

Nutrition-Sensitive Interventions and Agriculture Value Chains: Preliminary Lessons from Feed the Future Implementation in Four Countries

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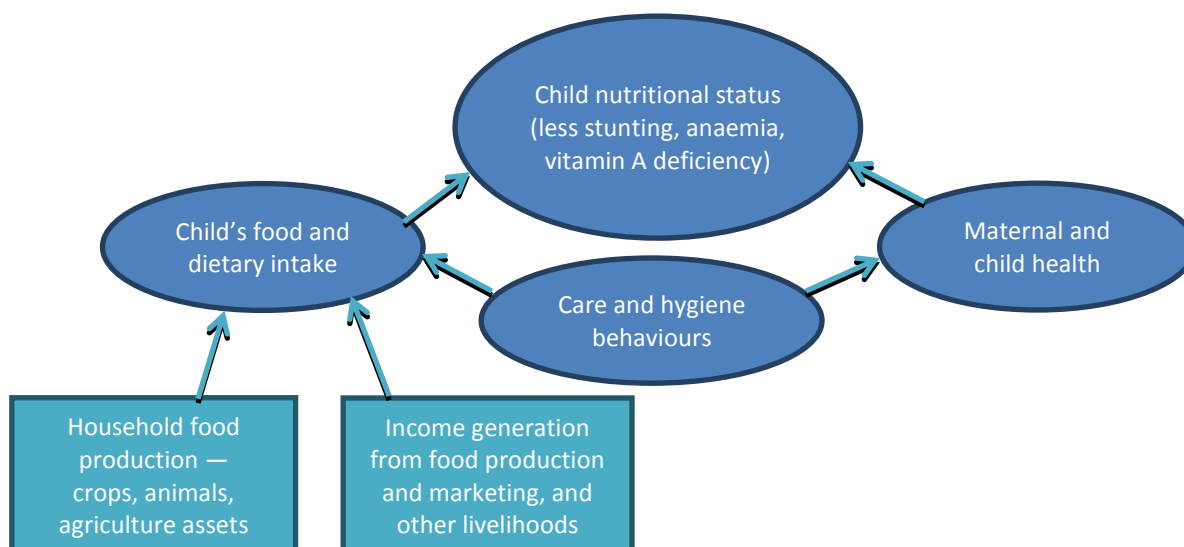
In this paper we draw preliminary lessons from four large, three- to five-year-long, agriculture value chain projects being implemented by DAI among smallholder farmers with varying degrees of nutrition sensitivity. The projects are located in the Democratic Republic of the Congo (DRC), Liberia, Malawi, and Tajikistan, and are supported by USAID and the U.S. Government's Feed the Future (FTF) initiative. Each is expected to improve productivity and incomes for between 250,000 and 400,000 households in implementation areas with populations of up to 3 million. In these projects, we are applying new principles of nutrition sensitivity (Herforth et al., 2012) across previously stove-piped agriculture and health-nutrition programmes and beneficiary groups.

The FTF initiative provides an unprecedented opportunity to explore how to enhance nutrition outcomes in agriculture programmes. On the basis of several years of experience with FTF, we are now in a position to reflect on lessons learned for the design and implementation of FTF processes, particularly as they apply to the agriculture and health sectors. In this paper we highlight intervention entry points for improving nutrition through agriculture, describe the four projects, and draw out initial recommendations.

ENTRY POINTS FOR NUTRITION-SENSITIVE AND NUTRITION-SPECIFIC INTERVENTIONS

Figure 1, below, shows entry points for agriculture and other interventions to improve the quantity and quality of household food consumption, children's dietary intake, and nutritional status. Adapting from the UNICEF nutrition framework (1990) and *Lancet* series nutrition-sensitive nutrition framework (Ruel et al. 2013), the nutrition variables in oval shapes show that children's nutritional status is determined by their dietary intake and their health, both of which involve critical care behaviours such as breastfeeding and complementary feeding practices; water, sanitation and hygiene (WASH) behaviours, and healthcare-seeking behaviour. Variables in the square shapes show the two key aspects of the agriculture and food security system that contribute to a household's access to food: household food production and income. Income is also often needed to access healthcare. Each set of variables represents entry points to influence outcomes for the next stage. This figure illustrates the approaches of the four FTF projects in the context of nutrition-sensitive and nutrition-specific interventions. Not shown in the figure, but expected in the long term, is that improvements in child nutritional status will contribute to improved learning and performance in school, and higher productivity in adulthood, ultimately building a workforce that can increase food production and income generation.

