



Nutrition-Sensitive Agriculture

Operational Guidance Note

August 2015

Key messages

Malnutrition is a key development challenge. The agriculture sector has the potential to improve nutrition and health outcomes. Australia's 2014 development policy identifies early childhood nutrition as 'a critical driver of better development outcomes'. It commits Australia's agriculture investments to enhancing global food security and nutrition.

DFAT activity managers can design new, or adjust existing, agricultural investments to improve nutrition outcomes by:

- > Analysing the context.
- > Improving collaboration with other sectors to improve nutrition outcomes using an integrated multisectoral approach.
- > Mainstreaming nutrition concerns to ensure that we 'do no harm'.
- > Defining the nutrition target group, articulating impact pathways, and incorporating nutrition objectives and indicators.

DFAT agriculture investments could improve nutrition through multiple pathways including:

- > Increasing year-round access to a range of nutrient-rich foods.
- > Increasing incomes, particularly for women, so as to better access nutrient-rich food and health services.
- > Safeguarding and strengthening the capacity of women to provide for the food security, health, and nutrition of their families.
- > Integrating nutrition messaging and nutrition-sensitive policies.

The purpose of this operational guidance note is to support DFAT activity managers to integrate nutrition considerations in agricultural programming. It introduces the concept of nutrition-sensitive agriculture, and provides step-by-step guidance from analysis, program design, implementation, and monitoring and evaluation. DFAT activity managers are the primary audience for this operational guidance note, and ACIAR, CSIRO, other whole-of-government partners, and other implementers of the aid program are encouraged to use it.

Australia's new development policy: *Australian aid: promoting prosperity, reducing poverty, enhancing stability*, launched in June 2014, outlines Australia's commitment to investing in sustainable agriculture and enhancing food security and early childhood nutrition. Under this policy, the newly-released *Strategy for Australia's Aid Investments in the Agriculture, Fisheries and Water Sectors*, outlines sectoral objectives and priority areas of engagement for new investments. This operational guidance note sits under the Strategy. It also complements and assumes knowledge of the *Health for Development Strategy 2015-2020*,

the forthcoming Operational Guidance Note on *Nutrition in Australia's Aid Program* and the *Aid Programming Guide*.

This Note draws on recent evidence, analysis and guidance from the UN Standing Committee of Nutrition, the UN Food and Agriculture Organisation, the World Bank, and other bilateral donors. Key resources are included in Annex 1. Globally, thinking in nutrition-sensitive agriculture is still emerging. Therefore, this document should be updated periodically.

For further information or to provide feedback on this note, please contact the Agricultural Productivity and Food Security Section (AFS), Agriculture and Food Branch, Office of Trade Negotiations.

1 Why is agriculture important for nutrition?

Globally, there has been an increasing focus on the global malnutrition challenge. Undernutrition contributes to 45% of child deaths under-five, resulting in 3.1 million deaths every year.¹ 1.4 billion people are now overweight and over 500 million are obese.² Australia's new development policy (June 2014) explicitly addresses nutrition under the *agriculture and fisheries* priority area. Under the health policy priority area, it commits Australia to strengthening our focus on nutrition in support of maternal and child health outcomes and to address non-communicable disease. DFAT will invest in nutrition in the first 1000 days of life and during a girl's adolescence, as well as the prevention of overnutrition³. Australia's focus on nutrition coincides with the Second International Conference on Nutrition (ICN2) in November 2014 and the development of World Health Assembly global nutrition targets for 2025⁴.

Australia, as a member of the Scaling Up Nutrition (SUN) Donor Network, has affirmed its commitment to work collaboratively with others to improve nutrition programming. The SUN Movement Strategy (2012-2015) and Revised Road Map (2012) includes agriculture as a nutrition-sensitive sectoral strategy.

The Indo-Pacific region is grappling with particularly serious and complex nutrition issues. Timor Leste and Papua New Guinea have some of the highest child stunting rates in the world at over 50 and 48 per cent respectively.

Some countries continue to face persistent child undernutrition even as overweight and obesity rates rise. This phenomenon is referred to as the **double burden of malnutrition**. For example, in the Solomon Islands, 33 per cent of children are stunted and 39 per cent of women are obese, while in Indonesia, 39 per cent of children are stunted, and 12 per cent

¹ Black, RE; Victoria, CG; Walker, SP; Bhutta, ZA; Christian, P; de Onis, M; Ezzati, M; Grantham-McGregor, S; Katz, J; Martorell, R; Uauy, R; and the Maternal and Child Nutrition Study Group, Maternal and child undernutrition and overweight in low-income and middle-income countries, *Lancet* 2013, 382, p427-51.

² World Health Organisation, Obesity and Overweight - Fact sheet No. 311, accessed 07 April 2014: <http://www.who.int/mediacentre/factsheets/fs311/en/>

³ DFAT, June 2015. *Health for Development Strategy, 2015-2020*. p12-13

⁴ The six targets include a 40% reduction in the number of children under-5 who are stunted <http://www.who.int/nutrition/global-target-2025/en/>

of children under five are overweight.⁵ There are linkages between undernutrition and overnutrition: undernourished children are vulnerable to obesity and non-communicable disease later in life.

In many of our partner countries, the double burden of malnutrition is experienced as societies undergo **the nutrition transition**⁶. Rising income is associated with changes in diet and physical activity, which in turn result in increasing prevalence of obesity. In rural areas, increased mechanization of farm activity leads to reduced physical activity at the same time that more food –but not necessarily better quality of foods– becomes available. Many farmers have given up subsistence farming of a variety of crops that provide a more balanced diet in favour of fewer high-yielding cash crops. Traditional diets featuring grains and vegetables are giving way to calorie-dense foods that are high in fat and sugar. This outlines the importance of nutrition education in our agriculture investments as incomes increase.

The causes of poor nutrition are multi-faceted and not just related to insufficient intake of food. Agriculture can improve nutrition through a number of **pathways**⁷.

- › **Agriculture as a source of food.** This is the most direct route to improving the diet (quantity and quality) ensuring year-round access to adequate, safe, nutrient-rich food, and is based on two assumptions: (i) that increases in production of a range of foods, including dairy, fish, fruits, grains, livestock, root crops and vegetables, enhance food availability and access to a diverse diet; and (ii) that increased food availability and access will lead to greater intake and improved nutrition outcomes at the individual level.
- › **Agriculture as a source of income.** This is based on the assumption that an increase in income from agriculture-related activities (including processing and sale of agricultural products or wages earned) can be used to access health services or purchase higher-quality, nutrition-rich food that is consumed by individual household members.
- › **Agriculture as a driver of food prices.** Increased availability of food through more efficient production techniques, improved technologies (for postharvest storage, processing and distribution) and domestic and trade policies affects a range of supply and demand factors and influences the price of food (fresh and processed). This in turn affects the income and purchasing power of households.
- › **Agriculture to empower women.** Initiatives that both educate women and enhance their involvement in agriculture-based activities can strengthen women's capacity, increase their access to, and control over, resources and assets, consequently augmenting their power to make decisions on the purchase and allocation of food, health and care within their households.
- › **Agriculture to contribute to macroeconomic growth.** Agriculture is the dominant productive sector in many developing countries. Increasing agricultural productivity raises national revenue, increasing the funds available to invest in improving essential

⁵ World Health Organisation, World Health Statistics 2013, Geneva, World Health Organisation, 2013

⁶ Popkin et al (2012), NOW AND THEN: The Global Nutrition Transition: The Pandemic of Obesity in Developing Countries. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3257829/>

⁷ Adapted from the European Commission, FAO, CTA and World Bank Group (2014), Agriculture and nutrition: a common future, a framework for joint action.

basic social services, such as education, health, safe water supply, sanitation and safety-net programmes, which have been shown to improve nutrition outcomes.

