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# From Agriculture to Nutrition

Insights from Enhanced Nutrition  
in Upland Farming Families (ENUFF) -  
Technical paper no. 2

# Summary

Poor dietary quality, particularly among vulnerable groups, continues to challenge the nutrition targets in Lao PDR. Despite significant progress, Lao PDR still has relatively high levels of malnourished children. In response to this, the Government of Lao PDR (GoL) has prioritised nutrition with the adoption of the National Nutrition Strategy and Plan of Action (2016-2025) (NNSPA). This includes objective and priority actions in nutrition sensitive agriculture (NSA), including improved access to nutritious food, and improved nutrient intake.

The Enhancing Nutrition of Upland Farming Families (ENUFF) is a programme of the Swiss Agency for Development and Cooperation (SDC), implemented by SNV – The Netherlands Development Organisation with the assistance of Agrisud International in Lao



Figure 1: ENUFF programme locations

PDR. The project is implemented together with government counterparts and other development partners with the aim of improving family nutrition in remote and ethnically diverse upland farming communities through nutrition-sensitive agricultural production, sustainable management of natural resources and good practices in health and hygiene.

A core pillar of ENUFF is NSA, which is seen as a key way to improve food production and diversity at the household level. NSA is complemented by improvement of women’s skills in nutrition and care practices, in particular women of reproductive age (WRA); physical and economic access to nutritious and diversified food through income generation activities, market and short value-chain opportunities and a development of a conducive policy, strategic and institutional framework to address and prevent food and nutrition insecurity. The project is being implemented in Xiengkhor and Viengxay districts of Houaphanh province and Nga and Beng districts of Oudomxay province in collaboration with the Provincial Health Departments (PHD), Provincial Agriculture and Forestry Offices (PAFO) and Lao Women’s Union (LWU) with their subordinate offices in the target districts. The project targets 4,000 farming families in 40 villages across the four districts of these two provinces.

The aim of this brief is to present some lessons learned to date in the implementation of NSA activities and their impact so far on dietary diversity in the target communities. The brief will also provide some recommendations for projects using NSA with a multi-sectoral approach in similar contexts.

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# Introduction: Rationale for Nutrition-Sensitive Agriculture

The idea of linking agriculture, food security and nutrition goals is not new. However, there has never been a better time to explore how agriculture can improve diets and in turn address malnutrition. Malnutrition is complex. One of the main causes of malnutrition is low quality diets. Furthermore, it now represents the number one risk factor in the global burden of disease<sup>1</sup>. Hence, high quality diets matter to resolving under-nutrition and micro-nutrient deficiency and we have to find ways to ensure that all people, particularly the most vulnerable, have access to a diversity of high quality food all year round.

However, gaps exist in our understanding on how agricultural programmes can accelerate improvements in diets and nutritional status<sup>2</sup>. Despite the clear potential for agricultural programmes to support the eradication of malnutrition, the evidence base for the

agriculture-nutrition relationship is poor. Systematic reviews have revealed that merely producing more food does not translate into improved nutrition. However, field experience indicates that NSA interventions, when properly implemented, can significantly contribute to improved diets and in turn improved nutrition outcomes. Hence, in recent years, there has been a shift from purely increasing agricultural production to develop nutrition-sensitive agricultural growth and strategies that support improved dietary diversity and quality, and participatory social and behaviour change communication programmes (SBCC)<sup>3, 4</sup>.

In essence, NSA should encompass the entire food system, the complete array of activities covering all stages of the food supply chain from input distribution, on-farm production, marketing,