FIGURE 1: ENTRY POINTS FOR INFLUENCING CHILD NUTRITIONAL STATUS



NUTRITION-SENSITIVE ACTIVITIES IN THE FOUR COUNTRY PROJECTS

The four FTF projects have mandates consistent with national policy to:

- Increase agricultural and livestock productivity through use of improved inputs and techniques
- Reduce post-harvest losses through storage and processing technologies
- Grow and husband a nutritious variety of plant and animal food sources
- Increase incomes from off-farm livelihoods and from sales of surplus food production through improved market access

These objectives are pursued through the promotion of key value chains in each country.

To improve nutrition outcomes in the four projects, agriculture value chain activities include:

- Agriculture demonstration plots with a variety of vegetables for home consumption and sale
- Nutrition education to promote dietary diversity
- Incorporation of food and nutrition-hygiene messages into agriculture training
- Demonstration of labor-saving technologies
- Fortification of flours and processed foods
- Scaled up cultivation of biofortified crops
- Analysis of options for processed complementary foods for young children

An overview of the improved outcomes sought in the four FTF country projects is summarised in Table 1 and described in more detail below.

TABLE 1: NUTRITION-RELATED OUTCOMES SOUGHT IN THE FOUR FTF PROJECTS

Improved Outcomes Sought	DRC	Liberia	Tajikistan	Malawi
Household food production	x	x	x	x
Income generated via food production and marketing or other livelihoods	x	x	x	x
Child’s food and dietary intake			x	x
Maternal and child health and care behaviours				x

In the Tajikistan and Malawi cases, nutrition-specific interventions such as promotion of exclusive breastfeeding for a child’s first six months were also mandated. In Malawi, improvement of nutrition clinical services within the health system is mandated so that all three nutrition-specific interventions for reducing child stunting and underweight—involving children’s food, care, and health—are addressed, in addition to many of the nutrition-sensitive interventions related to the food component. (Key activities for each project are outlined in the text boxes below.)

OBSERVATIONS AND RECOMMENDATIONS ON IMPLEMENTING NUTRITION-SENSITIVE AGRICULTURAL PROGRAMMES WITHIN THE FTF INITIATIVE

The FTF initiative provides an unprecedented opportunity to explore how to enhance nutrition outcomes in agriculture programmes. Aligned and consistent with national policy, and marked by a high degree of agency backing, FTF has a conceptual framework, robust requirements for monitoring and evaluation, a learning agenda, and incentives for performance. Given the limited experience and data on improving nutrition through agricultural programmes, it is important in the initial phase of FTF to get the design and implementation processes right. To this end, we offer the following observations and recommendations.

