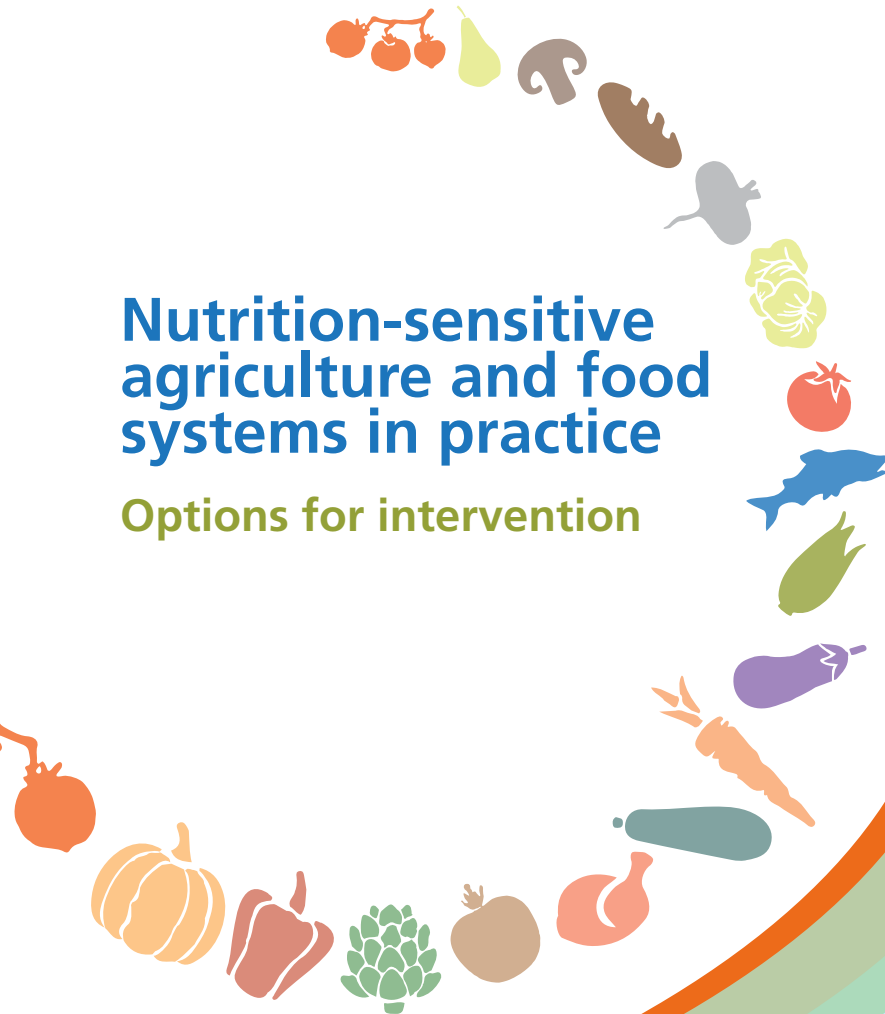




Food and Agriculture Organization  
of the United Nations

# Nutrition-sensitive agriculture and food systems in practice

Options for intervention



NUTRITION-SENSITIVE AGRICULTURE  
AND FOOD SYSTEMS IN PRACTICE  
Options for intervention

*Revised edition*

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS  
Rome, 2017

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## FOREWORD

The role of agriculture and food systems features as a central focus of the Rome Declaration on Nutrition signed during the Second International Conference on Nutrition and of the United Nations Decade of Action for Nutrition. Political commitment and efforts to make agriculture and food security policies and programmes “nutrition-sensitive” are growing and ministries of agriculture and rural development are increasing their contribution to multi-sectoral nutrition strategies. On their side, development partners are making nutrition-sensitive agriculture and food systems a central feature of their support to agricultural investments. A prominent challenge for transforming this commitment in action, however, is the lack of capacity for designing nutrition-sensitive food and agriculture policies and programmes, alongside the paucity of operational tools to assist professionals and policy makers to effectively integrate nutrition in their work.

*Nutrition-sensitive agriculture and food systems in practice. Options for intervention* addresses this need by providing a list of food system-based intervention options that have great potential to improve nutrition and a set of very concrete entry points for maximizing the impact of each of these interventions, including through the creation of an enabling environment. This tool is part of a broader package of guidance materials for programme planners and policy makers, the *FAO Toolkit for nutrition-sensitive agriculture and food systems*, which includes the *Key recommendations for improving nutrition through agriculture and food systems*, the *Designing nutrition-sensitive agriculture investments. Checklist and guidance for programme formulation* and the *Compendium of indicators for nutrition-sensitive agriculture*.

Developed through leveraging different expertise in FAO, *Nutrition-sensitive agriculture and food systems in practice. Options for intervention* is a key resource to assist professionals involved in different areas - from breeding to production; from food transformation and packaging to transportation and trade; from marketing and value chain to food safety; from food labelling to consumer education - to understand the linkages with nutrition.

Putting an end to malnutrition is possible, if nutrition is mainstreamed into relevant sectors. Agriculture and the food system have a crucial contribution to make. *Nutrition-sensitive agriculture and food systems in practice. Options for intervention* is a key resource for helping create nutrition-sensitive food systems, to achieve a world free from malnutrition in all its forms.



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# WHAT ARE NUTRITION-SENSITIVE AGRICULTURE AND FOOD SYSTEMS?

Nutrition-sensitive agriculture is an approach that seeks to ensure the production of a variety of affordable, nutritious, culturally appropriate and safe foods in adequate quantity and quality to meet the dietary requirements of populations in a sustainable manner. The recognition that addressing nutrition requires taking action at all stages of the food chain - from production, processing, retail to consumption – has led to a broader focus which encompasses the entire food system.

Making agriculture and food systems nutrition-sensitive necessitates taking action to address input quality, production, post-harvest handling, processing, retailing and consumption, in order to deliver safe and nutritious foods all year round to the consumer.

Nutrition-sensitive agriculture and food systems contribute to improving health outcomes, through for example, production of diverse, safe and nutrient-rich food, income generation that can facilitate access to health services, through reducing contamination of water sources, and through the application of labour-saving technologies.<sup>1</sup>

*“A food system gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socioeconomic and environmental outcomes.” (HLPE 2014, p29)*

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<sup>1</sup> FAO COMMITTEE ON AGRICULTURE, Twenty-fifth Session Rome, 26 - 30 September 2016 - Second International Conference on Nutrition (ICN2) Follow-up: Nutrition-related Implications for Agriculture and Livestock Development

# HOW DO YOU MAKE AGRICULTURE AND FOOD SYSTEMS NUTRITION-SENSITIVE?

While agriculture and food systems obviously play a key role in nutrition, experience shows that policies and programmes are more likely to have a positive impact on nutrition, and avoid negative impacts, if the following principles are applied:

1. Incorporate explicit **nutrition objectives and indicators** into their design, and track and mitigate potential harms.
2. **Assess the context** at the local level, to design appropriate activities to address the types and causes of malnutrition.
3. **Target the vulnerable and improve equity** through participation, access to resources and decent employment.
4. **Collaborate with other sectors** and programmes.
5. **Maintain or improve the natural resource base.**
6. **Empower women.**
7. Facilitate production **diversification**, and increase production of **nutrient-dense crops** and small-scale livestock.
8. **Improve processing, storage and preservation** to retain nutritional value and food safety, to reduce seasonality and post-harvest losses, and to make healthy foods convenient to prepare.
9. **Expand market access for vulnerable groups**, particularly for marketing nutritious foods.
10. Incorporate **nutrition promotion and education.**

Source: *Key Recommendations for Improving Nutrition through Agriculture and Food Systems* [www.fao.org/3/a-i4922e.pdf](http://www.fao.org/3/a-i4922e.pdf)



Effectively addressing the causes of malnutrition requires an integrated and coherent set of nutrition-sensitive interventions addressing all functions of the food system, combined with investments in other relevant sectors (e.g. water, sanitation, health, education and social protection).

See annex for details about the proposed four functions of the food system.

# WHAT INTERVENTIONS CAN WE IMPLEMENT TO MAKE AGRICULTURE AND FOOD SYSTEMS NUTRITION-SENSITIVE?

This document provides a list of interventions in food and agriculture that have potential to improve nutrition. The interventions are organized according to four key functions of the food system (often an intervention covers more than one function but it is classified according to the primary entry point) and as cross-cutting issues.

MAIN FUNCTIONS OF THE FOOD SYSTEM	INTERVENTIONS
Food production	Diversification and sustainable intensification of agricultural production
	Nutrition-sensitive livestock and fisheries
	Biodiversity for food and nutrition
	Biofortification
	Urban and peri-urban agriculture
Food handling, storage and processing	Nutrition-sensitive post-harvest handling, storage and processing
	Food fortification
Food trade and marketing	Trade for nutrition
	Food marketing and advertising practices
	Food price policies for promoting healthy diets
	Food labelling
Consumer demand, food preparation and preferences	Nutrition education and behaviour change communication
	Income generation for nutrition
	Nutrition-sensitive social protection
	School food and nutrition
	Nutrition-sensitive humanitarian food assistance
Cross-cutting issues	Nutrition-sensitive value chains
	Women's empowerment and gender equality
	Food loss and waste: prevention, reduction and management
	Food quality, safety and hygiene

For each intervention area, information is provided on:

- **WHAT** are we talking about? This section provides a definition of the intervention area.
- **WHY** does it have potential to improve nutrition?
- **HOW** do you make it more nutrition-sensitive?
- Which conditions are required to create an **ENABLING ENVIRONMENT** for this to work for nutrition?
- Key references to **KNOW MORE ON THE TOPIC**



# DIVERSIFICATION AND SUSTAINABLE INTENSIFICATION OF AGRICULTURAL PRODUCTION

## WHAT?

Diversification approaches aim to increase availability and affordability of diverse foods. Sustainable intensification refers to strategies aimed at simultaneously improving productivity and environmental sustainability, which can be achieved through increasing species diversity in cropping systems or ecosystem-based strategies. Principles of sustainable intensification and diversification can be applied at different scales, from the national and regional level to the farming system to the backyard garden.

## WHY?

The precondition for good nutrition is that a diversity of foods is available and affordable for all individuals at all times. However, the global food system is currently not meeting global requirements for the production of adequate amounts of nutritious foods necessary for healthy diets. At local level, excessive intensification (i.e. monoculture) risks simplifying diets and worsening nutrition in producer communities and threatens ecosystem resilience. Indeed, prevailing models of agriculture intensification do not ensure universal access to diverse diets and, in some cases, endanger the long-term sustainability of the agricultural resource base.

Diversification and sustainable intensification of food production have the potential to improve the availability, affordability, stability and consumption of diverse foods and to promote healthy, nutritional and sustainable diets for all, while simultaneously increasing climate resilience and enhancing the provision of ecosystem services. Diversification at farm level can offer a seasonal coping strategy in contexts where income streams and availability of nutritious foods vary within annual cropping cycles.

## HOW?

- Diversification on a large scale (e.g. implemented at regional or national level and/ or involving commercially oriented producers) can help enhance availability of diverse foods in markets and reduce prices of nutritious foods.
- Integrated farming systems (e.g. agrosilvipastoral systems, legume-based cropping systems including crop rotation and intercropping, rice-wheat farming systems) favour both diversification and sustainable intensification of production.
- Other ecosystem-based strategies for simultaneously achieving agricultural productivity and enhancement of the natural capital include conservation agriculture, integrated pest management, integrated plant nutrient management, water management and use of crops and varieties that are well adapted to local conditions.

- Strengthening the focus on the horticulture sector is crucial, given the importance of fresh fruits and vegetables for achieving healthy diets and preventing micronutrient deficiencies and diet-related non communicable diseases.
- Diversification strategies on a small scale (e.g. implemented at home or at smallholder level, predominantly for consumption purposes) can help increase direct access to micronutrients and proteins, which might otherwise be expensive or difficult to acquire, particularly for poor people living in remote communities.
- Home gardening with emphasis on nutrient-dense varieties of vegetables and fruit trees and small-scale integrated farming systems (e.g. mixed crop-livestock-aquaculture systems or VAC systems) have demonstrated potential to improve diet quality and raise levels of nutrition for producing households.
- Complementary activities such as beekeeping, mushroom and high-value crop farming, milk production, and maintaining fish ponds may also be included in these strategies to enhance income and livelihoods.
- In general, criteria for crop and varietal selection should go beyond solely a yield perspective and also consider nutrient content, so as to encourage production of species and varieties with high nutrient productivity.
- Market-based approaches, such as the multi-chain approach aiming to strengthen multiple value chains, can be used to stimulate production diversification.
- Diversification and sustainable intensification programmes are likely to have greater nutritional impact for producing households when carried out in a gender-sensitive way, with a view towards empowering women, and paired with nutrition education.
- Access to assets and inputs (e.g. land, water and seeds) and support for household food processing and preservation capacities are crucial requirements of these strategies.

