European Commission

Guidance Note on Food Fortification in development cooperation

July 2020

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NUTRITION FOR DEVELOPMENT

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(July 2020)

Malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients. Malnutrition in all its forms includes:

- *undernutrition which includes wasting (low weight-for-height, being an indicator of acute malnutrition), stunting (low height-for-age, being an indicator of chronic malnutrition) and underweight (low weight-for-age);*
- *micronutrient-related malnutrition, which includes micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess; and*
- *overweight, obesity; and diet-related non-communicable diseases (such as heart disease, stroke, diabetes and some cancers).*[1]

The European Union (EU) is committed to addressing all forms of malnutrition and supports a multi-sectoral approach towards improved nutrition outcomes by combining measures from a variety of sectors – including agriculture health; water, sanitation and hygiene; education; and social protection. Together with dietary diversification and supplementation, food fortification forms part of a broader package to tackle micronutrient deficiencies.

This Guidance Note on Food Fortification provides a rationale for food fortification measures in the EU development cooperation and offers suggestions on how such measures can be integrated into sectorial programmes. It is intended to support the European Commission's Directorate-General for International Cooperation and Development and in particular Agriculture and Food/Nutrition Security Heads of Sectors and Focal Points in the EU Delegations.

Food fortification is a cost-effective solution to reduce the risks of micronutrient malnutrition for all, including the most vulnerable, improving health and enhancing resilience. Being in the final decade of the Sustainable Development Goals (SDGs), and in light of the current coronavirus disease 2019 (COVID-19) crisis, it is imperative to make nutritious foods more available and affordable.

This guidance gives quick access to essential information on:

- *The global problem and consequences of micronutrient deficiencies.*
- *Potential partnerships to implement food fortification programmes.*
- *How food fortification fits into EU priorities.*
- *The place of food fortification in sustainable food systems and in promoting local food producing small and medium enterprises (SMEs).*
- *Practical suggestions to integrate food fortification into sectorial support.*

[1] World Health Organization. Malnutrition Factsheet. 1 April 2020. https://www.who.int/news-room/fact-sheets/detail/malnutrition.

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Acronyms

2FAS	Food Fortification Advisory Services of the European Union
ABC	Agribusiness Capital
AFD	Agence Française de Développement
AFD-PROPARCO	subsidiary of AFD focused on private sector development
AGREENFI	Agricultural and Rural Finance Label
AgriFi	Agriculture Financing Initiative
ASEAN	Association of South East Asian Nations
COFIDES	Compañía Española de Financiación del Desarrollo
COVID-19	Coronavirus disease 2019
EAC	East African Community
ECOWAS	Economic Community of West African States
EIB	European Investment Bank
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMO	Dutch entrepreneurial development bank
GAIN	Global Alliance for Improved Nutrition
GDP	Gross Domestic Product
GF-TAG	Global Fortification Technical Advocacy Group
IFAD	International Fund for Agricultural Development
LMIC	Low- and Middle-Income Country
REC	Regional Economic Community
SADC	South African Development Community
SDG	Sustainable Development Goal
SME	Small and Medium Enterprise
SUN	Scaling Up Nutrition
UN	United Nations
UNICEF	United Nations Children's Fund
WFP	United Nations World Food Programme
WHO	World Health Organization

Introduction: Improved nutrition to support the 2030 Agenda

The 2030 Agenda for Sustainable Development, and its 17 **Sustainable Development Goals (SDGs**), were adopted in 2015 by the United Nations (UN) and ratified by 193 countries.[2] This signalled a commitment to comprehensive, integrated efforts, to eradicate poverty, achieve sustainable development, and leave no one behind. The European Union (EU) and its Member States are implementing the 2030 Agenda across all internal and external policies.

Improved nutrition is essential to achieving at least 12 of the 17 SDGs[3] including those on health, education, employment, gender equality, poverty, and peaceful and inclusive societies. However, **no country is on track to meet the 2025 Global Nutrition Targets.**[4] This is despite substantial investments in health care, sustainable agriculture and humanitarian assistance to tackle acute and chronic malnutrition and long term food security.

The **2020 Global Nutrition Report**[5] calls for a pro-equity agenda that mainstreams nutrition into food and health systems, supported by strong financing and accountability. Governments must focus on action where the need is the greatest for maximum impact. The **EU Action Plan on Nutrition**[6] promotes nutrition-sensitive programmes in the field of food systems, health, social protection, education, women's empowerment and resilience to shocks, thereby leveraging the positive impact of multiple sectors on nutrition.

The current coronavirus disease 2019 **(COVID-19) pandemic** may further hinder efforts to deliver on SDG2, as measures taken to reduce its spread cause economic fallout around the world. As a result, the number of people facing acute food insecurity may double, from 135 million in 2019 to 256 million in 2020.[7, 8] There is real concern that the nutritional status of vulnerable populations will greatly worsen as poverty shifts diets towards more affordable staple foods, and as fresh fruits and vegetables become less available and affordable due to disrupted food systems. Moreover, currently, a large part of fortified foods available in low-income countries are not produced locally; availability depends on international productions and supply chains that have been strongly affected by the pandemic. A rise in the global prevalence of all forms of malnutrition is expected.[9] The situation is even more worrying for populations in fragile contexts, which are highly dependent on external assistance to ensure their basic food needs. The crisis will particularly affect micronutrient malnutrition, as per capita gross domestic product (GDP) is highly correlated with micronutrient deficiency, and expected GDP loss due

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[2] European Commission. The 2030 Agenda for Sustainable Development and the SDGs. 7 August 2019. https://ec.europa.eu/environment/sustainable-development/SDGs/index_en.htm.

[3] Scaling Up Nutrition. Nutrition and the Sustainable Development Goals. https://scalingupnutrition.org/nutrition/nutrition-and-the-sustainable-development-goals/.

[4] World Health Organization. Nutrition: Global Targets 2025 to improve maternal, infant and young child nutrition. https://www.who.int/nutrition/global-target-2025/en/.

[5] 2020 Global Nutrition Report: Action on equity to end malnutrition. Bristol, UK: Development Initiatives. https://globalnutritionreport.org/reports/2020-global-nutrition-report/executive-summary/.

[6] The Action Plan as well as first (2016), second (2017), third (2018) and fourth (2019) progress reports can be found at: European Commission. Directorate-General for International Development and Cooperation. Action plan on nutrition: Reducing the number of stunted children under five by 7 million by 2025. February 2016. https://ec.europa.eu/knowledge4policy/global-food-nutrition-security/action-plan-nutrition_en.

[7] Food Security Information Network (FSIN). 2020. 2020 Global report on food crises: Joint analysis for better decisions. Rome, Italy and Washington, DC: Food and Agriculture Organization (FAO); World Food Programme (WFP); and International Food Policy Research Institute (IFPRI). https://www.fsinplatform.org/global-report-food-crises-2020.

[8] The World News. UN warns coronavirus could double number facing acute malnutrition. 21 April 2020. https://theworldnews.net/ph-news/coronavirus-could-double-number-facing-acute-hunger-u-n.

[9] Predictions based on: Share of energy from cereals, roots and tubers – FAO (2017), Hidden Hunger Index in pre-school children – Muthayya et al (2013), Popultion (Gapminder, HYDE (2016) & UN (2019)). OurWorldInData.org/micronutrient-deficiency. https://ourworldindata.org/grapher/hidden-hunger-index-vs-share-of-energy-intake-from-cereals-roots-and-tubers.

to the pandemic is 3%, with some economies expected to have losses of 10% or more.[10, 11] To mitigate this, and to contribute to the achievement of SDG2 as well as to the global nutrition targets, proven, cost-effective programmes and interventions must be scaled up.

