



A blueprint for the design and implementation of large-scale food fortification programs

Evidence-based guidance to support large-scale food fortification program managers and planners

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Overview

The *Blueprint for fortification planning and programming* (the Blueprint) was developed through a collaboration between Nutrition International and the Food Fortification Initiative from January to June 2021.

Various partners and organizations working in fortification have created differing food fortification frameworks to guide program managers through the design, implementation, scale-up and monitoring of fortification programs. With these multiple frameworks available, it can be challenging for nations to determine optimal methods needed to design, implement and sustain fortification programs, particularly following the cessation of external technical support.

To this end, Nutrition International and the Food Fortification Initiative aimed to review existing frameworks and craft a novel approach as a means of operationalizing the review findings with ideals derived from current frameworks. Based on strengths, weaknesses, innovative concepts and gaps found in current frameworks and obtained from stakeholder discussions, the initial Blueprint was drafted.

Between November 2025 and March 2026, Nutrition International undertook a second review of the Blueprint to capture new tools, resources (guidelines, publications, policy briefs, experiences, etc.) and learnings. When practiced, these will ensure that large-scale food fortification (LSFF) programs — an imperative component of food systems — are implemented with the required technical and operational expertise and eventually integrated in national and subnational nutrition priorities. An internal Nutrition International validation committee was set up to review and approve the revisions.

The Blueprint is publicly posted and available on Nutrition International's website. The full study can be accessed here: [A blueprint for fortification planning and programming: Lessons learned from an analytical review of existing fortification frameworks](#). A [condensed version of the Blueprint](#) is also available.

How to use the Blueprint

The Blueprint aims to provide a broad-spectrum guide for program managers (within governments and/or partner organizations) of large-scale, mandatory food fortification programs. It considers learnings from a multitude of organizations and individuals, in addition to components known about current fortification programming shortcomings, such as the limited attention given to effective private sector business models, capacitating national academic institutions and reassessing fortification program design.

The goal of a single, streamlined fortification framework, drawing on review findings, is multi-faceted. It intends to do the following:

1. Provide a comprehensive and actionable design guide for individuals and agencies supporting fortification programming.
2. Better inform governments and partners about key elements for consideration at each stage of the fortification process, including elements needed for scaling and sustaining effective interventions.
3. Harmonize the approach to key programming elements, such as regulatory monitoring and the creation of fortification standards.
4. Draw renewed attention to key programming elements often absent from fortification program design.
5. Inform improved fortification policies and practices, enabling the design of more efficient and sustainable programs that retain the ability to generate a robust and meaningful impact on target populations.

Further, the Blueprint intends to refresh program thinking and priorities and to provide renewed guidance concerning program components required to scale fortification initiatives and achieve nutrition impact goals.

The Blueprint is organized into seven major programming actions, with each action further separated into specific components. Where relevant, the Blueprint provides existing tools and resources to enable the user to complete each action. Although the seven major programming actions are presented as a sequence of steps, it should be noted that several of the activities could occur simultaneously. The sequencing of the actions should be taken as a general guide and should not be interpreted as a requirement for countries to explicitly follow them as numbered.

For example, although countries will need to establish standards before the private sector begins fortification, a fortification strategy or policy does not necessarily have to be formally prepared before standards or legislation are finalized. Similarly, engaging and/or strengthening civil society or national laboratories can commence in the early stages of fortification implementation and does not have to wait until the formulation of policies or strategies.

The findings from the review and the proposed Fortification Blueprint intend to provide a call to action (and a means to operationalize this call to action) aimed at national and global-level policy makers, program implementers and donor agencies around the need for a renewed look at fortification program design. Due attention in the program design process is required to ensure the inclusion of innovative models and overlooked or undervalued programming components that break from status quo operations and aid in swift and feasible program adoption and maintenance.

HIGH-LEVEL OVERVIEW

ASSESS

- 1 Justify:** Identify need and feasibility with national stakeholders
 - Identify need and relevance of fortification; assess fortification as part of an optimal mix of interventions.
 - Demonstrate feasibility of fortification.
 - Provide justification for fortification.

ANALYZE

- 2 Galvanize:** Map and motivate key stakeholders
 - Map fortification stakeholders.
 - Build partnerships/alliances.
 - Garner political will.
 - Support national budgetary inclusions.
 - Support political, private and civil sector advocacy.
 - Align national programs with global/regional efforts and guidance bodies.
 - Identify and mobilize fortification champions.

ACT

- 3 Enable:** Establish guiding structures related to policy, legislation, standards and monitoring guidelines
 - Draft fortification policy.
 - Draft fortification legislation.
 - Establish fortification requirements included in food standards or food regulations.
 - Identify/establish inspection, audit and enforcement opportunities within existing food control system.

- 4 Operationalize:** Establish an enabling environment for industry
 - Identify industry scale-up support; and ensure strong QA/QC protocols (including quality premix and equipment).
 - Explore effective business models for food producers.
 - Ensure creation of a level playing field.

- 5 Monitor:** Enable inspection, audit and enforcement
 - Establish and strengthen regulatory monitoring and enforcement systems (including training inspectors on regulatory monitoring practices or an alternative means of assessing compliance).
 - Capacitate civil society to hold industry accountable.

- 6 Evaluate:** Establish coverage and nutritional impact assessment and evaluation
 - Support integration of key indicators into ongoing national surveys.
 - Capacitate academic institutions.

REASSESS

- 7 Review and reassess:** Ensure continued program harmonization and optimization
 - Review relevance and appropriateness of fortification standards and program design, and make adjustments as necessary.