## ENABLING ENVIRONMENT:

- Agricultural policies need to support the production of a diversity of nutrient-rich foods and to be congruent with national nutrition priorities and goals, including national food-based dietary guidelines.
- Research on improving productivity and quality of nutrient-rich commodities, as well as policies that facilitate access to inputs and support extension services for production of nutritious foods, are crucial to create an enabling environment for diversification and sustainable intensification.
- Incentives and regulations are needed to encourage initial adoption of sustainable practices (e.g. payments for environmental services, ecolabels and certification systems) and to ensure that environmentally sustainable practices are economically viable and can effectively compete with conventional farming.
- Potential negative impacts of agriculture intensification strategies (e.g. loss of dietary diversity) should be mitigated with market development to increase availability of other foods that are no longer produced on-farm or within the community, and thus maintain diversity of food supply.
- Adoption of sectoral and cross-sectoral frameworks and approaches – including for crops, livestock, forestry, fisheries and aquaculture – will facilitate transition to more sustainable and diverse production systems.

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# NUTRITION-SENSITIVE LIVESTOCK AND FISHERIES

## WHAT?

The livestock sector encompasses a large range of livelihoods (e.g. pastoralist; agro-pastoralist; urban farming) and activities ranging from extensive animal rearing (e.g. cattle rearing) to homestead animal rearing (e.g. poultry or goats rearing). The fishery sector refers to both wild capture and aquaculture, including intensive to non-fed extensive fish farming. These two sectors provide the largest contribution to production and consumption of nutrient-rich animal source foods (ASFs), including meat and organ meat, eggs, fish and dairy products such as milk, yoghurt and cheese.

## WHY?

The inclusion of ASF in the diet is an important food-based strategy for improving and safeguarding nutrition. In addition to being rich in protein and energy, animal source foods can be an excellent source of selected micronutrients (easily absorbable iron, zinc, calcium, vitamin A, vitamin B12 and various essential amino-acids). Fish products can also be good and natural sources of long chain omega-3 and iodine, both important for optimal brain development in children. Evidence exists on the links between intake of animal-source foods and improvements in cognitive and physical development. ASFs are particularly relevant in deprived areas and for vulnerable groups whose diet quality is suboptimal; however, care should be taken to avoid excessive consumption of animal source products (especially red and processed meat). A nutrition-sensitive approach to livestock and fishery development implies that consumption of ASFs is promoted in moderation and in accordance with food-based dietary guidelines, while possible health and environmental risks are taken into account.

## HOW?

- Livestock ownership (e.g. cattle, chicken and other poultry, small ruminants such as goats and sheeps) can contribute to dietary diversity and nutritional outcomes through home consumption and income generation, especially if accompanied with nutrition education aimed at promoting consumption of ASFs including for complementary feeding.
- Support to home-based animal husbandry is often implemented in the context of integrated farming systems (e.g. mixed crop-livestock-aquaculture systems or VAC systems) which have great potential to improve availability of and access to diverse and nutrient-rich foods.

- Milk and dairy production, is often used as a strategy to enhance income and livelihoods. Nutrition objectives can easily be integrated, for example by ensuring consumption by children or linking with school meal programs.
- Projects that promote sales of livestock and ASFs should ensure (as critical “do no harm” consideration) that sales do not translate in reduced home consumption especially for children, and that income is used for supporting nutrition.
- In many settings, animal rearing (such as dairy goat or poultry rearing) and cow milking are traditionally activities for women. Therefore, targeting women can help increase their control over the productive and economic resources and ultimately increase the likelihood of improved maternal, child and household nutrition.
- In semi-settled pastoral and agro-pastoral communities, restocking and destocking interventions in times of stress, and encouragement to leave some animals close to women and children when men migrate with the herds can optimize ASFs availability especially for consumption amongst children.
- In mixed crop-livestock settings, large animals are an essential input for crop agriculture, contributing to manure for crop fertilization, draft power for sowing, ploughing or harvest activities, as well as for transport of agricultural products to markets; this indirectly contributes to nutrition through reducing energy expenditure and freeing women time for other productive and caring activities.
- In some societies, ASFs are subject to taboos and cultural practices, especially targeting women and children, who may be excluded from their consumption. Nutrition education interventions should consider taboos, gender restrictions and intra-household allocation, and assess how best to address these issues.
- A nutrition-sensitive livestock-based intervention also include measures to prevent and reduce risks for human health associated with livestock rearing (e.g. food and water safety issues and environmental contamination, whereby animals are kept in the house premises, next to where children play or next to water sources; zoonoses).
- Fish products are the most traded food commodity from developing countries. Promoting sustainable fishing (e.g. practices that do not deplete valuable stocks, harm the marine environment, or damage rights of fishing communities) can therefore contribute to food security and nutrition not only as food, but also as an important income source.
- Promotion of home-based aquaculture, integrated multi-trophic aquaculture and/or aquaponics, agriculture-aquaculture farming systems such as fish production in rice fields are examples of fishery based interventions to enhance dietary diversity and nutrition. Attention should be paid to ensure fish ponds do not become malaria mosquito breeding sites.

- Additional entry points include promotion of small fish with high nutrient value that are consumed whole (with bones, heads and viscera), as well as nutrition-enhancing post-harvest handling and processing techniques (reducing post-harvest fish losses and discards, ensuring that the most micronutrient-dense parts of the fish are not removed during processing) and nutrition enhancing feeding practices (using feeds rich in omega 3 to increase the health benefits from consumption).

### ENABLING ENVIRONMENT:

- The potential of livestock and fishery sector to contribute to address malnutrition problems is high, but still undervalued. Building a body of evidence in nutrition-sensitive livestock and fishery, and developing capacity in integrated nutrition and livestock/fishery programming is necessary to foster a 'nutrition-sensitive' culture among experts of animal-based interventions and to ensure that these interventions are included in the portfolio of dietary diversification strategies supported by nutrition experts.
- The development of national food-based dietary guidelines is essential to advise on healthy consumption of animal source foods. If they integrate a sustainability dimension, food based dietary guidelines can also help reduce environmental impacts of dietary patterns and food systems activities.
- International guidelines and multistakeholder initiatives (e.g. GASF - Global Agenda for Sustainable Livestock; Livestock environmental assessment and performance partnership guidelines; Code of Conduct for Responsible Fisheries, Small scale fishery guidelines) can help inform the development of sustainable national livestock and fishery sector policies.

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# BIODIVERSITY FOR FOOD AND NUTRITION

## WHAT?

Biodiversity is defined as the variability among living organisms from all sources, including terrestrial, marine and other ecosystems and the ecological complexes of which they are part; it covers diversity within species, between species and of ecosystems. Interspecies biodiversity relates to diversity among crops and animal species; as it relates to nutrition, this biodiversity allows for eating many different foods, from different food groups (e.g. vegetables, legumes, fruits, grains, meat). Intraspecies biodiversity refers to a dimension below species level – i.e. varieties, cultivars and breeds, as well as wild, neglected and underutilized species.

## WHY?

Biodiversity can play a key role in ensuring dietary diversity and assuring nutrient adequacy. While the importance of eating different foods is generally recognized, less attention has been paid to differences in nutrient composition among various foods and among varieties/cultivars/breeds of the same food – which can differ dramatically. For example, some varieties of bananas can contain up to 1000 times more pro-vitamin A carotenoid than the most globally consumed variety. Therefore, the intake of one variety rather than another can mean the difference between micronutrient deficiency and micronutrient adequacy. Globally, there is a huge loss of biodiversity due to environmental destruction, industrialization of agriculture and the food system and urbanization. Decades of selecting and breeding for higher yields have resulted in a loss of species and an increase in water content, leading to a reduction of micronutrient content for many agricultural products. Globalization of diets and intensive production models have encouraged substitution of a great number of foods and locally adapted landraces and cultivars with a few highly productive and commercialized species. Protecting biodiversity and prioritizing foods of high nutrient value is key, not only to combat malnutrition but also to provide the necessary genetic resources to develop new nutrient-dense, pest-resistant or climate-smart varieties. Particular attention should be paid to indigenous peoples and their food systems, which tend to be neglected by agriculture development programmes and to be most impacted by adverse dietary changes and malnutrition in its various forms.

## HOW?

- Assessing biodiversity helps to identify available species and varieties that can address country-specific malnutrition issues in a cost-effective and locally acceptable way.

- Selection and production of species and varieties should be based not only on yields but also on nutrient content (concept of nutrient productivity), thereby enhancing the nutrient supply of agricultural products, especially for micronutrients.
- Collecting and analysing data on food composition, as well as data on yields, for different species and their varieties/cultivars and breeds (including for wild and underutilized foods) is essential to ensure that nutrient content becomes a priority criterion in cultivar promotion and research.
- Community-level initiatives for supporting the saving and exchange of seeds (e.g. community seed banks, village seed fairs, smallholder seed enterprises) and protecting ecosystems (e.g. community-based natural resource management, reforestation, promotion of micronutrient-rich forest foods) enhance availability of and access to genetic resources, strengthen local food systems and empower indigenous people.
- Use of market-based approaches, such as short supply chains and community-based agriculture, can increase incentives for – and thus stimulate production and consumption of – biodiverse nutritious foods.
- Existing material on biodiversity (e.g. *Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition; Food Composition Database for Biodiversity*) can be used to mainstream biodiversity into nutrition and agriculture, i.e. starting from the scientific basis going to advocacy and implementation suggestions, including identifying promising entry points, champions and potential barriers.
- Raising awareness of the general public and of different stakeholders on the importance of biodiverse foods for nutrition, as well as incorporating biodiversity in extension systems, are also key elements for enhancing nutrition-sensitive agriculture.
- Interventions should also aim to improve knowledge and appreciation of indigenous peoples' food systems and diets, taking note of their potential strength in terms of nutrition and environmental sustainability, understanding the drivers of disruption, and designing culturally appropriate approaches to conservation and use of indigenous genetic resources and food systems.

### **ENABLING ENVIRONMENT:**

- In a context where most subsidies, investments and research programmes are concentrated on major staple grains and selected animal species, policy support for other foods (including fruits, vegetables, pulses and underutilized species) is key to realize the full potential of nutrition-sensitive agriculture and biodiversity to improve nutrition and health.
- Biodiversity should be mainstreamed into all relevant policies, programmes and national and regional plans of action addressing malnutrition in all its forms.

- Regulatory mechanisms for protection of biodiversity in highly competitive markets should be developed, as elements of broader policies for tackling ecosystem degradation.
- Seed sector policy frameworks that support indigenous varieties and mainstream their production into national breeding programmes will help to enhance genetic diversity.
- Protecting indigenous peoples' food practices, culture and food systems requires, at a deeper level, recognizing their rights, including the right to adequate food, land rights, and the right to breed and exchange their traditional seeds.

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# BIOFORTIFICATION

## WHAT?

Biofortification consists in developing new varieties of staple crops (i.e. cassava, maize, orange-fleshed sweet potatoes, irish potatoes, wheat, rice, pearl millet, sorghum, banana, plantain, squash, beans, lentils and cowpeas) with the explicit intent of enhancing levels of bioavailable micronutrients (i.e. pro-vitamin A, iron and zinc). While biofortification is most commonly accomplished using conventional plant breeding, agronomic biofortification (i.e. application of micronutrient-rich fertilizers via soil or leaves) and transgenic techniques are also used.

## WHY?

Micronutrient deficiency is a very widespread form of malnutrition, caused by inadequate intake of fruits, vegetables, animal-source products and other micronutrient-rich foods. These foods are often prohibitively priced and out of the reach of many of the world's poor, whose diets tend to rely heavily on cereals and other relatively inexpensive, carbohydrate-dense staple crops. While it is important to continue efforts to increase dietary diversity and quality as a long-term solution to all forms of malnutrition, consumption of biofortified crops allows many people to increase dietary micronutrient adequacy simply by substituting a micronutrient-poor staple with its micronutrient-rich counterpart. A growing body of evidence demonstrates the efficacy and cost-effectiveness of this strategy.

## HOW?

- The main target group of biofortification programmes is subsistence and semi-subsistence farmers who grow crops for their own consumption.
- Biofortification is a complex process involving multiple stages:
  - *Discovery* – includes identifying target populations, setting and validating nutritional breeding targets, identifying appropriate candidate crops, screening crop genes.
  - *Development* – includes breeding new locally adapted varieties that have higher amounts of bioavailable micronutrients than conventional varieties and agronomic traits which match or exceed conventional varieties.
  - *Delivery* – includes the registration of new varieties and release to seed companies or directly to producers. It often includes leveraging the informal seed sector, as a vast majority of poor farmers acquire inputs through these systems.

- To achieve impact beyond the farm gate, biofortification programmes typically include additional activities such as technical assistance in post-harvest storage and handling, creation of market linkages, and support to value addition and demand creation. These post-farm gate activities require building a strong network of stakeholders all along the value chain, from research institutes and breeders to processors, retailers and consumers.
- The objective of biofortification is not to promote increased consumption of staples but rather to substitute consumption of nutrient-poor varieties with nutrient-rich ones. Hence, biofortification is best promoted as part of a broader portfolio of sustainable, food-based approaches to nutrition. For example:
  - Biofortification promoted in tandem with production diversification maximizes synergies between these two complementary strategies and increases nutrition impact.
  - Biofortification implemented in tandem with conservation policies that provide explicit support to biodiversity can mitigate the inherent risks of genetic erosion due to selective breeding focused on a few varieties and crops.