Failure to meet micronutrient requirements, coupled with a challenging enabling environment and the inadequate provision of care, are key drivers of wasting (which affects almost 50 million children each year) and stunting (which affects almost a quarter of all children under 5). Prevention is possible by undertaking interventions at all stages of the life cycle, and mainly involves the promotion of exclusive breastfeeding for the first 6 months of life, and the provision of adequate micronutrient dense complementary foods and family foods thereafter.

One proven strategy for improving the quality of diets is to enhance the nutritional content of widely consumed food by adding vital vitamins and/or minerals. Known as **food fortification**, this is a cost-effective solution that has been shown to significantly and sustainably improve health, wellbeing and resilience, especially for the most vulnerable. Food fortification is a strategic investment that, with EU cooperation, has great potential to be scaled up.

1. The consequences of micronutrient deficiencies on human health and national economies

Single or multiple micronutrient deficiencies can lead to increased morbidity and mortality, serious birth defects, undeveloped cognitive ability and reduced productivity. Severe micronutrient malnutrition contributes to maternal and infant deaths and childhood blindness. **Micronutrients** are essential in supporting a child's optimal growth and mental development. At every stage of life, micronutrients are crucial to immune system function. This starts in utero, continues after birth through the consumption of breastmilk, and is maintained throughout life by consuming a balanced diet. Preventable deficiencies in vitamins A and D, folate, iron, iodine and zinc contribute roughly to one million child deaths annually.[12] Micronutrients increase our resistance to all forms of disease, particularly infectious disease. This is especially relevant at the current moment as the world faces the consequences of the COVID-19 pandemic and braces itself for similar crises in the future.

Two billion people suffer from micronutrient deficiencies (also called 'hidden hunger'). Women, young children and adolescent girls in low- and middle-income countries (LMICs) are especially at risk.

Micronutrient deficiencies occur when a **diverse and nutrient-rich diet is unavailable or unaffordable,** and so the quality of food people eat fails to meet nutrient requirements. This is particularly common in poor households where less nutritious staples (bread, rice, maize) are the dominant foods. These households might reach their daily energy needs but they do not meet their vital vitamin and mineral needs.[13] This situation is projected to worsen if left unchecked – **shocks and rising carbon dioxide** levels also negatively impact nutritional status by reducing the vitamin and mineral content of staple foods.[14] Researchers estimate that by 2050, more than 5% of iron and zinc in wheat, rice and maize

[10] IMF warns of further drop in global growth due to Covid-19. The Guardian, 9th May 2020. https://www.theguardian.com/world/2020/may/09/imf-warns-of-further-drop-in-global-growth-due-to-covid-19.

[11] Lawrence Haddad. Biblical, on steroids, and across generations: The coming food and nutrition crash can be averted if we act now to counter the COVID-19 crisis. IFPRI Blog. 28 April 2020. https://www.ifpri.org/blog/biblical-steroids-and-across-generations-coming-food-and-nutrition-crash-can-be-averted-if-we.

[12] GAIN. Large-Scale Food Fortification. 2020. https://www.gainhealth.org/index.php/impact/programmes/large-scale-food-fortification.

[13] Deptford A, Baldi G and de Pee S. Essential Nutrient Requirements not Met by Diets High in Staple Foods. Results from the Fill the Nutrient Gap Analysis in selected countries. *Sight and Life*. Vol. 32(2) 2018. https://sightandlife.org/wp-content/uploads/2018/12/11_SALMZ_0218_Research_04.pdf.

[14] Intergovernmental Panel on Climate Change (IPCC), 2019: Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press. https://www.ipcc.ch/srccl/.

will be lost due to increased carbon dioxide in the atmosphere and soil. [15] Additionally, poor nutrition status can be aggravated by gut inflammation and other illnesses (diarrhoea, malaria, worms, tuberculosis, HIV/AIDS). [16]

Arguably, the most far-reaching consequence of micronutrient deficiencies is that they **perpetuate the cycle of poverty** by negatively impacting physical and cognitive development and learning capacity, which substantially reduce future labour productivity, and can diminish lifetime earnings by 10% or more.[17] This, in turn, undermines a country's economic development and all other development investments. The economic impact in LMICs is estimated to be a loss of between 2 and 5% of the annual GDP. [18,19]

Adverse effects of micronutrient deficiencies are largely preventable by dietary improvements, vitamin/mineral supplements and food fortification.

Food fortification is a tool to address micronutrient deficiencies, which should be regulated by governments (e.g.the Ministry of Health or Agriculture). Critical to its success is cross sectoral collaboration involving the private sector, public sector, civil society, bilateral and multilateral agencies, and other stakeholders including regional bodies such as regional economic communities. Nationally, food fortification requires multiple partners in public, private and civil society sectors working collectively. Multi-sector partnerships are critical to defining, advocating, driving, monitoring and coordinating fortification. Due to the number of actors involved, clear roles as to who is regulating and monitoring at various points of the supply chain (e.g. food control agency) and who is playing an enabling role (e.g. civil society organisations) must be defined and agreed. Trust between the regulatory authorities and the private sector is essential. Governance mechanisms or platforms, such as National Fortification Alliances can help in tackling programme-wide issues and coordination. Figure 1 (page 7) presents partners who typically have roles in national or regional fortification programmes.

2. Food fortification – an effective strategy to address hidden hunger

The 1992 Food and Agricultural Organization of the United Nations (FAO)/ World Health Organization (WHO) International Conference on Nutrition endorsed the World Declaration on Nutrition. This identified the following strategies to effectively address micronutrient deficiencies:

- production, preservation and marketing of micronutrient-rich foods combined with nutrition education to ensure increased dietary diversity and improved diet quality;
- targeted micronutrient supplementation for the most vulnerable;
- measures to control diseases; and
- food fortification.

Food fortification strategies need to be **country and context specific** and in line with national laws and international regulations. They should also align with the strategy recommended by the EAT Lancet Committee to reorient agricultural priorities to produce healthy foods, and sustainably intensify food production to increase high quality nutrition outputs.[20] The global source for food standards is the Codex Alimentarius Commission. This Commission develops harmonized international

[15] Myers, S., Zanobetti, A., Kloog, I. et.al. Increasing CO2 threatens human nutrition. Nature 510, 139-142 (2014) doi:10.1038/nature13179.

[16] Peter Katona, Judit Katona-Apte; The Interaction between Nutrition and Infection, Clinical Infectious Diseases, Volume 46, Issue 10, 15 May 2008, Pages 1582–1588, https://doi.org/10.1086/587658.

[17] The World Bank Group. Shaping the Global Food System to Deliver Improved Nutrition and Health. 12 April 2016. https://www.worldbank.org/en/topic/agriculture/publication/the-future-of-food-shaping-the-global-food-system-to-deliver-improved-nutrition-and-health.

[18] Horton, S., Alderman, H. and J.A. Rivera. Copenhagen Consensus 2008 Challenge Paper - Hunger and Malnutrition. March 6, 2008. Copenhagen Consensus Centre.

[19] Horton, S., 2006. The economics of food fortification. J Nutr 136 (4), 1068_1071.

[20] Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L. J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., De Vries, W., Majele Sibanda, L., ... Murray, C. J. L. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, *393*(10170), 447-492. https://doi.org/10.1016/S0140-6736(18)31788-4 .

food standards and codes of practice to protect the health of consumers and ensure fair trade practices. Adoption of Codex recommendations is voluntary, but they are often used as a basis for national food standards, including fortified foods (General principles for the addition of essential nutrients to foods CAC/GL 9-1987[21]).