- › **Agriculture to ensure sustainable food and nutrition security and resilience.** Protecting and promoting biodiversity is essential to support dietary diversity and the preservation of ecosystems. Agricultural practices that promote the sustainability of natural resources (biodiversity, forestry, soil and water) ensure the long-term future of agricultural production and the sustainability of livelihoods and build resilience to climate change.

2 What is nutrition-sensitive agriculture to DFAT?

DFAT uses the World Bank/DFID definition⁸ of nutrition-sensitive agriculture, which is:

Nutrition sensitive agriculture aims to maximise the impact of nutrition outcomes for the poor, while minimising the unintended negative nutrition consequences of agricultural interventions and policies on the poor, especially women and young children. It is agriculture with a nutrition lens, and should not detract from the sector's own goals. [Agriculture] projects may also affect water quality, disease occurrence, food safety and women's time use (which, in turn, affects child care practices) – each of which are important for nutrition.

This definition uses a **twin-track approach** of, *at a minimum*, mainstreaming nutrition concerns to ensure that we 'do no harm' with DFAT's agriculture investments, and where appropriate, incorporating nutrition outcomes into our investments. The twin-track approach will be used in the design of new investments, and to adjust existing investments.

DFAT sees agriculture as being one part of an **integrated multisectoral response** to the nutrition challenge. Agriculture programs alone are not able to tackle the nutrition challenges in our partner countries, and need to collaborate with other sectors, including health, education, water and sanitation, and social protection, to address the basic, underlying and immediate causes of malnutrition. This is likely to entail engaging with a range of in-country partners and stakeholders to develop a common understanding (preferably a theory of change) on how to improve nutrition in the target group. Coordination is also needed to ensure appropriate sequencing of activities, consistent nutrition messaging and common indicators.

DFAT recognises that **gender equality and women's empowerment** play a key role in nutrition and agriculture. Women's empowerment can lead to increased decision-making on how household incomes are allocated, potentially resulting in more income being allocated to nutritious food and health. **Women's work** can lead to increased income, which may be spent on food, resulting in improved nutrition outcomes. According to FAO, an increase to **women's income** of \$10 achieves the same improvements to children's nutrition and health as an increase in a man's income of \$110.⁹ Women's work, can however, place demands on women's time as well as have negative impacts on women's nutritional status during critical periods of pregnancy and exclusive breastfeeding. Women's work therefore needs to be balanced appropriately; women's time and wellbeing are crucial factors for improving

⁸The World Bank, Rapid Social Response, DFID, Government of Japan, 2013. *Improving Nutrition through Multisectoral Approaches: Agriculture and Development*

⁹ FAO infographic: Where does a gender gap in agriculture exist? <http://www.fao.org/gender/infographic/en/>

child nutrition as it impacts on the regularity of feeding and care of infants and young children. Therefore when designing DFAT interventions, gender divisions of labour for both agricultural and domestic work need to be analysed for their nutrition implications. This is especially important for farming communities across seasons, as the intensity of work and time inputs are likely to vary.¹⁰

3 How can DFAT improve nutrition through agriculture?

The Office of Development Effectiveness (ODE) 2015 evaluation of Australian aid investments in child nutrition, *A window of opportunity: Australian aid and child undernutrition*, recommends that DFAT should review existing and planned initiatives in agriculture to ensure the inclusion of nutrition objectives, interventions and indicators where relevant. It suggests that Australia's large investments in the food security sectors in particular offer opportunities for leveraging existing spend to achieve nutrition outcomes by incorporating a focus on nutrition in future phases of ongoing initiatives.

Box 1 outlines the actions that each DFAT country and regional program can take, and the actions that will be undertaken by DFAT policy and thematic areas to achieve nutrition outcomes through nutrition.

Box 1. DFAT actions to improve nutrition through agriculture

DFAT country and regional programs can:

1. Design new, or adjust existing, agricultural investments to deliver better nutrition outcomes through:
 - a. **Analysing the context**
 - b. Improving collaboration with other sectors to improve nutrition using an **integrated multisectoral approach**
 - c. Ensuring that our agricultural investments **'do no harm'** to nutritional outcomes
 - d. Where appropriate, incorporating **explicit nutrition objectives and indicators** into agricultural investments
 - e. Where appropriate, **adjusting or adding program activities** to improve nutrition outcomes
2. Where appropriate, **scaling up** proven nutrition-sensitive agricultural interventions at the country level
3. Where they exist, consider engaging with **country-level multi-stakeholder platforms** (such as SUN and REACH)

4 Guidance for DFAT activity managers

This section provides guidance for DFAT activity managers in country or regional programs who are **designing or adjusting** agricultural investments or **scaling up** proven nutrition-sensitive agricultural investments. It focuses on three areas: **context analysis; programming principles; and program design, monitoring and evaluation**. While these areas of focus are roughly aligned with DFAT's aid management cycle, they are likely to be iterative. For example, 'analysis' is required in the preparation for the aid investment concepts, but may be required for further stages including the preparation of investment designs or during implementation.

¹⁰ Rao, Nitya, 2015. *Agriculture for Nutrition? Not without gender!*, Secure Nutrition Platform blog

4.1 Context analysis

Nutrition-sensitive agriculture programming needs to be carefully informed by context analysis when a country program is deciding what programming to undertake in a country (Aid Investment Plan) and then when a country program is designing or implementing an investment (Investment Design). The following are some questions that DFAT activity managers may ask:

4.1.1 What is the nutrition situation in the country?

To better understand the nutrition context in a country, DFAT activity managers would require key nutrition data such as the prevalence of malnutrition (e.g., stunting, wasting, and underweight) and the type of undernutrition (e.g., protein-energy or micronutrient). Data should be disaggregated by age and sex, as well as variations across population groups, geographic regions and socio-economic groups. This data is required to determine the appropriate nutrition responses¹¹ as well as to **target the most nutritionally-vulnerable groups** in line with international best practice.

Some countries already have recent nutrition data, which may be sourced from national or regional health and social surveys (eg. Demographic Health Survey), health databases, or global resources by various UN agencies and the World Health Organisation (WHO). The globalnutritionreport.org website has nutrition profiles for many of the countries that DFAT works in. Where countries lack up-to-date nutrition data, DFAT Managers should consider advocating for – and supporting – updated data and analysis.

