100 g/CU/day) and other vegetables (200 g/CU/day) was almost met.

[1]Home garden is the traditional practice of growing fruits and vegetables around the house/in backyard area; Nutrition garden was promoted as a part of FSN intervention with more nutri-dense fruits and vegetables.

Table 5: Socio-demographic profile of sample households in Wardha and Koraput

Demographic and socio-economic characteristics	Wardha *N* (%)		Koraput *N* (%)	
	Baseline 2014	Endline 2017	Baseline 2014	Endline 2017
Caste				
OBC	48 (25.3)	48 (25.3)	108 (56.9)	108 (56.8)
Other castes	30 (15.8)	30 (15.8)		
Scheduled tribes	89 (46.8)	89 (46.8)	12 (6.3)	12 (6.3)
Scheduled caste	23 (12.1)	23 (12.1)	70 (36.8)	70 (36.8)
Dwelling types				
Kutcha	78 (41.1)	23 (12.1)	81 (42.6)	71 (37.4)
Pucca	11 (5.8)	17 (8.9)	5 (2.6)	7 (3.7)
Semi-pucca	101 (53.2)	150 (78.9)	104 (54.7)	112 (58.9)
Gender				
Male	457 (50.4)	448 (49.2)	419 (45.8)	467 (45.6)
Female	450 (49.6)	462 (50.8)	495 (54.2)	558 (54.4)
Family size				
1 to 4	89 (46.8)	86 (45.3)	86 (45.3)	47 (24.7)
5 to 7	90 (47.4)	95 (50.0)	92 (48.4)	126 (66.3)
8 & above	11 (5.8)	9 (4.7)	12 (6.3)	17 (8.9)
Age group				
0 – 5 years	99 (10.9)	98 (10.8)	147 (16.1)	191 (18.6)
6 – 11 years	93 (10.3)	73 (8.0)	117 (12.8)	137 (13.4)
12 – 17 years	90 (9.9)	100 (11.0)	108 (11.8)	106 (10.3)
18 – 44 years	388 (42.8)	401 (44.1)	383 (41.9)	425 (41.5)
>=45 years	237 (26.1)	238 (26.2)	159 (17.4)	166 (16.2)
Sources of drinking water				
Dug well	50 (26.3)	38 (20.0)	22 (11.6)	27 (14.2)
Piped water	107 (56.3)	137 (72.1)	44 (23.2)	12 (6.3)
Tube well/borewell/hand pump	33 (17.4)	15 (7.9)	124 (65.3)	151 (79.5)
Cooking fuel				
Fire wood	181 (95.3)	132 (69.5)	190 (100)	170 (89.5)
Gas (LPG)	9 (4.7)	58 (30.5)		20 (10.5)
Toilet type				
Toilets	62 (32.6)	114 (60.0)	1 (0.5)	30 (15.8)
Open defecation	128 (67.4)	76 (40.0)	189 (99.5)	160 (84.2)
Occupation of head of household				
Cultivation	136 (71.6)	136 (71.6)	144 (75.8)	144 (75.8)
Agricultural wage labours	31 (16.3)	31 (16.3)	6 (3.2)	6 (3.2)
Wage/salary labours	12 (6.3)	12 (6.3)	36 (18.9)	36 (18.9)
Not in labour force	11 (5.8)	11 (5.8)	4 (2.1)	4 (2.1)
Education of head of household				
No formal education	26 (13.7)	26 (13.7)	92 (48.4)	92 (48.4)
Primary	133 (70.7)	133 (70.7)	93 (49.0)	93 (49.0)
Secondary	18 (9.5)	18 (9.5)	5 (2.6)	5 (2.6)
Higher Secondary/tertiary	10 (5.3)	10 (5.3)		
Graduate	3 (0.8)	3 (0.8)		
Landholding size				
Landless	50 (26.3)	36 (18.9)	16 (8.4)	11 (5.8)
Marginal (< 1 ha)	18 (9.5)	14 (7.4)	109 (57.4)	116 (61.1)
Small (1 - < 2 ha)	52 (27.4)	62 (32.6)	50 (26.3)	47 (24.7)
Semi-medium (2 - < 4 ha)	49 (25.8)	57 (30.0)	12 (6.3)	13 (6.8)
Medium (> 4 ha)	21 (11.1)	21 (11.1)	3 (1.6)	3 (1.6)

Table 6:Comparison of FSN crop interventions, cultivation and production status between baseline and endline

Crop interventions under FSN	Koraput (N=156)		Wardha (N=158)	
	Baseline 2014	Endline 2017	Baseline 2014	Endline 2017
Millets*				
% of households cultivating	29	50	6	26
Average Production (kg ha^{-1}) ±SD	400±48	2513±28	1000±131	2200±45
% of households consuming from home production	21	39	1	7
Quantity consumed from home production (g/CU/day)	70.37	80.01	266.7	245.4
Red gram (Pigeon pea)				
% of households cultivating		21	65	41
Average Production (kg ha^{-1}) ±SD		953±17	600±74	1268±22
% of households consuming from home production		4	50	35
Quantity consumed from home production (g/CU/day)		58.85	38.67	117.72
Green gram				
% of households cultivating	14	37		25
Average Production (kg ha^{-1}) ±SD	245±82	450±12		505±20
% of households consuming from home production	6	30		8
Quantity consumed from home production (g/CU/day)	49.23	57.72		82.97
Black gram				
% of households cultivating	5	29		19
Average Production (kg ha^{-1}) ±SD	220±64	430±11		658±15
% of households consuming from home production	3	13		4
Quantity consumed from home production (g/CU/day)	39.81	51.79		53.74
Wheat				
% of households cultivating			16	16
Average Production (kg ha^{-1}) ±SD			1500±157	3200±48
% of households consuming from home production			11	11
Quantity consumed from home production (g/CU/day)			234.87	272.54
Bengal gram				
% of households cultivating			11	21
Average Production (kg ha^{-1}) ±SD			658±63	900±12
% of households consuming from home production			4	13
Quantity consumed from home production (g/CU/day)			44.32	120.30

*Finger millet in Koraput and Sorghum in Wardha; CU: Consumption Unit: The energy consumption of an average male doing sedentary work is taken as one unit. One unit of coefficient corresponds to an energy requirement of 2400 kcal/day.

In Koraput, the mean consumption of fruits and vegetables increased significantly and the consumption of fruits, green leafy vegetables (100 g/CU/day) and other vegetable consumed was more than RDI after intervention. In both study areas, number of vegetables and fruits that were grown in nutrition garden increased except for roots & tubers in Koraput. Average consumption of fruits and vegetables sourced from home/nutrition garden before and after FSN intervention is given in Table 8.

The average intake of micronutrients like calcium, iron, vitamin C and folic acid from fruits and vegetables sourced from home garden increased significantly in both locations after nutrition garden intervention; intake of vitamin A also increased significantly in Wardha. Table

9 gives the details. However, although the average consumption of nutrients increased, it was found to be lower than the recommended allowance.

The impact of nutrition garden on dietary diversity in both locations has been discussed in detail in Pradhan et al., (2018).

Table 7: Status of home/nutrition garden before and after intervention

Timeline	FSN	Wardha N=186	Koraput N=188
Baseline (2014)	Yes	32 households were growing few vegetables in their backyard.	120 households were regularly growing vegetables in their backyard
	No	154 households did not grow any vegetables (many households have backyard area but did not grow vegetables; some households don't have backyard area)	68 households don't have backyard area
Endline (2017)	Yes	138 households participated in nutrition garden intervention; sapling and seed kit were provided under the project.	98 households participated in nutrition garden intervention; sapling and seed kit were provided.
	No	48 households did not participate in NG intervention	90 households did not participate in NG intervention (22 households cultivated fruits and vegetables and followed own methods (traditional) and remaining households did not have backyard area).

Table8:Nutrition garden interventions, mean consumption of fruits and vegetables between baseline and endline in Wardha and Koraput

Food group	Baseline (2014)		Endline (2017)	
	N	Mean±SD	N	Mean±SD
			Wardha	
Fruits	31	15.72±24.38	138	91.20**±56.79
Leafy vegetables	32	40.87±21.96	138	59.44±21.73
Other vegetables	32	87.25±54.17	138	190.77*±61.96
Roots and Tubers	32	34.66±12.52	138	55.60**±22.11
			Koraput	
Fruits	119	52.28±40.73	90	138.98**±145.75
Leafy vegetables	120	58.16±38.05	90	117.16**±142.50
Other vegetables	120	116.32±89.49	90	265.92**±245.53
Roots and Tubers	120	94.34±53.61	90	104.76**±69.59

Significance@*p<0.05 and **p<0.01; Note: The number of households in Koraput given at endline was the nutrition garden intervention households and remaining households followed traditional practice; status of home garden is given in table 7.