Types of Food Fortification

There are three ways to improve the vitamin and mineral content of food:

• **Nutrient-enriched crops** are cultivated using conventional plant breeding techniques or agricultural practices to improve their vitamin and mineral content. These crops are climate-smart, drought- and pest-resistant, and do not necessarily require a change in farming methods. Where they are suited to local conditions, they can reach populations in remote areas with limited access to markets. The African Development Bank has recognized nutrient-enriched crops as a key priority for nutrition investments in its 5-year Multisectoral Nutrition Action Plan (2018).

• **Industrial fortification** adds vitamins and minerals during food processing and is generally used to fortify the most suitable commonly consumed foods (maize meal, wheat flour, oil). It can reach large segments of populations through existing food delivery systems, and does not require major changes to consumption patterns. Industrial fortification started in the 1920s in Europe and North America, eliminating debilitating conditions such as rickets, goitre, beriberi and pellagra. Industrial fortification bypasses seasonal unavailability, offering sources of micronutrients during lean seasons and before nutritious fresh produce has reached harvest.

• **Point-of-use-fortification** is the provision of a single sachet of micronutrients that can be added directly to solid or semi-solid food before it is consumed. It allows for targeted use, with the aim of reaching high risk populations.

Food fortification is a cost-effective solution that can reach large numbers of people with enhanced micronutrient intakes. It has been ranked among the top three international development priorities by the Copenhagen Consensus. Every USD1 invested in food fortification returns between USD10 and USD27.[22,23]

Evidence suggests that when implemented correctly and with political commitment, **food fortification** is a sustainable intervention. Industrial fortification has been practised for 100 years; it began in the 1920s with the voluntary fortification of salt with iodine in the USA and Switzerland, and the fortification of margarine with vitamin A in Denmark. Within the EU, Austria's mandatory legislation for salt iodisation dates back to the 1960s. In LMICs in Africa and Asia, food fortification is a newer phenomenon with most programmes launched in the 1990s with salt iodisation. Sources of financing for these programmes evolve over time with development partners, governments and private sector providing initial start-up costs. As programmes mature, estimates show that private sector and consumers cover 90% of recurrent costs, with the public sector covering the remainder, mostly for monitoring and enforcement.[24] Governments play a key role as an enabler for food fortification through setting standards, certification and auditing of fortified foods producers, and monitoring and regulatory enforcement for fortification to ensure a level playing field for industry.

[21] FAO/WHO. Codex Alimentarius. International Food Standards. General Principals for the Addition of Essential Nutrients to Foods CAC/GL 9-1987 Adopted in 1987. Amendment: 1989, 1991. Revision: 2015. (http://www.fao.org/fao-who-codexalimentarius.)

[22] FFI, GAIN, MI, USAID, World Bank, UNICEF. Investing in the future: a united call to action on vitamin and mineral deficiencies. Global Report 2009.

[23] Garrett G, Matthias D, Keats E, Mbuya M, Wouabe E. Doubling down on food fortification to fortify the future. Bill and Melinda Gates Foundation. The Optimist. 2019. https://www.gatesfoundation.org/TheOptimist/Articles/food%20fortification%20to%20fortify%20the%20future?mc_cid=517cf1eb94&mc_eid=56f6a28dd9&mc_cid=517cf1eb94&mc_eid=56f6a28dd9.

[24] Laviolette, Financing and Sustainability of Food Fortification Programs in Mannar MGV and Hurrell R (eds). Food Fortification in a Globalized World (pp 93-99. 2018). Elsevier Inc. DOI: https://doi.org/10.1016/B978-0-12-802861-2.00009-2.

Current food fortification efforts need enhanced mobilisation and political commitment, the generation and dissemination of knowledge on best practices, and the implementation of a multi-faceted approach:

- Countries with existing fortification programmes need support to **monitor quality and compliance, measure household coverage, and evaluate impact**. Forty-one of the 42 countries prioritising nutrition in their cooperation programme with the EU have mandatory fortification of at least one food vehicle (Annex 1).
- Agricultural value-chain development needs to take into account the **nutritional dimension** of actions (e.g. diversified farming systems for diversified diets). Countries with high potential for nutrient enriched crops[25] should develop programmes for these crops.
- Food processing companies need support to ensure optimal fortification, and must be equipped to self-monitor for **quality**.
- Seed and food companies and processors need capacity building and incentives to **expand the production of nutrient-enriched crops and nutrient-rich products** made from fortified ingredients.
- Farmers' organisations and non-governmental organisations need capacity building and incentives to better support **diversified farming systems**.
- **Digital technology** to collect and analyse data and assess national fortification programmes needs to be scaled up in order to better support policymaker and industry decision-making.

3. Unleashing food fortification through multi-stakeholder partnerships

UN agencies have been instrumental in scaling up food fortification globally by collating evidence on effectiveness, issuing guidelines and policy briefs, and supporting programme implementation. WHO and FAO have developed guidelines for food fortification;[26] FAO, jointly with HarvestPlus, issued a policy brief on nutrient-enriched crops;[27] the United Nations Children's Fund (UNICEF) has identified both the use of vitamin and mineral supplements and access to fortified complementary foods as key interventions for improving children's diets.[28] In 2004, The United Nations World Food Programme (WFP) Executive Board made a commitment to mainstream nutrition into its programmes in order to tackle malnutrition. As part of this, the organisation requires, where feasible, that foods procured or received in-kind are fortified, and this has become a key performance indicator. Besides other staple foods, WFP has integrated fortified rice in social safety net programmes they support, and jointly with the Global Alliance for Improved Nutrition (GAIN) has published a handbook on the production of fortified rice kernels for use in rice fortification.[29] A Call to Action "To Stand Together and Build on Evidence to Inform Nutrition Responses" to COVID-19 pandemic has been endorsed by Executive Directors of UNICEF, FAO, WFP and WHO.[30,31]

Several major donors invest in food fortification initiatives, including EU Member States. Most notable are the Government of the Netherlands, the German Federal Ministry for Economic Cooperation and

[25] Biofortification Priority Index can be found for each country at https://bpi.harvestplus.org/country_charts.html.

[26] Allen L, de Benoist B, Dary O and Hurrell R (eds). Guidelines on food fortification with micronutrients. WHO and FAO, 2006. https://www.who.int/nutrition/publications/guide_food_fortification_micronutrients.pdf?ua=1.

[27] FAO, HarvestPlus, Biofortification: a food systems solution to hidden hunger, 2019. http://www.fao.org/3/ca8711en/CA8711EN.pdf.

[28] United Nations Children's Fund (UNICEF). Improving Young Children's Diets During the Complementary Feeding Period. UNICEF Programming Guidance. New York: UNICEF, 2020. https://www.unscn.org/en/news-events/recent-news?idnews=2030.

[29] WFP and GAIN. Handbook for the production of extruded fortified rice kernels, 2019. https://www.wfp.org/publications/handbook-production-extruded-fortified-rice-kernels.

[30] Standing Together For Nutrition Consortium. One Virus, Many Consequences: A Call to Action to Stand Together and Build on Evidence to Inform Nutrition Responses.https://forms.gle/D7TyMUanzMj7VD5i9.

[31] UNICEF, FAO, WFP and WHO. Child malnutrition and COVID-19: the time to act is now. The Lancet. Vol 396 August 22, 2020. https://doi.org/10.1016/ S0140-6736(20)31648-2.

Development, Irish Aid, the United Kingdom's Foreign, Commonwealth & Development Office (formerly called "DFID"), the United States Agency for International Development, Global Affairs Canada, the Australian Department of Foreign Affairs and Trade, the Bill and Melinda Gates Foundation, the Children's Investment Fund Foundation, CGIAR Research Program on Agriculture for Nutrition and Health and the MacArthur Foundation. Collaborating with other donors and UN agencies offers the opportunity to scale up efforts and effectively reach more vulnerable populations.

