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SUMMARY OF THE ONLINE DISCUSSION

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Innovations in agriculture to improve nutrition. Share your success stories.

About the Document

This document summarizes the results of the online discussion "Innovations in agriculture to improve nutrition. Share your success stories" held on the Global Forum on Food Security and Nutrition (<http://www.fao.org/fsnforum>) from 18 May to 5 June 2015. The discussion was organized in collaboration with the [Leveraging Agriculture for Nutrition in South Asia \(LANSA\)](#) programme, a multi-partner research effort led by the MS Swaminathan Research Foundation in Chennai, India.

The following summary aims at providing readers with a general overview of the discussion, including the list of all references shared. For the full text of all contributions and further background information please refer to the discussion page:

http://www.fao.org/fsnforum/forum/discussions/agriculture_innovations_nutrition

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General considerations shared by participants

Importance of nutrition education

Reviews of existing evidence on the ability of food-based interventions to improve nutrition consistently find that nutrition education (or its absence) is related to the project success in increasing access to healthy, diverse foods.

However, the desired behavioural change goals vis-à-vis the importance of proper nutrition have in many cases not yet reached the lower strata of the Indian society. (Edye Kuyper, Krishna Sannigrahi)

Understanding consumption pattern before designing interventions

It would be interesting to assess the use of local foods in order to propose feeding patterns on the basis of local products that are often not taken into account. Interventions must be designed based on the analysis of local preferences and production, without being too dependent on external inputs. Good combinations based on local products are often not popularized due to a lack of understating. (Alexandre Tona Tona)

Need to be inclusive of women

Increasing women's participation in agriculture and related activities is of great significance for improving nutrition and reducing hunger worldwide. Women play a vital role in advancing agricultural development and food security as they participate in many aspects of rural life. However women face many constraints such as insecure land ownership, difficulties in accessing credit and extension, and to hire labor. These constraints as well as women's current and potential contributions to agricultural production often go unrecognized. (Santosh Kumar Mishra, Bibhu Prasad Mohanty)

Make traditional crops more easy to use

It could be helpful to give a similar treatment to traditional crops as it is being done in the case of oats and maize. By selling them as nutritious flakes/powder which can be prepared into a dish easily their utilization could be greatly increased. (Maruthi Vegapareddy)

Getting the most out of the crops we grow

One of the crucial factors in improving the nutritional value of the food is to get the crops being grow to function in the field at optimum rates. The right growing techniques, including crop rotation, proper fertilization and using the correct cultivars need to be identified and their application supported. (Frank Pons, Manuel Moya)

Need for a food-system approach

It is necessary to critically assess the classical supply-driven value chain/commodity approach and revisit production systems from the demand side; re-localize development efforts, support family agriculture and aim for resilient food systems which make the best of existing resources (including indigenous knowledge). (Florence Egal)

Assess the pathways from agriculture to better nutrition

The pathways from agriculture to better nutrition need to be studied more. To this date there is no sufficient evidence to prove that increased productivity, greater income, improved quality or variety of food production will necessarily result in improvements in diet and health. (Jane Sherman)

Cost-effectiveness of agricultural interventions

Very little work has been done on assessing the cost-effectiveness of agricultural interventions. It is necessary to address leakages in official spending, ensure monitoring of progress and create linkages among different agencies. (Krishna Sannigrahi)

Promotion of horticulture

The promotion of production of green leafy vegetable and fruits in the backyards of rural houses is very important. Horticultural promotion through education programmes and extension can effectively contribute to the decrease micronutrient deficiencies. (A. Laxmaiah, Bibhu Prasad Mohanty, G.N.V. Brahmam)

Need to keep the youth involved and interested in agriculture

The young generation is least interested to do farming and tends to migrate to the cities for employment. As a result, farming remains in the hand of older farmers who follow old traditions and production techniques and can be reluctant to accept new technologies. This makes the implementation of more modern technology, which a high level of expertise in technical knowledge and managerial skills, difficult. (Krishna Sannigrahi)

1. Are you aware of an untested innovation in South Asian agriculture that has the potential to have a major impact on nutrition and health in the region?

Application of Phosphate solubilizing bacteria to spinach

Studies on spinach have shown that the application of Phosphate solubilizing bacteria (PSB) improves both yields and the nutritional properties of the produce. The application of PSB in combination with farmyard manure is also recommended as it helps lowering phytates, tannins and oxalates content in the food crop. (Sreedevi Shankar Kobaku)

Agricultural Value Chain for wheat farmers in Pakistan

The Pakistan Poverty Alleviation Fund (PPAF), in collaboration with the NRSP-Bank, designed a comprehensive multi-dimensional agricultural value chain for 10,000 wheat farmers in the Bahawalpur district. The 10,000 farmers selected for the intervention were small farmers, having less than 5 acres of landholding.