4.1.2 What are the causes of malnutrition in the country and how can an agriculture sector intervention help?

DFAT activity managers should encourage studies or design missions to identify the **immediate, underlying and basic causes of malnutrition** in the country. Understanding these causes will support a country program to make investment decisions as well as to construct a nutritional impact pathway. It also helps in understanding with which programmes need to work with to develop an integrated multisectoral approach. Table 1 below summarises the causes of malnutrition, and provides example questions that DFAT activity managers may want to include in terms of reference for studies or design missions. Data can be gathered through a wide range of methods, including through desk-based sector reviews, household income surveys, knowledge, attitudes and practice (KAP) surveys of appropriate food utilisation, nutrition and infant and young child feeding (IYCF) practices.

Table 1. Causes of malnutrition and example questions to better understand their links with agriculture.¹²

	Causes of malnutrition	Example questions as they relate to agriculture
Immediate	<ul style="list-style-type: none">› Inadequate food intake› Infectious diseases› Inadequate care of infants and young children	<ul style="list-style-type: none">› What type of malnutrition is present, e.g., micronutrient or protein-energy? Are these due to availability, access or utilisation challenges? How is this related to agriculture?› How are different segments of the population (urban versus rural, farming versus non-farming, etc) affected?

¹¹ For example, Vitamin A deficiency may be helped by increasing the availability of Vitamin A rich foods such as orange-fleshed sweet potato, pumpkin or yellow maize.

¹² Adapted from: DFAT ODE, 2014. A window of opportunity: Australian aid and child undernutrition

		<ul style="list-style-type: none"> › What are the social, economic, political and cultural factors that may be contributing to malnutrition? › Are agriculture programs likely to increase prevalence of infectious diseases (e.g., malaria or Japanese encephalitis) or malnutrition (e.g., aflatoxin exposure)
Underlying	<ul style="list-style-type: none"> › Inadequate household access to food › Low agricultural productivity › Low status of women › Lack of access to safe water, adequate sanitation facilities, and basic hygiene practices 	<ul style="list-style-type: none"> › What is the current household access to food and sources of food? › What is the level of agricultural productivity? Are there links between low yields and high levels of malnutrition? Is there seasonal hunger? › Are nutrient-rich foods available in local markets at prices that poorer households can afford? › To what extent do women have control over resources (particularly agricultural productive resources), food, and income? › What is the women's workload in agriculture and child care? What opportunities are there to reduce the workload? › Are hygienic practices and safe water used in the processing and storage of agricultural produce?
Basic	<ul style="list-style-type: none"> › Poverty › Weak governance, particularly in the provision of public goods and services 	<ul style="list-style-type: none"> › What impact does poverty have on farming households' ability to invest in agriculture? › What are the government's policies on nutrition, in particular as it relates to agriculture?

4.1.3 What is the nutrition policy and institutional context?

Does the partner government have nutrition or nutrition-related policies? For example, the government may have [a set of] nutrition targets, either of its own formulation or based on (or adapted from) the nutrition targets¹³ for 2025 endorsed by the World Health Assembly. These targets would often be spelt out in a National Nutrition Policy, Strategy or Action Plan. Such a document may identify roles and responsibilities for the agriculture sector to meet specific nutrition targets and goals. It may also identify plans for multi-sectoral nutrition analysis, programming and nutrition monitoring systems, which might provide the basis for collaboration over program implementation.

What institutions are there to support activities to improve nutrition? The government may have signed up to the SUN movement or may have their own multisector coordination mechanisms. As a result, there may be existing coordinating committees or platforms, with common, shared analysis of the problem and good formal coordination between government and donors, providing opportunities for joint programming.

DFAT should consider aligning investments with national nutrition strategies and action plans while understanding the institutional context in which relevant programs operate. DFAT country programs could engage with existing coordination mechanisms, depending on available capacity and likely benefits.

¹³ The targets are: (i) a 40 per cent reduction in the number of children under five who are stunted; (ii) a 50 per cent reduction of anaemia in women of reproductive age; (iii) a 30 per cent reduction in low birth-weight; (iv) no increase in childhood overweight; (v) a 50 per cent increase in the rate of exclusive breastfeeding in the first 6 months; and (vi) a reduction of childhood wasting to less than 5 per cent.

4.1.4 What works with nutrition-sensitive agricultural interventions in the country?

The success of nutrition-sensitive agricultural interventions varies from area to area. For example, in some areas, biofortified crops such as orange-fleshed sweet potato are readily adopted. Yet, in other countries, there is significant resistance to their adoption. Similarly, work with small livestock (poultry and goats) results in significant improvements in child undernutrition, yet in others, the impact is limited. This may be due to dietary preferences, cultural practices, or the complex relationship between agricultural work and household gender dynamics. Evidence is building to show that adequate analysis, women's empowerment and collaboration with other sectors (including health, education, social protection, safe water supply, and sanitation) is needed to ensure the success and maximise the effectiveness of interventions.

During investment designs and implementation, DFAT activity managers should encourage information collection on what works and lessons learned. New interventions should be piloted on a small scale. Given the uncertainties in this field, there are opportunities for innovative thinking and experimentation, with interventions that identify success and failure at a small scale relatively quickly and then adapt iteratively based on learning. Only *proven* interventions should be implemented at scale. Collaboration with other sectors, as well as the private sector, should be encouraged by DFAT activity managers.

4.1.5 What is Australia's niche?

There needs to be consideration of Australia's potential niche or comparative advantage in improving nutrition outcomes in the country. Some questions to consider include:

- › What are Australia's existing agriculture investments in the country, and can these be leveraged to improve nutrition outcomes?
- › What are Australia's existing nutrition investments in the country, and can these be complemented and enhanced through an agricultural investment?
- › Can Australian experience in applying market-based approaches (see AgResults) be used here to improve nutrition outcomes?
- › Can Australian expertise in agricultural research and innovation (see Seeds of Life in Timor Leste) be used to improve nutrition outcomes?
- › Can Australian experience in women's empowerment (see Mama Lus Frut in Papua New Guinea) be used to improve nutrition outcomes?

4.2 Programming principles

4.2.1 To do no harm

A good starting point in thinking of nutrition-sensitive agriculture programming is to analyse the **potential negative consequences** of agriculture investments to ensure that investments 'do no harm'. Some questions¹⁴ to consider when reviewing investment concepts or design documents are:

¹⁴ Adapted from: The World Bank, Rapid Social Response, DFID, Government of Japan, 2013. *Improving Nutrition through Multisectoral Approaches: Agriculture and Development*

- › Will the investment reduce **women's access to resources** if it shifts production towards male-dominated crops?
- › Will the investment reduce **women's time availability** for child care, impacting on child health and nutritional status?
- › Will the investment compromise **access to nutrient-rich foods**? That is, will it decrease household production without a corresponding increase in income to access the foods from markets?
- › For investments that include **irrigation**: Will the investment increase hydrophilic vector-borne disease, e.g., malaria, shistosomiasis, Japanese encephalitis, that can lead to undernutrition?
- › For investments that include **animal husbandry**: Will the investment increase the risk of zoonotic disease that can lead to undernutrition?
- › For investments that include maize, groundnuts and other **crops prone to aflatoxin contamination**: Will the investment increase the risk of exposure to aflatoxin that can lead to undernutrition?