At the global level, the Global Fortification Technical Advisory Group (GF-TAG) – a multi-stakeholder partnership comprising donors, UN agencies, governments and non-governmental organisations active in food fortification – meets periodically to discuss issues of mutual interest, and convenes the Global Summit on Food Fortification every five years. The EU-funded Food Fortification Advisory Services (2FAS) is actively engaged in the GF-TAG.

Figure 1: Stakeholders in national and regional fortification programmes

4. How food fortification meets EU political priorities while enhancing resilience to the COVID-19 pandemic and other crises

The **Commission's headline ambitions**[32] of the European Green Deal, digitalisation, investments for jobs and growth, migration, governance, peace and security, as well as Human Development horizontal priority, need to be shaped to, and implemented in, partner country contexts impacted by the COVID-19 pandemic. The degree of vulnerability that various partner countries have shown to the pandemic, the way governments have reacted, the existence of specific strategies to fight the disease, and its socio-economic consequences need to guide EU-wide support, as well as Team Europe Initiatives.

[32] European Commission. Commission Priorities for 2019-2024. https://ec.europa.eu/info/strategy/priorities-2019-2024_en.

The **EU Farm-to-Fork Strategy**,[33] unveiled on 20 May 2020, recommends a pathway to address comprehensively the challenges of sustainable food systems. It recognizes the inextricable links between healthy people, healthy societies and a healthy planet, and states that the EU will support the global transition to sustainable and inclusive agri-food systems which ensure food and nutrition security, and access to sufficient, safe, nutritious and sustainable foods for all.

Food fortification can help to make nutritious food more available and affordable, especially at a time when micronutrients are essential to keep populations healthy and less susceptible to infection. Out of the 61 countries that have joined the Scaling-Up Nutrition (SUN) Movement and are committed to reducing malnutrition, 59 have mandatory legislation for food fortification (hence recognizing food fortification as an important development strategy) and have included it in their National Development Plans. Today, 129 countries worldwide mandate the iodization of salt, 84 the fortification of one or more grains (wheat, maize and rice) and 27 the fortification of edible oils.[34] More than 300 varieties of 11 nutrient-enriched staple crops have been released or are in testing in more than 60 countries around the world.[35] The EU supports food fortification programmes in partner countries focusing on improving the availability of fortified staple foods and condiments that are commonly consumed in large quantities by beneficiaries, for example: wheat flour, maize flour, oil, salt, cassava and orange-fleshed sweet potato. In no instance does the EU promote the fortification of unhealthy processed food rich in saturated and trans fats, added sugars and sodium ("junk food") putting consumers at risk of overweight/obesity and non-communicable diseases related to over consumption of these foods.

Availability and affordability of locally produced fortified foods help to strengthen population resilience in fragile contexts, especially for the most vulnerable, and can strongly improve local and national preparedness and response capacities to man-made crises and natural disasters.

5. Food Fortification – opportunities to engage with the private sector on development objectives

In the majority of LMICs, food is supplied by SMEs. According the SUN Business Network, SMEs in Africa produce 70% of the food that reaches low-income consumers. These enterprises generally struggle to access finance. Less than a quarter of the financing needs of the 450 million SMEs in developing countries are being met – the Initiative for Smallholder Finance estimates an annual financing gap of more than US$150 billion. Private investment in the agricultural sector, in particular in African countries, is less profitable and more risky than investments in other sectors.

Increased public investment in the agricultural and food industry sectors, hand-in-hand with private investments, could increase the profitability of private capital, and align private investment with development objectives. In this context, there is a strong appetite to scale up the use of innovative financing mechanisms, such as blending, to leverage more private funding into agricultural investments.

Increasing private investment in agriculture – and creating decent jobs – occupies a central role in the EU's current and future thinking. This presents an opportunity for focusing the EU investment on improving nutrition outcomes through the promotion of sustainable value chains of fortified products and staples, ensuring that the full range of instruments – private investments, public investments, grant assistance, and also dialogue mechanisms – contributes to the sustainable growth of our partner countries. Increased investment in targeted agri-food SMEs combined with technical assistance would contribute to positive nutrition outcomes by increasing the supply and consumption of safe, nutritious

[33] European Commission. Farm to Fork Strategy – for a fair, healthy and environmentally-friendly food system. EU. 2020. https://ec.europa.eu/food/farm2fork_en.

[34] Global Fortification Data Exchange. https://fortificationdata.org/.

[35] Harvest Plus. Biofortified crop map: What is available where? https://www.harvestplus.org/file/2653/download?token=tl3q_c9C.

foods, as well as the ability of SMEs to cope with and respond to crises by reducing their dependence on international supply chains and pipelines.

The EU relies upon the Development Financing Institutions, including the European Investment Bank (EIB), for blending activities. To date these have taken several forms (in each case mixing risk capital and technical assistance contributions):

- First loss contributions to investment funds, such as the Africa Agriculture and Trade Investment Fund - ATIF (KfW lead, EU contribution of EUR 30 million) and the Agribusiness Capital - ABC - Fund (IFAD, EUR 45 million);
- EU investment capital and technical assistance for an investment facility, such as the Agriculture Financing Initiative - AgriFI (FMO, EUR 39 million);
- Credit lines for investments via financial intermediaries, such as for Huruma Fund which improves access to finance in rural areas and the financial supply to small or excluded farmers (COFIDES, EUR 19 million), but also EIB programmes in Kenya, Malawi and Zambia (together totalling almost EUR 35 million);
- Under the European Fund for Sustainable Development's guarantee window for agribusiness the Agricultural and Rural Finance Label (AGREENFI) has been agreed (with AFD-PROPARCO, not signed yet), where the EU guarantee up EUR85 million (with an increase to EUR 160 million proposed under the COVID-19 response) and technical assistance (EUR 8.5 million) will support the provision of credit lines for agribusiness investments that benefit smallholders.

These blended finance investments use private sector mechanisms. They are, in principle, accompanied by technical assistance provided by the public sector, in recognition of the immediate risks of these investments. These seek to strengthen the organisational aspects of the supply chain in some cases, but can equally support the ability of local finance institutions to provide a suitable product for agriculture.

In some cases, blended finance is accompanied by parallel programmes providing grant support with the aim of promoting the wider value chain, and so strengthening the credible demand for capital – especially in areas where there is a strong development potential. The nature of these activities varies, but it underlines the potential for public sector engagement in preparing the ground for subsequent private sector investments.

It should be noted that in some countries where conditions are particularly difficult due to political instability and economic crises, it is not possible to use blending finance facilities.

Technical assistance can support local SME processors of fortified food to improve their performance and sustainability:

- Helping to ensure food quality and safety, by setting standards for the nutrient content of fortified foods.
- Preventing food loss and waste through appropriate storage, packaging and transportation.
- Avoiding contamination by developing capacity in good manufacturing practices.
- Ensuring overall quality through quality assurance and quality control of ingredients and products.
- Ensuring the development of adequate supply chain models to serve the most vulnerable populations.

Beyond technical support, grant-assisted programmes can provide wider support such as business and market capability development for producers and other key players in the supply chain (such as retailers and distributors) to improve access to, and supply of, fortified foods and nutrient-enriched seeds. This not only helps to contribute to SDG 2 on ensuring access to "safe and nutritious foods" for all, but also to SDG 8 on job creation, entrepreneurship and inclusive economic growth.

The EU is currently funding several projects where SMEs are supported with trainings, processing equipment and technical advice to develop their production and to improve the quality of their products (Annex 2).[36] There is a huge potential to scale-up these investments.[37] Ongoing projects are funded by grants, but blended finance is also possible, using the EU's financial instruments such as AgriFI and the ABC Fund.

