

SYNTHESIS OF GUIDING PRINCIPLES ON
AGRICULTURE PROGRAMMING FOR NUTRITION

FINAL DRAFT



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February 2013



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ACRONYMS

Organizations

ACF (Action Against Hunger International)
AED (Academy for Educational Development)
AGRA (Alliance for a Green Revolution in Africa)
BI (Bioversity International)
BMGF (Bill & Melinda Gates Foundation)
CCRP (McKnight Foundation Crop Collaborative Research Program)
CGIAR (Consultative Group on International Agricultural Research)
DFID (UK Department for International Development)
EC (European Commission)
FANTA (Food and Nutrition Technical Assistance - USAID)
FAO (Food and Agriculture Organization of the United Nations)
GAIN (Global Alliance for Improved Nutrition)
HLTF (High-Level Task Force on Global Food Security of the United Nations)
HKI (Helen Keller International)
ICRW (International Center for Research on Women)
IDS (Institute for Development Studies, University of Sussex, UK)
IFAD (International Fund for Agricultural Development of the UN)
IFPRI (International Food Policy Research Institute)
IYCN (Infant and Young Child Nutrition – USAID)
SC (Save the Children, UK)
UN SCN (United Nations Standing Committee on Nutrition)
USAID (United States Agency for International Development)
WB (World Bank)
WFP (World Food Programme of the UN)
WV (World Vision International)

Other

Ag2Nut CoP (Agriculture-Nutrition Community of Practice)
ASF (Animal-source food)
CAADP (The Comprehensive Africa Agriculture Development Programme)
IGA (Income-generating Activity)
M&E (Monitoring and Evaluation)
NARS (National Agricultural Research Stations)
PRA (Participatory Rural Appraisals)
SUN (Scaling Up Nutrition)

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INTRODUCTION AND PURPOSE

Since the food crisis in 2008, the L'Aquila commitments to agriculture - as well as increased investments in agriculture from multilateral development institutions and foundations - have led to increased funding and human resources for agricultural development, and in particular that focused on smallholder and women farmers. At the same time, the Scaling Up Nutrition Framework for Action (2010) and Road Map (2011) have also placed an emphasis on the need for urgent investment to reduce malnutrition, and the United Nations Committee on World Food Security (CFS) is developing a Global Strategic Framework for Food Security and Nutrition (2012). National governments and operational staff have also increased their requests for assistance and guidance from the international development partners on *what to do* to improve nutrition impact from agriculture. For example, since the inclusion of nutrition as Pillar 3 in the CAADP, African nations are seeking improved knowledge and capacity in this area.

The main underlying determinants of adequate nutrition are access to adequate nutritious food, healthy environments and access to health services, and adequate care practices for children and mothers. In turn, these underlying causes are affected by an array of basic causes, such as the political environment, gender equity and economic resources.¹ Therefore, nutritional improvement will come from approaches within many sectors that aim to impact the underlying determinants of nutrition - or "nutrition-sensitive" development - in addition to "nutrition-specific" approaches that directly affect the immediate determinants of nutrition (food intake and disease).² Agriculture is of fundamental importance to human nutrition, both as a direct determinant of household food consumption and through its role in livelihoods and food systems. There is a growing understanding that agricultural development provides an obvious and needed entry point for efforts to improve nutrition. At the same time, agricultural investments targeted to smallholder farmers are more likely to succeed if they address the human capital constraints due to malnutrition.

In the last few years, there has been heightened interest in leveraging agriculture to maximize nutrition impact. Many development institutions have published guidance notes about linking agriculture and nutrition, mainly intended to assist programme planners to understand and implement the linkages. Several other institutions have released public statements of their own approach to maximize nutrition impact through agricultural programmes. Development institutions have also sponsored literature reviews, community dialogue and research programmes to investigate the best strategies based on evidence and experience.

This synthesis aims to provide an updated and complete list of current guidance, institutional strategies and other publications released by international development institutions and inter-agency UN bodies on maximizing nutrition impact through agriculture, and provides a summary of the key messages currently available. The purpose of this paper is to provide accessible information on what the international development community is saying on this topic, to underscore key points of emerging consensus and to expose differences that may be potentially confusing to implementers or which offer opportunities for further refinement of guidance and strategies. The main audience is country-level policy-makers and programme planners; a secondary audience is the international development community, which has an opportunity to amplify key messages that have been voiced independently by separate institutions. In alignment with the Rome Principles (2009), this synthesis helps to foster strategic coordination among institutions and to strive for comprehensive, sustainable agricultural, food security, nutrition and rural development programmes.

1 UNICEF Framework on the Causes of Malnutrition, 1990.

2 These twin approaches are identified in the Scaling Up Nutrition Framework for Action (2010).

METHODS

Selection criteria of resources reviewed:

1. Bilateral, multilateral or NGO publications (no scientific journal articles, abstracts or results of individual studies).
2. Official institutional publications intended for public use (no internal deliberative documents or unofficial working papers).
3. Materials destined for professionals working on agriculture programme design and implementation.
4. Specific focus on agriculture-nutrition linkages (i.e. not nutrition programming in general).
5. Material published since 2008 (although a few exceptions were made where older documents were generally still consistent with the institution's current approach, or more recent material was not available).

Search methods:

1. Listed all organizations with a potential interest in links between agriculture and nutrition, and searched for guidance, with the assistance of the Agriculture-Nutrition Community of Practice (<http://knowledge-gateway.org/ag2nut>) and FAO staff.
2. Collected statements from bilateral, multilateral or NGO leaders given at the IFPRI conference "*Leveraging Agriculture for Improved Nutrition and Health*", New Delhi, February 2011.
3. Where organizations with a known agriculture-nutrition work programme did not appear to have published statements, contacted key informants to ask for links to published statements.
4. Contacted the Agriculture-Nutrition Community of Practice (Ag2Nut CoP) and FAO staff to review the list, and incorporated publications that were missing.

The complete list of documents identified is found in [Annex 1](#). A total of 53 publications have been identified to date; 31 development institutions have published guidance, a statement or explorations of the evidence linking agriculture and nutrition.³ The documents identified were then categorized into five groups:

- **Guidance notes.** The characteristic feature of a document categorized as a "guidance note" was its emphasis on general principles for maximizing nutrition impact of agriculture, supported in many cases by specific examples of actions.
- **UN inter-agency guidance.** These were categorized separately because they reflect co-signed consensus across many multilateral organizations. These included the UN Standing Committee on Nutrition (SCN) and the UN High-Level Task Force on Food Security (HLTF).

³ The institutions include: A2Z (USAID-funded project now closed), ACIDI/VOCA, ACF, AED (now closed), AGRA, AVRDC (The World Vegetable Center), Bill & Melinda Gates Foundation, Bioversity International, CGIAR, Concern Worldwide, EC, DFID, FANTA (USAID-funded project), FAO, Fintrac, GAIN, HKI, ICRW, IDS, IFAD, IFPRI, IYCN (USAID-funded project now closed), The McKnight Foundation Crop Collaborative Research Program, Save the Children UK, USAID, World Bank, WFP, WorldFish Center, World Vision International, UN HLTF and UN SCN.

- **Manuals.** These focused on specific operational steps within recommended actions. Two documents were cross-filed in both the “guidance note” and “manual” category; they were both entitled “manuals,” but placed significant attention on stating and describing overarching principles as well.
- **Statements and strategies.** These were documents that publicly outlined the approach of an individual institution to incorporate nutrition into agriculture, but that did not aim to give general comprehensive guidance on linking agriculture and nutrition.
- **Other.** Highly relevant published institutional documents that did not fall into any of the above categories were placed in the “other” category. These included four commissioned literature reviews, a community conversation and a research programme.

This synthesis paper includes only the 20 documents categorized as “guidance notes” and “UN inter-agency guidance,” published by 12 institutions. It also briefly compares the summary institutional guidance of four agency-commissioned literature reviews (in the “other” category) which provide information on how the recommendations align with available evidence.

All identified guidance documents were read thoroughly and coded for themes. The minimum inclusion criterion for a theme was that it was mentioned by at least three organizations. Combining and splitting themes was an iterative process. A list of potential themes was generated and populated with quotes, which then were analysed and sometimes combined or separated, based on how much material was available for each potential theme, and how much the material overlapped with other potential themes. The final list of 20 themes is based on an inductive process that resulted in messages that were conceptually distinct, although often somewhat overlapping (e.g. ensuring equitable access to resources and empowering women). There were several other potential themes which were not included, due to scant mention or excessive overlap with other themes:

- investing in infrastructure (included in “policy coherence” and “marketing opportunities”);
- food price policy (included in “policy coherence”);
- population and environmental policies/issues (both included in “policy coherence” and/or “natural resource management”, depending on the nature of the quotes);
- social protection components to programmes (included in “multisectoral collaboration” and “policy coherence”, depending on the nature of the quotes);
- food safety (mentioned by five institutions; recommendations fell under the principles of “post-processing”, “nutrition education” and “governance”);
- financial incentives for including nutrition objectives (discussed explicitly only by IFPRI; included in “multisectoral collaboration”); and
- budgeting (discussed only by ACF).

Resilience and mitigating risk was a cross-cutting, recurring theme integrated throughout many other themes. Many organizations recommended actions to increase resilience and mitigate risk, which is particularly important in vulnerable populations. Every recommendation around resilience, however, overlapped with other identified themes. For example, key areas for resilience and risk mitigation include the themes of crop diversification, livelihood diversification, management of natural resources (including climate change adaptation), equitable access to productive resources, seasonality reduction, social protection and infrastructure-strengthening (as a part of policy coherence), and surveillance systems (as a part of good governance for nutrition). Following those identified principles would strengthen resilience and mitigate risk. “Resilience and mitigating risk” was therefore not isolated as an independent theme, but is recognized as an important cross-cutting theme.

Review process

There were three stages of review. The first, described above, consisted of initial inputs from the Agriculture-Nutrition Community of Practice and FAO staff on which documents to include. The second stage involved contacting authors of the guidance notes so that they could check the validity of statements about their publications in an initial draft. The third stage was an open consultation on a final draft for consultation (April 2012), which was shared widely through professional networks, and actively through presentations of the draft (at FAO, USAID, the Association for International Agricultural and Rural Development 2012 Conference, and the Ag2Nut CoP) and solicitations for input from various individuals knowledgeable about the topic. Over 70 individuals representing 30 institutions provided documents or comments during the review process.

SCOPE

As noted above, the synthesis is of guidance published by institutions; it is not a review or synthesis of peer-reviewed journal literature. The review is focused on guidance on development approaches, rather than emergency response.⁴ Most existing guidance documents emphasized programming more than policy, but also included policy recommendations (mostly captured in the “supporting” principles) due to the reality that a given policy environment strongly influences the impact and sustainability of agriculture programming for nutrition.⁵ The primary audience of most existing guidance is actors involved in programming (many were written primarily for their own staff or to guide their own projects/investments), although most documents identify governments and global donors as part of their broader audience (see Table 1). The primary focus of the guidance is on reducing undernutrition, but several guidance notes include overnutrition as a possible nutrition problem discoverable through context assessment, and frame the goal of nutritious and sustainable diets as important for both sides of the dual burden. Similarly, the predominant focus is on improving producers’ nutrition rather than general consumer nutrition, but many organizations explicitly recognize dual benefits for both producers and consumers from the principles (as well as the dubitable dichotomy, since producers are also consumers). The main areas where principles may have different affects if applied mainly for the benefit of producers or consumers are: market or home consumption orientation, choice of crops/livestock for production and targeting.

This review has sought to be comprehensive, but it does not necessarily include all institutional publications relevant to the issue of linking agriculture and nutrition. It did not encompass publications focused on sustainable agriculture or food security with less explicit focus on strategies to link to nutrition, although some of the recommended principles (such as targeting smallholder farmers) may overlap. (Examples include the UK Government *Future of Food and Farming* report, the World Economic Forum’s *New Vision for Agriculture*, and reports of the Global Donor Platform for Rural Development, found in [Annex 2](#)). Likewise, reports focusing on nutrition without explicit linkage to agriculture were excluded, although several also may have contained relevant practical approaches for rural contexts (such as the SCN *Guiding Principles for nutrition policies, programmes and projects in the context of the global crisis*, which overlap to a large extent with the main themes found here).

4 Some of the guidance notes provided advice for reforming food aid, or supporting nutrition during crises: see identified guidance notes by ACF and HLTF, as well as other materials including FAO (“*Protecting and Promoting Good Nutrition in Crisis and Recovery*”, Annex 1), and USAID (“*Delivering Improved Nutrition*”, Annex 2). Of particular note, the UN HLTF documents included had a “twin track” dual focus on meeting immediate needs of vulnerable populations (dealing with emergency food assistance and safety nets), and building longer-term resilience and food and nutrition security (dealing with development approaches). For consistency, this review included mostly the latter (the development “track”) material.

5 The HLTF documents were also unique among all documents reviewed in that their primary focus was policy, rather than programming. However, they also contained significant mention of programming principles which are captured in this synthesis; again because it is difficult for either policy or programming to have an effect without the other. The abundance of policy recommendations from HLTF is briefly summarized in the synthesis sections on “supporting” principles.

SECTION 1: SUMMARY GUIDANCE

The recommendations in the guidance documents were synthesized into a list of 20 main themes, which broadly fit into three categories: (1) planning a programme or policy, (2) main activities (“doing”), and (3) a supporting set of factors based on governance, policy and capacity. These principles were compiled from the 20 guidance documents on linking agriculture and nutrition produced by 12 development institutions: multilateral organizations (FAO, IFPRI, Bioversity International, World Bank); bilateral and bilateral-supported organizations (EC, USIAD’s FANTA Project and IYCN Project); NGOs (ACF, Save the Children UK, World Vision); and inter-agency UN bodies (UN HLTF and UN SCN). A table containing the title, date, purpose, audience and scope of each guidance document is found in [Table 1](#). A list of all documents identified is found in [Annex 1](#).

The following summary is a distilled synthesis of the guidance, followed by a conceptual framework to aid in visualizing the main principles. All information contained in the summary, including sub-points as well as main points, has been asserted by at least three institutions. While a minimum of three was the initial cut-off for inclusion, in fact, **all principles were discussed by a majority of the institutions that have published guidance**. Of all 20 principles, eight were discussed by all 12 institutions, and another eight by 10-11 institutions; the remaining four principles were each discussed by at least seven institutions.

Important notes:

- The aim of this review is to present an objective summary and synthesis of existing published guidance. The identified principles (including their descriptions in the summary) do not necessarily reflect the views or priorities of FAO, the author or commenters.
- Further information on each principle can be found in Section 3, “[Synthesis of guidance by theme](#)” – a section that provides a concise summary of information and recommendations for each theme, capturing points raised by individual institutions.
- *Resilience and mitigating risk* was a cross-cutting, recurring theme integrated throughout many other principles (such as crop and livelihood diversification, management of natural resources, equitable access to productive resources, seasonality reduction, social protection and infrastructure-strengthening as a part of policy coherence, and surveillance systems as a part of good governance for nutrition). Following those identified principles would strengthen resilience and mitigate risk.

Main principles from the guidance documents

The identified principles, including their descriptions, represent existing published guidance and do not necessarily reflect the views or priorities of FAO, the author or commenters.

PLANNING

Best practice principles

- 1. Incorporate explicit nutrition objectives into agricultural projects, programmes and policies.** Traditional agriculture sector goals may have potential to yield nutrition improvements, but evidence and experience shows that explicit nutrition objectives are necessary to guide specific activities and M&E plans which maximize positive nutrition impact and minimize harm.
- 2. Assess the context** to identify nutritional problems and groups most at risk, to understand the causes of malnutrition and constraints to good nutrition, to identify opportunities to address those constraints taking into account local resources and culture, and to build on existing efforts, knowledge and resources. This will maximize effectiveness and efficiency of interventions and reduce negative side effects.
- 3. Do no harm.** Avoid unintended negative consequences through a process of identifying potential harms, developing a mitigation plan, and setting in place a well-functioning monitoring system for timely detection of negative effects. Potential harms could arise from increasing women's workloads, crop choice, agrochemicals, increased agricultural water use and zoonotic disease.
- 4. Measure impact through programme monitoring and evaluation.** Measure intermediate outcome indicators as well as nutritional status impact, to be able to track positive effects and attribute them to the intervention, and to identify and mitigate poor implementation or unintended negative effects. The most commonly-mentioned indicators are dietary diversity scores and stunting.
- 5. Maximize opportunities through multisectoral coordination.** Nutrition improvements depend on many sectors, and translating food security and consumption impact into nutritional status often requires improvements in health, sanitation, and care and feeding practices. Coordination - at least in the planning and review phases, and in the implementation phase where possible - will maximize the likelihood of nutrition impact from agriculture.
- 6. Maximize impact of household income** on nutrition through concerted design efforts, such as through increasing women's access to income-generating opportunities and discretionary control of income.
- 7. Increase equitable access to productive resources** through policies and programmes. At the policy level, pay particular attention to increasing access to land rights and water. Programmes can facilitate access to credit, productive assets, extension services and markets (for women in particular).
- 8. Target** the most vulnerable groups, including smallholder farmers, women and poor/ food- insecure households.

DOING: MAIN ACTIVITIES

All approaches should:

9. **Empower women**, the primary caretakers in households, through: (i) increased discretionary income, especially via increased attention to crops/livestock grown by women; (ii) improving women's access to extension services, financial services, technology, inputs, markets and information; (iii) avoiding harm to their ability to care for children; (iv) investing in labour- and time-saving technologies targeted to women; (v) adding programme components to enable high-quality child care; and (vi) advocating for policies to support women's rights to land, education and employment.
10. **Incorporate nutrition education** to improve consumption and nutrition effects of interventions. Develop a concise set of clear, actionable messages and strategies based on an understanding of local perceptions, and barriers and opportunities to behaviour change. Messages often involve improving food safety, promoting consumption of healthy diets and locally available and nutrient-dense food, understanding nutritional requirements of different family members and care/feeding practices. Employ agricultural extension agents to communicate nutrition messages as feasible.
11. **Manage natural resources** for improved productivity, resilience to shocks, adaptation to climate change, and increased equitable access to resources through soil, water and biodiversity conservation. These provide ecosystem services essential to smallholder livelihoods, water quality and food security.

These can be combined with approaches to:

12. **Diversify production and livelihoods** for improved food access and dietary diversification, natural resource management, risk reduction, improved income and other purposes.
13. **Increase production of nutrient-dense foods**, particularly locally-adapted varieties rich in micronutrients and protein, chosen based on local nutrition issues and available solutions.
 - a. **Horticultural crops** are highly recommended, particularly when combined with nutrition education, to improve year-round micronutrient intake and healthy diet patterns, and to increase income and women's income control. Homestead and market-oriented production are both likely to be positive, in view of nutrition improvement for both producers and consumers.
 - b. Produce **animal-source foods on a small scale**, including fish and livestock, to improve intake of micronutrients, protein and fat; keep production small-scale to avoid harm to the natural resource base.
 - c. Harness the potential of nutritious **underutilized foods** (such as indigenous or traditional crops) which often have high nutrient content and resource-use efficiency, and potential for income-generation.
 - d. Increase **legume** production for their nutritional value (rich in energy, protein and iron) and for their ability to fix nitrogen in the soil, which can improve soil fertility and yield, and reduce inputs.
 - e. Invest in **biofortification** as a complement to other approaches.
 - f. Staple crop production may be necessary but insufficient for addressing undernutrition because of its limited ability to improve dietary diversity.
 - g. Cash crops are viewed as unlikely to improve nutrition on their own, based on the risk of unintended consequences for smallholders, such as a potential reduction in dietary quality for a variety of reasons. Complementary strategies (e.g. diversification) are recommended to go along with cash crop production.

14. **Reduce post-harvest losses and improve processing** to increase and prolong access to and consumption of diverse foods among both producers and consumers, to preserve or increase nutrient content of food, to increase income and profit margins and to improve food safety. Solar drying and fortification are highly recommended processing techniques.
15. **Increase market access and opportunities** to improve smallholder incomes (especially for women) and consumer diets. Tools include farmer associations, improved infrastructure, and social marketing and demand creation for nutritious foods that smallholders may have a comparative advantage in producing.
16. **Reduce seasonality of food-insecurity** through diversification throughout the year, improved storage and preservation, and other approaches.

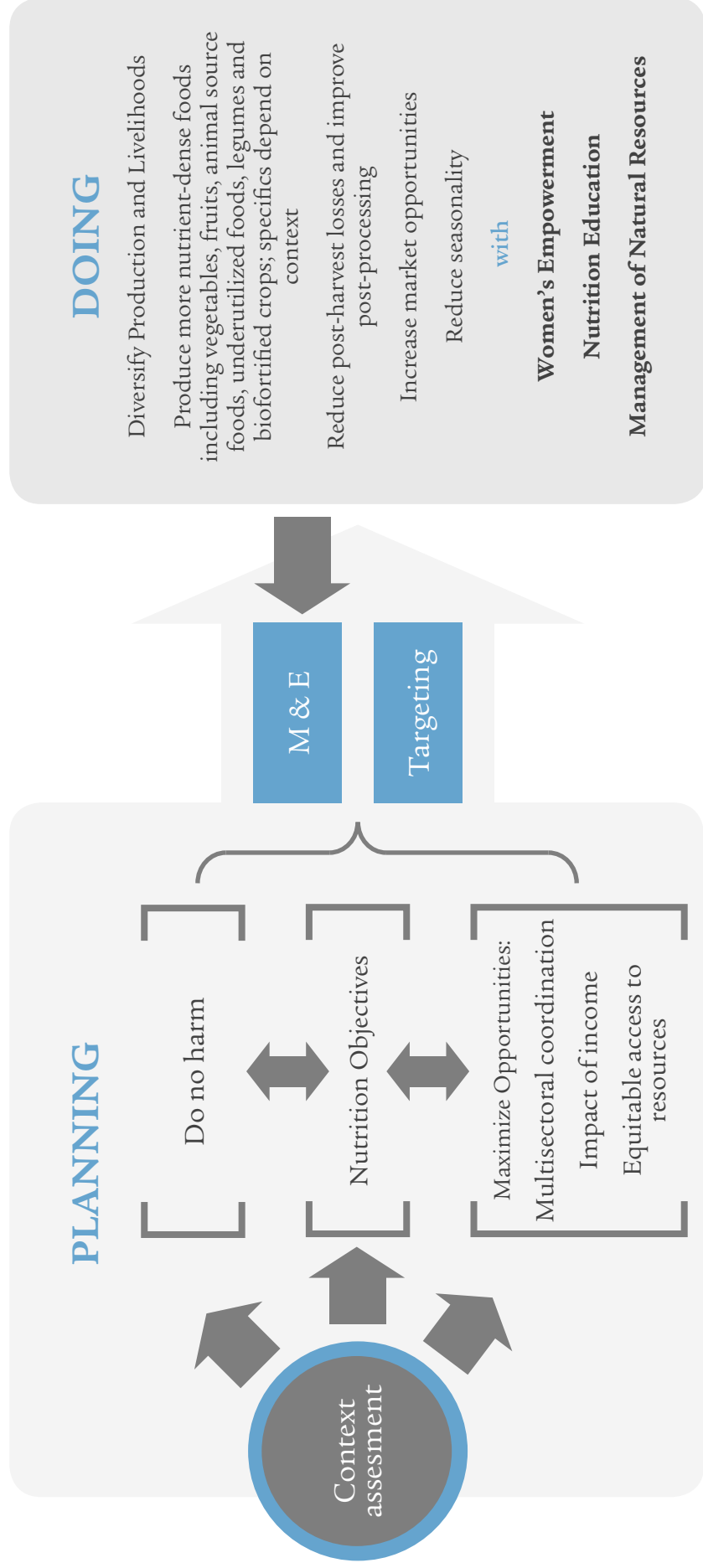
SUPPORTING

Principles that enable programmes to achieve nutrition impact

17. **Improve policy coherence** supportive to nutrition, so that one policy does not work against another policy or programme. Food price policies, subsidies and trade policies sometimes have counterproductive effects on nutrition and may need reform. Pro-poor policies including social protection schemes, land reform and infrastructure-building create an enabling environment for nutrition improvement.
18. **Improve good governance for nutrition**, including leadership and commitment at the highest levels of governments and donors, implemented by drawing up a national nutrition strategy and action plan, allocating adequate budgetary resources, carrying out nutrition surveillance and being held accountable through transparency and nutrition indicators.
19. **Build capacity** in ministries at national, district and local levels, and increase nutrition staff.
20. **Communicate and continue to advocate for nutrition**. In addition to basic awareness-raising on the extent and consequences of malnutrition, disseminate impact results across sectoral, national and institutional boundaries and translate them into policy-relevant messages for effective programme and policy changes.

