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# Fortifying Food Markets

## Unlocking the potential of food fortification partnerships to improve nutrition

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# Foreword

The need to transform food systems to make production more localized, sustainable and resilient, and to ensure that safe, nutritious food is more available and affordable, has become a dominant theme in today's development context. But what does this mean in practice? What role can the private sector play, and how can partnership make a difference? This report explores these questions in the domain of food fortification.

Fortifying commonly consumed staple foods and condiments with essential micronutrients, such as minerals and vitamins, offers untapped potential to help scale up access to nourishing diets for millions of people affected by malnutrition. This well-established practice, commonly known as food fortification, is applicable to foods such as wheat, maize flour, rice, edible oil, dairy and salt.

There is growing recognition among governments, donors and large corporations that the local millers and food processors who are responsible for fortifying staple foods in most countries play a crucial role in reducing malnutrition. Historically, efforts to scale food fortification have been led by governments, principally through the introduction of mandatory and voluntary regulation, policies and standards. Donors and development organizations, often working with industry partners, have supported this work in middle- and low-income countries by providing technical support and funding to equip millers with the resources and know-how they need to fortify correctly.

It is essential that governments continue to take the lead responsibility for scaling food fortification. At the same time, there is potential for more strategic and structured partnerships with the private sector as well as the donor community. Against this backdrop, this report aims to explore the role that business, predominantly large international and domestic companies, can play along the food fortification value chain, working with governments and other actors, to build local industry capacity for food fortification.

The report draws from existing experiences of food fortification business to business (B2B) partnerships. The report aims to:

- Define the role of large international and domestic companies in strengthening food fortification value chains in countries within the broader ecosystem of government, non-governmental organizations (NGOs), foundations, local private sector, and identify opportunities to further widen and deepen this role to help strengthen the overall market for fortification
- Extract learnings and good practices from existing food fortification partnerships engaged in B2B capacity building
- Identify opportunities for greater cross-sector collaboration to remove systemic barriers that prevent millers from achieving the scale, quality and reliability that are needed for successful food fortification.

We hope this report provides public and private stakeholders with valuable insights and practical recommendations to remove the systemic barriers that hold back millers from playing a key role in reducing malnutrition at scale.

## Methodology

The report authors have engaged in extensive desk research and conducted interviews with nutrition-focused development organizations, companies along the large-scale food fortification value chain and industry experts (see acknowledgements in Appendix for details).

In addition, six public-private partnerships aimed at strengthening local large-scale food fortification capacity have been studied and key stakeholders interviewed:
1. Affordable Nutritious Foods for Women (ANF4W)
2. Africa Improved Foods (AIF)
3. Iodine Global Network (IGN)
4. Smarter Futures
5. Strategic Alliance for the Fortification of Oil and Other Staple Foods (SAFO)
6. Strengthening African Processors of Fortified Foods (SAPFF)

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Written by Christina Tewes-Gradl, Richard Gilbert and Jane Nelson

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# Executive summary

**Food fortification has the potential to improve lives, especially at a time when many families cannot afford a balanced diet. Local millers and food processors hold the key to providing fortified staple food at scale. Yet, they require an operating environment that supports them and rewards good fortification practice. Companies and other stakeholders must move beyond the linear regulation-and-training approach and fix systemic constraints in the food fortification market system. This report identifies six opportunities that can help unblock barriers and realize the potential of food fortification to enable more healthy, productive lives.**

Today, about 3 billion people – 37% or more of the world's population – suffer from some kind of micronutrient deficiency.[1] A lack of essential micronutrients such as folate, iodine, iron, vitamin A, or zinc can lead to serious health disorders. These include blindness, anemia, goitre, brain damage, stunting and wasting among children, birth defects and a weakened immune system. In turn, these disorders can undermine learning ability, livelihoods, wellbeing and life expectancy, with negative social and economic consequences.

Governments must take the lead in establishing public policies, regulations and standards for improved nutrition, and prioritizing efforts to tackle undernutrition and malnutrition as part of national health, food and agriculture strategies. At the same time, millers and local food processors (we refer to food processors as millers in this report) play an important role in improving nutrition and can help to counter these deficiencies by adding micronutrients to commonly consumed staple foods such as wheat and maize flour, rice, dairy products, and condiments like salt and edible oils.

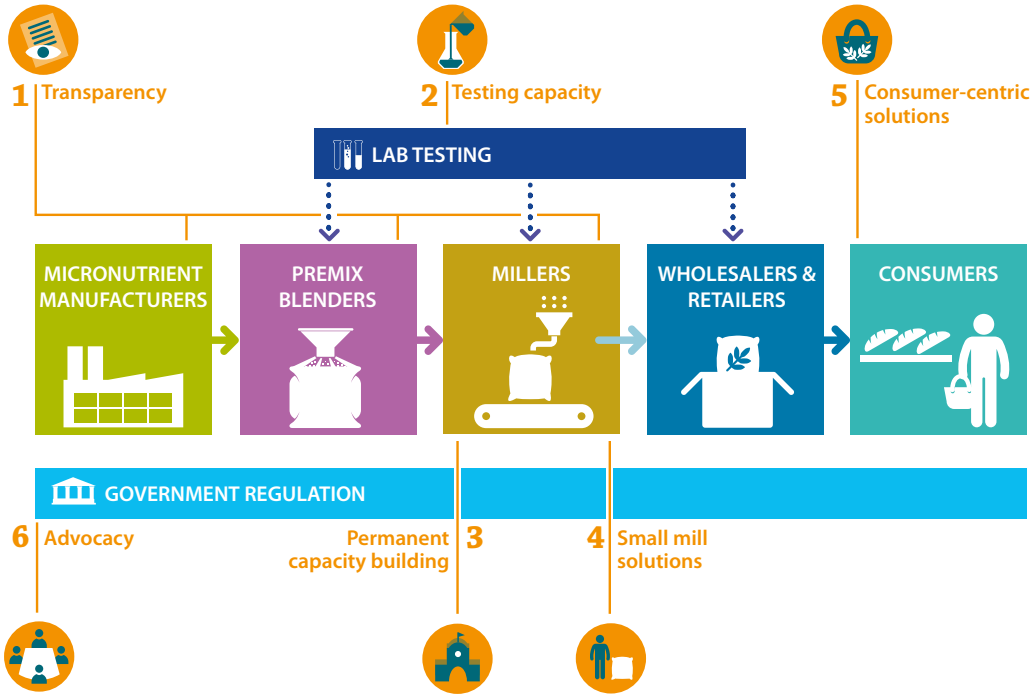
Adequate standards embedded in regulations for food fortification exist in many countries. Today, 154 countries have a standard for at least one food vehicle and 140 countries have made fortification of at least one staple food mandatory.[2] These regulations and mandatory approaches are complemented by a variety of voluntary food fortification initiatives and alliances. To date, interventions targeted at driving millers to adopt appropriate fortification practices have been focused on establishing regulation and standards and the provision of technical training.[3]

Too little attention has been paid to ensuring public or independent oversight of miller compliance, or to creating the incentives and capabilities that are necessary for millers to comply effectively with regulations and voluntary standards. Too often, the additional costs of investing in food fortification equipment and implementing processes on a continuous and reliable basis are hard for millers to justify given the market risks or lack of competitive advantage in doing so. Likewise, too little attention has been paid to raising consumer demand for fortified foods through greater awareness and knowledge of the benefits of food fortification.

By strengthening the miller segment (see diagram below) of the food fortification value chain – "fortifying staple food markets" – other companies from the food fortification value chain, together with public, private and civil society development organizations, can help to create the incentives and deliver the funding and

**Miller segment of the food fortification value chain**

## Six opportunities to strengthen the market system for millers




other support millers need to fortify correctly and, in the process, contribute to improved nutrition and public health. This is a system-level challenge that can only be addressed through multi-disciplinary interventions and multistakeholder collaboration. This paper identifies systemic barriers to adoption of adequate fortification practices among millers and six areas of opportunity for overcoming them through partnership among key actors in the system.

The table below introduces the areas of opportunity, along with an example for each of them, drawn from existing initiatives and partnerships.

| Opportunity areas | Description | Example |
|---|---|---|
| **1: Transparency:** Increase transparency of food fortification results | Large companies working with others can help set up transparency mechanisms that collect data at various points of the value chain to understand fortification levels and company compliance. | The **Micronutrient Fortification Index (MFI)** in Nigeria brings producers of fortified foods together to improve availability of data on premix use and fortification levels. The subsequent ranking of brands creates competition around fortification among companies. |
| **2: Testing capacity:** Build local food fortification testing capacity | Public and private partners can support local laboratories and mills or food processing plants to test products regularly in a quick and affordable way and thereby increase visibility on fortification effectiveness and allow companies to react quickly to changes in fortification levels. | As part of a wider initiative to strengthen the ecosystem for fortification by supporting mills with technical know-how and supporting research and standard setting, the **SAFO initiative** of BASF and GIZ in Tanzania provided semi-quantitative test kits and BioAnalyt iCheck devices for on-the-spot quantitative tests to both factories and laboratories and trains users in how to apply the tests. BASF also offers support to regulators and manufacturers with its micronutrient test laboratory in Lagos, Nigeria. |

| Opportunity areas | Description | Example |
|---|---|---|
| **3: Permanent capacity building:** Support more permanent capacity building institutions for food fortification | Large companies can join forces with governments, donors and NGOs to build more permanent capacity building institutions, both in local physical locations and online. | **The African Milling School** provides flour millers in Africa with training on milling, fortification, and quality management. It was built and is managed by milling equipment provider Bühler. **The National Institute of Food Technology Entrepreneurship and Management** (NIFTEM) is a higher education institute operating under the Ministry of Food Processing Industries of India. It offers academic curriculum in food technology and supply leading to Bachelor of Technology, Master of Technology, and Ph.D degrees. NIFTEM is supported by Hexagon, an Indian vitamin and mineral premix and nutritional product company to provide technical assistance to millers on food fortification. |
| **4: Small mill solutions:** Enable targeted fortification solutions structured specifically for small mills | Small mills are more difficult to reach and to motivate for fortification. But they often cover a large part of the relevant market, especially vulnerable households. Large companies and development partners can support solutions that are adapted to meet the specific needs of this market. | **Sanku** has developed a model for small industrial mills whereby premix is bundled into the cost of the empty flour bags that millers buy to pack their flour. Sanku installs its fortification technology at these small mills enabling remote monitoring. Premix company **Mühlenchemie** supports the model by providing technical support and adapting premix composition and packaging for the use in small mills. Sanku currently reaches an estimated 6 million people with fortified flour. |
| **5: Consumer-centric solutions:** Develop new consumer-centric solutions that create demand for fortified foods | Consumers are often unaware of the benefits of fortified food or unwilling or unable to pay a premium. Creating new affordable products and raising public awareness can help to drive greater consumer demand. | **Africa Improved Foods Rwanda Ltd** is a joint initiative of public and private actors, including the government of Rwanda, DSM and Bühler, to provide fortified cereal to at-risk populations in East Africa. Products are available on the market as well as via humanitarian organizations. Founded in 2016, it reaches 1.6 million consumers and beneficiaries per year. |
| **6: Advocacy:** Advocate for effective policies, regulation and standards | Private and civil society actors can call on governments to establish more reliable frameworks, including standards and effective enforcement mechanisms, that create a more level playing field for all. | **Smarter Futures** is a public-private partnership that aims to raise awareness of the benefits of grain fortification. Public, private, and civil society actors collaborate to provide information and practical support to governments to advance food fortification regulation. |

Each of these areas of opportunity can help to overcome specific barriers to food fortification. To drive and sustain systemic change, however, they need to be addressed synergistically and through collaborative approaches. No single solution alone can shift the system and overcome entrenched barriers for millers. Only a set of interconnected solutions will overcome the challenges millers face. A concerted effort is needed by international and national companies as well as governments and public, private and civil society development organizations to create a better market environment for food fortification. Working in partnership is at the heart of achieving results in food fortification.

Learning from existing and past partnerships, the research has identified six factors for successful and sustained cooperation:

1. Take a systemic approach by understanding different stakeholders and their motivations and addressing system dynamics
2. Align stakeholder incentives, strategies and activities at country level to ensure synergies
3. Work with organizations that have capacities on the ground and strengthen them
4. Invest in and use data as a key management tool
5. Harness industry champions – individual leaders, companies or trade associations to advocate for and lead the way on food fortification
6. Avoid short-term interventions and abrupt program ends and plan for a long-term commitment and resilience to adapt to shocks and changes in market conditions.

Fighting malnutrition continues to be a complex and urgent task. Over the past decades, useful lessons have been learned on creating and sustaining large scale food fortification initiatives. Government leadership is essential to success, but the private sector, from local millers to multinational corporations, also has a crucial role to play. As this paper outlines, there is untapped opportunity to scale up market-based approaches to food fortification and create the conditions for long-term sustainability.