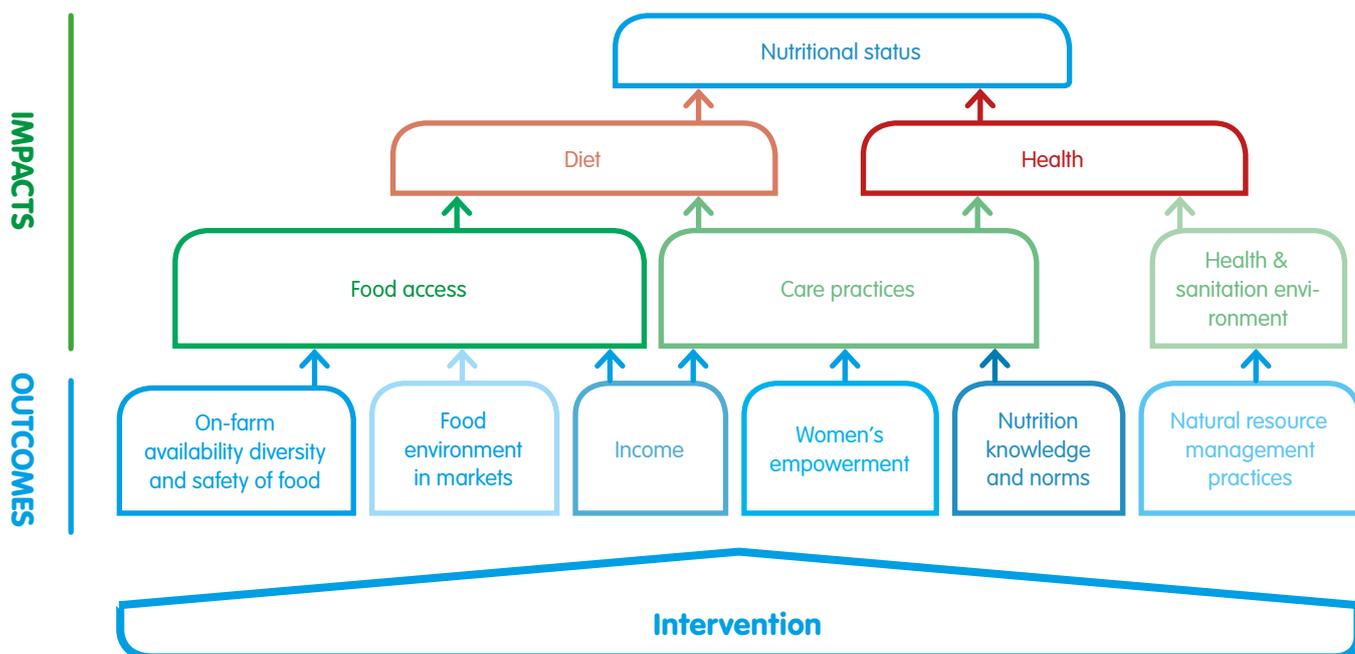


Figure 2: Impact pathway framework of Nutrition Sensitive Agriculture (NSA) projects. Source: Herforth and Ballard, 2016

processing and storage. NSA interventions can include diversification and increased production of nutrient dense crops and small-scale livestock. The aim is to support the supply of healthy, diverse and safe food containing essential micro-nutrients, and to increase year-round, affordable access of healthy food for both rural and urban populations. Activities in the food system can range from better production of food (or production of nutritious food not available locally) to improved processing, storage and preservation that retains the nutritional value, shelf life and safety of food. Additionally, NSA can reduce seasonality of food insecurity and post-harvest loss. Market access for vulnerable groups are another opportunity to increase income for improved food and health expenditure. The role of women in the effort to increase the supply of healthy and diverse food for households should be carefully considered.

Multiple reviews have highlighted a number of pathways from agriculture to nutrition. Figure 2 outlines an impact pathway between agriculture and nutrition developed by Herforth and Ballard (2016)<sup>5</sup>. This framework identified six outcome areas that are directly affected by agriculture and food systems, and in turn how these can affect nutrition outcomes.

This brief uses this framework to explore the impact pathways that activities in ENUFF can have. The main pathways that are discussed in this brief include:

### Agriculture as a source of food and diversity

Agriculture can and should be the basis of good nutrition. However, in many situations while agricultural systems produce food, they do not produce food with the required diversity and at affordable costs, especially for the poorest farmers (with limited sources of income and access to markets). In the past, agriculture interventions have focused in the production of staple foods with limited consideration for diversity of food.

NSA production can include diversifying production with nutritionally rich crops or animals; incorporating bio fortified crops such as orange flesh sweet potatoes and improved domestic storage/processing that maintain the safety and nutritional content of food.

