

## **Brainstorming Meeting on Measurement Indicators under Farming System for Nutrition**

A two-day workshop was convened to deliberate and decide upon the impact assessment indicators of the farming system for nutrition initiative (FSN) under the project on Leveraging Agriculture for Nutrition in South Asia (LANSA) at MSSRF, Chennai on 25-26 July, 2013. Following is a brief of the proceedings. The agenda and list of participants are in the annexes.

Dr. Ajay Parida, Executive Director, MSSRF, welcomed the gathering. He introduced the audience to LANSA, the MSSRF initiative on Farming Systems for Nutrition (FSN) that had been conceptualised by Professor Swaminathan and emphasised on the main objective of the workshop – to identify key indicators of measurement for the FSN initiative.

Following a round of self-introduction by the participants present, Prof. M S Swaminathan addressed the gathering and explained FSN – the main focus was on providing agricultural remedies to nutritional maladies. He spoke of ways in which FSN can mainstream nutrition considerations into farming systems to address nutritional deficiencies. It should be a food based approach rather than a drug based approach. He also spoke about non food factors playing a predominant role in improving the nutrition status, viz. enabling environments such as clean water, sanitation and good health care that play a crucial role in enhancing nutrition along with the farming systems. He briefly touched upon the 3 forms of malnourishment – chronic hunger, protein hunger and hidden hunger. The problem of chronic hunger would be partly addressed by the national food security bill and income enhancement through improved productivity; protein hunger through consumption of pulses and animal protein, and hidden hunger or micronutrient deficiencies through introduction of bio-fortified crops and greater intake of fruits, vegetables and foods from animal sources.

He advised that a credible measurement tool should be in place to capture the effect of FSN. A Lifecycle approach could be adopted where the impact is measured starting from pregnant mothers to children apart from other common measurement tools – stunting, underweight, wasting, BMI and low birth weight.

He emphasized on 3 M's that were required for the success of the program – Management, Monitoring and Measurement. He concluded by encouraging the participants to engage in healthy discussions to develop methodologies and impact measurement tools that could be useful in measuring the impact of the FSN intervention.

Following Prof. Swaminathan, Dr. Prakash Shetty, CEO LANSA spoke about how nutrition sensitive agriculture is now the in-thing in the development sector. Briefly elucidating the three research pillars under LANSA and FSN as a pro-nutrition agriculture intervention, he emphasised that DFID was looking for good evidences of agriculture interventions in impacting nutrition and how these can be up-scaled and adapted to different agro-climatic regions. Impact evaluation indicators are therefore crucial. He urged the participants to be open and give critical comments that would help in identifying indicators for measuring the impact of FSN.

Dr. Prasun Das, Research Director, LANSA reiterated the importance of FSN and the objective of the meeting. He spoke about how the villages under consideration should be saturated through different interventions as part of FSN and stressed upon the importance of a robust methodology and impact measurement tool.

Following this, Dr. Nagarajan from MSSRF presented the FSN framework as operating on three axes – better nutrition harvest through agriculture, converting the harvest into a better food basket for better health and improvement in economic indicators and social uptake. The objective was to promote a holistic land-animal-aquatic based farming system to mitigate nutrient deficiency maladies. Highlighting the various on-farm demonstrations that are underway in Wardha and Koraput districts, he underlined the importance of soil, infrastructure and technology as crucial components for improving the farming system. He also put forward that it is not enough if we quantify productivity in agriculture but should also measure nutrition.

With the tone set by the inaugural session, three technical sessions followed -

### **Technical Session I**

This session began with Dr. Vishwanath from UAS Bangalore, sharing his experience in Integrated Farming Systems (IFS) demonstrations across Karnataka through the network of *Krishi Vigyan Kendras*. The major target of this project was the marginal and small farmers and the intervention consisted of crop, horticulture and animal components with input support services and training and exposure visit. Agriculture-horticulture-pasture systems were being promoted in marginal soil areas and intercrop of pulses like cowpea, groundnut and green gram in fruit orchards of mango and custard apple. He presented some results of the economic impact of these interventions and the formation of commodity based associations. The nutrition component was now being integrated into the approach. Models for sustainable food and nutrition security from a 1 ha plot and nutrition garden on 200 sq m were presented.