CROSS-CUTTING THEMES

Institutionalize: Ensure national program ownership

- Integrate fortification into existing nutrition plans and national systems.
- Support the creation of academic curriculum on fortification.
- Establish mechanisms that favour financial self-sustainability.

Mainstream gender equality and safeguarding into LSFF programs: Integrate gender equality in public and private sector supporting fortification efforts

- Integrate gender-responsive business practices in fortification industry.
- Advocate for women as leaders to provide technical oversight to and for enforcement of fortification programs.

Do no harm: LSFF programs should not cause unintentional harm to the target population

- Reducing or eliminating industrially produced trans fatty acids in fortified oil and food items prepared using the same.
- Guidance to integrate sodium reduction with salt fortification program.
- Use of iodized salt for processed foods.

Food systems: Reiterate that LSFF programs are an integral component of food systems and need to be integrated in national and sub-national nutrition priorities

Justify: Identify need and feasibility with national stakeholders

A. Identify public health need and relevance of fortification; assess fortification as part of an optimal mix of interventions

Obtain up-to-date national data on dietary inadequacy and/or micronutrient deficiency and establish the need to improve population dietary quality and nutrient intake for specific vitamins and minerals, disaggregated by geography and demographics where possible. Identify current micronutrient interventions in place and model the contribution of fortification and fortified foods, alongside other micronutrient interventions, to diets and to improving the identified dietary inadequacies. Determine whether existing micronutrient reduction strategies are sufficient to address the identified nutritional needs and demonstrate that fortification — under new and/or improved scenarios — can fill the dietary quality/nutritional gaps while complementing other nutrition-specific interventions. Identify professionals and institutions within the country with knowledge, credibility and experience in public health nutrition who can champion or influence fortification programming in-country.

TOOLS/RESOURCES

Public health and optimization assessments:

- USAID AFFORD Public Health and Costing Analysis Approach.
- University of California at Davis [MINIMOD](#) tool.
- [Micronutrient Action Policy Support \(MAPS\)](#).
- Data from National-level Household Income and Expenditure Surveys (HIES)/Household Consumption and Expenditure Surveys (HCES) are generally used to analyze nutrient gaps. However, the apparent intake data require food composition tables to convert intake into micronutrient content.
 - The Food and Agriculture Organization (FAO) has compiled a [list of links for different national-level HCES](#) to access data for different countries.
 - There is also a description of [common characteristics of key food and nutrition information that is available in HCES, as well as basic steps for processing HCES data](#) to fill food consumption information gaps.
 - In addition, guidance is available on the [use of expenditure data from HCES as a proxy for household food consumption for designing food fortification programs](#). Examples are available from [Guatemala](#), where HIES information was used to support the design of a fortification program, and the [Solomon Islands](#), where HIES data supported the identification of a potential food vehicle for fortification.
 - Very recently in India, data from two rounds of HCES (2011–2012 and 2023–2024) has been compared and visually presented through the [India Diet & Nutrition Dashboards](#), highlighting trends in diet affordability, micronutrient adequacy and dietary diversity.
- Iodine Global Network's [global scorecard of iodine nutrition](#) provides global and country-level status of iodine nutrition in 194 World Health Organization Member States based on national median urinary iodine concentration in school-age children.
- UNICEF's [Multiple Indicator Cluster Survey \(MICS\)](#) provides a tool guide to support overall planning, design and data collection in the field to data processing, analysis, interpretation, documentation and dissemination.

- [Nutrition data portal](#) is an interactive platform for summarizing nutrition data, including micronutrient data.
- WHO's [Vitamin and Mineral Nutrition Information System](#) (VMNIS) lists [Micronutrient Survey Analyser](#) as an online tool to perform comprehensive analysis of micronutrient status survey data for all populations.
- [OPTIMA Nutrition](#) provides practical advice to governments to assist with the allocation of current or projected budgets across nutrition programs.
- The Lives Saved Tool ([LiST](#)) is a mathematical modelling tool that allows users to estimate the impact of coverage change on mortality in low- and middle-income countries (LMIC).
- World Food Programme's [Fill the Nutrient Gap](#) (FNG) is a collaborative analytical process that combines secondary literature review with linear optimization to understand local drivers that affect the availability, cost and affordability of nutritious diets.
 - FNG analysis helps decision makers identify the most effective, context-specific interventions to improve access to healthy, nutritious diets for vulnerable groups.
 - The application of FNG analysis has been presented for selected countries in [Asia and the Pacific](#), [Eastern Africa](#), [Latin America and the Caribbean](#), [Middle East, Northern Africa and Eastern Europe](#), [Western Africa](#) and [Southern Africa](#). The [FNG and Fortification](#) resource lists the applications of FNG in identifying the entry points for fortification interventions through case studies from Burundi, Philippines, Ivory Coast and Mozambique.
 - It uses the [Save the Children's Cost of the Diet \(CotD\)](#) analysis tool to calculate the cost and affordability of nutritious diets. Here is a specific example of [introducing rice fortification through a social protection program in Indonesia](#) using FNG analysis.
- Food and Nutrition Technical Assistance (FANTA) [OPTIFOOD](#) is a linear programming software application that allows public health professionals to identify the nutrients people obtain from their local diets, and to formulate and test population-specific, food-based recommendations to meet their nutritional needs.
- The [Comprehensive Nutrient Gap Assessment \(CONGA\)](#) is an approach for identifying nutrient and evidence gaps by reviewing multiple evidence sources based on biomarker and/or dietary data. It does not require primary data collection or secondary quantitative data analysis but does require at least two experts in nutritional assessment.
- The [effectiveness of fortifying food with essential vitamins and minerals](#).
- Using secondary data, [a methodology was piloted using existing diet, market and diet -cost data](#) to assess its implementation feasibility and usefulness for LSFF decision making in Nigeria and Zambia.
- [Five lessons for advancing large-scale food fortification in the Global South](#).