In a recent systematic review on NSA projects, homestead garden programmes with a strong nutrition and health BCC strategy were shown to produce improved nutritional outcomes in Burkina Faso and India<sup>6</sup>. Key features of the programmes were that mothers in the households were supported to establish homestead gardens, participate in trainings in gardening, irrigation and small livestock rearing and also participated in nutrition education.

New programmes have expanded the breadth of NSA from traditional home gardens to enhanced homestead farm production systems with small animals, livestock programmes and dairy value chains and their impact on diets, particularly in infants and women of reproductive age (WRA)<sup>6</sup>.

### Income from food sales for health and food expenditure

Agriculture as a source of income can play an important role in diets and nutrition.

However, evidence to date indicates that income growth alone is not sufficient to improve dietary diversity or child anthropometry<sup>6</sup>. The relationship between income and dietary diversity also varies by market access, and complementary nutrition education. Diets can improve but only when the households have relatively good market access<sup>7</sup>. When agriculture is the main source of livelihood, increases in income, complemented with nutrition education and BCC strategies can facilitate the purchase of more diverse food as well as access to other primary social services such as health care.

Rural producers are also frequently net buyers of food, hence are affected by low and unstable incomes, and inadequate infrastructure including poor access to markets. The poorest communities, particularly female headed households, often feel the effects of rising food prices most acutely. Increases in food costs may force households to reduce the quantity and nutrient quality of food consumed. This often affects those with the highest energy and micro-nutrient requirements such as young children, adolescent females, pregnant and lactating women<sup>7</sup>.

### Intra-household dynamics affecting dietary diversity

There are a number of pathways that affect dietary diversity at the intra-household level as illustrated in Figure 3. Evidence suggests that women’s control over resources is associated with reduced child under-nutrition (stunting)<sup>8, 9</sup>. Strategies that integrate women’s empowerment can support women to gain decision-making power related to income, time, labour assets and knowledge. The mother is typically the caregiver, and needs to have decision-making power to ensure that resources are used to grow or purchase nutritious food, and that the food is allocated equitably amongst household members, including infants.

Often the best ways for women to influence how household income is spent is by earning their own income. However, they frequently continue to lack the authority to access agricultural resources and decide what is produced. Agricultural development interventions can also strongly affect women’s use of time as well as their labour burden. Furthermore, women are typically responsible for a wide range of household and agricultural tasks, and the amount of

time or labour they spend on such tasks can affect their own health and energy expenditure and their nutritional status<sup>10</sup>.

Hence to effectively address malnutrition, it is imperative that a gender sensitive approach is taken, to empower women to have control over resources and decision making whilst also providing nutrition education to men on their supportive roles as husbands and fathers. Other household influencers must also be considered, for example mothers-in-law<sup>10</sup>.

Although there is a strong consensus on what needs to be done, less is known on how to operationalise the right mix of actions in different contexts and how to do it at scale in an equitable manner<sup>11</sup>. Moving forward there is a need to understand which impact pathways are the best ones in different contexts, and how best to positively influence these pathways to benefit the more vulnerable groups<sup>12</sup>.