#### **ENABLING ENVIRONMENT:**

- Prior to actual planning, a robust rationale for biofortification programming must be developed, based on market assessment, solicitation of government endorsement, assessment of food consumption patterns, production system analysis and assessment of the micronutrient status of the target population.
- Recognition of the nutrition-promoting role played by biofortification in national policies is necessary for ensuring sustainability of programmes over time.
- Public sector investment to strengthen national agriculture research and extension systems and seed producers is crucial to ensure continuous production of high quality, nutritious seeds.
- Investing in impact research to evaluate the impact of biofortification on the micronutrient status of target groups and on other key variables (e.g. farmer adoption rates, consumer acceptance, cropping and seed systems) is important to maintain sustained public and private sector investment and support.
- Regulatory and legal frameworks which provide harmonized standards for claims regarding quality, nutrient levels, health benefits and biosafety of biofortified crops need to be developed at international and national levels.

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# URBAN AND PERI-URBAN AGRICULTURE

## WHAT?

Urban and peri-urban agriculture is defined as the growing of plants and the raising of animals within and around cities. It includes crop production, small animal rearing, growing of non-food crops (e.g. medicinal herbs) and trees managed for producing fruits and fuelwood, including within integrated systems (e.g. agroforestry, tree-aquaculture systems).

## WHY?

Fresh and nutritious foods in urban markets may be expensive or hard to find, especially for the urban poor, and they must compete with aggressively marketed, abundant and cheap energy-dense foods which are high in sugars, saturated fats and salts, including ultra-processed foods. In such contexts of nutrition transition, urban and peri-urban agriculture offers an opportunity to increase the availability of fresh and nutritious foods in proximity markets, and access to a diversified and nutritious diet for urban residents. This intervention supports prevention of both undernutrition and micronutrient deficiencies, as well as of overweight, obesity and non-communicable diseases. It can also be a good income-generating activity for poor urban households.

## HOW?

- In urban and peri-urban agriculture, food is grown within and around cities in a range of formats, from backyard gardening to collective farming activities on community lands, as well as commercial farming.
- Urban and peri-urban agriculture can be integrated into the urban economy and embedded in the urban ecosystem, making use of available resources such as vacant and unused lands for urban farms, organic waste for compost and urban wastewater for irrigation, in accordance with Good Agricultural Practice and with a view to ensuring food safety.
- In urban quarters, provision of assets such as small livestock and inputs (e.g. seeds), as well as technical support for microgardens and rooftop gardens, grey-water recycling systems, and other space and resource-saving techniques can be used to promote diverse urban food production and consumption.
- These interventions should be paired with nutrition education to enhance nutrition outcomes.
- Commercial viability of urban and peri-urban agriculture can be increased by building capacities of producers and their organizations, and ensuring enterprise development through access to finance and markets.

- Supporting direct sales (producer-to-consumer agreements, farmers' markets, community-supported agriculture, etc.) and short value chains benefits consumers' nutrition by allowing access to fresher foods at more affordable prices, while producers enjoy a fairer remuneration.
- Nutrition impact can be increased by targeting and engaging with the most vulnerable urban residents, and with women in particular.

### ENABLING ENVIRONMENT:

- Policies in support of urban and peri-urban agriculture recognize urban food production as a legitimate economic activity, enhance access to vacant lands (with clean soil and water) and integrate urban agriculture in land-use planning.
- Local institutions play a critical role in supporting and scaling up innovative forms of production and marketing in urban areas – for example, by facilitating access to finance for urban producers and enterprises, ensuring preferential local procurement and facilitating establishment of farmers' markets.
- Civil society organizations also play a key role in mobilizing and organizing both farmers and consumers.

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- FAO. Greener Cities: [www.fao.org/ag/agp/greenercities/](http://www.fao.org/ag/agp/greenercities/)
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# NUTRITION-SENSITIVE POST-HARVEST HANDLING, STORAGE AND PROCESSING

## WHAT?

Post-harvest handling includes all the steps that a harvested crop has to go through to get from the producer to the market – i.e. handling and treatment of the harvested produce, bulk packaging, transportation, storage, distribution and marketing. Storage is the phase of the post-harvest system during which agricultural products are kept in such a way as to maintain their quality and prevent them from deterioration for a specific period beyond their normal shelf-life. The processing phase includes both primary and secondary processing. Primary processing is used to prepare food for consumption or for further processing; it includes basic cleaning, peeling, slicing, dicing, drying, milling and packaging. Food preservation involves treating and handling food in such a way as to stop or greatly slow down spoilage to prevent food-borne illness and extend shelf-life; it includes refrigeration, freezing, fermentation, pickling, canning and pasteurization. Secondary processing is the process whereby fresh foods or the products of primary processing are converted into other food products, often in a way that substantially alters their physical form. Methods include, for example, juicing, dicing, canning, cooking and drying. According to the extent of processing being used, foods can be distinguished as unprocessed, minimally processed, processed or ultra-processed.

## WHY?

A balanced diet is needed throughout the year to maintain good health and nutrition. Post-harvest handling, processing and storage contribute to: maintaining a secure supply of food (and thus of nutrients) throughout the year; preserving the quality of harvested raw material as it moves along the food supply chain from the producer to the market; reducing losses; and making fresh produce available in local markets as well as in distant locations. Food storage helps to maintain food quality over an extended period until its final use, permits its deferred use (on an annual or multiannual basis), guarantees the regular and continuous supply of raw materials for processing and helps to balance the supply and demand of agricultural products, thereby stabilizing market prices. At the household level, storage contributes to food security and nutrition by offsetting seasonal scarcity. Although crops have the highest nutritional value when consumed in the fresh state, food processing contributes to nutrition by extending the shelf-life of raw materials and by enhancing the safety and retaining the nutritive value of many foods. Furthermore, it enhances the palatability of food and saves time for cooking and food preparation at the household level. Nevertheless, the rise and prominence on markets of industrially prepared ultra-processed foods and beverages, which tend to have unbalanced formulations (i.e. dense in energy, low in micronutrients and high in fats, sugars and salt) is a challenge. Excessive consumption of these products is a key factor behind rising levels of overweight, obesity and non-communicable diseases.



## HOW?

- Crops must be harvested at an appropriate stage of maturity if their quality is to be maintained throughout their post-harvest life. Good post-harvest handling, supported by appropriate transport and logistical operations, including efficient cold chain infrastructure, is critical to maintaining the quality of food as it moves from the producer to the fresh produce market. Good quality raw material is also an important input for primary and secondary processing operations.
- Strengthening the capacity of smallholders and small entrepreneurs, in particular women, to store, preserve, process and package foods can help secure a year-round food supply that can improve nutrition and income generation. This can be done through – for example – trainings on techniques to optimize the shelf-life and nutritional quality of foods. In addition to training, provision and maintenance of necessary equipment for storage (e.g. small silos), processing and packaging as well as sustainable supply of inputs, are key.
- The choice of processing technique should take into consideration its impact on the content and bioavailability of nutrients. For example, germination and malting of grains and pulses can enhance their vitamin, mineral and protein content and bioavailability. On the contrary, techniques that include prolonged exposure to heat or sun significantly reduce vitamin content.
- Food value addition is often promoted as an income generation activity. Examples of entry points to enhance the nutrition sensitivity, in addition to the choice of processing techniques, include: targeting nutrient-rich foods (e.g. village-based milk processing enterprises), prioritizing vulnerable populations (e.g. women), and integrating nutrition education components to ensure that additional incomes is used to support nutrition. It is also important to assess the potential market and economic sustainability.
- Working with the food industry to improve or reformulate food composition of processed foods to reduce or eliminate the use of ingredients such as salt, trans fats, sugar and additives, is imperative.
- Package size matters to nutrition:
  - Use of small packaging and even single servings for nutritious products can help to reach the poor, who tend to purchase little quantities on a daily basis.
  - Given that packaging represents a large share of the cost of processed products, selling in bulk form, whereby clients bring their own containers, can make healthy processed foods more affordable. This should be coupled with appropriate food safety measures, including at point of purchase and household level.
  - On the other side of the spectrum, reducing portion size and calories per serving can be a mean of addressing overweight.

## ENABLING ENVIRONMENT

- A good infrastructural support base, including efficient cold chain infrastructure, is required to facilitate and support post-harvest handling operations.
- Different kinds of instruments can be used to promote nutrition-sensitive food reformulation at manufacturer levels, including:
  - incentives (e.g. funding allocated to schools that choose processed products free of added sugar, fats and salt, as “healthy snacks”);
  - voluntary and co-regulatory schemes (e.g. salt reduction initiatives) entailing agreements between governmental bodies and the private sector, including manufacturers and retailers, with the oversight of public health experts from research institutes and hospitals;
  - mandatory approaches (e.g. mandatory labels indicating high salt content, mandatory limits on levels of salt, bans on trans fats in food products).

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# FOOD FORTIFICATION

## WHAT?

Food fortification is defined by FAO and the World Health Organization (WHO) as the *“practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health”*. The process of food fortification directly enhances the nutrient composition of different foods through adding, for example, vitamins, iron, zinc, folic acid or iodine. This can be done during the processing phase or at the point of use (e.g. household level).

## WHY?

Micronutrient deficiency is a very widespread form of malnutrition, due to inadequate intakes of fruits, vegetables, animal-source products and other micronutrient-rich foods. While it is important to continue efforts to increase dietary diversity and quality as a long-term solution to all forms of malnutrition, food fortification policies can help to tackle micronutrient deficiencies through increasing the micronutrient content of staples and condiments consumed by large segments of the population and/or by vulnerable groups, such as children.

## HOW?

- There are four main types of food fortification:
  - mass or universal fortification of basic staples or condiments (e.g. folic acid-fortified wheat flours, vitamin A-fortified cooking oil, iodized salt);
  - community fortification of locally available staples (e.g. small-scale grain fortification, using village mills);
  - point-of-use fortification (e.g. sprinkles, micronutrient powders);
  - production of fortified food products (e.g. complementary foods for children 6-23 months, snacks).
- Fortification programmes can be mandatory and implemented on national scale via mass fortification (which is the preferred approach when the majority of the population is at risk of micronutrient deficiency) or voluntary, whereby the decision to fortify is taken by food manufacturers within the regulatory limits set by the government (e.g. fortification of porridge and other complementary foods for infant feeding).
- Fortification can also target specific vulnerable groups (e.g. provision of fortified school meals, emergency food distributions, or social protection programmes).

- Mass fortification is likely to be easier to implement and to have bigger impact in urban areas, where physical and economic access to manufactured products is higher; thus, it should be implemented within a broader food-based strategy, alongside “rural-based” interventions such as diversification, biodiversity-based strategies and biofortification.
- Community-based fortification can help to increase availability and affordability of fortified staples for rural dwellers; other strategies include, among others, micro-franchises and linkages between manufacturers of fortified foods and traditional retailers/street vendors, as well as doorstep distribution and partnerships with non-profit organizations.
- Consumer demand for fortified products can be stimulated through social marketing and information campaigns, closely linked with nutrition education programmes.
- Specialized nutritional products are specifically used to prevent and treat malnutrition, notably in response to humanitarian situations. This includes, for example: supplements for young children (e.g. Ready-to-Use Foods, Lipid-based Nutrient Supplements) in order to prevent or treat moderate acute malnutrition and to prevent micronutrient deficiencies and stunting; fortified blended foods; and micronutrient powders for home fortification of foods.

#### **ENABLING ENVIRONMENT:**

- Large-scale micronutrient fortification is an approach that requires well-developed industrial processing and distribution networks.
- Legal frameworks are needed to set mandatory fortification and appropriate technical standards (on the basis of WHO guidelines), as well as mechanisms for monitoring and controlling quality of fortified products and truthfulness of nutrition claims.
- It is important to develop programmes to facilitate business compliance, including mechanisms to facilitate access to required vitamin and mineral premixes for manufacturers.
- In the context of voluntary fortification, partnership approaches can be a way to reduce the costs of fortification and incentivize private sector investments – with a particular emphasis on small and medium enterprises, which face greater market challenges and business risks.
- National legal frameworks, based on relevant international (e.g. WHO) standards, should prevent inappropriate promotion of fortified food for infants and children and ensure that it does not undermine support to optimal breastfeeding practices and use of locally available and affordable nutritious foods for complementary feeding.
- Impact evaluations, as well as cost-benefit analyses, should also be conducted in order to choose the best approach for food fortification.

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## TRADE FOR NUTRITION

### WHAT?

Trade is the connection between demand and supply. Food trade at multiple levels – domestic, regional and international – facilitates the availability of food and can broaden choice for consumers. Trade policy instruments and trade agreements that are relevant for nutrition include, among others: export subsidies and domestic support provisions; export restrictions; tariff and non-tariff barriers, including sanitary and phytosanitary measures and standards; and food labelling regulations (so-called “technical barriers to trade”).