Landscaping resources:

- The Organisation for Economic Co-operation and Development (OECD) compiled a [comprehensive framework for solid regulatory governance of LSFF](#), which lists six core pillars that are critical for the effective design and implementation of LSFF initiatives across diverse country contexts.
- The [Fortification Assessment Coverage Toolkit](#) (FACT) offers standardized methods for the collection, analysis and synthesis of data on quality, coverage and consumption of fortified foods across countries, as well as guidance on its [application in assessing program coverage in eight countries](#) and the [information generated from FACT surveys across different countries and contexts](#).

- The [Micronutrient Survey Manual and Toolkit](#) includes resources to help assess and monitor vitamin and mineral deficiencies, including national-level surveys such as the Demographic Health Survey (DHS) and the [Nutrition Data Portal](#).
- The [Global database on the Implementation of Food and Nutrition Action \(GIFNA\)](#) is an interactive platform for sharing standardized information on food and nutrition policies and actions.
- [Some data gaps hampering LSFF programs and potential solutions](#) in measuring LSFF program coverage, equity, monitoring and evaluation, program co-coverage and risk of excess intake, role of modelling and data networks/support to ensure target populations are reached.

B. Demonstrate feasibility of fortification

Based on knowledge of dietary micronutrient gaps among the target population obtained in Step 1a, identify appropriate vehicle(s) using the 5 Cs (coverage, cost, consumption, central processing, compatibility), as well as factors such as physiological availability, presence of dietary inhibitors and flour extraction rates. Assess milling and production infrastructure, reach and readiness of production facilities; conduct market analysis (including a review of storage conditions); conduct a supply chain diagnostic; and conduct a costing analysis to further assess plausible vehicles by context, considering economic implications and/or conducting an economic analysis.

TOOLS/RESOURCES

- USAID AFFORD LSFF industry feasibility assessment tool.

Consumption and/or coverage data:

- Catalogues of completed surveys, some of which provide downloadable datasets:
 - [World Bank's Living Standards Measurement Survey \(LSMS\)](#) microdata library.
 - [International Household Survey Network \(IHSN\)](#).
 - FAO country profiles for food availability data in grams per capita per day.
 - [FAO INFOODS](#) for national and regional food composition tables.
 - [FAO/GIFT](#) for country-specific food consumption data.
 - [Fortification Rapid Assessment Tool \(FRAT\)](#).
 - [GENuS Dataverse](#).
 - [Cost and Affordability of a Healthy Diet \(CoAHD\)](#).
 - [Food Balances](#).
 - [Global Fortification Data Exchange \(GFDx\)](#).
 - National Nutrition Surveys.
 - [Tufts Global Dietary Databases](#).
 - [WHO/CDC e-Catalogue](#) (quality, coverage, biological indicators, process indicators).
- It is important that the design of a successful fortification program includes the collection of nationally representative quantitative [24-hour dietary recall data](#) for relevant demographic groups in the target population.
- FAO's [dietary assessment](#) guidelines on methods for measuring food and nutrient intakes and their application in low-resource settings.

- [Example of maize flour fortification in Africa describing the markets, feasibility, coverage and costs.](#)
- [Critical areas in coverage and utilization in food fortification programs.](#)
- [Spatially representative statewide survey to assess household coverage of wheat flour, edible oil and salt](#) in Rajasthan, India.

Supply chain assessment:

- [Example supply chain diagnostic template for rice.](#)
- [Scaling up rice fortification in West Africa.](#)
- [Understanding the rice value chain in Lao PDR.](#)
- [Understanding the rice value chain in South and Southeast Asia.](#)
- [Iron rice fortification capacities, supply chain and campaign initiatives in the Philippines.](#)

Costing analysis:

- USAID AFFORD LSFF costing analysis approach (not currently publicly available; if interested, please see Nutrition International contact at the end of this document).
- USAID AFFORD costing analyses completed in Senegal, Madagascar and Zambia (not currently publicly available; if interested, please see Nutrition International contact at the end of this document).

Examples of landscape analysis:

- [Nutrition Landscape Information System \(NLIS\)](#) brings together nutrition-related indicators in a standardized form, helps to track changes over time and monitor progress, and generates easy-to-interpret country profiles.
- [Landscape analysis of large-scale food fortification in Indonesia](#) (covers cooking oil, rice, salt and wheat flour).
- [Landscape feasibility analysis of rice fortification in Indonesia.](#)
- [Landscape analysis of food fortification, quality and safety in West and Central Africa.](#)
- [Rice fortification in India.](#)
- [South Asia landscape analyses](#) on national iodine programs in Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.
- Supplemental landscape analysis of the National Salt Iodization program in the Philippines (pending public distribution, please contact Nutrition International and/or IGN to request access).

Introduction of fortified foods in social safety net programs:

- [Operational guidelines on rice fortification in India.](#)
- [Introducing double fortified salt in social safety net programmes in Madhya Pradesh and Gujarat in India: Success factors, challenges and lessons learned.](#)
- Case studies on insights and lessons learnt from [India's](#) successful pilot-to-scale approach for rice fortification and scaling up rice fortification in [Peru](#) through social assistance programs.

It is important to note that we can advocate to include fortified foods in social safety net programs, emergency response rations and school meal programs, as appropriate, even while advocating for mandating the legislation in the country if the standard for fortification have been developed already. It is important to note that fortified foods can be included in social safety net

programs, emergency response rations and school meal programs, as appropriate, while also advocating for mandatory legislation where fortification standards have already been developed.