## Linking Agriculture

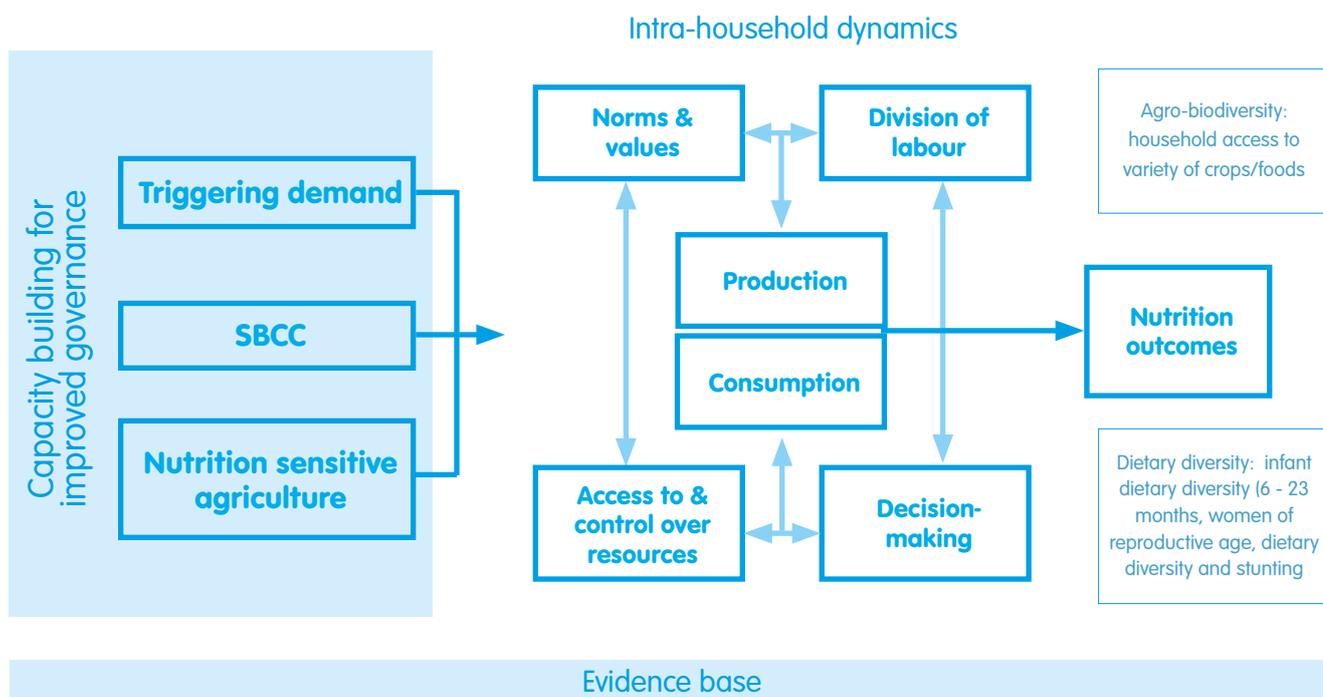


Figure 3: Nutrition model through an intra-household lens (KIT, SNV, CDI, SDC, 2018)<sup>10</sup>.

# and Nutrition in Lao PDR

Agriculture is the primary activity and source of income for over three quarters of the population of Lao PDR. While there are clear indications that Lao PDR has already embarked in an agricultural transition from

subsistence to commercial farming, most of the people living in remote rural areas poor produce most of their food, with either weak purchasing power to buy market food or poor access to markets. Although 80% of farmers follow a subsistence mixed crop-livestock farming system, many grow very few crops and in small quantities for short periods during the year. The affordability of food has been found to be a critical barrier of a nutritious diet. In Oudomxay, for example, over half the households cannot afford a nutritious diet<sup>13</sup>. Hence, diets are often monotonous, lacking in dietary quality and quantity, and mainly consist of foods such as sticky rice, bamboo shoots or chilli<sup>14, 15</sup>.

The Ministry of Agriculture and Forestry (MAF) has embraced the commitment to support and strengthen

nutrition sensitive agriculture. The Agriculture Development Strategy 2025 and Vision to 2030 is the core strategy of the Ministry of Agriculture and Forestry, adopted 20 February 2015. Although the strategy is focused on expanding farming systems for commodity production and improving regional and global market linkages, its overall strategic orientation is on food and nutrition security. In addition to this strategy, a number of complementary strategies, guidelines, studies and plans have been produced by local and international stakeholders, and government agencies.

## Agriculture as a source



Many households do not follow a nutritious diet

# of food and diversification

ENUFF target villages are remote ethnically diverse communities that still largely practice subsistence farming. As such, farmers largely depend on what they grow for consumption. Many of these villages have limited

access to markets and frequently suffer from having even the most basic infrastructure, such as WASH facilities, irrigation and roads. Having limited means to produce, store food safely and process foods also increases their vulnerability to climate issues, food-borne diseases and/or other shocks.

In ENUFF, households are supported to grow diverse foods year-round through homestead gardening. The process started with the development of a seasonal calendar to identify locally available nutritious crops which was also discussed with households.