Box 2. Gender, agriculture and nutrition.

Emerging findings from research in Pakistan¹⁵ indicate that the period of cotton harvesting involves intensive work for women in small and marginal farms as well as landless labour households. While this contributes to improved incomes for the women, it severely affects the time available to care for children, leading to irregular feeding and poor nutrition outcomes for children under the age of two. This case study demonstrates the tensions that may arise in agricultural programming. Supporting women's work can potentially harm nutrition outcomes if not balanced with household requirements for the feeding and care of infants and young children.

4.2.2 When designing or adjusting program activities

Following minimising negative consequences, consideration needs to be given to **designing or adjusting program activities** to improve nutrition outcomes. This can be done by checking existing and planned investments against the ten **programming principles** developed by USAID:

1. Incorporate appropriate **objectives and indicators** into design
2. Incorporate **nutrition promotion** and education
3. **Diversify production** and increase **nutrient-dense** crops and livestock when this makes economic sense – that is, when not in conflict with obtaining income for that pathway
4. Improve quality of processing, storage, and preservation of food
5. Expand market access to vulnerable groups and expand markets for nutritious foods
6. During project design, assess the **local context** and address the **underlying causes** specific to the situation
7. Ensure designs work to **empower women**
8. **Target** the nutritionally vulnerable and improve equity
9. **Work across sectors**, collaborating and coordinating where possible

¹⁵ A case from [Secure Nutrition Platform](#)

10. Maintain or improve the agricultural **natural resource base** (i.e. water, soil, air)

Small changes to the design of an agricultural program can significantly improve nutrition outcomes. For example, incorporating **nutrition promotion** activities (such as nutrition messaging or cooking classes) could increase the consumption of nutrient-rich foods.

Adjusting targeting to ensure that poorer households with infants and young children or adolescent girls (the ‘1,000 day plus’ window) are reached can result in better child nutrition. Similarly, shifting focus from staple grains to more nutrient-rich foods (see Box 3 below) can improve dietary diversity and thus nutrition outcomes. We may also want to specifically include additional activities in existing investments. Examples of potential **nutrition-sensitive agriculture interventions** are detailed in Annex 2. For investments using a **value chain approach**, there can be consideration of possible nutrition-sensitive ‘adjustments’ along the value chain (see Annex 3).

Box 3. What are nutrient-rich foods?

A commodity is defined as nutrient-rich or nutrient-dense if it meets any of the following criteria:

1. Is bio-fortified
2. Is a legume, nut, or some seeds such as sesame, sunflower, pumpkin seeds, wheat-germ or sprouted legume seeds
3. Is an animal sourced food, including dairy products (milk, yoghurt, cheese), fish, eggs, organ meats, meat, flesh foods, other miscellaneous small animal protein (e.g., grubs, insects)
4. Is a dark yellow or orange-fleshed root or tuber
5. Is a fruit or vegetable that meets the threshold for being a “high source” of one or more micronutrients

(Summarised from the USAID draft Technical Brief on Nutrition Sensitive Agriculture)

4.3 Program design, monitoring and evaluation

The recently released DFAT evaluation report (December 2014), *A window of opportunity: Australian aid and child undernutrition*, recommends that DFAT country programs ensure the inclusion of nutrition objectives and indicators where relevant. Despite its potential to contribute to nutrition outcomes, only 12 per cent¹⁶ of food security and rural development spending incorporated nutrition considerations into their results framework.

Globally, the donor community is challenged by the paucity of evidence on the nutritional impact of agricultural and food security interventions. DFAT is committed to working with others through the SUN Donor Network and the Global Donor Platform for Rural Development to build an evidence base on nutrition-sensitive agriculture.

DFAT activity managers can encourage agriculture investments to clearly define the **nutrition target group**, articulate **clear impact pathways**, and select **nutrition objectives and indicators**.

¹⁶ Data refers to 2010 sector spending.

4.3.1 Define the nutrition target group

DFAT takes a lifecycle approach to nutrition, focusing on the first 1000 days of life from conception to 2 years, as well as adolescent girls¹⁷. This **'1000 days plus'** is a window of opportunity as undernutrition prior to the age of 2 years is largely irreversible. Maternal undernutrition, leading to poor growth in utero, may initiate stunting. In addition to this target group, investments may consider mainstreaming the prevention of over-nutrition more broadly.

For DFAT's agriculture investments using a nutrition-sensitive approach, we would seek improved nutrition outcomes for individuals in the 1000 days plus window. For example, an agricultural investment can have a stated nutrition target group of **women of reproductive age (WRA, aged 15 to 49 years) and children under the age of 2**. Typically, this group would be a **subset of the beneficiary households** within the broader agricultural investment. They are the group of individuals whom we have an intention to achieve nutrition outcomes *for*, but are not necessarily the group of individuals that the agricultural investments work *with*. For example, the investment may work *with* women and men farmers to improve agricultural production and income to achieve nutrition outcomes *for* WRA and children under 2.

4.3.2 Articulate clear impact pathways

Impact pathways provide the theory of change linking interventions to nutrition outcomes. DFAT activity managers are encouraged to question the logic of the impact pathways, and the risks and assumptions that may impinge on their success. DFAT activity managers should also identify ways to collaborate with other sectors (e.g., health, education and social protection) that is required to achieve impact.

Figure 1 shows the possible big-picture pathways through which a policy or program intervention in the agriculture sector can affect nutrition. For example, food access can be improved through increased incomes, greater availability and diversity of food production, and increased availability and diversity of nutritious foods in markets. This in turn improves diet, which in turn can lead to improve nutritional status. Figure 1 shows that agriculture interventions are not limited to growing nutrient-rich foods. Interventions that empower women (e.g., through increased income or labour saving technology) can lead to improved care of infants and young children. Similarly, interventions that raise income and purchasing power can also achieve nutrition outcomes.