C. Provide justification for fortification

Based on evidence collected above on need, relevance and feasibility, build a case to present to the government that justifies the inclusion of fortification into the national nutrition strategy and/or implementation plans.

TOOLS/RESOURCES

- Cost Benefit Analysis (CBA) tool for [wheat flour](#) and [cooking oil](#).
- [FFI's cost-benefit tool](#).
- Nutrition International's [Cost of Inaction Tool](#), which estimates the health, human capital and economic impacts of inaction on stunting, low birthweight and anaemia.
- A recently conducted [systematic review of cost effectiveness of food fortification for reducing global malnutrition](#) is available. It assessed data from 63 countries, including more than 40 LMICs (56 studies across 66 reports, reporting more than 200 analyses), and found that food fortification programs are likely cost-effective in most contexts. This is an important piece of evidence, particularly in resource-constrained economies.
- Further information includes:
 - [Implementing a revised standard for wheat flour fortification in Indonesia: A Benefit-Cost Analysis](#).
 - [Cost effectiveness of wheat flour fortification in Cameroon](#).
 - [Cost benefit analysis of rice fortification in India](#).
 - [Predicted effects and cost-effectiveness of wheat flour fortification in Cameroon](#).
 - [Cost-effectiveness of a folic acid fortification program in Chile](#).
 - [Costs and cost-effectiveness of the unfinished global fortification agenda in the 48 priority countries](#).
 - [An investment case for costs and benefits of folic acid fortification in developing countries](#).
 - [The economics of food fortification](#).
 - [Economic impact of using fortified rice in Cambodia's school feeding program](#).
 - [Cost-effectiveness of grain fortification](#).

Galvanize: Map and motivate key stakeholders

A. Map fortification stakeholders

Identify all government stakeholders that will be involved in a fortification program to gauge existing capacity and the gaps that need to be filled. Determine all partner organizations providing nutrition-specific and nutrition-sensitive support to the government. Assess the added value of additional external partner support for fortification based on technical abilities, budgets, timelines and mandates. Build partnerships/alliances with other development partners working in the country on nutrition interventions and messaging to provide a harmonized message to government.

TOOLS/RESOURCES

- [Example of partner mapping assessment](#).
- UN's [Nutrition stakeholder and action mapping](#).
- [Mapping stakeholders for nutrition](#) (part of the Maximising the Quality of Scaling Up Nutrition Plus Toolkit on Multisectoral Planning for Nutrition).

B. Build partnerships/alliances

Identify and convene all stakeholders, including (but not limited to) producers, civil society (e.g., consumer groups, parent and physician groups), necessary government agencies (including regulatory bodies), academia and external partners. Establish an alliance platform (often referred to as a National Fortification Alliance or NFA) or ensure that fortification is included in similar existing and functional nutrition or micronutrient-specific convening platforms. Agree on the roles and responsibilities of stakeholders, identify the lead or home agency/ministry responsible for guiding the national fortification program, and identify mechanisms to support the platform's long-term functionality. Industry engagement in this context should include consultation with food producers regarding the scope of legislation, standards, implications on regional trade and implementation timelines. Such convening platforms are useful mechanisms to allow different stakeholders to establish roles and responsibilities, coordinate efforts, drive collective decision making and take shared action. The establishment of a coordination or oversight structure is critical since inadequate or ineffective coordination is, in many cases, one of the weakest points of mandatory fortification programs.

TOOLS/RESOURCES

- [What is a National Fortification Alliance?](#)
- [The Fortification Collaborative – Micronutrient Forum](#).
- [Micronutrient Data Innovation Alliance – Micronutrient Forum](#).
- [Africa Regional Dialogue on Data for Action in Food Fortification – Micronutrient Forum](#) also offers a list of data relates sources.

C. Garner political will

Conduct a political readiness assessment and obtain government permission and willingness to move forward. Make a formal presentation to the relevant government body that recommends effective staples and market channels based on diagnostic results. Support the relevant government agency to establish a plan and move to the next phase. The primary actions government will need to take include: (a) drafting a policy; (b) drafting national standards that align with current dietary inadequacy needs and regional and/or global guidelines; (c) drafting and passing legislation; (d) establishing inspection, auditing and enforcement protocols; (e) identifying means by which the government can coordinate, oversee and maintain the program long-term; and (f) establishing

mechanisms to assess program performance and evaluate impact. Each action is vital to the success of the program; different sectors of government will be responsible for each action.

TOOLS/RESOURCES

- [Examples from Vietnam and Indonesia on the legal framework for food fortification.](#)

D. Support national budgetary inclusions

Outline all expected one-time and recurring government costs required for the program. Initiate high-level discussions that include a line item for fortification in fiscal year budgets. Discussions should outline one-time and recurring costs and establish a paying entity for each activity. The budget should include requirements for routine monitoring and alliance meetings and may also include surveillance/impact work. Discussions should also be held around how to mobilize existing national resources long-term for fortification programming and/or how to access alternative financing opportunities for such fiscal needs.

TOOLS/RESOURCES

- The University of California at Davis [MINIMOD](#) tool, used to help inform optimal interventions, contains a costing module with line items to calculate the cost of implementing fortification from the regulatory perspective.
 - Since this component is not publicly available, users will need to work directly with [MINIMOD researchers](#) to access this budget template. [ISF Advisors](#) is one group that supports the provision of technical guidance to the public and private sectors on how to mobilize sustainable financing for LSFF and nutrition in general.

E. Support political, private and civic sector advocacy

Assess the type of targeted advocacy that may be needed, including civic sector, ministerial level and/or private sector.