Table 9:Nutrition garden interventions and mean consumption of nutrients from fruits and vegetables between baseline and endline, Wardha and Koraput

Food group	Baseline (2014)		Endline (2017)	
	N	Mean ±SD	N	Mean ±SD
		Wardha		
Calcium (mg)	32	116.56±65.90	138	222.05**±70.81
Iron (mg)	32	1.70±0.99	138	5.63**±2.45
Vitamin A (µg)	32	243.64±133.10	138	548.79**±207.59
Folic acid (µg)	32	50.13±31.69	138	69.34**±27.15
Vitamin C (mg)	32	67.72±55.28	138	102.33**±30.96
		Koraput		
Calcium (mg)	120	209.77±130.11	90	318.42**±277.05
Iron (mg)	120	2.36±1.47	90	6.59**±5.54
Vitamin A (µg)	120	429.77±279.19	90	493.21±427.02
Folic acid (µg)	120	26.97±16.10	90	59.28**±51.28
Vitamin C (mg)	120	61.60±35.78	90	174.95**±163.86

**Significance@ p<0.01

3.4. Food consumption pattern

3.4.1. Food frequency

The percentage of households consuming pulses and legumes, leafy vegetables and fruits twice or thrice a week increased in Koraput. The daily consumption of other vegetables by households increased while the frequency of consumption of roots & tubers decreased. The frequency of consumption of animal source products like fish once a week by the households increased consumption of meat and poultry once a fortnight also increased. Consolidated frequency of food consumption at baseline and endline and the quantity of food groups consumed in Wardha and Koraput is given in Table 10 and detailed tables of frequency of food consumption for Wardha and Koraput are in annexure 1.

The percentage of both, households consuming pulses and legumes, leafy vegetables and fruits daily and quantity consumed increased. The daily consumption of other vegetables decreased and this could be due to the increased frequency consumption of leafy vegetables. The frequency of consumption of animal source foods, fish - once a week and meat and poultry - twice or thrice a week, and milk daily, increased. The quantity of all the food groups consumed increased when compared to baseline.

Table 10: Frequency of food groups consumed and the average quantity consumed before and after FSN interventions

Food groups	Koraput			Wardha		
	Frequency	% of households		Frequency	% of households	
		Baseline (2014)	Endline (2017)		Baseline (2014)	Endline (2017)
Pulses and legumes	Twice or thrice a week	59	72	Daily	44	62
Leafy vegetables	Twice or thrice a week	17	46	Daily	15	38
Other vegetables	Daily	6	49	Daily	97	91
Roots and tubers	Daily	97	82	Daily	99	99
Fruits	Twice or thrice a week	27	34	Daily	0	15
Fishes and sea foods	Once a week	17	23	Once a week	11	26
Meat and poultry	Fortnight	30	41	Twice/ thrice a week	1	10
Milk and milk products	Daily	8	12	Daily	92	96

3.4.2. 24 hour diet recall

Diet survey based on 24hour recall revealed significant decrease in the consumption of cereals and millets in both the locations when compared with baseline. The quantity of cereals consumed in Koraput however remained more than the recommended level (Table 11).

Table 11: Average intake of food groups by sample households (g/CU/day) during baseline and endline

Food Groups	Wardha		Koraput	
	Baseline 2014 (n:160)	Endline2017 (n:150)	Baseline 2014 (n:150)	Endline2017 (n:150)
	Mean ±SD	**Mean ±SD**	**Mean ±SD**	**Mean±SD**
Cereals & Millets	322.2±92.9	294.7*±106.7	563.9±190.5	509.9**±127.3
Pulses & Legumes	57.5±46.9	55.9±44.5	39.5±27.4	31.6±26.4
Green Leafy Vegetables	11.1±23.0	9.5±20.6	15.8±43.5	25.1±56.1
Roots & Tubers	28.7±22.2	48.7**±39.3	103.2±67.8	136.7**±82.4
Other Vegetables	32.3±35.5	26.9±42.0	67.8±81.2	87.9*±87.4
Fruits	17.1±27.5	34.6**±71.9	2.3±28.1	5.1±39.1
Fish & other Sea Foods	0.0±0.0	3.4*±19.9	7.6±31.3	10.8±27.7
Meat &Poultry	5.2±20.0	8.7±29.6	7.2±21.2	20.1**±47.3
Milk & Milk Products	27.9±38.1	30.4±39.5	4.0±18.4	8.0±27.6
Fats & Edible Oils	24.0±12.4	38.3**±18.6	12.8±9.8	9.8*±11.2
Sugar &Jaggery	34.6±18.9	38.7±19.5	12.5±9.8	15.1*±9.8

Significance**p<0.01,*p<0.05

The average consumption of pulses and legumes, green leafy vegetables and other vegetables decreased, but the frequency of consumption increased, particularly in Wardha. In Koraput, there was an increase in the average consumption of green leafy vegetables, and significant increase in consumption of other vegetables and roots &tubers. It was also observed that there was a slight increase in the consumption of animal sourced foods like, meat, poultry, fish and milk. In terms of nutrients, there was a significant increase in intake of energy, calcium, vitamin A and C in Wardha and non-significant increase in intake of calcium and vitamin C in Koraput (Table 12).

Table 12:Intake of energy and nutrients by households (per CU/day)

Nutrients	Wardha				Koraput			
	Baseline 2014 (n:161)		Endline 2017 (n:150)		Baseline 2014 (n:150)		Endline 2017 (n:150)	
	Median	Mean ±SD	Median	Mean ±SD	Median	Mean ±SD	Median	Mean ±SD
Protein (g)	49.8	51.9±17.0	48.6	51.3±18.3	56.4	58.6±18.6	53.4	56.6±17.2
Total Fat (g)	29.1	32.7±14.1	45.2	49.5**±21.8	16.8	19.0±10.7	13.0	16.1*±12.9
Energy (kcal)	1676.0	1758.0±469.2	1861.3	1880.3*±587.7	2371.0	2463.9±667.1	2189.9	2242.2±533.6
Calcium (mg)	254.1	269.0±92.1	286.2	308.2**±141.5	368.3	435.3±273.3	433.2	476.6±228.3
Iron (mg)	17.2	17.5±6.2	16.9	18.3±8.0	11.6	13.6±14.6	11.4	11.8±3.7
Vitamin A (µg)	58.6	97.4±101.6	66.8	152.3**±211.6	41.2	201.6±386.8	63.9	188.4±302.9
Thiamine (mg)	1.5	1.6±0.6	1.5	1.6±0.8	0.9	1.8±3.4	0.9	1.6±1.8
Riboflavin (mg)	0.8	0.8±0.3	0.7	0.8±0.9	0.6	2.0±5.1	0.7	1.8±2.6
Niacin (mg)	14.6	14.7±4.4	14.5	15.4±6.9	13.4	18.6±21.6	12.7	17.1±11.8
Vitamin C (mg)	19.1	23.9±21.8	22.3	30.7*±25.7	29.1	48.3±60.5	37.0	51.3±37.9
Dietary Total Folate (µg)	167.5	178.8±70.9	153.0	167.0±75.1	91.0	108.1±52.2	81.0	89.4±38.0

Significance @**p<0.01,*p<0.05

3.4.3. Dietary diversity

The endline survey showed that household dietary diversity improved significantly in Koraput and there was very slight improvement in Wardha (Table 13).

3.4.3.1 Household dietary diversity (HDD)

The average HDD score in Koraput significantly increased when compared with baseline, i.e. from 4.9 to 5.5; it remained almost at the same level in Wardha, i.e., increasing from 6.2 to 6.3. It can be seen from table 13 that in Koraput, the percentage of households with HDD of 5 decreased and percentage of households with HDD of 6 increased significantly. Similar trend was observed in Wardha also.

Table 13: Mean Household Dietary Diversity and Distribution of Households (%) based on the HDD scores

HDD	Koraput		Wardha	
	Baseline 2014 (n:150)	Endline 2017 (n:150)	Baseline 2014 (n:160)	Endline 2017 (n:150)
Average HDD	4.95±0.7	5.46**±0.7	6.24±0.8	6.27±0.7
HDD score	% of households			
3	4.00	0	0	0
4	15.40	6.70	0.6	0
5	61.70	46.00	18.1	16.0
6	18.80	42.00**	37.5	41.3
7	0.00	5.30	43.8	42.7

**Significance@p<0.01

3.4.3.2. Individual dietary diversity (IDD)

Similar to the HDD, the average IDD score increased significantly in Koraput, while in Wardha it remained almost the same when compared to baseline (Table 14).

Table 14: Mean Individual Dietary Diversity score

Area	Baseline (2014)		Endline (2017)	
	N	Mean ± SD	N	Mean ± SD
Koraput	669	4.7±0.8	783	5.3**±0.9
Wardha	728	6.0±1.1	681	6.1±0.9

**Significance@ p<0.01

3.5. Nutrition status

Reduction in the prevalence of underweight among 0 to 5 years children and thinness among 5 to 9 years children was observed in Koraput. This was however not seen in Wardha, where underweight among 0-5 years children and thinness among 5-9 years children was seen to have increased. Table 15 gives the details.