Results from implementation of the value chain indicate that crop yield of the farmers has increased by up-to 20%. Direct links created with the government departments have enabled the farmers to gain maximum profits through sale on government support price, minimizing the dependence on middlemen (arthi). This value chain has resulted in a positive impact on the rural economy, improved nutrition, gender empowerment and fuelling a process of local as well as national agricultural growth. (Naureen Bakhsh Chaudhry)

Kitchen gardens in Malkapur

Ramai Jagrut Maila Shetakari Samiti, a women farmers' group promoted by the M S Swaminathan Research Foundation helps women by giving them guidance on the importance of a balanced diet and of having a kitchen garden to help enhance the health status of her family members. The project also teaches how to best cultivate vegetables using integrated fertilizers and natural pesticides. Among the women participating in the project, an improvement of the nutritional status due to the consumption of the self-cultivated vegetables was achieved. (Sonali Phate)

Eco-villages in Chandragiri Panchayat

Aragamee entered into dialogue with tribal farmers, to help tribal communities preserve their cropping patterns and produce their own food. In Chandragiri Panchayat, Rayagada District, Odisha farmers identified a need for better governance of commons, improved land use and soil management, moving towards settled cultivation, and multi-tier plantations that could provide livelihood support as well as cash income.

Production processes involve minimum or no soil disturbance methods, and Masanobu Fukuoka's principles of no tilling, no weeding, no chemicals, and no pesticides. It is expected that the results will help farmers make a major shift away from slash and burn cultivation, and leading to a rejuvenation of tribal eco-systems, and improvement in quality of life within tribal communities. (Vidhya Das)

Underplanting of paddy with fodder species

R. Stennett advocated the underplanting of paddy with fodder species so as to get more forage in the stubble after the paddy had been harvested. The main problem faced during the implementation of this approach was the cultural change and social discipline involved in getting all the farmers to undertake the same practices and to share equitably the improved feed for their livestock. (John Weatherhogg)

Propagating local cow pea varieties cultivated by the Tribal groups in Kerala

FAO supported a project to propagate the growing of cow peas by women farmers in Kerala. The project purchased seeds from those already growing the peas and supplied them to other women. It also constituted a revolving fund, giving loans for cultivating this local variety. The response was very positive with more and more women starting to show interest in the cultivation. (James T.J.)

Success with salt tolerant sweet potatoes

In order to provide assistance to the areas hit by the 'Super cyclone' in Odisha in 1999, ICAR scientists developed a salt tolerant β -carotene and anthocyanin rich sweet potato which is currently gaining popularity not only in coastal belts of Odisha but also in hilly areas across India. (Archana Mkhherjee)

Helping overcome the effects of Cyclone Aila

After cyclone Aila hit Parganas of West Bengal, the soil was damaged due to deposition of salt on the farm soil and as a result for 2-3 years the farmers could not raise crops. The Mennonite Central Committee in India with collaboration of the Canadian Food Grain bank and the Rural Development Foundation have undertaken saline soil reclamation work. The project also worked on rain water harvesting structure and supply of saline-resistant crop seeds. In addition it formed self-help groups, identifying women leaders and provided them training on micro finance and micro enterprise development followed by micro finance support. (Pabitra Paramanya)

Fortified rice in Bangladesh

To address the micronutrient deficiency of zinc which is prevalent in Bangladesh, the Global Alliance for Improved Nutrition (GAIN) has enriched rice, a staple food in the country. Enriched rice can fit into traditional consumption patterns as it involves limited behaviour change on the part of the consumer and can take advantage of current supply and distribution channels.