The overall rationale for the agriculture sector to increase attention to nutrition is based on two main reasons cited in the documents: (1) nutrition is inseparable from goals most agricultural programmes and policies set out to achieve (food security and poverty reduction), and (2) actions to improve nutrition would remove constraints to productivity and income-generation.

CONCEPTUAL FRAMEWORK OF GUIDANCE



SECTION 2: DISCUSSION

MAIN CONCLUSIONS

Current guidance shows a high degree of alignment between institutions. It is striking how much overall agreement there is on main principles for reaching nutrition. This is true even though many institutions published guidance primarily for the use of their staff in their own programmes and investments (see [Table 1](#)). Disagreement by omission was not considered, because of the wide range of length/scopes of the guidance notes (1 to 100 pages), omission could simply have been due to limited page space. The 20 main messages were each supported by a majority of the institutions, not just the minimum of three for inclusion, which demonstrates a strong convergence around a discrete set of principles. Some stakeholders have voiced concern over the empirical evidence base underlying actions to increase nutrition impact through agriculture programmes, but the fact that a majority of international development institutions independently stand behind very similar approaches is itself a strong justification to act on these principles. Policy decisions often must be made without the benefit of indisputable scientific evidence. The status quo continues has been clearly shown to be inadequate for addressing malnutrition, and there is no good argument for inaction when the international development community is so well aligned on many principles which would maximize the nutrition impact of agricultural investments. In addition, there is a low risk that acting on these principles would cause any harm. Many of them are based on ethical concerns and good practices for programming, and the best evidence available. As new evidence is generated from projects implementing the current guiding principles, such guidance may be refined or revised in the future.

Outright disagreement has not been observed for any principle, but there were some differences in emphasis between guidance notes. Specific points where recommendations may differ due to institutional priorities or experience in different contexts are:

- how much to prioritize homestead food production for household consumption or for market purposes, either of which could theoretically result in improved diets for producers.
- Whether the primary aim of nutrition-sensitive agriculture would be the observable impact on individuals within producer households, or contributions to larger-scale food systems to improve nutrition sustainably for the population (or both).
- How to target agricultural interventions to the needs of different livelihoods groups; those that most benefit one group may be slightly less beneficial to another (though double wins may also exist - for example, production by smallholders and processing or retail by landless labourers).
- How much emphasis to place on three kinds of production - in particular (within the recommendations on [what to produce](#)): *staple crops* (because of their utility for energy intakes but potential competition with more nutrient-dense food production), *biofortified crops* (notes were quite positive but several emphasized that biofortification needed to be accompanied with other strategies, with ACF supporting use of only classical breeding methods for biofortified crops), and *animal-source foods* (which have characteristics that may be highly beneficial in some circumstances, and harmful to health and the environment in others).

- How much to depend on agricultural extension agents or programme agents to deliver nutrition-relevant information, and how much to collaborate with or depend on health staff to deliver coordinated messages.
- Whether multisectoral collaboration should involve joint implementation of projects, or simply joint planning and review (e.g. for coordinated messages and referrals).

Comments from partners during the consultation phase echoed these main conclusions. There was unanimous support for the usefulness of a clear set of principles and no commenters raised opposition to the 20 main messages. Comments also revealed the same differences in emphasis apparent in the guidance notes, referred to just above.

- Some commenters working on market-led approaches wanted to see more emphasis on marketing and income-generation and less on small-scale own-production approaches.
- Some partners highlighted the importance of keeping in mind an end goal not just of improved nutrition measurable in the short term, but also of sustainable diets.⁶ Comments indicated that the principle of “manage natural resources” (discussed by 10 of the 12 institutions) should go beyond short-term farm-level natural resource management by encompassing regional and global food systems – especially in light of climate change. If not, efforts would be short-sighted and less effective than necessary to ensure food and nutrition security for all globally, for the long term.
- Some noted that the guidance is geared toward rural contexts (smallholders in particular), and suggested that additional guidance may be needed for agricultural approaches to improving the nutrition of landless labourers and the urban poor.
- Several commenters preferred greater emphasis on diversification; one viewed investment in biofortification as competing with stronger planning and action on diversification, writing: “Diversification in agriculture, retail and distribution, food and consumption systems needs to be maintained, since it seems to be the best way for empowerment of all actors, resilience of the environmental ecosystems, and sovereignty of the developing countries.”
- A few commented that the amount of nutrition information agricultural extension agents can be expected to communicate should be limited, and were sceptical of the approach; others emphasized agricultural extension was an important part of strategies for nutrition education.
- One group communicated a strong preference for multisectoral implementation (not just planning).

⁶ “Sustainable diets” are: “those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.” (FAO, 2010)

ARE THE PRINCIPLES BACKED BY EVIDENCE?

Each institution that produced guidance notes strove to include the best practices based on evidence and experience. Many of them referenced individual studies and recent literature reviews. This section briefly compares the synthesis of guidance (summarized above) directly to the conclusions of literature reviews.

Several major recent reviews of existing literature on agriculture-nutrition linkages have been sponsored by development institutions. In keeping with the methodology of this document to focus on institutional publications, the following four reviews are considered here:⁷ the World Bank's report "*Pathways from agriculture to nutrition*" (2007), a review supported by USAID (through A2Z, hosted at AED) and IFPRI "*The micronutrient impact of multisectoral programs focusing on nutrition*" (2008), IYCN's "*A review of experience*" (2010), and the widely-cited review by Masset *et al.* (2011) commissioned by DFID. A full appraisal of peer-reviewed articles on agriculture and nutrition was beyond the scope of this synthesis document and would also be redundant given the extensive ground these four sponsored reviews have covered.

These literature reviews reached the following conclusions (found by all four reviews except where otherwise noted):

- Impact on nutritional status has been observed in only a very few studies of agriculture programmes, but the lack of observed impact may be due to methodological problems and cannot be interpreted as evidence for no impact.
- Most programmes promoting specific nutrient-dense crops/livestock resulted in increased consumption of those foods by producer households. Few evaluated total diet.
- The few well-designed strategies to increase production and consumption of nutrient-rich food have generally shown evidence of improving micronutrient status, particularly of vitamin A.
- Most studies that have shown nutrition impact to date have attributed it mainly to changes in home consumption of foods produced.
- Nutrition education enhances consumption of own-produced nutritious foods.
- Observed nutrition impact was generally not due to household income, and many studies have documented increased income in the absence of nutrition impact. However, the most relevant income measurements (e.g. measuring total income instead of just income resulting from the intervention, and disaggregating by gender) are methodologically difficult and have not been done well, hampering ability to draw more specific conclusions about the effect of income. The World Bank review covered nutrition impact of cash crop (including staple grain) production and found little impact on nutritional status, positive or negative, despite observed increases in income. The USAID (A2Z) and IFPRI report concluded that the programmes aiming at addressing gender equity issues have shown positive results for women's income. Several past studies were cited that have linked women's income and overall empowerment positively to child nutritional status.
- Three of the reviews concluded that women's empowerment and nutrition education were central to interventions that had nutrition impact. (The review by Masset *et al.* did not attempt to identify intervention characteristics that led to nutritional status impact.)

⁷ The WorldFish Center also sponsored a review of fish projects and human nutrition; because of its limited scope, it is not discussed here.

- Studies showing improved diets were not all able to document improvement in nutritional status. This is due in part to the fact that dietary intake is necessary but not sufficient for child growth and nutrition. The reviews concluded that agriculture programmes may need to be combined with health, sanitation and education elements in order to address the underlying causes of malnutrition and observe impact on nutritional status.
- All reviews suggest that programmes should incorporate explicit nutrition considerations or goals so that they can be designed to enhance nutrition impact.
- The World Bank and IYCN reviews documented cases of unintended harm arising from agricultural projects, including disease risk due to standing or contaminated water use, zoonotic disease, aggravating exclusion of the most vulnerable groups, and negative impacts on women (greater workload and/or reduced equity of income control), which could affect child care and feeding.
- The World Bank, DFID, USAID (A2Z) and IFPRI reviews discussed the importance of effective evaluation for understanding nutrition impact and attributing it to project approaches; the World Bank review also noted effective monitoring as a feature of successful projects, which allowed them to adapt to changing conditions.
- The World Bank and IYCN reviews highlighted cases where more formative research or context assessment resulted (or would have resulted) in better nutrition outcomes.
- The World Bank and IYCN reviews provided evidence from several regions and countries on the effect of food policy, with heterogeneous effects depending on country context and the specific combination of policies. Examples from IYCN included: policies which inflated food prices counteracted agricultural subsidies in their effect on consumption; the effect of producer price supports on smallholders depended on whether the commodity supported was primarily produced by small or larger farms.
- The World Bank review provided analytical evidence of constrained capacity for nutrition analysis at country level, and that support of government nutrition strategies and multisectoral nutrition planning agencies is necessary to provide incentives and accountability for activities that target nutrition outcome.

A limitation of these literature reviews is their exclusive focus on studies measuring nutrition impact in the producer household. They did not evaluate nutrition more broadly in the population; for example, they did not address the affordability of healthy diets, or the double burden of undernutrition and overweight, or the environmental sustainability of diets. This evidence base is probably a major reason for *producers' nutrition* as the primary focus within the guidance documents reviewed in this synthesis.

The principles within the “doing” category are those most amenable to experimental research, and these reviews primarily lend empirical strength to the principles of producing nutrient-dense foods, empowering women and strengthening nutrition education. In particular, there is strong evidence for increasing women’s access to financial resources and linking nutrition education with greater access to nutrient-dense foods (usually through diversification of some sort). Evidence on the effects of diversification per se was not covered in these reviews, but interventions on home gardens and livestock in effect were diversification interventions; i.e. most of the projects which were successful in increasing consumption of nutrient-dense foods supported the production of diverse crops, as opposed to specializing in a single nutrient-rich crop. However, one case study of an approach to increase production of a single vitamin A-rich crop, orange-fleshed sweet potato, showed strong evidence of nutrition impact – partly due to the characteristics of the crop: an ideal complementary food for young children (soft targeting principle) - primarily controlled by women - and also supported by substantial nutrition promotion.

Reducing seasonal food insecurity and improving post-harvest processing generally have not been evaluated in the studies reviewed.⁸ These principles are based on broader evidence that hungry seasons can have long-term impacts on child growth and development, and that, the less food is lost from their harvests, the more food and income farmers have. Nutrition impacts of successful approaches to reducing seasonality and post-harvest losses merit evaluation.

The reviews included only those interventions that aimed at having nutrition impact, and most of those did not focus on marketing. Evidence on nutrition impact of marketing approaches - particularly those dealing with nutrient-dense foods that smallholders or women produce - is therefore limited. The studies of agricultural commercialization discussed in the World Bank and IYCN reviews dealt with cash crops and did not find significant impact on nutrition.⁹

The reviews did not explicitly cover management of natural resources; the effects of an intervention on natural resources and its relationship to nutrition has not been measured in most agriculture projects which aim to achieve nutrition impact. The World Bank review, however, presents evidence from Malawi that a project integrating legumes, primarily for the purpose of restoring soil fertility, also resulted in improved consumption of legumes (and later results provided evidence of improved child growth).¹⁰ The participants' primary motivation for introducing legumes, however, was for food and child nutrition. This provides evidence that interventions to improve ecosystem services can be closely linked with goals to improve nutrition. Direct impact of natural resources on nutrition is most evident for water. There is evidence from irrigation projects that interventions that reduce water quality for consumption can cause increased disease (discussed in the World Bank review, 2007). Other effects of natural resources on nutrition may take longer to document, well beyond programme cycles (e.g. the impact of crop genetic diversity on resilience to shocks). In terms of hard evidence, projects may well be able to achieve nutrition, income and other gains in the short term at the expense of some natural resources. The international development community apparently does not embrace an approach that discounts natural resources, based not on programmatic evidence, but on ethical concerns for equity across populations and generations.

8 One relevant project was discussed in the A2Z (USAID) and IFPRI review: a solar drier project (for vegetables) in Tanzania, which did not generate income but did appear to save women time, and resulted in increased intake of animal-source foods primarily in association with a nutrition education component.

9 The WB review states: "In sum, the case studies documented fairly consistent positive impacts on focus crop production, household income, and food expenditures, but no substantial impacts on young child nutritional status (the main indicator assessed across studies). In one case in which subsistence food production was not maintained, outcomes were worse. DeWalt (1993) concluded that a focus on commercialization per se was misplaced and that impacts on food consumption and child nutrition were determined by control of production and income, allocation of household labour, maintenance of subsistence production, land tenure and pricing policies for both food and non-food crops. Kennedy et al. (1992) also attributed the lack of impact on child nutritional status to the generally high levels of morbidity observed in project areas" ... "The studies therefore suggest that although agricultural interventions that promote commercialization may effectively increase income and food expenditures, they are not sufficient to improve childhood nutrition if they are not complemented by interventions that specifically address other determinants of child nutrition such as improved health, diet quality, child feeding, and other caregiving practices."

10 Bezner Kerr R, Berti P and Shumba L (2011). Effects of a participatory agriculture and nutrition education project on child growth in northern Malawi. *Public Health Nutrition* 14 (8): 1466-1472.

Many of the “planning” and “supporting” principles are discussed as “lessons learned” in the reviews, based on analysis of experimental evidence.¹¹ Of note, however, is that the evidence base for these principles is far wider than just studies specifically on agriculture and nutrition interventions.

The principles in the “planning” category are mostly best practice principles in programmatic work in general - context assessment to design an appropriate programme, having an objective, appropriate monitoring and evaluation to measure the specific objective(s), safeguarding against unintended negative consequences (which have been documented from agriculture; see World Bank 2007, and references within the World Bank guidance note, 2012), and targeting vulnerable groups - are clear programmatic best practices. Their effectiveness will depend on *how well* these principles are implemented by any individual programme.

The principle of multisectoral collaboration is soundly based on the proven multiple causes that influence nutrition: multiple sectors affect the causes of malnutrition (notably health, social protection, education, and water and sanitation), so nutritional outcomes will be maximized if agriculture acts in tandem with other sectors. The effectiveness of multisectoral collaboration in any given project or context depends primarily on the extent to which it happens in reality, rather than in principle. Several individual studies on agriculture-nutrition programmes have highlighted the role of some sort of multisectoral collaboration, such as paired extension agents delivering nutrition messages, or geographic co-location (World Bank 2007); other studies have attributed the lack of impact from agriculture programmes to issues related to other sectors (e.g. Kadila *et al.*, 2000, as referenced by Masset *et al.*: declines in nutritional status among agriculture programme participants were attributable to parasitic infestation). Efforts to collect case studies of effective multisectoral collaboration are ongoing¹², and these may help to provide insight into how governments and programmes can influence this principle for nutrition.

The recommendation to increase income in ways that would more likely affect nutrition (i.e. the effects of household income differ according to who controls it, and other factors such as what form it is in, and how often it is received) has been supported empirically, as discussed in World Bank 2007 (sections on commercialization and women’s income control). This principle continues to be validated with a large body of research on the differential effects of women’s versus men’s discretionary income on young child nutrition and health (see references in World Bank, 2007 and IYCN, 2010).

Increasing equitable access to resources is a principle based on ethics as much as evidence. Issues on land rights and other productive resource constraints appear in the World Bank and IYCN reviews (e.g. vulnerable groups could not benefit if they could not access the inputs, as shown from evidence presented in the IYCN review). The Masset *et al.* study draws attention to this issue by calling for more research to document participation rates by socio-economic status, gender, etc., based on (1) concerns for targeting efficiency (which is taken as a given principle) and (2) knowledge that the poorest households may lack even the most basic capital needed, making it difficult or impossible to participate in agricultural projects aimed at improving nutrition. If they do not participate, nutritional benefits from the project are likely limited.

11 See for example p31-32 and 69-72 in World Bank 2007.

12 See Garrett and Natalicchio, 2011 (IFPRI), and Levinson, forthcoming (UNICEF)

The World Bank and IYCN reviews provide evidence for the important effect of policy on nutrition and on programming¹³; due to contextual differences, specific policies were not identified that could be universally applied for better nutrition. Analysis of constraints due to capacity and governance was presented in the World Bank review¹⁴, which included recommendations for capacity development (such as including nutrition in agricultural training), nutrition objectives for agriculture activities, and multisectoral planning and coordination. According to the experiences of the guidance documents' authors and commenters on this paper, many agriculture programme and policy-makers have low awareness about the causes and consequences of malnutrition, and advocacy and communication would be helpful.

Which principles must be implemented to guarantee success?

There is no one combination of approaches that would be universally applicable or successful.

- The principles in the “planning” category are good practice principles that ensure a well-designed intervention.
- The three principles first underscored in the “doing” category – women’s empowerment, nutrition education and natural resource management – are those which are likely to be important to success in any context. This conclusion is based on the small body of research showing positive impact on diet or nutritional status from agriculture interventions, which consistently include women’s empowerment and nutrition education. (Natural resource management is immediately critical in projects involving water, but also contributes to food and nutrition security over a longer period in all projects.) Other main programmatic activities recommended (such as crop diversification or post-harvest loss reduction) are likely to have effects that differ by context and the factors which limit food security and nutrition.
- The “supporting” activities may be critical for implementation or sustainability - but are often difficult to change from a programme perspective. Their importance would be highly context-dependent, based on limiting factors to nutrition within a given context.

The need for each principle depends on the context, including what actions would eliminate barriers to good nutrition, and what actions are possible given local and institutional resources. In most cases, it is unlikely (or exceedingly difficult) that all 20 principles could be achieved within a single programme. However, the most successful examples in existing experimental evidence frequently apply many of the principles at once. It stands to reason that the more principles are applied, the better the chance of positive nutrition outcomes.

13 See p3-6 of the IYCN review and p43-57 of the World Bank Review.

14 See “*Institutional frameworks for action in the agriculture sector to address undernutrition*” (p58-68)

Which type of agriculture programme should integrate nutrition considerations?

The guidance is most easily applied to community-level projects, focused on impact for vulnerable households employed in agriculture. It is also clear from the guidance, however, that all agriculture programmes or projects should at least assure that harm to nutrition is minimized (for all stakeholders, including farm owners, labourers and consumers), suggesting that nutrition-sensitive agriculture should at least follow the principles of “do no harm” and “M&E.” Therefore, at least for avoiding harm, “nutrition-sensitive” thinking should not only be applied to miniscule proportions of overall investment, but should also be mainstreamed into all agriculture programmes and planning. This is pertinent particularly if “food security” is a goal.

Guidance is needed on methodology and evaluation tools for generating new evidence

Among the partner consultations to this report there was resounding support for the monitoring and evaluation principle, and for generating more and better quality evidence on agriculture programming for nutrition. Evaluation of impact needs to be rigorous and well designed in order to reach credible and useful conclusions. Communication and tools for current best evaluation practices need to be made available to researchers in order to avoid the methodological problems of some of the previous research (as thoroughly described in Masset et al.). Furthermore, while the need for “evidence” in agriculture-nutrition linkages is a common statement, both the approach for generating evidence and the type of evidence needs need to be clarified. What is acceptable and relevant to agriculture professionals is often quite different from what is acceptable to the health sector. For example, health professionals may call for randomized controlled trials to verify impact on nutritional status, while agricultural professionals may prefer less costly observational approaches, and to seek evidence on the trade-offs or co-benefits with economic outcomes. Whether key indicators should be limited to nutritional status, and/or more direct outcomes such as food consumption and women’s discretionary income, is not clear in the discussion (see guidance on indicators in the [M&E section](#)). A clearer vision is needed on key research questions and key indicators, along with methodological support and evaluation tools. Commenters particularly noted the need for documenting and testing programme impact pathways which were relevant to programmatic contexts (highlighted in the ACF guidance document). They also suggested that assessing different programmatic aspects separately (e.g. education intervention) may be useful to identifying the most cost-effective package of interventions.