Table 15: Prevalence (%) of under-nutrition among children, adolescents and adults

Age group/Gender	Wardha				Koraput			
	Baseline 2014		Endline 2017		Baseline 2014		Endline 2017	
	N	%	N	%	N	%	N	%
Underweight among 0 to 5 yrs	59	39.0	69	63.8	129	54.3	169	45.6
Stunting among 0 to 5 yrs	59	39.5	69	40.8	129	39.5	169	40.8
Wasting among 0 to 5 yrs	59	30.5	69	29.0	129	31.8	169	27.2
Thinness among 5-9 yrs	56	19.6	62	37.1	98	44.9	112	33.0
Thinness among 10-14 yrs	84	50.0	58	31.0*	86	32.6	90	21.1
Thinness among 15-17 yrs	23	47.8	32	28.1	49	24.5	50	20.0
CED among >18 yrs Men	292	37.0	281	28.1*	243	35.4	274	35.4
CED among >18 yrs Women	264	43.6	272	37.9	261	42.1	294	41.8

*Significance @p<0.05; CED: Chronic Energy Deficiency

Significant reduction in the prevalence of thinness among 10 to 14 years children was observed in Wardha when compared to baseline. Improvement in the nutritional status of 15 to 17 years children and adult men and women (>18 years) was also observed in Wardha. In Koraput, the prevalence of thinness among 5-9 years children decreased from 45% to 33%; from 33% to 21% among 10 to 14yearschildren and from 24.5% to 20% among 15 to 17 years children. The prevalence of Chronic Energy Deficiency (CED) (characterised by body mass index <18.5) among adult men and women however remained the same when compared with baseline. This could be because the endline survey was done during the planting season, which is a busy agricultural period.

3.6. Nutrition awareness

The internal evaluation of the nutrition awareness initiatives revealed attitudinal and behaviour changes initiated by the CHFs on their own to move towards nutrition security, with respect to consuming a balanced meal, spacing of meals, number of times a meal was

consumed, sources of food that people accessed, setting up a nutri-garden to joining a community seed bank (Narayanan et al, 2018).

The external evaluation reported a 'moderate' effect of the CHF intervention in the community in Koraput, facilitated by the various factors; and a large pool of CHFs joined the capacity building exercise with a genuine interest to learn about nutrition and its connect with agriculture and 'seeing' their own empowerment in the process. A 'mild effect' was observed in Wardha district due to factors like insufficient internalisation of the concept, and the CHFs belonging to a younger age group[2].

3.7. Focus group discussion

In Wardha, the participants reported that after FSN intervention, their expenses on purchasing vegetables from market and the transportation cost to the market had come down as they were now growing vegetables in field and nutrition gardens had also increased the availability of vegetables. They were having more diversified food consumption pattern. Seeds were now available through seed banks and this helped in increased availability of good quality seeds. Participants who had taken the poultry intervention said that they consumed eggs and sold the excess eggs for Rs.10 each within the village itself. The participants reported that the villagers were happy with the programme and that they also shared information about the FSN approach with relatives and friends in other villages. The calendar with nutrition messages that was distributed under nutrition awareness programme was felt useful to see messages in pictorial form. Few women reported that their children had shared information about the drawings and messages in the calendar and that they shared the awareness messages that they learnt at school. Participants said that they had interacted with Community Hunger Fighters (CHF) and that the CHF sometimes even spoke to them informally while walking, telling them about the importance of nutritious food.

In Koraput, the FGD revealed that production especially of rice and finger millet had increased over the last 4 years. Line sowing and mixed cropping practices which were promoted as a part of FSN interventions had helped to increase productivity. Production of pulses such as black gram, green gram, horse gram and pigeon pea as well as fruits and vegetables had also increased compared to before. They were growing more drumstick, papaya, onion, brinjal and cauliflower in the home gardens and market dependence had reduced. They usually ate what they grew and sold only surplus produce. The consumption pattern had

[2] http://59.160.153.187/sites/default/files/CHF%20External%20Evaluation%20report.pdf

improved in terms of frequency of consumption, i.e. while earlier they used to consume 2 meals a day and it had increased to 3 times a day. They were also consuming a more diversified diet with 2-3 food items included in their meals. Triple layered bag promoted under the FSN programme was used for safe storage. Earlier they had to buy vegetables from the market and women used to eat less if there was less availability. Now, since it is home grown, they ate as much as they liked. The participants responded that FSN interventions had increased their knowledge of agriculture and agricultural practices. They had not just told other people and relatives in other villages about the programme, but also shared their better quality seeds with them. They were telling other people about the training and knowledge that they had got from the programme. They would continue growing and eating nutritious crops in the future. The nutrition awareness programmes had made them aware that good nutrition and good health is linked to good food and that eating well makes them healthy. The children also shared messages of nutrition with their parents and relatives. Community Hunger Fighters (CHF) trained through the programme in their villages had told them about the importance of a balanced diet, nutri-rich foods and incorporating fruits and green leafy vegetables in the diet.

4. Discussion and Conclusion

This report has presented the results of the feasibility study on "Farming Systems for Nutrition", conducted in two agro-ecologically different locations. The results following three years of intervention show that introducing nutrition sensitive agriculture interventions along with nutrition awareness resulted in improved household dietary diversity. Studies (Chakravarty, 2000; Ruel, 2001) have shown that household dietary diversity is an intermediary outcome before improvement in nutrition status.

The farming system for nutrition approach was designed as per the agro-ecological system of the specific location and was based on the nutritional status and food consumption pattern of the population. Both the locations revealed high prevalence of protein calorie malnutrition and micronutrient deficiency at baseline. The food consumption pattern was largely cereal dominated. Nutrition dimension of the crop interventions were addressed through two approaches - enhancing productivity and production of nutrient dense crops through varietal substitution, and diversification through crop intensification.

Starting with a small number of farm households and providing both input and technical knowledge support for on-farm demonstrations in 2013-14, farmers were facilitated with only technical knowledge in 2017-18 and there was evidence of uptake within the core study villages

(Fig 2). The linkage between agriculture and nutrition and objective of the FSN study had been explained to them at village meetings, training programs, technical sessions, plant health clinics, animal health camps, programmes on value addition, focus group discussions, on-farm demonstrations, farmer's field day and through exposure visits. The uptake of FSN interventions had also expanded in 2017 beyond the core group of villages to 25 more villages in Wardha and 18 more villages in Koraput, reaching out to more households. Farm men and women had emerged as spokespersons of the FSN approach within the community and at different stakeholder forums.

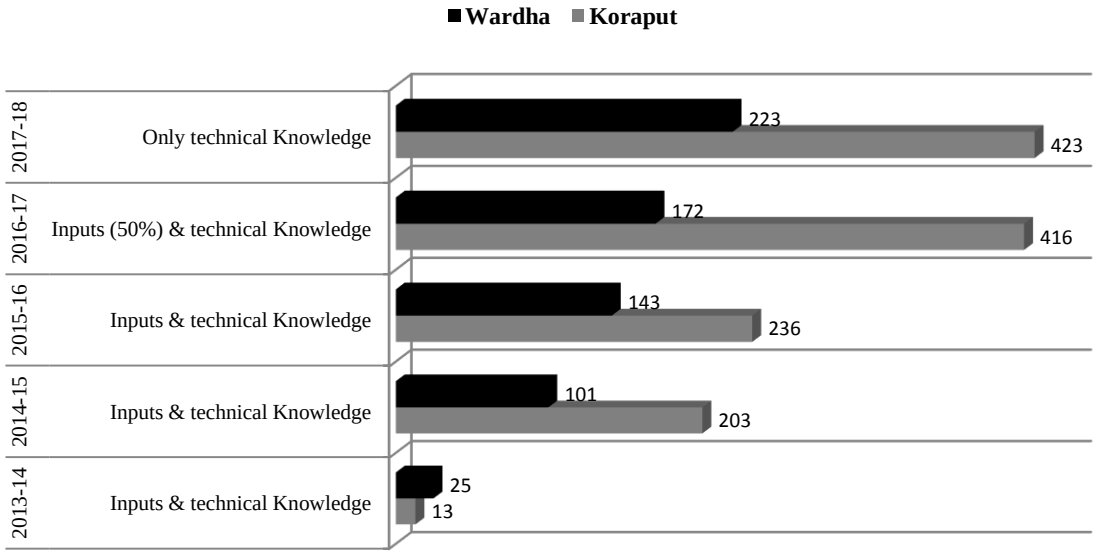

Figure 2: No. of farmers participating in FSN Interventions (Total households Koraput=658, Wardha=556)

The household nutrition garden interventions of natural and bio-fortified fruits and vegetable species were designed in discussion with the community. Backyard poultry in Wardha and fishery in Koraput were introduced as supporting animal food interventions. Nutrition awareness on importance of consuming vegetables to address micronutrient deficiencies and balanced diet, accompanied with awareness on water, sanitation and hygiene (WASH) practices and attention to the health of women and children in particular, was an integral component of the study. The endline survey in 2017 showed that the production of intervention crops increased and the awareness on retaining the produce first for self-consumption and sell only surplus if available, was reflected in improved household consumption of intervened crops. Nutrition garden intervention at various levels increased the consumption of fruits and vegetables as they were easily available and accessible. Poultry and fishery can help address protein inadequacy in the diet and also contribute to additional income.