# The potential of food fortification to reduce malnutrition

**A food and nutrition crisis is putting millions of people around the world at risk of hunger and malnutrition.** Food supplies are under threat and prices have increased in many countries as a combined result of the COVID-19 pandemic, conflicts, supply chain disruptions and the impact of climate change. While most countries were making progress toward achieving zero hunger prior to the pandemic, this trend has now been reversed.[4] The UN's State of Food Security and Nutrition in the World 2022 report projects that nearly 670 million people will still be facing hunger in 2030 – an anticipated 8% of the world population, which is the same as the percentage in 2015 when the 2030 Agenda and the Sustainable Development Goals were launched.[5] According to FAO, almost every 10th person is undernourished, due to a lack of sufficient nutrients or calories.[6]

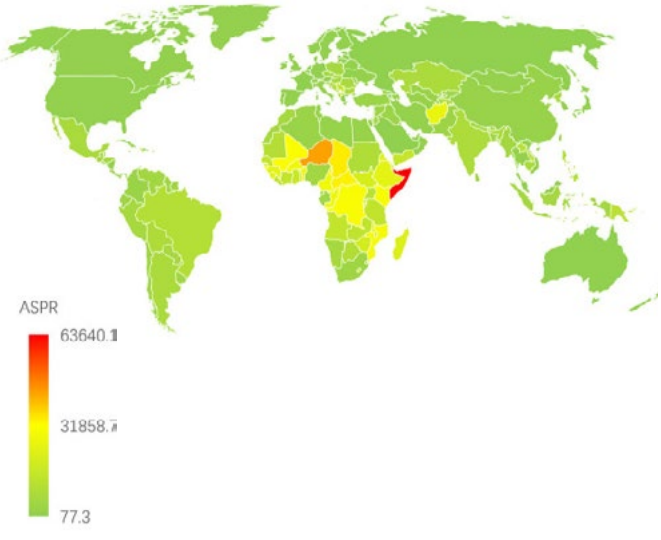
Even in situations where food is available, more people in low- and middle-income countries are prioritizing cheaper staples with lower nutritional value, exposing them to a risk of micronutrient deficiencies. A study in 2020, for example, concluded that nearly 43% of people globally could not afford healthy diets, which the researchers defined as those that follow food-based dietary guidelines.[7]

The figure increased to 87% of people in low-income countries.[8] The study found that to afford a healthy diet, a person needed to spend $3.75 / day on average, of which 40% should go towards fruits and vegetables.[9] This amount was almost double the international poverty line at the time, which was at $1.90 / day.[10] The research further concluded that people close to the poverty line were more likely to purchase starchy staple foods, which were five times cheaper than the cost of maintaining a healthy diet.[11]

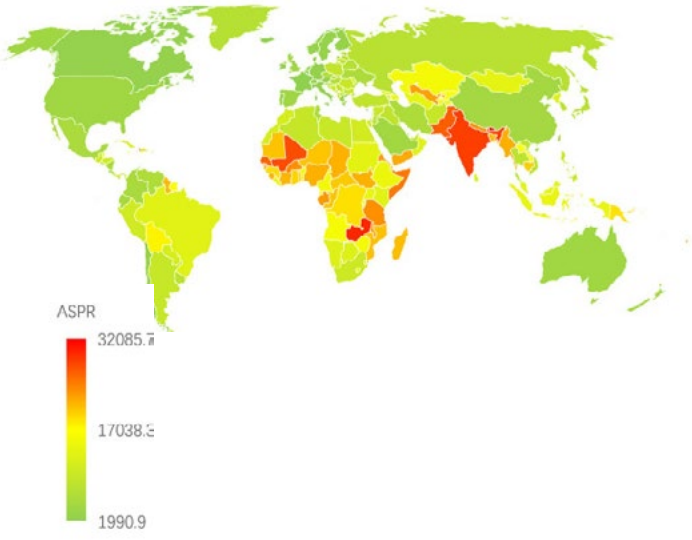
**Micronutrient deficiencies afflict over a third of the world population – more than 3 billion people.**[12] Micronutrient deficiency often coincides with undernutrition and hunger, but even more people suffer from "hidden hunger", meaning that people may have enough calories to eat, but not enough iron, iodine, folic acid, vitamin A, zinc or other micronutrients, which can lead to serious health issues, reduced productivity and lower longevity (See Figure 1 and Table 1). Those most at risk are children as well as pregnant and lactating women. They require comparatively more of these micronutrients and are more susceptible to the harmful consequences of deficiencies.[13]

Figure 1: **Global prevalence of vitamin A and iron deficiency**[14]

Age-standardized prevalence rate of vitamin A deficiency in 2019




Age-standardized prevalence rate of iron deficiency in 2019




Source: Han et al. Global, regional, and national burdens of common micronutrient deficiencies from 1990 to 2019

Table 1: **Selected micronutrient deficiencies and their effects**[15, 16]

| Micronutrient deficiency | Effects include | Number of people affected |
|---|---|---|
| **Iodine** | Brain damage in newborns, reduced mental capacity, goiter | ≥1.8 billion |
| **Iron** | Anemia, impaired motor and cognitive development, increased risk of maternal mortality, premature births, low energy | ≥1.6 billion |
| **Vitamin A** | Severe visual impairment, blindness, increased risk of severe illness and death from common infections such as diarrhea and measles in preschool age children; night blindness; increased risk of death | 190 million preschool age children; 19 million pregnant women ≥500 million |
| **Zinc** | Weakened immune system, recurrent infections, stunting | 1.2 billion |
| **Folate** | Anemia, spina bifida, anencephaly | 214 000–322 000 pregnancies worldwide are affected by spina bifida and anencephaly annually, at an average prevalence of about 20 cases per 10 000 births |

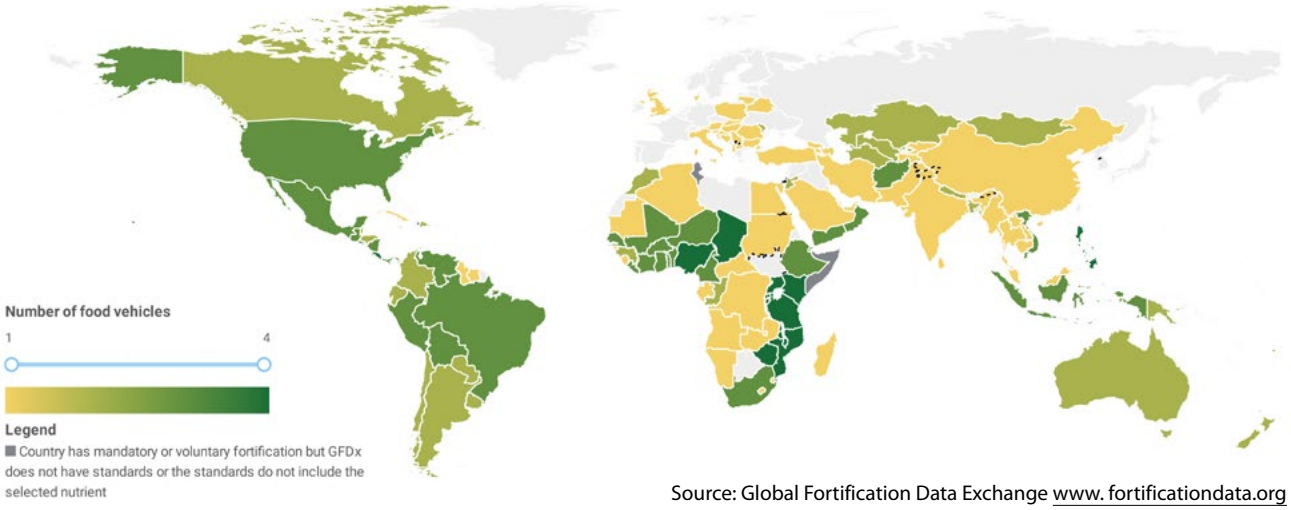
(Note: Given increases in population sizes since 2014, rates of deficiencies are expected to be considerably higher now.)
Source: Von Grember et al. (2014) Global hunger index: The challenge of hidden hunger. IFPRI.

**Substantial efforts have been made to improve nutritional outcomes. One long-standing solution is food fortification, which provides access to essential micronutrients to millions of people in a cost-effective and efficient way.**[17] The World Health Organization (WHO) defines food fortification as: "…an evidence-informed intervention that contributes to the prevention, reduction and control of micronutrient deficiencies. It can be used to correct a demonstrated micronutrient deficiency in the general population (mass or large-scale fortification) or in specific population groups (targeted fortification) such as children, pregnant women and the beneficiaries of social protection programs. Large-scale food fortification is especially suitable to tackle micronutrient deficiencies for a general population."[18]

The addition of essential micronutrients to commonly consumed staple foods and condiments during milling and food processing can be mandatory or voluntary.

**Food fortification is not new. Countries in Europe and North America have been fortifying food to address micronutrient deficiencies for over a hundred years.**[19] Today, it is estimated that some 154 countries have a standard for at least one food vehicle, and 143 countries have made fortification of at least one staple food mandatory.[20] Salt fortification, for example, is mandatory in 123 countries, mainly with iodine. Other common vehicles are wheat and maize flour, edible oil and rice (see Figure 2).

Figure 2: **Number of food vehicles with selected micronutrients in country standards**[21]




Source: Global Fortification Data Exchange www. fortificationdata.org

**Evidence shows that food fortification works.** Food fortification has substantially increased the global availability of micronutrients.[22, 23] This has led to measurable improvements in nutritional and functional outcomes.[24] Salt iodization is a good example of the effectiveness of food fortification. By 1990, less than one fifth of global households had access to iodized salt. After commitments by the World Health Organization (WHO) and UNICEF in 1994, efforts to increase access to iodized salt were scaled up by countries across the world.[25] As a result, the proportion of the global population having access to iodized salt increased from less than 20% in 1990 to 90% in 2020.[26]

**Food fortification can be cost-effective.** It is estimated that, on average, every $1 invested in fortification of foods generates $27 in economic return due to reduced health care spending and increased productivity.[27] The incremental cost of fortification per person and per year is low (e.g., $0.05 for iodized salt, $0.12 for wheat and maize fortified with iron, and $0.012-0.12 for vitamin A fortified oil).[28, 29] Additionally, the food fortification market is projected to grow over the coming years, making it a relevant market for both micronutrient producers, millers and food processors.[30]

**Millers can play a critical role in food fortification value chains but face obstacles to starting and then sustaining fortification activities.** Millers process and distribute commonly consumed staple foods and condiments, many of which require fortification. To fortify these foods, they need to install suitable technical equipment, procure micronutrient premix and ingredients, manage the fortification process and consistently control product quality.

Despite the important role that millers play in processing commonly consumed staple foods and condiments in many low- and middle-income countries, they often lack the capabilities, incentives and enabling environment to start fortifying these foods and then to sustain fortification to the correct standards over time. They need to have sufficient capabilities and resources to evaluate, invest in and maintain technical equipment and to buy micronutrient premix. The additional costs of such investments can be difficult to pass on to the consumer because consumers are often unaware of the benefits of fortification and are price sensitive. Other consumer barriers include an unwillingness to change consumption habits and move to unfamiliar or untrusted brands. Moreover, without the existence and the effective enforcement of mandatory food fortification regulations, millers have little reason to fortify, especially in voluntary environments when investing in fortification processes does not give them an advantage over their competitors.

**As a result, it is often the largest and best resourced millers and brands in the market that have led the way on food fortification.** Large mills often serve the market with packaged products, which are relatively higher priced and therefore less affordable for low-income consumers compared to informal or loose trade. These large millers also receive the bulk of attention and technical support from large micronutrient and premix providers as well as international development and health organizations, as they are generally easier to reach and cover a relatively large proportion of the population.