Trade for nutrition refers to actions taken by countries to *“improve the availability and access of the food supply through appropriate trade agreements and policies and endeavor to ensure that such agreements and policies do not have a negative impact on the right to adequate food in other countries”* (ICN2 Framework for Action, Recommendation 18).

### WHY?

Trade plays a critical role in achieving food security and nutritional targets. Trade helps balance food deficits and surpluses across countries, facilitating the availability of food and contributing to price stability. By integrating national and international food markets, trade can help absorb domestic supply and demand shocks that could otherwise result in excess domestic food price volatility. Covering local shortfalls and smoothing out price swings are especially important in view of the challenges posed by climate change. Trade and trade policies can promote better nutrition, but can also have negative nutritional outcomes. For example, freer trade broadens food choice, thus promoting a more diversified diet but, at the same time, it is associated with increased availability of cheaper foods characterized by high calorie and low nutritional content, which can lead to an increased incidence of obesity and other diet-related chronic diseases. The links between trade policies and actions designed to address malnutrition are complex and generate considerable controversy. In a context of globalization, urbanization and increased market reliance, looking at trade through a nutrition lens is increasingly important for maximizing benefits and reducing risks.



## HOW?

- Lowering trade barriers for fruits and vegetables has great potential to improve nutrition through increasing their availability in importing countries, especially in counter-seasonal periods.
- Increased import tariffs and import bans on some “unhealthy” foods have been used in some Pacific Islands in response to the obesity epidemic, along with lowered tariffs on specified “healthy foods”.
- The implementation of complementary policies as part of the package of trade reforms is generally required to ensure that the benefits of trade policies are transferred to the people who most need them and to mitigate the risks. For example:
  - Complementary policies to enhance the purchasing power of low-income groups and infrastructural investments to reach underserved areas can ensure that imported fruits and vegetables are also consumed by those most in need. Indeed, infrastructural investments such as road construction and electrification are crucial to facilitate food transportation, including of more perishable but often nutrient-rich items. In addition, pairing efforts with nutrition education and behaviour change communication will help shape and sustain demand for more nutritious foods, while incentivizing their production in rural areas.
  - Complementary policies to increase retail prices through taxes on ultra-processed foods, restrict inappropriate marketing for such foods, ensure clear labelling and educate consumers on healthy food choices can help to avoid drastic changes to traditional diets that would lead to inferior nutritional outcomes.
- Restrictive trade regimes can have counterproductive effects on food and nutrition security within and beyond the national boundaries (e.g. export restrictions in response to food price shocks can exacerbate food price volatility).
- Domestic trade, rural-urban linkages, short food supply chains where feasible, and city-region food systems should be promoted as a way to simultaneously increase access to fresh foods for consumers and to remunerative markets for producers.
- Trade liberalization policies often target urban populations who need low-priced food; however, lower prices and increased competitive pressures can threaten smallholders’ livelihoods and thus their food security and nutrition. Measures might be needed to prevent, mitigate and cope with this risk, such as nutrition-sensitive social protection measures.

## ENABLING ENVIRONMENT:

- Adoption of harmonized standards (e.g. sanitary and phytosanitary, as well as food labelling standards based on the Codex Alimentarius) is an option for facilitating trade while ensuring food safety and protecting consumer health. However, consideration should be given to small farmers and small-scale food processors (especially in the informal sector), who might not be able to comply with such standards, in order to avoid their exclusion from the market.
- The preconditions to motivate and enable coherence between trade policy and nutrition action are:
  - Improved capacity to analyse the coherence between trade policy and nutrition action and to understand the opportunities and risks presented by trade policy for nutrition action (and by nutrition action for trade policies). This includes the capacity to anticipate impacts of trade liberalization, analyse the distribution of costs and benefits and identify suitable complementary policies.
  - Stronger institutional capacities and governance mechanisms to enable not only joint analysis but also greater coordination in the implementation of complementary policies. Trade, agriculture and nutrition/health officials in countries need capacity to negotiate across governments to implement those policies and to expand the policy space for nutrition action in trade agreements.

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# FOOD MARKETING AND ADVERTISING PRACTICES

## WHAT?

Food marketing refers to all activities, actors, infrastructures and regulations around the physical sale of food – e.g. wholesaling, retailing, catering – and its promotion – e.g. discounts, display of products, branding and packaging, advertisement and use of media.

## WHY?

In a context of urbanization, rise of the middle class and increased industrialization and globalization of the food system, the way that food is sold to consumers is changing. Supermarkets and fast food restaurants, for example, are rapidly spreading in developing countries and particularly in urban areas. These modern market outlets do not substitute for, but rather coexist, compete and sometimes cooperate with, traditional retailers and caterers (e.g. “mom and pop stores”, street food vendors, “wet markets”). Transformations in the retail environment are accompanied by increased use of food advertising and promotional strategies to encourage consumers to buy more industrialized food products, including ultra-processed foods that are high in sugars, fats and salt. This results in increased exposure to obesogenic diets. Understanding the impact of marketing and advertising on consumer preferences, eating habits, diets and nutrition is crucial to design policies and strategies for shaping healthy food environments and leveraging both traditional and modern retail sectors to facilitate consumption of healthy diets.

## HOW?

- Strategies to improve the retail environment need to acknowledge that supermarkets play a growing role and that they have a potential to affect nutrition both positively (via increased availability, accessibility and affordability of diverse and fresh foods) and negatively (by encouraging consumption of energy-dense, nutrient-poor, highly processed foods).
- Likewise, they need to acknowledge that small retailers, petty traders, street food vendors and informal sellers remain the main suppliers of nutrient-dense foods, yet suffer multiple challenges, especially in ensuring food quality and safety.

- A combination of incentives and regulations can be used to improve the nutrient value of products sold by retailers and caterers. For example:
  - sensitizing retailers that good nutritional value is a key marketing argument, supporting them to improve display and promotion of nutritious foods and meals and leveraging social marketing techniques to generate consumer demand for nutritious foods;
  - using economic incentives to increase availability of retailers and fresh food providers in “food deserts” (e.g. underserved neighbourhoods). This can be crucial to improve diets for the most marginalized populations and reduce the prevalence of obesity and micronutrient deficiencies;
  - establishing subsidy schemes for healthy foods, which can encourage street food vendors and other caterers to reformulate their recipes and use healthy ingredients (especially if trained to do so – for example, through training in food preparation);
  - leveraging traditional retailers to increase access to healthy foods, including fresh foods and long shelf-life products (which can help offset seasonal scarcities), fortified foods and specialized nutritional products in rural areas and among lower income groups. This means to use business strategies that purposely target the poor (also known as Bottom of the Pyramid – or BoP – models) in a more nutrition-smart way;
  - restricting the advertising and promotion of foods and beverages that are high in fats, salt and sugars to children and adolescents, which can help to limit their exposure to, and curb the power of, marketing. This might also include restrictions on the location of some food outlets (e.g. prohibiting fast foods in and around schools and playgrounds) and regulations on specific marketing techniques (e.g. restricting advertising of unhealthy foods during TV programmes targeted to children);
  - establishing nutrition standards for public procurement and catering services to ensure that food and menus supplied in schools, hospitals and public sector bodies are healthy and nutritionally balanced. This can also create incentives for farmers and the manufacturing sector to invest in nutritious foods.

### ENABLING ENVIRONMENT:

- Investing in urban planning, as well as water, sanitation, sewage, waste removal and other services and infrastructure to tackle the state of physical deterioration of wholesale and retail markets is a key element of the enabling environment for the sale of safe food.
- Enabling farmers' markets, small shops and traditional retailers and caterers to survive and compete on a level playing field with large players helps to create a more balanced retail environment where the healthy choice becomes the easy choice (e.g. purchasing the right quantity of foods, choosing fresh over ultra-processed items).
- International standards, such as the Set of Recommendations on the Marketing of Foods and Non-alcoholic Beverages to Children and the International Code of Marketing of Breastmilk Substitutes, can provide guidance to develop policy recommendations at national level.

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# FOOD PRICE POLICIES FOR PROMOTING HEALTHY DIETS

## WHAT?

Food price policies refer to fiscal measures (e.g. taxes, subsidies and price ceilings) designed to influence the level and the stability of prices for certain food items. Fiscal measures to promote healthy eating refer to taxes or subsidies designed to change the relative prices of healthy and unhealthy foods or nutrients.

## WHY?

Healthy diets are often less affordable than unhealthy diets, and high prices for nutritious foods (e.g. fruits, vegetables and animal-source foods) are one of the main barriers that prevent vulnerable populations from adopting healthy food choices. Food price policies thus have the potential to create incentives for increasing the supply and demand for nutritious food products. Countries have traditionally used subsidies, imports and price ceilings to keep staple foods - such as bread and rice – affordable; however, research shows that untargeted subsidies on staple foods are expensive to maintain and risk increasing overweight and obesity. More recently, such policies are starting to be designed to encourage consumption of healthy and nutritious foods and discourage consumption of certain highly processed, sugar-rich products.

## HOW?

- Subsidies for selected nutritious foods can increase affordability of healthy diets and/or incentivize purchase. These subsidies might be at various levels:
  - production (e.g. agricultural subsidies);
  - retail (e.g. subsidies to facilitate establishment of markets for fresh foods, supermarkets and shops in poor and underserved neighbourhoods);
  - catering (e.g. for lowering the cost of healthy meals at the workplace);
  - consumption (e.g. vouchers for fresh foods).
- Pairing subsidies with well-designed and well-targeted consumer information campaigns, which stimulate demand for nutritious foods, increases the likelihood of success of such strategies.
- Taxes on ultra-processed foods (e.g. sugar-sweetened drinks) can also be used to increase prices and restrict consumption.
- Great attention should be paid to potential unintended effects of price interventions designed to encourage healthy diets (e.g. increase in price of one unhealthy food resulting in substitution with an even unhealthier food).



- In particular, countries affected by the double burden of malnutrition should carefully select the right types of price interventions, considering that a given change in prices can positively impact some forms of malnutrition or population groups (e.g. reduction of undernutrition) and be harmful to others (e.g. increase in overweight and obesity).
- Countries with high levels of obesity should consider the impact of subsidies for commodities that are used in large quantities by the food processing industry (e.g. oil crops, sugar cane, corn).

### **ENABLING ENVIRONMENT:**

- The high level of consolidation in the food system results in a few food companies acting as gatekeepers between producers and consumers and exercising significant control over market prices. Adoption and enforcement of competition policies in the food sector, which is often prone to collusion and other forms of anti-competitive practices, are fundamental to ensure fair prices for both producers and consumers.
- Single and short-term price changes focusing on one or few foodstuffs might have limited effects on a population's diet. Achieving long-term impact requires a coherent package of policies and investments, including: agriculture policies; subsidies; taxation laws; investments in infrastructures for healthy foods; financial incentives and disincentives to business, including for food loss and waste prevention and reduction; education campaigns aimed at the population; and other measures.

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## FOOD LABELLING

### WHAT?

A food label is the information found on the food product that is seen by the consumer. The internationally accepted definition of a food label is any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on, or attached to, a container of food. Food labelling includes any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for the purpose of promoting its sale or disposal (Codex Alimentarius Food Labelling, 2007).

### WHY?

Prepackaged foods represent a growing part of many people's diets, especially in urban settings. Nowadays, most packaged foods, from minimally processed to ultra-processed foods, carry some sort of label. Food labelling influences food choices by informing consumers on ingredients, health, safety, nutrition claims and nutrient content of a given item. Increasingly, labels inform consumers about foods with healthier nutrition profiles and can also motivate manufacturers to produce foods with healthier nutrition profiles.

### HOW?

- Mandatory minimum requirements for food labelling are important to protect the consumer and contribute to safe, nutritionally balanced diets. Nutrition-related mandatory requirements typically include the ingredient list and the nutrition facts declaration (e.g. energy value, proteins, total fats, saturated fats, sugar) expressed as a percentage of reference values based on scientific data regarding nutrient requirements and dietary risks.
- Regarding voluntary labelling – whereby manufacturers provide additional information on “superior attributes” of their product, including health and nutrition claims (e.g. “low in” or “free from”) – the government should provide guidance to prevent inappropriate labels.
- Nutrition labels should be designed to enable consumers to follow recommended daily nutrient intakes and limit intake of ingredients associated with dietary risks (e.g. obesity, non-communicable diseases). Information provided on food labels should be accurate yet simple and easy to understand for consumers, including those with low literacy.

- Research has shown there are limitations on how consumers perceive and use nutrition labels and has assessed consumer preferences for different nutrition labelling schemes. Appropriate use of labels requires that nutrition education and behaviour change communication campaigns and strategies be provided to the public on an ongoing basis.
- Food advertising and marketing are closely related to labelling, as they can affect consumers' interpretations of the label, either reinforcing or detracting from the label message.

### **ENABLING ENVIRONMENT:**

- Policies regulating nutrition labelling and claims, if carefully designed, can have positive impacts on nutrition by promoting foods with healthy profiles attractive for consumers. Nutrition labelling policies should take into account consumer use, interpretation and understanding of different nutrition labelling schemes.
- To ensure that food labelling is effective and complies with national regulations, enforcement is necessary within the country and at the borders where food enters or leaves the country.
- National regulatory frameworks for food labelling should be in alignment with international standards (e.g. Codex Alimentarius, International Code of Marketing of Breastmilk Substitutes) and tailored to the specific nutritional problems of the country.