Farmers are further supported through trainings and mentoring on improved agricultural practices such as the use of high quality seeds, pruning, shade management, spacing and timing of planting. Capacity strengthening on these topics enable smallholder farmers to maximise the potential of their resources without a large additional investment. They are encouraged to diversify and produce more whilst sustaining the natural resource base on which their livelihoods depend. The promotion of good soil and water management may also improve diets through the retention of micro-nutrients in the soil and ensuring safe water use to avoid disease. The practice of inter-cropping diversifies production as well as increase household consumption.

As was mentioned before, the use of sustainable agricultural practices does not guarantee a direct contribution to improved nutrition of the household. Because of this, training and support in the adoption of new and/or better agricultural practices is coupled with nutrition education to achieve improved nutrition (see IHHD section). Nutrition education includes counselling on good nutrition practices and practical skills development through cooking demonstrations using seasonal, locally available foods.

As reported in the recently conducted ENUFF annual review (2018), the average number of crops grown by households, particularly perennials, and average number of livestock raised per household has increased (although only minimally) since the programmes' baseline (2016). However, there are variations in the diversity and number of crops grown between districts and even between villages, suggesting that the intervention needs to be contextualised even further. In Beng and Nga districts for instance, the variety of crops grown between baseline (2018) and the annual review (2018) decreased, potentially because farmers are increasingly engaging in cash crop production or off-farm employment such as the railroad construction. Additionally, poorer households have additional challenges around land access and cattle ownership<sup>15</sup>

Interestingly, the number and variety of crops consumed by different members of the household has also increased (albeit also marginally). Future research will explore if there is a correlation between the increase in number and volume of crops grown in home gardens and the increase in diversity of food consumed. However, interviews with farmers point towards a link between the two. This is also in line with recent research exploring the relationship between increase in diversity of production and diversity of consumption<sup>15</sup>.

As part of the regular Monitoring and Evaluation (M&E) process, ENUFF is also following 40 households throughout the programme through regular interviews to understand their experience in participating in different project activities and have insights into the pathways that work most effectively. The interviews conducted so far reveal that the challenges for women to participate in home garden trainings vary, including lack of time and lack of support to look after children to attend the training.

Furthermore, women face challenges to set-up and develop their home gardens. In Houaphanh province for instance, the quality of water and soil is a challenge and in Oudomxay province, farming equipment is reported as not adequate and the location of many gardens (far from the home) makes it difficult for women to work on them. The main benefits of having a home garden for the women interviewed are consistent, including eating more organic fruit and vegetables that have no chemical pesticides at least once and up to three times a week. The studies have revealed that 100% of the interviewed households eat vegetables from their gardens.

Other findings to date indicate that there is an important impact due to seasonality on agricultural production and food consumption, with the period June-August highlighted as a difficult time to access food.

To address these findings, ENUFF has adapted some of their activities to make sure that most families are

able to start home garden without putting an extra burden on women's already busy schedule. These include, providing more trainings at different times of the day so that women are able to attend, providing trainings and inputs (seeds) on how to grow other vegetables (which were found to be little consumed in the annual review), pilot green houses to allow households to grow vegetables year round, and create communal gardens for households that have no space to build one.

Moving forward, nutrition education will be expanded to include household budgeting. This can support the household in improved food purchase and mitigating the impact of seasonal access to food thereby promoting a more diverse and nutritious diet. This will be closely integrated/harmonised with the market development component of the programme.

## Agriculture as a source of income



Teaching communities about growing nutritious foods

# for food and health expenditure

Income is a key incentive to farmers. How income affects nutritious consumption practices depends on intra-

household dynamics (who controls the income and what is allocated towards food/health) as well as the local food environment (i.e. what foods are available, accessible and affordable in the local markets). In ENUFF, data from the aforementioned in-programme studies indicate that the income from sale of agricultural products has remained stable over the last two years, and in general income from livestock is more lucrative. There are clear variations in income from agricultural products between and within the villages, and the market linkages component of ENUFF will take time to yield nutrition results.

The project's monitoring indicates that the main type of food purchased from the market by targeted households is meat. However, the price of meat can vary significantly throughout the year, in particular in Oudomxay province, therefore affecting purchasing decisions. Interestingly, in Houaphan province people indicate that it is difficult to buy food because of their low income, therefore illustrating that improving purchasing power along with nutrition education and affordable food prices may have a lot of potential.