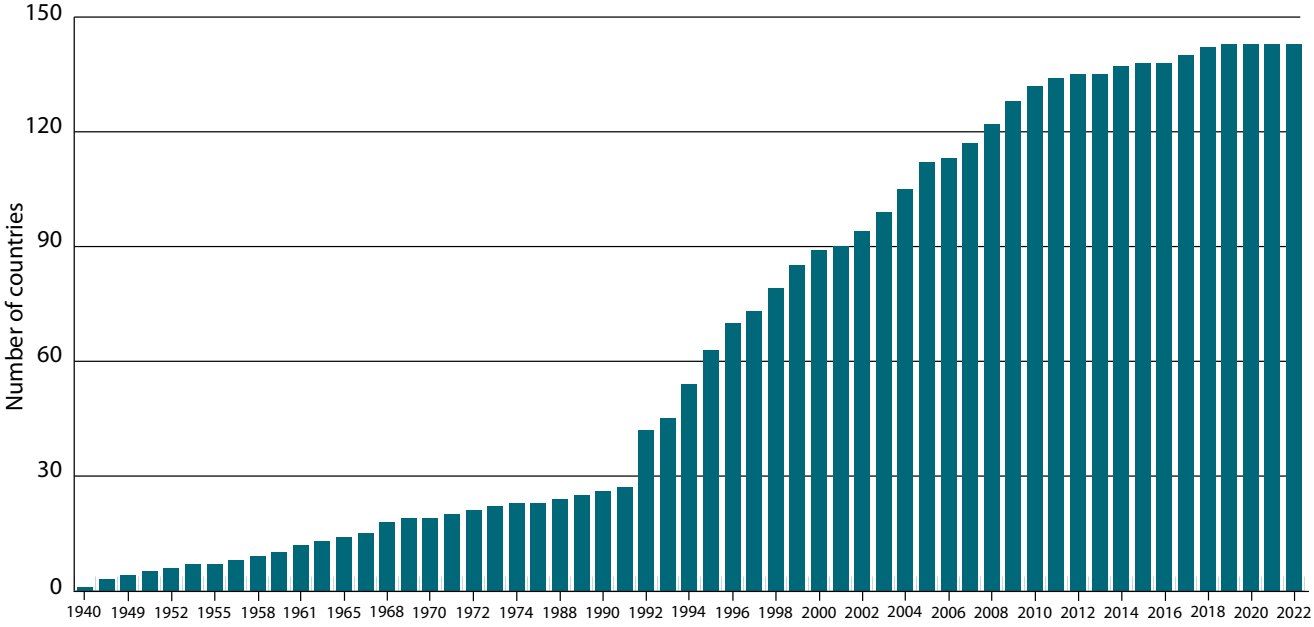
*"One of the major challenges we have is that the cost of maize and fortificants are high. Also, consumers go for the cheapest brands that are not fortified."*
**Small mill owner, Kenya**

*"A lack of a consistent supply of quality premix makes it challenging for us to produce a consistent, good quality product."*
**Flour miller, Jordan**

*"Since Covid supply chain disruptions and the war in Ukraine, costs are continuing to rise. Which is forcing small millers especially to cut costs and corners when it comes to fortification."*
**Miller, Nigeria**

*"There are multiple fortification standards – national and provincial standards and regulatory bodies which creates confusion among millers."*
**Fortification adviser, Pakistan**

Figure 3: **Cumulative number of countries with mandatory fortification, by year**




Source: Global Fortification Data Exchange www. fortificationdata.org

**To reach the full potential of food fortification, it is necessary to enable more millers to cost-effectively and reliably fortify staple foods.** Reaching the poor with adequate food fortification requires a strategy that recognises the benefits of scale achieved through market consolidation among large players, engages with the medium and small-scale sector and harnesses social safety nets for the most marginalised. To reach these millers, fundamental changes need to be made in the wider regulatory and market system that millers operate within, rather than only targeting individualized support to the largest players.

**Collaboration across sectors is necessary for changing the regulatory and market system to enable more millers to start and sustain fortification.** The challenges that millers face with fortification are multiple and interconnected, and they cannot be tackled in silos. For example, the inability of millers to secure consistent quality premix often results from a lack of premix quality standards from governments. A lack of engagement by millers in ensuring the right fortification levels frequently occurs because of a lack of available laboratory testing capacity and timely data. Ultimately, millers can only succeed if they operate in a supportive regulatory and market system. Therefore, all those in the system with a stake in the success of millers need to move towards a more collaborative approach to remove the barriers they face.

**Governments are critical to enabling large-scale food fortification.** They create the regulatory environment and framework conditions for all private companies to operate in, from local small-scale millers to multinational corporations. At the minimum, governments need to establish the public goals and standards that prescribe how certain staple foods and condiments should be fortified. Where a certain type of micronutrient deficiency is causing a significant health burden and food fortification can effectively contribute to lowering that burden, governments may decide to make fortification mandatory. In principle, mandatory fortification ensures that the whole population benefits from fortified products, including those most in need. As of 2022, it was estimated that about 143 countries had established mandates for fortification

of specific staple foods (Figure 3). For this strategy to work, clarity of public goals and standards and effective monitoring and enforcement of these regulations is required alongside awareness raising and capacity building for mills. Governments need to equip their national food and nutrition authorities with enough qualified inspectors and testing capabilities to allow for regular, reliable and consistent oversight of miller performance, as well as effective means to sanction non-compliance. In addition, governments have the responsibility to inform and educate citizens about nutrition and health and to raise awareness of the benefits of food fortification. Currently, however, in the face of many competing demands and needs, many low- and middle-income country governments do not have the resources and capacities to implement this multi-pronged approach effectively.

**Large companies play a key role as producers of micronutrients and premix, as well as providers of technical and testing equipment, including data gathering and analytics**. A vanguard of multinational companies have supported food fortification efforts over the past two decades by raising awareness among miller customers and providing technical assistance and testing support – with the intention to enlarge their market for the quality products they produce. These include companies such as BASF, DSM, Mühlenchemie and Bühler, among others, that feature in the partnership profiles that accompany the report. The challenge is to scale both their individual engagement and their collective efforts at national level in partnership with millers, industry associations, governments and, where relevant, public and philanthropic donors. There is also a challenge to increase the number of larger companies that are capable and willing to step up to this leadership role.

**Public, private and civil society humanitarian and development organizations play an important role in funding, coordinating and implementing fortification initiatives.** Organizations such as UNICEF, the UN World Food Programme (WFP), USAID, GIZ, the Bill and Melinda Gates Foundation, the Global Alliance for Improved Nutrition (GAIN), the Scaling Up Nutrition (SUN) Movement, TechnoServe, Hellen Keller International, PATH and Nutrition International have either funded fortification programs, raised awareness, provided technical assistance to mills and/or supported governments to develop standards and regulations. In the last decade, public, private and civil society actors have increasingly worked together, often under the framework of public private partnerships (PPPs), to leverage resources and to combine their complementary capabilities.[31, 32]

Examples of such partnerships, which have been documented alongside this report, include Africa Improved Foods (AIF), the projects Affordable Nutritious Foods for Women (ANF4W), Smarter Futures, the Strategic Alliance for the Fortification of Oil and Other Staple Foods (SAFO) and Strengthening African Processors of Fortified Foods (SAPFF) (see Table 2 below for an overview). Multistakeholder initiatives such as the Iodine Global Network (IGN), the Global Alliance for Improved Nutrition (GAIN) and the Scaling Up Nutrition (SUN) Movement facilitate cross-sector coordination and implementation at country level. These partnerships have been studied as part of this report to learn what has worked and what else is needed to increase the impact of food fortification.

Table 2: **Multistakeholder partnerships for food fortification** (in alphabetical order)

| Affordable Nutritious Foods for Women (ANF4W) | | | | | |
|---|---|---|---|---|---|
| **Companies** | **Other partners** | **Funder(s)** | **Short description** | **Country** | **Period** |
| Aglukon, Ajinomoto, BASF, Bayer CropScience, DSM, Mühlenchemie | National government authorities, Sight and Life, Sanku | BMZ & Bill and Melinda Gates Foundation | An initiative to reduce micronutrient deficiencies in pregnant women and women of child-bearing age | Ghana, Kenya, Tanzania, Bangladesh | 2013 - 2020 |

| Africa Improved Foods (AIF) | | | | | |
|---|---|---|---|---|---|
| DSM, Bühler | Government of Rwanda, World Vision, Clinton Health Access Initiative | IFC, CDC Group, FMO | AIF manufactures and sells fortified cereals, in particular targeting pregnant and breast-feeding women and children | Rwanda, Tanzania, Uganda, Kenya, South Sudan | 2016 - |

| Iodine Global Network (IGN) | | | | | |
|---|---|---|---|---|---|
| Multiple salt companies and industry associations | GAIN, Nutrition International, UNICEF, World Health Organization, Centers for Disease Control, EU Thyroid, ETH, George Institute | Bill and Melinda Gates Foundation, USAID, Kiwanis | An initiative to eliminate iodine deficiency disorders (IDD) through salt iodization | Worldwide | 1986 - |

| Smarter Futures | | | | | |
|---|---|---|---|---|---|
| Nouryon, Mühlenchemie, Bühler | WFP, Nutrition Intl, Helen Keller Intl, GAIN, Intl Federation for Spina Bifida and Hydrocephalus (IF) | Government of the Netherlands | An initiative to provide technical support and training for flour millers, government food control staff, and other stakeholders in Africa with a focus on the fortification of wheat and maize flour | 26 African countries | 2007-2021 |

Table 2: **Multistakeholder partnerships for food fortification** (continued)

| Strategic Alliance for the Fortification of Oil and Other Staple Foods (SAFO) | | | | | |
|---|---|---|---|---|---|
| **Companies** | **Other partners** | **Funder(s)** | **Short description** | **Country** | **Period** |
| BASF | GIZ | BMZ & BASF | An initiative focused on reducing vitamin A deficiency by fortifying edible oils | Bangladesh, Bolivia, Brazil, Cambodia, Indonesia, Madagascar, Tanzania, Uzbekistan | 2008 -2012 |

| Strengthening African Processors of Fortified Foods (SAPFF) | | | | | |
|---|---|---|---|---|---|
| Partners in Food Solutions: General Mills, BASF, Cargill, Royal DSM Bühler, The Hershey Company and Ardent Mills | Technoserve | Bill and Melinda Gates Foundation | An initiative to support millers to improve production and fortify at the right standards | Nigeria, Kenya, Tanzania | 2016 - 2022 |

# Six opportunities to address systemic challenges to food fortification

**While there has been progress in making fortified food more affordable, safe and available to vulnerable populations, food fortification has not yet achieved the scale and systemic impact needed to tackle micronutrient deficiencies**. Although rigorous data is lacking, there is some evidence to suggest that many millers, whether in mandatory or voluntary operating environments, do not yet fortify. If they do fortify, they often do not comply with the required quality standards. Given the persistent prevalence of micronutrient deficiencies and related impediments to quality of life for millions of people, a more effective approach is needed. This approach must recognize and address the blockages in the food fortification system that prevent current interventions from reaching their full potential.

To date, interventions targeted at driving adoption by millers of appropriate fortification practices have been focused on establishing regulations and standards and the provision of technical training. Too little attention has been paid to ensuring public or independent private oversight of miller compliance or to creating the incentives and capabilities that are necessary for millers to comply effectively with regulations and voluntary standards. Too often, the additional costs of investing in and implementing food fortification equipment and processes on a continuous and reliable basis do not outweigh the market risks to millers or lack of competitive advantage in doing so. Likewise, too little attention has been paid to raising consumer demand through greater awareness and knowledge of the benefits of food fortification.

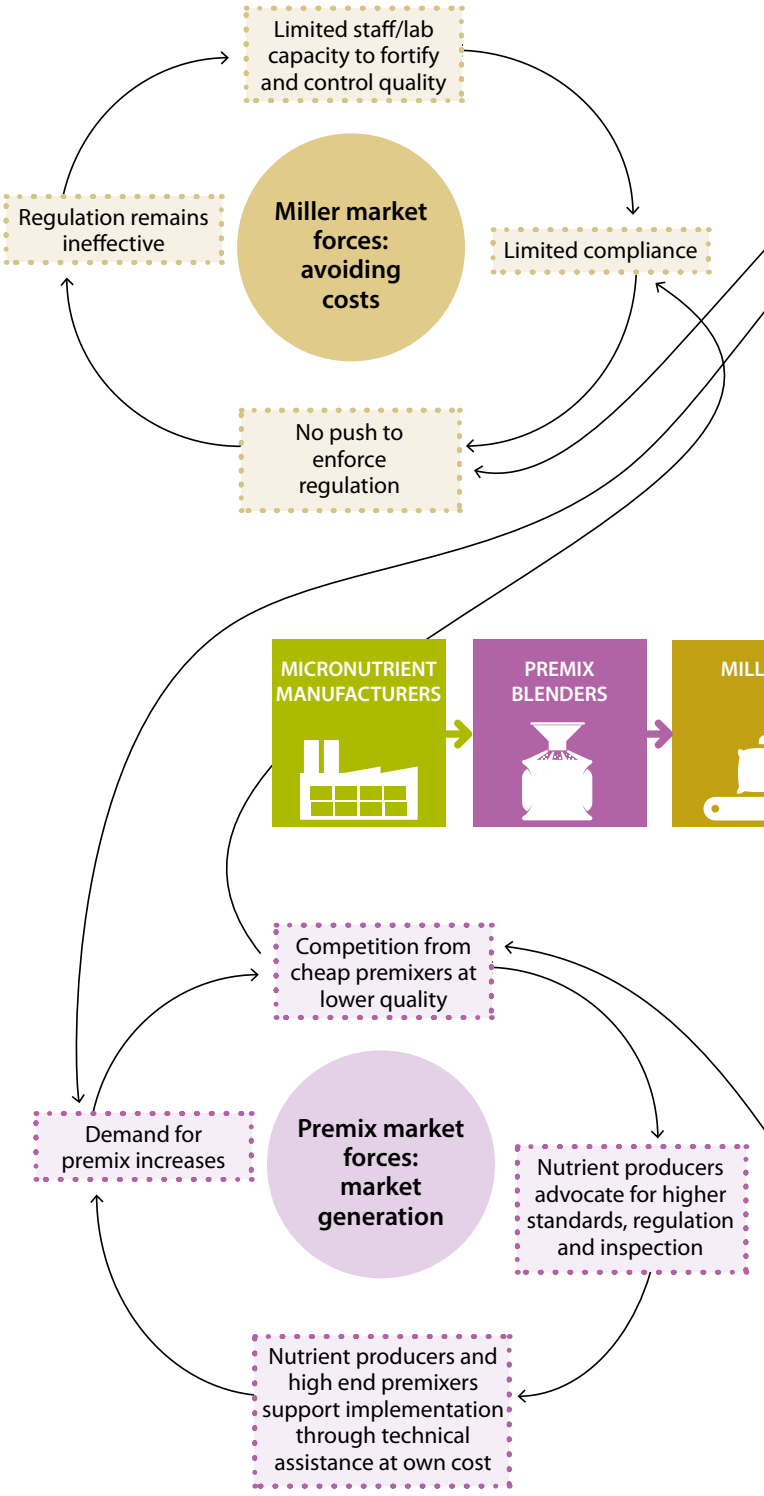
**The system map in Figure 4 visualizes some of the dynamics and obstacles that prevent effective scale-up of food fortification**. By focusing on dynamic cause-effect relationships and interdependencies rather than individual factors, a system map enables users to hypothesize how – and whether – interventions will change the current state and to identify areas of opportunity in the large-scale fortification system. The system map does not aim to be complete or accurate given the multitude of different factors and interactions in terms of diverse stakeholders, industry structures, regulations, incentives, enforcement mechanisms, consumer attributes, power dynamics, and other factors that vary country by country, staple food by staple food, micronutrient by micronutrient. However, at this generic level, the system map can be a useful tool to identify some of the gaps that need to be addressed to achieve a more widespread and sustained food fortification impact.