Comparison of food consumption pattern and dietary diversity between the same set of households at the baseline and endline of the study reveals the impact of the FSN study in the area. The acceptance and adoption of the FSN approach in neighbouring villages is evidence of the feasibility and sustainability of the approach. The CHF approach created learning spaces for the community and build a community resource network for integrating learner centred nutrition literacy in agricultural research. The experiences gained in the FSN study underpin the need for a nutrition education policy to be incorporated in all agricultural interventions / research.

Although changes in the nutritional status of adolescents and adults were observed, an observable reduction in the prevalence of undernutrition can be achieved when the FSN approach is followed for a longer period. The need for focused attention to the under-five age group and for appropriate social protection programmes are factors to keep in mind, so that women are able to effectively balance work in agriculture and care work.

The FSN framework developed under this study is perhaps one of the first in designing a system-wide farming intervention with nutrition focus to enhance dietary diversity of households primarily involved in agriculture and allied activities. While the evidence generated through this study provides a framework for designing nutrition sensitive farming systems, the feasibility has to be demonstrated in different agro-ecological zones of the country and scalability and sustainability established. Generating evidence of impact and policy support for promotion of available biofortified crop varieties (e.g. zinc fortified paddy, iron fortified sorghum) becomes an urgent requirement in this context. In addition, agricultural policy can make a real impact by considering appropriate means to incentivize additional production and consumption of nutrient dense foods like millets and pulses, particularly if the crop is not currently produced or consumed in large amounts. This will have to be accompanied by nutrition awareness campaigns to generate consumer demand. Such a farming system approach that has improving nutrition of small farm households as the primary goal can contribute to the realization of Sustainable Development Goal 2 of zero hunger.

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Annexure 1: Food Frequency

A 1.1 Frequency (%) consumption of various food groups by the households –Wardha

Food group	Study Period*	Daily	Twice/ Thrice	Once a week	Fortnight	Once a month	Occasionally	Never
Cereals and millets	Baseline	100						
	Endline	100						
Pulses & legumes	Baseline	44.4	55.6	0.0				
	Endline	62.1	35.3	2.6				
Leafy vegetables	Baseline	15.0	84.5	0.5				
	Endline	38.4	60.0	1.6				
Other vegetables	Baseline	96.8	2.1	1.1				
	Endline	91.0	9.0	0.0				
Roots & tubers	Baseline	99.5	0.5					
	Endline	99.0	1.1					
Fruits	Baseline	0.0	1.6	10.7	16.6	48.7	13.9	8.6
	Endline	15.3	39.0	39.5	6.3	0.0	0	0
Fishes & sea foods	Baseline	0.0	0.0	11.2	9.6	29.4	0.0	49.7
	Endline		1.1	26.3	27.4	21.1	0.5	23.7
Meat and poultry	Baseline	0.0	1.1	73.3	13.4	2.7	0.0	9.6
	Endline	1.1	10.0	47.9	26.84	3.16	0.53	10.5
Milk and Milk products	Baseline	92.0	4.3	2.7	0.5	0.5		
	Endline	96.3	0.5	0.5	0.53	1.58		0.53

A 1.2: Frequency (%) consumption of various food groups by the households –Koraput

Food group	Study Period*	Daily	Twice/ Thrice	Once a week	Fortnight	Once a month	Occasionally	Never
Cereals and millets	Baseline	100						
	Endline	100						
Pulses & legumes	Baseline		58.7	41.3	0.0	0.0		
	Endline		72.1	10.5	16.8	0.5		
Leafy vegetables	Baseline	0.0	16.9	63.0	20.1			
	Endline	3.7	45.8	37.4	13.2			
Other vegetables	Baseline	6.4	76.2	16.4	1.1			
	Endline	49.5	47.9	1.6	1.1			
Roots & tubers	Baseline	97.4	2.1	0.0	0.5			
	Endline	82.1	17.9	0.0				
Fruits	Baseline	0.5	27.0	43.9	28.0	0.0	0.0	0.5
	Endline	4.7	33.7	37.4	8.4	1.1	14.7	0.0
Fishes & sea foods	Baseline	0.0	6.9	16.9	39.2	24.3	10.1	2.7
	Endline	9.5	12.1	22.6	24.2	25.3	4.2	2.1
Meat and poultry	Baseline	0.5	4.2	44.4	29.6	15.9	4.2	1.1
	Endline	0.0	3.2	27.9	41.1	17.9	8.4	1.6
Milk and milk products	Baseline	8.5	3.2	2.1	2.1	1.1	30.7	52.4
	Endline	12.1	7.4	2.6	5.8	2.1	23.7	46.3

Annexure 2.

Endline survey schedules

&

Checklists (evaluation of nutrition awareness and FGD)

Leveraging Agriculture for Nutrition in South Asia (LANSA)

Farming Systems for Nutrition (FSN) Study

Endline Survey

2017

M S Swaminathan Research Foundation, Chennai, India

Consent Statement

This survey is part of a study conducted by M S Swaminathan Research Foundation under the project Leveraging Agriculture for Nutrition in South Asia (LANSA). You are requested to participate in this voluntary interview. The information provided by you will be used only for the purpose of our research.

Respondent Name

Signature

Schedule 1: Household Characteristics & Anthropometry

Dist Name…….. Village Name…….. HH ID_____Date of Interview____ /____ /____

1.1 Name of the head of the household…… Respondent Name…….. Investigator Name……

1.1a Caste…… 1.1b Sub-caste …….. 1.1c Household Size …… (Total) Male…… Female……..

1.2 Particulars of the household members

S.No	Particulars	101	102	103	104	105	106	107	108	109	110
1	**Name**										
2	**Gender (M=1; F=2)**										
3	**Age***	____ . ____	____ . ____	____ . ____	____ . ____	____ . ____	____ . ____	____ . ____	____ . ____	____ . ____	____ . ____
4	**D.O.B(dd/mm/yyyy)**										
5	**Relationship to Head Code**										
6	**Education Code**										
7	**Physiological Status code**										
8	**Major Occupation Code**										
9	**Subsidiary occupation**										
10	**Physical ActivityCode**										
11	**Consumption Units**										
12	**Whether migrated in the last year*(Yes=1;No=2)***										
13	**Whether remittance sent (*Yes=1;No=2)***										
14	**If yes, how much? (In Rs)**										
15	**Whether participated in MGNREGS*(Yes=1;No=2)***										
16	**Number of days**										
17	**Wages earned MGNREGS**										
	Anthropometry										
18	**Height (Cms)**										
19	**Weight (Kgs)**										
20	**Remarks**										

*Age in completed years; Up to the nearest month in case of children below 5 years of age

Code for Caste : SC=1; ST=2; OBC=3; Others=4

Code forS.No(5) – Relationship to the Head of the Household

Head=1; Spouse=2; Children=3; Son/daughter-in-law=4; Grandchildren=5; Parents=6; Siblings=7; Parents-in-law=8; Niece/Nephew=9; Grandparents=10; Any Other=11

Code for S.No(6) - Education Code

Illiterate	=1	Completed Secondary (10thStd)	=6	Not Applicable (<4 years) = 11
Pre-School/ICDS (4-6years)	=2	Completed Higher Secondary (12thStd/+2)	=7	
Less than primary	=3	Graduate & above	=8	
Completed Primary (5thStd)	=4	Vocational/technical courses	=9	
Completed Middle School (8thStd)	=5	Not going to school (6-14yrs)	=10	

Code for S.No (7) – Physiological Status

Women in the age group 15-45yrs : NPNL (Non-pregnant Non-lactating)=1; Pregnant=2; Lactating (up to 12 months)=3
Children <2 yrs of age : Only breast fed=4; Breast fed+water=5; Breast fed+Complementary feed=6; Not breast fed=7
All Others* : Not Applicable=9

Code for S.No(8) & (9)

Unemployed=1; Not in labour force (Student, Housewife, Elderly persons)=2; Cultivation=3;
Allied activities (livestock, fisheries & forestry)=4; Agri wage labourer=5; Non-agri labourer=6;
Manufacturing & processing (Agri)=7;Manufacturing & processing (Non-agri)=8; Trade & transport (Agri)=9; Trade & transport (Non-Agri)=10; Services=11; Any Other=12
[Tea shop/grocery shop/vegetable seller comes under code-10, Disari/THP/TBA comes under code-12]

Code for S.No (10) – Physical Activity

Sedentary –Student, Landlord, Service, Business, Housewife, Postman, Teacher etc =1
Moderate – Ag. labour, Other labour, Cultivator, Artisans, masons, Servant maid, Tailor, Rickshaw puller etc = 2
Heavy – Blacksmith, Stone cutter, Wood cutter, Mine worker etc = 3

Code for Col (11) – Consumption Units

Adult male (≥ 18yrs) – Sedentary=1.0 Moderate=1.2 Heavy=1.6

Adult female (≥ 18yrs)- NPNL : Sedentary=0.8 Moderate=0.9 Heavy=1.3
Pregnant : Sedentary=0.9 Moderate=1.0 Heavy=1.4
Lactating : Sedentary=1.0 Moderate=1.1 Heavy=1.5