- **Civic sector:** Engage neurosurgeons, consumer associations, parent groups, political groups, local leaders.
- **Ministerial level:** Advocate across ministries, including health, finance, education, trade and commerce. Include cost-effectiveness analyses (outlined in 1b), if appropriate.
- **Private sector:** Engage food producers, industry associations, other private sector entities. Demonstrate to the private sector their potential contribution to national-level nutritional and economic impacts and assess perceived barriers to implementation by the private sector. Assess consumer perceptions of fortification, address any misconceptions and outline cost implications for consumers.

TOOLS/RESOURCES

- Nutrition International's [Cost of Inaction tool](#) (estimates on health, human capital and economic impacts of inaction on stunting, low birthweight, anaemia, etc. that can help support advocacy efforts).
- Spina Bifida Support Group Foundation and their advocacy material, The Global Alliance for Prevention of Spina Bifida (GAPSBiF).
- [FFI Fortification Communications Toolkit](#) and scroll down for the [link to the FFI Fortification Communications Workbook](#).
- FFI [Advocacy Alliances and Toolkit](#).
- [GAIN Global Food Fortification Advocacy Toolkit](#).

- [Manual for Country-Level Nutrition Advocacy](#) (step-by-step guidance for nutrition advocacy using PROFILES tool and nutrition costing).

Some suggestions on types of policy briefs to share during advocacy meetings:

- [Turning resolution into action: Implementing the World Health Assembly resolution on food fortification](#).
- [Large-Scale Food Fortification is a safe and cost-effective strategy to improve nutrition](#).
- [Policy Recommendations to Strengthen Programmes and Enhance Impact](#).
- [Mighty Nutrients Coalition Policy Brief – Preventing Micronutrient Deficiencies Worldwide](#).
- [Policy briefs](#) developed by Indonesian Nutrition Foundation for Food Fortification (KFI).
- [Nutrition Accountability Framework Commitment Tracker](#) (a useful resource to track LSFF specific commitments made by national governments and advocate for their operationalization including an option to [track progress made at the global, regional and country level](#) towards achieving the global nutrition targets).

F. Align national programs with global/regional efforts and guidance bodies

Engage regional bodies, such as the Caribbean Community (CARICOM), East, Central and Southern Africa (ECSA), Southern Africa Development Community (SADC), the Economic Community of West African States (ECOWAS) and the Association of Southeast Asian Nations (ASEAN). Ensure harmonization with global guidelines, regional standards or neighbouring countries. Obtain support as needed for implementation. Advocate for the inclusion of fortification into Scaling Up Nutrition (SUN) activities or other national/regional/global nutrition efforts.

TOOLS/RESOURCES

- [The Caribbean Community \(CARICOM\) regional fortification standards](#).
- [Economic Community of West African States \(ECOWAS\) harmonized regional fortification standards](#).
- East, Central and Southern Africa (ECSA) Health Community fortification standards for [wheat flour](#), [maize flour](#) and [edible fats](#).
- [ECSA Inspection Guidelines](#).
- [Southern Africa Development Community \(SADC\) Minimum Standards for Fortification](#).
- [ASEAN Guidelines and Minimum Standards for Implementation of Mandatory Large-scale Food Fortification](#).

G. Identify fortification champions

Ideally, this group will include individuals who can advocate for fortification in the country. Champions could be, but are not limited to, political appointees, celebrities or members of civil society, such neurosurgeons or academics.

TOOLS/RESOURCES

Example advocacy declaration:

- [The North American Teratology Society – Resolution on Folic Acid Fortification](#).
- [The Global Alliance for Prevention of Spina Bifida](#).
- Spina Bifida Support Group Foundations in different countries.

Enable: Establish guiding structures related to policy, legislation, standards and monitoring guidelines

A. Draft fortification policy

The government should draft and adopt a national fortification policy as a standalone policy or strategy or integrate the fortification policy within an existing national nutrition or micronutrient policy or strategy. Such a policy or strategy does not necessarily need to be formalized prior to the adoption of relevant legislation, but the process of formalization should be initiated at this early stage of programming.

TOOLS/RESOURCES

Example fortification and micronutrient policies or strategies:

- [Malawi Fortification Strategy](#).
- [Malawi National Micronutrient Strategy](#).
- [Tanzania Fortification Action Plan](#).
- [Pakistan Multi-sectoral Nutrition Strategy 2018–2025](#).
- [Philippine Plan of Action for Nutrition \(PPAN\)](#).
- [Mandatory food fortification and stunting reduction in Indonesia](#).
- WHO's guidance on [monitoring flour fortification](#).
- [Regulatory monitoring of national food fortification programs](#).
- [FFI monitoring framework shell](#).

B. Draft fortification legislation

Map the legislative process for a mandatory fortification program and support efficient enactment of the legislation. Address potential communication gaps between industry and public sector leaders, which can often result in legislation and standards that restrict, rather than enable, private sector investment in fortification. Legislation (and standards) for fortification should be within the national food control system, rather than a standalone intervention. The food control system sets basic requirements for food quality and safety; fortification should be legislated as a component of this system to facilitate implementation, enforcement and sustainability.

TOOLS/RESOURCES

- [FFI Standards and Legislation Document Checklist – 44-point checklist \(sample text\)](#): Fortification legislation, standards and monitoring often miss key items (use this checklist to review necessary components in English, French, Russian and Spanish).