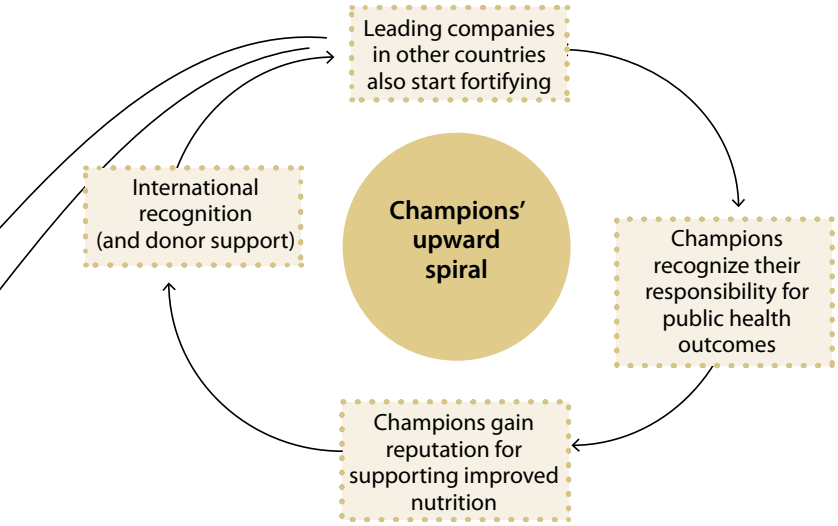
Given the persistent prevalence of micronutrient deficiencies and related impediments to quality of life for millions of people, a more effective approach is needed.

Figure 4: **Systems map of dynamics in the food fortification space**

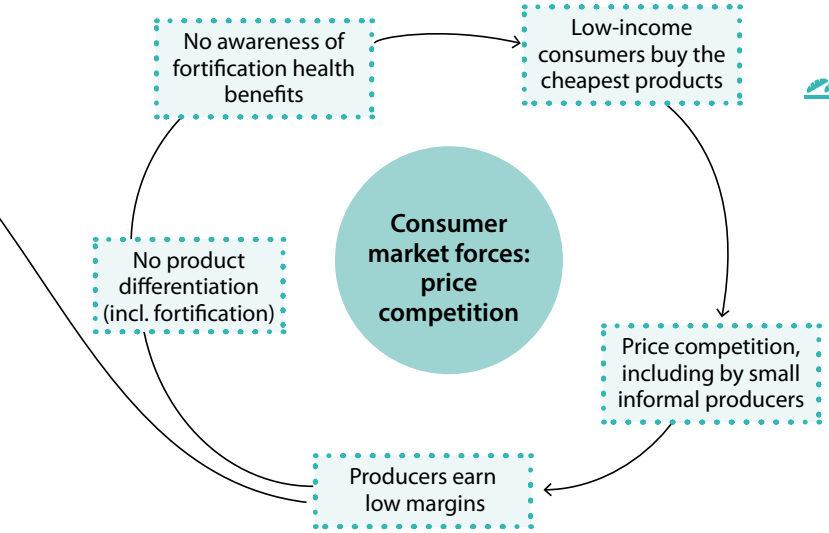
**Miller market forces:** In theory, the challenge of driving adoption of food fortification by millers is solved once government passes regulation and mandatory requirements, at least for those staples and micronutrients that become mandatory. In practice, this regulation is often difficult to implement. Government agencies often lack resources to effectively implement, monitor and enforce the regulation and consequently to create a level playing field for all mills.[33] Many mills do not have the required staff, equipment and quality assurance systems to implement the new mandatory standard. As a result, they cannot comply with the regulation, and therefore do not push the government to enforce the regulation. Consequently, the regulation remains ineffective, which in turn means that companies do not have a reason to build the required capacities. When standards or guidelines for food fortification are voluntary in nature, for example through industry-wide coalitions, the challenge of driving scale and systemic impact is obviously even greater. In the absence of strong consumer demand, millers lack the market incentives to invest in new equipment, processes or products and have no motivation to incur additional costs or risks that won't enhance their competitiveness or that they cannot share with or pass onto consumers.

**Premix market forces:** Micronutrient producers and premix manufacturers invest in new markets and provide capacity building in the form of technical assistance to miller customers who are interested in fortification. These efforts are often undertaken by the producers and manufacturers at their own cost with the goal of increasing the demand for high-quality premix in the market. In theory, the increased demand sparks competition. Some competitors, however, provide cheaper premix products that do not comply with standards and regulations in terms of nutrient content, quality, or stability. The problem is compounded by a lack of commonly agreed premix quality standards and testing in many countries. Responsible producers try to counter substandard products by raising awareness, helping with testing, and educating millers. In the absence of effective premix controls, nutrient producers and premix manufacturers face a competitive dilemma or so-called first mover disadvantage. The more successful they are with their market creation efforts, the more competition will likely be attracted into the market, some of it at a lower quality and lower price. Where quality cannot be effectively controlled, millers in the low-margin market have the incentive to opt for the cheaper product, while the initial costs of building the market are borne by the more responsible and compliant market-building companies. This creates an uneven playing field.







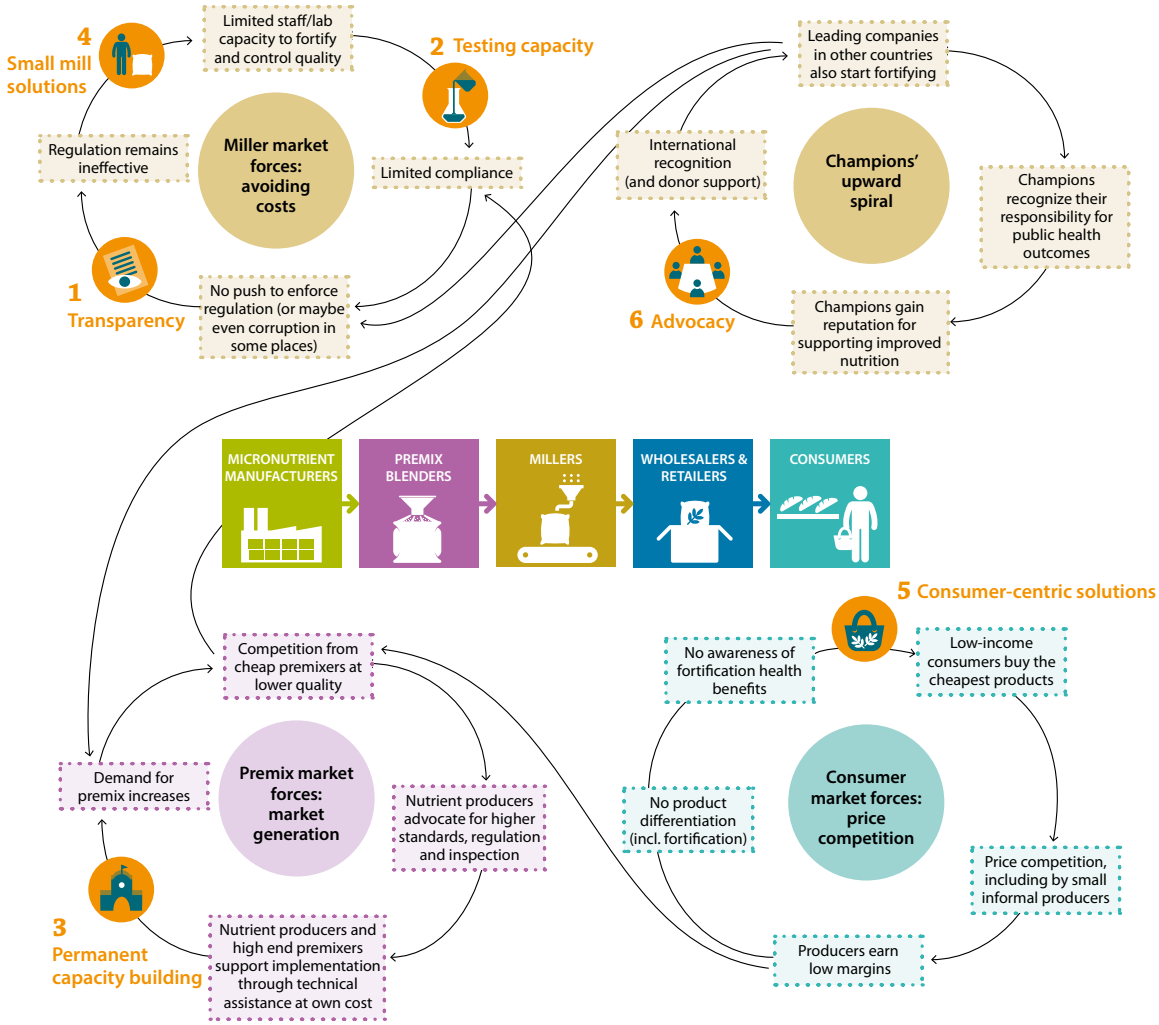



**Champions' upward spiral and exclusion of small and medium millers:** To date, most efforts of large micronutrient and premix producers to strengthen food fortification have been focused on the largest millers and food processors in a given country. These players are usually motivated to act as champions to strengthen their brand and leadership position. They often cover a significant part of the market and have the resources to invest in fortification. Champions benefit from improved reputation among customers, public authorities, and the general public, further strengthening their brand and market position. Their engagement also leads to international recognition and support from international donors. Their example attracts other leaders in the space to follow. Industry champions have thus played an important role in advancing the food fortification agenda, both locally and internationally.

Yet, the next tier of millers, and even more so, local small and medium-sized enterprises, have difficulties seeing how they can benefit from participating in food fortification efforts relative to the costs and risks of doing so. Without effective enforcement and/or consumer demand, there are no clear incentives to act. And while the costs of premix itself are minor, there are further fortification-related costs that do not offer a clear return on investment, for example, setup and management costs for equipment, quality assurance costs, and costs associated with the added complexity of managing production issues. These smaller players require more targeted support, especially at the outset.

**Consumer market forces:** In many low- and middle-income countries, consumers lack awareness of the benefits of fortified products. They do not recognize nutritional labels or information on packaging, and in many cases, the potentially more expensive fortified product looks and tastes the same as the non-fortified version. Moreover, the benefits of consumption only emerge over time. Consumers, especially those on low incomes who tend to be most affected by malnutrition, focus mainly on price when buying staples. This leads to fierce price competition in the market, including with small and informal mills, which produce cheap, basic products locally. The competition leaves millers with low margins. They do not have the resources to differentiate their product and educate consumers about it.[34] As a result, consumers remain unaware of the benefits of food fortification and unwilling or unable to pay higher prices. The cycle continues.

Figure 5: **Six opportunities to strengthen the market system for millers**




**To scale up food fortification, stakeholders from across the food fortification value chain need to align around shared areas of opportunity to build a supportive and mutually reinforcing market system.** This paper (See Figure 5) identifies six such areas of opportunity around which businesses, development organizations, governments and other stakeholders can collaborate to strategically address the above-mentioned systemic challenges and to build an ecosystem that enables food fortification to scale and thrive.

**1 Transparency:** Increase transparency of food fortification results

**2 Testing capacity:** Build local food fortification testing capacity

**3 Permanent capacity building:** Support more permanent capacity-building institutions for food fortification

**4 Small mill solutions:** Enable fortification solutions structured specifically for small mills

**5 Consumer-centric solutions:** Develop new customer-centric solutions that create demand for fortified foods

**6 Advocacy:** Advocate for effective policies, regulation and standards.

These six areas of opportunity are identified in the system map in (Figure 4) indicating where and how they might help to shift the dynamics in the present food fortification system.
To be effective, they require cross-sectoral collaboration between different partners from the private, public and civil society sectors.
No individual intervention alone has the power to change the system.