¹⁷ DFAT, June 2015. *Health for Development Strategy, 2015-2020*. p12-13

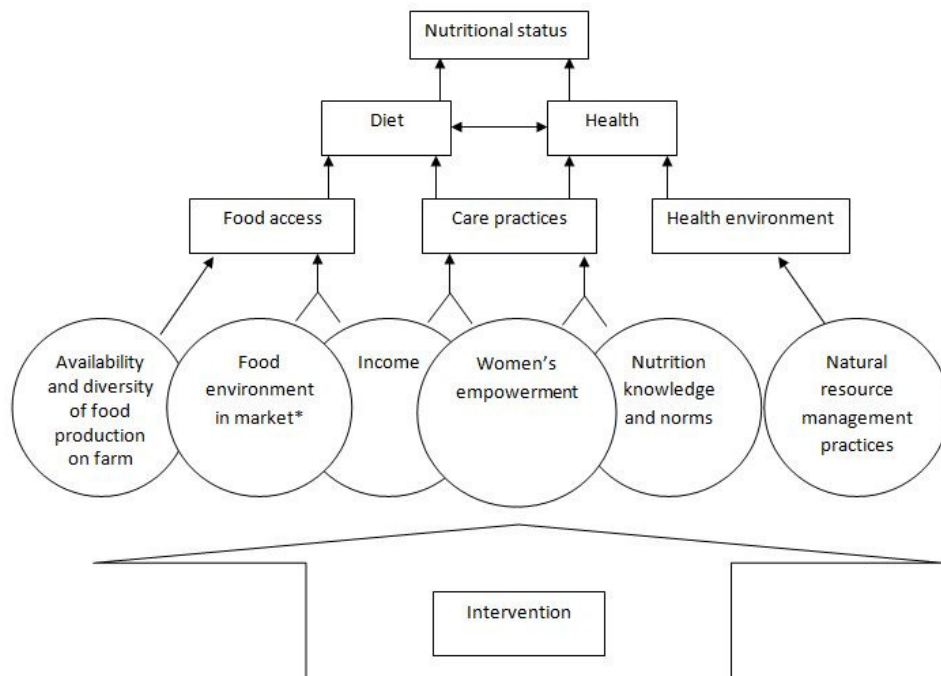


Figure 1. Conceptual framework of the big-picture pathways through which agriculture interventions can affect nutrition¹⁸

Within the DFAT agriculture aid portfolio, there are a range of opportunities for interventions to lead to nutrition outcomes. Potential pathways are detailed in Table 2 below.

Table 2. Possible impact pathways against three pillars of work under DFAT’s Strategy for Australia’s aid investments in the agriculture, fisheries and water

Strategy Objective	Examples of impact pathways
Pillar 1. Markets	
To help increase small-scale farmers’ participation in markets and address constraints to agri-food business, including by leveraging private-sector investment and innovation (with an emphasis on women’s economic empowerment).	<ul style="list-style-type: none"> > Increase household incomes from agriculture-related activities (including cash cropping and agricultural labour) → increase purchasing power → improve food access or increase access to health services → improve diet or child care practices > Improve production of nutrient-rich foods → increase the year-round availability and diversity of food in the household and in markets → increase food access → improve diet
Pillar 2. Innovating for productivity and sustainable resource use	
To improve productivity along food and agriculture value chains and promote more efficient and sustainable use of natural resources, using international and Australian research and expertise.	<ul style="list-style-type: none"> > Introduce agricultural labour-saving devices → decrease the amount time that women spend on agriculture → women have more time to feed and care for young children → improve child care practices > Introduce technologies that improve resilience of food crops to extreme weather events → increase year-round availability of food → improve food access → improve diet > Support dry season production of nutrient-rich foods (e.g., through small scale irrigation) → increase year-round availability of food → improve food access → improve diet

¹⁸From FAO brief – Nutrition-relevant indicators in agriculture projects, draft April 2015)

- › Reduce postharvest food loss and waste → increase year-round availability of food → increase consumption of nutrient-rich foods
- › Mitigate risks from water-borne diseases in agriculture such as malaria → children are less sick → protect health

Pillar 3. Promoting effective policy, governance and reform

To assist partner countries achieve more effective policy settings to promote sustainable and inclusive growth and open trade, and improve the enabling environment for business, investment and innovation.

- › Promote sustainable and efficient agriculture sector → contribute to macroeconomic growth → increase number of jobs in the sector → increase household incomes → increase purchasing power → improve food access → improve diet
 - › Promote policies that support multisectoral approaches to improve nutrition → increase effectiveness of nutrition actions
-

4.3.3 Select nutrition objectives and indicators

Once impact pathways have been articulated, the next step is to develop nutrition objectives and indicators. Most agricultural investments should be able to sensibly incorporate at least one or two nutrition objectives that are relevant to the impact pathways. Examples of nutrition objectives for agriculture programs include:

- › Improve dietary diversity
- › Improve household access to food (including through increased income)

Investments could select **nutrition-relevant indicators** benchmark progress (along the articulated impact pathway) towards a nutrition outcome. Table 3 details indicators that were collated during an FAO survey of nutrition indicators in agriculture interventions.

When selecting the nutrition-relevant indicators, the following questions¹⁹ should be considered:

- › Which determinants of nutrition is the project most likely to impact?
- › Which factors, if measured, would help to attribute any changes in nutrition to project activities?

Table 3. Example nutrition-relevant indicators²⁰

Outcome	Example indicators
Nutritional status	<ul style="list-style-type: none"> › Stunting of children under the age of 2 › Stunting of children under the age of 5 › Body mass index for women of reproductive age › Anaemia › Vitamin A status
Diet	<ul style="list-style-type: none"> › Minimum dietary diversity for women (MDD-W) › Individual dietary diversity score (IDDS) › Minimum acceptable diet for children (MAD-C) › Consumption of specific target foods such as Vitamin A-rich or iron-rich foods
Food access	<ul style="list-style-type: none"> › Household dietary diversity score (HDDS) › Food consumption score (FCS)
Food environment	<ul style="list-style-type: none"> › Availability of specific foods

¹⁹ World Bank, 2012. [Prioritizing Nutrition in Agriculture and Rural Development: Guiding Principles for Operational Investments](#).

²⁰ Herforth, Anna and Ballard, Terri (April 2015), Nutrition Indicators in Agriculture Survey. Presentation to the Global Donor Platform in Rural Development.

	<ul style="list-style-type: none"> > Prices of specific foods > Production diversity > Cost of a healthy diet
Income	<ul style="list-style-type: none"> > Wealth indices such as asset scores > Income or consumption data
Women's empowerment	<ul style="list-style-type: none"> > Women's control of income > Women's workload and labour
Care practices	<ul style="list-style-type: none"> > Minimum acceptable diet for children (MAD-C) > Minimum meal frequency for children (MMF) > Breastfeeding indicators

To ensure that we are able to track progress along the impact pathway, a range of nutrition-relevant indicators should be selected. The challenge in only measuring one high-level indicator (e.g., under-two child stunting) is that we are not able to understand changes in the underlying determinants of nutrition. For example, an agricultural program which fails to show improvement in child nutritional status has not necessarily failed to affect nutrition; if it shows positive impact on underlying determinants of nutrition, then it has succeeded in creating some of the conditions necessary (but not always sufficient) for good nutrition. Similarly, improvements in child nutritional status may not necessarily be caused by the agricultural program; it may be caused by a safe water supply program that is implemented in the same area. Tracking progress along the impact pathway will allow the program to attribute changes.

For an example of how nutrition objectives and indicators have been incorporated into a DFAT program, please see Annex 4.

5 Nutrition-sensitive agriculture and the private sector

Food production and distribution is largely a private sector endeavour that includes private sector players along the value chain, such as input providers, food producers, traders, processors, transporters, wholesalers or retailers. These players range from small household operations, to medium-sized businesses, to large corporations.