The ongoing longitudinal study of 40 households has revealed that a large proportion of women make decisions about what to buy and what to cook for the family. Women are less involved in decision making on what to grow as these decisions are frequently made by men. This suggests that the project needs to continue its efforts on transforming gender and household decision making.

While income is a key incentive to farmers, encouraging better consumption practices may also contribute to increases in income. More nutritious consumption practices may expand markets by increasing demand for more nutritious foods.

On the other hand, it is important to remember that improved year round income and cash flows to meet household needs including diverse nutritious foods and health care assumes nutritious foods and health services are accessible, which in ENUFF's target villages is not always the case.

## Intra-household dy-

# ynamics affecting dietary diversity

The access to food to cover the required calorie intake remains a challenge to households in ENUFF target

villages. The diversity in the diet, particularly in WRA and infants (6–23 months) is particularly low. This indicates that household food security particularly at the intra-household level remains a challenge. The recent annual review revealed that DDS for infants is low, and in all four districts the average was below three (the cut-off is the consumption of at least 4 of 7 food groups). A disaggregation of dietary data also indicated that the diversity score of the morning and afternoon snacks for infants was extremely low, below 2, and mainly included a biscuit. Poor dietary diversity scores were also recorded for children between 24-60 months, where the DDS was on average around four groups (out of 8 food groups). The data also showed that few children receive snacks, particularly in the afternoon. Generally the diets of IYC mostly consisted of rice, other fruits/vegetables and some meat and fish.

A number of factors may be at play in the low diversity of diets of children. Among the most salient issues in monitoring and anecdotal evidence show

that women’s heavy workload can affect their own nutritional status and also affect the time for IYCF. During FGDs conducted during the annual review women indicated that they have limited time to cook food for infants under 2 years, as they are busy looking after younger children (0–6 months), doing household chores or working in the field. This was observed in the case study families where there is an expectation that even pregnant women work ‘full-term’ during their pregnancy in the field.

While fathers in many villages support in the caring of children, they do so with little understanding and interest for the needs of infants. Frequently, fathers are seen feeding children only rice or snacks and paying limited attention to the signs of stress or hunger of children. This indicates that more work is needed in increasing the knowledge and commitment of fathers in the care of their children.

## Conclusion



Working with men and women to address intra-household dynamics

The lessons of the programme so far complement and reiterate the evidence to date in NSA. Agriculture diversity alone will have limited impact on women and infant's dietary diversity and consideration must be

given to income generating activities, market access, intra-household dynamics and SBCC strategies to improve dietary and IYCF practices. In Lao PDR, NSA can potentially impact diets and nutrition, through household production of diverse foods for own consumption and increased income through the sales of surplus agricultural products for improved food and health expenditure. Better market linkages could also contribute to an improved food environment where diverse, safe and nutritious foods are available and affordable. In ENUFF, the poor production diversity is an underlying factor in the poor DDS in infants. However, for households that have adequate access to diverse food, it is suggested that IHHD are affecting the intra-household allocation of food to infants.

While there is not one model that can make agriculture more nutrition sensitive there are many opportunities and entry points for action. Although the pathways, related to food diversification and income generation, are important, they are limited in how they can improve diets. An extensive and targeted approach is needed which integrates gender sensitivity and SBCC. In ENUFF experience to date, practical and participatory counselling and cooking demonstrations are most effective for community participation and application. Gender can be effectively integrated in community based interventions and gender sensitive SBCC tools will be continually used to positively affect women's self-efficacy and skills; women's control of income and assets and household decision making, including food and health expenditure and women's workload and time for childcare and feeding as well as self-care. SBCC should reach families, including fathers and

elders, in a culturally appropriate way that both respects and challenges traditional gender roles.

Considering the seasonality of agriculture, subsistence farming, even with diversification may be insufficient to improve diets all year round. Hence, it is important to build access to markets where affordable, safe and nutritious foods can be purchased. In remote upland areas, investment is needed in infrastructure.