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# NUTRITION EDUCATION AND BEHAVIOUR CHANGE COMMUNICATION

## WHAT?

Nutrition education consists of a variety of educational strategies aimed at helping people to achieve long-lasting improvements in their diets and eating behaviours. Nutrition education is not only about giving people information; it includes empowering people to take charge of their own diets and health, understanding people's needs and what influences their diets, carrying out realistic and participatory educational activities and aiming at small, appealing, achievable improvements in what people perceive and do.

## WHY?

Increasingly recognized as an essential catalyst for the success of food security and nutrition interventions, effective nutrition education ensures that increased food production/income translates into improved diets and improved nutrition status. Many causes of poor nutrition are rooted in attitudes and practices that can be influenced by education: food taboos, long-established dietary and snacking habits, agricultural production decisions, food distribution in the family, ideas about child feeding, misleading food advertising, ignorance of food hygiene or negative attitudes towards fruit and vegetables. Nutrition education is also becoming critically necessary in countries experiencing a dangerous dietary transition to cheap processed foods rich in sugar, fat and salt.

## HOW?

- Nutrition education and behaviour change communication to consumers can be delivered through multiple venues and activities, and may include health and nutrition counselling during pregnancy, education on breastfeeding or improved complementary feeding of children under two years of age, nutrition education in schools and hands-on learning to enable families to practise good nutrition behaviours.
- Food preparation, cooking and intra-household distribution are crucial to determine the healthiness of diets in all their aspects, including safety, frequency, variety, balance and proportion. These issues can be addressed by behaviourally-focused food and nutrition education, which go beyond simple knowledge to motivate and help people develop the confidence and skills they need to feed themselves and their families well.

- For example, nutrition education can provide actionable knowledge on cooking methods that preserve nutrient value, and empower the caregiver (e.g. through cooking demonstration) to prepare nutritious meals for the whole family with special focus on small children, while addressing food related taboos and beliefs that affect food choices and distribution in the household (e.g. household member hierarchies in food distribution).
- Nutrition education activities should target, and be adapted to, both men and women, in order to ensure that their respective roles and responsibilities in household nutrition are recognized and harnessed. Grandmothers, who frequently play a role in making nutrition decisions in the household, should also be targeted.
- Nutrition education can be delivered in schools, together with promotion of diversified school meals, as part of a whole school food and nutrition approach. Classroom learning should be linked with practical activities and reinforced by a nutrition- and health-friendly school environment. Ensuring active participation of all school personnel, families and the community is also important.
- Nutrition education and information campaigns for the general public, such as the five-a-day campaign for increasing daily consumption of fruits and vegetables, are useful to raise awareness about nutritious food choices and healthy diets. Campaigns can be via traditional or new media.
- Incorporating nutrition education into agriculture projects is likely to improve consumption and related nutrition impacts in the producing household. It can also incentivize households to diversify their production and retain more food for their own consumption.
- Agriculture and health extension workers can play an important role in facilitating community health and nutrition sessions.
- Nutrition education is also important as part of all food system programmes, including food storage, processing and fortification programmes, micronutrient supplementation programmes and social protection programmes, among others.
- Nutrition education does not target diets alone, but stresses the importance of healthy lifestyles and health-seeking behaviours such as household sanitation, hygiene and physical activity, among others.

#### **ENABLING ENVIRONMENT:**

- For nutrition education to be successful, it is necessary to engage all people and sectors which can help or hinder dietary changes, and strengthen their capacities to influence decision-makers and advocate for policies and food environments that are favourable to healthy food choices.
- National food-based dietary guidelines should form the basis for public food and nutrition, health and agricultural policies and nutrition education programmes to foster healthy eating habits and lifestyles.
- Education curricula and linkages with universities and learning institutions should be set up to ensure proper professional training for nutrition educators.

- Nutrition education and behaviour change programmes will have greater impact when implemented as part of larger consumer education efforts that include food standards, labelling and broad-based media campaigns aimed at raising awareness about food and nutrition.

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# INCOME GENERATION FOR NUTRITION

## WHAT?

Income generation for nutrition refers to strategies aimed at leveraging the potential of agriculture and food systems to generate income, while maximizing the likelihood that the income is spent on buying nutritious foods and accessing nutrition-enhancing services (known as the *“income pathway from agriculture to nutrition”*).

## WHY?

Ensuring regular and decent incomes for consumers is essential to achieve good nutrition, as it allows not only purchase of healthy foods, but also access to health care and education services. However, an increase in household income does not necessarily lead to improved nutrition. Several mediating factors need to be considered, such as: the amount of change in, and stability of, household income; intra-household income distribution and control; the role of market prices; household preferences and other determinants of purchase. With increasingly commercialized agriculture and food systems, income becomes more important for nutrition than own food production. It thus becomes important to integrate nutrition objectives and components into interventions whose primary objective is to generate income (e.g. agriculture commercialization programmes).

## HOW?

- Agricultural production and other food system activities offer opportunities for generating income through sale of agricultural products or wage labour, and can thus contribute to nutrition both directly through food production and indirectly through increasing economic resources, which can be used to buy nutritious foods.
- The nutritional impact of income-generating activities will depend, however, on whether households choose to spend the extra income on nutritious foods and/or other resources that are beneficial for nutrition (e.g. soap for hygiene, access to health care). Delivering nutrition education (e.g. alongside routine agricultural extension services for households involved in agriculture livelihoods or in the workplace for other income-generating activities) is thus crucial for motivating consumers to properly plan the use of income for health and nutrition. This includes sensitizing farmers to keeping some highly nutritious products for home consumption, where appropriate.
- Nutritional impact will also depend on whether nutritious foods (or other items beneficial for nutrition) are available on local markets at affordable prices. This should be assessed prior to the intervention, especially in remote areas.

- The success of income generation activities will depend on their economic viability – i.e. the potential to generate a profit to sustain the activity. This depends on the tradability and prices of the crops/products that the household sells. A market assessment and an analysis of the economic sustainability of the activity should thus be carried out before the intervention is launched.
- Focusing on cash crops is often seen as a strategy to increase household income, reduce poverty and thus potentially improve nutrition. However, there is a need to manage the risk of specialization that endangers production diversity and diversity of diet. Such strategies might not be appropriate for remote settings, where populations mainly consume what they produce and access to markets is low.
- Targeting food crops that are both high in market value and nutritious, such as horticultural crops and milk, dairy and fish products, can have multiple benefits, as it increases availability of nutritious foods on-farm and in the market while increasing smallholder incomes.
- Diversifying income sources can help ensure year round cash flow for consumption of nutritious foods, including in counter-seasonal periods.
- Ensuring financial inclusion of vulnerable people - including through informal models such as table banking and saving and credit groups - can help increase and stabilize income stream as well as consumption.
- Women's control of income appears to be especially important, because it is more likely to lead to increased expenditure on nutritious foods and health services. Targeting women for income-generating opportunities and ensuring equitable access to employment and control over the earned income is thus advisable. Meanwhile attention should be paid to ensure women's increased work burden does not impinge on vital health and caring activities for which they are also responsible.
- Value addition (through storage, processing, marketing, etc.) is key to generating income throughout the food system. Processing methods that preserve or add nutritional value should be encouraged to promote availability of nutritious foods on markets (e.g. dried mangos may be preferable to candy or biscuit making).

### **ENABLING ENVIRONMENT:**

- Success of such strategies will depend on the availability of and access to nutritious foods for the consumer. Agricultural policies should simultaneously support production of a diversity of nutrient-rich foods and ensure that they enter the market at affordable prices.
- Potential negative impacts of agriculture strategies focusing on cash crops and monocropping should be mitigated with market development to increase availability of other foods which are no longer produced on-farm or within the community, and thus maintain diversity of food supply.
- Legal frameworks to support decent employment in the formal sector, as well as innovative approaches to facilitate employment in the informal sector, are key elements of the enabling environment.

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# NUTRITION-SENSITIVE SOCIAL PROTECTION

## WHAT?

*“Social protection encompasses initiatives that provide cash or in-kind transfers to the poor, protect the vulnerable against risks and enhance the social status and rights of the marginalized – all with the overall goal of reducing poverty and economic and social vulnerability.”* (SOFA, 2015). Nutrition-sensitive social protection seeks to reach the nutritionally vulnerable, to incorporate explicit nutrition objectives and indicators and to promote strategies that enable households to access healthy and sustainable diets as well as health care.

## WHY?

Safety nets and social protection schemes can play an important role in improving nutrition and addressing the social and economic determinants of malnutrition. Social protection instruments can assist households in protecting their food entitlements as well as minimizing negative coping mechanisms in the event of a shock – e.g. reducing food intake or pulling children out of school. Moreover, social protection helps families to increase their consumption and to access more and better food, while also helping to develop their productive asset base which is critical for sustaining good nutrition in the long term and facilitating access to health care and services.

## HOW?

- Every social protection instrument (including social assistance, social insurance and labour market programmes) provides specific entry points for increasing its impact on nutritional outcomes.
- Social assistance schemes designed to support the nutrition of vulnerable groups can thus take a variety of forms, including:
  - In-kind transfers through general food distribution or targeted distribution of specialized foods for women and children (e.g. supplements). Nutrition impact of food transfers can be maximized by adding a nutrition education component, and by ensuring high nutritional quality of food baskets. This can include provision of nutrient-rich foods (e.g. animal-source foods, fruits and vegetables), fortified flours and biofortified staples.

- Quasi in-kind transfers, consisting of vouchers for accessing goods and fee waivers for accessing services. Nutrition-sensitive vouchers enhance access to nutritious food (e.g. one option is to restrict choices to items such as fresh foods and legumes), maternal and child health services and child care services that support optimal infant and young child feeding practices. Fee waivers and differentiated pricing enhance access to health and child care services for vulnerable families, including families with a high number of children and/or dependent members.
- Cash transfers, either conditional or unconditional. Conditionality on participation in health or nutrition education programmes, in particular, can maximize potential changes in the purchase and consumption of specific selected foods. Transfers can also be conditional on child school enrolment and attendance.
- Transfers of productive assets, which can integrate provision of “nutritionally interesting” assets such as dairy cows, small ruminants, poultry or nutrient-rich seeds.
- Social transfers such as non-contributory pensions and child support grants.
- School meals, which can be considered a form of in-kind transfer to ensure access to nutritious foods for vulnerable school-aged children, while encouraging school attendance.
- Promoting local procurement for social assistance programmes, such as for school meals or food distribution, can improve nutrition for both consumers and poor producers.
- Social insurance schemes, including health insurance, targeted weather-based insurance for crops and livestock, maternity protection and employment insurance also contribute to protecting basic pro-nutrition assets against shocks and crises.
- Labour market programmes can support nutrition through providing food, transfers and vouchers to those enrolled in public work programmes. Food-for-work programmes, in particular, should ensure that labour requirements do not outweigh the energy and nutrient value of the ration and do not entail excessively heavy workloads for women.
- The acute and long-term negative effects of shocks can be reduced if social protection systems already in place can be expanded and adapted in a timely manner.

## ENABLING ENVIRONMENT:

- States have the responsibility to recognize the Right to Food and the Right to Health and to ensure adequate social protection systems as a way to fulfill them.
- National nutrition policies should include social protection as a way of achieving national nutrition objectives. Conversely, social protection policies should also explicitly include nutrition considerations, when relevant.
- Social protection is more likely to be nutrition-sensitive if it is part of an integrated package of sectoral policies including food assistance policies, health policies (e.g. universal health coverage with special focus on ante- and post-natal care, paediatric services and immunization), labour regulation (e.g. maternity protection), gender equality and women's empowerment policies, among others.
- Regular, predictable and sustainable financing for social protection programmes should also be ensured.

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# SCHOOL FOOD AND NUTRITION

## WHAT?

The school food and nutrition approach is the portfolio of activities benefiting the nutrition of school-aged children. It encompasses several elements – from provision of nutritious meals to nutrition education, from school gardens to school environments that support nutrition and health – for addressing the immediate food and nutritional needs of school children, as well as the wider aims of improving the health and nutrition of children beyond the school years.

## WHY?

Good nutrition is key to children's physical and mental development. While the prioritized window of opportunity for nutrition intervention is the period between conception and two years of age, targeting school-aged children is critical for attaining some amount of recovery from damage caused by infant malnutrition, improving nutrition, supporting health and school attendance and performance, and providing knowledge and skills for children. School nutrition is also important to reach adolescent girls – i.e. future mothers. By encouraging children, their families and the school community to develop life-long healthy eating habits, these programmes also contribute to generating new demand for, and supply of, healthy and nutritious foods.