WHAT IS MISSING FROM THE CURRENT GUIDANCE¹⁵

Increased collaboration with agriculture professionals

While the recommended principles are well-founded from a nutritional point of view, greater collaboration with agronomists, agro-economists and other professionals from the agriculture sector would be helpful in refining them and making them more actionable. So far most of the authors of these guidance notes are based in nutrition. Increasing the substantive contributions from the agriculture side may result in guidance that speaks the agriculture “language” and is more aligned with the main priorities and incentives of professionals working in the agriculture sector. For example, only three notes mentioned [market viability](#) as a criterion for production choice – which, next to yield, is a fundamental principle for the agriculture sector. Nutritionists may wish to increase guidance on how to increase market viability of certain nutritious foods, e.g. indigenous or biofortified crops, so that agriculture professionals are better able to act on advice to promote them. A greater inclusion of agriculture staff may prompt wider discussion of production/income/nutrition trade-offs and co-benefits, at the same time exposing any misalignment in preferred approaches to reach nutrition. For example, in the Inter-agency Report to the G20 on Food Price Volatility (June 2011), agricultural economists from FAO, IFAD, IMF, OECD, UNCTAD, WFP, the World Bank, WTO, IFPRI and the UN HLTF offered annexed advice on increasing the resilience of agriculture through nutrition, and discussed only biofortification as a strategy, specifically dismissing dietary diversification strategies as being too long-term. That is the opposite of what the guidance notes emphasize; they offer multiple strategies to achieve dietary diversity and consider biofortification a complementary approach. Nutritionists need to work together with agriculturalists in a sincere and open dialogue about how to combine priorities and approaches, and to raise awareness about the determinants of malnutrition and best practices to achieve nutrition results; advice that pervades the guidance notes. This process, of course, requires partnership from the agriculture side as well, which may be gained through continued [communication and advocacy](#) about nutrition.

Comments from various partners indicate that engagement with agriculture professionals needs to happen at both country and institutional levels. It seems there is somewhat of a chicken-and-egg problem regarding country-led and donor-supported action. The World Bank guidance note stated that country client demand for improving nutrition is one of the most important factors for increasing financing for nutrition-sensitive development; lack of country demand has a resonating impact on the priorities of agencies’ country-level managers as well as senior management. On the other hand, HLTF wrote that official development assistance “has an important role to play in supporting the case for catalyzing and then accelerating necessary increases in national spending.” In other words, raised commitment and capacity at country level would be crucial for donors to invest in nutrition-sensitive agriculture; and at the same time, global agencies also have an indisputable role in dialogue and capacity development.

15 This section incorporates views expressed by commenters who responded during the open consultation process.

Further guidance on improving market access for smallholders

One area that would particularly benefit from agriculture sector input is the recommendation to increase marketing opportunities. Most guidance notes discussed the importance of livelihoods and increasing [market access](#) for vulnerable farmers. The call for market access is based on concerns about equity as well as income-generation. Some partners, however, saw too little emphasis on marketing in the guidance, and too much on small-scale solutions. The comparison of guiding principles with evidence is one explanation for this apparent leaning: many guidance notes explicitly sought to be evidence-based and the best evidence has come from small-scale production such as homestead gardens, especially if they include nutrition education or promotion. Where the nutrition effects of commercialization have been examined, commercialization was based on cash crops or staples, and generally resulted in no nutrition impact, either positive or negative. Almost all guidance notes strongly endorsed the need for increased market opportunities – but focused on an approach qualitatively different from a traditional cash cropping approach.

Recommendations for marketing approaches with nutrition as an explicit outcome focused on: (1) nutrient-dense foods, and (2) commodities for which vulnerable groups (especially smallholders and women) have a comparative advantage in producing and marketing. Market opportunities were viewed as a way for producers to increase income, as an incentive to grow nutritious and underutilized foods, and as a way to increase consumers' access to nutritious foods. Recommendations were also centered on improving equity or levelling the playing field; whereas traditional commodity “cash cropping” often gives a comparative advantage to larger farms and to men, the focus of increased market opportunities should be specific to women and smallholders in particular (e.g. indigenous crops). The guidance talked about the usefulness of social marketing and demand creation to help bring about market opportunities. In the area of marketing nutrient-dense foods that give a comparative advantage to women and smallholders, there are relatively few documented experiences to date - an area where the literature could be vastly enhanced.

Therefore the lack of more comprehensive marketing recommendations should not be interpreted as a lack of support for the principle, but rather as a lack of expertise and experience in successful approaches with nutrition as an explicit outcome. Apart from often focusing on cash crops for marketing, the agriculture sector, for reasons of efficiency in its use of resources, has in the past tended to assist vulnerable households in subsistence/home production activities, because investing in market access programmes is too risky or too involved. In many cases, smallholders need intensive training in business principles such as budgeting, production calendars and consumer demand. They may also need lengthy assistance from projects to broker deals with lucrative markets, in part because large buyers may not be willing to consider contracts with smallholders without an insurer, and smallholders may not be able to survive financially due to infrequent payments. There are a host of marketing problems which marketing specialists and agricultural economists are best equipped to handle. Investing in market access assistance for smallholders, especially for nutrient-dense foods they have a comparative advantage producing, is an important topic that needs further discussion and partnership with the agriculture sector. One commenter wrote of looking forward to efforts “to engage those of us in the agricultural community through a market-related focus.”

Evidence for approaches to reduce both poverty and malnutrition efficiently

Some commenters were concerned that the approaches emphasized in the guidance are not most efficient for poverty reduction (and that poverty exacerbates malnutrition). Much of the guidance arose from the mirror image concern: that poverty reduction approaches in agriculture are not necessarily most efficient for malnutrition reduction (and that malnutrition exacerbates poverty). The most relevant research should seek to identify approaches that reduce both poverty and malnutrition. Relatedly, research should seek to identify diversification strategies that improve incomes; diversification is commonly recommended on the grounds of nutrition improvement, economic gain and risk reduction.¹⁶

Further considerations for reducing post-harvest losses

Commenters suggested more attention should be given to aflatoxins in relation to cultivation and food storage practices, marketing and potentially regulations, based on emerging knowledge about its prevalence and apparent negative effects on child growth. (Some existing guidance notes discuss aflatoxins briefly.) Also, improving infrastructure for refrigeration may be a critical need for ensuring that farmers can successfully market nutrient-dense foods.

Stronger and clearer guidance on food price policies, with attention to the nutrition transition

Another area that would benefit from more concrete and specific guidance, based on interaction with agricultural economists, is on food price policies and other food and agriculture policies in the “[policy coherence](#)” theme. Most smallholder farmers, a commonly recommended target population, are net buyers of food; and urbanization is accelerating. The relative prices of foods affect the likelihood of consuming a diverse diet; more work is needed on elasticities of demand for nutritious foods, supply constraints, and effective food policies and regulations to improve dietary quality. Given that the reality of many low- and middle-income countries is that substantial proportions of their populations are both underweight and overweight (with overweight increasing), guidance will need to move towards addressing both nutritional problems in order to avoid harm. There is a growing body of policy-oriented literature aimed at reducing overnutrition through food policy (see, for example, the Foresight Project, Chicago Council and PROFAV documents referenced in Annex 2), but so far this literature has been substantially overlooked by institutions focusing on development in low-income countries.

¹⁶ Note from a contributor: “A specific challenge is that food and market demands (and social mores) often induce people to focus on staple crops. Consequently, inordinate amounts of time and labour are dedicated to those. Unless these pressures are reduced, that pressure (e.g. via policy change, other market opportunities, labour-reducing technologies, nutrition promotion, etc.), increasing focus on other crops is difficult.”

Stronger emphasis on environmental sustainability of approaches

Some partners highlighted the importance of keeping in mind an end goal not just of improved nutrition measurable in the short term, but of sustainable diets. This concept is captured to some extent within the principle of “managing natural resources” – which has been discussed by 10 of the 12 institutions – because the livelihoods, food production and disease exposure of farmers is closely connected to the natural resource base. Recognizing ecosystem services as the foundation for nutrition, comments from partners indicated that the “natural resources” principle should go beyond short-term farm-level natural resource management, encompassing regional and global food systems – especially in light of climate change that will increase vulnerability of farmers. (This was especially clear in the HLTF documents.) If not, efforts may prove to be short-sighted and weaker than necessary to ensure global and long-term food and nutrition security.

Costing

Costing of recommended interventions is currently missing. The most important costing may be for agriculture programmes that include nutrition objectives, for planning and budgeting purposes. Cost benefit analyses that look at the effects of “option A” (an approach with nutrition considerations) and “option B” (a standard approach) would also be helpful. Neither pure costing nor cost benefit analyses¹⁷ have been done with agriculture objectives in mind; even Save the Children UK did not attempt to cost its agriculture recommendations within the guidance note “*An eight-step, costed plan of action*”.

Effective delivery of nutrition education/behaviour change within agriculture

Many guidance notes recommended agricultural extension agents as a channel for nutrition-relevant information, but depending on agricultural extension agents for the array of nutrition messages recommended may not be feasible; greater attention is needed as to who will deliver [nutrition education](#) in the context of agricultural programmes, and on what messages they should focus. More evidence and experience from various contexts would be useful in identifying effective combinations of delivery channels, including not just who conveys the information but how it is done. Further, relying on agricultural extension agents requires that there are sufficient numbers in the first place. In many countries, there are not. An enhanced role of agricultural extensionists in nutrition education probably needs to be combined with advice on how to increase funding allocations for agricultural extension in general. This includes better quality of training, including nutrition, as well as more personnel (see [capacity-building](#)); increased remuneration may in some cases to offer an incentive for skilled people to join and to provide high-quality assistance.

17 Credible cost-benefit analyses have been done for biofortification, reaching the top of the Copenhagen Consensus list (2008) for the outcome of improved micronutrient intake. An initial cost benefit analysis of HKI’s Homestead Food Production model in one region of Bangladesh estimates an economic rate of return of 160 percent (Annex 2).

The guidance provides some information on “how” nutrition education or behaviour change communication can be carried out effectively (beyond the “what” messages and “who” delivers them), but this aspect is critical. (For example, this may be accomplished through dialogue and negotiation, barrier analysis, social mobilization, exploration of motivations, demonstration and modelling, mutual support and peer education, hands-on practice and feedback - small steps in the existing systems that influence nutritional change.) A few partners emphasized that behaviour change is a social phenomenon – that social barriers or supporters affect whether change occurs, so education often needs to go beyond messages to individual households. It also can be directed at consumers to increase market demand for nutritious foods (as noted in the WB guidance note). There is substantial experience on effective social and behaviour change communication that would bring important insights to operationalizing the “nutrition education” recommendation.¹⁸

Considerations for avoiding unintended disempowerment of women

Two areas related to [women’s empowerment](#) lacked a full discussion of potential consequences that could unintentionally result in disempowerment for women. One was promoting market-oriented production of women’s crops (e.g. horticultural or indigenous crops) for the purpose of empowering women through enhanced income-generation, which may lead to the unintended consequence of shifting control over the crops to men. This has sometimes been observed in practice, but how to ensure that women maintain production and income control, even when yields and profits increase, was not discussed within the recommendations. One possibility is that nutrition education – recommended by all institutions – and extension can address roles and responsibilities of men and women. They can highlight the benefits to the household from women’s income, and of women taking a more proactive role in maintaining their control over production and sale. Context assessment may also prove useful for exploring the likely impact of marketing women’s crops.

The universal advice to recognize women’s role in providing child care also requires careful operational thought and action. While the guidance generally was very supportive of approaches which allow women to participate in economic opportunities at the same time as feeding their children well, there is a fine line between protecting women’s ability to care for their children and prioritizing child care over other choices women may make. Similar to anti-discrimination and maternity leave policies in high-income countries, it is important that the recommendations avoid an unintended consequence of projects passing over women for lucrative opportunities because they are assumed to be unable to take them on due to child care. Successful approaches that increase women’s economic empowerment while maintaining or improving child care practices need to be documented.

18 Some tools are included in Annex 2 under “nutrition education”; USAID-funded SPRING is also working to pull together existing tools, and the forthcoming guidance document by the McKnight Foundation CCRP focuses on lessons learned in behaviour change within their agriculture programmes.

Overcoming inadequate support for context assessment, efforts to avoid harm and multisectoral collaboration

Although the recommendations stressed the importance of [context assessment](#), currently it is rare to find adequate funding, staff and time for achieving that goal in most programmes. Interventions are frequently designed in proposals without a comprehensive understanding of cultural context and opportunities for collaboration with existing initiatives. Requests for proposals may need to be reoriented to commit more funding, time and staff to context assessment before the programme begins. Some existing tools describe participatory methods for rapid assessment at low cost¹⁹, and these methods may increase willingness of donors and programme staff to invest in context assessment. Local NGOs sometimes specialize in participatory assessment, and large donor projects could sub-contract them for the purpose of context assessment. Improved access to information on the existence and capacity of local NGOs would be helpful. One NGO that commented emphasized the need for farming systems analysis and research to design appropriate and effective interventions.²⁰

The recommendation to [do no harm](#) was almost universal, and processes to operationalize that advice have advanced recently. While the guidance notes listed many general categories of harm (such as reductions in women’s time), this recommendation is difficult to generalize because it is context-dependent, and a likely harm in one place may be a non-issue elsewhere. More work is needed to help agriculture projects predict potential harms for their specific region and project, and to incentivize that thoughtful process in the planning and monitoring stages.

There are also inadequate incentives to [collaborate multisectorally](#). All guidance notes were supportive of multisectoral collaboration, at least in the planning stages of projects. Although the guidance notes fully acknowledged the difficulty of collaboration, advice was generally weak on improving incentives for effective collaboration, even in the planning stages. FAO’s “*Joint Planning*” document (in the “Manuals” category) offers operational guidance for a workshop approach, and is an important tool to accompany the advice.²¹

Emphasis on university training to build capacity

One of the main principles was to build capacity in governments by increasing nutrition personnel within ministries, or at least increasing agriculture-nutrition training for existing personnel. Commenters pointed out that it would be difficult, however, to find professionals who can bridge nutrition to agriculture because there are so few professionals globally with that skill set. Higher education needs to address this gap. Multi-sectoral programs on food and nutrition security are needed in universities, and the technical training in agriculture degree programs should revolve around the overall goal to improve food security: consistent access to nutritious diets. This kind of training would help to increase the number of people able to support agriculture-nutrition linkages in ministries and national and international agricultural research centres.

19 For example, see ACF and FAO manuals in [Annex 1](#), and other tools such as the RAP guide in [Annex 2](#).

20 Examples include: (1) in areas with high rainfall at harvest time, where groundnuts are often consumed: there is a high risk for aflatoxins. Train beneficiaries on reducing risks. (2) Home vegetable gardens: difficult if livestock roam freely around the village. (3) Animal protein and milk: need to increase fodder production before introducing animals. See FAO guide on farming systems: http://www.fao.org/farmingsystems/description_en.htm

21 There is also a new IFPRI book: “*Working multisectorally in nutrition*” (Garrett and Natalicchio, eds., 2011).

Guidance specifically targeted to government audiences

The guidance here has been mainly written for programming (often the primary audience was staff within the authoring agency). Some re-writing or revision may be needed to speak directly to a government audience. Many of the principles are, however, directly relevant to government ministries: the governance, policy and capacity themes (and part of the equity theme) are geared toward governments, and many of the other principles can be reformulated as policies that would enable and incentivize all of those actions (e.g. policies to promote diversification). Commenters pointed out the need for more policy guidance at the sub-national, local level, where programmes are implemented.

Clarity on targeting

Some commenters saw a conflict between targeting either agricultural or nutrition criteria. The relatively low focus in the guidance on lifecycle stage for targeting efforts (only three guidance notes suggested targeting young children) differs from the overwhelming focus on the “1 000 days” in nutrition community – such as in the SUN Framework (2010) and Road Map (2011) and the 1 000-days movement – referring to the period of conception to a child’s second birthday where damage due to nutrition is largely irreversible. Setting criteria in agriculture programmes which include only households with pregnant women and young children would be logistically and ethically problematic. “Targeting” in the guidance, however, can also refer to soft targeting, or programme design characteristics which reach vulnerable groups within households (e.g. producing crops or livestock products that can be easily used as nutritious complementary foods for young children).

Participatory development, ownership and programme sustainability

A theme highlighted by commenters was the need for participatory development and building ownership in communities. As one commenter wrote: “health ownership is a cardinal point of health promotion: that is, the ability of individuals and communities to act for themselves and to undertake some of the essential educational process – looking after their own needs, deciding on a range of actions, providing social support, monitoring what they do and measuring impact for themselves.” This is related to ensuring programme sustainability. Several guidance notes did discuss community involvement and ownership during programme design and even monitoring (see context assessment synthesis: one purpose is to initiate a process of inclusion). This seems to be an important point of the “how” or the process of nutrition-sensitive agriculture to ensure uptake, impact and continuation of new practices and behaviours.

Increased accessibility and generation of “how-to” knowledge and case studies

Overall, the guidance notes provide a comprehensive, well-founded set of principles for maximizing the nutrition impact of agricultural policies, projects and programmes. How to implement the guidance effectively was generally not addressed substantially, although that is due to the inclusion of only “guidance notes” (and not operational manuals) in this synthesis, and also to the context-dependent nature of applying the principles.²² In the few instances where organizations gave “how-to” advice (such as using positive deviance sessions as a tool for context assessment, women’s empowerment and nutrition education), it was particularly noted in the synthesis of guidance by theme. Some of the individual guidance notes highlight case studies of well-designed programmes trying to make the links (EC and WB provide many examples; FAO (2001), Save the Children UK (2012) and WV provide one example each), and the World Bank review (2007) also provides several examples of such programmes in detail. Many tools exist that would assist with implementing the guiding principles, although they are not necessarily easily accessible and may not be adequate for needs in varying contexts. Partners noted that ‘how to’ guidance exists for agriculture and nutrition interventions individually and could be merged as relevant to projects attempting to link the two. Incentives for knowledge-sharing may also need to be addressed: since most documentation that NGOs produce are to meet the donors’ reporting requirements, it may be difficult to learn from their experiences if they are not describing how they proceed to integrate their activities, and lessons learned. Beyond the project level, operational guidance or a distillation of experience on how to strengthen nutrition governance and alignment among sectors is needed. Research in implementation science can help to identify approaches and tools that work.

Interactive capacity-building

There is likely a limit, however, to what pre-written tools can do, for two reasons: firstly, that the specific “how-to” depends greatly on the context (and most organizations implicitly recognized this, in spending so much page-space discussing the importance of context assessment and how to do it). Secondly, capacity-building training is most effective in person, with written material only as a support. Absorbing and understanding even the principles in this synthesis paper require time and familiarity with nutrition determinants. Some of the guidance documents included an introductory primer on nutrition, which is helpful as reference material, but practitioners cannot be expected to absorb in-depth knowledge without personal interaction and discussion. Therefore, in addition to operational tools and implementation of scientific research, a recommendation of this synthesis is that the principles be communicated through interactions, for example in workshops and iterative feedback on country and programme plans. Development institutions are encouraged to provide such support. To do so, they must build their own capacity as well as those of in-country practitioners.

22 Some practical how-to tools are included in Annex 2; the ACF, EC and WB guidance notes also contained links to additional resources.

Changing the dialogue on food security

All guidance notes took as a given that food security means consistent physical and economic access to nutritious diets. This meaning, while clear from the UN definition²³, differs from a view functionally limited to staple production or even income-generation. Only one institution (WB) recommended explicit efforts to make nutrition a central point in the dialogue; many other guidance notes mindfully used the term “food and nutrition security”, partly to emphasize the centrality of nutrition. Agriculture professionals often see “improved food security” as part of their mission. Consistently referring to nutritious diets within discussion on food security could increase commitment to mainstreaming nutrition in agriculture.

NEXT STEPS

The most important next step is to include the agreed-upon principles in future agriculture programmes and learn from the outcomes. This requires commitment from the highest levels of government and development institutions to link agriculture and nutrition, which has thus far been inhibited by four main constraints: (i) information on what to do, (ii) how to do it, (iii) how much it will cost (per benefit gained), and (iv) how it will be supported or rewarded.

The first constraint to action so far has been a perceived lack of clarity in guidance and evidence for nutrition-friendly agriculture. Interested agriculture professionals have been unclear on *what to do* to improve nutrition through agriculture, and the nutrition community on the whole has not yet agreed on a common approach. This synthesis is a step towards filling that gap, and it is encouraging to find remarkable similarity of guiding principles among guidance notes published by 12 international development institutions.

A second constraint - apart from “what to do” - is *how to do* nutrition-friendly agriculture. Better guidance on operational best practices for including nutrition in agriculture projects, particularly on improving market access and ensuring that women benefit, would be advantageous. Recommendations specific to project types, value chains for specific crops, and agro-ecosystem types may also help.

The lack of *costing* and cost-benefit information is another constraint for agriculture sector staff who wish to spend scarce resources wisely. Cost and impact information (including nutrition impact, productivity and economic impact) should be collected wherever possible.

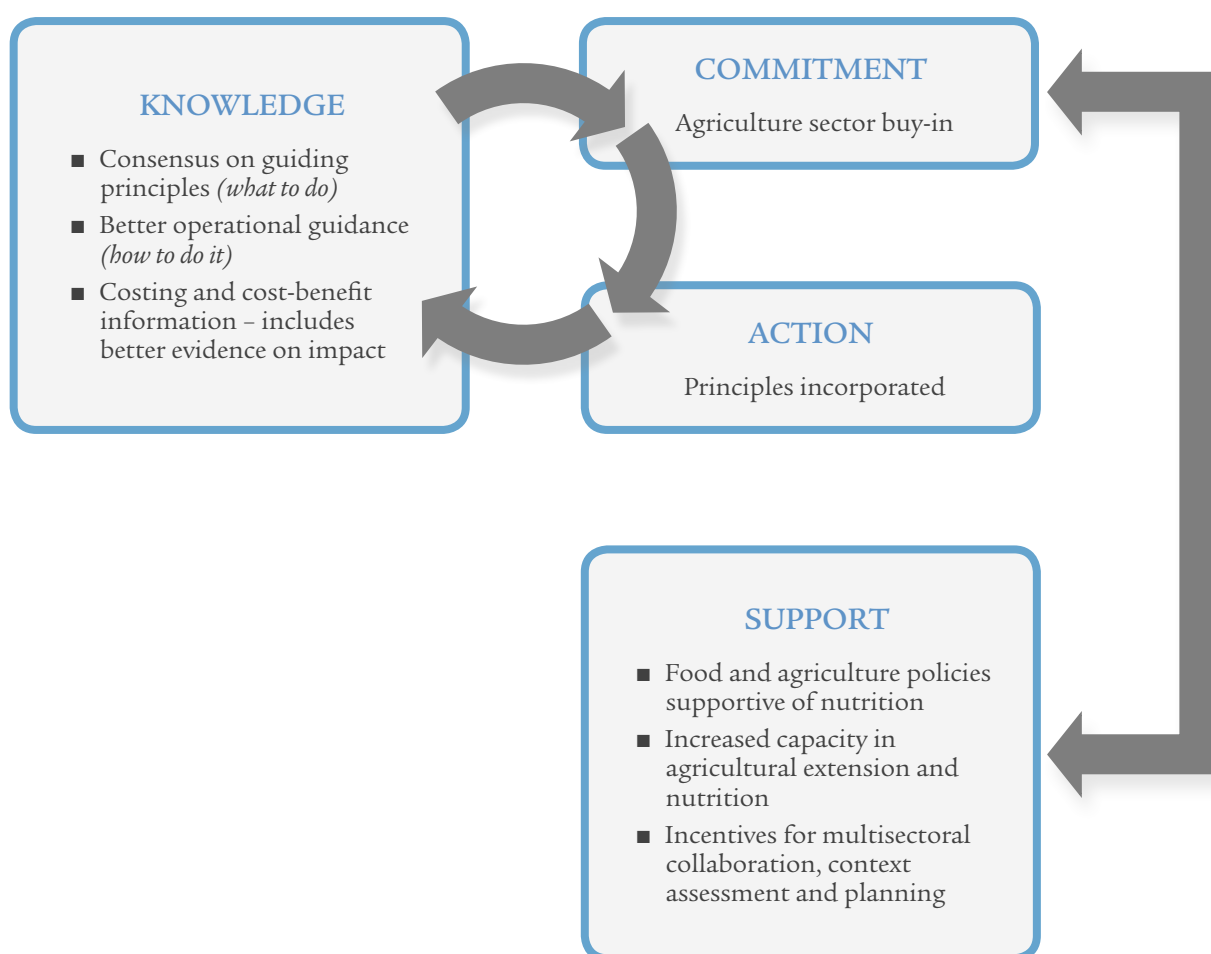
Each of these first three constraints deals with the availability of high-quality evidence based on evaluations and case studies of the nutrition impacts of agriculture programmes. Support for producing the next generation of evidence, including guidance on study design and methodology, and locating adequate human and financial resources to carry it out, is critical.