NSA does not exist in a silo. Projects and staff working in the agriculture sector will need to collaborate more effectively with other sectors including health, education, water and sanitation in order to address the multi-sectoral causes of malnutrition. ENUFF follows the national example and encourages and facilitates the collaboration between sectors. For instance, ENUFF supports the District Nutrition Committees, where representatives from the nutrition-related sectors meet to exchange information, knowledge and coordinate for improved planning and implementation. Furthermore, ENUFF uses as its main mechanism of implementation District Nutrition Teams, comprised of staff from DAFOs, DHOs and LWU. This ensures that Government staff at the ground level are learning and developing their capacity to understand and address malnutrition from a multi-sectoral perspective.

## Recommendations

**Based on ENUFF's experience so far, SNV makes the following recommendations to fulfil the**

## **potential of NSA to eradicate malnutrition:**

### Development partners and public sector:

- 1. Invest in participatory SBCC resources and actions that involve caregivers as well as influential family members and can address poor complementary feeding:** The findings of ENUFF's monitoring and other national surveys (LSIS II) indicate that more attention has to be placed in the nutrition of children between 6 months and 2 years old. While important strides have been made in the adoption of exclusive breastfeeding, adequate complementary feeding of infants is still lagging behind. Nutrition activities need to be focused and devoted to improving the way diverse food is prepared and given to infants. This will require an investment in a number of areas such as the production and access of nutritious food for infants, gender norms and practices, in particular in the distribution of household activities to alleviate workload and caring practices, and on monitoring growth of children and looking for signs of malnutrition. It is also recommended to extend SBCC activities to fathers and all caregivers including grandparents, who may have responsibility for feeding infants when their parent(s) are in the field. The time is opportune for government and development partners to join forces in strategising and developing key tools, communication channels, and implementation plans to promote SBCC among target populations as well as to identify and fill existing knowledge gaps.
- 2. Align and integrate agriculture activities with SBCC,** for example cooking demonstrations that utilise locally available and readily accessible foods that are in season; promote gender messages such as joint decision making in agriculture activities that reach men and women. A coordinated planning and implementation of activities is required to ensure that the potential benefits of acting multi-sectoral are obtained.
- 3. Ensure vulnerable farming communities are included:** There is a need to have an intense focus on the production of nutritious food for families. While better production of cash crops or livestock could produce higher incomes if this is paired with efficient interventions to facilitate access to markets, in the short term it is more important to ensure that families have access to nutritious foods locally. It is key to keep in mind that special considerations need to be made for the most vulnerable families.
- 4. Invest in better data collection and analysis.** Progress is hindered by a scarcity of good quality data. The existing tools to monitor progress in agriculture, for example only capture some elements of the food system such as agricultural output, and total food supply. These indicators provide only a partial assessment of actual food and nutrition needs of vulnerable populations. Qualitative research related to SBCC, as well as the drivers of food choice, is highly necessary, to capture in particular the motivations, barriers and incentives to make particular food choices, as well as the potential sustainability of interventions.
  - To ensure that the way in which projects have an impact on nutrition is well understood, it is vital to trace the impact pathway. This will provide clear evidence of which combination of activities and in which sequence produce the highest impact, in particular contexts. Understanding the impact pathways that work will also allow to address opportunities and constraints that affect each pathway such as the institutional environment, gender or environmental sustainability, through policy and stakeholder engagement.

### Private sector:

5. **Develop strong business cases to incentivise private sector nutrition action that link producers to markets:** While the promotion of cash crops, fruit trees and others could be in theory a good option to increase family income, in reality the impact of this activity will be minimal in contexts where there are serious systemic bottlenecks and challenges to bring products to markets (i.e. remote communities, no roads, small volumes, lack of buyers, etc.). However, the involvement of the private sector at the early stages of production could be beneficial to incentivise producers and to help them have access to useful market information.
6. **Invest in the infrastructure, technologies and mechanism to sustainably produce safe and diverse nutritious foods.** Cold chain management, storage and processing can improve the nutrient value and safety of food as well as reducing post-harvest loss. Both public and private investments are essential to provide the market infrastructure for year-round availability of these foods. Working collaboratively, government and private sector participants can take targeted actions to address specific nutrition objectives. Certain processing, storage and home food preparation activities can preserve or improve nutrient values. Energy or time saving devices can reduce the amount of time it takes to prepare more nutritious foods.