The six opportunity areas can also be mapped along the fortification value chain to highlight the need and opportunity to strengthen the functioning of the entire value chain. These six opportunity areas can only achieve their full potential when implemented together and alongside existing efforts by the private sector to build millers' capacity and awareness, and by the public sector and civil society to create standards and legislation, and to implement enforcement procedures. It is this systemic lens that distinguishes this approach from more siloed efforts.

# 1 OPPORTUNITY AREA 1: Transparency

## Increase transparency of food fortification results

### The opportunity

**Increasing transparency on results is a key lever towards achieving consistent and adequate food fortification.** One of the key challenges in food fortification is that data on compliance, including premix and food quality, is often limited and not publicly available. Companies along the value chain may be capturing some of this data but are usually not required to publish it. In some places, neither they nor the public food inspectors have the required testing infrastructure. This is especially true for many low- and middle-income countries.[35] Lack of data creates an environment in which millers and other food industry players lower their efforts and investment into food fortification because they are unmotivated to comply and unlikely to be held accountable for non-compliance. This may result in unfortified or under fortified foods, for example, through the use of less expensive and often lower quality premixes. Furthermore, a lack of transparency may encourage fortification fraud where millers label under fortified food as fortified, which in turn can erode trust among consumers if discovered.[36]

**Transparency mechanisms therefore constitute critical infrastructure for functioning food fortification markets by driving compliance and incentivizing good practice**. With outside support, efforts to increase transparency can also be led by private sector players. Champions have an interest in measurably demonstrating that they comply. Likewise, nutrient providers are interested in creating rewards for millers that use high-quality premixes. If a few industry players establish voluntary data sharing procedures, other brands become motivated or pressured to join, thus launching a race to the top. Visibility of fortification outcomes also builds trust with consumers and government institutions and it helps the latter with their monitoring efforts.[37, 38, 39]

**Digital solutions enable more effective and efficient ways of creating transparency on food fortification results.** Innovative solutions enable collecting data at different points of time along the value chain, analyzing data and making it accessible to the general public.[40, 41]

### The role of large companies and other stakeholders in the food fortification value chain

Large companies can contribute to building transparency by:

- **Making available their own data on premix quality and sales volumes.** This could be shared possibly in an aggregated or sanitized form to maintain commercial confidentiality. Examples exist in other industries where an independent body, such as the World Bank, receives and aggregates relevant data at a national level before making it public.[42]
- **Supporting digitalization efforts of millers and food processors.** Supporting customer digitization efforts enables continuous tracking of premix use and fortification levels.
- **Join and support in-country initiatives to create transparency.** Company leadership can participate in and champion transparency initiatives at the country level.

The establishment of such voluntary transparency initiatives is best led by civil society organizations. As independent actors, they can facilitate the contributions of companies, including competitors, and can align activities with public sector actors.

Public sector actors can endorse such transparency initiatives. They can also contribute data from their own data collection activities, such as on nutrition outcomes and food testing.

Setting up such a multi-faceted and transparent platform takes time and money. Donors can fund the initialization phase. Later, funding for maintenance costs can also come from members.

### Examples of partnerships and collective action

Public-private collaboration plays an important role in innovating such solutions. Some partnerships are leading the way and have devised creative approaches to increase transparency of food fortification at different levels.

**At a global level:**

**The Global Fortification Data Exchange (GFDx)** is a data analysis and visualization tool to track food fortification progress on a global level. The tool was initiated in 2015 as a joint effort by the Global Alliance for Improved Nutrition (GAIN), the Iodine Global Network (IGN), the

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Food Fortification Initiative (FFI) and the Micronutrient Forum. A range of actors contribute data, including NGOs, the private sector and governments. The GFDx aggregates and visualizes data on the five most common staple foods: wheat and maize flour, oil, rice, and salt. It also collects and publishes data points on relevant indicators such as countries' food fortification legislation status, fortification standards, food availability, fortification quality and coverage, amongst others.[43]

**The Access to Nutrition Index** compares some of the largest packaged food and beverage producers and brands on their nutrition-related activities and performance on a global level. The initiative was incubated by GAIN through a multi-stakeholder consultative process and is now independently housed at the Dutch non-profit organization Access to Nutrition Initiative (ATNI). It aims to encourage global food producers and brands to increase consumer access to healthy and nutritious foods.[44, 45]

**At the country level:**

**The Micronutrient Fortification Index (MFI)** is an industry-led transparency initiative in Nigeria. The open platform was developed by TechnoServe as part of the Strengthening African Processors of Fortified Foods (SAPFF) project in Nigeria.[46] The purpose of the platform is to share data on fortification levels of various branded staples. It enables food processors to demonstrate their commitment and compare their food fortification progress against other food processors in their sector, while providing consumers with important information about the products they purchase (see Example 1).[47, 48]

The **Flour Fortification Monitoring and Surveillance System (FORTIMAS)** is a methodology to track the impact of flour fortification programs over time using a combination of population-level and industry data. The methodology was developed by the public-private-civic partnership Smarter Futures. It guides countries on how to gather information on population coverage of adequate fortified flour as well as identify trends in the prevalence of deficiencies within defined geographic areas.[49]

**FortifyMIS** is a management information system to assist food producers and government inspectors in their monitoring efforts. The tool was developed by Project Healthy Children (PHC) and GAIN to simplify data collection on compliance and ensure food quality.[50] FortifyMIS consolidates all monitoring metrics by the public and private sector into one tool and hence reduces time and costs of monitoring. FortifyMIS' output metrics include, among others, the total amount of fortified food produced, imported, and marketed and the total amount of fortification premix purchased and utilized.[51]

**EXAMPLE 1**

## The Micronutrient Fortification Index (MFI) – helping businesses to fight malnutrition through increased transparency

Strengthening African Processors of Fortified Foods (SAPFF) is a public-private partnership that works to tackle malnutrition in Nigeria, Tanzania, and Kenya, using a market-building approach. Funded by the Bill & Melinda Gates Foundation from 2016 - 2022, key partners of the initiative include TechnoServe and the Global Alliance for Improved Nutrition (GAIN) as implementing partners, BioAnalyt as technology partner for testing, and micronutrient producers BASF and DSM, and Bühler's Africa Milling School.

Nigerian industry leaders convened at the 2018 CEO Forum, an annual event specific to food fortification, to discuss the country's progress in scaling up food fortification. Participants agreed that a collective approach was needed that combines food quality management, transparency and accountability surrounding food fortification progress and results.

SAPFF responded to this call by developing the Micronutrient Fortification Index (MFI), an industry-driven initiative that generates and publicly shares data on companies' progress towards food fortification. The MFI builds on competition by ranking companies' fortification performance results online. It encourages industry to take the lead and drive high-quality fortification while, at the same time, providing consumers with information and increasing transparency around the fortification of staple foods. Furthermore, the MFI generates valuable industry insights that can be harnessed by industry, government, and NGOs to continuously improve the enabling environment for food fortification. After a successful pilot phase with four firms in 2019, Technoserve officially launched the index in September 2019. To date, 18 Nigerian companies representing 31 brands have joined the MFI.

Sources:

Micronutrient Fortification Index (n.d.). Website. Available at mfi-ng.org/ (Accessed 13.07.2022).

Technoserve (n.d.). Website. Available at www.technoserve.org/ (Accessed 13.07.2022).

Technoserve (2021). Ensuring Improved Access to Safe and Nutritious Foods. MFI Brochure. Available at www.technoserve.org/wp-content/uploads/2021/09/MFI-Brochure.pdf (Accessed 13.07.2022).

# 2 OPPORTUNITY AREA 2: Testing capacity

## Build local food fortification testing capacity

### The opportunity

**Effective sample testing is a critical step towards ensuring high-quality premix and fortified food.** Testing is important for factories to manage quality, for governments to set and control standards and enforce compliance, and for consumers to gain trust in fortification. Testing needs to happen at different stages of the value chain: with premix producers or importers, at mill or factory level, and in distribution, for example, in retail shops.

**Testing can be done with different levels of accuracy and effort.** Simple qualitative tests can confirm whether a nutrient is present in a certain staple food and can often be done quickly and cheaply on site, e.g., with test strips. Small spectrometer devices like BioAnalyt's iCheck produce quantitative results quickly on site but require qualified handling and more expensive reagents. Government-certified labs work with qualified staff and even more accurate lab machinery. They are often required for government procedures such as certification.

**Lab testing capacity is limited in many low- and middle-income countries.** Some countries do not have the capacity to effectively test for micronutrient levels.[52, 53] In a study across 17 countries in Africa and Asia, for example, 38% of regulatory agency respondents reported insufficient equipment in laboratories, and 50% reported a lack of staff and technical capacity. In the same study, poor laboratory capacity is ranked third in terms of barriers to fortified food producers. The lack of trained personnel is the primary reason behind gaps in regulatory monitoring, according to the respondents.[54] Common issues include poor capacity to collect and transport samples, lack of technical know-how, lack of available testing facilities, lack of testing reagents and other equipment, lack of human resources to carry out the tests as well as long sample processing times because samples have to be sent to central laboratories or even outside of the country.[55]

**Cheaper, less complex testing solutions can reduce the need for lab testing.** Easy-to-use devices can help millers and food processors to conduct on-site quality checks. They also allow food inspectors to test samples quickly. Whilst these solutions do not replace a full lab, they ease the pressure on lab capacity. Rapid, low cost, qualitative tests are available for many different micronutrients such as iodine, iron, vitamin A, and for different staples foods such as flour, oil, rice, sugar, milk, rice and salt.[56]

For example, iodine rapid test kits are available at an approximate cost of US$1 per sample, do not require trained staff, and yield immediate results on the presence of iodine in salt. Such tests, however, cannot quantify the iodine levels in a sample.[57] BASF provides a semi-quantitative test kit for vitamin A in oil, flour, and sugar to food processors as well as food inspectors.[58]

**Rapid quantitative tests also exist.** BioAnalyt's portable *iCheck* device quantitatively determines micronutrient content in food samples, including iron, iodine, vitamin A, and vitamin E, amongst others.[59] Results on fortification levels are obtained within 10 minutes. Other examples available on the market include the Thai solution *i-Reader,* and the Chinese *WYD* to determine iodine levels. All three solutions come with basic laboratory equipment such as reagents, activation solutions and either dosage spoons or scales. They can be used in the laboratory as well as in the field.[60, 61] While more needs to be done to reduce the cost of rapid quantitative tests, they help bridge existing barriers of insufficient laboratory infrastructure. [62]

### The role of large companies and other stakeholders in the food fortification value chain

Large companies can help to build local testing capacity by:

- **Creating access to testing equipment.** BASF makes its test kit available to its customers and collaboration partners free of charge. It also facilitates access to iCheck devices. (See example 2) DSM has supported local labs in India to enable local testing of fortified rice. Companies can also help when challenges with testing facilities arise, for example, by facilitating access to reagents together with premix supplies or providing technical support when machinery breaks down.
- **Building capacity of technical staff.** Companies can organize workshops and technical trainings on quality assurance and control procedures for both private and public sector actors.[63]
- **Supporting private labs.** The market for lab testing is often small in low- and middle-income countries. Setting up a private facility comes at a high cost and with significant risk. By working collectively and guaranteeing a certain amount of business, large companies can facilitate the setup and continuity of private labs.

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The public sector can ease lab bottlenecks by acknowledging the relevance and validity of different testing approaches for different purposes. It can also support capacity building of public sector staff in traditional and new testing methods.

Civil society organizations can help with the provision of technical workshops to build and update skills around testing as part of wider technical capacity building activities. Consumer organizations can also play a role in product testing and engage consumers on the results.

Donors can help fund the provision of testing equipment and local capacity-building efforts.

### Examples of partnerships and collective action

In 2019, BASF opened a micronutrient test laboratory in Lagos, Nigeria, to support regulators in deepening the food fortification agenda of the government of Nigeria and also supports small and medium-sized enterprises in the edible oil, flour, and sugar industries in achieving the required dosage of vitamin A in their products.

**EXAMPLE 2**

## BASF and GIZ lead Strategic Alliance for Fortified Oil and Other Staple Foods (SAFO)

Strengthening local testing capacity to ensure high quality fortified foods

The **Strategic Alliance for Fortified Oil and Other Staple Foods (SAFO)** was a public-private partnership under the German develoPPP.de program. With a focus on reducing vitamin A deficiency through fortification of edible oils, the initiative initially operated across eight countries from 2008 - 2010: Bangladesh, Bolivia, Brazil, Cambodia, Indonesia, Madagascar, Tanzania, and Uzbekistan. In a second phase, the initiative was extended until 2012 with a particular focus on Bolivia, Indonesia, and Tanzania. Key partners of the initiative included GIZ, a German federal enterprise and service provider in the field of international cooperation (GIZ) and BASF, a leading vitamin producer. The partnership was active on four workstreams: advocacy, support around regulation for mandatory fortification, technical assistance, and testing capacity.