23 FAO defines “food security” as “a situation that exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 1996: *World Food Summit Declaration and Plan of Action*. Rome)

A fourth constraint relates to how efforts to link agriculture to nutrition would be supported and rewarded by governments and institutions. Food and agriculture policies supportive of healthy diets and nutrition would help to make nutrition-friendly agriculture the profitable option, and this would be by far the most powerful way to increase action. There is a need for capacity in agricultural extension, as well as nutrition training and staffing at all levels. This requires appropriate investments to be made in institutional programming related to nutrition in the agriculture sector, an area which has so far received very limited development support. Institutional incentives for multisectoral collaboration, context assessment and a planning process to avoid nutritional harm, would help the support process.

If the principles - including appropriate monitoring and evaluation - could be incorporated into agriculture programmes now, then the result would be a new generation of evidence that will improve knowledge on operational “how-to” best practices, costs and impact – and may result in a revision of current guiding principles. This new knowledge would further improve the ability to plan for and include nutrition outcomes in agriculture projects, initiating a virtuous cycle of knowledge, commitment and action.

Figure 1. Virtuous cycle of knowledge, commitment and action based on next steps



SECTION 3: SYNTHESIS OF GUIDANCE BY THEME

NUTRITION OBJECTIVES

The most common message in all the guidance notes was the inclusion of clear, specific, explicit nutrition objectives in agriculture projects, programmes and policies. All institutions that have published guidance stated some form of this recommendation; 11 stated it outright, and IFPRI implied it from statements to “design agriculture, nutrition, and health programs with cross-sectoral benefits”. All of the guidance notes make the point that nutrition objectives are needed to drive agricultural programmes in a manner that would better address nutrition. World Vision makes the strongest statement, that to have an impact: “improved nutrition outcomes, particularly for children, must be an explicit objective of agricultural policy and programs,” and “there is limited evidence that improved nutrition will occur” in the absence of such an objective.

Common among the documents were the words “clear” and “explicit” objectives, repeated several times (BI, EC, FANTA, FAO, Save the Children UK, SCN, WB, WV). Specific tools recommended to clarify objectives included logical frameworks (ACF) and the Nutritional Impact Assessment Tool (IYCN).

FAO (2009) emphasizes the important idea that explicit nutrition objectives guide agricultural programmes so that: (1) they avoid harm, and (2) they maximize opportunities. These two outcomes are not the same, and it is important to note that both may be furthered by adopting nutrition objectives. Similarly, the World Bank states that an approach without explicit nutrition objectives would likely miss opportunities for improving nutrition – as well as overall farmer well-being and women’s participation. The FANTA publication (2001) echoes those two effects, and in addition points out that specific nutrition goals help to guide agriculture and health staff “in their efforts to improve consumption and nutrition and to ensure integration and overlap with health systems.” This is a reminder that objectives should and do matter to guide programme staff from planning committees to field level, and as a corollary, that they need to be communicated clearly and understood by staff at all levels for appropriate action to be taken.

The SCN wording suggests that a nutrition objective makes explicit the inherent opportunities within agriculture programmes, and can “activate” such opportunities. ACF, Bioversity, IYCN and FAO (2004) bring up the basic use of an objective to: (1) identify and clarify activities to reach nutrition, and (2) design appropriate indicators and M&E systems to track desired impact. ACF encourages planners to include a nutrition objective in the project log-frame, and also to “make sure that the objective is obtainable within the framework of the project.” In addition, ACF notes that the indicators chosen will depend on “the nature and duration of the intervention.” These two points together highlight the fact that planners need to think through *how* their programme or policy will reach nutrition objectives, and act and measure appropriately; that it is not enough to simply add a global nutrition indicator to a project without linking it to concerted activities and outcomes. Bioversity builds on this idea operationally, by suggesting to “start first with the smallest change possible for the largest impact possible” to instil confidence, which implies it is important to measure impacts other than stunting, which is slow to show change.

CONTEXT ASSESSMENT

Papers from almost all institutions (11 out of 12) included the specific recommendation to assess the context where an agricultural programme was being planned, during the design phase; the twelfth (UN SCN) discussed tailoring interventions by agro-ecological zone, and using underutilized local foods, thereby implying context assessment. This guidance was targeted more to programme and project planning than policy-making, although the HLTF also clearly recommended context assessment for making policy choices “that take account of the local environment and social realities.” The main point of the context assessment recommendation was to identify and build on existing efforts, knowledge and resources, in order to maximize effectiveness and efficiency of interventions and reduce negative side effects.

Several specific functions of context assessment emerged from the guidance notes, listed below.

- Identifying nutritional problems, which could be carried out using existing data (such as DHS and other survey data) (ACF, BI, FANTA, FAO, HLTF, WB).
- Identifying and targeting population groups most at risk (ACF, FANTA, WB).
- Identifying the main causes of those problems and the main constraints to good nutrition, using existing data and reports, collaborating and communicating with other sectoral practitioners, civil society organizations and workers familiar with the area, and holding focus groups with community members (ACF, BI, FAO).
- Identifying opportunities within the agriculture sector to address those constraints, including those based on seasonality, labour and local foods; and adapting interventions to the specific programme community/country based on the agroecological, market, economic and human resources available (ACF, BI, FANTA, FAO, HLTF, UN SCN, WB); and taking into account climate change (HLTF). Ways to do this included:
 - ◆ creating seasonal crop and labour calendars, and fluctuations in food security and nutrition (ACF, BI, FANTA, FAO).
 - ◆ FAO recommended a specific assessment of how processing, storage and marketing affect prices of non-staple foods, which would enable prediction of how income-generation may or may not affect dietary quality.
 - ◆ Several notes, most notably Bioversity International, highlighted the need to understand local food resources, food culture, household decision-making and markets regarding specific foods to envision how agricultural production could maximize food-based opportunities (ACF, BI, FANTA, FAO, IYCN).
 - ◆ HLTF specified that context analysis should take into account risks as well as market opportunities.
- Understanding gender-specific demands and implications of potential investments (ACF, HLTF, FAO, WB).
- Understanding existing knowledge, beliefs, skills and practices within communities and cultures (Save the Children UK), which complements outsider information (FAO, IFPRI) and provides a basis for effective behaviour change and information dissemination (ACF, BI, IYCN); the Positive Deviance/Hearth method²⁴ was suggested as an effective one to identify and scale up positive practices (BI, WV).

²⁴ See Positive Deviance/Hearth: A resource guide for sustainably rehabilitating malnourished children. CORE Group, 2003. http://www.positivedeviance.org/pdf/hearth_book.pdf

- Building on and complementing existing interventions within the agriculture sector and other sectors (ACF, IFPRI, WB, WV).
- Initiating a process of collaboration and co-planning: activities related to context assessment can build communication between development partners within or between sectors, and can set a tone of inclusion of under-represented groups (e.g. women and minorities) (ACF, BI, FANTA, FAO, WB).
- Assessing potential harm and developing mitigation strategies, as well as setting in motion a process of continuous assessment throughout the project, as the effects of any intervention in a given context need to be monitored to avoid harm (EC, WB).

FAO highlighted participatory approaches as the primary way to plan programmes and involve stakeholders. Several of the manuals listed in Annex 1, including those of ACF, Bioversity International and FAO, include specific steps on context assessment and emphasize participatory methods.

DO NO HARM

Ten of the 12 institutions cautioned that agricultural programmes can have unintended consequences that cause harm to nutrition, health and livelihoods. Potential harms included:

- overburdening women who are also responsible for the care of young children, with potential negative effects on optimal infant feeding (ACF, EC, IFPRI, IYCN, FAO, Save the Children UK, WB); could be mitigated by reducing tasks of women (FAO, WB).
- Potential negative impact of crop choice (especially cash crops) on food production, financial risk and gender inequality (ACF, FAO, IYCN, WB); could be mitigated with diversification and context analysis.
- Inability of smallholders to participate in projects requiring new investment, the danger of widening resource gaps between wealthy and poor farmers, and the potential for smallholders to be outcompeted (ACF, IYCN); could be mitigated by encouraging small-scale appropriate technologies (IFPRI).
- Higher food prices, through price supports or other reasons, can result in reduced availability of food (FAO, IYCN).
- Danger of agrochemicals to health (ACF, FANTA, FAO, IFPRI, Save the Children UK); could be mitigated with protective gear and training.
- Risk of disease from agricultural water use (malaria transmission, microbes and pollutants in wastewater) and zoonotic disease and parasites (ACF, EC, HLTF, Save the Children UK, WB); could be mitigated with bed nets, improved wastewater management, and veterinary services.
- Reduction in natural resource availability or access (ACF, IFPRI, FAO); could be mitigated with sustainable production techniques.
- Higher production costs (FAO).
- Danger of mechanization increasing unemployment among landless (IYCN).
- Manual labour can damage health and increase caloric needs (Save the Children UK).
- Health risks of over-promoting animal-source foods: chronic disease and the use of cow's or goat's milk may displace breastfeeding (ACF).
- Increased production/reduced prices of food that could influence diet patterns negatively and contribute to obesity and chronic disease; could be mitigated with production and promotion of micronutrient-rich crops based on context (WB).

Most of the notes identifying the risk of potential harm also suggested overall strategies to avoid causing harm. The main strategies are:

1. go through a systematic process in the planning phase to identify potential unintended negative impacts on nutrition based on the context within which the programme is operating, and develop a mitigation plan. (ACF, BI, EC, FAO, IFPRI, IYCN, WB).
2. Have a well-functioning monitoring system to detect negative effects, to ensure timely mitigation efforts on unforeseen negative impacts (ACF, EC, FAO, IYCN, WB).
3. Have a clear nutritional goal to start with (FANTA, IYCN).
4. Collaborate with health officials to provide information on health risks and solutions (which could be considered a specific type of mitigation plan) (IFPRI).

IYCN developed a “*Nutritional impact assessment tool*” to assist project planners to avoid unintentional nutritional harm, mentioned also by ACF, Save the Children UK and WB (see Annex 1, “Manuals” section). This tool is the first formal attempt to “operationalize a process for considering the nutritional and food security impacts of proposed activities on these groups, and [to help] designers to develop alternative sets of activities as well as a ‘do nothing’ alternative.”²⁵

PROGRAMME MONITORING & EVALUATION

All guidance notes discussed the central importance of measuring nutrition-relevant impact through programme monitoring and evaluation, and most (nine of 12) also made suggestions for specific indicators. The main reason was to demonstrate nutrition impact, but there were other reasons. Several institutions emphasized M&E for the purpose of timely identification of poor implementation or negative effects, so that problems could be corrected by adaptive management before substantial time and money is wasted (ACF, BI, FAO, IYCN, UN SCN, WB). Bioversity also noted that M&E processes can help staff decide when it is appropriate to phase out or provide more permanent support (assuming the project timeline is flexible). Documenting successes and failures, and lessons learned was seen as important for the general good (BI, IFPRI, Save the Children UK). UN SCN said that M&E can increase government accountability and policy-makers’ awareness, raising the profile of nutrition on national agendas.

There was an expectation expressed throughout the guidance notes that projects should show impact on nutritional status (ACF, EC, FANTA, Save the Children UK); in fact Save the Children UK said reductions in child underweight “should be the litmus test for good agricultural investment.” In contrast, ACF argued for increased attention to outcome indicators based on careful consideration of programme theory²⁶, stating that “the measurable effects of stand-alone food security and livelihood interventions on nutritional status are likely to be less significant...than multi-sectoral interventions, thus most changes will be detected at the outcome level.” The World Bank discussed the practical costs and technical training needs for measuring nutritional status for agriculture projects, and suggested careful consideration of whether its measurement would be worthwhile based

25 The steps are as follows: 1. List project objectives. 2. Define food-insecure population groups. 3. Determine the nutritional status of nutritionally vulnerable groups. 4. Create alternative approaches. 5. Estimate expected outcomes. 6. Modify the approach as needed. 7. Assess alternative approaches. 8. Design a mitigation plan. 9. Develop a review plan.

26 The pathway from an intervention input to programmatic delivery, household and individual utilization to its desired impact; with reference to Habicht, J.P. and Pelto, G.

on calculations of power and likelihood of observing change. The same note recommended food consumption indicators as the most feasible and appropriate first step to measuring nutrition-relevant impact (WB). In this regard, FANTA stated that programmes should be able to associate any nutritional status changes with the specific strategy or interventions, in the same logic of programme theory: “intermediate results, together with the corresponding performance indicators, trace out the underlying conceptual framework of a program...” Many of the notes suggested both outcome (particularly diet) indicators and impact indicators (see below).

Some institutions noted that specific indicators would clearly vary according to context and goals of individual projects (ACF, EC, FANTA, FAO, WB). All indicators should be SMART (specific, measurable, achievable, relevant and time-bound) (ACF, IYCN). Four guidance notes pointed out that capacity to measure and analyse the indicators chosen is an important consideration; there is no standard set of indicators for nutrition in agriculture projects yet, and often there are inadequate time and skills for analysis (ACF, FANTA, WB, WV); ACF also suggested allocating 2 percent of the overall budget for M&E. FANTA and WB recommended simple, easy-to-administer indicators of consumption and nutrition, including only those indicators that monitoring agents can accurately measure, or otherwise partnering with additional technical support.

The following are indicators the guidance notes specifically mentioned as important or promising in many contexts; references for the tools to measure some of these indicators are in [Annex 2](#).

Consumption-related

- Dietary diversity scores (ACF, BI, EC, FANTA, IYCN, UN SCN, WB, WV)²⁷
 - ◆ HDDS (Household Dietary Diversity Scores) (ACF, BI, UN SCN, WB)
 - ◆ Food Consumption Scores (ACF, WB)
 - ◆ IDDS (Individual Dietary Diversity Scores) for women of reproductive age (EC, FANTA, IYCN, WB)
 - ◆ Minimum dietary diversity for children 6-23 months (EC, IYCN, WB, WV)
 - ◆ Minimum acceptable diet for children 6-23 months (ACF, EC, WV)
- Meal frequency (ACF, WV)
- Consumption of iron-rich foods for children aged 6-23 months (ACF, EC)
- Number of days in the previous week where any amount of X (nutritious food) was consumed, and change in grams/day of X consumed (WB)
- Other core infant and young child feeding indicators (excluding breastfeeding, initiation of breastfeeding) (ACF)
- Caloric intake (IYCN)
- Caloric adequacy of available food (kcal/person/day) (FANTA)
- Vitamin A and iron intake (IYCN)
- HFIAS (Household Food Insecurity Access Scale) or HHS (Household Hunger Scale) (FANTA-developed food-insecurity measures²⁸) (IYCN, WB)
- Months of adequate household food provisioning (MAHFP, developed by FANTA) (BI, WB)

²⁷ FAO could reasonably be added to this group although its guidance documents did not specifically mention DDS, because FAO produced the widely-used “Guidelines for measuring household and individual dietary diversity” (2011), referenced in Annex 2.

²⁸ These were years away from publication at the time the FANTA guidance notes were published.

Nutritional status

- Stunting²⁹ (ACF, EC, FANTA, IYCN)
- Underweight (FANTA, IYCN, Save UK)
- Wasting (FANTA)
- Anthropometry in general (BI, EC, WB)
- Vitamin A, iron and iodine status for women and children (FANTA, IYCN, WB)

Sickness and health

- Sanitation, health, home facilities (BI)
- Incidence of illness (FANTA)

Gender

- Gender of project participants (FANTA, WB)
- Women's access to land and other productive assets (WB)
- Women's control over cash from agricultural activities (e.g. intra-household allocation of income between men and women, or the extent of women's ability to make decisions about purchases) (WB)

Other

- Changing seasonality of income, labour use and micronutrient-rich food availability (FANTA)
- The Nutritional Functional Diversity Index, developed by the Earth Institute at Columbia University (Remans, Flynn, 2011), which quantifies the depth and breadth of agrobiodiversity according to dietary usage (BI).

MULTISECTORAL COLLABORATION

Every organization discussed multisectoral collaboration of some sort as essential for impact on nutritional status. Three quotes from different notes clearly describe the rationale for multisectoral collaboration: "Perhaps the greatest challenge for the implementation of the guidance given throughout this manual is that no-one can do it alone - it requires preparation, action and collaboration across a variety of sectors and stakeholders" (ACF). "Agricultural interventions can make important contributions in the form of increasing production and income and, often, household food consumption. However, health and environmental conditions, health status, and childcare and feeding practices will ultimately determine whether increased food access and consumption has a positive effect on nutritional status" (FANTA). "Provision of livelihood support, creation of social safety-nets and an explicit focus on maternal and child health are essential to improving the food and nutrition security of [vulnerable] groups" (UN SCN).

29 The ACF paper specifies that stunting is most likely to change if children under two years are direct beneficiaries and the intervention lasts at least 3-5 years.

These quotes emphasize the need to address all the underlying factors of malnutrition (food, health and care), and that agriculture cannot do that alone. All guidance notes concurred that all stakeholders (programme planning staff and management, field-level operational staff, researchers, educators) in various sectors (agriculture, health, nutrition, water and sanitation, environment, sociology, social protection, poverty reduction, education) and institutions (government ministries, NGOs and multilateral programmes) have essential roles to play in the fight against malnutrition, and coordination can maximize impact. The World Bank noted that building awareness on nutrition would improve commitment to collaboration. Several terms for the concept appeared throughout the guidance notes: multisectoral consultation, coordination, collaboration, partnership, combined action, linkages, synergies and integration.

The guidance notes agreed that coordination was desirable at least in the planning stage. There was lack of clarity or possibly disagreement on whether sectors should collaborate mostly in planning and then carry out their own sectoral responsibilities; or if sectors should actually work together in implementation as well. The standpoint of each institution was not very clear in any note, although the EC recommended joint programming in emergencies and Save the Children UK showcased an integrated programme. The two approaches are not, of course, mutually exclusive; sectoral implementation based on shared accountability and indicators (IFPRI) can co-exist with initiatives where multisectoral partners have joint funding for the same project (World Vision). The opportunities for multisectoral implementation depend on context. Recognizing the difficulty in prescribing one approach over another, FANTA offered a range of options for successful collaboration: “[1] by implementing agriculture and nutrition programs in the same geographical area, [2] adding program components to specifically address cross-sectoral issues, or [3] fully integrating programs.”

Six notes gave examples of how multisectoral linkages could occur:

- shared indicators and accountability mechanisms (IFPRI, HLTF, WV);
- shared funding for co-implemented projects (FANTA, WV);
- multisectoral structures such as a national nutrition council or a multisectoral, multi-institution task force for joint investment planning (FANTA, FAO, HLTF);
- consultation with nutrition or water and sanitation colleagues for technical expertise or collaboration on a baseline survey (ACF);
- improved professional training through problem-based learning (i.e. building capacity for multisectoral thinking and work among sector staff) (IFPRI);
- overlapping sector programmes in the same geographic area (FANTA);
- linking smallholder production to social protection schemes, for example through involving local producers in food-based safety nets (HLTF);
- specifying cross-sectoral collaboration as a condition in requests for proposals, and requiring identification of potential collaborators in the field (FANTA);
- multidisciplinary extension teams, and increased communication among nutrition, home economics and agricultural extension staff (through workshops, for example) (FAO, WB);
- IFPRI noted the need to learn more about how to build successful multisectoral coordination.

FANTA also described an example of how to plan a functional multisectoral programme; the quote is included in its entirety here:

“A program design that effectively links agriculture, health and nutrition might employ the following three-pronged approach:

- 1.The program has a well-designed agricultural component - effective at generating output, income or added value, as well as at drawing in smallholders, women and/or poorer households.
- 2.The program has a well-designed nutrition component - providing well-tailored health and nutrition education to address specific local problems.
- 3.The agricultural, health, and nutrition components are mutually reinforcing. Project staff collaborate to ensure appropriate health services and complementary health and nutrition messages are provided, and that beneficiary populations participating in the agricultural and health activities overlap.”

MAXIMIZE IMPACT OF HOUSEHOLD INCOME

All 12 organizations discussed household income as an important mechanism for agriculture to affect nutrition. Eight of the 12 also included a caveat, that income-generation broadly is not enough; it may be inefficient or ineffective at improving nutrition without additional inputs. In the words of the FANTA document: “Agriculture and Health Officers may reasonably anticipate strong income-consumption linkages, but this outcome is not inevitable.” One document further suggests that in some cases, income-generating activities could do harm to nutrition, if it increases a power imbalance between women and men (FAO, 2004). IYCN stressed that income increases are not always necessary for nutritional improvements: “In Bangladesh, an improved vegetable program increased vitamin A consumption, decreased chronic malnutrition by 28 and 43 percentage points among girls and boys, respectively, and improved women’s nutrition - all despite failing to produce measurable effects on household income.” In summary, the effect of income-generation on nutrition improvement is modifiable, and varies by circumstance.

Several recommendations are provided for how to increase the likelihood of additional income having positive nutrition effects. These include the following:

- most prominent among the recommendations is increasing women’s access to and control of income, achievable through project design. The notes cited the increased likelihood of women’s income translating into expenditures related to nutrition, keeping in mind the need to promote income-generating activities that do not reduce the quality of infant and young child care (ACF, EC, FANTA, FAO, IYCN, WB, WV).
- Two institutions noted the importance of liquidity of financial resources and frequency of income stream (BI, FANTA) – implying that regular, small amounts of income may even be more beneficial than larger, less frequent payments.
- Related to both of the above points, two notes recommended diversification of production systems and livelihoods, including small-scale agroprocessing and in-kind revolving funds or inventory credit (FANTA, SCN).
- FANTA also noted that income gains are more likely to be spent on food if nutrition education is provided, or if income is in-kind (related to social protection schemes linked to agriculture).
- Save the Children UK also pointed out the need to specifically target the poorest and most vulnerable for income-generating opportunities.