This was followed by a brief presentation by Dr. Swarna Vepa from MSSRF on the macro-indicators of Agriculture and Nutrition Linkages based on secondary data from India. This was a state level panel data analysis which showed that agricultural growth did not have a significant impact on nutrition status whereas gender related indicators such as female literacy rate, female land holdings; operational land, gini ratio etc., had a significant correlation with the nutrition status.

Dr. Meenkashi from DSE shared her experience of guiding the study to measure the nutritional impact of Orange Flesh Sweet Potato (OFSP) intervention in Uganda and Mozambique. The objectives of the intervention were to improve intake of vitamin A and see its outcome and assess the cost of achieving it. She spoke in detail about the methodology adopted in conducting the intervention – a randomized control trial (RCT). She explained the relevance of using RCT, considered as a highly robust way of studying impact of an intervention. The study revealed that intake of vitamin A did improve. Adoption of OFSP was found to be the most important variable. Interestingly, both nutrition education and market support were not found to have any significant impact on the nutritional status.

In the discussion that followed, it was suggested that using dried blood sample would be the ideal way for testing Vitamin-A as compared to drawing blood samples which was used under the OFSP intervention. Studying 'wasting' as an impact indicator instead of stunting in the secondary data study was suggested as it is a multi-dimensional indicator. A suggestion was also made to examine the implications of women headed households in the FSN intervention villages, since the secondary data analysis revealed the importance of gender relations on nutrition.

## **Technical Session II**

Under this session a brief presentation was made by the MSSRF team on the two FSN intervention sites and the work undertaken so far. The geographic and demographic details of the selected sites were presented followed by some results on land holding pattern, livestock holding pattern, consumption details, existing cropping patterns etc from the preliminary household survey conducted in the selected villages in June and the proposed interventions at each site. Suggestions were sought on the methodology and indicators for impact assessment.

During the discussion that followed, it was pointed out that the project was too ambitious and impact evaluation would be difficult. It was suggested that more focus was required on the intervention and on what we want to achieve in the end. It was suggested that a Randomised Control Trial be done in order to have a robust impact measurement. A suggestion was made that it would be useful to look at the existing consumption and production patterns before deciding on the interventions.

It was expressed that although there maybe food adequacy amongst the adults it often does not translate into food adequacy of children. So looking at only children in the 0-5 years category may not be a good idea. It was suggested that that the nutrition assessment in terms of anthropometric, clinical and food intake indicators be done for all the members of the household rather than a sub-sample. Whereas haemoglobin and Vitamin-A tests could be canvassed for a sub-sample. The impact of the entire intervention as a whole should be assessed rather than individually as separate packages.

The need to establish a link between the farming systems and the nutritional requirement was pointed out. The gender analysis should cover both time-use and access to and control of assets/resources and role in decision making. The local food systems (traditional and wild food) should also be taken into consideration.

It was also suggested that two approaches could be used - holistic approach and innovative approach, for improving the existing practices. Family expenditure patterns must be recorded. The interventions should be put in separate modules for various sub-groups and then implemented.

There was a query if Vitamin-A and Iron deficiencies were prevalent in these villages and have they been previously established. For which it was noted that these two were the most highly occurring deficiencies in India and in the chosen districts and hence were chosen.

## **Technical Session III**

Spilling over from the previous session, Dr. Brahmam, formerly from NIN, made a detailed presentation on the multiple factors that affect nutrition status, survey methodologies and methods of assessment of nutrition status. He illustrated the various instruments and measurement tools used in measuring the nutrition status.