Adolescents & Children (<18yrs):

16 -17 yrs : Boys=1.2, Girls=0.9	7 - 9 yrs (B+G)=0.9	
13 -15 yrs : Boys=1.1, Girls=1.0	4 - 6 yrs (B+G)= 0.7	
10 -12 yrs : Boys=1.0, Girls=0.9	1 - 3yrs (B+G)= 0.5	< 1 year (B+G)=0.0

1.3 House Type ☐

1. Kuccha 2. Semi-Pucca 3. Pucca

1.4 Source of Drinking water ☐

1. Dug well2. Piped Water3. Tube well/bore well4. Any other _____

1.5 What kind of toilet facility does this household use? ☐

Open defecation=1; Closed toilet=2; Any Other (Specify……)=3

1.6 What type of fuel does this household mainly use for cooking?

Firewood=1; Crop residue=2; Kerosene=3; Cow dung=4; LPG=5; Bio-gas=6;

Any Other (Specify……..)=7

Primary Source ☐ Secondary Source ☐

1.7 Do you have Electricity Connection? ☐

1. Yes 2. No

1.8 Do you have crop insurance/ weather insurance etc? Y=1; N=2 ☐

If Yes, fill in the table

S.No	Name	Individual ID	Crop insurance=1; Flood insurance=2; Drought insurance=3	Remarks
(1)	(2)	(3)	(4)	(5)
1				
2				

1.9 Household Expenditure (last 12 months)

S.No	Items	Value (Rs.)
1	Education(Books, stationery, fees etc)	
2	Medical expenses	
3	Any other expenditure (Clothes/Marriage/ Death/ Family function)	
4	Total expenditure food & non food (Last Month)	

1.10Asset Details/ Asset Purchase Details

S.No	Asset	Do you own any? (As on date) Y=1; N=2	Number as on date	Purchased any in the last one year? Y=1; N=2	If Yes, Value (Rs.)	S.No	Asset	Do you own any? (As on date) Y=1; N=2	Number as on date	Purchased any in the last one year? Y=1; N=2	If Yes, Value (Rs.)	S.No	Asset	Do you own any? (As on date) Y=1; N=2	Number as on date	Purchased any in the last one year? Y=1; N=2	If Yes, Value (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Household						**Agriculture**						**Animal Husbandry**				
1	House					19	Ag. Land (Acre)					37	Milch Cattle				
2	Non-ag. Land(Area)					20	Tube wells					38	Cattle				
3	TV					21	Open wells					39	Milch Buffalo				
4	Air Cooler					22	Tanks and ponds					40	Buffalo				
5	Radio					23	Electricity Pumps					41	Goat				
6	Electric Fan					24	Diesel Pumps					42	Pig				
7	Refrigerator					25	Drip irrigation					43	Poultry				
8	Cooking appliances					26	Sprinklers					44	Duck				
9	Mattress/Bed					27	Sprayer					45	Bullocks				
10	Furniture					28	Tractor					46	Sheep				
11	Bicycle					29	Tractor trolley					47	Animal shed				
12	Motor Cycle					30	Bullock Cart					48					
13	Mobile					31	Thresher					49					
14	Jewellery					32	Seed driller					50					
15	LPG Cylinder					33	Power Tiller					51					
16	Hand pump					34	Generator					52					
17						35	Storage facility*					53					
18						36						54					

*Storage facility means shed/ godown etc. outside the house. Does not include bin or bags stored within the house

1.11 Land details (in Acres)

Land Type	Total Own land	Irrigated					Unirrigated/ Rainfed				
		Own land	Leased in	Leased out	Fallow land	Encroached land	Own land	Leased in	Leased out	Fallow land	Encroached land
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Light											
Medium											
Heavy											
Total											

Note 1: Own land is inclusive of leased out land and fallow land
Note 2: Own land should not include leased in land and Encroached land

Schedule 2: Agriculture, Animal Husbandry & Home Garden Details

Village Name…… HH ID_____Date of Interview____ /____ /____Respondent Name……. Investigator Name…….

2.1.1 Household Farm Details in *Kharif* (For the last 12 months) Yes=1; ☐ **No=2**

2.1.1a Total Operational Land …….. (Acres) **(*Note: Operational land includes own land as well as leased in – irrigated and rainfed*)**

S.No	Crop Name	Crop ID	Area (Acres)			Land type	Border/ Field (only for veg)	Total Expenses (in Rs)	Total Output (Qtl.kg)	Mkt Value/ MSP (Rs.)	Qty - Self Cons (Qtl.kg)	Qty – Sold (Qtl.kg)	Price/ Qtl (Rs.)	Qty – Seed (kgs)	Value of seeds/Unit	Value of By Product (Rs.)
			Irrigated	Rainfed	Total											
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																

Codes for (7) Land type *1 light 2 medium 3 heavy* **Codes for (8)***Only for vegetables grown in 1 field 2 Border of field 3 In lines(with in field) 4 Any other (specify)____*

2.1.2 Household Farm Details in *Rabi* (For the last 12 months) Yes=1; ☐ **No=2**

2.1.2a Total Operational Land …….. (Acres) **(*Note: Operational land includes own land as well as leased in – irrigated and rainfed*)**

S.No	Crop Name	Crop ID	Area (Acres)			Land type	Border/ Field (only for veg)	Total Expenses (in Rs)	Total Output (Qtl.kg)	Mkt Value/ MSP (Rs.)	Qty - Self Cons (Qtl.kg)	Qty – Sold (Qtl.kg)	Price/ Qtl (Rs.)	Qty – Seed (kgs)	Value of seeds/Unit	Value of By Product (Rs.)
			Irrigated	Rainfed	Total											
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																

Codes for (7) Land type *1 light 2 medium 3 heavy* **Codes for (8)***Only for vegetables grown in 1 field 2 Border of field 3 In lines(with in field) 4 Any other (specify)____*

2.2 Livestock Details (For the last 12 months)Yes=1; No=2 [ ]

S.No	Items		Cow	Buffalo	Goat	Sheep	Piggery	Poultry	Duckery	Ox/ Bullocks	Fisheries
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Number (as on date)										
2	How many milch animals										
3	How many Used for agriculture/labour purpose										
	Expenses										
4	Purchase of animals (Rs.)										
5	Labour (Rs.)										
6	Feed (Rs.)										
7	Infrastructure (eg. Shed) (Rs.)										
8	Veterinary charges (Rs.)										
9	Interest on loan (Rs.)										
10	Other expenses (Rs.)										
11	Total (Rs.) (4 to 10)										
	Receipts										
12	Milk	Total Output (Ltrs)									
13		Self-cons - Qty (Ltrs)									
14		Distribution as gift (Ltrs)									
15		Sale - Qty (Ltrs)									
16		Value (Rs./Ltrs)									
17		Total Value (12*16)									
18	Egg	Total Output (Nos.)									
19		Self-cons - Qty (Nos.)									
20		Distribution as gift (Nos.)									
21		Sale - Qty (Nos.)									
22		Value (Rs./Nos.)									
23		Total Value (18*22)									
24	Meat	Total Output (Kg)									
25		Self-cons - Qty (Kg)									
26		Distribution as gift (Kg)									
27		Sale - Qty (Kg)									
28		Value (Rs./Kg)									
29		Total Value (24*28)									
30	Fish	Total Output (Kg)									
31		Distribution as gift (Kg)									
32		Self-cons - Qty (Kg)									
33		Sale - Qty (Kg)									
34		Value (Rs./Kg)									
35		Total Value (30*34)									
36	By-products (Rs.)										
37	Sale of animal (Rs.)										
38	Other receipts (Rs.)										

2.3.1 Home Garden Details (For the last 12 months)Yes=1; No=2 ☐

2.3.1a Total Home Garden Area in *Kharif* (square feet) _____

S.No	Item	Code	*Expenses (Rs.)*									*Receipts*				
			Seeds/ Seedling/ plt.matl.	Manure	Fertiliser	Pesticides/ Insecticides (Organic)	Pesticides/ Insecticides (Inorganic)	Irrigation	Infrastructure (eg. Fence)	Other expenses	Total expenses	Output (Kg)	Self-cons (Kg)	Distribution as gift (Kg)	Qty - Sold (Kg)	Price/Kg (Rs.)
(1)	(2)	(3)	(4)	(5a)	(5b)	(6a)	(6b)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20	**Total Expenses (Rs.)**															

Column 4 - MSSRF Kit (Rs.10)

2.3.2 Total Home Garden Area in *Rabi* (square feet) _____

S.No	Item	Code	*Expenses (Rs.)*									*Receipts*				
			Seeds/ Seedling/ plt.matl.	Manure	Fertiliser	Pesticides/ Insecticides (Organic)	Pesticides/ Insecticides (Inorganic)	Irrigation	Infrastructure (eg. Fence)	Other expenses	Total expenses	Output (Kg)	Self-cons (Kg)	Distribution as gift (Kg)	Qty - Sold (Kg)	Price/Kg (Rs.)
(1)	(2)	(3)	(4)	(5a)	(5b)	(6a)	(6b)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20	**Total Expenses (Rs.)**															