- FAO and IYCN raised the concern that mechanization can be helpful to reduce women’s workloads in some circumstances, but the situation should be carefully analysed to ensure that introduction of mechanization will not displace farm labour and thereby deprive landless vulnerable households of income.
- HLTF suggested that producer organizations are a means to higher incomes for smallholders, including women.

IFPRI simply stated the issue as a question: “What incentives need to be put in place to ensure that increased farmer income translates into better health and nutrition?” Further work could increase understanding of how household income could have a greater effect on nutrition in diverse contexts.

EQUITABLE ACCESS TO RESOURCES

Nine of the organizations explicitly discussed improved equity of resources as a requisite for improved nutrition for vulnerable households (ACF, EC, FANTA, FAO, HLTF, Save the Children UK, UN SCN, WB, WV). The main recommendations fell into two broad categories: policies and programme activities.

Ensuring equitable access to resources is related to the principle of policy coherence; development institutions could also advocate for policy changes. The main policy recommendation was securing land rights for poor and vulnerable groups, particularly for women (ACF, FANTA, HLTF, Save the Children UK, UN SCN, World Vision) as well as ethnic minorities (EC), smallholder/urban farmers (FAO, UN SCN), and emergency-affected groups (EC). Land tenure is a necessary basis for productivity and food security, and the UN SCN further noted that foreign direct investment may be a threat to vulnerable groups without formal land rights, including to forests and rangeland (EC). The UN SCN further gave specifics on how land tenure policies could improve even in situations where entrenched rules and procedures may make sweeping change difficult. The HLTF linked equitable access to biodiversity to the discussion of land rights, including the needs of landless labourers. HLTF also discussed constraints to production due to climate change, which will affect the most vulnerable first and to the greatest extent.

Apart from land tenure reform, other policy recommendations included:

- policies to increase access to water (EC, FAO, HLTF, Save the Children UK, UN SCN).
- Legal and policy support for the poor to access employment opportunities (ACF, EC, WB).
- Policies to increase extension services, financing, access to inputs and appropriate technologies for smallholders (FAO, HLTF, Save the Children UK), adapted to reach women and ethnic minorities (HLTF).
- Investment in agricultural research that reflects the interests of smallholders, particularly women (HLTF).

Programmatic approaches to improved equity included:

- credit and financial services, including insurance (ACF, EC, FANTA, FAO, HLTF, Save the Children UK, UN SCN, WV);
- increasing smallholders' (and women's in particular) access to markets (ACF, EC, HLTF, Save the Children UK, UN SCN, WV) through transport, information and farmer organizations or cooperatives;
- increasing access to productive assets such as livestock, seeds and storage facilities (EC, FAO, HLTF, Save the Children UK, UN SCN, WV);
- improved access to water resources (EC, Save the Children UK, UN SCN);
- facilitating access to extension services and technology, especially for women (ACF, FAO, Save the Children UK);
- social protection measures such as cash, food transfers and child care services (ACF, EC).

FANTA, HLTF and the UN SCN stressed the importance of farmer groups. The UN SCN discussed support for farmer organizations or cooperatives at length, as an activity for improving equity as well as efficiency: "... groups are able to access credit, information and other important goods and services better than individuals." Some of the other potential equity benefits of smallholder farmer groups include political power to protect their rights (including land rights), bargaining power in markets, and ability to purchase equipment and training they would not be able to afford individually, thus putting them on more equal ground with large-scale farmers. Programme activities with farmer groups could include capacity-building on prioritizing, costing and managing production and marketing, as well as training on value-addition (UN SCN).

TARGETING

Eleven of the 12 institutions explicitly recommended some form of targeting as a way of maximizing nutrition impact, mostly favouring pro-poor approaches, smallholder farmers and women. Despite these underlying priority groups, advice was somewhat diffuse on whether to target by income level, occupation (marginal farming, landless labour), geography (rural/urban/at-risk areas), gender, lifecycle stage (first 1 000 days), or some other characteristic. The main point voiced by all, however, was that it is important to target the most vulnerable groups; which population group represents those most vulnerable may vary by context. Two institutions specifically stated that the target groups often may not be chosen a priori, and would depend on context assessment (ACF, BI).

To enable targeting, several organizations pointed out that some form of data collection is necessary. ACF, Bioversity and IYCN explicitly recommended collecting data on household food security and nutritional status, with ACF highlighting nutritional status of women and children under age two. In EC's advice to "prioritise areas or groups worst affected by undernutrition", and HLTF's guidance to "identify and address the needs of the most vulnerable [which may be defined by geography, gender, livelihood, age, disease, disability, ethnicity]", data collection is implied. Bioversity suggests deciding on geographic target areas based on "rapid assessment, key informant interviews, and visiting clinics and hospitals to determine areas of need...". Data collection need not always require primary data, however, but can rest on household surveys, vulnerability maps or other existing sources (as described in the "context assessment" recommendations).

As for which groups to target:

- nine institutions recommended targeting smallholder farmers (BI, EC, FANTA, FAO, IYCN, HLTF, Save the Children UK, UN SCN, WB), and three of those pointed out the idea of targeting via promoting appropriate technologies for smallholders (IYCN, HLTF, UN SCN), such as micro-irrigation.
- Five recommended targeting poor and/or food-insecure households (ACF, FANTA, FAO, UN SCN, WB).
- Eight institutions advised explicit targeting of women (ACF, BI, FANTA, FAO, HLTF, Save the Children UK, WB, WV), although all guidance notes underscored the importance of women in agricultural projects (see the “women’s empowerment” section).
- Three also mentioned young children (ACF (<2 years), Save the Children UK and World Vision (<5 years) along with women/mothers.³⁰
- Three highlighted the vulnerability of landless labourers and the need to avoid labour displacement (EC, IYCN, UN SCN).
- Two mentioned targeting urban and peri-urban food systems to expand access to diets (BI, UN SCN).
- One discussed reaching marginalized groups such as indigenous and nomadic peoples (HLTF) and
- one suggested targeting youths for training in new technologies and gender roles (FAO).

Some unique target populations were also mentioned. Bioversity recommended targeting “early-adopters” within programme communities, so that households which may perceive too much risk in investing in something new can observe what happens before adopting it themselves. ACF recommended approaches to prevent malnutrition, which has implications for how data on food security and nutritional status are used for targeting; i.e target those at risk rather than those already malnourished.

The point was also made that efforts to target need to be mindful of social implications. According to the two institutions that raised this concern, “restricted targeting...could create tensions within families” (ACF) and “care should be taken to not alienate the non-target groups” (BI).³¹

DIVERSIFY PRODUCTION AND LIVELIHOODS

Nine of the institutions included the specific advice to diversify agricultural production; in addition, two that did not specify diversification (IYCN, IFPRI) could be assumed to support the advice, since each recommended incorporating home gardens, which typically implies diversification. Production diversification, according to the guidance, can offer support for multiple pathways to nutrition, including:

- food access and dietary diversification (EC, FANTA, FAO, WB, WV);
- natural resource management (ACF, BI, UN SCN, WB);

³⁰ “Targeting” here does not necessarily mean including only households with young children in agriculture programmes; it refers to programme design characteristics to reach vulnerable groups within households (e.g. producing nutritious complementary foods, an activity targeted to child nutrition).

³¹ Evaluations of social protection programmes have shown that it is difficult to target single children within households, because of the natural tendency to share resources among all children in a household.

- productivity enhancement (BI); IFPRI also noted that incorporating home gardens, which often implies diversification, can boost production;
- risk reduction (e.g. from monocrop failure due to biotic or abiotic stresses, price shocks) (ACF, FANTA, WB);
- reduced seasonality (FANTA, FAO);
- improved income streams and reduced cost of a nutritious diet (FANTA, Save the Children UK, WB);
- adaptation to climate change (UN SCN) ; and
- women’s empowerment, based on production of home gardens and minor crops, which in many cases would constitute production diversification – this comes from the “what to produce” section (BI, FAO, IYCN).

Ways to diversify included intercropping (FANTA, UN SCN), improved seed and information to facilitate diversification through extension services (FAO, UN SCN), home gardens (FANTA, and others recommending gardens in the “Horticultural crops” section), introduction of cash crops as supplements rather than substitutes for food crops (FANTA), and integrated crop-livestock systems (FAO). FANTA acknowledged that many semi-subsistence farmers already use diversity as a strategy, and that it would be a useful strategy to “build on and improve traditional cropping systems”. This suggests that farmers often choose intercropping, for example, as a rational response to various household needs and weather/market uncertainties, and that displacing such systems could do harm.

Several development organizations consider off-farm employment as an important activity to steady income and reduce risk. World Vision and UN SCN specifically mentioned *livelihoods’ diversification* as a strategy to improve incomes, reduce risk/increase resilience, and “increase the amount of nutrient-dense foods for household consumption” (World Vision), presumably through increased or more regular income streams or food preservation. UN SCN gave examples of revolving funds and food processing as ways to diversify, noting that the latter can also improve diet quality for urban dwellers. ACF also had a section on income-generating activities for women, including food preservation, food service and child care provision, which implies livelihood diversification as a strategy for improved nutrition, through women’s empowerment, income-generation or reductions in seasonality.

WHAT TO PRODUCE

All organizations gave some guidance about what to produce on-farm to optimize nutrition. Ten of them gave general guidelines as well as crop-specific suggestions.

General guidance centred on production choice based on nutritional value (ACF, BI, FANTA, FAO, HLTF, IYCN, Save the Children UK, WB, WV). Most institutions recommended simply choosing nutritious foods to produce on the basis of local nutrition issues and available solutions (BI, FANTA, FAO, IFPRI, Save the Children UK, WB, WV), which would increase availability of nutritious food and meet greater demand for it (HLTF, WB). Six also advised promotion of micronutrient-rich foods (ACF, FANTA, FAO, IYCN, WV); three advised promotion of protein-rich foods (ACF, FAO, WV); three advised locally-adapted varieties, particularly those which may have higher nutrient content (ACF, BI, WV). Unique advice from ACF included promoting foods favoured by children, foods rich in other non-nutrient components such as antioxidants and fibre, foods low in anti-nutrients, foods or varieties acceptable in terms of processing and cooking costs, and factoring in consumer acceptance. IYCN suggested increasing production of foods consumed by at-risk groups.

Strikingly, only one guidance paper included a production choice recommendation based on increasing calorie intake: increasing oil and fat in situations where fat/energy density is too low (FAO). To achieve nutrition impact, the vast majority of available institutional guidance recommended actions to improve dietary quality over quantity.

Horticultural crops comprised the most commonly-suggested type of production to maximize nutritional gain (by 11 institutions). The main reason for the cultivation of these crops was to increase availability, access and consumption so as to improve micronutrient intakes and dietary diversity, and dietary patterns protective against obesity and chronic disease. The various notes interpreted this goal in two distinct ways:

- (1) focusing on household use through homestead food production (ACF, FANTA, FAO, IFPRI, IYCN, UN SCN, WB, WV), and
- (2) increasing general availability and reducing prices of horticultural products for general public health nutrition, for both producers and consumers (FAO, Save the Children UK, UN SCN).

Five of the notes also recommended horticultural crops particularly because they are often under the control of women (ACF, BI, FANTA, FAO, IYCN); one noted that kitchen gardening is a way for women to increase food access and decision-making without harming child care (ACF). To ensure that production translated into increased consumption, several notes suggested combining horticultural interventions with education and behaviour change including social marketing (ACF, FAO, UN SCN, WB; and several others more generally, see “Nutrition Education” section).

Other goals of horticultural production included reducing seasonality (ACF, FANTA, FAO), increasing income (ACF, FANTA, FAO, Save the Children UK) and agricultural production (ACF, IFPRI), and raising awareness about good nutrition in schools and communities (UN SCN).

Within horticultural crops in general, few notes made specific suggestions about what to grow, but three notes named dark green leafy vegetables (ACF, FAO, WV). Three notes included caveats about horticultural products: Save the Children UK cautioned against high-value horticulture projects simply as cash crops, WB noted a potential financial sustainability risk of subsidized home gardens, and ACF noted that vegetables are low in energy content, that leafy vegetables may contain tannins which can inhibit iron absorption³², and that it is important to choose vegetables that are favoured by children.

Animal-source foods (ASF) were discussed by nine institutions, with eight clearly endorsing ASF production at least on a small scale. The main reason for increasing household access to and consumption of ASF was to improve nutrient intakes (including micronutrients, protein and fat) and food security (ACF, FAO, HLTF, Save the Children UK, UN SCN, WB, WV). Similar to the advice on horticulture, all these notes recommended homestead production of animals to improve diets; ACF, Save the Children UK and UN SCN highlighted their contribution to income-generation; Bioversity pointed out animal husbandry as a potential pathway to women’s income; and HLTF emphasized the importance of livestock as smallholder assets. Advice on how to encourage animal production included promoting fish as well as livestock (ACF, FAO, Save the Children UK, UN SCN, WB, WV), distributing improved poultry species but also using indigenous and small livestock, training on livestock management and improving veterinary services (UN SCN).

³² While concern over anti-nutrient content is valid, this caveat is difficult to act upon: information on tannin content of vegetables is generally unavailable, and dark green leafy vegetables are overwhelmingly recommended as being nutritious foods (including by ACF).

In contrast to the horticulture guidance, most organizations urged homestead production of ASF for household use and income-generation, without also recommending increasing ASF availability for general consumption (among urban consumers, for example, as was recommended for horticulture). Save the Children UK was the one exception, which generally recommended increased availability and reduced cost of nutritious foods, including meat and milk in pastoral areas. The focus on small-scale production was due to environmental concerns (ACF, IFPRI, UN SCN, WB), concerns about ASFs as risk factors for zoonotic disease (ACF, WB), chronic disease (ACF), and food system-level food security concerns, because animal production competes with cereal production and availability (IFPRI). Together with ACF's and WV's advice to ensure ASF consumption through education/promotional efforts at the household level, IFPRI recommended encouraging people to consume sustainable diets, implying advice to reduce consumption of ASFs in many cases (such as in urban areas). UN SCN recommended livestock sector reform to improve environmental sustainability. ACF brought up the need to ensure that animal production does no harm to nutrition at the household level, through zoonotic disease, parasites, reductions in water availability, and the possibility that promotion of cow milk could displace breastfeeding if not done carefully.

Underutilized foods were discussed at length by seven of the organizations, and mentioned briefly by an eighth. Most conveyed the notion that traditional, indigenous and/or wild foods are often powerful nutritional resources because of their nutrient content (ACF, FAO, HLTF, IFPRI, UN SCN, WB). ACF and FAO highlight the resource use efficiency and reduced inputs of producing indigenous food crops. UN SCN noted their role in climate change adaptation due to superior productivity response against local stresses, and Bioversity noted that minor crops, which include many traditional and underutilized crops, are often controlled by women and may increase women's empowerment. Echoing the general production advice of IYCN to promote foods consumed by poor households, FANTA and FAO noted that indigenous food crops are important in the diet of poor households and their continued productivity is important to food security. In addition, niche markets and value chains for indigenous food could harness a comparative advantage of poor/indigenous farmers (IFPRI, HLTF, FAO, UN SCN, and WB), supporting farmer incomes and also making nutritious foods more available to consumers (FAO).

Advice on how to promote underutilized crops included supporting research to document indigenous foods and their nutrient content (FANTA, FAO), enhancing production and marketing of these foods through extension services (FAO) and research (HLTF), creating value chains (IFPRI), and promoting indigenous crops particularly among HIV-affected households (FAO). Two notes gave examples of underutilized foods: traditional staples like sorghum and millet, forest products including trees and wild plants (UN SCN); wild fruits, insects, worms and termites (which are acceptable and even prized in some cultural contexts), herbs and perennial plants (trees and bushes), which provide structural and soil-improving functions as well as for food (ACF). WB noted that there may be limited commercial potential in some contexts.

Legumes were highlighted by half of the institutions; not only for their nutritional value (rich in energy, protein, and iron) (ACF, EC, FAO, IFPRI, WB, WV), and their use as fodder (WB), but also for their attribute of nitrogen fixation, which can improve soil fertility and yield and reduce inputs (ACF, FAO, IFPRI, WB). FAO and WB noted that they are also typically women's crops. The only caveat about legume production was in terms of its use for land management, which could potentially increase women's labour (WB). Advice on how to incorporate legumes included increasing awareness and consumption via extension services (FAO), nutrition education on complementary cereal-legume protein (FAO), and intercropping (FAO, IFPRI).

Biofortified crops, which often but not always are staple crops, were viewed more favourably than staple crops in general, having been fully endorsed as an important strategy by six of the seven institutions that discussed them (EC, FAO, IFPRI, UN SCN, WB, WV), and accepted by the sixth as long as they are produced by traditional breeding methods (ACF). Three of the notes framed biofortification as a complement to other approaches (e.g. gardens and other endeavours to increase dietary variety) (ACF, FAO, WV), noting that biofortification “is not a panacea” (ACF, FAO). ACF raised concern about genetic modification in production of *some* biofortified varieties, as well as questions about farmer and consumer acceptability (WB).

Staple crop production was mentioned by half of the 12 institutions. While three made positive statements about the importance of staple crops for energy intake and income-generation (ACF, EC, FAO), none made unqualified statements endorsing staples. Of the six institutions, four voiced the caveat that staple crops are necessary but insufficient for addressing undernutrition (ACF, FAO, Save the Children UK, WV), because of their limited ability to provide dietary diversity and also the anti-nutrient effects of phytates that reduce iron and zinc absorption; one institution stated that evidence was lacking to support the theoretical positive link between staple production and reduced undernutrition (EC); and one gave an example where the introduction of improved maize varieties could cause harm to vulnerable groups if it were to reduce their ability to compete with larger farmers (IYCN). FAO suggested including staples consumed more often by the poor, which may differ from those consumed by wealthier households.

Cash crops were viewed sceptically within agricultural production-based strategies to improve nutrition. Six guidance notes mentioned cash crops, in the context of doing no harm and the mitigation of negative unintended consequences (ACF, FANTA, FAO, IYCN, Save the Children UK), or with regard to their insignificant impact on nutrition (WB). The main concern for potential harm was reduction in food security and dietary quality, if cash crops displace household food production: “gains from cash crops do not automatically cover this potential food gap” (ACF). According to FANTA, the risk is greater for high-value export crops than for commercialization of a pre-existing food crop or ASF. Other concerns were the increased risk due to dependence on market volatility (ACF, FANTA), and increased inequity of income control between men and women (FAO). Various strategies were proposed to mitigate nutritional risk from cash cropping. Two notes suggested support for diversification strategies in the context of cash cropping (ACF, FANTA), while the other notes overall were supportive of production diversification (FAO, IYCN, Save the Children UK, WB). FAO urged consistent monitoring of effects on nutrition and community social welfare, as well as nutrition education. According to two notes, cash crop promotion is less risky when land and labour are surplus (FANTA, IYCN), when there is strong seasonality of food crops and the cash crop takes advantage of slack labour periods, and when the cash-cropping is a female-led venture (FANTA).

REDUCE POST-HARVEST LOSS AND IMPROVE POST-PROCESSING

Beyond growing more food, retaining more of the food that is already grown would make a significant contribution to agriculture and nutrition goals. ACF cited a statistic that 20 percent of harvest is lost due to bad storage and handling. Reductions in post-harvest loss and improved post-processing were discussed by nine of the 12 institutions, for three main reasons:

- (1) increasing and prolonging food availability, access and consumption, particularly micronutrient-rich food,
- (2) preserving or increasing the nutrient content of the food, and
- (3) increasing income through higher profit margins of food sold during the off-season or with value-added processing, steadier income flows throughout the year, and employment in the processing cycle.

Other reasons not universally voiced included:

- (4) improving food safety (FAO, IFPRI, UN SCN), and
- (5) improving consumer access to diverse foods, through improved availability and reduced prices (IFPRI, HLTF, UN SCN).

HLTF emphasized reductions in waste at all stages of the value chain. UN SCN pointed out that education is helpful to translate increased year-round access to micronutrient-rich food into consumption.

Several types of actions were suggested, with some specific approaches for each.

- Controlling pests and disease, including aflatoxins prior to harvest (HLTF, WB).
- Harvesting and handling
 - ◆ Efficiency in post-harvest handling (ACF, HLTF, IFPRI, WB);
 - ◆ other “healthy harvesting” techniques, such as harvesting at maturity, avoiding damage and bruising, and not consuming or selling crops recently sprayed with pesticide (ACF).
- Preservation and processing
 - ◆ Solar drying (FANTA, FAO, UN SCN, WB, WV) or shed-drying (ACF), with vegetables blanched before drying (ACF);
 - ◆ fortification (ACF, EC, FANTA, IFPRI, WB, WV) or light milling (ACF);
 - ◆ pressing oilseeds (FANTA);
 - ◆ fermentation of flour, porridges and milk (ACF).
- Transport and storage
 - ◆ Washing and drying fresh produce before storage (ACF);
 - ◆ using cool, dark, well-ventilated facilities protected against insects and rodents (ACF);
 - ◆ storage of seed and planting materials (FAO).
- Strengthening post-harvest issues in agricultural research (FAO)

Locally specific problems along the value chain and feasible, innovative solutions would depend on context (ACF, FANTA).