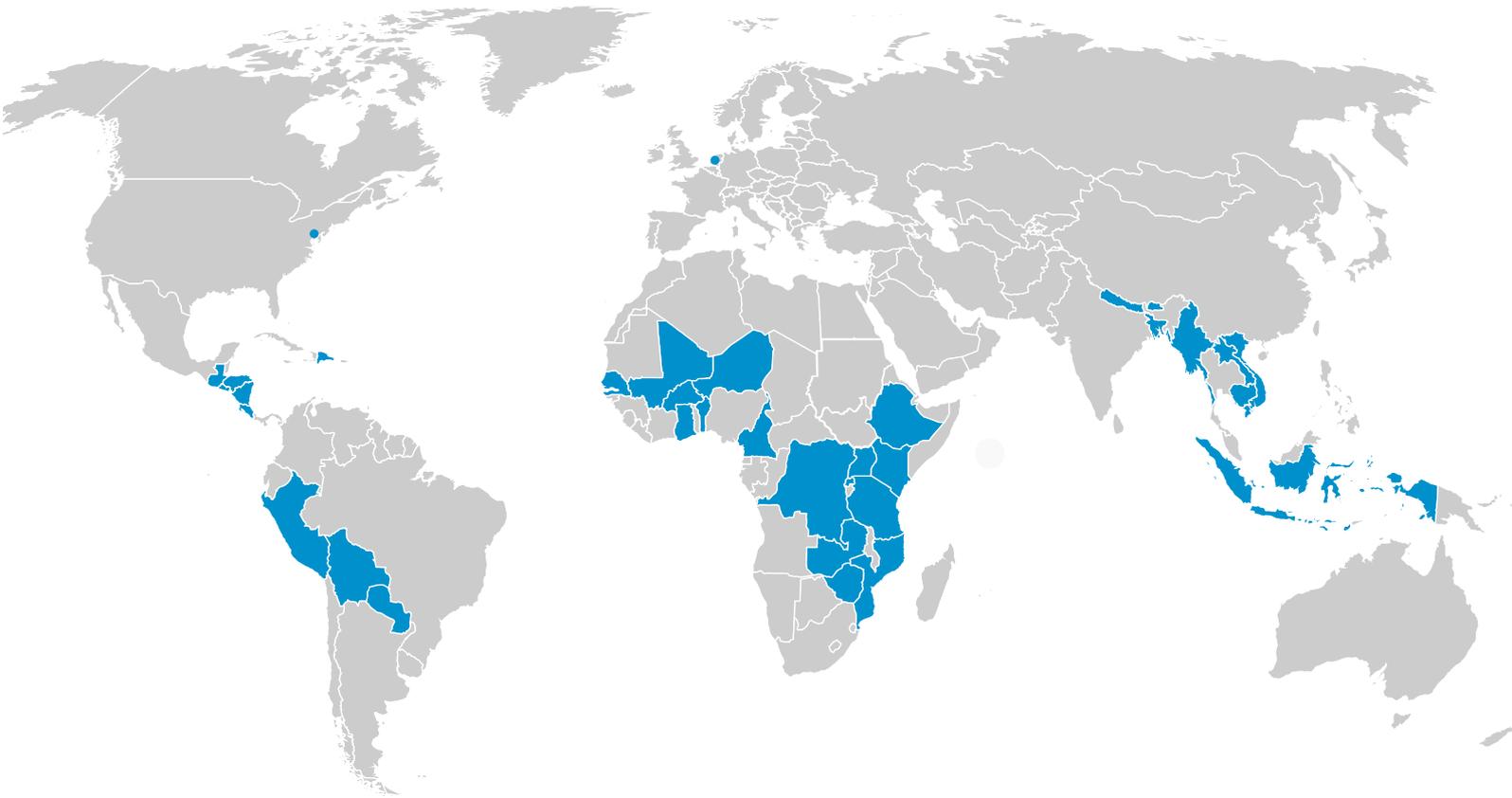
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Growing nutritious foods on a garden plot

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