Along the value chain (see Annex 3), there are a multitude of opportunities for DFAT investments to engage with private sector actors to improve nutrition outcomes. These range from increasing productivity through improved inputs (such as high yielding varieties, drought and pest resistant crops), better access to finance, improved irrigation (water pumps and drip systems), improving postharvest practices (storage, processing and food safety and handling), fortifying staple foods and improved food distribution and transport. The private sector can also be involved in messaging for better nutrition and maternal and child health, and women's economic empowerment.

Examples of existing DFAT investments that work with the private sector in nutrition-sensitive agriculture include:

- > The **AgResults Zambia Biofortified Maize Pilot** aims to support the introduction of biofortified provitamin A (PVA) orange maize into commercial markets through incentive prizes for millers. Maize biofortification is a low-cost method to combat vitamin A deficiencies, which cause up to 250,000 child deaths triggered from blindness annually

in Africa. In Zambia, research indicates vitamin A deficiency rates as high as 31% in children and 21% in women.

- › DFAT's **Market Development Facility (MDF)** is assisting Timor Global to establish appropriate storage and aflatoxin testing facilities to enable safe local sourcing of maize and soy. The intervention is expected to assist Timor Global in the sourcing of maize and soy for the production of fortified food stuff and other products. Additionally, the intervention is to contribute to creation of jobs in the testing facilities and related activities.

Internationally, there are a range of platforms and partnerships with private sector players to improve nutrition outcomes. In 2009, the Global Alliance for Improved Nutrition (GAIN) brought together stakeholders, including agribusinesses, to improve food security and nutrition in the Amsterdam Initiative against Malnutrition (AIM). AIM uses bottom-up market-based approaches to work at multiple levels of value chains. The AIM approach seeks to make nutritious foods more accessible to consumers at the bottom of the pyramid (BoP). Examples of projects include fortified foods, quality assurance and access to finance. Another example of the increasing commitment from business to achieve nutrition outcomes can be seen in the Nutrition for Growth Compact, officially launched during the 2013 G8 meeting, where businesses committed to focus on improving nutrition for its own workforces.

Annex 1. Key Resources

The following is a list of resources that may be helpful to DFAT activity managers and thematic areas. For further resources, including technical support, consultants, training opportunities, please contact the Agricultural Productivity and Food Security (AFS) section.

Resource	Description and Comments
DFAT resources	
DFAT (2015). Guidance note on Nutrition. (Available from the Health Policy section)	This operational guidance note aims to i) provide good practice principles in nutrition which can be applied to different sectors and country contexts, and; ii) help DFAT staff integrate nutrition into a range of sectoral investments
DFAT ODE (2014). A window of opportunity: Australian aid and child undernutrition.	This evaluation examines how Australian aid policy and programming addresses child undernutrition, and assess the extent of how its approaches align with the evidence and principles of effective practice. It also identifies opportunities to improve how Australian aid addresses child nutrition. Recommendations from this report have been incorporated in the development of this operational guidance note.
DFAT ODE (2014). Addressing child nutrition: an evidence review	The review focuses on: interventions to address child under-nutrition; contemporary policy thinking and approaches to nutrition; and child nutrition data. This document is useful for those who would like a better understanding of child nutrition.
Food Systems Innovation (FSI) initiative (2014). Dossier on Improving nutrition through agriculture linkages	This dossier provides an introduction to the key themes in global discussions on NSA and includes suggestions for incorporating nutrition principles in development planning and practice. The document also contains corresponding links to key documents in each of the sub-headings for additional information.
Food Systems Innovation (FSI) initiative (2014). Enhancing the nutrition-sensitivity of agricultural development interventions in the Eastern Gangetic Plains	This Working Paper makes the case for incorporating nutrition-sensitive approaches into agricultural development interventions using the Eastern Gangetic Plains as a case study. The paper draws from recent literature to consider key challenges and presents options for nutrition-sensitive approaches in the region. The piece was written to invite comment and further discussion.
Nutrition-sensitive agriculture resources	
The Agriculture-Nutrition Community of Practice (Ag2Nut CoP)	Ag2Nut CoP is a global network professionals working on issues pertaining to the intersection of agriculture and nutrition. The group is informal, and designed to facilitate information sharing and networking. The main activities are a monthly, thematic conference call with a topic proposed by a group member, webinars, and an announcement-only email list. The CoP is hosted by the United Nations Standing Committee on Nutrition (UNSCN). Join there group here: https://knowledge-gateway.org/ag2nut
Secure Nutrition Platform, linking agriculture, food security and nutrition	SecureNutrition is one of six of the World Bank's Knowledge Platforms. It is working to bridge the operational knowledge gap between agriculture, food security, and nutrition. This platform offers a space to exchange experiences and to disseminate and gather information. The Platform has a useful resources page, and can be subscribed to.
European Commission, FAO, CTA and World Bank Group (2014). Agriculture and nutrition: a common future, A Framework for Joint Action	This framework for joint action was released following ICN2 in November 2014. It outlines the potential of agriculture to improve nutrition. It outlines very useful and comprehensive guiding principles, and sets out three strategic priorities.
Herforth, A., Jones, A., and Pinstrip-Andersen, P. (2012). Prioritizing Nutrition in Agriculture and Rural Development: Guiding Principles for Operational Investments. The World Bank:	This Discussion Paper produced by the Health, Nutrition and Population (HNP) unit provides a set of guiding principles for incorporating nutrition goals into the design and implementation of agriculture and rural development projects. For each principle identified, a set of key questions are provided which highlight various pathways by which nutrition can be influenced.

Washington.	
World Bank (2013). Improving Nutrition through Multisectoral Approaches: Agriculture and Development	This World Bank guidance brief defines nutrition-sensitive agricultural approaches, summarises the strength of evidence for pathways linking agriculture to nutrition and introduces a number of nutrition-related indicators for measuring food consumption for improved nutrition. This brief is a compact source of information containing basic principles and concepts related to NSA.
DFID (2014) Can agriculture interventions promote nutrition? Agriculture and nutrition evidence paper	This is a critical review of the strength and quality of the evidence base linking agricultural based interventions and nutrition outcomes. The review recognises that the evidence base on a range of interventions is limited in both size and quality.
USAID, Improving Nutrition through Agriculture Technical Brief Series	Strengthening Partnership Results and Innovation in Nutrition Globally (SPRING) has developed a series of briefs that illustrate how a set of evidence-based pathways and principles can strengthen agriculture and nutrition linkages under Feed the Future (link is external). Short vignettes from agricultural activities highlight how the pathways and principles can be applied in diverse contexts. The conceptual frameworks of the pathways and principles for improving nutrition through agriculture are described in Brief 1: Understanding and Applying Primary Pathways and Principles. Each subsequent brief explores a different route between agriculture and nutrition: food production, income generation, and women's empowerment.
USAID (2015 draft). USAID Multi-Sectoral Nutrition Strategy 2014-2025 Technical Guidance Brief: Nutrition Sensitive Agriculture	This short Technical Brief features a range of useful tables to guide NSA-related activities. Key programming principles, nutrient-rich value chains and various entry points are all described.
FAO (2013). Synthesis of guiding principles on agriculture programming for nutrition.	This synthesis aims to provide an updated and complete list of current guidance, institutional strategies and other publications. It provides a summary of the key messages currently available. This paper provides 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.
FAO (2013). The State of Food and Agriculture 2013: Food Systems for Better Nutrition.	This report by the FAO takes a food-systems approach to outline the pathways from food and agriculture to improved nutrition. It identifies production, prices and income as key contributors to improved health and nutrition and references global food and health systems data to highlight potential entry points for improved outcomes.
General nutrition resources	
Scaling Up Nutrition (SUN)	Scaling Up Nutrition (SUN) is a movement that includes from governments, civil society, the United Nations, donors, businesses and researchers in a collective effort to improve nutrition. Australia is a signatory to SUN and is part of the SUN donor network. Member countries include Cambodia, Laos, Pakistan and the Philippines. The SUN website details what it means to be a SUN country. For the agriculture sector, SUN seeks to make nutritious food more accessible to everyone, and support small farms as a source of income for women and families.
Global Alliance for Improved Nutrition (GAIN)	Established in 2002, GAIN is an international organization driven by the vision of a world without malnutrition. GAIN acts as a catalyst – building alliances between governments, business and civil society – to find and deliver solutions to the complex problem of malnutrition. GAIN brought together the Amsterdam Initiative against Malnutrition (AIM), which is a group of 30 organisations, to explore innovative and sustainable solutions to address malnutrition, using a market-based approach and new social business models that are financially