In Bolivia, Indonesia, and Tanzania especially, SAFO provided targeted advice to create effective monitoring systems and promoted and distributed portable testing devices. The test kits were developed by BASF and provided semi-quantitative (yes/no) results on the presence of vitamin A in cooking oil. To complement this solution, BioAnalyt provided its quantitative iCheck mobile test kits which were developed during this period. Both test kits were combined to assist monitoring activities in the countries. Semi-quantitative testing was used as an initial screening, and once the presence of vitamin A was validated, quantitative testing was used to determine the exact micronutrient levels. Both mobile testing kits can be used on site and are low cost compared to traditional lab testing. These tests were used for preselection and hence significantly reduced the number of samples that arrived at national laboratories and factories.

Sources:
Adam, S. & Wilson, A. (2014). Building alliances for better nutrition: The SAFO (Strategic Alliance for the Fortification of Oil and other Staple Foods) approach to fortifying edible oils with vitamin A in Bolivia, Indonesia and Tanzania; Gradl, Christina (2011) Building A Strategic Alliance for the Fortification of Oil and other Staple Foods – A Case Study.

3

OPPORTUNITY AREA 3:

# Permanent capacity building

## Support more permanent capacity building institutions for food fortification

### The opportunity

Capacity building for millers and food processors to date happens mostly through direct engagement and workshops. As a result, technical assistance tends to be short-term and irregular. Workshops are provided by civil society organizations or by large companies as part of their Corporate Social Responsibility and market building efforts. Generally, workshops occur on a supply-push rather than demand-pull basis. Millers and food processors have few ways to articulate their needs and find support on an ongoing basis. At the same time, large companies that provide technical assistance feel the financial pressure and growing disincentives of investing into food fortification market building whilst lower-quality competition in premix delivery is increasing.

### The role of large companies and other stakeholders in the food fortification value chain

Instead of providing technical assistance directly to food processors, large companies can contribute collectively to building more permanent capacity building institutions that can respond to the demand of food processors on a sustainable basis. Bühler's support for the African Milling School is a good example of such an approach. (See example 3). This kind of market infrastructure would ease pressure on companies' scarce resources in the long run.[64, 65] Centers of Excellence can start to generate their own funding via training and consulting fees and leverage donors' funding, so that they become financially independent over time.

Large companies can help to build local testing capacity by:

- **Helping to set up regional training facilities or Centers of Excellence**. To do so, they can pool resources and knowledge with civil society organizations and donors.[66]
- **Building capacity of local experts**. Local institutions would foster the development of local experts. Companies can collaborate closely with these experts to keep them up to date. They can also link their local sales teams, be it internal or external, to the capacity building centers as a resource. Typically, these sales teams also have a wealth of technical knowledge and skills.
- **Setting up digital capacity building infrastructure.** To increase efficiency and keep local centers of excellence up to date, companies can support the creation and provision of online knowledge repositories and distance learning courses. For example, they can make their existing tools and guidance available via such online offerings.

Donors, public sector, and civil society organizations can support the set-up and maintenance of local capacity building institutions. They can provide funding, incubate such facilities, and provide their expertise.[67]

### Examples of partnerships and collective action

**The Centre of Excellence for Food Fortification** at the National Institute of Food Technology & Entrepreneurship Management (NIFTEM) in India was established under the auspices of the public sector Union Ministry of Food Processing Industries, which launched the Centre together with GAIN and Hexagon Nutrition. The partnership brings together three different types of stakeholders – a government institution, a development sector agency and a nutraceutical manufacturer. The goal is to pool resources for capacity building to scale up food fortification. A Joint Technical Advisory Committee (JTAC), including representatives from the Indian government, academia, and the development sector was set up to aid the establishment of the Centre. JTAC's initial priorities include providing adequate funding for technical training. GAIN supports the Centre through providing training and curriculum design. The Centre will offer courses to students, faculty, professionals, and officials from regulatory agencies. It will also accredit premix suppliers to ensure that Indian government standards and guidelines are followed.[68] India is one of a few countries that has a premix standard.

**Partners in Food Solutions (PFS)** is an example of how large companies have pooled their knowledge to make technical assistance more sustainable and demand-led. The consortium consists of experts from international companies such as General Mills, Cargill, DSM, and Bühler. PFS works in 11 countries across Africa. Implementing partners TechnoServe, Grassroots Business Fund and Root Capital identify promising food businesses and plan technical or business projects. Corporate volunteers from partner companies then advise food businesses remotely, as volunteers. Interested volunteers can register online and choose projects based on an online database. The PFS team then organizes a kickoff session for volunteers and local food companies.[69]

3

**EXAMPLE 3**

## The African Milling School

Local staff shortages, lack of technical knowledge, and high staff turnover limit the scale-up of food fortification initiatives in many countries. Therefore, training and education are key elements to their sustainability.
In response to these challenges, milling equipment supplier Bühler built the first ever milling training facility in Kenya in 2015, the African Milling School (AMS). Located in the outskirts of Nairobi, the AMS offers comprehensive training courses on grain milling for different expertise levels (e.g., miller apprenticeship programs), at different stages of the food process (e.g., milling, analytics, maintenance), as well as through different course formats (e.g. in person and virtual classes).[70]

SAPFF collaborated with the AMS to harness its infrastructure and competencies in the field of grain milling. AMS hosted trainings and conducted lab tests. Together with SAPFF and BioAnalyt, AMS offered a range of training sessions to assist food processors in their fortification efforts.

Sources:

African Milling School (n.d.). Website. Available at www.africanmillingschool.com/ (Accessed 13.07.2022).

BioAnalyt (n.d.). Website. Available at www.bioanalyt.com/ (Accessed 13.07.2022).

Bühler Group (2015). Sustainable Performance. 2015 Annual Report.

4

OPPORTUNITY AREA 4:

# Small mill solutions

## Enable fortification solutions structured specifically for small mills

### The opportunity

**Including small mills in food fortification initiatives is important to achieve relevant coverage, and especially for ensuring vulnerable populations most at risk of vitamin and mineral deficiencies have access to adequately fortified food.** In many low- and middle-income countries, small mills hold a considerable market share for staple foods, especially in rural and remote areas. In Uganda, for example, only 20% of maize flour is industrially processed and the rest is produced by smaller mills.[71] According to a report by the Royal Tropical Institute (KIT), 95% of millers in Tanzania are small and medium-scale.[72] In 2016, malnutrition was estimated to contribute to 130 child deaths in Tanzania daily.[73] Consumers in rural areas largely consume locally produced food from small mills and do not have access to industrially processed foods, for example, because they are excluded from distribution areas of industrial mills or are unable to afford industrially processed food.[74, 75]

While these are often the consumers who could benefit the most from fortified food, **small mills tend to be left out of fortification efforts.** They are difficult and costly to reach for premix suppliers, require only small quantities and are often unable to install relevant equipment or establish robust quality control processes.[76] Due to these challenges, they are often excluded from mandatory fortification requirements. Therefore, including small mills in food fortification efforts holds great potential for reaching populations at high risk of micronutrient deficiencies.

**In order to enable small mills to participate in food fortification, targeted solutions are needed.** They need to be low-cost, easily transportable and easily installable, while being equipped with robust and automated monitoring mechanisms.[77] Furthermore, they need to provide incentives for small mills to fortify.[78] "Hand-scoop" methods where millers add premix manually have been tested, but outcomes are not reliable enough. Technological advancements, such as employed by Sanku (see Example 4), can help to include small mills and monitor results.

4

EXAMPLE 4

## SANKU – catering to the needs of small-scale mills

Sanku is an initiative launched in 2013 by the NGO Project Healthy Children (PHC) to enable small mills to fortify flour. Sanku addresses key challenges faced by small-scale, rural millers using a proven and cost-effective business model and a fully automated system. Sanku developed a special dosifier, which is easy to install at small flour mills and accurately dispenses premix. Premix is dispensed based on the weight of grain passing through the machine. Data is stored digitally, and transmitted by cellular link, allowing Sanku to monitor dosing accuracy remotely. To distribute the premix, Sanku buys flour bags in bulk and sells them in a bundle with the premix. Bags are pink to make them easily recognizable. Millers don't pay more for the bags than they usually would, effectively getting the premix for free.

The premix has been developed specifically for use with the dosifier. For this, Sanku collaborated closely with Mühlenchemie, who developed a customized nutritional blend suitable to the local operating conditions. Mühlenchemie provides technical training and support along the fortification value chain. While the company usually sells premix at 25 kg per bag, the partnership enabled Sanku to bulk buy it in smaller packaging sizes of 5 kg bags. Sanku covers the cost of premix through the margins generated through the sale of branded flour bags to millers.

Since the start of the initiative, Sanku has reached 6 million people with fortified flour across East and Southern Africa. Its goal is to reach 100 million people by 2030.

Sources:
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World Food Program (n.d.). Sanku – Fortifying flour through a micronutrient dosifier. Website. Available at https://innovation.wfp.org/project/sanku (Accessed 27.05.2022).

Interviews with Leo Schulte-Vennbur & Maximiliane Schneider (Mühlenchemie) & Leah Tronel, Wilson Chonjo, and Timothy Laku (Sanku).

### The role of large companies and other stakeholders in the food fortification value chain

Large companies can collaborate with specialized solution providers to tap the significant and underserved small mills market by:

- **Providing adjusted products.** Large companies can collaborate with providers who cater to small mills by adjusting packaging sizes and labeling to meet small millers' needs (including limited literacy). BASF, for example, collaborated with a local blender to provide pre-diluted fortified oil to the smallest oil producers. The pre-diluted oil can be distributed in small container sizes to make fortification affordable.
- **Supporting research and development for small mills.** Technical equipment and quality assurance procedures need to be adjusted to small mills' needs. Large companies can collaborate with specialized providers by providing expertise.
- **Helping fund small mill solutions.** Serving small mills is costly. Companies catering to this market require external government or donor funding in the beginning and, depending on the market conditions, even over the long term. They may operate as for-profit or non-profit organizations or a hybrid of both. Large companies can help fund non-profits through grants as part of their Corporate Social Responsibility activities. They can also invest in for-profits via their (impact) or venture capital programs.

### Example of partnership and collective action

Donors can support specialized solutions through grants, service contracts, and technical assistance. For example, the World Food Program's Innovation Accelerator is running regular challenges to address nutrition challenges through innovation. Winners participate in an acceleration program that helps them advance their business model and connects them with relevant partners. They can also pitch for financial support. The Innovation Accelerator has also supported Sanku in its growth phase.

5

OPPORTUNITY AREA 5:

# Consumer-centric solutions

## Develop new customer-centric solutions that create demand for fortified foods

### The opportunity

**Demand creation for fortified products is a critical but challenging activity in food fortification.** The advantage with fortification is that it does not usually require consumers to change their consumption habits, but it does require them to be informed of the benefits so they can actively seek out, identify and purchase fortified products. Consumer demand for fortified foods is often limited, particularly in low- and middle-income countries.[79] Reasons for this are numerous. Consumers may lack awareness of fortified foods and its benefits or even be skeptical or afraid of negative side effects. Consumers cannot see or taste the difference to unfortified foods, and the benefits of consumption only become evident over time.[80, 81] In rural areas, locally produced food is often not branded or packaged. Consumers are highly price sensitive and unwilling or even unable to cover the additional cost of fortified foods.[82]

A study conducted in Kenya in 2022, for example, shows that only about a third of consumer respondents had knowledge about food fortification, and this knowledge was correlated with tertiary and secondary education. Almost half of the respondents had a positive attitude towards fortified foods, and 66% expressed concern with the price associated with such foods. Over 80% said they had purchased fortified foods in the past, but only 20% did so for the fortification itself.[83] In another study in India, 76% of rural mothers thought that targeted fortification products should not be used for children, and only 19% fed their children with such products.[84]

**Consumer-centric solutions can create demand for fortified foods.** These solutions start from the needs and preferences of target consumers. New products can be processed foods that are high in demand and desirable among the target population or new staples which are consumed on a daily basis, such as fortified rice. Improved packaging and branding, and including nutritional logos, labelling and regulated health claims, can underline messages that resonate with the target group and proactively address concerns. This can be supported by public health messaging and other awareness-raising campaigns.

### The role of large companies and other stakeholders in the food fortification value chain

Companies can create consumer-centric solutions to raise awareness and increase demand among target populations in the following ways:

- **Invest in and conduct market research.** Companies along the value chain need to understand what consumers buy, how they cook and eat, what they are looking for, and what knowledge and perception they have of fortified food. Researching target groups, using effective and responsible methods and protocols, is the foundation for identifying effective consumer-centric solutions.
- **Develop new products.** Companies can develop new product solutions. New vehicles can reach population groups that do not yet consume available fortified foods.
- **Help raise awareness.** Product packaging can be adjusted to appeal more to target populations, explain benefits and address misconceptions better. Companies can also support awareness-raising campaigns by public and civil society actors.

The public sector has a key role to play in implementing campaigns to raise awareness among consumers on the impact of micronutrient deficiencies on health and wellbeing and the role of fortified food in countering deficiencies.