1. DEFINE AND USE A LEXICON OF COMMON KEY NUTRITION AND AGRICULTURE TERMS

Nutrition terms have various meanings and nutritionists and agriculturists may use them differently. Nutritionists may refer to child nutritional status, for example child stunting, as an impact indicator for FTF. They may also refer to exclusive breastfeeding of children aged 0–6 months and good complementary feeding of children aged 6–24 months. A nutrition intervention may involve direct distribution of iron tablets to reduce women’s anaemia or of vitamin A capsules to children. These are predominantly nutrition-specific interventions. When agriculturists speak of nutrition, on the other hand, they may be referring to healthy foods; that is, increasing the nutritive quality of the diet, especially ensuring adequate protein, vitamin, and mineral intakes (through, for example, food fortification). They may also be referring to ensuring adequate food consumption to reduce hunger, which is also considered a food security intervention. These are predominantly nutrition-sensitive interventions. It is useful to understand the larger picture, and then segment it into discrete parts at the nexus of nutrition and agriculture. For example, the nutrition topic can be segmented into dietary diversity, anaemia, vitamin A deficiency, child stunting, adolescent nutrition, nutrition during pregnancy, and other factors; agriculture can be segmented into productivity, storage, processing, marketing, food access, and so on; and, at the nexus, FTF programming can be segmented into food consumption, dietary quality, hunger, and so forth. To achieve clarity on the aspects of nutrition that can be improved, FTF programmes should first articulate their full lexicon of terms, and then use that lexicon to specify project objectives. The potential objectives and outcomes become clear and feasible as the parts are divided into segments that can be understood, planned, and implemented.

2. UNDERSTAND THE SECTORS' DIFFERENT APPROACHES TO TARGETING

Agricultural value chain projects have various target beneficiaries. Those people with the spirit and circumstances allowing for entrepreneurial and risk-taking business behaviour are often targeted at project onset as early adopters and first beneficiaries, such as model farmers and small business entrepreneurs who can demonstrate the economic potential and feasibility of project interventions like new seeds and new food processing techniques. Middle and late adopters will benefit as they decide to adopt new products or behaviours, often after observing results among the early adopters. The early adopters may be better off economically and less vulnerable than the late ones, but over time benefits accrue across the spectrum of beneficiaries. The approach to targeting in a public health nutrition setting is different. Project beneficiaries are usually the most vulnerable populations, such as mothers with undernourished children who might benefit from health and nutrition services or education and behaviour change communication. An additional aspect of targeting is that the systems used to reach beneficiaries are quite different. The public health system has a wider reach, extending to the general public, whereas the agriculture extension system has limited reach, and to private sector actors, like farmers and suppliers. Both the agricultural and nutrition approaches to targeting are useful to their objectives, but can cause confusion when trying to design nutrition-sensitive agricultural programming. Clarity about beneficiary targeting at the design phase is recommended, so the points for complementarity among the approaches and beneficiaries can be identified, e.g. women playing key roles in both nutrition and agriculture (see #10 below).

3. RAISE AWARENESS ABOUT NUTRITION IN COUNTRIES AMONG STAKEHOLDERS

Global awareness of nutrition among policy makers and other influential figures is on the rise, due to advocacy by the Scaling Up Nutrition movement, the 1000 Days initiative, the UN REACH initiative, and others. Within FTF itself, several years were spent designing how to include nutrition in the new global FTF agenda. Now this process is extending to agency offices and ministries in the FTF countries, where the potential for agriculture to improve diet and nutritional status must be compellingly argued anew. Advocacy is needed to get nutrition-sensitive activities on the agriculture agendas of the agency and local ministries, and needed on a continual basis to keep it there. To some stakeholders, projected school performance and adult productivity and wages make the case; to others, addressing undernutrition in young children is simply the right thing to do. Once nutrition is established on the policy agenda, its advocates must find a balancing point where any new nutrition activities seem doable (specific and feasible) yet not overly simplified (e.g., not a single intervention).

DRC – Food Production, Processing and Marketing (FPPM) project, 2011–2016

FPPM assists smallholder farmers in the districts of three provinces of western DRC that have the most potential to supply Kinshasa and other western Congo cities with plentiful, affordable, and nutritious food. The five-year FTF-aligned project's priority commodities are cassava, maize, and legumes such as peanut, soya, and niebe. The project seeks to increase yields of cassava and maize while addressing post-harvest elements of the value chains, including transport, post-harvest storage, processing, and marketing so that minimal food is lost and income from sales is optimised. Farmers are encouraged to operate like businesses, minimising risks and maximising returns to the land, labor, and capital they use to produce, store, process, and market their products, and to develop farmers' business management capacity accordingly. Key nutrition-sensitive activities of the project are listed below.