## HOW?

- A comprehensive school food and nutrition approach (as promoted by FAO) supports pupils' nutrition through provision of nutritionally balanced school meals, promotion of healthy eating habits and creation of a supportive policy and regulatory framework.
- School meals (i.e. cooked meals, snacks and take-home rations, as appropriate) must be based on children's dietary requirements and comprise a diversity of foods, including local foods for healthy, traditional diets.
- Local procurement for school meals (e.g. Home Grown School Meals) offers opportunities to link local farmers (including smallholders and family farmers) to structured demand, increase their incomes, promote their social and economic inclusion and reduce poverty. When school meals are diversified, it can also stimulate production of nutritious foods locally and bring positive spillover in terms of increased affordability of nutritious foods for the general population.

- Nutrition education and training are essential for promoting healthy eating habits. Hands-on activities, such as school gardening, can be leveraged within comprehensive and culturally appropriate nutrition and health awareness programmes that provide opportunities to learn about hand-washing, personal hygiene, food safety and physical activity.
- Training on nutrition, food safety and other relevant topics also needs to be provided to food service personnel involved in procuring, storing and preparing food in schools.
- Beyond increasing children's access to basic and diverse foods, school meals can integrate fortified and biofortified food products.
- Schools can be used as platforms for delivering nutrition-specific interventions (e.g. deworming).

### **ENABLING ENVIRONMENT:**

- School food and nutrition guidelines, based on national food-based dietary guidelines, including food safety guidelines, are needed to ensure adequate standards and practices related to school meals.
- Policy frameworks related to public procurements should shift from a narrow focus on price to broader considerations of food quality, diversity and cultural acceptability.
- Smallholder farmer/enterprise-friendly procurement mechanisms are needed to ensure that smallholders and family farmers are not excluded, but rather prioritized vis-à-vis other suppliers, to the extent possible. Lessons can be learned from countries and programmes that have had experience linking local and smallholder farmers' production to schools (e.g. the Brazilian school feeding programme, the FAO-World Food Programme [WFP] Purchase from Africans for Africa programme, and the WFP Purchase for Progress programme).
- Policies and regulatory frameworks should include measures for healthy school environments – e.g. to ensure that food available and sold in school environments is of high nutritional quality, to protect children from marketing of unhealthy foods, to ensure sustainable and equitable access to and use of safe water and basic sanitation services.
- It is important to establish clear institutional mandates and responsibilities, as well as coordination mechanisms (e.g. School Food Councils) to ensure participation and control by parents, the local community, civil society and other stakeholders.
- Effective integration of school food and nutrition into national programmes and policy frameworks (e.g. National Nutrition Strategy, Education Sector Plan, Poverty Reduction strategy) is key to ensure effectiveness, sustainability and stable funding.

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# NUTRITION-SENSITIVE HUMANITARIAN FOOD ASSISTANCE

## WHAT?

Humanitarian food assistance aims at meeting the food and nutritional needs of people affected by crises, including those affected by forced displacements, living in camps or informal settlements, as well as host families and relatives. This not only requires action during a crisis, but also ahead of looming crises and often in the immediate recovery period following a crisis. Humanitarian food assistance interventions can take different forms such as food, cash or voucher distributions, and can be delivered using several modalities, including general or targeted, conditional or unconditional distributions.

## WHY?

Humanitarian food assistance should ensure a balanced dietary intake for people affected by crises, and prevent acute and chronic malnutrition as well as micronutrient deficiencies. However, too often, little consideration is given to the nutritional status of assisted communities and to the availability of and access to nutrient-dense foods for the most nutritionally vulnerable groups. Focus should be given not only to caloric intake; the micronutrient content and the overall dietary quality of the distributed food are also important to consider. Moreover, it is important that interventions recognize and address the nutritional needs of specific groups and vulnerable members of the households (e.g. infants and young children, pregnant and lactating women, disabled and elderly people).

## HOW?

- Any intervention that aims at addressing nutrition should be based on a comprehensive understanding of the nutrition situation, of the causes of malnutrition, and of the food dietary patterns and preferences for the different population groups.
- Targeting strategies should consider special needs of the most vulnerable population groups and family members. This includes attention to maternal and infant and young child nutrition, including but not limited to the “1000 days window” (children under two years of age and pregnant and lactating women), also known as the window of opportunity.
- During emergencies, when malnutrition incidence increases, an increasing proportion of older children may be affected too. Context-specific data needs to be collected to identify which age groups are most at risk of or affected by malnutrition and to identify what targeting strategy is the most relevant.

- When designing food or cash transfers, specific consideration should be given to ration composition, size of transfer, choice of modality and the need for complementary interventions.
- Interventions should go beyond the delivery of food staples by providing access to a diversified diet containing the right foods and right nutrients, taking into account local preferences and eating habits. This could be done, for example, through provision of fresh food vouchers to complement household food baskets.
- In addition to a nutritious food basket, households should have appropriate and sufficient inputs and assets to properly store and prepare the food; such as cooking utensils, combustibles, and stoves. During the early stage of an emergency, when securing access to these items could be particularly challenging due to pervasive insecurity and logistics constraints, pre-cooked and quick cooking foods could be the preferable option. During protracted crisis, providing access to reliable and affordable energy and improved cooking technologies (e.g. fuel-efficient stoves and fuel-saving cooking practices) is a crucial step to ensure nutrition of vulnerable populations, notably in the context of forced displacement, people living in refugee camps, or high insecurity.
- Nutritional impact of food assistance can be increased by focusing on specialized foods for specific population groups. This includes, for example, supplements for younger children (e.g. Ready-to-Use Foods, Lipid-based Nutrient Supplements) to prevent or treat moderate acute malnutrition and to prevent micronutrient deficiencies and stunting; complementary foods for children 6-23 months; fortified blended foods; micronutrients powders for home fortification of foods; and supplementary foods for pregnant and lactating women.
- Cash-based interventions combined with nutrition-specific interventions, such as provision of micronutrient supplements for management of acute malnutrition, can contribute to preventing new cases and relapses of malnutrition. However, evidence is still needed on how the size, timing and conditionality of cash transfers affect impacts.
- During a crisis, the occurrence and spread of diseases increases, while access to health services, drinkable water, safe and hygienic living environments is undermined. Nutrition-sensitive humanitarian assistance should seek to integrate with health and water, sanitation and hygiene-based interventions, so as to tackle the different determinants of malnutrition and to maximize impact.
- Incorporating or linking with nutrition education and behaviour change communication activities supports improved breastfeeding and complementary feeding practices – which tend to worsen in crisis contexts – and helps people to achieve long-lasting improvements in their diets, eating behaviours and infant feeding practices.
- Humanitarian food assistance can be planned to help both in raising levels of nutrition during the crisis and supporting and strengthening livelihoods of affected communities (e.g. WFP's Food Assistance For Assets programme, which provides immediate advantages to vulnerable households and communities in terms of food security and nutrition while (re)building household and community assets).

- Linking with national, government-led, social protection and social safety net programmes would help protect the most nutritionally vulnerable outside of emergencies, and respond to crises in a timely manner by building on and expanding already existing schemes.
- Monitoring and evaluation is critical to improve the relevance and nutrition impact of humanitarian food assistance programmes. Such monitoring and evaluation frameworks can embed objectives and indicators related to consumption, maternal and child dietary diversity and care practices. Nutrition status outcomes can also be evaluated, taking into account that stunting may not be the most appropriate indicator, given the time needed to reverse stunting vis-à-vis the limited duration of humanitarian programs.

#### **ENABLING ENVIRONMENT:**

- There is a need to build evidence on what works and why in crisis situation, including through monitoring and evaluation and operational research, so as to inform the design of nutrition-sensitive humanitarian food assistance programmes.
- In contexts of emergencies and protracted crisis, national capacity building on nutrition should also enhance skills of those involved in the design and delivery of humanitarian food assistance programmes. This requires that appropriate tools are available to mainstream nutrition into food assistance programming in a pragmatic and cost-effective way. These tools are needed at all stages of the project cycle, including for costing nutrition-sensitivity of interventions.
- Addressing the disconnect between the food security and the nutrition sectors during emergencies – and encouraging a coordinated approach – is crucial to ensure cohesive programming and a community of good practices.
- Interventions addressing malnutrition in protracted crises should not be limited to the management of acute malnutrition, but accompanied by greater investments in addressing underlying causes, in particular through long-term programmes related to infant and young child feeding, household food security, water and sanitation, and social protection.



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# NUTRITION-SENSITIVE VALUE CHAINS

## WHAT?

A food value chain consists of the full range of farms and firms and their successive coordinated value-adding activities which transform raw agricultural materials into food products that are sold to final consumers. While traditional value chain approaches are used to increase economic returns by enhancing efficiency, nutrition-sensitive value chain approaches aim at maximising the nutrition benefits delivered by value chains. This entails promoting value chains for nutritious food products (e.g. fruits and vegetables) and identifying entry points to increase nutritional value at any step of the value chain.

## WHY?

Given the current trends of urbanization and reduction of labour force in agriculture, people's reliance on markets for satisfying their basic food needs is increasing. Market linkages and value chains play a critical role in determining availability, affordability and quality of food. In this context, nutrition-sensitive value chain approaches offer a useful framework to navigate the complexity of the food system and to unleash its potential to deliver healthy foods, by maximizing nutrition opportunities at any step of the value chain.

## HOW?

- Value chain approaches can be used in response to a nutrition problem. One possible approach could include the following steps:
  - situation analysis to characterize the nutrition problem of the target population;
  - identification of key foods which can help solve this nutrition problem but are currently undersupplied, underconsumed by those most in need, or whose nutrient value is lower than the potential;
  - value chain analysis of the targeted foods, with the aim to identify bottlenecks and propose relevant and tailored market-based interventions that offer supply- and/or demand-side solutions.
- Based on whether the constraints are on the supply or demand side of the value chain, three possible strategies could be adopted:
  - enhance the supply of nutritious food (e.g. increasing production, improving processing, storage and transport capacities);

- enhance the demand for nutritious food with social marketing and behaviour change campaigns;
- add nutritional value (e.g. ensuring food safety, minimizing food and nutrient loss and waste, applying nutrition-sensitive processing methods such as reformulation and fortification).
- Being focused on individual value chains, these approaches are best used to help fill dietary gaps of the population/sub-groups rather than to improve the overall quality of diets – although this latter objective can be achieved through integrated interventions targeting multiple and complementary value chains that together could create a healthier food system.
- Value chain analysis with a nutrition lens can also help to re-design existing value chain interventions to achieve greater nutritional impacts (e.g. through assessing the nutrition implications of an existing value chain and introducing appropriate changes in the way the chain is organized).
- Where market demand for nutritious foods is constrained by low purchasing power, public procurement for social protection programmes can help enhance consumption among vulnerable groups, create the demand and thus stimulate supply.
- Promoting investments in value chain logistics is an integral part of trade strategies and policies. In particular, value chains can be leveraged to improve rural-urban trade linkages and to achieve a win-win outcome in which rural producers enjoy greater economic returns and urban consumers enjoy a diversity of nutritious foods at affordable prices.
- Most people, and especially the poor, access fresh foods from informal and traditional value chains composed of smallholder farmers, traditional traders, street vendors and small retailers. Opportunities can be seized from targeting and empowering these actors.

#### **ENABLING ENVIRONMENT:**

- Beyond value chain interventions, broader interventions to improve the business environment in developing countries (e.g. taxation, availability of infrastructure, presence of distribution outlets in rural areas) can be necessary to enable the private sector to profitably supply nutritious foods to the poor.
- Value chain for nutrition approaches are often implemented in the context of public-private collaboration. However, transparent and inclusive policy frameworks are needed to manage potential risks and trade-offs between (private) economic objectives and (public) health goals.
- Tools need to be developed to ensure that value chain development provides equitable distribution of value with special focus on farmers, who are often “the weakest link” of the chain.

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# WOMEN'S EMPOWERMENT AND GENDER EQUALITY

## WHAT?

Women's empowerment refers to improving the social, economic, political and legal strength of women so that they gain power and control over their own lives. Women's empowerment is the precondition to achieving gender equality, which refers to women and men having equal rights, opportunities and entitlements in civil and political life. In the food and agriculture sector, gender equality refers to equal participation of women and men as decision-makers in rural institutions and equal access to productive resources, assets, decent employment opportunities, income, goods and services for agricultural development and markets. The pathway from women's empowerment to improved nutrition consists of three interrelated components: women's use of income for food and non-food expenditures; women's ability to care for themselves and their families; and women's energy expenditure.

## WHY?

Women's empowerment and gender equality are at the nexus of the agriculture, nutrition and health sectors. Research shows that resources and income flows that women control have positive impacts on nutrition because they are more likely to be directed towards food, education, health and care. Gender-based inequalities between men and women have a strong impact on the population's nutritional status when women do not have access to family income or other resources (land, credit, information, etc.) or are not empowered to make decisions on their use and distribution. Furthermore, women's workloads (in fields, fetching water and fuelwood, domestic chores, etc.) can result in reduced time for child care, breastfeeding and food preparation. Moreover, heavy workloads can have a significant impact on pregnant women's health and nutritional status, increasing the chances that children are born with low birth weight (less than 2,500 g) and become stunted adolescents and malnourished adults. This process is called the inter-generational cycle of malnutrition.