As well as supporting local producers of fortified food, there are also opportunities for European companies to partner and engage in developing countries by supporting quality control services in fortification programmes or by providing technical support to projects. Partnerships between European companies and local SMEs enable mentoring and capacity building on much needed areas of expertise, building the capacity of SMEs to become stronger, economically viable and resilient in the face of crises. Expertise that could be transferred to the SMEs in partner countries includes: food processing and quality control; business planning and marketing; and supply chain management from farmers' organisations to consumers, with particular attention to the environment in order to ensure sustainable development.

Working with the private sector is an essential part of food fortification programmes, especially industrial and point-of-use fortification. However, it also implies the risk of conflict of interest, which needs to be mitigated, especially with the fortification of non-healthy foods that some multi-national and national companies could promote.

6. Practicalities: integrating food fortification into sectorial support

Food fortification measures should always be adapted to the local context and designed to address the causes of the micronutrient deficiencies. Food fortification should be considered alongside other strategies to address micronutrient deficiencies, such as promoting increased availability, access and consumption of healthy diets.

As a first step, in order to determine if and what kind of food fortification is an appropriate strategy in a specific country, a situation analysis needs to be conducted to identify and quantify micronutrient deficiencies, and to determine their causes. Such an analysis should identify whether micronutrient deficiencies are a public health concern, and which population groups are affected. Key indicators should be considered, for example: prevalence of different forms of malnutrition in children under 5, women of reproductive age and pregnant/breastfeeding women; prevalence of micronutrient deficiencies (with details on which vitamins and/or minerals are deficient among the target population, for example: vitamin A deficiency in children under 5, folate deficiency in women of reproductive age, iron deficiency among children and women). This can determine whether a population-based approach or a targeted programme is needed.

When the situation analysis shows that the level of prevalence and causes of micronutrient deficiencies justify the implementation of food fortification programmes, it is necessary to identify the most appropriate type of food fortification (nutrient-enriched crops, industrial fortification or point-of-use-fortification) considering the population groups affected and other local settings. Often, a mix of programmes is needed to adequately address all population groups. Depending on the local food system, it may not be feasible to implement certain types of fortification programmes. An analysis should be undertaken to determine, among other things, local consumption patterns, industry structure/capacity and agro-ecological conditions. In particular, food vehicles identified for fortification need to be adapted to the local context and cultural habits. Such a food vehicle should

[36] Food Fortification Advisory Services (2FAS). Overview of EC funded food fortification initiatives. January 2020. Available at https://52e290c5-5ae7-4142-a06a-2dd5ebbc41f3.filesusr.com/ugd/613086_f57cd4a17f5a4e349e9b5ab5aeca3e3c.pdf.

[37] Hoogendoorn A, Luthringer C, Parvanta I and Garrett GS. Food Fortification Global Mapping Study. 2FAS, 2016. https://static1.squarespace.com/static/553f9958e4b06d466cd3ce1e/t/594d257b29687feedff9ee2b/1498228161192/Global+Mapping+Study+2016.pdf.

preferably be a locally produced staple food (for example: vegetable oil as a vehicle for vitamin A, or millet flour as a vehicle for folic acid).

There are many ways to encourage food fortification as a contributor to a pro-equity agenda**.** Some illustrative actions include:

Agriculture and value chain actions:

- ⇒ Partner with **agricultural institutions** to support the development of nutrient-enriched crops, diversified farming systems and healthy food systems.
- ⇒ Where nutrient-enriched crops have been released (validated by local authorities), support scale-up by farmers and uptake by consumers. Support research aiming at national and global benefits (e.g. the effects of climate change on the nutrient quality of food systems and the impact on child and maternal nutrition, and the development of climate-smart nutrient-enriched crops).
- ⇒ Enhance the **scale up of nutrient-enriched crops**; support the commercialisation of nutrient-enriched seeds through seed production and retail strategies, including last mile distribution.
- ⇒ Promote **value chains in the effort to stimulate private investment**:
    - Integrate fortified staples, including nutrient-enriched crops, into **sustainable food value chains**, e.g. fortified cassava and beans (Democratic Republic of Congo) and sweet potatoes (Ethiopia). There is room for expansion and knowledge sharing.
    - Give priority to supporting **value chains** of the most nutritious crops (e.g. niebe and millet)**.**

Private sector/support to SMEs actions:

- ⇒ Promote **employment creation and economic growth** by supporting new business models for fortified foods and nutrient-enriched crops, as well as **SME business development,** including access to finance. Whenever possible, link with the local SUN Business Network to see how to support local SMEs.
- ⇒ Strengthen **trade and regional markets** for fortified foods and nutrient-enriched crops by working with regional economic communities (RECs) on harmonization of regional food quality and safety standards, mutual recognition schemes, regional monitoring frameworks and proficiency testing schemes. Play a catalytic role through regional convening of RECs such as Economic Community of West African States (ECOWAS), East African Community (EAC), Southern African Development Community (SADC), Association of South East Asian Nations (ASEAN) and other regional economic and cooperation communities.
- ⇒ Mitigate vitamin and mineral premix **supply chain** disruptions as exemplified by the COVID-19 pandemic; support or strengthen local premix distribution systems to ensure availability of buffer stocks.
- ⇒ **Prioritise support to SMEs** through various instruments, including blended finance, to enhance access and availability of safe and nutritious foods (post COVID-19, finance may be drawn towards less risky high return investments).
- ⇒ Support the **gender equity agenda** by economically empowering women producers of local fortified foods, and by promoting research on the impact of nutrient-enriched crops on women and children, and on economic and social changes (costs, distribution, and the value to commercial stakeholders).

Health and social protection actions:

- ⇒ Promote the production and distribution of fortified products and staples in **social protection programmes**' food assistance interventions accompanied by measures enhancing nutrition knowledge. Include fortified foods in EU grants, through distribution and social protection programmes.

⇒ Promote sustainable access for the most vulnerable to **quality health care** by including fortified food incentives such as fortified complementary foods for infants and young children and/or fortified staples in national safety net programmes accompanied by nutrition education programmes. To achieve full impact of provision of food incentives at the health facilities, optimal coverage and accompanying resources (human resources, logistics, technical capacities, financing) should be ensured.

⇒ Support generation of solid evidence on the overall effectiveness of **point-of-use fortification** to strengthen the **resilience of vulnerable populations to shocks** in the local context**.** If conducive, adopt this approach alongside growth monitoring and prevention activities and wherever health practitioners work with children, adolescent girls, and pregnant and lactating women.

⇒ Partner with national and local authorities to promote measures that could enhance access of the poorest with a high malnutrition burden (e.g. the urban poor with no access to social protection, or the rural poor with limited capacity or access to agri-based livelihoods) to nutritious diets and nutrient enriched crops.

Knowledge management and digital technology:

⇒ Enhance **innovation and digital technology** by considering product innovations in ingredients and micronutrients, and systems innovations that would build on big data management and artificial intelligence. Support fortification management information systems and digital systems such as smart fortificant dosifiers and inline analytical and process data technologies for food fortification Establish data-driven feedback loops to optimize the impact of fortification by assessing consumption patterns and nutrient intake.

⇒ Enhance **learning and health outcomes**, ensure school feeding programmes are nutrition sensitive, when relevant by promoting fortified staplecomplementary foods and point-of-use fortification.

⇒ Where **nutrition knowledge** is limited, and inappropriate eating and care behaviours impede consumption of fortified foods (especially by the most vulnerable) develop information campaigns and social and behaviour change communication to generate demand for fortified foods. This can be developed with governments or/and with national institutes in charge of communication on nutrition.

Policy/regulation actions:

⇒ Support **food control**, and **regulatory monitoring and enforcement**, including costing studies of various models of regulatory financing, and support subsequent reforms. Enforcement of food regulation and monitoring is constrained by resource limitations, and the situation is likely to worsen as a result of negative economic growth due to COVID-19.