- Cassava, maize and legume value chains:
 - Increase production and income among smallholder farmers
 - Establish the transport system so harvested food can be moved to Kinshasa and other cities in western DRC
 - Promote diversified diet from own consumption or purchases
 - Distribute HarvestPlus biofortified planting materials
 - Iron-rich bean seeds
 - Vitamin A-rich cassava planting materials
 - Conduct market tests of nutritional products and support promotion of composite flours, fortified foods, and complementary (weaning) foods
 - Strengthen business capacity of food companies making nutritious foods (e.g., taste tests, packaging)
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4. DESIGN SPECIAL STUDIES TO UNDERSTAND HOW NUTRITION-SENSITIVE AGRICULTURE CAN IMPROVE NUTRITION

Practitioners have only limited experience promoting a nutritionally diverse, tasty, safe, and affordable diet along the so-called “farm-to-fork continuum.” Various aspects of this continuum from crop to food to diet require further exploration and deeper experience. How, for example, does producing and marketing crops in particular ways influence food consumption and the diets of rural and urban people who are vulnerable to undernutrition? Answers to these types of questions will contribute to the global learning agenda, deepening our understanding of how the agriculture-nutrition conceptual frameworks will function and deliver in practice.

One way to deepen our understanding is to experiment with strategies and activities under more controlled circumstances before scaling up. Both the experimentation and the scale-up could occur within the framework of the large-scale project. For example, if productivity, processing, and marketing of crops chosen as value chains is a focus, but it is not clear if these efforts are reducing hunger and leading to greater year-round access to food, the incidence and prevalence of hunger in select sites over several lean seasons could be studied, including: 1) Are the hungry targeted by the project’s main activities, or are they outside the target group? 2) When productivity of the value chain crops increases, how is the surplus distributed—own consumption, sold to market? Studies should emphasise the process, exploring not only *if* certain relationships among variables and actions occur, but *how* and *why* they occur, and under what circumstances.

Within FTF, conducting studies to understand *how* approaches to nutrition-sensitive agriculture can improve nutrition will fit within the mandate of FTF projects that are intersectoral, including agriculture and nutrition objectives like in Malawi INVC. When a FTF country supports sectoral-based projects, with the nutrition project separate from the agriculture one (or more traditionally with the nutrition objectives contained within a health project), studies to understand the effectiveness of intersectoral approaches are less likely to fit. It is recommended that more FTF projects include both agriculture and nutrition objectives, providing an intersectoral environment for investigating the effectiveness of different nutrition-sensitive agriculture approaches for improving nutrition.

Liberia – Food and Enterprise Development (FED) project, 2011–2016

FED is working with U.S. Government partners, the Liberian public and private sectors, and other donors to invest in agriculture in Lofa, Nimba, Bong, Grand Bassa, Margibi, and Montserrado counties, with a focus on four value chains selected as having the greatest potential to alleviate poverty and end undernutrition: rice, cassava, vegetables, and goats. FED’s primary goals are commercialising the four value chains and improving rural household food security. The project is focused geographically, on corridors and high-potential locations, and technically, addressing the major bottlenecks along the value chain. FED is strengthening the value chains’ input supply, production and productivity, post-harvest processing, and trade and marketing to increase the sustainable and economic production of food and goats in Liberia. Its nutrition activities are expected to provide Liberian households with access to more and more diverse food (improving quantity and quality). Key nutrition-sensitive activities of the project are listed below.