This was followed by three presentations on Farming Systems Approach for pro-nutrition agriculture. Dr.Nadarajan, Director, Indian Institute of Pulse Research, briefly touched upon the importance of pulses as a valuable source of protein and how it can help address protein deficiency. He also highlighted that pulses have higher iron and zinc content compared to cereals. Promotion of

pulses as intercrop, pulse waste as feed to improve the nutrient intake of animals and diversified pulse based food products were highlighted by him.

This was followed by a detailed presentation by Dr. Ravishankar, from the Project Directorate for Farming Systems Research, ICAR, on integrated farming systems model. The objective of IFS he explained was to increase productivity and resource efficiency for improved income and food security. As a first step, the constraints have to be identified and based on that modules designed and implemented and the impact studied. Indicators are required to measure system efficiency, like productivity and income and pro-nutrition assessment indicators like expenditure on food and dietary diversification. Presenting models/case studies of small farm holders and the economic impact of the IFS intervention, he offered collaboration from the IFS centres in the respective states in capacity strengthening of farmers in the FSN project villages in Wardha and Koraput districts.

The last presentation under this session was by Dr. Asokan, Madras Veterinary College on the role of livestock in improving the nutrition status. He pointed out that this can be achieved through various pathways – income, agri technology, direct access to quality food, value chain innovations, allocation of household resources and behavioural change. He stressed the importance of supplementation of diets through animal proteins through intake of milk, meat, fish and eggs. Biofortification of animal products for greater nutritional benefit was also suggested.

The second day began with a re-cap of the previous day's session by Ms. Bhavani, MSSRF and was followed by two presentations -

Dr. Brahmam made a presentation on nutrition status of the rural community in India based on NFHS and NNMB data. He highlighted that the major challenges faced were the low food intakes especially micronutrient intakes. This could be solved through fortification of food items and through nutrition literacy. Knowledge of breast feeding practices and the importance of immunization should be inculcated. He also went on to say that supplements could serve as short term solution, fortification as medium term solution, but in the long run it is important to have state specific policies, literacy, dietary diversity and better enabling factors to improve the overall nutrition status.

This was followed by a presentation on the effects of water and sanitation on nutrition by Dr. Indra Chakravorty, Chief Advisor, PHED, Govt of West Bengal. She emphasized the crucial importance of enabling environment in improving the nutrition status, calling for a multi-sectoral approach. She illustrated various case studies that have shown the importance of such enabling factors (sanitation and clean water) on improving the nutrition status without any direct nutrition intervention per se. She also pointed out that providing clean water source nearby (water accessibility) reduces the time and energy spent (calories saved) by women in collecting/fetching water.

The final session of the day was a panel discussion moderated by Dr. Prasun Das on the methodology, strategy and measurement indicators for FSN intervention. It was decided that the intervention be looked at with a comprehensive approach. Control villages should be taken to assess the difference between the baseline and end line with both the intervention and control group of villages (Double Difference Approach).

Survey schedules on socio-economic status, anthropometry, food frequency, morbidity may be canvassed to all the households; Weighment diet survey (24-hour recall) – to a sample of the

population (one in 4 households). It was also suggested that dried blood samples be taken to test for anaemia and vitamin-A deficiency. With regard to the gender aspect – besides time use survey on a sub-sample of both men and women in the household, information on access to resources and services and decision making should be collected.

This was followed by final closing remarks and conclusion of the workshop.

Dr. Shetty summarised the important comments and suggestions from the two day session. He reiterated the importance of using a scientific approach in measuring the impact of the intervention. He also suggested that it is important to clearly draft and document the MSSRF's model for FSN as it evolves, so that it can be adopted in other areas and for up scaling. He concluded by thanking the participants for their valuable inputs and urged their support in taking the FSN intervention forward.

Dr. Das spoke about the specific interventions that are planned under FSN and pressed upon the importance of saturating the entire village in terms of providing some form of intervention for everybody. He also spoke about the various IEC tools that will be used and how the intervention will facilitate the villagers in linking with the existing government programmes.