⇒ Support food fortification and safety standards setting; guidelines development; and national food fortification policies, strategies and workplans.

Conclusion

The new European Consensus on Development recognizes that all forms of malnutrition – including micronutrient deficiencies – are a crucial impediment to comprehensive human development, social and economic inclusion and poverty alleviation.

Food fortification is a proven, cost-effective strategy allowing for multiple partners, public and private, to work together on enhancing progress towards the 2030 Agenda for Sustainable Development, while at the same time improving the resilience of populations to infectious disease.

The urgency to come together to ensure that vulnerable populations have access to essential micronutrients is even more prominent under the current health crisis that has gripped the world, especially those countries already affected by humanitarian crises. The COVID-19 pandemic, and the shocks caused by containment strategies to reduce transmission, could have unprecedented impacts on global hunger and malnutrition – and thereby on mortality, human capital and future productivity of countries. Addressing micronutrient deficiencies in COVID-19 response, and also in tackling future crises, by integrating food fortification measures would not only contribute to strengthening human resilience to infectious diseases, but also enhance optimal physical growth and mental development of children affected by the pandemic.

Furthermore, food fortification offers opportunities to engage with the private sector on public health and development objectives. Supporting local producers of fortified food not only improves the nutritional status of local people, but also creates jobs and boosts local economies. According to the World Bank, growth based on agricultural productivity is almost three times more effective in raising the incomes of the poorest than growth in other sectors. Due to continued population growth and urbanisation, the imports of food into Africa now exceed its exports by EUR20 billion each year.[38] Food fortification provides significant opportunities to contribute to positive nutrition outcomes by increasing the supply and consumption of safe, nutritious foods from local smallholders. Food systems in our partner countries are capable of responding – since the early 90s, production volumes and amount of produce being sold in the market have increased substantially in Africa, as in Asia. There is great interest in supporting new nutrition-enhancing investment tools for replication in the agri-food sector.

How to ask for support:

You can contact the Nutrition Team of DEVCO Unit C1 for more detailed information and policy and technical advice: Mrs. Fadoi Chaouki, Policy Officer: Fadoi.CHAOUKI@ec.europa.eu; in copy to: EuropeAid-C1-NUTRITION@ec.europa.eu.

We can facilitate technical expertise from the EU's Food Fortification Advisory Services (2FAS) for identification, formulation, monitoring and evaluation of projects and policies related to food fortification. 2FAS offers technical and institutional assistance, including evidence-based policy guidance and capacity development. 2FAS is implemented by Landell Mills in partnership with the Global Alliance for Improved Nutrition (GAIN): https://www.2fas.org/.

[38] Rakotoarisoa MA, Iafrate M, Paschali M. Why has Africa become a net food importer? Explaining Africa agricultural and food trade deficits. FAO, 2011 http://www.fao.org/3/i2497e/i2497e00.pdf.

Annex 1: Partner countries with mandatory food fortification

Country	Food Vehicles with Mandatory Legislation	Country	Food Vehicles with Mandatory Legislation
Afghanistan	Salt, Oil, Wheat Flour	**Kenya**	Salt, Oil, Wheat Flour, Maize Flour
Angola	Salt	**Lao People's Democratic Republic**	Salt
Bangladesh	Salt, Oil	**Madagascar**	Salt
Benin	Salt, Wheat Flour	**Malawi**	Salt, Oil, Wheat Flour, Maize Flour
Burkina Faso	Salt, Oil, Wheat Flour	**Mali**	Salt, Maize Flour
Burundi	Salt, Oil, Wheat Flour	**Mauritania**	Salt, Oil, Wheat Flour
Cambodia	Salt	**Mozambique**	Salt, Oil, Wheat Flour, Maize Flour
Cameroon	Salt, Oil, Wheat Flour	**Myanmar**	Salt
Chad	Salt	**Nepal**	Salt, Wheat Flour
Côte d'Ivoire	Salt, Oil, Wheat Flour	**Niger**	Salt, Wheat Flour
Democratic Republic of the Congo	Salt	**Nigeria**	Salt, Oil, Wheat Flour, Maize Flour
Djibouti	Salt, Oil, Wheat Flour	**Pakistan**	Oil
Ethiopia	Salt	**Rwanda**	Salt, Oil, Maize Flour, Wheat Flour
The Gambia	Salt	**Senegal**	Salt, Oil, Wheat Flour
Guatemala	Salt, Wheat Flour, Maize Flour	**Sierra Leone**	Oil
Guinea-Bissau	Salt	**Somalia**	Salt
Haiti	Salt, Oil, Wheat Flour	**Sri Lanka**	Salt
Honduras	Salt, Wheat Flour	**Sudan**	Salt

Reference: Global Fortification Data Exchange. https://fortificationdata.org/

Annex 2: Overview of EU-funded food fortification initiatives

Chad

Country profile/nutrition situation

Micronutrient deficiencies are widespread in Chad, with vitamin A and iron deficiencies highly prevalent among young women and children. Iron deficiency anaemia is a major public health problem, with more than three-quarters of young children and more than one-third of adult women affected. In addition, the country suffers high rates of stunting, with a national average of 32.4 percent. According to the Lancet Series 2013, complementary food which meets quality standards is one of nine interventions that can have a significant impact on the nutritional status of children aged 6-23 months.

Project name:	**AFORT**
Project location:	Ouaddaï, Logone occidental, Logone oriental, Moyen Chari, N'djamena, Tandjilé
Project duration:	January 2017-December 2020
Target groups:	225,000 children aged 6-23 months
Final beneficiaries:	12 women's economic interest groups (EIGs)
Type of fortification:	Point-of-use

Summary of the project

In 2016, the EU Delegation in Chad funded a programme for the production of complementary foods, called PRO-FORT. The programme focuses on establishing a value chain for a fortified food targeted at children aged 6-23 months.

As part of this programme, the AFORT project, implemented by the World Food Programme (WFP), supports 12 women's EIGs who produce artisanal flour for complementary feeding. The project provides EIGs with micronutrient powders, which they then give to caregivers who buy their infant flour, so that it can be fortified at point of use.

The project also provides technical support to the EIGs on production techniques, quality control and hygiene, and packaging and preservation. Additionally, EIGs are trained on optimal infant and young child feeding practices (IYCF) and the use of micronutrient powders, so that they can pass on this knowledge to their customers.

Over four years, the AFORT project aims to reach 225,000 children aged 6-23 months, improving their micronutrient status by enhancing the availability and quality of locally produced fortified complementary foods, as well as by strengthening caretakers' knowledge on IYCF. The project also aims to offer a long-term, sustainable business model for participating EIGs.

National partners

This project is being implemented in close partnership with Chad's Ministry of Health, the Directorate of Nutrition and Food Technology, and the Food Quality and Control Centre.

Democratic Republic of the Congo

Country profile/nutrition situation

The Democratic Republic of the Congo continues to face high levels of poverty, malnutrition and food insecurity. Almost 90 percent of arable land remains uncultivated, and agriculture is largely limited to subsistence production and cash crops. Stunting rates among children under 5 are very high at 42.7 percent; 61 percent are deficient in vitamin A; and 60 percent are anaemic. Additionally, 41 percent of women of reproductive age suffer from anaemia.

Project name:	**Fortification of food to fight micronutrient deficiencies in Kwango**
Project location:	Kwango province
Project duration:	February 2017-December 2022
Target groups:	Children under 5, and pregnant and breastfeeding women, in 500,000 households
Final beneficiaries:	All leaders (1,000) of Farmers' Organisations in the province; 42 nutrition sentinel sites
Type of fortification:	Nutrient-enriched crops

Summary of the project

The project is implemented by the Italian non-profit organisation ISCO-SC. It aims to improve the dietary diversity of 500,000 smallholder farming households in Kwango, comprising 2.3 million children, women and men.