Civil society organizations can help with awareness raising. They also often have a good understanding of the target groups and existing data. They may also implement research among target groups using appropriate methods. Consumer protection and rights organizations can also help to raise awareness of the benefits of fortified food, check product quality and make food producers accountable.

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## Examples of partnerships and collective action

**The Iodine Global Network (IGN)** significantly expanded its coverage of the benefits of iodized salt by also including food processors in its efforts. In doing so, the IGN responded to a change in global dietary patterns and the fact that industrially processed foods account for an increasing proportion of dietary salt intake compared to household salt.[85] Use of iodized salt in processed foods such as low-cost instant noodles or baking goods provides opportunities to reach more consumers, especially those in regions that still struggle with iodine deficiency.[86]

**The Strategic Alliance for the Fortification of Oil and other Staple Foods (SAFO)**, a public-private alliance between GIZ and BASF, placed great emphasis on educating consumers about the benefits of vitamin A in edible oils. In Indonesia, for example, together with the non-profit organization Indonesian Nutrition Foundation for Food Fortification (KFI), the team developed a series of educational materials that were distributed across various channels. These included newsletters in the national language and the promotion of fortified oil products on Indonesian television and radio.[87]

**EXAMPLE 5**

## DSM and Africa Improved Foods (AIF) in Rwanda

### Accessible and affordable nutritious foods for everyone

Africa Improved Foods (AIF) Rwanda Limited is a joint-venture enterprise that was established in 2016 to improve access to nutritious, locally sourced foods. It is a public-private partnership between the Government of Rwanda, micronutrient producer DSM, the International Finance Corporation (IFC), the Dutch development bank FMO, and the UK development finance institution British International Investment (BII).

Sourcing most of the grain locally, AIF produces Fortified Blended Foods (FBF) such as fortified porridge or cereals in its Rwandan-based factory, targeted at women, children and entire families. The production and distribution of these types of novel fortified food products differs in approach to the fortification of commonly consumed staple foods and condiments. The company distributes them commercially or through partners such as the World Food Program and the government of Rwanda to populations at risk of malnutrition in Ethiopia, Rwanda, Tanzania, Kenya, Uganda, and South Sudan.

DSM and milling equipment manufacturer Bühler Group have been key partners of the initiative, with a strong focus on building local fortification capacity. Besides providing premix at commercial rates, DSM has supported extensive technical capacity building and training sessions in topics such as food safety, food fortification and processing, and quality assurance. Additionally, DSM has worked to build local management capacities, including by providing advice and expertise on how to market AIF products to maximize demand and uptake.

The Bühler Group built AIF's US$62 million plant in Kigali and supported the initiative in finding qualified staff and training local millers in grain processing. The company utilized its training centre, the African Milling School (AMS), to train AIF mill operators on operating the factory effectively and safely.

As of early 2023, AIF reaches 1.6 million consumers and beneficiaries across the region daily through the World Food Programme, and more than 90,000 children over six months and pregnant and lactating women in Rwanda, who now have access to nutritious complementary foods.[88]

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6

OPPORTUNITY AREA 6:

# Advocacy

## Advocate for effective policies, regulation and standards

### The opportunity

**Food fortification, as one intervention in a wider, integrated nutrition portfolio, needs conducive framework conditions to be established by the public sector.** The public sector formulates strategic policy directions, enacts legislation, mandates fortification and sets standards.[89] The clearer the public sector's signal to companies on the rationale for fortification and what they need to do, the easier it is for companies to implement and sustain fortification.

**However, public sector buy-in is not a given.** The public sector may lack awareness of the value of high-quality fortified foods, the health and economic benefits that come with it, or require further research on food fortification topics.[90] Furthermore, the public sector, particularly in low-income countries, face scarce resources and competing priorities, and food fortification is not always a high priority.[91] Implementing a sophisticated national fortification program is complex and requires extensive resources, capacity and knowledge. This ranges from assessing the need, relevance and feasibility of fortification activities to implementing appropriate policies and programs to ensuring effective monitoring and enforcement.[92]

**While companies do not have a mandate to influence the content of standards and regulations, they can help to accelerate and facilitate public sector processes.** Although the first priority for companies is to translate LSFF standards into business practices, they can then help to inform public sector fortification processes. Given distrust of large corporations in many countries, such efforts need to be transparent and ideally, collective in nature and independently monitored. In order to achieve this, partnerships with public and civic actors are key, albeit with a strong focus on managing and mitigating risks associated with conflicts of interests.

### The role of large companies and other stakeholders in the food fortification value chain

Opportunities to advocate for food fortification generally depend on the stage of fortification in a country. They can range from initiating fortification efforts to revising standards and supporting stronger compliance of existing efforts.[93] Companies can assist these processes by:

- **Supporting research activities and technical understanding of food fortification.** Solid evidence is essential to lay the groundwork for food fortification in countries.[94] Companies can work with donors and research institutes to support academic research and scientific studies or provide market knowledge and technical inputs for guidelines, toolboxes, reports and case studies.[95, 96]

- **Supporting local proponents:** Working with (local) food fortification champions is one of the most effective ways towards supporting conducive government policies and frameworks.[97] Proponents can range from high profile individuals to national agencies for food fortification. Food fortification partnerships can support these champions in their efforts, e.g., by actively involving them in their partnerships.

- **Engaging in dialogue.** Companies can participate in the wider dialogue around nutrition and food fortification with global and national multi-stakeholder platforms and in public forums. While primarily the task of multi-stakeholder National Fortification Alliances, several global initiatives, such as IGN, GAIN and SUN, also create spaces for dialogue among diverse actors on a global level and advocate for nutrition topics. Companies can share their experience and contribute technical know-how to such collective platforms, both nationally and globally.

Civil society actors such as NGOs, associations, physicians, as well as patient advocates and parents with personal experiences of micronutrient deficiencies can voice the potential risks of micronutrient deficiencies and the benefits of adequate food fortification on the population. They can also be effective in calling for greater transparency and holding industry and governments accountable. The approach has been used effectively by the Smarter Futures initiative (See Example 6). Civil society organizations can also work with governments and companies to develop and implement food fortification campaigns.[98]

### Examples of partnerships and collective action

In the case of SAFO, BASF supported the Indonesian Nutrition Foundation for Food Fortification (KFI) in developing technical guidelines for standard setting processes. The company provided information on vitamins as well as technical know-how on oil fortification with vitamin A.

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Public-private partnerships can help translate scientific results for the global health community, governments and consumer organizations. IGN maintains a strong connection to the scientific community. The network regularly publishes Global Iodine Scorecards that indicate iodine status for all countries and tracks progress in tackling global iodine deficiencies. The partnership regularly summarizes scientific research results on key questions and translates them into tangible recommendations for governments and other non-scientific decision makers.[99]

**EXAMPLE 6**

## Smarter Futures

### Making the case for food fortification by involving civil actors

Smarter Futures was a public-private-civic partnership focused on grain fortification, such as wheat flour, maize flour, and rice. Formed in 2007 and concluded in 2021, Smarter Futures brought key stakeholders together to stimulate exchange and share experiences in grain fortification across regional, national, and cross-country levels. Main partners of the initiative included the Food Fortification Initiative (FFI), the Global Alliance for Improved Nutrition (GAIN), the International Federation for Spina Bifida and Hydrocephalus (IF), Bühler Group, Helen Keller International (HKI), Mühlenchemie, Nouryon (formerly AkzoNobel), Nutrition International (NI), and the World Food Programme (WFP).

Advocacy for food fortification was an important element of the initiative and collaboration with civil society was key. For example, Smarter Futures worked closely with IF, a civil society organization that specializes in decreasing the birth prevalence of spina bifida and other neural tube defects, as well as disability groups, consumer associations, and physicians. The initiative organized workshops in several countries that allowed for public, private and civic actors to meet and exchange information on the importance of food fortification. Mühlenchemie supported these efforts by contributing information on technical and business aspects of fortification. Showcasing personal stories on the impact of conditions such as spina bifida with both millers and government actors demonstrated firsthand the benefits of food fortification. Smarter Futures also assisted governments in facilitating the process towards legislation, for example, by conducting assessments of monitoring needs, cost-benefit analyses, providing guidelines, and training regulatory personnel on QA/QC practices.

Over the last 15 years, Smarter Futures has reached 723 million people, provided specialized support to 26 African countries, and convened 27 trainings and stakeholder meetings. Furthermore, a total of 41 African governments have participated in workshops, training and other events on fortification in Africa, out of which 29 countries have now adopted the legislation to make grain fortification mandatory, and six countries allow fortification on a voluntary basis.

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Interviews and Inputs from Scott Montgomery, Enzama Wilson, Afidra Ronald (FFI), Leo Schulte-Vennbur (Mühlenchemie)

# Working in partnership for a better food fortification system

Research undertaken for this paper identified six factors that can help to make food fortification partnerships between large companies and other actors successful:

1. Take a systemic approach by understanding different stakeholders and their motivations and addressing system dynamics
2. Align stakeholder incentives, strategies and activities at country level to ensure synergies
3. Work with organizations that have capacities on the ground and strengthen them
4. Invest in and use data as a key management tool
5. Harness industry champions – individual leaders, companies or trade associations to advocate for and lead the way on food fortification
6. Avoid short-term interventions and abrupt program ends and plan for a long-term commitment and resilience to adapt to shocks and changes in market conditions.

## 1 Take a systemic approach by understanding different stakeholders and their motivations and addressing system dynamics

Food fortification is a complex topic that involves many different actors and activities to succeed. Partnerships that aim to scale food fortification at a national level should reflect this complexity and actively address different constraints, incentives and other enablers. This typically requires engaging different relevant stakeholders in a coordinated way. The SAFO project, for example, supported the government of Indonesia in developing mandatory fortification regulations while – at the same time – it worked with the private sector to adhere to food fortification standards – all the time with a "firewall" in place between these activities to avoid conflicts of interest. The work around mandatory regulation created a strong incentive for private sector partners to engage in fortification practices to be well prepared. National industry players were more interested in championing food fortification because it was set to become mandated.

In such a multi-pronged approach it is critical to pay attention to a clear division of roles between public and private partners. Private partners should focus on providing technical assistance to millers and food processors and invest in building local infrastructure for food fortification. Research, advocacy for mandatory regulations and definition of fortification levels and standards, on the other hand, are primarily the domain of public sector partners, civil society organizations and academia, although the private sector can contribute to enhancing the effectiveness of these efforts in a transparent manner.

## 2 Align stakeholder incentives, strategies and activities at country level to ensure synergies

In most countries, a range of key stakeholders implement food fortification. In addition to the large millers and food processors, these include the public authorities defining and enforcing standards, public and private testing laboratories, civil society organizations building awareness and capacity, and, to some extent, media and distributing organizations. While the interventions featured in this publication focus on the role of private companies in supporting and building the capacity of millers and local value chains, it is important to align activities within the broader ecosystem. SAPFF managed to do this through its annual CEO Level Roundtable, a forum that brings together public and private leaders to promote food fortification excellence, but also through regular bilateral contact with public and civil society actors. Civil society organizations can play an important role as intermediaries and facilitators between public and private sector actors. Smarter Futures also facilitated regular multi-stakeholder gatherings to discuss food fortification topics.

Having all stakeholders around one table is even more important when developing shared sector infrastructure, such as data collection, sharing standards or transparency processes like micronutrient tracking. These mechanisms can only realize their full potential if they are being used and supported by a critical and diverse mass of players. The Micronutrient Fortification Index (MFI) was designed by TechnoServe in alignment with processing companies and standard setting agencies.

### 3 Work with organizations that have capacities on the ground and strengthen them

Where local food fortification platforms and proponents exist, such as National Alliances for Food Fortification, which bring together fortification stakeholders at the country level, partnerships should focus on strengthening their capacity and supporting these organizations in their efforts to scale food fortification at national level rather than setting up parallel or competitive initiatives.

In countries where they do not maintain an office of their own, international nutrient and premix manufacturers typically collaborate closely with independent local distribution companies. The international nutrient and premix manufacturers train such partners to provide technical assistance to clients. In some cases, they go beyond that and set up local technical institutions. In all cases, the focus should be on building and strengthening the capacity of local institutions.

### 4 Invest in and use data as a key management tool

Data is becoming increasingly important to monitor and manage fortification processes. A good example is the Micronutrient Fortification Index, which has been established in Nigeria. The index tracks fortification levels by sourcing data from several steps in the value chain, including premix purchases and shelf sampling. Quarterly updates enable stakeholders to identify drops in fortification levels quickly and to respond. This information is used by the millers and processing companies to fix issues and to improve their processes. It is also used by civil society organizations to identify gaps and entry points for interventions. Finally, it may also be used by government agencies to ensure compliance. Wherever fortification is mandatory, such levels of transparency are in the interest of all stakeholders as they prevent a race to the bottom dynamic. But even where stakeholders do not run the risk of regulatory fines and sanctions, the use of comparative, reliable and transparent data can fuel a race to the top by increasing competition and incentivizing companies to fortify.