- Rice, cassava, high-value vegetables, and goat value chains:
 - Increase production and income among smallholder farmers
 - Support small and medium-sized enterprises in food preservation
 - Encourage home storage and processing
 - Add value to commodities (for example, small-scale cassava flour milling)
 - Explore small-scale fortification with flour milling
 - Promote diversified diet from own consumption or purchases
 - Nutrition assessment and gap analysis
 - Identify gaps in nutrition programming for USAID-FTF-Liberia that could be filled through support from health and agriculture programming
 - Enhance household dietary diversity
 - Incorporate dietary diversity and nutrition-hygiene messages in agriculture training and extension
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5. CAPTURE CONSUMPTION AND DIET BENEFITS AMONG URBAN CONSUMERS

In DAI's FTF projects in DRC, Liberia, Malawi and Tajikistan, technical support for increasing agricultural productivity is directed to farmers in the rural areas, and their households are the only populations monitored. Meanwhile, an implicit goal of each project is to increase the food being sold into the markets of one or more major *urban* areas. However, nutrition outcomes are not monitored there. While the rural farmers are intended to benefit by being able to sell a greater amount of produce, urban consumers will benefit from greater food supply, hence lower prices. It is recommended that as part of its learning agenda, FTF also assesses consumption and dietary diversity benefits to urban consumers.

6. UNDERSTAND THE MULTIFACTORAL NATURE OF REDUCING CHILD STUNTING

As shown in Figure 1, child growth and development, as summarised in the child stunting indicator, depend on multiple factors in the realms of food, care behaviour, and health. Young children might be fed well, but might still experience diarrhoea, pneumonia, or malaria that stunts their growth. Thus, any one of multiple factors could be the limiting one. The implication is that each set of interventions is necessary but not sufficient for assuring good child nutritional status, growth and development by itself. Thus, agriculture programmes on their own cannot be expected to reduce child stunting, but can contribute to more and better food and diets (Masset et al., 2012). Understanding the multifactoral nature of child stunting is critical to setting realistic objectives and assessing success by aligning the right indicators to them.

Malawi – Integrating Nutrition in Value Chains (INVC) project, 2012–2015

INVC assists smallholder farmers in seven districts in Central Malawi to harness their commercial agriculture potential, which is expected to increase their incomes and improve the household's diet and the women and children's nutritional status. Priority commodities are soya, groundnuts, and dairy. The project supports elements all along the value chains, increasing farm-, firm-, and industry-level competitiveness. INVC supports the Government of Malawi, which has for years co-located and integrated its agriculture and nutrition functions. Together, the government and INVC will enhance agricultural productivity, agro-enterprise profitability, and nutritional outcomes. Key nutrition-sensitive and –specific activities of the project are listed below.

- Soybean value chain
 - Increase production of soy to use and sell for animal feed, cooking oil, corn-soy blend in relief efforts, and roasted flour for complementary foods
 - Increase income for smallholder farmers
- Groundnut value chain
 - Increase production for diversifying household consumption and selling to markets, paying particular attention to reducing aflatoxin contamination
 - Increase income for smallholder farmers
- Dairy value chain
 - Increase production and incomes
 - Improve transport to improve food safety and reduce losses
 - Influence perceptions and demand for milk as nutritious food (formative research, behavior change communications [BCC], community groups)
- Home gardens
 - Facilitate and promote cultivation and consumption of nutritious crops
 - Promote dietary diversity
- Nutrition-specific activities
 - Promote vitamin A supplementation and deworming via health days and clinic services
 - Facilitate use of growth monitoring and promotion of young child feeding, WASH, and child growth
 - Analyse production options for processed complementary foods for young children
- BCC strategy to promote practices in the agriculture and nutrition realms, for nutrition-sensitive and nutrition-specific objectives

A unique feature of the INVC model is its combination of the Care Group, focused on behavior change and nutrition guidance, with farmer organisations where agricultural knowledge is shared. By marrying these two organisational approaches and integrating agriculture and nutrition knowledge, INVC aims to deliver technical assistance and BCC leading to both increased household income and improved child nutritional status.

7. MANAGE THE NUTRITION-SENSITIVE AGRICULTURE MANDATE

Within the FTF initiative, each country's FTF programme decides the number of projects it will support to achieve its local contribution to USAID's global agriculture and nutrition impact objectives. It might decide to divide the agriculture and nutrition components into separate projects or combine them into one. Depending on the design, nutrition-sensitive agriculture must be managed accordingly. If the agriculture and nutrition objectives are contained in one project, DAI or other implementing partners manage the nutrition-sensitive agriculture mandate and nurture the intersectoral relationships, as in the Malawi INVC project. If the nutrition and agriculture mandates are in separate projects, FTF manages the alignments between the agriculture and the health-nutrition projects and their funding streams, as in the DRC, Liberia, and Tajikistan FTF projects. Lessons from each of these approaches to managing the nutrition-sensitive agriculture mandate, including the funding streams, should be analysed and documented and the lessons applied to future projects.