GAIN engaged in a series of comprehensive nutrition and market-feasibility studies to assess the effect that particular modifications to the rice value chain would have in improving the nutritional density of rice. Amongst the concepts studied, fortifying rice during the soaking process has shown to have a significant effect on the nutritional quality of rice such that it warrants further investigation and validation. At the same time, preliminary market-feasibility research identified several constraints that must be further tested in field and industrial settings. (Debashish Chanda)

Examples of integrated agriculture

- Farmers in Odisha cultivate paddy straw mushroom between two rows of coconut plants. This is the most common and popular farming system in coastal Odisha especially in Puri district.
- Farmers in Dhenkanal have shown interest in popularizing off-season mushroom cultivation under Bamboo based poly houses
- Planting Babul (*Acacia nilotica*) trees along the farm boundary with the paddy has enabled to increase the production and productivity as well as ensuring nutritional security of livestock, (Manoj Kumar Behera)

Hydroponics and stitching in urban slums

SAFWCO successfully introduced hydroponics in an urban slum in Hyderabad Sindh, inhabited by minority ethnic community-Hindus. The project also imparted female households members with vocational training (stitching) and provided them with sewing machines to earn their livelihoods. (Wajid Pirzada)

Purchase for Progress (P4P) in Afghanistan

In Afghanistan WFP's Purchase for Progress (P4P) initiative supports linkages between smallholder farming and nutrition, with an emphasis on soya production and by supporting millers to produce fortified flour while buying smallholders' crops. To complement this, a mobile factory has been introduced to produce High Energy Biscuits (HEB) for sale on the local market and use in WFP emergency responses. The biscuit factory is sourcing part of the soy and wheat from smallholder farmers participating in P4P. (Chelsea Graham)

Cultivating mung beans in Bangladesh

BARI Mung-6 is a high yielding, short duration, synchronous maturing, and disease resistant variety of mung bean which can be grown on fallow fields after the harvest of the main crop. By including mung beans in the cropping pattern, soils benefit from N-fixation while communities can benefit from improved access to food, and enhanced employment opportunities. (Omar Ali)

Smallholder poultry production in Afghanistan

The Government of Afghanistan is promoting smallholder poultry production as a means of poverty alleviation and food security and gives special emphasis to disadvantaged groups and less favored areas.

The Backyard Poultry development project, funded by IFAD through RMLSP of MAIL, trained 5000 vulnerable rural women in improved family poultry husbandry and organized them in 101 Farmers Organizations called Village Poultry Producer Groups (VPPGs). (Mohammad Jafar Emal)

Curbing post-harvest losses

Food losses in South Asia are known to be on the order of 30 to 50%. Investments in time and money that are made to increase food production without paying attention to the postharvest practices that can reduce losses often will result in wasted resources.

Empowering women in the postharvest technology sector can improve nutrition for them and their families. "Panchayat and Economic empowerment of rural women by hands on Training" by NagaLaxmi M. Raman* and Neeru Dubey give some indications.

<http://iasir.net/AIJRHASSpapers/AIJRHASS14-205.pdf>

Supporting women farmers for better nutrition in Bangladesh

IFPRI researchers at the Policy Research and Strategy Support Program (PRSSP) in Bangladesh have designed a pilot study to identify actions and investments in agriculture that can leverage agricultural development for improved nutrition and stimulate pathways to women's empowerment within agriculture. The pilot project focuses on strategic choices in high-value agricultural production (high-value food commodities are also usually rich in essential nutrients such as vitamins and minerals) and in developing "nutrition-sensitive value chains".

The modalities are:

1. *Agriculture Production*: Facilitating the production of the high-value food commodities that are rich in essential nutrients. The focus would be on diversifying agricultural production (fruits and vegetables; pulses; oilseeds; and poultry, dairy, fish, livestock).
2. *Nutrition behaviour change communication*: Conducting high-quality behaviour change communication (BCC) training to improve nutrition.
3. *Gender Sensitization*: Undertaking gender sensitization activities that lead to the improvement in the status/empowerment of women. (Akhter Ahmed)

Supporting women-headed household on water management

LEDARS provided training to 220 women-headed households on effective water management and giving support to farmers to excavate 54 small ponds, re-excavate 2 canals to reserve rain water, install deep tube-wells, and distributes saline and drought tolerant paddy and vegetables seeds. (Mohon Kumar Mondal)

Fertilizer deep placement for better nutrition

Fertilizer deep placement (FDP) has the potential for increasing yields while lowering pollution and reducing costs.

In 2013, IFDC partnered with the Walmart Foundation to bring best farm management practices, including FDP technology, to 40,000 Bangladeshi women farmers. The goal is to empower women to grow and market more nutritious, high-value vegetables and fruits. This crop diversification provides variety for primarily rice-based diets, which inherently lack balanced nutrients necessary for human health. Income increases for women farmers utilizing FDP in vegetable crops have averaged U.S. \$202 per farm per season to date. (Courtney Greene)

2. Are you aware of a tested or untested innovation in Africa or other world region that could be introduced or adapted to the South Asian region and has the potential to improve nutrition outcomes in the South Asian context?