Column 4 - MSSRF Kit (Rs.10)

Schedule 3: Household Food Consumption Pattern

Dist Name…….. Village Name…….. HH ID __ __ __ __ Respondent Name…….. Date of Interview__ __ /__ __ /__ __

No. of Adult Members…… No. of Children …… Total CU __ __ . __ (Please enter this from Schedule 1)

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Cereals and Millets	1001												
1	Rice (raw milled)	12												
2	Wheat	21												
3	Rice Flakes	14												
4	Semolina (Suji)	24												
5	Puffed rice	15												
6	Ragi/finger millet	8												
7	Sorghum	4												
8	Foxtail Millet	7												
9	Little millet	16												
10	Maize (Tender)	6												
11	Maize (Dry)	5												
12														
13														
	Pulses and Legumes	1002												
14	Bengal gram Whole	28												
15	Bengal gram dhal	29												

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6

* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
16	Bengal gram roasted	30												
17	Blackgram dhal	31												
18	Greengram whole	34												
19	Greengram dhal	35												
20	Pigeon pea/red gram dhal	44												
21	Peas green	40												
22	Peas dry	41												
23	Rajmah	43												
24	Lentil	38												
25	Rice bean dhal	465												
26	Horse gram	36												
27	Cow pea	32												
28	Broad Bean	33												
29														
30														
	Leafy Vegetables	1003												
31	Curry leaves	77												
32	Coriander leaves	75												
33	Amaranthus	50												
34	Indian Spinach	93												
35	Radish leaves	103												
36	Drumstick leaves	78												

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6
Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6
* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
37	Cabbage	66												
38	Spinach	110												
39	Pumpkin leaves	102												
40	Barada Leaves	478												
41	Cauliflower leaves	68												
42	Sunusunia leaves													
43	Mint leaves	94												
44	Colocasia leaves	73												
45														
46														
47														
	Roots and Tubers	1004												
48	Carrot	118												
49	Colocasia	119												
50	Beetroot	117												
51	Onion big	122												
52	Potato	125												
53	Radish	129												
54	Sweet potato	130												
55	Orange flesh sweet potato													
56	Tapioca	131												
57	Yam ordinary	135												

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6

* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
58	Yam Elephant	134												
59	Arrowroot	115												
60														
	Other Vegetables	1005												
61	Ash gourd	137												
62	Beans	138												
63	Broad beans	143												
64	Bottle gourd	141												
65	Bitter gourd	139												
66	Brinjal	142												
67	Cauliflower	144												
68	Cluster bean	146												
69	Colocasia stem	147												
70	Cow pea	148												
71	Drumstick	151												
72	French bean	155												
73	Jackfruit tender	158												
74	Ivy gourd	164												
75	Spine gourd/Kankoda	160												
76	Pumpkin	178												
77	Ridge gourd	180												
78	Ladies finger	166												

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6

* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
79	Papaya green	172												
80	Parwar	173												
81	Plantain green	176												
82	Plantain stem	177												
83	Snake gourd	181												
84	Cucumber	149												
85														
86														
87														
88														
89														
	Nuts and Oil seeds	1006												
90	Coconut fresh	195												
91	Coconut dry	194												
92	Mustard seeds	206												
93	Groundnut fresh	202												
94	Groundnut boiled													
95	Groundnut roasted	203												
96	Niger seeds	207												
97	Sesamum (Til seed)	201												
98	Cashewnut fresh	192												
99	Cashewnut Roasted													

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6
Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6
* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
100														
101														
	Condiments and Spices	1007												
102	Chillies dry	217												
103	Chillies green (fresh)	218												
104	Coriander seeds	221												
105	Cumin seeds	222												
106	Fenugreek seeds	223												
107	Garlic dry	224												
108	Ginger	225												
109	Pepper dry	232												
110	Tamarind	236												
111	Turmeric	237												
112														
113														
	Fruits	1008												
114	Amla	239												
115	Apple	240												
116	Bael	244												
117	Banana	245												
118	Cashew fruit	251												
119	Custard apple	304												

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6
* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
120	Date palm	255												
121	Grapes	257												
122	Guava	261												
123	Jackfruit	264												
124	Jamun	266												
125	Lime	273												
126	Mango	278												
127	Orange	283												
128	Papaya	287												
129	Pineapple	294												
130	Tomato ripe	306												
131	Wood apple	309												
132	Zizypus	310												
133														
134														
135														
136														
137														
	Fishes and Sea Foods	1009												
138	Small fish													
139	Small fish (dry)													
140	Crabs													
141	Prawn (fresh)													

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6

* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
142	Prawn (dry)													
143	Big Fish (Fresh)													
144	Big Fish (Dry)													
145														
146														
	Meat and Poultry	1010												
147	Egg duck													
148	Egg chicken													
149	Fowl (chicken)													
150	Goat meat													
151	Snail													
152	Beef													
153	Pork (pig meat)													
154														
155														
	Milk and Milk products	1011												
156	Milk Buffalo													
157	Milk Cow													
158	Milk Goat													
159	Curd													
160	Paneer													
161														
162														

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6

* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Fats and Oils	1012												
163	Butter													
164	Ghee cow													
165	Ghee Buffalo													
166	Vanaspathi/Dalda													
167	Cooking oil Specify :_____													
168														
	Sugars	1013												
169	Sugar													
170	Jaggery date palm													
171	Jaggery cane													
172	Sago													
173														
	Beverages	1014												
174														
175														
176														
	Salt	1015												
177	Salt crystal (Iodized)													
178	Salt crystal (Non Iodized)													
179	Salt Crystal Powder (Iodized)													
180	Salt Crystal Powder (Non Iodized)													

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6
* Total quantity collected during the last quarter

S.No	Food Group	Food Code	Frequency of consumption (Code)	Raw amounts consumed (g)		Purchased from PDS	Home grown		Purchased from market		Collected from other sources		Market Price (Rs./Kg)	Remarks
				Per HH/Day	Per CU/Day	Qty (Kg/Ltr)	Qty (Kg/Ltr)	Ref Per	Qty (Kg/Ltr)	Ref Per	Qty* (Kg/Ltr)	Other source code		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
181	Salt Powder Free flowing (Iodized)													
182	Salt Powder Free flowing (Non Iodized)													
	Wild Foods	1016												
183														
184														
185														
186														
187														
188														
189														
190														
191														
	Others	1017												
192														
193														
194														
195														
196														
197														
198														
199														
200														

Code for Col (4) – Frequency of Consumption
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col (9), Col (11)
Daily=1; Twice /thrice a week=2; Once a week=3; Once in fifteen days=4; Once in a month=5; Occasionally=6

Code for Col(13)
Forest=1; Relatives/friends=2; Agriculture land=3; ICDS=4; Kind =5; Any other=6

* Total quantity collected during the last quarter

Schedule 4: 24-hr Recall

Dist Name…….. Dist Code__ __ __ Village Name…….. Village Code__ __ __ __ HH ID __ __ __ __ Date of Interview__ __ /__ __ /__ __

Individual ID					101	102	103	104	105	106	107	108	109	110		Remarks
Name																
Age																
Gender (M=1; F=2)																
Physiological Status																
Physical Activity																
Consumption Units																
Meal Pattern	Type of preparation	Food Stuff	Raw Amount (g)	Total Cooked Quantity	Individual Intake										Left Over	

Individual ID					101	102	103	104	105	106	107	108	109	110		Remarks
Meal Pattern	Type of preparation	Food Stuff	Raw Amount (g)	Total Cooked Quantity	Individual Intake										Left Over	

Food Compilation Sheet

Dist Name…….. Dist Code__ __ __ Village Name…….. Village Code__ __ __ __ HH ID __ __ __ __ Date of Interview__ __ /__ __ /__ __

Individual ID				101	102	103	104	105	106	107	108	109	110	
Name														
Age														
Gender (M=1; F=2)														
Physiological Status														
Physical Activity														
Consumption Units														
Name of Food Stuff	Local Name	Food code	Total Qty (Raw)	Quantity of raw food stuff (gms/ml)										Left Over

Individual ID				101	102	103	104	105	106	107	108	109	110	
Name of Food Stuff	Local Name	Food code	Total Qty (Raw)	Quantity of raw food stuff (gms/ml)										Left Over

CHECKLIST FOR EVALUATION OF NUTRITION AWARENESS INITIATIVE

CATEGORY I
EVALUATION OF PARTICIPATION OF CHFs IN THE AWARENESS PROGRAMME

A. Background information:

Name :
Village : District :
Age :
Sex :
Caste :
Sub caste :
Religion :
Literacy :
Family members :

Name	Age	Sex	Earning / school going / at home	Relation to CHF

Land holding : Landless (1) If landed then pl fill the table

Type of land	Extend of land holding

B. Participation in the Residential Programme :

In which training did the CHFs participate ? (only first, only second or both)
Did you find it useful ?
Could you say three things that you learnt in the training that impressed you the most / which you thought was useful to you ?