	sustainable.
Global Panel for Agriculture and Food Systems for Nutrition (Glopan)	<p>The Global Panel is an independent group of influential experts with a commitment to tackling global challenges in food and nutrition security. The Panel's objectives are to</p> <ul style="list-style-type: none"> • Generate and stimulate a stronger evidence-base for how changes in agriculture and food systems can improve nutrition. • Create and promote a new understanding of the role and future potential of agriculture and food systems in improving nutrition. • Catalyse collaboration in agricultural and food systems that will improve diets and nutrition outcomes for all.
Global Nutrition Report	<p>The Global Nutrition Report Secretariat, based at the Institute of Development Studies and the International Food Policy Research Institute, supports the Independent Expert Group in developing the Report through research, data analysis, communications and coordination functions. This website provides nutrition country profiles with useful infographics. Information is also provided on underlying determinants, such as food supply and gender indicators.</p>
Executive Summary of the Lancet Maternal and Child Nutrition Series (2013).	<p>This Executive Summary is a concise compendium of the global prevalence, determinants and consequences of maternal and child under- and overnutrition, compiled from the 2013 Lancet series on Maternal and Child Undernutrition. The summary identifies key drivers for improved outcomes for both nutrition-specific and nutrition-sensitive interventions as well as the conditions most likely to enable progress at the policy level.</p>
Levinson, F.J., and Balarajan, Y. (2013) Addressing Malnutrition Multisectorally: What Have we Learned from Recent International Experience? UNICEF Nutrition Working Paper, UNICEF and MDG Achievement Fund, New York.	<p>The authors share lessons from three case studies – Peru, Brazil and Bangladesh – on working multisectorally for improved nutrition outcomes. The findings highlight: the value of combining nutrition-specific with nutrition-sensitive approaches to improved outcomes; the importance of results-based incentives for action at sub-national levels and; the role of sustained civil society advocacy in ensuring political commitment to tackling malnutrition. The authors promote the principle - “Plan multisectorally, implement sectorally, review multisectorally”.</p>

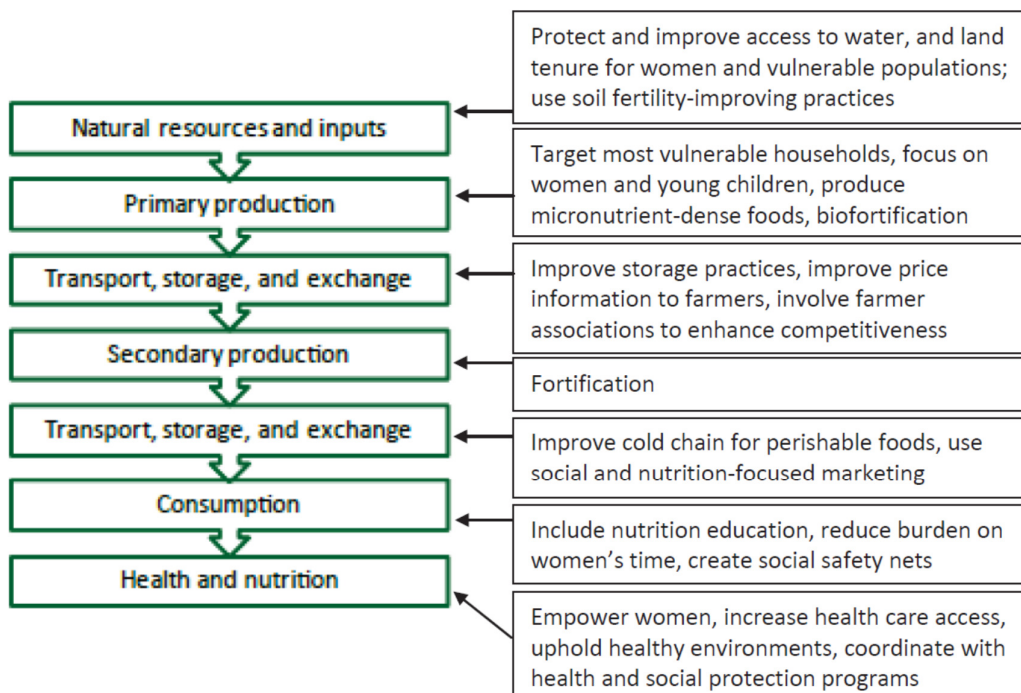
Annex 2. Examples of nutrition outcomes and interventions

Source: World Bank's (2012) Prioritizing Nutrition in Agriculture and Rural Development: Guiding Principles for Operational Investments.