INCREASE MARKETING OPPORTUNITIES

Ten institutions discussed market access and opportunities. Reasons were mainly to increase incomes, especially for women (implicit in all notes), and because “improving market access for nutritious foods provides farmers additional incentives to produce [them]” (WB). Increasing availability, access and demand for nutritious local foods can improve consumer diets, in addition to farmers’ income (HLTF, IFPRI, Save the Children UK, UN SCN). There were several suggestions on how to improve market access and opportunities:

- policies to increase access to markets for smallholders (including women) (Save the Children UK, HLTF), such as removing constraints to domestic trade (HLTF). FANTA suggested an analysis of market-relevant policies to understand their impact on nutrition (e.g. commerce regulations, policy support to agribusiness and non-traditional agriculture export promotion).
- Public investment in rural development to promote private investment in inputs, services and “value-added agroenterprises that integrate smallholders into national and regional food supply chains.” (HLTF)
- Farmer associations (FANTA, HLTF, UN SCN), business training and inventory credit schemes (FANTA) to help smallholders achieve better prices, gain bargaining power and participate in decision-making processes.
- Small-scale processing and micro-enterprise, particularly for women (e.g. dried fruits, jams) (ACF, FANTA).
- The need to choose marketable foods to produce was also noted (ACF, Save the Children UK, WV), as market viability is central to meeting needs for income as well as food.
- Market viability for nutritious foods that smallholders may have a comparative advantage in producing can be increased through promotion and social marketing to increase demand (FAO, IFPRI, UN SCN). The World Bank cited two examples of marketing traditional African foods: a nutrition-focused marketing approach for African leafy vegetables that led to increased production, farmer incomes and consumption; and sales of dried local wild fruit to Air Botswana.
- Improve infrastructure (e.g. roads, irrigation, storage facilities, wholesale markets, electrification) to improve market access (EC, HLTF, WB).
- Market information (Save the Children UK, WB).
- Save the Children UK also discussed access to transportation and cultural restrictions as barriers to women’s access to markets.
- FAO (2001) advised assessing the context to identify intra-household factors and bottlenecks to marketing and income for smallholders.
- Meeting quality standards, such as through improved food safety (e.g. reducing aflatoxins) (WB)
- Food procurement operations by governments for stockholding or food aid as a potential market (HLTF).
- “Strengthen functional linkages between farmers, food traders and processors (for instance, through enforceable contract farming systems)” (HLTF).

REDUCE SEASONALITY

Seven of the institutions included reducing seasonality of food access as a main recommendation. As stated by World Vision, “this is particularly important for nutritionally vulnerable groups such as children under 5, who have a very small window of time before reductions in quantity and quality of food can cause severe and often irreversible health and cognitive impacts”. The main recommended strategies cross into other themes, including diversification and use of locally-adapted varieties throughout the year (BI, FAO, WV), and improved storage and preservation (BI, FANTA, WB, WV), including inventory credit programmes (FANTA). FAO specifically mentioned designing vegetable gardens to maintain the supply of micronutrient-rich food year-round. ACF included other possible ways to reduce nutritional deficiency in hungry seasons: pre-positioning health resources and food aid before the lean months arrive, and providing food or cash transfers (indexed to price trends) or other forms of social protection during the lean season. HLTF focused on the importance of well-functioning markets for year-round access to nutritious food.

WOMEN’S EMPOWERMENT

According to the IFPRI paper, women “are the nexus of the agriculture, nutrition, and health sectors”. The recommendation to empower women through agriculture programmes and policies was universal in the guidance notes, and it was far beyond a mere mention; each guidance note had much to say on the topic. Due to the volume and specificity of guidance about empowering women, it has been taken as a distinct theme, even though women’s empowerment issues also fall under the themes of “targeting,” “household income,” “do no harm,” “equitable access to resources” and “market access”.

All of the guidance notes discussed why it is important to empower women for nutrition impact, and the reasons fell into two main categories: (1) reasons of equity and human rights, and (2) practical reasons related to women’s centrality in translating agriculture inputs and outputs into nutrition impact. The impact-related reason most often cited was that women’s income and decision-making power have greater impact on household health and nutrition than income controlled by men (ACF, FANTA, IYCN, FAO, Save the Children UK, UN SCN, WB, WV). This rests on women’s role across cultures as providers and gatekeepers of household food, child care and health (ACF, EC, FANTA, HLTF, IFPRI, Save UK, WB, WV). Bioversity highlighted women’s role as “keepers of food culture,” which affects how food production may translate into food consumption, and their role in using biodiversity in farming systems, which may reveal underutilized agricultural approaches to improve nutrition. FAO, HLTF and WB pointed out that women are due attention simply because of their enormous contribution to agriculture, which would be foolhardy to overlook. The guidance notes had many suggestions on what to do to enable women’s empowerment through agricultural programmes.

- In the planning stages of a programme, IFPRI and IYCN advised assessing the trade-offs between child care and agricultural production. ACF advised that time and labour demands should be evaluated, and that physical labour is harder for undernourished people, especially those suffering from iron deficiency – most of whom are women.

- In this regard, several notes stressed avoiding harm mainly by:
 1. avoiding giving an increased workload to women, which could harm both their own nutritional status due to physical work, and their children's, if the time or quality women devote to child care were reduced (ACF, FANTA, FAO, IYCN, Save the Children UK, WB). FANTA pointed out increased female labour could also harm food production for the household, since women are often responsible for producing gardens or other products for household own-consumption.
 2. Including men and boys can also be helpful to avoid harm and to increase chances of success, so that they understand and become more supportive of women or the projects targeting women (ACF).
- Specific agriculture activities to reach women included:
 1. focus on food crops grown by women (ACF, BI, FANTA, FAO, IYCN, WB). FANTA, FAO and Bioversity specify that non-staple minor crop production (including vegetables, fruit, legumes and traditional and indigenous food crops) and/or animal husbandry are more likely to be female-controlled (depending on the local context). Bioversity points out that focusing on women's production of these can "offer opportunities for value addition and increase income security" while FAO states: "commonly, crops grown by women are used for home consumption and, therefore, have a direct impact on household food security and nutrition." ACF and IYCN advocate for home gardens primarily because they are usually under women's control, and can therefore increase women's decision-making power about food consumption. WB suggests training and market opportunities for crops and animal products that women sell.
 2. Improving women's access to extension services, technology, inputs, markets and information (ACF, FANTA, FAO, HLTF, WV).
 3. Investing in technologies to reduce labour and time costs, especially for typically women's tasks such as weeding, harvesting, processing and food preservation (FANTA, FAO, HLTF, IYCN, Save the Children UK, WB). World Bank lists some examples, such as lighter farm tools, drum seeders that allow for mechanized weeding, mechanized mills and water-harvesting technologies such as treadle pumps.
 4. EC, IYCN, Save the Children UK and all the others by implication of their initial rationale, stressed the importance of strengthening women's income control (through the above activities) – as long as trade-offs with child care quality are not too great.
- Other potential components to agricultural programmes related to women's empowerment were suggested:
 1. Creating an enabling environment for child care (ACF, EC, FAO, IYCN, Save the Children UK, WB). ACF encouraged project planners to think about child care during training for women: this would include breastfeeding spaces, the engagement of fathers and mothers-in-law and other authority figures, and support to day care centres or the like for working women (especially urban women). FAO suggested a policy of allowing breastfeeding breaks for labourers. Save the Children UK suggested supporting men to increase their participation in care-giving.
 2. Improving access to financial services (ACF, FANTA, WV);
 3. including gender-sensitive social protection measures, such as providing extra food rations or vouchers, vouchers for services and multiple micronutrient sachets (ACF).
- Several notes couched activities to empower women within broad needs for policies that support women's rights to land, education and employment (ACF, FANTA, WV), or investment in agricultural research on topics disproportionately affecting women (HLTF).

Only three guidance papers discussed the process for how to best engage women in activities such as those listed above. FANTA and FAO recommended that the best way is to involve women at the design stage, and to continue working with them directly during implementation. That way, “women can identify appropriate mechanisms for addressing labor and other time constraints” (FANTA). FAO suggested that deliberate policies to target women through extension, designing extension programmes relevant to women’s agricultural activities, and/or increasing the number of women extension officers would help to reach women farmers more effectively. World Vision recommended positive deviance as an approach to empower women directly through confidence in their own knowledge and abilities: “access to opportunities must be accompanied by programs (such as PD/Hearth) that recognize and build on poor women’s priorities and knowledge; the purpose here is to support women’s leadership and confidence-building, so that they can translate opportunity into action”.

NUTRITION EDUCATION

Nutrition education was discussed by all 12 institutions, in terms of education, information, promotion and/or behaviour change.³³ **Why:** The main reasons for stressing incorporation of nutrition education into agriculture projects was to improve consumption and also to improve the nutrition impact of consumption (by modifying care practices and hygiene, for example) (FANTA) – or as FAO summed it up: “to improve dietary habits and feeding practices”. World Vision identified sustainability of interventions and associated nutrition benefits as a reason for education and behaviour change, and UN SCN described nutrition education as a way to “activate the latent nutrition aspects of many agricultural development projects and programmes,” or to provide an “extra incentive to produce more, diversify production and retain more food for household consumption,” according to FANTA. The World Bank and HLTF also noted the potential for general nutrition education efforts (reaching consumers) to increase consumer demand. The primary target group for education efforts (explicitly or implicitly) was mostly women, while a few papers also noted the importance of including men and whole families (FANTA, FAO, WB, WV).

What: Important topics education or training could address included:

- awareness-raising on food handling and food safety (ACF, BI, FAO, HLTF, Save the Children UK, UN SCN);
- healthy food choices and balanced diets (FAO, HLTF, Save UK, UN SCN, WB);
- nutritional requirements of different family members (ACF, BI, FAO, HLTF, Save the Children UK);
- encouraging cultivation and consumption of locally-available nutrient-dense food, even if available nutritious foods are low status (FANTA, FAO, UN SCN);
- food preparation and storage, including cooking demonstrations (ACF, Save the Children UK, World Vision);
- reduction of post-harvest losses and long-term storage to maintain nutrient content (FAO);
- strategies to increase and diversify family food supplies (FAO);
- encouraging environmentally sustainable food consumption patterns (IFPRI);
- health risks of highly processed foods and obesity/chronic disease (UN SCN); and
- care practices, breastfeeding and addressing food taboos (FANTA, FAO, HLTF).

33 Save the Children UK put nutrition education in its own section, separately from agriculture, although that section contained similar advice to many of the other guidance notes.

How: Several of the guidance notes wrote extensively on principles for forming specific messages. They advise that successful education and behaviour change efforts will do the following:

- base messages and strategies on an understanding of local perceptions about diet and nutrition, reasons for current behaviours and barriers to and opportunities for behaviour change (ACF, BI, FANTA, Save the Children UK). Bioversity suggests using the positive deviance approach for behaviour change, because it inherently encompasses these considerations.
- Have a concise set of clear, actionable messages (ACF, BI, FANTA, Save the Children UK).
- Build on existing messages and guidelines in-country, such as essential nutrition actions (ENAs) or national food-based dietary guidelines (ACF, WV).
- Relate messages closely to the agricultural intervention, such as nutrition information about crops produced and ways of preparing and preserving them (FANTA, Save the Children UK, UN SCN, WB).
- Release information through multiple channels at once (ACF, HLTF, Save the Children UK).
- Four institutions (EC, FAO, Save the Children UK, UN SCN) discussed ways to build an enabling environment for nutrition education to take hold, through capacity-building, including nutrition training for agriculture, health and education extension agents; nutrition curricula in primary schools, which may include school gardens; and increasing the availability of fruits and vegetables.

Where: The guidance notes also presented a number of ideas for venues for reaching target communities with nutrition education and information:

- group-based activities (women's groups, marketing associations, microfinance clubs) (ACF, FANTA);
- schools (ACF, FAO, UN SCN);
- home visits (ACF, UN SCN);
- community gardens or other gatherings specifically organized for training sessions (ACF, FAO, UN SCN);
- ACF and FAO also suggested utilizing market days; religious centres; performances (e.g. dramas, storytelling); and mass media (radio, television, billboards, posters).

Who could or should give nutrition education training sessions, and how much should be expected of agricultural extension, is probably the subject of most debate within this theme. Five institutions singled out agricultural extension agents as the most effective medium for communicating nutrition information in the context of an agricultural programme (ACF, FANTA, FAO, IYCN, UN SCN). Save the Children UK and World Bank included agricultural extension as one possible channel, together with health workers, mass media and schools. FANTA, UN SCN and World Bank underscored the need for information to be closely tied in with the intervention, but FANTA also suggested that agricultural extensionists could include simple, basic health messages. ACF and World Bank discussed collaboration with health staff (community health workers, auxiliary nurses, birth attendants) or nutrition volunteers to get all the necessary messages out. Other notes did not specify who should be responsible for nutrition education.

MANAGEMENT OF NATURAL RESOURCES

The fact that 10 of the 12 institutions discussed natural resource management at length, in documents providing guidance on how to reach nutrition, is interesting. At first glance, the identified goals of improved productivity (ACF, FAO, UN SCN), resilience and adaptation to climate change (ACF, EC, IFPRI, HLTF, Save the Children UK, WB, WV), and increased equitability of access to natural resources (BI, EC, FAO, HLTF) through soil, water and biodiversity conservation may seem simply production- or environment-oriented with little direct impact on nutrition. These goals are, however, relevant to nutrition: they would support livelihoods, improve pro-poor availability of water and water quality management including control of water-borne diseases (EC, FAO, IFPRI, UN SCN, WV), and provide the foundation of food security. IFPRI stated: “stress on natural resources... may cause farmers to adopt farming practices that are harmful to their own health and to the health of the consumers and that are ultimately not sustainable.” According to the HLTF, which discussed managing ecosystems for food and nutrition security extensively:

“Within any society, farmers – particularly smallholders – are most likely to be affected by changing climate, degradation of the environment and increasing competition over natural resources. Long-term food and nutrition security depends on the ways in which ecosystems are managed and access to natural resources is governed.”

EC reiterated that climate change and natural disasters are a clear threat to food security and nutrition, and therefore nutrition-sensitive investments are those that increase resilience while restoring or enhancing the natural resource base. FAO and HLTF (as well as IFPRI in another theme) used the concept of “sustainable diets”, indicating that food choices and ability to sustain food production are linked.

Each of the ten institutions discussed improving soil quality through fertility and control of erosion. Suggested mechanisms included legume production and intercropping, integrated crop-livestock systems, economic support for inputs such as fertilizer and sustainable land management techniques. FAO and World Bank advocated for the use of iodine, zinc and iron fertilizers which could improve soil fertility but more directly increase those micronutrients in food crops grown in the soil. Five of the notes discussed equitable access to water and sustainable, pro-poor management of water resources (EC, FAO, IFPRI, HLTF, UN SCN, WV); IFPRI and HLTF noted this need would increase due to climate change. FAO highlighted the potential of micro-irrigation (e.g. rainwater harvesting, low-cost drip systems, treadle pumps) based on positive experience in Nepal. Four of the notes discussed biodiversity conservation as an ecosystem service for nutrition, including use of agroforestry, locally adapted varieties and supporting pest biocontrol from natural pests and parasites (ACF, BI, HLTF, UN SCN). FAO supported integrated pest management. UN SCN and HLTF tied the issue of natural resource management back to policy coherence toward food and nutrition security, and urged global policies supportive of conservation, biodiversity and sustainable management of natural resources. HLTF suggested several such policies, including pricing and distributing inputs according to local conditions and natural capacity of ecosystems; paying farmers for ecosystem services they provide; and well-functioning governance of land, plant genetic resources, irrigation and fisheries.

POLICY COHERENCE

A majority of the guidance notes expressed that even efforts to improve nutrition through well-targeted, context-appropriate, nutrition-friendly interventions at the household/community level may be counteracted by a broader policy environment unsupportive of nutrition. HLTF writes: “Policies that enable all people to enjoy good nutrition are referred to as “nutrition-sensitive”. The common message on the need for policy coherence can be summed up as the need to “mainstream nutrition considerations into relevant policies and programmes, thus contributing to long-term nutrition-sensitive development” (FAO). Nine of the institutions included the advice simply to improve policy coherence, so that one policy does not work against another policy or programme (ACF, EC, FANTA, FAO, HLTF, IFPRI, Save the Children UK, UN SCN, WB).

Furthermore, most of the above-named institutions, together with World Vision, offered recommendations on exactly what kind of policies are needed. These included:

- food policy, which was by far the most common concern (discussed by seven institutions). Areas of food policy where guidance notes advocated for nutrition-sensitive reform:
 - ◆ food price policies (EC, FAO, IFPRI). IFPRI made a special point that “price policies can be used to promote consumption of more nutritious foods”, and strongly recommended the use of policy instruments (including incentives, taxes and education/information) to correct market failures on the true price/cost of food items, taking into account health and environmental issues. HLTF mentioned policies to mitigate food price volatility and to ensure diversified supply.
 - ◆ Subsidies (EC, FAO, IFPRI, HLTF). IFPRI specifically noted that “downstream” effects are as important to consider as immediate effects of subsidies, giving the example that untargeted consumer subsidies can help the poor obtain food in the short term but in the long term they can negatively affect consumption choices and reduce more nutrition-sensitive investment. HLTF also urged against generalized consumer food subsidies.
 - ◆ Trade policies, including import, export and informal border trade of food (EC, FAO, HLTF, Save the Children UK, UN SCN), and agricultural inputs (HLTF). Policy recommendations from HLTF differed based on whether countries were food-exporting or food-importing.*
 - ◆ Incentives (unspecified) to produce and market micronutrient-rich foods (UN SCN).
 - ◆ Policies specifically on export crops and staples (FAO).
 - ◆ Control/release of food buffer stocks (FAO, HLTF).
 - ◆ Food security policies which favour the need for adequate nutrition (WB).
- Pro-poor policies in general (EC, FANTA, HLTF, UN SCN).
 - ◆ Land reform (FANTA, FAO and others as detailed in the “equitable resources” section).
 - ◆ Legal codes, pro-poor regulations and decentralization of licensing processes for cooperatives, associations and micro-enterprises (FANTA).
 - ◆ Policies that enable access to agricultural inputs (HLTF, Save the Children UK).
- Infrastructure-building (roads, transportation, communications) (FANTA, EC, FAO, HLTF, IFPRI), which FAO noted can facilitate food distribution and reduce prices, and can provide employment opportunities.

- Social protection/social services (ACF, EC, FAO, HLTF*, IFPRI, Save the Children UK)
 - ◆ Cash transfers and other programmes or policies moderate prices³⁴ for basic goods and services for the poor (ACF, EC, FAO, IFPRI, Save the Children UK).
 - ◆ Provision of health services for the poor (FAO, IFPRI).
 - ◆ School feeding programmes (FAO).
 - ◆ Supplementary feeding programmes (FAO).
- Environmental policies, to support sustainable farming activities (FAO, HLTF, IFPRI, Save the Children UK), including policy support for climate change adaptation (HLTF)*,
- Macro-economic policies promoting investment in the agriculture sector (EC, FAO, HLTF),
- Policies to support open and well-functioning markets, enabling access to nutritious food (HLTF)*,
- Responsible foreign direct investment that includes smallholders (UN SCN),
- Policies on non-food land use (Save the Children UK).
- Population policies (FAO).
- Disaster risk reduction (HLTF).

*The HLTF guidance documents were primarily about policy needs to support sustainable food and nutrition security, and emphasized three areas in great detail: environmental sustainability, well-functioning markets free of trade distortions and social protection.

GOOD GOVERNANCE FOR NUTRITION

Good governance for nutrition refers to high-level planning and action specifically to reduce malnutrition. Policy coherence - which is about changing policies in various sectors that are counterproductive to nutrition policies, and adding helpful non-nutrition-specific policies such as pro-poor regulations - goes hand-in-hand with good governance for nutrition. They are treated separately here because ten institutions had advice focused on specific nutrition governance (ACF, EC, FANTA, FAO, IFPRI, HLTF, Save the Children UK, UN SCN, WB, WV). The EC paper had a complete section on improving nutrition through governance, and HLTF documents also focused strongly on this area with many points of guidance.

Leadership and commitment at the highest levels of government and donors are prerequisites for supporting the processes needed within good governance for nutrition (ACF, EC, FAO, HLTF, Save the Children UK, WB). The World Bank noted that countries' demand for improving nutrition is one of the most important factors towards increasing financing for nutrition-sensitive development. On the other hand, HLTF noted that official development assistance "has an important role to play in supporting the case for catalyzing and then accelerating necessary increases in national spending... the primary source of increased investment will usually be a rise in the amount of the national budget going to food and nutrition security". HLTF also suggested that international partners come together on the issue: "At global level, partnerships can facilitate convergence among initiatives on sustainable agriculture and food and nutrition security... Regional and international organizations increasingly seek to align their assistance to national authorities and other in-country partners". The IFPRI paper suggested operational research is needed to learn how to generate effective leadership for multisectoral collaboration and coordination.

34 Could include tax breaks, pricing by ability to pay, vouchers, subsidies and other incentives

The main recommendation in this area has been to draw up a **national nutrition strategy or action plan** (ACF, EC, FANTA, FAO, HLTF, WV). FANTA discussed two kinds of plans: a food security strategy that aims to improve nutrition (generally an agriculture sector document), and a nutrition strategy that can be explicitly addressed by agriculture (usually a national-level or health-sector document). ACF, EC, HLTF, FAO and World Vision noted that the current and planned budget (from national and international sources), as well as institutional structures and capacity to support the plan rapidly are also important factors, so that the plan doesn't merely stay a plan.

Nutrition surveillance was also frequently recommended (ACF, EC, FAO, HLTF, UN SCN, WV), disaggregated by age, gender, livelihood and geography, and including surveillance of trends affecting food and nutrition security such as food prices, local food availability and consumption of good quality food, water and sanitation, and disease (HLTF). National-level capacity to integrate and manage information from various sectors was noted to be largely absent (FAO), and a topic that would benefit from research (IFPRI). HLTF urges support from international organizations and non-governmental groups to assist governments with national monitoring and information systems.

Accountability based on information, transparency and nutrition indicators (EC, FAO, HLTF) is important to good governance. HLTF states: "Countries making the most progress on food and nutrition security are those with a strong political and financial commitment and a high sense of accountability on all interlinked areas of food and nutrition security". Three notes also mentioned that reform of international bodies affecting policies and actions at country-level, such as the Committee on World Food Security (FAO, IFPRI, HLTF) would assist with accountability. Sound government regulation on the implementation of national policies (on fortification and food safety policies, for example) is necessary to ensure that nutritional benefits from activities are realized (HLTF, WB), and everyone, especially the most vulnerable and marginalized, should be able to seek recourse if they do not receive their entitlements (HLTF).

Respect for human rights is a basic characteristic of good governance in general, and also for nutrition (HLTF).

Other recommendations approached "policy coherence". Incorporating nutrition into 5- or 10-year development plans, poverty reduction strategy papers and UN frameworks (EC, UN SCN) is an element of good governance for nutrition, based on convincing planners that targeted nutrition policies and interventions are necessary above and beyond economic development. Agreement with international codes supportive of nutrition, such as the International Code of Marketing of Breast Milk Substitutes, is also a step toward good governance (ACF, EC).