C. Daily dietary pattern of CHF

1) What changes have you brought into your own personal food habits as a result of participation in the training programme ? (timing of meal, spacing between meals, no of times eaten)
2) What was your yesterday's meal ?
Morning –
Mid morning –
Lunch –
Evening –
Dinner -
3) Show the dietary plan given by the CHFs in the first training (only if the CHF has attended the first training) and ask the following : ' In the training you had evolved the following one day dietary schedule for winter, summer and rainy seasons as a group'. How much of this could you follow in your own life ? If yes how ? If no why ? Do you think this is practical ?
4) Whatever changes you have brought in your eating pattern, for how many days in a week do you follow that ? Why ?
5) Does this vary with season or you are able to follow it throughout the year irrespective of the season?
6) Has this affected the household routine or members of household in any way ? If yes then was it any of the following ? If there is anything besides this please mention
(eg) more work for women in cooking (say what extra things they do) time spent in kitchen increased (how much time they were spending earlier and how much now ?) cost had increased (buying more food items from market, fuel consumption has increased etc – specify how much increase in money because of changed consumption pattern)

7) Did these changes affect the household decision regarding cropping pattern / agricultural cultivation ?
8) If yes how ? (how did the cropping pattern change and why ?)

D. Cropping pattern (in case a landless CHF had decided to take a piece of land on lease then mention that and include them also. In case they participated in backyard poultry or other interventions for the landless, pl mention about that ?)

1) Please mention the training programmes that you have participated with regard to agriculture organized by MSSRF and or by other agencies.
(eg) IPM, seed treatment etc. If any other training by any other agency then please mention that also.
2) Please mention the practices you adopted ? If yes, why ? If you did not adopt something then why ?
3) Did you get material support (seed, fertilizer, poultry etc ?)
4) What results did you get / or in what way was this different from your previous cropping experience ?
(more production, less pests without more production etc)
5) Do you think you can continue doing this in the forthcoming years, when the support is withdrawn ? If yes how ? if no why ?
6) Generally who takes decision with regard to cropping and agricultural production in your house ?
7) In case it is someone else do you have a chance to give your views ?
8) What crops were grown by you before participating in MSSRF intervention ?
9) Did the participation in the programme influence your cropping pattern in any way ? If yes how ? (type of crops, increase in quantity produced or both ? or anything else ?)

Baseline crops	Quantity	How much sold	How much consumed	

Crops During intervention period or during final data collection	Quantity	How much sold	How much consumed	

(no need to repeat if the above information is already available as part of final data collection)

10) Show them the agricultural cropping pattern they had developed during the second training along with the quantity of production and ask the following :
This is what you had said was possible to do. Did you stick to the pattern ? Could you or anyone else in your village achieve this ? If yes how ? if no why?
11) In the training the participants had mentioned that though they could produce a large quantity of vegetables, because they were perishable they could not store it for prolonged consumption and had to sell. Could they manage to bring in green leafy and other vegetables in their diets after the production got exhausted ? if Yes how ? and for how many days in a week ?
12) Do you have dietary diversity with 4-5 food groups everyday or atleast for 4 days in a week ? If yes how ? if no why ?

E. Subsequent trainings . (During the residential trg the participants had demanded several training programmes which were organized subsequently . Show them the list of trg programmes and ask them the following questions.

1) Why did you demand for these training programmes ?
2) In which programmes did you participate ?
3) Did you adopt any of those practices ?
2) Did you get the desired result or no ?

F. Empowerment and Community Resource (Qualtitative)

Please tell us if you felt happy participating in the awareness programme and about being selected to be trained by your community .

Has it helped you personally ? (not only technical details but your growth as a human being)

Did you share the training experiences with friends and family and how was it received ?

By participating in the awareness programme –

- do you feel confident about managing your household food security ?
- do your neighbours / friends / families come to you and discuss about agricultural, diets and health issues ?

What do you think are the limitations of the programme ? How could it have been improved ?

Any thing else you want to share ?

CATEGORY II
HOUSEHOLDS WHOM THE CHFS CONTACTED

Note : The first step is to construct a list of people whom the CHFs contacted. This can be taken from the report. However the reports contain only some examples. Please request the staff to discuss with the CHFs to construct the list. See example below :

Village : Atalguda

CHF 1. Name :

People whom he contacted :

1. Name : Sex Who it is : neighbor/ friend / villager

2. Name : Sex Who it is : neighbor / friend / villager

CHF 2. Name :

People whom she contacted "

1. Name : Sex: Caste : Who it is : neighbor / friend / villager

2. Name : Sex: Caste : Who it is : neighbor / friend / villager.

Once this list is ready we will pull out some people from each one of the CHFs list and then do an interview with them using the following schedule :

1. Are you aware of the LANSA project being conducted in this village ?
2. Are you aware that some people were selected for residential training from your village
3. Did you hear about what was discussed in the training ?
4. Who told you about these things ?
5. Do you think these messages were useful to you in your daily life ?
6. Do you think it is possible to adopt these things in your daily life ?
7. If yes how ? If no why ?
8. Do you think that such type of capacity building of a few people in the community in nutrition will lead to the entire village benefitting from them ? If yes how ? If no why ?

CATEGORY III
COMMUNITY ENDEAVOUR

NOTE : A community endeavor is usually seen from the perspective of several other stakeholders besides the actual participants in the endeavor, (such as those who did not participate) since the endeavor could very well affect those who are not participating in it. (eg) if a group of women decide to use Panchayat or common land for the purpose of growing vegetables then permission from the leaders, PRI members and other members of the community becomes important . They could allow the use of the land with some conditions such as sharing of part of the proceeds. In the same way the experiences of the group members and whether they want to remain as a cohesive group will also need to be captured.

This checklist should be seen as a guide to understand what to capture while assessing a community endeavor and how to do it. The users are requested to modify it suitably while collecting information. You can add, delete, or omit any information that you think relevant / irrelevant.

PART 1 GENERAL INFORMATION ABOUT COMMUNITY ACTIVITIES

Questions to be filled by the office staff before going to the field : (examples are given wherever possible. In case of doubts please feel free to clarify)

First step is to list all the group activities villagewise (list only the groups that did not collapse during the project period)

Village	No of group activities facilitated by LANSA	Type of activity		
		Kitchen garden	Seed bank	School garden**
Saheli	3	1	1	1
Kurkuti	1	-	1	-
Chikma*		3	3	- -

*please note that in this example all three groups in the same village are doing the same activity.

** school garden is grouped with community activity because the school serves the community as a whole and the children and staff are involved collectively in the endeavour

II. (The following questions must be discussed and replied by the staff collectively as a team (team leader, volunteer and field staff and any other staff)

- What were the common group activities that you promoted as part of this research ?
- Why were these activities chosen ?
- Who were involved in the choice of these activities? (if it was decided by the implementers please mention who and if it was in a stakeholder meeting or just by MSSRF)
- How did you expect the participants / households to benefit through these activities in fulfilling their food /nutrition needs?
- What benefits can a person get through a group activity that he / she cannot get as an individual participant in the research project ?
- Were the group activities necessary to answer the research questions ? If yes how ? If no why ?
- What percentage of people in each group also participate in your individual intervention?
- Did you attempt to promote group activities in all the villages?
- If no why ? What were the challenges ?
- Did you visualize / facilitate the group as a formal structure with office bearers or it was just a loose group of people who came together ? Why ?
- At what point of time in the project did you start the activity ? Why ? (if the groups had been promoted in different villages at different points of time then pl mention and say why)
- Who were the key players in facilitating the groups ?
- Do you think there was sufficient time for people to come and work together as a group and benefit from that activity ?
- If no why ?
- Totally how many groups were started in each village and with what activities ? How many worked as a group till the end of the research ? How many collapsed ?
- If some collapsed, why did they collapse (pl say which village and give details)
- Besides seed bank / community kitchen garden and other group activities proposed by the project did you identify any other activity as a suitable activity to the mandate of the project during the course of the intervention ?
- If yes, then what were they ?
- Could you promote them ?
- If yes how ? if no why ?
- Anything else you want to say ?

PART II STAFF ASSESSMENT OF COMMON ENDEAVOURS

This part also has to be answered after a joint discussion between the team leader, the field staff and the volunteers. First, from each type of group activity that you facilitated choose one group as a sample. For example if you had facilitated community kitchen garden in three villages, then choose one group from any village, that worked together without collapsing till the end. Similarly if school gardens had been started in all the villages, then choose one school that produced, harvested and consumed the vegetables. Same holds true for the seed bank.

1. Village :
2. Group activity : Kitchen garden / seed bank / SHG activity such as value addition / any other
3. When did the group come together and when did they actually start on the endeavor ?

You can give descriptive answers (for eg) the group could have actually started in July 2016 but could have collapsed after two months and then re grouped and started by December 2016. Sometimes the group starts as a small nucleus and more members could have joined gradually.