Food insecurity and a lack of dietary diversity cause a high prevalence of micronutrient deficiencies and malnutrition in Kwango. A survey conducted by ISCO in 2010 showed that 70 percent of the population lack access to protein and micronutrient rich foods. Cassava, the main staple food, represents nearly 84 percent of total energy intake, and makes up the main source of protein. However, protein from cassava is of poor quality, resulting in low intake levels – 39 g daily, compared to a global daily average of 77 g.

The project aims to increase dietary diversity and protein intake through promoting the production and consumption of moringa and caterpillars, two local foods that are rich in micronutrients and high-quality protein. Prior to the project, moringa was almost non-existent in diets in Kwango, due to its traditional use as a medicine. Caterpillars are sold rather than consumed by the local population, due to their high monetary value.

The project is also introducing a variety of cassava, biofortified with vitamin A; yellow maize biofortified with vitamin A; and iron-rich lima beans. These varieties are also rich in sulphur amino acids which prevent a paralytic disease known as konzo, which is highly prevalent in Kwango.

National partners

This project is being implemented in close partnership with Kwango Provincial Ministry of Health; the Ministry of Agriculture and Rural Development; the Ministry of Environment; and a network of 'Organisations Paysannes' (OPs) or Farmers' Organisations. These organisations cover over 5,000 villages in a pyramid structure which stretches from village clusters to administrative territories. OP leaders are key to the delivery of project services; they work under the supervision of 14 nutritionists and 14 agricultural facilitators, located at local health centres.

Ethiopia

Country profile/nutrition situation

Food insecurity persists in Ethiopia, where undernutrition is a principal cause of child mortality. Despite progress in reducing stunting levels, Ethiopia has the 7th highest number of stunted children in the world, with 38 percent (6 million children) affected.

According to the 2016 Ethiopian National Micronutrient Survey, anaemia, Vitamin A deficiency, iodine deficiency and zinc deficiency are public health problems.

Project name:	**Quality Diets for Better Health**
Project location:	Four woredas in SNNPR (Southern Nations, Nationalities and People's Region) in southern Ethiopia
Project duration:	January 2017-June 2021
Target groups:	15,000 households containing women of reproductive age and/or children under 5; urban consumers and their households; Agriculture and Health Extension Workers and volunteers
Final beneficiaries:	Smallholder and commercial farms; sweet potato breeders; traders, retailers and food processors (e.g. bakers and injera makers); policy makers; local leaders; agriculture and nutrition professors and students
Type of fortification:	Nutrient-enriched crops

Summary of the project

Quality Diets for Better Health is implemented by the International Potato Center (CIP) in partnership with People in Need and Emory University. It seeks to improve food security and nutrition outcomes by supporting the production and consumption of a climate- and nutrition-smart orange fleshed sweet potato (OFSP), biofortified with vitamin A. Sweet potato is drought-resistant, and as such can strengthen the food and income security of the poorest households which have no access to irrigation.

The project aims to improve the demand and supply of OFSPs, and to integrate them into the SNNPR's agricultural and health promotion systems. Key activities include testing new varieties at community level; nutrition education and agricultural training through Healthy Living Clubs; and the introduction of new recipes to ensure that OFSP is included in a wide range of staple dishes.

The project has the potential to reach of over 3 million women and children who are at risk of vitamin A deficiency.

National partners

This project is being implemented in close partnership with the Regional, Zonal and Woreda offices of the Bureau of Agriculture and Health; Hawassa University; the Southern Agricultural Research Institute; and the Food Analysis and Nutritional Evaluation Laboratory.

The Gambia

Country profile/nutrition situation

The Gambia has a population of 1.9 million. Food insecurity and malnutrition are high, the highest levels being in North Bank Region and Central River Region. The 2018 Gambia Micronutrient Survey found that iron deficiency affects 60 percent of children under 5, and 41 percent of women of reproductive age; additionally, 18 percent of children under 5 suffer from vitamin A deficiency. In this latter age group, stunting rates are 15.7 percent, underweight 10.6 percent and wasting 5.8 percent.

2FAS is supporting two projects in The Gambia.

Project name:	**Improving Food Security and Nutrition in The Gambia through Food Fortification**
Project location:	National (industrial fortification); North Bank Region and Central River Region (nutrient-enriched crops)
Project duration:	March 2017 – February 2021
Target groups:	Women of reproductive age and children under 5
Final beneficiaries:	The Gambia Standards Bureau; Food Safety and Quality Authority; domestic wheat mills; edible oil and salt importers; National Agriculture Research Institute; female and male farmers; Agriculture Extension Workers
Type of fortification:	Industrial and nutrient-enriched crops

Summary of the project

The project is implemented by the Food and Agriculture Organization of the United Nations (FAO), in collaboration with United Purpose. It aims to reach beneficiaries with an integrated package of industrially fortified foods (wheat flour, vegetable oil and salt), as well as biofortified OFSP, iron-rich beans, and pro-vitamin rich cassava and maize. A nutrition education component is included, with a focus on IYCF.

National partners

This project is being implemented in close partnership with the National Nutrition Agency; the Food Standards Agency; the Department of Agriculture; the National Agriculture Research Institute; the Food Safety and Quality Authority; and the Ministry of Health.

Project name:	**Reducing micronutrient deficiencies of women and children in The Gambia through sustainable and integrated approaches to food fortification**
Project location:	Upper River Region, Central River Region, Lower River Region, North Bank Region and Western Coastal Region
Project duration:	February 2017 – February 2021
Target groups:	Women of reproductive age and children under 5
Final beneficiaries:	Smallholder farmers (especially women); National Agriculture Research Institute; local agriculture NGOs
Type of fortification:	Nutrient-enriched crops

Summary of the project

The project is implemented by United Purpose. It aims to reduce micronutrient deficiencies and increase dietary diversity by providing 18,000 smallholder farmers (75 percent of whom are women) with the capacity to cultivate OFSP, iron pearl millet and African leafy vegetables. In addition, mothers' clubs have been established to provide cooking demonstrations and nutrition education for mothers with children under 5, breastfeeding mothers and pregnant women. The project also aims to improve household security by creating strong value chains for the smallholder farmers' produce.

National partners

This project is being implemented in close partnership with the National Nutrition Agency; the Ministry of Agriculture; and ten regional non-governmental organisations.

Kenya

Country profile/nutrition situation

In Kenya, malnutrition remains a public health concern. Findings from the 2011 report, *Maternal and Child Health: Kenya*, show that undernutrition contributes to one-third of the deaths of children under 5. Micronutrient deficiencies in this age group are widespread, with almost 20 percent of young children suffering from iron deficiency, and 10 percent from vitamin A deficiency.

The Kenyan Ministry of Health implements different strategies to fight malnutrition, one of which is food fortification.

Project name: **Strengthening the Kenyan National Food Fortification Programme**
Project location: National
Project duration: January 2017 – December 2022
Target groups: Poor and vulnerable groups, women, girls and children
Final beneficiaries: Jomo Kenyatta University of Agriculture and Technology; the Ministry of Health; small and medium milling businesses
Type of fortification: Industrial

Summary of the project

National law in Kenya requires all commercially produced maize flour to be fortified. However, although large-scale millers fortify their maize flour successfully, most medium- and small-scale millers struggle with technical constraints and knowledge gaps. The project aims to enable these millers to adequately fortify their maize flour. This is especially important because small- and medium-scale millers produce flour primarily consumed by low socio-economic groups.