C. Establish fortification requirements included in food standards or food regulations

Ensure that the formulation of premix and specific nutrients levels and ranges intended to fill identified nutritional gaps aligns with up-to-date consumption and dietary inadequacy data. Ensure harmonization of fortification standards with existing interventions/policies and regional fortification standards. Standards should include up-to-date guidance on the most appropriate fortificant forms and methods to establish realistic target levels and ranges based on what is plausible for local food producers. Include all relevant stakeholders in the standards setting process and ensure the regulations are actually enforceable in the context. Standards (and

legislation) for fortification should be requirements within the national food control system rather than a standalone intervention. The food control system sets basic requirements for food quality and safety; fortification standards should be a component of this system to facilitate implementation, enforcement, and sustainability.

TOOLS/RESOURCES

- [FFI Standards and Legislation Document Checklist – 44-point checklist \(sample text\)](#): Fortification legislation, standards, and monitoring often miss key items. Use this checklist to review necessary components in English, French, Russian, and Spanish.
- [WHO Guidelines on Fortification](#).
- [WHO Intake, Monitoring, Assessment, and Planning Program \(IMPAPP\)](#).

Tools for establishing country-specific fortification standards:

- [Food Fortification Formulator](#).
- [Proposing nutrients and nutrient levels for rice fortification](#).
- WHO-recommended fortification levels ([salt](#), [edible oils and fats](#), [wheat flour](#), [maize flour and corn meal](#), [rice](#)).

Additional documents on salt:

- [Guidance for Salt Fortification with Iodine](#).
- [Guidance on the monitoring of salt iodization programmes and determination of population iodine status](#).
- [Development of legislation and standards for wheat flour fortification in Indonesia](#).

D. Identify/establish inspection, audit and enforcement opportunities within existing food control system

Agree upon and draft realistic guidelines for government inspection, auditing and enforcement to ensure compliance with national standards, including effective incentives and penalties for the production of fortified foods and for compliance with these standards. Establish linkages to food safety.

TOOLS/RESOURCES

- FFI [Document Checklist](#): Fortification legislation, standards and monitoring often miss key items (use this checklist to review materials in English, French, Russian and Spanish).
- [2018 Regulatory Monitoring Policy Guidance Document](#): [template](#) for the adaptation of the Regulatory Monitoring Policy Guidance Document to a country-specific context.
 - [Monitoring flour fortification to maximize health benefits: a manual for millers, regulators and programme managers](#).
 - [Monitoring, surveillance, and evaluation of fortification program](#).

Operationalize: Establish an enabling environment for industry (fortification begins)

A. Identify industry scale-up support and ensure strong quality assurance and quality control (e.g., internal monitoring) protocols (including quality premix and equipment)

Secure technical support for industry to scale up fortification, including: (a) sourcing, installation and maintenance of proper equipment; (b) sourcing and importation of quality premix; and (c) the creation of strong quality assurance and quality control systems. Continue to engage industry associations and involve industry in discussions concerning legislation, standards, monitoring and implementation timelines. Ensure industry is linked to sustainable sources of support for machinery maintenance and changes to premix sourcing.

TOOLS/RESOURCES

- [Basic checklist for fortification practice.](#)
- [FFI's flour millers toolkit.](#)
- [Flour miller's quick guide checklist.](#)
- [Global Alliance for Improved Nutrition \(GAIN\) Global Premix Facility.](#)
- [FFI's Rice Millers Toolkit.](#)

B. Exploration of effective business models for food producers

Producer perspective model: determine models to incentivize producers/businesses to fortify food, assess potential approaches that could be used to create consumer demand if and as needed, and examine the feasibility and structure of potential tax breaks. Ensure that premix and fortification equipment are included as duty-free products nationally. Make attempts to address foreign exchange issues, if relevant, and explore operational efficiencies to offset fortification costs. These efforts should be explored even in light of mandatory legislation for fortification to ensure an enabling environment for food producers. Generate demand for quality products by connecting producers to large institutional buyers, such as schools, school feeding programs, clinics, hospitals, prisons and WFP food basket purchases to further incentivize quality production, particularly when legislation is delayed or enforcement is weak.

TOOLS/RESOURCES

- [Millers for Nutrition](#), an AI Knowledge Hub for registered millers.
- [Example from Peru on harnessing market forces to combat anaemia through rice fortification in Peru.](#)

C. Create a level playing field

Assess the types of consumer advocacy that the government is willing to undertake once industries commence fortifying food. Determine how government can ensure that communities accept and understand fortified foods. The private sector can communicate consumer benefits of specific products, but the public sector can more credibly communicate the health and national development benefits.

TOOLS/RESOURCES

- [A sample communication plan](#) from the Solomon Islands for government, industry and consumers, with [separate activity plans](#) for each audience.
- [Testing the Acceptability and Organoleptic Qualities of Multiple Micronutrient Fortified Rice in School Children, LAO PDR.](#)
- [Narrative for LSFF with guidance for communicators.](#)
- [FFI communications toolkit](#) and [workbook.](#)
- [Corn Masa Fortification Communications Toolkit.](#)

Monitor: Enable inspection, auditing and enforcement

A. Establish and strengthen monitoring systems

Train inspectors on process monitoring, conducting audits, leading end-product inspections and carrying out enforcement measures within food production facilities as outlined in national monitoring guidance documents. If food safety inspectors/inspections do not have capacity or if food safety inspectors/inspections do not exist within a country, determine alternative means of retrieving compliance information, including the potential roles of consumer groups and existing national databases in providing said information.