CAPACITY-BUILDING³⁵

Capacity-building, a theme closely related to nutrition governance, was discussed by seven institutions (ACF, FAO, IFPRI, HLTF, UN SCN, WB, WV). Advice was given regarding kinds of capacity needed as well as those who need it. Ministry staff, including local and extension services in agriculture and health, were specifically singled out as needing greater capacity to understand and address malnutrition (ACF, FAO, UN SCN, WB), as well as policy-makers and communities/the public (FAO). As stated by the UN SCN: “There is a shortage of qualified personnel at every level - national, district, and local”. Kinds of capacity needed included identifying food and nutritional problems and their causes and prioritizing needs, designing intervention strategies, providing management and operational support, nutrition communication skills (FAO, UN SCN), capacity of NARS for breeding and dissemination of relevant biofortified crops, and technical capacity for food quality control and laboratory analysis (e.g. of aflatoxins, micronutrient content) (WB). Currently, coverage of agricultural extension is low, especially of agents with capacity in horticulture, livestock and aquaculture, and agents often have very limited resources available to them (FAO, WB). FAO, UN SCN and the World Bank suggested that an increase in nutritionists and home economics staff would also help: “procuring funding for training nutrition specialists at all levels of government should be a priority” (UN SCN). IFPRI recommended “investing in research, evaluation, and education systems capable of integrating information from... agriculture, health, and nutrition” as well as human and institutional capacity. Civil society involvement and inclusion may increase capacity for action and assessment (ACF, EC).

ADVOCACY AND COMMUNICATION

Communication and advocacy were raised by 10 institutions as important tasks to link agriculture and nutrition. The most common recommendation was wider dissemination of relevant knowledge and experience across sectoral, national and institutional boundaries, translated into policy-relevant messages for effective programme and policy changes (BI, FANTA, FAO, HLTF, IFPRI, WB, WV). Suggested formats for knowledge-sharing included bulletins, regular working groups, workshops, inter-agency meetings and policy dialogue (FANTA). ACF, FAO, IFPRI and Save the Children UK advocated for continued awareness-raising among policy-makers from various fields on the extent and consequences of malnutrition, and EC recommended effective nutrition champions in different stakeholder groups (such as the agriculture sector). FANTA suggested making food security and nutrition monitoring data more available, such as “standard data on health and agricultural production and prices collected by ministries, NGOs and UN agencies.”

Related to the topic of advocacy is communicating the rationale for agriculture programmes and policies to support nutrition. While most of the guidance was on *what to do* to design, implement and support nutrition-sensitive agriculture, the question of *why to do* nutrition-sensitive agriculture is often pertinent to agriculture programmers when faced with changing the scope of their programmes. Several guidance notes discussed rationale for the agriculture sector to have an interest in nutrition (EC, FANTA, HLTF, IYCN, IFPRI, FAO and WB). These reasons fell into two general categories:

35 Note: this term refers to capacity-building of personnel. Capacity-building of households or beneficiaries is treated under “Nutrition education”, above.

1. Agriculture is supposed to be nutrition-sensitive anyway, and accountability can be improved.

- ◆ At a high level, objectives of agriculture programme/investment funders are almost always improved farmer well-being and improved food security (which means consistent access to nutritious diets); and sometimes child health or survival (depending on the funding source) (FANTA, FAO, WB).
- ◆ No other sector is better placed to address food production and consumption (WB).
- ◆ Consumption and diets can be improved without compromising other programme-specific strategic objectives (FANTA).
- ◆ Nutrition-sensitive agricultural activities are closely linked to increased women's participation, often an explicit goal of agriculture programmes (WB).

2. Nutrition-sensitive agriculture would further the objectives of productivity and economic gain.

- ◆ Malnutrition results in lower labour capacity, and losses in productivity and agricultural income (EC, FAO, HLTF, IFPRI, IYCN, WB); this is especially pertinent in contexts where HIV/AIDS is a factor (IFPRI). Nutrition-sensitive agriculture can help reduce those constraints.
- ◆ Nutrition knowledge (on the part of both producers and consumers) can create incentives to transition to diversified production, which can reduce risk and increase income from high-value production (WB).
- ◆ Greater women's participation (which is part of nutrition-sensitive agriculture) results in higher productivity (WB).

TABLE 1: PURPOSE, AUDIENCE AND SCOPE OF EACH GUIDANCE NOTE

The purpose and audience of each guidance note were copied directly in most cases and summarized when a direct quote was not available.

ORGANIZATION	DOCUMENT TITLE	YEAR	PURPOSE	AUDIENCE	LENGTH
ACF	Maximizing the nutritional impact of food security and livelihoods interventions: a manual for field workers	July 2011	“This manual aims to provide practical guidance to field workers in order to maximise the nutritional impact of food security & livelihoods (FSL) interventions”	ACF staff and other humanitarian practitioners	100 pages (excluding annexes)
BI (Bioversity International)	Improving nutrition with agricultural biodiversity: a manual on implementing food systems field projects to assess and improve dietary diversity, nutrition and health outcomes	Oct 2011	“This guide describes the process and procedures for collecting important information required to assess local farming systems and agrobiodiversity, household food consumption norms and the nutritional status of vulnerable groups within a given population using specific indicators. Additionally, this guide provides a framework for practical implementation of a holistic program that focuses on creating a customized intervention based on community-specific data.”	“This manual is aimed at Bioversity’s national and regional partners and humanitarian organizations with interests in the impacts of agrobiodiversity on food availability, nutrition and health in developing countries. It is a practical tool that can be used by field workers trained in agroecology and home survey data gathering techniques, as well as experienced health and agriculture professionals.”	35 pages (excluding annexes)
EC	Addressing undernutrition in external assistance: an integrated approach through sectors and aid modalities	Sept 2011	“This Reference Document is intended as a resource to guide the practical incorporation of nutrition objectives into relevant sectors and different funding methods used by the European Union (EU) – whether in development cooperation or in humanitarian response.”	“Aid administrators working within country teams – delegations of the EU and offices of Member States. In addition... national counterparts and other stakeholders.”	100 pages (3pp specifically pertaining to food security and agriculture)

ORGANIZATION	DOCUMENT TITLE	YEAR	PURPOSE	AUDIENCE	LENGTH
FANTA	Improving the nutrition impacts of agriculture interventions: strategy and policy brief	2001	“This strategy and policy brief presents recommendations for improving consumption and nutrition impacts of agricultural interventions, emphasizing opportunities for strengthening complementarity between agriculture, health and nutrition program areas without compromising program-specific strategic objectives”	“USAID Mission staff, particularly Agricultural and Health Officers.” “The information is most appropriate for Missions in countries with high rates of poverty and malnutrition, where agriculture is a significant source of income for the poor and where the Mission has expressed a strong interest in tackling problems of malnutrition”	20 pages
FANTA	Increasing the nutritional impacts of agricultural interventions	1999	“To foster a clearer and more in-depth understanding of program and policy options for improving the impact of agricultural projects on consumption and nutritional status.”	Broad; but “produced for USAID’s Office of Sustainable Development, Agricultural Development Division within the Africa Bureau”	20 pages
FAO	Assisting the food and agriculture sector in addressing malnutrition	2010	To describe the role of the food and agriculture sector; and FAO, “to protect, promote and improve food-based systems to ensure sustainable food and nutrition security, improve diets, combat micronutrient deficiencies, and raise levels of nutrition, and in so doing, achieve the nutrition-related Millennium Development Goals (MDGs).”		2 pages
FAO	Investing in food security: <i>linking agriculture to nutrition security</i>	2009	“The FAO Agriculture and Consumer Protection Department has produced this series of briefs in the interest of guiding investments. They highlight 12 aspects of agricultural production, processing and food quality to illustrate where investments can have big returns in terms of improving productivity and livelihoods while protecting the natural resource base so essential for sustainability.”	Investors (international and donor communities and the commercial private sector)	2 pages (out of a 30pp set of briefs)

ORGANIZATION	DOCUMENT TITLE	YEAR	PURPOSE	AUDIENCE	LENGTH
FAO	Incorporating nutrition considerations into development policies and programmes	2004	<p>“The overall objective of this policy brief is to create awareness and understanding of the advantages of good nutritional status to the development process, so that nutrition considerations can be incorporated into development policies to facilitate sustainable development.”</p> <p>This brief will “(a) provide policy-makers with practical strategies for incorporating nutrition considerations into relevant development policies; (b) provide health and nutrition workers with a tool to advocate for nutrition at the policy level.</p>	Country-level policy-makers, health and nutrition workers ³⁶ and	76 pages (2pp specifically on agric. policies and programmes, but other sections also contained relevant guidance)
FAO	Incorporating nutrition considerations into agricultural research plans and programmes	2001	<p>“This paper presents a series of guidelines meant to encourage and assist Member Nations of the United Nations Food and Agriculture Organization (FAO) in addressing and including nutrition and health issues in their agricultural research planning and programmes... The paper also offers practical suggestions for implementation of these Guidelines, which are designed specifically for four different disciplines of the agriculture sector: policy-makers, research planners and managers, agricultural research workers and extension services.”</p>	Policy-makers, research planners and managers, agricultural research workers and extension services	5 chapters

³⁶ “In adopting the ICN (International Conference on Nutrition) Plan of Action for Nutrition, participating countries agreed to prepare National Plans of Action for Nutrition (NPAN). In formulating their NPAN, several countries expressed the need for assistance in terms of advocacy to raise awareness about the need to integrate nutrition objectives into development policies. In response to this request, FAO developed this advocacy document.”

ORGANIZATION	DOCUMENT TITLE	YEAR	PURPOSE	AUDIENCE	LENGTH
IFPRI	Leveraging agriculture for improving nutrition and health outcomes: the way forward	2011	“This “Way Forward” statement is a synthesis of IFPRI’s preliminary conclusions based on the policy consultation process and is designed to stimulate international debate on the way forward.”	Broad	4 pages
IYCN	Achieving nutritional impact and food security through agriculture: fact sheet	Feb 2011	“This fact sheet summarizes these relationships by offering examples of what works and what does not, serving as a resource for agricultural professionals involved in the design and planning of projects”	“Agricultural professionals involved in the design and planning of projects”	4 pages
IYCN	Integrating household nutrition and food security objectives into proposed agriculture projects: illustrative guidance	Feb 2011	“This tool briefly describes how to develop objectives and determine indicators that will maximize nutritional benefits for populations most vulnerable to food insecurity and malnutrition.”	Agriculture program designers	6 pages
Save the Children UK	A life free from hunger <i>Chapter 4: Harnessing the potential of agriculture to tackle malnutrition</i>	2012	To “galvanize political commitment...[to] dedicate the necessary time and resources to ending the malnutrition crisis.”	Leaders of countries with high numbers of malnourished children, global institutions that have a mandate to tackle hunger and malnutrition, and rich country governments	10 pages
Save the Children UK	Hungry for change: an eight-step, costed plan of action to tackle global child hunger; <i>Component 3: nutrition-friendly agriculture and livestock policies</i>	2009	To “[provide] governments and international agencies with a clear and credible roadmap to combat child malnutrition.”	Governments and international agencies	1 page

FINAL DRAFT

ORGANIZATION	DOCUMENT TITLE	YEAR	PURPOSE	AUDIENCE	LENGTH
World Bank	“Improving nutrition through multisectoral approaches: Guidance note for agriculture and rural development”	Jan 2013	“The overall objective of this guidance note is to offer practical guidance to support World Bank Task Team Leaders (TTLs), development partners and country implementers in maximizing the positive nutrition impacts of agricultural investments, and minimizing the unintended negative consequences on nutrition. The specific objectives of this guidance note are to support TTLs, partner agencies, and country clients in making agriculture investments more <i>nutrition sensitive</i> .”	“World Bank task team leaders, development partners and country implementers”	40 pages (excluding annexes)
World Vision	Growing healthy children: addressing child undernutrition through agriculture	Feb 2011	“This discussion paper seeks to make explicit the role that agriculture in particular, support to smallholder farmers, has in reducing child undernutrition... to stimulate thinking on concrete ways to improve nutritional status through agricultural interventions.”	Broad; specifically WV and other NGO program staff	9 pages
World Vision	Growing healthy children: key lessons from evaluations of World Vision’s integrated agriculture-nutrition-health programming	Feb 2011	To present publicly the information in the discussion paper and key lessons from World Vision’s experience, and to gain feedback at an international meeting (IFPRI International Conference, “Leveraging Agriculture for Improving Nutrition and Health”)	Broad	4 pages
UN HLTf	Food and nutrition security for all through sustainable agriculture and food systems	Mar 2012	“To contribute to a stronger focus on outcomes related to agriculture, food and nutrition security within the Rio + 20 processes and beyond.” -David Nabarro	Broad	12 pages

FINAL DRAFT

ORGANIZATION	DOCUMENT TITLE	YEAR	PURPOSE	AUDIENCE	LENGTH
UN HLTf	Food and nutrition security: comprehensive framework for action: summary of the updated comprehensive framework for action	Aug 2011	“Policies and action for responses to food and nutrition insecurity need to address two parallel tracks: (i) meeting the immediate food and nutritional needs of those at risk; and (ii) building longer-term resilience by eliminating the root causes of hunger and poverty. The UCFA sets out ways in which the HLTf can support food and nutrition security policies along these twin tracks...This summary version of the UCFA has been prepared as an easy-to-read concise document that highlights the concepts and principles of the framework. Special attention has been given to maintaining the meaning and spirit of the full version of the UCFA without reopening sensitive debates on which there is a measure of consensus.”	Broad	36 pages
UN SCN	6 th report on the world nutrition situation, <i>Chapter 4: Sustainable food and nutrition security</i>	2010	“Chapter 4 discusses current trends in food and nutrition security, explores immediate and long-term challenges, and presents the case for why agriculture is central to improving nutrition.”	Broad	22 pages

ANNEX 1: ALL DOCUMENTS IDENTIFIED

INSTITUTIONAL GUIDANCE/STATEMENTS ON LINKING AGRICULTURE AND NUTRITION

A total of 53 publications have been identified to date; 31 development institutions have been involved in publishing guidance, a statement or explorations of the evidence linking agriculture and nutrition. These fall into the categories of “guiding principles and operational guidance” for increasing nutrition impact of agriculture programmes; UN inter-agency guidance; “manuals” to assist programme staff in implementing the principles; “statements and strategies” describing approaches of individual institutions; and “other” including four academic reviews, a community conversation and a research programme. The papers identified in each category are below.

GUIDANCE NOTES (10 INSTITUTIONS)

ACF International (Action Against Hunger)

Maximizing the nutritional impact of food security and livelihoods interventions: a manual for field workers (Le Cuziat, G. and Mattinen, H.) July 2011

<http://www.actionagainsthunger.org/publication/2011/07/maximising-nutritional-impact-food-security-and-livelihoods-interventions>

Bioversity International (BI)

Improving Nutrition with Agricultural Biodiversity: a manual on implementing food systems field projects to assess and improve dietary diversity, and nutrition and health outcomes October 2011

http://www.bioversityinternational.org/fileadmin/bioversityDocs/Research/Nutrition_new_/Improving_Nutrition_with_agricultural_biodiversity.pdf

EC (European Commission)

Addressing undernutrition in external assistance: an integrated approach through sectors and aid modalities. September 2011

Note: Sections 2.6-2.7 are: “Improving Nutrition through Food Security” and “Improving Nutrition through Agriculture”

<http://capacity4dev.ec.europa.eu/topic/fighting-hunger-food-security-nutrition>

FANTA (Food And Nutrition Technical Assistance - USAID)

Improving the nutrition impacts of agriculture interventions: Strategy and policy brief 2001
http://www.fantaproject.org/downloads/pdfs/NutAg_Mar01.pdf

Background paper: Increasing the nutritional impacts of agricultural interventions (Bonnard, P.) 1999
http://www.fantaproject.org/downloads/pdfs/nut_ag.pdf

FAO (Food and Agriculture Organization of the UN)

Assisting the food and agriculture sector in addressing malnutrition. 2010

http://www.fao.org/fileadmin/user_upload/agn/pdf/Food_and_Agr_sector_and_malnutrition.pdf

Investing in food security: Linking agriculture to nutrition security. 2009

http://www.fao.org/fileadmin/templates/ag_portal/docs/i1230e00.pdf

Incorporating nutrition considerations into development policies and programmes. 2004
Note: p44-46 is most relevant: Policies and programs in agriculture.

<ftp://ftp.fao.org/docrep/fao/007/y5343e/y5343e00.pdf>

Incorporating nutrition considerations into agricultural research plans and programmes. 2001

<http://www.fao.org/docrep/005/y1181e/Y1181E00.htm>

IFPRI (International Food Policy Research Institute)

Leveraging agriculture for improving nutrition and health outcomes: The way forward. 2011

<http://2020conference.ifpri.info/publications/the-way-forward/>

This piece has also been published as Ch.23 in *Reshaping agriculture for nutrition and health* edited by S Fan and R Pandya-Lorch, IFPRI 2012 (Fan, S., Pandya-Lorch, R. and Fritschel, H.)

<http://www.ifpri.org/publication/reshaping-agriculture-nutrition-and-health>

IYCN (Infant and Young Child Nutrition – USAID)

Achieving nutritional impact and food security through agriculture: Fact sheet. February 2011

<http://www.iycn.org/resource/achieving-nutritional-impact-and-food-security-through-agriculture/>

“Integrating household nutrition and food security objectives into proposed agriculture projects: Illustrative guidance” Feb 2011

<http://www.iycn.org/resource/integrating-household-nutrition-and-food-security-objectives-into-proposed-agriculture-projects-illustrative-guidance/>

McKnight Foundation Crop Collaborative Research Program (CCRP)

What we know about agricultural interventions to improve child nutrition. Forthcoming (listed alphabetically: Berti, P. Bezner-Kerr, R., Creed, H., Cruz, Y., Jones, A., Nicklin, C., Omonte, M., Perez, M., and Scurrah, M.)

To be released 2013.

Save the Children, UK

A life free from hunger: *Chapter 4: Harnessing the potential of agriculture to tackle malnutrition*. 2012
<http://www.savethechildren.org/atf/cf/%7B9def2ebe-10ae-432c-9bd0-df91d2eba74a%7D/A%20LIFE%20FREE%20FROM%20HUNGER%20-%20TACKLING%20CHILD%20MALNUTRITION.PDF>

Hungry for change: An eight-step, costed plan of action to tackle global hunger. 2009
Note: "component 3" of the plan is about nutrition-friendly agriculture
http://www.savethechildren.org.uk/en/54_9544.htm

World Bank (WB)

Improving nutrition through multisectoral approaches: Guidance note for agriculture and rural development. 2013
<https://www.securenutritionplatform.org/Pages/DisplayResources.aspx?RID=151>

World Vision International (WV)

Growing healthy children: Addressing child undernutrition through agriculture. (Sheri Arnott) February 2011
<http://voices.worldvision.ca/wp-content/uploads/2012/04/Food-Sec-Nutrition-Discussion-Paper-FINALver-2-feb-2011-21.pdf>

Growing healthy children: Key lessons from evaluations of World Vision's integrated agriculture-nutrition-health programming. (Munyao, K.) February 2011
http://2020conference.ifpri.info/files/2010/12/20110211parallel2C3_Munyao_Kioko_note.pdf

UN INTER-AGENCY GUIDANCE (2 INTER-AGENCY BODIES)

UN SCN (Standing Committee on Nutrition)

6th report on the world nutrition situation: Progress in nutrition. 2010
 Chapter 4: Sustainable food and nutrition security
Note: the 6th report (SCN's most recent) focuses on two priority areas: maternal nutrition (Ch 3), and agriculture as central to improving nutrition (Ch4).
<http://www.unscn.org/files/Publications/RWNS6/html/index.html>

UN HLTF on Global Food Security (High Level Task Force)

Food and nutrition security for all through sustainable agriculture and food systems. March 2012
<http://www.un-foodsecurity.org/>
 Updated Comprehensive Framework for Action (CFA). 2010
http://un-foodsecurity.org/sites/default/files/UCFA_English.pdf
http://un-foodsecurity.org/sites/default/files/SUMMARY_UCFA_EN.pdf

MANUALS (8 INSTITUTIONS)

ACDI/VOCA

Set of four Nutrition Integration Fact Sheets on integrating nutrition into value chains for legumes, vegetables, maize, and rice, accompanied by a nutrition primer. April 2012

<http://www.thousanddays.org/author/acdivoca/>

ACF International

Maximizing the nutritional impact of food security and livelihoods interventions: a manual for field workers. July 2011

<http://www.actionagainsthunger.org/publication/2011/07/maximising-nutritional-impact-food-security-and-livelihoods-interventions>

Bioversity International

Improving nutrition with agricultural biodiversity: a manual on implementing food systems field projects to assess and improve dietary diversity, and nutrition and health outcomes. October 2011

http://www.bioversityinternational.org/fileadmin/bioversityDocs/Research/Nutrition_new_/Improving_Nutrition_with_agricultural_biodiversity.pdf

FAO

Guidelines for joint planning for nutrition, food security, and livelihoods: Agreeing on causes of malnutrition for joint action. May 2011

http://www.fao.org/fileadmin/user_upload/wa_workshop/docs/Joint_Planning_for_Nutrition_Nov2012.pdf

Protecting and promoting good nutrition in crisis and recovery. 2005

<ftp://ftp.fao.org/docrep/fao/008/y5815e/y5815e00.pdf>

Guidelines for preparing micro-project proposals to improve food security and nutrition. 2002

<http://www.fao.org/DOCREP/005/y2829e/y2829e00.htm>

Guidelines for participatory nutrition projects. 1993; currently being updated

<http://www.fao.org/docrep/v1490e/v1490e00.htm>

GAIN, IDS, and USAID

Nutritious agriculture by Design: A tool for program planning. May 2012

<http://gain.staging.website-express.co.uk/project/nutritious-agriculture-design-tool-program-planning>

IYCN

Nutritional impact assessment tool: a tool for maximizing the positive impacts of agricultural interventions on nutritionally vulnerable and food insecure populations. September 2011

<http://www.iycn.org/resource/nutritional-impact-assessment-tool/>

STATEMENTS AND STRATEGIES (12 INSTITUTIONS)

AGRA (Alliance for a Green Revolution in Africa)

Transforming agriculture, nutrition, and health linkages. (Ngongi) February 2011

http://2020conference.ifpri.info/files/2011/02/20110210inaugural_panel_Ngongi_Namanga_note.pdf

AVRDC – The World Vegetable Center

Brochures of mission and activities *Consumption/nutrition is one of the main themes*

http://203.64.245.61/web_docs/brochures/HQ_brochure_web.pdf

http://203.64.245.61/web_docs/brochures/unique_center_latest.pdf

Indigenous Vegetables: A home-grown answer to malnutrition

http://203.64.245.61/web_docs/brochures/point/Point-Nutrition.pdf

Home gardens: Fresh vegetables within reach of all

http://libnts.avrdc.org.tw/web_docs/media/background/home%20gardens_rev_s.pdf

BMGF (Bill & Melinda Gates Foundation)

Optimizing nutrition outcomes from investments in agriculture. August 2012

<http://www.gatesfoundation.org/agriculturaldevelopment/Pages/optimizing-nutrition-outcomes-from-investment-agriculture.aspx>