4. No of members in the group
In the beginning :
At the end :

(this is not applicable in case there was no change in the group members)

5. List of participants

No Name Age(yrs) Sex (if all members are of the same sex then it can be mentioned at the top and this column can be avoided)

6. Give your views on the following :

(the team leader alongwith the volunteers and field staff should sit and discuss and reply to the following questions. In case there are different view points among the staff members then it should be mentioned.

1. How did the group come together as a group ? Who facilitated the process besides staff ?
2. Is it a mixed group or belonging to one particular caste ?
3. Is it only women's group / only mixed group / or having both sexes
4. What were the material and cash resources that the group members needed to get the activity started ? (seed, fertilizer, any labour charges paid ?)
5. How much time and labour were contributed by the participants (including safe guarding of premises ?) (how many members actually contributed, how much time each gave for how long. Total time spent of all members)
6. How could they adjust with other work ?
7. How many times in a year was this activity done ?
8. What all were produced and in how much quanity ?
9. How was it shared among the members ?
10. For how long did it last ? (ie) how much of the daily household requirement could it meet and for how long ?
11. In case something was realized as cash how much did each person / household get ?
12. While calculating net benefit to each member, do you think this is a viable activity to participate in ?
13 According to you what are the challenges involved in trying to promote group action for sustainable food security ?

PART III. PARTICIPANTS IN THE GROUP ACTIVITY (choose 4 persons, two males and two females and ask them the following questions)

1. How did you join this group for this activity ?
2. What is the purpose for which you are doing / did this activity
3. What was your role / responsibility in this group ?
4. How often did you meet / what did you talk about ?
5. Who took decisions about what the group should do ?
6. Are you happy being part of the group ?
7. What were the strengths and weaknesses of the group?
8. How did you benefit from being part of the group ?
9. Did your group get support (material / cash / advice / any other) for implementing the activity ?
10. If yes briefly describe ?
11. How did the group gain collectively by this activity ?
12. If the project withdraws would you continue to do this activity together ? If yes how ? if no why ?

CATEGORY IV
SPECIFIC TARGET GROUPS FOCUSSED BY INDIVIDUAL NUTRITION AWARENESS TRAININGS

(those who attended the training programmes)

Groups

Wardha: Adolescent girls, Pregnant and lactating women, School children
Koraput: Adolescent girls, Mothers, School children

Name of village:
Name of the respondent:

In which group he/she attended:
1) Do you know about MSSRF and its work in your village ?
2) Have you attended any meeting/programme – organized by MSSRF ?
3) If yes, how many meetings have you attended ?
4) Could you say what was discussed in those meetings ?
5) Did you enjoy attending those meetings ?
5) Did you benefit from the discussion ? in what way ?
6) Could you use any of the messages / information in your daily life ?

CATEGORY V
THIRD PARTY VALIDATION
ASHA, Anganwadi worker, School Teacher, Medical officer, NGO's, Other Government official, any other

Name of the village:
Name of the respondent:
Role in the village:

Begin by requesting the respondent to say about the services they are rendering to the village (anganwadi services, health camps etc) and their impression about the food habits, health and nutrition status of the people with specific reference to women and children upto three years

1. MSSRF is working in these villages. Are you familiar with any of their work ?
If yes, then continue to question no. 2
If no, then the interviewer has to briefly explain about the interventions of MSSRF in the concerned villages. After this go to question no 6.

2. How did you come to know about their work?
3. Have you interacted with MSSRF staff /or have you jointly implemented any activity in the village?
4. Do you think MSSRF intervention has influenced or helped people in their daily lives ?
5. If yes in what way? (With regard to food habits, personal hygiene etc)
6. Do you see any difference in the way people seek/utilise health/ nutrition services during the past five years?
7. If yes in what way?
8. Do you see any attitudinal changes in the way they interact with the govt staff ? If yes could you kindly describe them?

CATEGORY VI.
ROLE AND PARTICIPATION OF VILLAGE LEADERS
PRI members, Traditional leaders, SHG leaders

Role and participation of village leaders has to be written down by the volunteers. Ask them to briefly put down what role the village leaders played in ushering in household nutrition security. Following hints might help

1. Do you have traditional leader/ leaders in your village?
2. What caste/community to which they belong?

3. Generally what role do they play in village development? (Eg)
a) They settle disputes
b) They are consulted on all matters concerning the village
c) Others (please ask them to give examples)
4) Were they consulted / involved in the FSN study implementation?
5) If yes in what way? Describe
6) Did they support the programme or were they indifferent / non cooperative?
7) Are they aware of the CHF programme? We're they present during the selection of CHFS?
8) What support did they give the CHFS in their village in spreading nutrition awareness? Did the CHFS go to them for any support and how did they respond?

CATEGORY VII
THOSE WHO DID NOT PARTICIPATE IN THE FSN PROGRAMME
(Only small marginal and landless households)

Name of the village:
Name of the respondent:

Note : Before the interview briefly say that MSSRF had been working with the people to improve household nutrition security and agricultural practices and that you are now trying to see how it helped the community. Tell them about the how training of a few people in appropriate and healthy food habits was thought of as a strategy to build the overall capability of the community to eat nutritious foods. Also tell them that you are doing a diet survey to know about food habits

1. Are you aware of the LANSA project/MSSRF being conducted in this village?
2. If yes, could you kindly say what services they have been rendering to people ?
3. Could you participate / benefit from any of these activities ? If no, could you say why you could not do so ? (here you have to probe more. They may not have participated in the direct trainings but they could have benefitted from the seed, fertilizer distribution etc. If they have benefitted from the intervention then, ask how they managed to get the facilities)
4. If there is an opportunity in the future for you to participate in training programmes would you like to do so ?
5. According to you what encourages people to participate in intervention programmes ?
6. Even before you heard from me just now, were you aware that some people were selected from your village (they can tell the names of the CHFs) for a residential training programme ?
7. If yes, did they get to know what the training was about ? From whom did they hear and where ? (in tea shop, SHG meeting etc)
8. Was it helpful to them in any way ?
9. In yes, then if they want more information would they approach them again ?
10. Can you say how the people who participated in the trainings / interventions benefitted from the same ?
11. If yes, do you think these benefits are long lasting or they are temporary
12. Do you think that such type of capacity building of a few people in the community in nutrition will lead to the entire village benefitting from them ? If yes how ? If no why ?
13. Diet survey:

No	Time of the day	Menu	Raw materials	Food groups*
1	Morning			
2	Mid morning			
3	Lunch			
4	Evening			
5	Dinner			

*this can be done at headquarters also

Focus Group Discussion - Checklist

1. Were people familiar with the fact that nutrition and good health is linked to the food we eat?
2. Which interventions are most popular?
3. Due to the interventions, what happened
    a. Are they, specifically women, working longer hours?
    b. Are more members from the household working now due to the intervention?
    c. Has something else changed, such as use of crop residue for fuel or feed?
    d. Are there more biofortified crops? For instance, drumstick (prompt only if no response)
    e. Has any intervention also led to an increase in soil nutrients?
    f. Is there an increase in home grown consumption?
    g. Are they consuming more pulses than before?
    h. How are pulses consumed?
    i. Are they consumed all through the year?
    j. What about processing?
    k. Are you also more aware about storage?
4. What are the challenges?
5. Nutrition gardens
    a. Do nutrition gardens help in increasing home consumption of fruits and vegetables?
    b. Do you get enough throughout the year?
    c. Have you told others?
    d. Do you get surplus? If yes, what do you do with surplus from home/community garden?
    e. How do you get seeds?
    f. What are the challenges?
6. What percentage of expenditure of the total expenditure is on food?
7. Has this come down after interventions?
8. Are producers aware of the access to markets? Where do they sell - local market or somewhere further? For instance, if in some villages, it is known that there is a weekly market, is that incentive to produce?

9. Are they aware of Minimum Support Prices (MSP)?
10. Do the producers prefer to sell in the market and source it from the market itself, rather than home grown i.e. is the income effect more pronounced?
11. Are you or anyone else you know growing nutritious food with your own crops?
12. Are there any strengths of the programme?
13. Are there any weaknesses of the programme? Do you have any suggestions on how to improve this programme?
14. Have you been telling your friends and family about the interventions?
15. How will you get seeds in the future?
16. Will you continue growing nutri-foods even after the project is over?
17. Have there been any changes in the type of sanitation and use of cooking fuel in the past 3 years? If yes, get details.

Nutrition Awareness

1. Have you attended the nutrition awareness meetings/programmes conducted by MSSRF?
2. Was it informative? Are you able to follow it in your day today life?
3. Do you know the benefits of balanced diet and food items? Were you able to bring changes in your daily consumption pattern? If yes, list some.
4. Effects of anemia in women and VAD in children. What are the foods that are good for anemia and VAD?
5. Have you seen the nutrition calendar with pictures drawn by school children? Was it useful?
6. Did your child share any messages related to health, nutrition and diet and WASH?
7. Are you aware of community hunger fighters/community resource persons? Have you heard that they have undergone trainings on nutrition and linking agriculture to nutrition?
8. What are the messages that you have heard from them?
9. Have you discussed anything related to food and nutrition with CHF?
10. Do you think that creating a CHF at community level is useful to make change in nutrition and health of population?