8. CAPITALISE ON AGRICULTURE'S ECONOMIC APPROACH WHEN CONSIDERING NUTRITION

The agriculture sector views its efforts largely from an economic perspective. How can crop and livestock productivity be enhanced? How can income be maximised and losses minimised? Where are the markets and how can farmers' produce reach them more easily? How can price information flow to farmers most expeditiously so it can inform their decisions from inputs to crop choice to selling to processing? What are the optimum circumstances for exporting food versus selling it locally? This is different than the approach to good health and nutrition as a public good. To capitalise on this economic perspective, nutrition-sensitive agricultural efforts should consider when and where to promote business options, as in food processing. The DRC, Liberia, Malawi, and Tajikistan FTF projects are providing technical support for the development, testing, and sale of food storage and food processing supplies and techniques. Economic benefits accrue to less post-harvest crop loss and more jobs and income from food processing. Public health benefits accrue to access to safer and more nutritious food (because it is processed and preserved, and could be fortified), possibly at lower prices (less post-harvest loss leading to greater supply). Beyond food processing, FTF agriculture projects are also applying business approaches toward public health nutrition benefits, as these examples show:

Tajikistan – Family Farming Project (FFP), 2010–2014

FFP assists smallholder farmers in the Tajikistan's Khatlon Oblast to improve food security by increasing production and reducing post-harvest losses; raise household income levels from the sale of surplus or processed food; and improve food utilisation, especially for young child feeding, by introducing better home economic practices. The four-year project shifted focus in its final year to contribute to food security by developing public and private organisations to manage on-farm irrigation water, but in its early years the project provided agriculture planning, extension, and marketing advice to farmers, as well as nutritional consultation at the household level. On home garden demonstration plots, nutritionists chose vegetables and other crops for their nutritive value and agriculturists demonstrated approaches to increase the productivity of crops and of milk yields from cows. The fruit and vegetable value chains selected by FTF did not drive the project objectives. Key nutrition-sensitive and –specific activities of the project are listed below.

- Nutrition-specific activities
 - Provide nutrition trainings for maternal and child feeding, care, and WASH practices
 - Research perceptions of child feeding and growth
 - Provide tools and incentives for nutrition behaviour change, including distributing recipe books and hosting nutrition education events at schools
 - Homestead food production – crops and livestock
 - Promote dietary diversity through crop diversity (for example, kidney beans, pumpkin, peanuts)
 - Provide training at demonstration home gardens on post-harvest food processing and agriculture extension services
 - Household economics
 - Conduct qualitative research on household economic decision-making, including how women plan for irregular remittances from husbands
 - Demonstrate features and benefits of household economic planning tools and resilience strategies
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- Using value chain analysis in the Malawi project to consider reaching 6-24 month old children with market-based fortified complementary (weaning) food products, as we did earlier in Nepal (Magnani et al., 2013)
- Considering the nutritive value of vegetables, in addition to their end-market demand, in the Liberia project when selecting vegetables within the horticulture value chain
- Taking an intersectoral approach to implementing the homestead demonstration gardens of the Tajikistan project -- project nutritionists chose nutritious crops to demonstrate cultivating and canning, while project agriculturists advised on enhancing productivity.

In short, agriculture and its economic perspective can contribute to nutritional benefits in a variety of ways that should be explored further.