Nutrition outcome statement	Interventions that lead to the nutrition outcome
<i>Increase dietary diversity</i>	<ul style="list-style-type: none"> › Diversify production systems to encourage dietary diversification (for example, broaden the diversity of foods included in agricultural training, extension, seed provision programs, and exports) › Package agriculture projects with gender-sensitive nutrition education › Enhance market opportunities for a diversity of foods, particularly micronutrient-dense vegetables, fruits, pulses, and animal-source foods › Improve infrastructure needed to enable market access (especially for perishable foods) › Implement preservation technologies (for example, drying) › Improve income, particularly of women, coupled with nutrition education
<i>Increase micronutrient intake</i>	<ul style="list-style-type: none"> › Diversify production systems to encourage dietary diversification › Package agriculture projects with gender-sensitive nutrition education › Implement preservation technologies (for example, drying) › Grow biofortified crops › Fortify foods › Promote use of fertilizers with key micronutrients (zinc and iodine), through education and policy
<i>Improve maternal and child care and feeding</i>	<ul style="list-style-type: none"> › Design projects to enhance women's control of income from agricultural activities and preserve their time available for child care › Package agriculture projects with gender-sensitive nutrition education › To increase women's income, focus on crops and livestock breeds that women disproportionately produce › Prioritize technologies that improve productivity and introduce time savings for tasks that women traditionally perform (for example, weeding and hoeing, food processing, crop transportation) › Strengthen women's access to productive resources, training and support services (for example, land, agricultural inputs, credit, extension services) › Involve the entire family, not only women
<i>Protect health</i>	<ul style="list-style-type: none"> › Improve water delivery systems (for irrigation and home use), paying close attention to water use efficiency › Ensure that new agricultural techniques do not increase risk of parasitic or mosquito-borne disease or contamination of available water › Improve basic food safety, including control of aflatoxin, and improved storage and transport › Overlap agriculture, health, and social protection projects geographically
<i>Improve environment supportive of nutrition</i>	<ul style="list-style-type: none"> › Increase capacity of staff in ministries to address malnutrition › Cross-train program staff and extensionists in relevant content areas. E.g., Agricultural extensionists could provide nutrition messages while remaining focused primarily on agricultural training and production goals › Improve land tenure policies, particularly for women and indigenous groups › Employ policies to reduce non-food expenses of the malnourished, such as school fees and health care costs › Improve infrastructure to enable market access › Provide social safety nets

Annex 3. Nutrition-sensitive interventions along the food value chain

From the World Bank's (2012) *Prioritizing Nutrition in Agriculture and Rural Development: Guiding Principles for Operational Investments*, p. 17.



Annex 4. Example: Nutrition-sensitive design in Timor-Leste

The DFAT-funded Food Systems Innovation (FSI) initiative provided specialist input to enhance the nutrition sensitivity of an agriculture investment design for the Timor-Leste program. The case study here draws on learning from the design mission conducted in March 2015.

Context analysis. The Timor-Leste Food and Nutrition Survey undertaken in 2013 by the Government of Timor-Leste, along with studies undertaken by Monash University and NGOs, provided valuable information on the nutritional situation. Malnutrition was found to be widespread across Timor-Leste, with 50 per cent of children under five being stunted. The causes of malnutrition were not definitive from the desk review of the available literature, but likely causes include poor feeding practices, food insecurity, poor access to safe water, and the high disease burden. It was determined that further analysis was required at the inception phase of the project to fill in information gaps, particularly at the district level.

While there are multiple causes of malnutrition in Timor, attitudes to food play an important part in influencing diet. A study undertaken by Monash University²¹ (2014) showed that for poorer families, increased income does not necessarily result in improved household intake of nutritious foods. For wealthier families, imported processed foods are convenient and symbolise economic success, and there is a risk that they are purchased at the expense of more nutritious local foods. This underscores the importance of nutrition messaging alongside work to increase incomes.

Design. Nutrition is **mainstreamed** through the proposed investment design, which seeks to maximise the impact of nutrition outcomes for the poor, while minimising the unintended negative nutrition consequences. The investment will use a **multisectoral** approach, working collaboratively with other investments in the health, WASH, and governance sectors, to achieve nutrition outcomes.

The **nutrition target group** is women of reproductive age (WRA, aged 15 to 49 years), infants and children under the age of 2 within the beneficiary households. The overall **nutrition objective** is to increase household access to sufficient and diverse food. The **indicators** that can be tracked in the investment are detailed in Figure 2.

²¹ Monash Centre for Development Economics and Sustainability. Research Paper Series on Timor-Leste. RP-TL1. Poverty and the Agricultural Household in Timor-Leste: Some patterns and Puzzles. Research Report June 2014

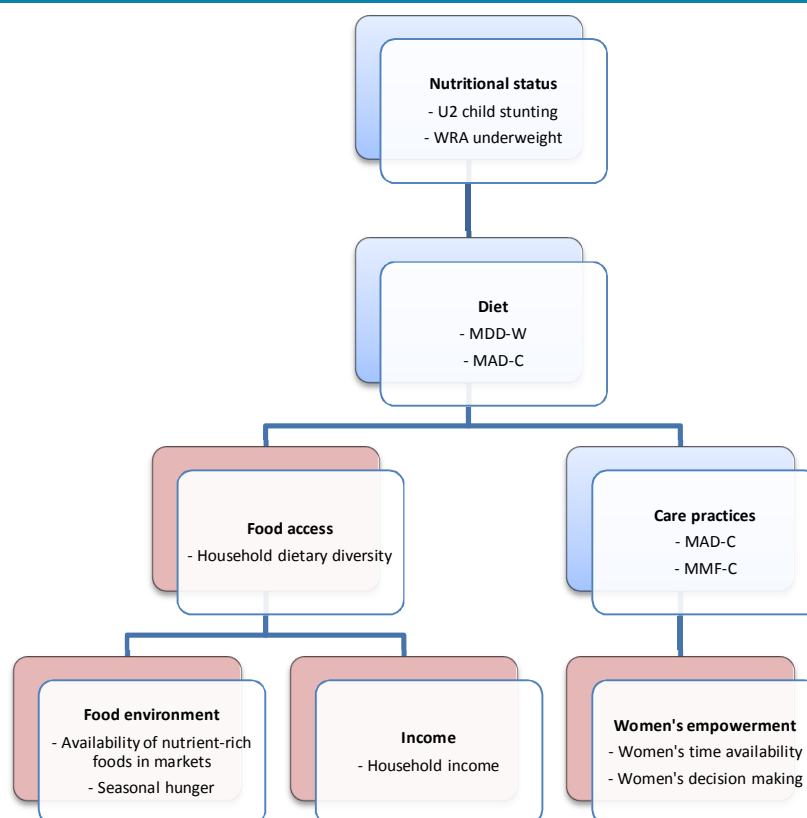


Figure 2. Impact pathways for the proposed agricultural investment including indicators. The red boxes are the outcomes that the investment can realistically expect to achieve, whereas the blue boxes show the outcomes that will require multisectoral actions beyond the investment.

To achieve these outcomes, the proposed investment will have a dual approach of ‘mainstreaming’ nutrition concerns as well as undertaking ‘direct action’ to impact on nutrition outcomes. Activities include:

- › Integrating **nutrition messages** to improve utilisation of food through activities such as training, advocacy, mass media, or cooking demonstrations.
- › Promoting the **empowerment of women**, in particular regarding women’s crops, and to ensure that they have sufficient time for good feeding and care practices for infants and young children.
- › Including ‘nutrition’ criteria in selection of **agricultural value chains** to work with.
- › Supporting households to integrate ‘**dual purpose**’ crops or livestock options into their farming system. That is, crops or livestock that serve the purpose of earning income and ensuring food security and nutrition.
- › Improving **household food systems** for nutrition outcomes through training and improved access to agricultural inputs. Some ‘low-hanging fruit’ that are likely to improve nutrition include: postharvest processing, storage and preservation; livestock (particularly poultry) and aquaculture; time and labour saving technologies, especially for women; irrigation, in particular for the dry season; and improved varieties or breeds of nutrient-rich foods.