Working with Community Based Solution Providers

The USAID Feed the Future project in Yaajeende, Senegal applied a Community Based Solution Providers (CBSP) approach, which uses a network of community-based service providers and volunteers to sell and promote nutrition-sensitive products, services, and training. The CBSPs are selected by the communities where they live and provide or facilitate access to services and credit by working with larger input suppliers and financial institutions. The CBSPs buy in bulk and facilitate group purchases and access to credit in order to reach more vulnerable households with limited assets and purchasing power. (Madeleine Smith)

Field nutrition schools

Field nutrition schools train trainers chosen among the rural population. They pass information on more nutritious recipes using local products and better food preparation to young mothers/pregnant women and men. (Jerome Bossuet)

Dimitra Clubs

The Dimitra Clubs follow a gender-sensitive participatory approach implemented by FAO and have been set up in isolated and remote rural communities of Sub-Saharan Africa (DR Congo, Senegal, Niger, Burundi, and Ghana). These clubs are groups of women, men and young - mixed or not, who organize themselves to bring about changes in their community by facilitating a more gender-equitable access to productive resources, information, services, markets and agricultural innovations.

In Niger, a group of women's members of the Dimitra Clubs obtained a 99-year land lease contract of almost 3 ha of arable land, which allows them to grow nutritious crops and vegetables to feed their families and to sell on the market. (Ghady Chedrawi)

Fruit and vegetable production in women cooperatives in Kenya

A project funded by the Centre for Higher Education of the United States Agency for International Development enabled over 2000 rural Kenyan women farmers to produce nutritious fruits and vegetables. The intervention also helped cooperatives of women to add value to their produce by processing and locally marketing nutritious, convenient, culturally-appropriate complementary feeds. (Robert Mwadime)

Using water harvesters to improve livelihoods

In semi-arid areas of Africa, access to simple technology for storing water can dramatically improve the lives of people and farm animals.

A study carried out by Compassion in World Farming in the Ethiopian highlands describes mixed farming system where water harvesters have been used to lift farmers from requiring food

assistance each year, to being fully independent, productive and self-reliant for food most years. The food security, nutrition and financial status of these small-scale family farmers have been advanced dramatically through this simple, low cost, easy to maintain technology. It may be adaptable to benefit other semi-arid areas. (Emily Lewis-Brown)

Producing mangosteen capsules

Micro-entrepreneurs in the Philippines managed to harness the vitamins and minerals from mangosteen, and provide them in capsule form. Mangosteen has proven to be rich in anti-oxidants and tannins that can have beneficial effects on the organism. The mangosteen capsules could be procured almost everywhere but prices are still not affordable for the poor. (Aimée Hampel-Milagrosa)

Farmer Field Schools form livestock keepers and mothers

The project "Agriculture and Food Security Project" funded by Global Agriculture and Food Security Programme (GAFSP), aims to integrate crop, livestock and nutrition for synergistic effect.

The project makes use of Farmer Field Schools to increase the knowledge and skill base of farmers and women who are involved in the small-scale farming. Farmers are informed about the importance of animal source proteins and micronutrients and mothers are trained on how to establish home nutrition gardens and poultry at a demonstration field known as "village model farm".

In addition, the groups are reached by regular household visit where they discuss maternal, infant and young child feeding practices. (Sumit Karn)

Free range chick for better nutrition

On a farm just outside Beijing, a slower-growing, dual purpose traditional free range breed of chicken is used to rear male chickens for meat and females primarily for eggs before being used for meat at the end of their laying lives. Research shows that chicken and eggs from free-range and slow-growing breeds are of higher nutritional value than those from intensive farming of fast-growing breeds. Meat from male chickens also has superior nutritional value. (Emily Lewis-Brown)

3. Among these innovations, are there any interventions in agriculture that might also help to reduce the likely impact of multiple environmental changes on agricultural production in South Asia?

Forests as sinks for greenhouse gases

Forests as a sink for greenhouse gases have a key role in climate change mitigation and can help reduce the associated risks including around food security and nutrition. (Wajid Pirzada)

Promotion of nutritious and climate-resilient crops

Funds need to be allocated to promote nutritious and climate resilient crops like millets, sorghum and grain legumes that are key for dryland farmers. A more diversified farming system (rotation) and growing more water-efficient crops will also improve the management of water and soil resources. (Jerome Bossuet)