9. DESIGN VALUE CHAINS FOR GREATER CONSUMPTION OF ANIMAL-SOURCE FOODS

Animal-source foods – such as meat, milk, eggs, insects, and fish -- are an important ingredient of a diverse, high-quality diet, especially for young children, because these foods are rich in essential nutrients needed for child growth and development. Without animal-source foods, children frequently do not take in adequate iron and are often anemic. Animal-source foods are often available in markets, and are generally preferred foods, so the main constraint to their consumption is usually the high price relative to other foods. Animal-based value chains have been chosen in some FTF countries, yet consumption by targeted beneficiaries is limited. In Liberia, goats are one of the target value chains, but goats tend to be kept by the beneficiary households as an asset to be sold when needed for cash, and only eaten occasionally. In Malawi, dairy is one of the target value chains, but most milk is sold into the urban market. To allow more nutritional benefit through consumption of animal-source foods, other animal-based value chains should be considered so that more of the animal source food can be consumed.

10. LEVERAGE THE UNIQUE POSITION OF WOMEN FARMERS AT THE NEXUS OF NUTRITION AND AGRICULTURE

Women are the primary caretakers of their children. For the youngest, most dependent children, this responsibility involves breastfeeding, preparing and feeding complementary (weaning) foods, seeking preventive health care such as immunisations and vitamin A supplementation, and treating sick children. In some cultures, women have their youngest children with them at all times, even when farming or doing other work. Rural women also tend to do a lot of agricultural work, and though they may not have significant influence on the agriculture resource decisions, they tend to be in the fields extensively. Thus, they are the lynchpin between their households' nutrition and agriculture, a unique position that should be leveraged. (Leveraging means being strategic about women's time and roles, not necessarily targeting women with more work, since they already balance their time and energy between nutrition, agriculture, and other responsibilities.) In DAI's Malawi programme, women who lead community care groups (which complement the efforts of community health workers) are the same women who serve on district committees of the national farmers' association, providing a bridge for cross-fertilisation and innovation that spans agriculture and nutrition. This simple alignment helps to make nutrition-sensitive agriculture a reality.

LOOKING FORWARD – ADDITIONAL CONSIDERATIONS

The recommendations discussed above pertain to changes that could enhance results within the FTF framework as it exists today. The following additional observations and recommendations could inform future iterations of FTF.

11. ADOPT DIETARY GUIDELINES AT THE COUNTRY GOVERNMENT LEVEL

As dietary diversity and quality win more attention as one of the lynchpin variables linking nutrition and agriculture programme objectives, it is clear that the lack of a common understanding in many countries

about what constitutes a healthy diet constrains public health and agriculture planning. National dietary guidelines could fill this gap by providing recommendations on the quality and quantity of ingredients in the diet and their relative proportion, focusing on local foods as preferred ingredients. The World Health Organisation's global dietary strategy could be used to guide the development of national dietary guidelines (WHO 2004).

12. ADDRESS OVERWEIGHT AND OBESITY SIMULTANEOUSLY WITH UNDERNUTRITION

In many FTF countries, the prevalence of overweight and obesity in women (and also men) is approaching or is as high as the prevalence of underweight in women or stunting in young children. In addition, the prevalence of overweight in children under five years has begun to increase (6% in developing countries in 2015, up from 4% in 1990; UNICEF et al. 2012). As a major contributor to chronic, non-communicable diseases such as cardiovascular disease, stroke, diabetes, and hypertension (Murray et al. 2012 and Lim et al. 2012, WHO 2004), these conditions have already begun to take a toll on countries' health budgets. Since diet quantity and quality are common factors influencing overweight and obesity, as well as undernutrition, healthier diets should be promoted with both conditions in mind.

13. PROMOTE PRODUCTION OF SAFE, DIVERSE, ACCESSIBLE, AND AFFORDABLE FOODS THAT ARE ALSO NUTRITIOUS

Ultimately, if the economic objectives of the agriculture sector could be aligned more closely with the public health nutrition objectives of the health sector, a set of foods could be produced and promoted that is nutritious as well as safe, tasty, diverse, accessible, and affordable (Nugent et al. 2012). Such foods could contribute to reducing undernutrition as well as overweight and obesity.

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