The project is being implemented by Jomo Kenyatta University of Agriculture and Technology (JKUAT). In addition to building the capacity of small- and medium-scale millers, it aims to strengthen the legal structure and governance for food fortification, and to spread consumer awareness on the benefits of eating fortified food.

National partners

This project is being implemented in close partnership with the Ministry of Health. Other partners are the Kenya National Food Fortification Alliance (KFFA); the Kenya Bureau of Standards; small-, medium- and large-scale maize millers; and community-based organisations.

Madagascar

Country profile/nutrition situation

Poverty affects two-thirds of the population of Madagascar, and is a major cause of household food insecurity. A third of the population is undernourished, and diets are insufficient in terms of both energy and diversity. Almost 50 percent of children under 5 are stunted, and 8 percent are wasted. Despite healthy IYCF practices, the quality of complementary foods is low.

Project name:	**Improving the nutritional status of the Malagasy, especially the most vulnerable (PFAO)**
Project location:	Centre-East, South, South-East and North regions
Project duration:	January 2017 – December 2021
Target groups:	Children aged 6-24 months, pre-school aged children, children and adolescents aged 6-14
Final beneficiaries:	Nutri'Zaza (local social enterprise), Taf Madagascar (Malagasy agribusiness)
Type of fortification:	Industrial

Summary of the project

The project is implemented by GRET and Madagascar's National Office of Nutrition (ONN). It aims to strengthen local production, distribution and promotion of fortified foods, and to develop fortified products for infants and children aged 6-23 months, children aged 3 to 5 years, and children and adolescents aged 6 to 14 years. The products are manufactured by the Malagasy agribusiness Taf, and distributed by local social enterprise Nutri'zaza through its network of baby restaurants (hotelin'jazakely) and various points of sale.

A monitoring and evaluation system is being designed to provide key nutrition actors and stakeholders in Madagascar with analyses of the efficacy of the project, including consumption rates, effectiveness, and quality-price ratios of the fortified foods.

The project is also supporting ONN, the Ministries of Health and Trade, and the National Food Fortification Alliance, to ensure a supportive national legislative framework for food fortification interventions.

National partners

This project is being implemented in close partnership with the Ministries of Health, Commerce and Primary Education.

Niger

Country profile/nutrition situation

Niger is one of the poorest countries in the world, with 44 percent of the population living on less than USD1 a day. The country is plagued by extremely high levels of stunting and wasting, with 48 percent of children under 5 are stunted, and 15 percent are wasted. Women of reproductive age are also highly affected by chronic undernutrition in rural areas, while overweight and obesity are emerging in urban areas. The high prevalence of malnutrition is associated with severe micronutrient deficiencies. Vitamin A deficiency is a major public health problem; and prevalence of anaemia is very high, affecting all population groups.

2FAS is supporting two projects in Niger.

Project name:	**Fortification de Produits Alimentaires Transformés (FOPAT)**
Project location:	Four regions – Zinder, Maradi, Tahoua, Dosso
Project duration:	December 2016 – December 2021
Target groups:	Smallholder farmers; small and medium food producers; general population
Final beneficiaries:	Union of Farmer Organisations; Sahara Sahel Food; the National Food Fortification Alliance; the National Agency for Verification and Compliance with Standards; the Directorate for Quality and Metrology; the National Laboratory in Public Health and Expertise
Type of fortification:	Industrial

Summary of the project

The project is implemented by WFP in collaboration with GRET. It aims to improve the quality and availability of nutritious fortified food products made from local produce – millet, niébé, groundnuts and selected wild foods. These foods, regularly consumed in Niger, have been chosen to appeal to local tastes and preferences. The project is supporting the entire value chain, from production, processing and certification, through to marketing and commercialisation. Objectives are to improve the nutrition status of the general population, as well as to increase household security for participating farmers and producers.

National partners

This project is being implemented with a number of national partners, including the National Fortification Alliance; the National Agency for Verification and Compliance with Standards; the Ministry of Agriculture; the National Institute of Agronomic Research; the National Directorate of Nutrition; and the National Association of Smallholder Farmers.

Project name:	**Projet d'Appui à la Fortification Alimentaire au Niger (PAFAN)**
Project location:	Ten districts (in seven regions) – Tillabery, Niamey, Dogon Doutchi, Tahoua, Keita, Mayahi, Tessaoua, Mirryah, Matameye, Maine Soroa
Project duration:	January 2017 – March 2022
Target groups:	550,000 children aged 6-24 months; 500,000 women of reproductive age; children under 2 with moderate acute malnutrition
Final beneficiaries:	Women's organisations; local agrifood companies
Type of fortification:	Industrial

Summary of the project

The project is being implemented by GRET, in collaboration with Misola, Garin Yaara, Concern Worldwide, Action contre La Faim Espagne and L'Institut de Recherche pour le Développement.

The project aims to improve the nutritional status of women of reproductive age and young children by strengthening the local production, distribution and promotion of fortified food products, within a supportive national legislative framework. This will be achieved by creating new production units; sensitizing populations on optimal food and nutrition practices; developing a fortified food for women, and supporting its production, distribution and promotion; implementing innovative door-to-door sales schemes of fortified foods; and supporting quality standards and certification of fortified infant cereals.

National partners

This project is being implemented in close partnership with I3N (Nigeriens Nourishing Nigeriens); the Ministry of Health; the Ministry of Commerce and Manufacturing; the National Mechanism for the Prevention and Management of Disasters and Food Crises; the Department of Standardization, Quality and Metrology (DNPQM); and the National Agency for Standards and Compliance.

Sudan

Country profile/nutrition situation

According to the Global Nutrition Report 2018, Sudan experiences a serious malnutrition burden among children under 5. Stunting prevalence in this age group is over 38 percent, compared to the developing country average of 25 percent. Wasting rates are almost double those of other developing countries, at nearly 17 percent.

A micronutrient survey was carried out in Sudan as part of the project, with technical support from the World Health Organization (WHO). Findings showed that 42 percent of children aged 6-59 months, and 16 percent of women of reproductive age, suffered from anaemia; and 13.5 percent of mothers suffered from maternal night blindness. There is also little protection against iodine deficiency disorders, with less than 5 percent of households consuming adequately iodized salt.

Project name:	**Improved nutritional status of vulnerable and deprived communities in Sudan through large-scale fortification, home fortification and the introduction of biofortified crops in rural communities**
Project location:	National (flour and salt fortification), urban areas (micronutrient powders), Kassala State (sorghum and millet nutrient-enriched crops)
Project duration:	January 2017 – December 2020
Type of fortification:	Point-of-use, industrial and nutrient-enriched crops
Target groups:	Women and girls of reproductive age, children aged 6-24 months
Final beneficiaries:	Sorghum and millet farmers; domestic wheat mills; salt processing plants; pharmacies; Sudan Standards and Metrology Organisation; the General Directorate of Environmental Health & Food Safety; the Ministry of Industry; National Seeds Administration

Summary of the project

This project is being implemented by WFP, in collaboration with FAO, WHO and the Government of Sudan. It aims to improve the nutritional status of vulnerable groups across Sudan, particularly women, girls and children under 5. The project is building the capacity of government to implement a national food fortification programme by initiating industrial fortification of wheat flour and vegetable oil; the project is also assisting the improvement of national salt iodization efforts. Support is being provided to the private sector to produce iron- and zinc-biofortified sorghum and millet, and to produce a micronutrient powder (brand name *Vitamino*) which will be commercially available at an affordable price.

The project includes an awareness raising component on micronutrient deficiencies, as well as social marketing of Vitamino.

National partners

This project is being implemented in close partnership with the National Food Fortification Alliance; the Ministries of Health, Agriculture, and Industry; and national regulatory bodies and research institutions.