Bioversity International

Resilient food and nutrition systems: Analyzing the role of agricultural biodiversity in enhancing human nutrition and health. 2011

http://www.bioversityinternational.org/fileadmin/bioversityDocs/Research/Nutrition_new/Bioversity_Nutrition_strategy_fullversion_.pdf

Concern Worldwide

The time is now: Improving food security and nutrition for the poorest. 2012

http://www.concernusa.org/media/pdf/2011/06/FINAL_Hunger_Broch.pdf

Realigning Agriculture to Integrate Nutrition (RAIN) Project (Arnold, T.). February 2011

http://2020conference.ifpri.info/files/2010/12/20110211parallel1B3_Arnold_Tom_note.pdf

Fintrac and USAID

Spotlight analysis: nutrition and agriculture. December 2011

http://typo3.fao.org/fileadmin/user_upload/fsn/docs/Agriculture_nutrition/ACCESO_Spotlight_Nutrition_12_11_ENG.pdf

HKI (Helen Keller International)

Homestead food production and nutrition education (Quinn, V.). February 2011

http://2020conference.ifpri.info/files/2010/12/20110211parallel1B1_Quinn_Victoria_note.pdf

“Homestead food production – a strategy to combat malnutrition and poverty.” 2001

http://www.hki.org/research/HFP_Strategy_Combat_Malnutrition_Poverty_2001.pdf

ICRW (International Center for Research on Women)

A leadership strategy for reducing hunger and malnutrition in Africa: the agriculture-nutrition advantage. (Johnson-Welch, C., MacQuarrie, K. and Bunch, S.) 2005

<http://www.icrw.org/files/publications/A-Leadership-Strategy-for-Reducing-Hunger-and-Malnutrition-in-Africa-The-Agriculture-Nutrition-Advantage.pdf>

IFAD (International Fund for Agricultural Development of the UN)

Strategic Framework 2011-2015: Enabling poor rural people to improve their food security and nutrition, raise their incomes and strengthen their resilience

<http://www.ifad.org/sf/index.htm>

http://www.ifad.org/sf/strategic_e.pdf

USAID (United States Agency for International Development)

Feed the future guide. 2010

Note: p13-14 outlines FTF approach to reducing undernutrition through agriculture investments.

http://feedthefuture.gov/sites/default/files/resource/files/FTF_Guide.pdf

Feed the Future Indicator Handbook: Definition Sheets

http://www.feedthefuture.gov/sites/default/files/resource/files/ftf_handbookindicators_apr2012.pdf

WorldFish Center

Fish and human nutrition.

http://www.worldfishcenter.org/sites/default/files/fish_human_nutrition_1.pdf

WFP (World Food Programme of the UN)

Enhancing nutrition along the value chain (Davies, K; Purchase for Progress P4P). February 2011

http://2020conference.ifpri.info/files/2010/12/20110211parallel1A2_Davies_Ken_note.pdf

WFP Nutrition Policy (2012) *discusses P4P and biofortification*

<http://documents.wfp.org/stellent/groups/public/documents/eb/wfpdoc061668.pdf>

OTHER (5 COMMISSIONED LITERATURE REVIEWS, 1 RESEARCH PROGRAMME, 1 COMMUNITY DIALOGUE)**AED and FAO**

Deepening the dialogue: agriculture and nutrition collaboration to enhance global food security: summary report from the Open Forum held on Nov 1, 2010.

http://typo3.fao.org/fileadmin/user_upload/fsn/docs/Agriculture_nutrition/Deepening_the_Dialogue__Summary_Report.pdf

CGIAR (Consultative Group on International Agricultural Research)

CRP4: Agriculture for improved health and nutrition. 2011

http://www.cgiarfund.org/cgiarfund/sites/cgiarfund.org/files/Documents/PDF/crp_4_Proposal.pdf

DFID-commissioned review (University of London):

A systematic review of agriculture interventions that aim to improve nutritional status of children. (Masset, E., Haddad, L., Cornelius, A. and Isaza-Castro, J.). 2011

http://www.dfid.gov.uk/R4D/PDF/Outputs/SystematicReviews/Masset_etal_agriculture_and_nutrition.pdf

<http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=QbYFOITyugs%3D&tabid=2974&mid=5583>

Effectiveness of agricultural interventions that aim to improve nutritional status of children: systematic review. Masset, E., Haddad, L., Cornelius, A. and Isaza-Castro, J. *Brit Med J* (2012).

<http://www.bmj.com/content/344/bmj.d8222>

IYCN

Nutrition and food security impacts of agriculture projects: A review of experience (Levinson, J.) February 2011

http://www.iycn.org/resource/?resource_categories=agriculture-tools

USAID (through A2Z, hosted by AED); IFPRI

The micronutrient impact of multisectoral programs focusing on nutrition. (Leroy, J.L., Ruel, M., Verhofstadt, E. and Olney, D.) 2008

WorldFish Center

The contribution of fish intake, aquaculture, and small-scale fisheries to improving nutrition: A literature review. (Kawarazuka, N.) 2010

http://www.worldfishcenter.org/resource_centre/WP_2106_Nutrition.pdf

World Bank

Pathways from agriculture to nutrition. 2007

<http://siteresources.worldbank.org/INTARD/825826-1111134598204/21608903/January2008Final.pdf>

ANNEX 2: ADDITIONAL RESOURCES

Some additional tools are identified below, which would assist implementers in following the available guidance, or to understand the issues further. Note that **this list is far from exhaustive**; it simply provides some pertinent references suggested by contributors. This list also does not include scientific journal articles and books; it only lists institutional publications (“grey literature”).

CONTEXT ASSESSMENT AND IMPLEMENTATION GUIDANCE

A2Z: The USAID Micronutrient and Child Blindness Project

Program assessment guide. (Pelletier, D., Corsi, A., Hoey, L., Houston, R., Faillace, S.) August 2010

AED

Designing by dialogue. Consultative research to improve young child feeding. (Dickin, K., Griffiths, M. and Piwoz, E.) 1997

<http://www.globalhealthcommunication.org/tools/58>

CINE (Centre for Indigenous Nutrition and the Environment at McGill University)

Documenting traditional food systems of indigenous peoples: international case studies; guidelines for procedures. (2006)

http://www.mcgill.ca/cine/sites/mcgill.ca.cine/files/ProcedureManual_Steps.pdf

CORE Group

Nutrition program design assistant: A tool for program planners. (2010)

<http://www.coregroup.org/component/content/article/119>

FANTA

Nutrition, food security and HIV: A compendium of promising practices. (2008)

<http://www.fantaproject.org/publications/fsHIVcompendium2008.shtml>

FAO

Analysis of farming systems.

http://www.fao.org/farmingsystems/description_en.htm

A response analysis framework for food and nutrition security interventions at district level, drawing on work done in NTT Province, Indonesia; a facilitation guide. (2011)

<http://www.fao.org/docrep/014/i1996e/i1996e00.pdf>

A response analysis framework for food and nutrition security interventions at district at inter-cluster and cluster level, drawing on work done in relation to the IPC (version 1.1) and the IASC cluster system in Somalia; a facilitation guide. (2011)

<http://www.fao.org/docrep/014/i1994e/i1994e00.pdf>

Improving nutrition programmes: an assessment tool for action. (2005)

<ftp://ftp.fao.org/docrep/fao/009/a0244e/a0244e00.pdf>

IFAD

Good practices in participatory mapping. (2009)

http://www.ifad.org/pub/map/PM_web.pdf

INFDC (International Nutrition Foundation for Developing Countries)

RAP: Rapid Assessment Procedures: qualitative methodologies for planning and evaluation of health related programmes. (Scrimshaw, N. and Gleason, G., eds.) 1992

<http://www.idpas.org/pdf/309A-Contents.pdf>

IPC (Integrated Food Security Phase Classification)

Standardized tool for classifying food security. (2011)

<http://www.ipcinfo.org/index.php>

Manoff Group

Trials of Improved Practices (TIPs): Giving participants a voice in program design.

<http://www.manoffgroup.com/resources/summarytips.pdf>

Technical brief: The Manoff Group's formative research expertise.

<http://www.manoffgroup.com/documents/technicalbrief-programresearchaug1.pdf>

Micronutrient Initiative (MI)

Nutrition survey toolkit. (2012)

<http://www.micronutrient.org/nutritiontoolkit/>

Never Ending Food (Malawi)

Low input food & nutrition security manual.

<http://www.neverendingfood.org/h-low-input-fns/>

WFP

World Food Programme's food security analysis service (Vulnerability Analysis & Mapping).

<https://www.wfp.org/food-security>

WHO/UNICEF

Planning guide for national implementation of the global strategy for infant and young child feeding. (2007)

<http://www.who.int/nutrition/publications/infantfeeding/9789241595193/en/index.html>

Complementary feeding: family foods for breastfed children. (2000)

http://www.who.int/nutrition/publications/infantfeeding/WHO_NHD_00.1/en/index.html

World Bank

Nutrition toolkit: project design.

<http://go.worldbank.org/7K1WV3B4M0>

CONTEXT ASSESSMENT DATA SOURCES

DHS

<http://www.measuredhs.com/>

LSMS

<http://go.worldbank.org/IPLXWMCNJ0>

MICS

http://www.unicef.org/statistics/index_24302.html

FAO

Data

<http://faostat.fao.org>

Nutrition country profiles

http://www.fao.org/ag/agn/nutrition/profiles_en.stm

FIVIMS (Food Insecurity and Vulnerability Information and Mapping Systems) initiative

<http://www.fivims.org/>

UNICEF

Statistics and monitoring

http://www.unicef.org/statistics/index_24287.html

State of the world's children. (2011)

http://www.unicef.org/publications/index_57468.html

Tracking progress on child and maternal nutrition. (2009)

http://www.unicef.org/publications/index_51656.html

WHO

Nutrition databases

<http://www.who.int/nutrition/databases/en/index.html>

Indicators for assessing infant and young child feeding practices: Part III Country Profiles.

<http://www.who.int/nutrition/publications/infantfeeding/9789241599757/en/index.html>

Global nutrition policy review. (2010)

http://www.who.int/nutrition/EB128_18_Backgroundpaper1_A_review_of_nutritionpolicies.pdf

World Bank

Data

<http://data.worldbank.org/>

World Development Indicators

<http://data.worldbank.org/data-catalog/world-development-indicators>

Nutrition Country Profiles (2011)

<http://www.worldbank.org/nutrition/profiles>

M&E

JPAL (Jameel Poverty Action Lab at MIT)

5-day course on evaluating social programs

<http://www.povertyactionlab.org/course>

World Bank

Nutrition toolkit: monitoring and evaluation

<http://go.worldbank.org/7K1WV3B4M0>

What can we learn from nutrition impact evaluations? Lessons from a review of interventions to reduce child malnutrition in developing countries. 2010

http://siteresources.worldbank.org/EXTWBASSHEANUTPOP/Resources/Nutrition_eval.pdf

Methodologies to evaluate the impact of large-scale nutrition projects. (Habicht, J.P., Pelto, G.H. and Lapp, J.) 2009
http://siteresources.worldbank.org/INTISPMA/Resources/383704-1146752240884/Doing_ie_series_13.pdf

INDICATOR GUIDANCE

FANTA/FANTA-2

Household hunger scale (2011)

http://www.fantaproject.org/publications/hhs_2011.shtml

Household food insecurity access scale for measurement of food access: indicator guide, Version 3. (2007)

http://www.fantaproject.org/publications/hfias_intro.shtml

Household Dietary Diversity Score (HDDS) for measurement of household food access: indicator guide, Version 2. (2006)

http://www.fantaproject.org/publications/hdds_mahfp.shtml

Months of adequate household food provisioning (MAHFP) for measurement of household food access: indicator guide, Version 4. (2010)

http://www.fantaproject.org/publications/hdds_mahfp.shtml

Measuring household food consumption: A technical guide. (2005)

<http://www.fantaproject.org/publications/householdcons.shtml>

FAO

Guidelines for measuring household and individual dietary diversity. (2011)

<http://www.fao.org/docrep/014/i1983e/i1983e00.htm>

Expert Consultation on Nutrition Indicators for Biodiversity. 2. Food Consumption. (2010)

<http://www.fao.org/docrep/014/i1951e/i1951e00.htm>

IFAD

Results and impact management system. (2011)

<http://www.ifad.org/operations/rims/>

IFPRI, USAID, OPHI (Oxford University)

Women's empowerment in agriculture index. (2012)

<http://www.ifpri.org/publication/womens-empowerment-agriculture-index>

WHO, UNICEF, USAID, AED, UCDAVIS, IFPRI

Indicators for assessing infant and young child feeding practices: Part I Definitions. (2008)
<http://www.who.int/nutrition/publications/infantfeeding/9789241596664/en/index.html>

Indicators for assessing infant and young child feeding practices: Part II Measurement. (2010)
<http://www.who.int/nutrition/publications/infantfeeding/9789241599290/en/index.html>

WOMEN'S EMPOWERMENT

Actionaid, CARE, Christian Aid, Concern Worldwide, Find Your Feet, Oxfam, Practical Action, Save the Children, Self Help Africa

What works for women: Proven approaches for empowering women smallholders and achieving food security. 2012

http://www.actionaid.org/sites/files/actionaid/what_works_for_women_-_final.pdf

BMGF

Creating gender-responsive agricultural development programs. 2012

<http://www.gatesfoundation.org/learning/Documents/gender-responsive-orientation-document.pdf>

CFS policy round table on Gender, food and nutrition security: A concept note.

http://cso4cfs.files.wordpress.com/2011/06/cfs_policy_rt_concept_note_gender_nutrition_and_food_security_24_05_11.pdf

CPHCC, WFP, UNSCN, ACF

Enhancing women's leadership to address the challenges of climate change on nutrition and security and health.

<http://climatehealthconnect.org/sites/climatehealthconnect.org/files/resources/Enhancing%20Women%27s%20Leadership.pdf>

Farming First

Rural women: policies to help them thrive. 2012

<http://www.farmingfirst.org/wordpress/wp-content/uploads/2012/03/FF-Policy-Paper-Rural-Women.pdf>

FAO

Policy on gender equality: attaining food security goals in agriculture and rural development. 2012

http://typo3.fao.org/fileadmin/templates/gender/docs/FAO_FinalGender_Policy_2012.pdf

The State of Food and Agriculture, 2010–11: Women in agriculture: closing the gender gap for development. 2011

<http://www.fao.org/docrep/013/i2050e/i2050e.pdf>

Country programming framework: integrating gender issues. 2010

<http://www.fao.org/docrep/013/i1913e/i1913e00.pdf>

Gender and nutrition key facts.

<http://www.fao.org/docrep/012/al184e/al184e00.pdf>

Focus on: right to food and gender. 2007

http://www.fao.org/righttofood/wfd/pdf2007/focus_gender_eng.pdf

IASC (Inter-Agency Standing Committee)

Gender marker tip sheet. 2011

<http://pakresponse.info/LinkClick.aspx?fileticket=1vjO3q47mu4%3D&tabid=107&mid=629>

Gender handbook in humanitarian action: women, girls, boys and men; different needs, equal opportunities. 2007

[http://www.humanitarianinfo.org/iasc/documents/subsidi/tf_gender/IASC%20Gender%20Handbook%20\(Feb%202007\).pdf](http://www.humanitarianinfo.org/iasc/documents/subsidi/tf_gender/IASC%20Gender%20Handbook%20(Feb%202007).pdf)

ICRW

Bridging the gender gap in agricultural extension. 1985

<http://www.icrw.org/publications/bridging-gender-gap-agricultural-extension>

Women, land, and sustainable development. 1995

<http://www.icrw.org/publications/women-land-and-sustainable-development>

HKI

Group marketing and women Farmers. HKI Bangladesh Bulletin No. 2, Feb 2010.

<http://www.hki.org/research/HKI%20Bulletin%20Bangladesh%20February%2010%20Group%20Marketing%20and%20Women%20Farmers.pdf>

NUTRITION EDUCATION

FAO

Nutrition handbook for the family. 2009

<http://www.fao.org/docrep/012/al302e/al302e00.pdf>

Complementary feeding for children aged 6-23 months; A recipe book for mothers and caregivers. 2011.

<http://www.fao.org/docrep/014/am866e/am866e00.pdf>

Trials of Improved Practices; Guiding notes for TIPs trainers and implementers. 2011

<http://www.fao.org/docrep/014/am868e/am868e00.pdf>

Trials of Improved Practices; reference notes and tools. 2011

<http://www.fao.org/docrep/014/am869e/am869e.pdf>

Nutrition education in primary schools: A planning guide for curriculum development 2006

<http://www.fao.org/docrep/009/a0333e/a0333e00.htm>

Curriculum development centre, Zambia and FAO: Nutrition education, supplementary material; teacher's book Grade 4. 2007

<http://www.fao.org/docrep/010/ai210e/ai210e00.htm>

Setting-up and running a school garden; Teaching toolkit. 2010

<http://www.fao.org/docrep/012/i1118e/i1118e00.htm>

Setting-up and running a school garden; A manual for teachers, parents and communities." 2005

<http://www.fao.org/docrep/009/a0218e/a0218e00.htm>

A new deal for school gardens. 2010

<http://www.fao.org/docrep/013/i1689e/i1689e00.pdf>

World Bank

Nutrition toolkit: nutrition communication"

<http://go.worldbank.org/7K1WV3B4M0>

MANAGEMENT OF NATURAL RESOURCES

AVRDC – The World Vegetable Center

More Crop per Drop: Using Simple drip irrigation systems for small-scale vegetable production. 2011

http://libnts.avrdc.org.tw/fulltext_pdf/EB/2011-2015/eb0086.pdf

FAO

Forests for improved nutrition and food security. 2011

<http://www.fao.org/docrep/014/i2011e/i2011e00.pdf>

NUTRITION-ORIENTED AGRICULTURAL PRODUCTION

AVRDC – The World Vegetable Center

Discovering Indigenous Treasures: Promising indigenous vegetables from around the world. (2009)

<http://libnts.avrdc.org.tw/e-book/ebook1.htm>

A Primer on Vegetable Gardening. (1993)

http://libnts.avrdc.org.tw/fulltext_pdf/EB/1900-2000/eb0131.pdf

These, and additional titles dealing with specific crops available at:

http://avrdc.org/?page_id=424

FAO

Food composition study guide; questions and exercises – questions and answers. (Charrondiere, U.R., Burlingame, B., Berman, S. and Elmadfa, I) (2011)

http://www.fao.org/fileadmin/templates/food_composition/documents/upload/StudyGuideEquestionsrevised1July2011.pdf

FAO and International Network of Food Data Systems (INFOODS)

International Food Composition Tables Directory.

<http://www.fao.org/infoods/infoods/tables-and-databases/en/>

Food Composition Database for Biodiversity Version 2.0 – BioFoodComp2.0. (2012)

<http://www.fao.org/knowledge/documents-detail/en/c/123965/?type=list>

Nutrition and Biodiversity

<http://www.fao.org/infoods/infoods/food-biodiversity/en/>

POST-HARVEST PROCESSING

AVRDC – The World Vegetable Center

Vegetables postharvest: Simple techniques for increased income and market. (2010)

http://libnts.avrdc.org.tw/fulltext_pdf/EB/2001-2010/eb0146.pdf

FAO

Maintaining Quality of Food and Feed Grain through Trade and Processing; Training Manual. (2007)

<http://www.fao.org/docrep/010/a1417e/a1417e00.htm>

MARKETING

ACF

The market for the poor approach: A new methodology to integrate poor people in market systems. (2008)

http://www.actioncontrelafaim.org/sites/default/files/publications/fichiers/acf_market_for_the_poor.pdf

Farm Concern International

Commercial village approach. – information can be found at:

<http://www.farmconcern.org/>

HKI

Group Marketing and Women Farmers. HKI Bangladesh Bulletin No. 2. February 2010.

<http://www.hki.org/research/HKI%20Bulletin%20Bangladesh%20February%2010%20Group%20Marketing%20and%20Women%20Farmers.pdf>

CAPACITY BUILDING

FAO

Nutrition handbook for community mobilisers. (2009)

<http://www.fao.org/docrep/012/al303e/al303e00.htm>

Promoting improved complementary feeding (with recipes); a manual for community nutrition promoters. (2011)

<http://www.fao.org/docrep/014/am867e/am867e.pdf>

Integrating food security, nutrition and good governance in district development planning through advocacy, social mobilisation and capacity strengthening; A methodological guide. (Immink, M.D.C.) (2011)

<http://www.fao.org/docrep/012/i1548e/i1548e00.pdf>

E-learning course: Assessing impact of development programmes on food security.

<http://www.foodsec.org/DL/elcpages/food-security-courses.asp?pgLanguage=en&leftItemSelected=food-security-courses>

Needs assessment for professional training in nutrition education, and communication. 2011

<http://www.nutritionlearning.net>

FAO, Food and Nutrition Council of Zimbabwe, UNICEF, EC

Healthy harvest: A training manual for community workers in good nutrition, and the growing, preparing and processing of healthy food.

<http://motherchildnutrition.org/healthy-nutrition/pdf/mcn-healthy-harvest.pdf>

IFPRI

Agriculture, nutrition and health essentials for non-specialist development professionals. (Harris, J.) (2011)

http://www.lidc.org.uk/_assets/2020_ANH_Essentials_JodyHarris_M.pdf

OTHER

Chicago Council on Global Affairs

Bringing Agriculture to the Table: How agriculture and food can play a role in preventing chronic disease. (Nugent, R., chair) (2011)

http://www.thechicagocouncil.org/UserFiles/File/GlobalAgDevelopment/Report/Bringing_Agriculture_To_The_Table.pdf

CINE (Centre for Indigenous Peoples' Nutrition and Environment) and FAO

Indigenous peoples' food systems: the many dimensions of culture, diversity and environment for nutrition and health. (2009)

<http://www.fao.org/docrep/012/i0370e/i0370e00.htm>

Indigenous peoples' food systems and wellbeing: interventions and policies for healthy communities. (Kuhnlein, H.V., Spigelski, D., Erasmus, B. and Burlingame, B., eds.) (in press)
Currently not available online

The Coalition for Sustainable Nutrition Security in India

A leadership agenda for action. (2008)

<http://www.nutritioncoalition.in/pdf/Leadership-Agenda-for-Action.pdf>

Farming First

Guide to food security initiatives

<http://www.farmingfirst.org/foodsecurity/>

FAO

Sustainable Diets and Biodiversity: Directions and Solutions for Policy, Research, and Action. (Burlingame, B. and Dernini, S. eds.) 2012

<http://www.fao.org/docrep/016/i3004e/i3004e.pdf>

Combating micronutrient deficiencies: food-based approaches. (Thompson, B. and Amoroso, L., eds.) 2010

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