TOOLS/RESOURCES

- [Case studies on flour fortification monitoring.](#)
- [2018 Regulatory Monitoring Policy Guidance Document.](#)
- [Regulatory Monitoring of Fortified Foods: Identifying Barriers and Good Practices.](#)
- [KFI's recommendation on a monitoring and evaluation system for large scale food fortification in Indonesia.](#)
- [Guidelines on external and internal monitoring \(ECSA\).](#)
- [Operational guidelines for pilot of fortification of rice and its distribution under Public Distribution System.](#)
- Efforts to digitize monitoring systems for fortification programs are ongoing, including Nutrition International's Fortification Information System (FortIS), which enables real-time tracking of mill-level production of fortified staples in Pakistan, as well as other systems such as [FoRTrace](#), [Digital Fortification Quality Traceability Plus \(DFQT+\)](#) and [Fortify Management Information System \(FortifyMIS\).](#)
- Example self-regulation model used in Nigeria: [Technoserve Micronutrient Fortification Index.](#)

B. Equip civil society with the ability to hold industry accountable

Capacitate consumer groups, parent groups (e.g., spina bifida associations), and/or academia to assess fortified products sold in the market for compliance to national standards, as necessary and appropriate.

TOOLS/RESOURCES

- “Pull Strategy” [report](#) and [toolkit.](#)

C. Strengthen laboratories

Ensure that designated national or regional labs have the necessary infrastructure and capacity to conduct periodic quantitative or qualitative testing of nutrients in food.

TOOLS/RESOURCES

- ECSA laboratory manuals [Part 1](#) and [Part 2](#).
- [Successful implementation of a laboratory iodization quality assurance system in small-scale salt production facilities in India](#).
- [Development of a qualitative spot assay for zinc detection in fortified cereal grain matrices and zinc spot test](#).
- Nutrition International and Nuclear Institute for Food and Nutrition have collaborated to develop a semi-quantitative testing kit to assess vitamin A levels in fortified edible oil (work in progress). Nutrition International can be contacted for more information. Some qualitative spot tests include:
 - For zinc: [Xylenol Orange for wheat flour and white rice](#), [Dithizone for maize flour and rice](#)), developed under USAID's AFFORD program.
 - For iron: [Qualitative Spot Test for Iron in Fortified Rice](#).

Evaluate: Establish coverage and nutritional impact assessment and evaluation

A. Support integration of key indicators into ongoing national surveys

Incorporate relevant fortification, micronutrient, nutritional status, and food coverage and consumption indicators into national Demographic and Health Surveys (DHS) and/or other relevant national studies to gauge changes in nutritional status or consumption patterns throughout the life of the program.

TOOLS/RESOURCES

- WHO's [eCatalogue of indicators for micronutrient programmes](#) and [Micronutrients database](#), developed as part of the Vitamin and Mineral Nutrition Information System (VMNIS), lists 40 indicators of the status of 17 micronutrients or micronutrient-related conditions, covering both deficiency and excess.

Examples from countries include:

- A micronutrient module included in [the Cambodia DHS](#).
- Food coverage indicators included in [the Papua New Guinea DHS](#).
- Indicators like household coverage of iodized salt, prevalence of micronutrient deficiencies, nutritional status of population groups included in Bangladesh's [National Micronutrient Survey](#), [Standardized Expanded Nutrition Survey](#) and [Demographic And Health Survey Report](#).
- India's [National Family Health Survey \(NFHS\)](#).
- Pakistan's [National Nutrition Survey](#).
- Philippines' [Expanded National Nutrition Survey](#).
- Tanzania's [Tanzania Demographic and Health Survey and Malaria Indicator Survey](#).

- Kenya’s [National Micronutrient Survey](#).
- Senegal’s National Food Security, Nutrition and Resilience Survey [National Food Security, Nutrition and Resilience Survey](#).
- Ethiopia’s [National Food and Nutrition Strategy Baseline Survey](#).
- Indonesia’s [Health Survey](#).
- [Nutritional status and other survey result reports](#).

Existing government surveillance systems for neural tube defects could be used to assess changes in nutritional status. This WHO Birth Surveillance Tool includes [a manual for programme managers](#) and an [online, self-paced course](#) for health professionals and other interested individuals in English, Spanish and French. Existing health management information systems could also be used to share trends before and after fortification.

B. Capacitate academic institutions

Strengthen and commission academic institutions to conduct and support surveys, surveillance, analysis and impact studies. Support the inclusion of fortification programming into academic curriculum. This may include the basics of fortification program design in nutrition or public health programs, the use of HCES data to infer dietary inadequacy for statisticians and the mechanics of fortification in milling programs.

TOOLS/RESOURCES

- [CDC micronutrient survey toolkit](#).
- [Fortification Assessment Coverage Toolkit](#) (FACT).
- [FORTIMAS](#) (uses sentinel surveillance sites to assess trends in fortification production and access to fortified foods).
- [WHO/CDC logic model for micronutrient interventions in public health](#).
- WHO’s guidance and tools for conducting micronutrient surveillance, including:
 - [Requirements for monitoring both iodine status and adequacy of iodine levels in salt](#).
 - [WHO guideline on the use of indicators to assess a population’s iron status and application of ferritin concentrations to monitor and evaluate iron interventions](#).
 - [Tool for detection and control of anaemia at national or regional level](#).
 - [Birth defects surveillance](#) manual, a tool for the development, implementation and ongoing improvement of a congenital anomalies surveillance programme, particularly in low-resource settings.
- [Online courses](#) via FFI’s website, including: (a) introductory training on micronutrients and food fortification, and (b) fortification monitoring for flour and rice programs.
- Contact Nutrition International for information about work done under USAID AFFORD to develop university-level curriculum for using HCES data to infer dietary inadequacy.