Gender equality and shared care responsibilities positively influence food security and nutrition as well as agricultural production. Designing and implementing gender-sensitive interventions in agricultural and rural development and the food system, which address unequal gender relations and empower women, are major factors contributing to the success of programmes to improve nutrition.

## HOW?

- Women perform productive as well as reproductive roles; therefore the trade-offs between child care and agricultural production should be carefully assessed. Time and labour demands should be evaluated to avoid negative impacts on care, health and nutritional status that might result from women's increased workloads.
- Moreover, promoting the adoption of labour-saving technologies and practices can reduce women's workloads and free up valuable time for child care, food preparation and women's health and leisure. For example:
  - Higher-yielding and pest-resistant crops, use of draft animals, conservation agriculture and no-tillage methods, and transport facilities to and from fields can all decrease labour needs for agriculture production.
  - Women are usually in charge of primary processing; therefore, women's work can be facilitated by the introduction of appropriate post-harvest technology, such as small pounding and dehusking machines.
  - Women in rural communities also spend significant time on tasks such as collecting water and firewood; water-source construction and rehabilitation is thus a labour-saving investment, as are programmes to widen the use of fuel-saving technologies and fuel-efficient stoves for food preparation.
- Women play a key role in all phases of the value chain including reducing food loss and waste at the production, post-harvest and processing stages. Interventions that focus on enhancing women's knowledge and capacities are therefore important to ensure that an adequate quantity of food is available and that the nutritional value of food is preserved.
- Focusing on food crops grown by women and improving women's access to extension, rural advisory and financial services as well as to information and markets are some examples of how women can be supported to access and gain control over productive resources and increased income. When working with "women's crops", it is important to have a holistic approach to gender, as experience shows that when such crops become profitable, men may take over their management.
- Targeting women for income-generating opportunities and ensuring equitable access to decent employment and control over earned income are equally important.

- Involving all members of the household as well as community leaders, who often play an important role in household dynamics and decision-making, is an important factor for successfully ensuring sustainable behavioural change and achieving better nutrition and recognition of women's key roles. In particular, efforts should be made to involve fathers and grandparents and to build their knowledge on nutrition and care. Fathers should be encouraged to participate actively and share responsibilities with mothers in caring for their infants and young children.
- It is important to design nutrition education activities and programmes that can target, and be adapted to, both men and women.

#### **ENABLING ENVIRONMENT:**

- Empowering women is in itself an essential element of the enabling environment for nutrition.
- It is important to ensure that national strategies for women's economic empowerment (and related implementation plans) take nutrition into due considerations (e.g. women nutritional requirements, especially during pregnancy and lactation; nutritional risks and stress linked to women's multiple responsibilities, as producer/wage earner and caregiver, etc).
- Consideration of women's and men's differentiated needs, roles and responsibilities in sectoral policies helps to advance women's rights and status, as well as nutrition. This includes land tenure policies, education strategies, business policies and labour policies, among others.
- These policies should recognize and protect women's productive and reproductive roles (e.g. with maternity protection, work-life balance policies, occupational health and safety measures, facilitating access to child care facilities, breastfeeding promotion).
- Health and nutrition policies and guidelines should pay specific attention to the physiological needs of pregnant and lactating women, addressing their greater vulnerability to malnutrition and micronutrient deficiencies.
- Policies and legal frameworks for halting child marriage and harmful traditional practices that violate the human rights of women (such as female genital mutilation), promoting reproductive health and enhancing access to family planning and reproductive health services are crucial for empowering women and improving their health as well as that of their children.
- Promoting and facilitating women's access to education, including high school and higher education is a fundamental foundation for women's empowerment.



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# FOOD LOSS AND WASTE: PREVENTION, REDUCTION AND MANAGEMENT

## WHAT?

Food loss is the decrease in quantity or quality of safe and nutritious food available and accessible for direct human consumption. Food loss can include loss in nutritional value, economic value and/or food safety. Food waste is an element of food loss and refers to discarding or making an alternative (non-food) use of safe and nutritious food at any point along food supply chains. Food loss can take place at primary production level and at post-harvest (handling and storage), processing, distribution and consumption stages in the agricultural, livestock, fisheries or forestry food supply chains. Prevention and reduction of food loss and waste is embedded in the broader concept of sustainable food systems.

## WHY?

Yearly, almost one-third of the food produced globally for human consumption – or 1.3 billion tonnes per year – is lost or wasted. Food loss and waste is a problem for all regions of the world and for all food groups, especially when it comes to highly nutritious and perishable foods such as fresh fruits and vegetables, fish, meat and dairy products. Causes of food loss and waste are context-specific and may relate to gaps in capacity of the food supply chain actors, inadequate storage facilities and food packaging, lack of access to markets and consumer behaviour. In middle and high-income countries, most of the food loss and waste occurs at distribution and consumption levels, while in low-income countries, it is concentrated at production and post-harvest.

While most waste occurs in industrialized countries, it is also becoming a growing issue for developing countries, due to such factors as urbanization, gaps in the urban-rural continuum, inefficient distribution chains and changes in diets and lifestyles.

## HOW?

- For greater human nutrition impact, measures aimed at prevention and reduction of food loss and waste should place a special emphasis on preventing and reducing nutrient losses in addition to quantitative food loss.
- In developing countries food losses occur mainly at early stages of the food value chain. Strengthening the supply chain through the direct support of farmers and investments in cold chain infrastructure, transportation, and safe packaging could help to reduce the amount of food loss.

- Ensuring that the distance between producers and consumers is adequate to the context (e.g. through supporting short value chains) can contribute to the prevention and reduction of food loss.
- Nutrition education which includes sensitization about production, transformation, distribution and purchasing behaviours that reduce food loss and waste can be a key tool to enhance consciousness of all actors in the food system including end consumers.
- Food waste prevention at its source can be achieved through recovery and redistribution of safe and nutritious food for direct human consumption. Recovery involves receiving, with or without payment, food that would otherwise be discarded or wasted. Redistribution means to store or process and then distribute the received food directly or through intermediaries, with or without payment, to those in need.
- Distributors can contribute to reducing food waste by adopting nutrition-conscious cosmetic standards that can apply to fresh fruits and vegetables or other foodstuffs (i.e. not discarding “ugly” yet perfectly safe and nutritious foods).
- Other strategies may include adapting portion sizes so that they meet dietary needs and enhancing consumer capacity to plan meals, preserve foods and adequately use leftovers at household level.
- Efficient use of former foodstuffs as animal feed, compost and for other industrial uses could also be explored.

#### **ENABLING ENVIRONMENT:**

- The 2030 Agenda Sustainable Development Goals places food loss and waste (SDG 12.3) as a key development priority.
- The Committee of World Food Security (CFS 2014) promotes the adoption of the “food use-not-loss-or-waste” hierarchy (i.e. food loss and waste prevention, recovery and redistribution of safe and nutritious food) and the establishment of targets for monitoring and measurement.
- Policies to address food loss and waste need to be established from production to consumption, supported with adequate budget allocation, monitoring and evaluation frameworks, and coordinated both vertically (from national to local levels) and horizontally (between sectors).
- Key elements of effective strategies for behaviour change on food loss and waste include adequate short, medium, and long-term investments, economic incentives for virtuous actions and effective waste management and monitoring regulations.

- Enhanced availability of data on food loss and waste is an important element of an enabling environment for informed decisions and multistakeholder collaborations, including for achieving SDG 12.3.

#### **KNOW MORE ON THE TOPIC:**

- GIZ, RUAF & FAO. 2016. *City Region Food Systems and Food Waste Management. Linking Urban and Rural Areas for Sustainable and Resilient Development.* [star-www.giz.de/starweb/giz/pub/servlet.starweb?path=giz/pub/pfm.web&r=42540](http://star-www.giz.de/starweb/giz/pub/servlet.starweb?path=giz/pub/pfm.web&r=42540)
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- FAO, IFAD & WFP *Community of Practice on Food Loss Reduction.* [www.fao.org/food-loss-reduction](http://www.fao.org/food-loss-reduction)
- FAO. *Technical Platform on the Measurement and Reduction of Food Loss and Waste.* [www.fao.org/platform-food-loss-waste/en/](http://www.fao.org/platform-food-loss-waste/en/)
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# FOOD QUALITY, SAFETY AND HYGIENE

## WHAT?

Food safety refers to the assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use. Safe food is free from hazards – i.e. any biological, chemical or physical agent in food with the potential to cause an adverse health effect.

## WHY?

Food contaminated with biological, chemical or physical hazards, including harmful pathogens, natural toxins and chemicals can contribute to undernutrition and cause adverse health effects. Most of the burden of food-borne disease is associated with fresh animal-source food and vegetables. Detection and elimination of these food-borne risks is complex and challenging; as international connectivity of food markets increases, supply chains lengthen and the number of actors in the food system grows. Increased food trade may also introduce new safety hazards, reintroduce previously controlled risks and spread contaminated food widely. Food quality, hygiene and safety standards are therefore systematic preventive approaches to food safety that aim to protect public health and improve accessibility of nutritious and safe foods in ways that address modern food environments.

## HOW?

- Risks related to food safety and hygiene need to be controlled all along the food supply chain, from production to processing, trade, preparation and consumption. A risk-based rather than a hazard-based approach allows for better resource allocation, which is particularly important in poorer countries.
- Risks can be controlled at various points of the supply chain, including through: reduction of pesticide use in cultivation and antibiotics in animal production; prevention of harvest contamination by animals; implementation of basic sanitation; air circulation and humidity controls in storage and processing facilities; aflatoxin control; improved hygiene and safety practices of street food vendors; and delivery of messages to households on hand-washing and safe food handling and preparation.
- Simple innovations such as food grade containers or chlorinated water can result in substantial improvements to food safety and quality, even in low technology sectors such as the informal food sector. The uptake of appropriate technology should be encouraged.

- Where the informal sector predominates, it is advisable to “professionalize” rather than “penalize”. Combining capacity development of the informal sector with incentives to further motivate behaviour change has proven an effective approach to advancing food safety in many developing countries.

#### **ENABLING ENVIRONMENT:**

- The Codex Alimentarius Commission develops internationally recognized food standards, guidelines and codes of practice that contribute to the safety and quality of the food trade. While private food safety standards play an increasingly important role, national legal frameworks, which establish minimum safety and quality requirements, are the foundation for national food control. These should build on well-established international codes and standards developed by the Codex Alimentarius Commission and allied food safety concepts such as Good Agricultural Practices, (GAP), Good Manufacturing Practices (GMPs), Good Hygienic Practices (GHP) and Hazard Analysis and Critical Control Point (HACCP).
- While each country will have a different setup reflecting particular national circumstances and needs, a modern national food control system encompasses five essential elements: i) organizations with clearly defined roles and responsibilities for food control management, and mechanisms for communication and coordination among them; ii) an enabling policy, legal and regulatory framework for food safety; iii) functioning food inspection and certification systems; iv) access to capable diagnostic and analytical laboratories; and v) working mechanisms for information, education and communication with stakeholders.
- National policies should be carefully designed so as to avoid unintended discrimination against small and medium-sized enterprises, which constitute the backbone of economies in most developing countries, and informal markets, from which poor consumers often source much of their food.
- Strengthening compliance capacities of small and medium-sized enterprises is critical. It can be necessary to adapt regulations to specific needs of these enterprises in order to reduce the regulatory burden without compromising consumer health and safety.