Prof. Swaminathan concluded by saying that the development of measurement indicators is complex and a dynamic approach has to be taken. Both direct (chronic hunger, protein hunger, hidden hunger) and indirect (drinking water, sanitation, health, literacy) indicators have to be used in measuring the impact. He advised the team to be a vehicle to carry other interventions along with FSN. He wished the team to develop reliable and implementable set of indicators from the inputs contributed by the experts through this workshop; and thanked all the participants for their valuable contributions.

**Agenda for Brainstorming Meeting on Measurement Indicators under  
Farming System for Nutrition**

**Thursday 25 July**

9.30 Registration  
10.00 – 10.45 Inaugural Session  
Welcome: Dr. Ajay Parida, Executive Director, MSSRF  
Self-introduction by participants

**Farming System for Nutrition (FSN) Initiative under Leveraging Agriculture for Nutrition in South Asia (LANSA)**

Introductory Remarks: Professor M S Swaminathan, Founder Chairman, MSSRF  
Dr. Prakash S Shetty, CEO, LANSA  
Dr. Prasun Das, Co-Research Director, LANSA, MSSRF  
Dr. S Nagarajan, Advisor, LANSA, MSSRF

10.45-11.00 Tea

**Technical Session I Chair: Dr. Prakash S Shetty**

11.00 - 11.20 Evidence of Agriculture-Nutrition Linkages: Dr. Swarna Vepa, Consultant,  
LANSA, MSSRF

11.20 – 11.40 Experience of UAS Bangalore in implementing Integrated Farming Systems (IFS)  
Project and measurement indicators used to study impact: Dr. A P Vishwanath, Professor & Head, AICRP on IFS, UAS Bangalore

11.40 – 12.20 Key indicators to measure impact on nutrition status:  
Professor J V Meenakshi, Delhi School of Economics

12.20 – 13.00 Discussion

13.00 – 14.00 Lunch

**Technical Session II Chair: Dr. Prakash S Shetty**

14.00 – 14.30 FSN Sites in Wardha and Koraput - Findings from Preliminary Household Survey: Ms. Bhavani R V, Project Manager and Ms. Vinodhini U. Scientist,  
LANSA, MSSRF

14.00 – 15.30 Survey Methodology & Measurement Indicators  
Dr. G N V Brahmam, Scientist (Retd.), NIN  
Dr. Brinda Viswanathan, Assoc Professor, Madras School of Economics  
Dr. J V Meenakshi, Professor, Delhi School of Economics

(15 min each followed by discussion)

15.30 – 15.45            Tea

**Technical Session III      Chair: Dr. K Ramasamy, Vice Chancellor, TNAU; Co-Chair: Dr. S Nagarajan**

15.45-17.30            Farming Systems Approach for pro-nutrition agriculture - key indicators  
Dr. N Nadarajan, Director, Indian Institute of Pulse Research, Kanpur  
Dr. N Ravisankar, Principal Scientist, Project Directorate, Farming Systems  
Research, Modipuram  
Dr. S A Asokan, Dean, Madras Veterinary College, Chennai  
  
(15 min each followed by discussion)

**FRIDAY 26 JULY**

10.00 - 10.15            Recap – Ms. Bhavani R V

10.15 - 10.45            Experience Sharing: Methodology & Indicators for Impact Assessment  
Dr. G N V Brahmam

10.45 - 11.15            Experience Sharing: Methodology & Indicators for Impact Assessment  
Dr. Indira Chakravorty, Chief Advisor, WSSO, PHED, Govt of West Bengal

11.15 – 11.30            Tea

11.30 - 13.00            Discussion on Measurement Indicators for FSN intervention  
**Moderator: Dr. Prasun Das**  
(All participants)

Lunch

14.00 - 15.30            Finalisation of indicators and closing Remarks  
Professor M S Swaminathan  
Dr. Prakash S Shetty  
Dr. Prasun Das

**List of Participants**

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