Review and reassess: Ensure continued program harmonization and optimization

A. Review relevance and appropriateness of fortification standards and program design (in light of national changes and regional or global recommendations) and make adjustments as necessary

Program managers should review the overall design of the fortification program, including fortification requirements in food standards, every five years to coincide with the formulation of national nutrition and health plans and/or with national changes in dietary patterns, nutritional deficiencies, environmental health, production capacity and profiles, or implemented nutrition programs. The review should include efforts to generate evidence and sustain political will, as necessary. Program managers should view fortification programs as dynamic and under constant evolution with the ability to respond to contextual changes. The review of fortification program design, including fortification standards, should be led by the program’s in-country “home” ministry or agency.

Cross-cutting themes

Institutionalize

If the fortification program receives external support, focus should be placed on design, advocacy and establishment of programming guidelines. Establish structures in the country that allow for ownership of the program, including appropriate budget allocations, knowledge of programming aspects and champions to advocate for fortification during political turnover/transitions.

A. Integration of fortification into existing national systems

Although this component is embedded throughout the specific blueprint activities outlined above — including references to tools and resources to further enable institutionalization of fortification — it is worth emphasizing it again as a cross-cutting theme that program managers should consider throughout program planning and implementation. Mandatory fortification of staple foods should be integrated into existing systems and structures to ensure sustainability. This integration includes: fortification as part of national nutrition strategies or policies; fortification legislation under the national food act or equivalent; fortification requirements imbedded into national food standards; premix included on duty-free importation lists; inspections, audits and enforcement conducted through routine food control or safety protocols; on-going fortification maintenance costs accounted for in national budgets; and fortification program indicators integrated into routine national surveys.

B. Support the creation of academic curriculum on fortification

Ensure that nutrition programs within academic institutions cover the purpose, components, methods and impact of fortification programming.

TOOLS/RESOURCES

- [Kansas State University \(KSU\) and Food Fortification Initiative \(FFI\) training module.](#)
- [KSU/FFI/GAIN online courses for wheat flour and rice fortification monitoring.](#)
- [Kenya’s Africa School of Milling Training.](#)

C. Establish mechanisms that favour financial self-sustainability

These mechanisms may include components ensuring purchases of premix and fortification equipment are duty-free, or if not declared duty-free, funds generated from these taxed items should be allocated to support monitoring of the food industry and enforcement of compliance with national fortification standards. Provide support to both the public and the private sectors to ensure financial mobilization strategies are in place to enable government and food producers to manage, monitor and maintain programs without external support.

Mainstream gender equality into large-scale food fortification programs

The [Gender-Responsive Diagnostic \(GRD\) tool by TechnoServe](#) is not publicly available, but interested parties may contact TechnoServe to request access to the tool and related training. TechnoServe also provides guidance on [developing gender equality policy](#) upon request.

Nutrition International has developed a Rapid Gender Situational Analysis tool and is currently piloting it in countries across Asia and Africa. Contact Nutrition International for access to the tool and findings from the pilot.

Do no harm

A. Reduction of industrially produced trans fatty acids

WHO has developed the [REPLACE action package](#), which provides a strategic approach (through a technical document and six areas of action) to eliminate industrially produced trans fat from national food supplies. Resources include [the trans fatty acids country score card](#), guidance for [global laboratory protocol for measuring trans fats in foods](#) and a [communications toolkit](#).

In Pakistan, Nutrition International advocated with the government to harmonize the existing standard on industrially produced trans fatty acids (iTFA) levels in edible oils, fats and their food products at the provincial and federal levels with WHO recommendations, and it has provided recommendations to implement the same. Nutrition International has also provided technical support to edible oil millers in formulating standard operating procedures (SOPs) for adopting alternative methods to produce iTFA-free oil fortified with vitamins A and D. Contact Nutrition International for more information.

B. Sodium reduction

WHO has developed guidance on [sodium reduction](#). This includes: a guideline on [sodium intake among adults and children](#); a [brief](#) outlining why and how policies for salt iodization Universal Salt Iodization (USI) and the reduction of dietary sodium intake are compatible and cost-effective; [global sodium benchmarks for different food categories](#); a [sodium country score card](#); and a guideline on the [use of lower sodium salt substitutes](#). Policy briefs have been developed for [South Asia](#) and the [Eastern Mediterranean region](#) to support alignment of salt iodization and sodium reduction program implementation.

[The George Institute for Global Health has been redesignated as the official WHO Collaborating Centre on Population Salt Reduction](#). Its key areas of work include supporting countries in the development of national salt reduction targets and policies. If required, the [NCD Data Portal](#) can be accessed for country-specific information on indicators related to noncommunicable diseases and their key risk factors.

C. Guidance for the use of iodized salt in processed foods

The Iodine Global Network and its partners have developed program guidance to help national program managers assess the potential contribution of widely consumed, industrially processed foods and condiments to iodine intake. The guidance has been piloted in Kenya, North

Macedonia, the Republic of Moldova, Sri Lanka and Thailand, with [findings](#) available from four of the pilot programs.

A [review of regional trade standards on processed foods and iodized salt](#) was conducted for countries in South Asia, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. [Case studies on iodine intake through processed food](#) are also available from Egypt, Indonesia, the Philippines, the Russian Federation and Ukraine.

Food systems

[The Food Systems Dashboard](#) is a one-stop shop for all information related to food systems. It [explains the concept of food systems](#), brings together data from multiple sources and presents that under indicators categorized as drivers, food supply chains, food environments, individual factors, cross-cutting issues and outcomes. Data can be viewed at global and country levels. The dashboard also has the Food Systems Countdown Initiative, which helps monitor global food system transformation to 2030 and beyond.

More information

To contact Nutrition International with questions, comments, or request for resources, please e-mail Laura Rowe, Sr. Global Portfolio Director, Food Fortification at lrowe@nutritionintl.org.