## KNOW MORE ON THE TOPIC:

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# GLOSSARY

1000 days - Window of opportunity	<p>The period between conception and two years of age when irreversible damage caused by malnutrition can and should be prevented.</p> <p>Reference: The 2008 Lancet Series on Maternal and Child Undernutrition</p>
Acute malnutrition (wasting/ low weight-for-height)	<p>Wasting or thinness indicates in most cases a recent and severe process of weight loss, which is often associated with acute starvation and/or severe disease. Children under 5 years of age are the most exposed to risks of acute malnutrition, in particular when transitioning from exclusive breastfeeding to complementary feeding.</p> <p>Reference: WHO</p>
Aquaponics	<p>Aquaponics refers to any system that combines conventional aquaculture (raising aquatic animals such as snails, fish, crayfish or prawns) with hydroponics (the cultivation of plants by placing the roots in liquid nutrient solutions rather than in soil) in a symbiotic environment, where the plants metabolize the by-products from aquaculture, keeping the water environment clean for aquatic animal life.</p> <p>Reference: FAO</p>
Balanced diet	<p>A diet that provides an adequate amount and variety of food to meet a person's macro and micronutrient needs for a healthy, active life.</p>
Bioavailability	<p>The amount of an ingested nutrient that can be digested, absorbed and used by the body.</p> <p>Reference: Codex Alimentarius</p>
Bottom of the Pyramid	<p>The Bottom of the pyramid (BoP) refer to the bottom of the wealth pyramid, which is the largest but also the poorest socio-economic group. BoP models refer to business models targeted at providing goods and services to the poorest, through product innovation (e.g. small packaging, to respond to the need of those with little purchasing power) or process innovation (e.g. franchising with small retailers which serve the poor).</p>

Chronic malnutrition (stunting / low height-for-age)	A form of growth failure that causes both physical and cognitive delays in growth and development, which arises when the body is not able to absorb the sufficient amounts of nutrients (due to lack of access to adequate foods and/or to disease) to meet dietary energy and nutrient requirements over a prolonged period of time. Reference: WHO
Climate-smart agriculture (CSA)	An approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA aims to tackle three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible. Reference: FAO
Complementary feeding	Nourishment of an infant with foods in addition to breastmilk or breastmilk substitutes. After six months of age, when breastmilk is no longer enough to meet the nutritional needs of the infant, complementary foods should be added to the diet of the child. Reference: FAO
Dietary Diversity	A measure of the variety of foods from different food groups consumed by an individual or by a group over a determined period. Reference: FAO
Double burden of malnutrition	The co-existence of undernutrition (wasting, stunting and micronutrient deficiencies) along with overweight/obesity, within an individual, household or group, across the lifecourse. Reference: FAO/WHO
Enabling environment (for food security and nutrition)	The enabling environment for food security and nutrition comprises commitments and capacities across a range of dimensions such as policies, programmes and legal frameworks; mobilization of human and financial resources; coordination mechanisms and partnerships; and evidence-based decision making. Reference: FAO
Energy-dense food	A food with a high content of calories (energy) per gram. Highly-processed energy-dense foods that are high in sugars, saturated fats and/or salts but poor in micronutrients are likely to adversely affect health. Reference: FAO/WHO

Food environment	<p>The food environment is one of the emerging concepts associated with food systems and nutrition. It designates the interface between the food system and consumers. The food environment is defined as the availability, affordability, convenience and desirability of various foods. The food environment is directly affected by the food system, and in turn affects diet quality and nutritional status. In research, the concept of food environment has been mainly used in relation to dietary quality issues in high-income countries (i.e. overweight, obesity and Non-Communicable Diseases [NCDs]).</p> <p>Reference: Herforth and Ahmed, 2015</p>
Food system	<p>A food system encompasses all the people, institutions and processes by which agricultural products are produced, processed and brought to consumers. A food system gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socioeconomic and environmental outcomes.</p> <p>References: SOFA 2013, HLPE 2014</p>
Food-based approach	<p>An approach which recognizes the central role of food for improving nutritional status. A food-based approach recognizes the multiple benefits (nutritional, physiological, mental, economic, social and cultural) that come from enjoying a variety of foods. Food-based approaches can be complemented with strategies that rely on medically-based interventions such as vitamin and mineral supplementation.</p> <p>Reference: FAO</p>
Food-based dietary guidelines	<p>Food-based dietary guidelines (also known as dietary guidelines) are intended to establish a basis for public policies, programmes and actions fostering healthy eating habits and lifestyles. They provide advice on foods, food groups and dietary patterns to promote overall health and prevent chronic diseases.</p> <p>Reference: FAO</p>
Healthy diets	<p>Diets that provide protection against malnutrition in all its forms, as well as non-communicable diseases (NCDs), including diabetes, heart disease, stroke and cancer.</p> <p>Reference: WHO</p>
Home Grown School Meals (HGSM)	<p>Home grown school meals (HGSM) is a school meals model to provide school children with safe, diverse and nutritious food, sourced from local smallholders.</p> <p>Reference: WFP</p>

Indigenous crop	Native plants to a given area in geologic time. This includes neglected and underutilized species. Reference: FAO
Livelihood	A livelihood comprises the capabilities, assets (natural, human, physical and financial) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the long and short term. Reference: R. Chambers & G. Conway, 1992
Low birth weight	Weight at birth of less than 2 500 grams, contributing to a range of poor health outcomes and an increased mortality risk. Reference: WHO
Malnutrition	An abnormal physiological condition caused by deficiencies, excesses or imbalances in energy and/or nutrients necessary for an active, healthy life. Malnutrition includes undernutrition, micronutrient deficiencies, overweight and obesity, conditions that can arise separately or coexist. Reference: FAO/WHO
Micronutrient deficiency (hidden hunger)	Lack of vitamins, minerals and/or trace elements which are essential for the proper functioning, growth and metabolism of a living organism. Usually caused by poor diets, it is often referred to as “hidden hunger” as its physical symptoms are not obvious to detect, while its consequences can be deadly. It can, and often does, coexist with undernutrition and overweight and obesity. Reference: FAO/WHO
Integrated multi-trophic aquaculture (IMTA)	A method of aquaculture whereby different species are raised together in a given controlled area, connected by nutrient and energy transfer through water (e.g. recycling of by-products from a given species serves as feed for another). Reference: FAO.
Neglected and underutilized species (NUS)	Neglected and underutilized species (NUS) are those to which little attention is paid or which are ignored by agricultural researchers, plant breeders and policymakers. Typically, NUS are not traded as commodities. They are wild or semi-domesticated varieties and non-timber forest species adapted to particular, often quite local, environments. Many of these varieties and species, along with a wealth of traditional knowledge about their cultivation and use, are being lost at an alarming rate. Reference: Bioversity International

Non-Communicable Diseases (NCDs)	<p>Non-communicable diseases (NCDs), also known as chronic diseases, are not passed from person to person. They are of long duration and generally slow progression. The 4 main types of non-communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes.</p> <p>Reference: WHO</p>
Nutrient-dense crop	<p>Crops with a high content of nutrients per gram.</p> <p>Reference: FAO</p>
Nutrient productivity	<p>This is a measure to assess the extent to which the agriculture production is meeting the nutritional needs of its population for 9 nutrients: energy, protein, dietary fiber, iron, zinc, calcium, vitamin A, vitamin C and folate. It combines yield, the nutrient composition of the agricultural product and the nutrient requirement for these 9 nutrients for humans.</p> <p>Reference: FAO</p>
Nutrient-rich foods	<p>Foods with a high content of nutrients per gram.</p> <p>Reference: FAO/WHO</p>
Nutrition	<p>Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition - an adequate, well balanced diet combined with regular physical activity - is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity.</p> <p>Reference: FAO/WHO</p>
Nutrition-sensitive interventions	<p>Interventions in any sector, which do not necessarily have nutrition as predominant goal but are designed to also address some of the underlying causes of malnutrition (which include household food security, care for mothers and children, and primary health care services and sanitation).</p> <p>Reference: Lancet 2008/FAO</p>
Nutrition-specific interventions	<p>Interventions which predominant goal is nutrition, designed primarily to address immediate determinants of malnutrition such as adequate food and nutrient intake, treatment of acute malnutrition, care-giving practices and reducing the burden of infectious diseases.</p> <p>Reference: Lancet 2008/WHO</p>

Nutrition transition	<p>“Nutrition transition” refers to a trend of decreased proportion of undernourished children and adults, and a rise in the proportion of children and adults who are overweight, obese and suffer from diet related non-communicable diseases. It is the outcome of a dietary transition from traditional diets, characterized by high intakes of cereals and fibers, to affluent diets, rich in saturated fats, sugar and highly processed foods as well as of broader lifestyle changes.</p>
Overweight and obesity	<p>Body weight that is above normal for height, as a result of an excessive accumulation of fat. A Body Mass Index (BMI) comprised between 25 and 30 corresponds to Overweight. A BMI above 30 corresponds to Obesity. BMI is defined as the body mass (expressed in kilogrammes) divided by the square of the body height (expressed in meters).</p> <p>Reference: WHO</p>
Processed food	<p>According to the extent of processing being used, foods can be distinguished in:</p> <ul style="list-style-type: none"> <li>- <b>Unprocessed foods:</b> food consumed shortly after harvesting, slaughtering etc.</li> <li>- <b>Processed culinary ingredients:</b> food products extracted and refined from constituents of foods (e.g. plant oils, animal fats, starches, sugar) and salt.</li> <li>- <b>Minimally processed foods:</b> unprocessed foods altered in ways that do not add or introduce any substance, but that may involve subtracting parts of the food (e.g. through cleaning, peeling, squeezing, filleting, drying, pasteurization and freezing, etc...).</li> <li>- <b>Processed foods:</b> food made by adding a culinary ingredient to unprocessed or minimally processed foods; the resulting product retain the basic identity and most of the constituents of the original food, but the substances added infiltrate the foods and alter their nature (e.g. canned or bottled vegetables or legumes, tinned fish preserved in oil, bread made from cereal flours, water, ferments and salt).</li> <li>- <b>Ultra-processed foods and drink products:</b> products which are formulated mostly or entirely from substances derived from foods, with little or even no whole food content. They typically contain various combinations of preservatives; stabilizers, emulsifiers, solvents, sweeteners, colours, flavours etc. (e.g. mass-manufactured breads and pastries; confectionery; ready meals, canned or dehydrated soups; chips; snacks; sugared or sweetened drinks, etc).</li> </ul> <p>Reference: NOVA Food definition and classification system</p>

Ready-to-eat food	Any food that is normally eaten in its raw state or any food handled, processed, mixed, cooked, or otherwise prepared into a form, which is normally eaten without further virucidal steps, e.g. by processing
Ready-to-use supplementary food	Ready-to-use supplementary food is a type of ready-to-use food that is specifically designed for the treatment of moderate acute malnutrition in children 6-59 months of age. RUSFs are fortified with micronutrients and contain essential fatty acids and quality protein to ensure a child's nutritional needs are met
Ready-to-use therapeutic food	Ready-to-use therapeutic food has revolutionized the treatment of severe malnutrition – providing foods that are safe to use at home and ensure rapid weight gain in severely malnourished children. Reference: FAO
Social marketing	Social marketing seeks to alter specific behaviour practices (in this case, dietary practices) in pursuit of a social good (in this case, improved nutrition) by drawing upon commercial marketing methods Reference: FAO
Social Protection	Social protection encompasses initiatives that provide cash or in-kind transfers to the poor, protect the vulnerable against risks and enhance the social status and rights of the marginalized; all with the overall goal of reducing poverty and economic and social vulnerability. Reference: FAO
Staple food	A staple food is one that is eaten regularly and in such quantities as to constitute the dominant part of the diet and supply a major proportion of energy and nutrient needs. A staple food does not meet a population's total nutritional needs: a variety of foods is required. Reference: FAO



Sustainable diets	<p>Sustainable Diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.</p> <p>Reference: FAO/Bioversity International</p>
Undernutrition	<p>The outcome of insufficient intake, and/or poor absorption and/or poor biological use of nutrients consumed as a result of repeated infectious disease. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition).</p> <p>Reference: FAO</p>
VAC systems	<p>VAC (Vuon, Ao, Chuong) are small scale, integrated systems used in Vietnam and typically include crop farming (e.g. staple production and home gardening for fruits and vegetables), aquaculture (e.g. flooded rice paddies used as fish ponds) and animal husbandry (e.g. small poultry, which also provide fertilisers for crop production).</p> <p>Reference: FAO</p>



# ANNEX. THE 4 FUNCTIONS OF THE FOOD SYSTEM

## Consumer demand, food preparation and preferences



Consumer demand shapes decisions on what foods to produce, process and trade.

The main drivers of demand at **household level** are:

**purchasing power**



determined by level of incomes, prices, productivity, wage rates, taxes and cash transfers and remittances.

**preferences**



linked to food-related knowledge, attitudes and practices at individual and societal level.

**Individual** food consumption is influenced by household food **preservation, preparation and cooking** practices, and intra-household food distribution.

**Social protection schemes** including subsidies, school feeding programmes, consumer education can be crucial for supporting consumer demand and consumption.

## Food trade and marketing



Food **trade** encompasses exchanges at different levels, including **domestic** (i.e. within and between rural and urban areas), **regional** and **international** (i.e. import/export) which serve to bring food to consumers from the locations where it is produced.

Elements of food trade - e.g. quality roads, cold chain during transportation and at the marketplace, import regulations, prices and price policies, etc. - thus shape the food supply as well as food prices.

Food **marketing** refers to all activities, actors and related infrastructures and regulations around the physical **sale of food** (wholesaling, retailing, catering) and its **promotion** (labelling, pricing, branding and advertising).

## Food production



Food production encompasses a range of activities - and relevant actors - including rural and urban crop production; livestock rearing at small, medium and large scale; fisheries; and forestry.

Food production also requires managing the underpinning **natural resource base** (land, water, soil, plants seeds, animal breeds etc.) and **supporting infrastructures** (e.g. water supply network).

Beyond making food available, food production is critical to sustain **rural livelihoods** and shaping - positively and negatively - natural environments and landscapes.

## Post-harvest handling, storage and processing



Post-harvest handling, storage and processing are essential to **preserve food**, help increase **shelf-life** and **limit food losses**, which in turn stabilizes food supply and prices throughout the year.

Proper food handling storage and processing also help make food **safe, digestible and tasty** and broaden the range of food products that can be consumed.

Post-harvest handling, storage and processing include activities at **household** (e.g. domestic food preservation), **community** (e.g. village granaries, mills) and **commercial** levels (e.g. commercial silos, food industries).

Techniques and level of processing from minimal processing (e.g. peeling, freezing or packaging vegetables), to ultra-processing (e.g. production of snacks or soft drinks), to fortification, impact the nutrient content of foods, either positively or negatively.





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