### 5 Harness industry champions – individual leaders, companies or trade associations to advocate for and lead the way on food fortification

The leadership of top-tier millers and food processors is important to bring company colleagues and industry peers on board. Whether fortification is mandatory or not, a strong voice by the most respected and influential industry players can make a big difference. KenSalt, for example, was instrumental in recruiting smaller salt producers in East Africa for the Iodine Global Network and motivating them to start fortifying salt with iodine. In some cases, they even provided technical assistance to smaller competitors. Second tier companies can also drive innovation because food fortification for them can be a key differentiating factor compared to industry leaders that dominate the market. SunCo in Indonesia, for example, was keen to highlight their vitamin A fortification practice on their products to attract new customers and increase market share. Seeing their success and increased sales, larger players followed.

Industry leaders also have much to gain from first mover roles, as they typically own the leading brands and have high visibility among consumers and government agencies. Some also lead on a regional or even international level or have the ambition of doing so. Taking the lead in public health nutrition creates international recognition. Second-tier companies are motivated by this championship, since they often regard the leaders as the quality benchmark (as do their customers). It is often easier to start with the leaders in the space and then build the incentive structure that brings in others.

**6 Avoid short-term interventions and abrupt program ends and plan for a long-term commitment and resilience to adapt to shocks and changes in market conditions**

Food fortification may look like a quick and relatively easy intervention from a technical perspective but embedding it in national policies, institutional structures and norms takes time. Standards and regulation require years to be developed and market tested, millers and food processors need time to make fortification a routine process, and consumer awareness and trust requires time to grow. The typical 3- or 5-year timeframe of many donor initiatives is usually too short to achieve lasting change. Instead, food fortification partnerships should be designed from the beginning with a view to sustainability, and with options to continue engagement beyond initial timelines, individually or collectively.

Private sector partners should have an interest in continuing engagements and investing in long-lasting local support structures because if market conditions are good, they are there to stay and conduct business. For development partners, continuous engagement of the private sector and local agencies is a crucial driver to increasing sustainability of their interventions, especially when donors intend to have a catalytic role and not remain long-term themselves. The example of SAFO in Indonesia shows how GIZ managed to provide catalytic funding by investing in local organizations like the Indonesian Nutrition Foundation for Food Fortification and engaging in an initiative with the private sector. Other examples of building sustainability mechanisms into initiatives include support of local structures and skills, such as mentoring government staff to ensure there is capacity beyond the duration of the initiative, incorporating fortification training into local universities and / or miller training programs, and advocating for a fortification line item in government budgets for on-going monitoring and meetings.[100]

**In conclusion, food fortification improves lives.** At a challenging time when many low-income consumers are reverting to staples and cannot afford a diverse diet, providing micronutrients via commonly consumed staple foods is an urgent priority.

To achieve widespread food fortification, the collaboration of local millers and food processors is critical. They need an operating environment that is supportive and rewards fortification. Companies and other stakeholders must move beyond the simple regulation-and-training approach and fix systemic constraints in the food fortification market system.

This report has identified six opportunities for companies to work with the public sector and development organizations to create a supportive market system for local millers and food processors. Realizing these opportunities and unblocking barriers will increase the potential of food fortification – and, ultimately, enable millions of people to live healthier, more productive lives.

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# In-depth partnership profiles: Multistakeholder partnerships for food fortification

Fortifying Food Markets
Unlocking the potential of food fortification partnerships to improve nutrition

PARTNERSHIP PROFILE

## Affordable Nutritious Foods for Women (ANF4W)

Small-scale maize fortification in East Africa

Fortifying commonly consumed staple foods and condiments with essential micronutrients, such as minerals and vitamins, offers untapped potential to help scale up access to nourishing diets for millions of people affected by malnutrition.

There is growing recognition among governments, donors and large corporations that the local millers and food processors who are responsible for fortifying staple foods in most countries play a crucial role in reducing malnutrition, and that more needs to be done to support and unlock their vital contribution.

A new report: "Fortifying Food Markets", developed by the Corporate Responsibility Initiative, Harvard Kennedy School and Endeva, identifies six opportunities to remove barriers that prevent millers from achieving the scale, quality and reliability that are needed for successful food fortification.

The report is informed by a series of profiles that identify learnings and good practices from existing food fortification partnerships engaged in building the capacity of millers. We thank the Bill and Melinda Gates Foundation for supporting this research.

### Introduction to the initiative

The Affordable Nutritious Foods for Women (ANF4W) initiative was established in 2013 under the auspices of the German develoPPP.de program, with the goal of increasing and improving the local production of affordable, micronutrient-rich foods. The initiative was jointly funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Bill & Melinda Gates Foundation, and it was supported by the German Agency for International Cooperation (GIZ).

As a part of the program, the different private sector partners provided support to local food processors through training, technical advice and business development. The program focused on several areas: business-to-business solutions with local food processors, biofortification of rice, maize flour fortification by small and medium size mills, demand creation for nutritious foods, quality assurance & control of fortified foods, and monitoring costs and effectiveness. Its principal aim was to address women's insufficient intake of vitamins and minerals due to poor diets, and, as a result, ensure an adequate supply of nutrients during the critical window of the first 1,000 days of children's lives.

In East Africa, maize flour is the principal staple food. It is an ideal vehicle for fortification with essential micronutrients as it has the potential to reach a large part of the local population at low cost. In Tanzania, 95% of the population of 57 million people consume maize flour.[1] In 2018, an average of 130 children died each day in the country due to malnutrition.[2]

About 95% of the maize flour consumed in Tanzania is produced in remote small-scale mills.[3] Such facilities generally lack the technical equipment, capabilities and incentives to fortify their foods to the desired standards. Furthermore, small mill owners cannot afford the additional cost of micronutrient premix, and they cannot pass these costs on to the consumer due to the price-sensitive nature of the maize flour market.

In 2016, as part of the ANF4W initiative, Sarsku, a social enterprise that provides affordable flour-fortification technology and business solutions to small mills, teamed up with Mühlenchemie, an international market leader in the fortification of flour, with the goal of unlocking small mill food-fortification opportunities in East Africa.

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Fortifying Food Markets
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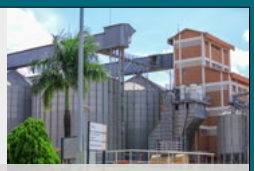

PARTNERSHIP PROFILE

## Africa Improved Foods (AIF)

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### Introduction to the initiative

Africa Improved Foods (AIF) Rwanda Limited is a joint-venture enterprise, established in 2016, to help people in Rwanda and the wider region achieve their full potential through improved access to nutritious, locally sourced foods. With a focus on driving improvements in the country's food system, AIF's operations encompass the entire food value chain, including local and regional sourcing of agricultural inputs, the production of Fortified Blended Foods (FBF), such as micronutrient rich cereals and porridge, and the marketing and distribution of fortified food products among local populations.[1] AIF manufactures in Rwanda and its products are distributed in Rwanda, Tanzania, Kenya, Uganda and South Sudan.[2] AIF aims to both reduce undernutrition in populations at risk, including pregnant and breastfeeding women and children, and to provide jobs and livelihoods.

AIF is a public-private partnership between Royal DSM, the International Finance Corporation (IFC), the Dutch development bank FMO, and the Government of Rwanda.[3] Other partners include the Clinton Foundation (Clinton Health Access Initiative (CHAI)),[4] World Vision,[5] the Ministry of Agriculture and Animal Resources (MINAGRI), and the milling equipment supplier Bühler,[6] among others.

AIF's product range encompasses institutional products (relief) and commercial products (mass market). The relief products are for institutional buyers such as the government of Rwanda and the World Food Programme (WFP) for use in public distribution programs for populations in vulnerable health, social, environmental and financial situations. For example, in partnership with the government of Rwanda, AIF distributes its Shisha Kibondo range, a nutritious complementary porridge, free-of-charge to Rwandan mothers and infants.[7]

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PARTNERSHIP PROFILE

## Iodine Global Network (IGN)

Fortifying commonly consumed staple foods and condiments with essential micronutrients, such as minerals and vitamins, offers untapped potential to help scale up access to nourishing diets for millions of people affected by malnutrition.

There is growing recognition among governments, donors and large corporations that the local millers and food processors who are responsible for fortifying staple foods in most countries play a crucial role in reducing malnutrition, and that more needs to be done to support and unlock their vital contribution.

A new report: "Fortifying Food Markets", developed by the Corporate Responsibility Initiative, Harvard Kennedy School and Endeva, identifies six opportunities to remove barriers that prevent millers from achieving the scale, quality and reliability that are needed for successful food fortification.

The report is informed by a series of profiles that identify learnings and good practices from existing food fortification partnerships engaged in building the capacity of millers. We thank the Bill and Melinda Gates Foundation for supporting this research.

### Introduction to the initiative

The Iodine Global Network (IGN) was first established in 1986 under the name International Council for Control of Iodine Deficiency Disorders (ICCIDD) with support from UNICEF, WHO and the Australian government.[1] The network since has served as the definitive scientific authority on iodine nutrition, while also supporting national iodine deficiency prevention programs. In collaboration with the partners which make up the network, IGN advocates for the importance of iodine nutrition and catalyzes coalitions and political action for a sustainable elimination of iodine deficiency disorders (IDD).[2] The network strives to ensure that populations across the globe can achieve and maintain iodine sufficiency by establishing enabling structures on national and regional levels. Given that the main intervention to ensure optimal iodine nutrition is universal salt iodization (USI), the intentional engagement and recognition of the role of the salt industry has been imperative to IGN's work.

The IGN works with a range of stakeholders towards harmonizing global and regional iodine programs (see table 1).[3]

Network partners are the salt industry to produce and iodize salt, governments to mandate salt iodization, monitor compliance, assess population coverage and iodine status of the population, civil society to create demand for iodized salt and development partners for support on the ground.[4] Key partners include:

- The Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) are normative agencies responsible for setting standards and guidelines
- UNICEF supports advocacy
- GAIN, Nutrition International (NI) and others provide technical assistance in program implementation
- Kiwanis was responsible for raising up to $80 million to support USI programs in the 1990s and 2000s
- Academic institutions support the research, for example ETH leads global research on indicators and cut-off points, the George Institute leads research on salt reduction and alignment with salt fortification and EU Thyroid is a consortium of academic institutions
- Multiple salt companies and associations
- Bill and Melinda Gates Foundation, USAID and other donors funding the work.

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3. Iodine Global Network (n.d.). About the IGN. Website. Available at ign.org/about/ (accessed 10.01.2022).
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PARTNERSHIP PROFILE

## Smarter Futures

Fortifying commonly consumed staple foods and condiments with essential micronutrients, such as minerals and vitamins, offers untapped potential to help scale up access to nourishing diets for millions of people affected by malnutrition.

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### Introduction to the initiative

Smarter Futures was a public-private-civic partnership focused on grain fortification, including wheat flour, maize flour and rice. Smarter Futures supported marginalized communities, providing essential vitamins and minerals, notably iron and folic acid, to adolescent girls and women in Africa in a sustainable manner. The initiative started in 2007 at the request of the former Minister of Foreign Affairs of the Netherlands and has since provided fortification support to grain millers, micronutrient suppliers, international organizations, governments, and academic institutions across 26 African countries.[1]

Smarter Futures focused on bringing together key stakeholders to stimulate the exchange and sharing of experiences in grain fortification at the regional, national and local levels. Through the activities of its partners, the initiative provided technical support to millers, governments, monitoring agencies, and other stakeholders to create robust grain fortification programs.[2] As such, Smarter Futures did not invest large resources itself but focused on supporting and strengthening the activities of its partners.

The partners[3] of the initiative included the Food Fortification Initiative (FFI) as the main implementing partner, the Global Alliance for Improved Nutrition (GAIN), the International Federation for Spina Bifida and Hydrocephalus (IF), Bühler, Helen Keller International (HKI), Mühlenchemie, Nouryon (formerly AkzoNobel), Nutrition International (NI), and the World Food Programme (WFP). The initiative was funded by the Dutch Ministry of Foreign Affairs.[4]

Through the involvement and actions of IF, Smarter Futures placed a particular focus on the involvement and inclusion of civil society actors such as disability groups, consumer associations, physicians and neurosurgeons, and parent associations related to Spina Bifida and Hydrocephalus. For example, IF specializes in decreasing the birth prevalence of spina bifida and other neural tube defects (NTDs), which can be caused by vitamin and mineral deficiencies. IF represents member associations in 14 countries across Africa that all support the advocacy activities of the Smarter Futures initiative. In some countries, the initiative brought in parents' groups to interface with the millers directly and to demonstrate

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2. www.wbcsd.org/Programs/Food-Energy-Water/Sustainable-Nutrition/Publications/Fortifying-Food-Markets-Unlocking-the-potential-of-food-fortification-partnerships-to-improve-nutrition
3. Partners as of 2020; founding members were Food Fortification Initiative, the International Federation for Spina Bifida and Hydrocephalus, Helen Keller International and Nouryon (formerly AkzoNobel) with funding from the government of the Netherlands.
4. Food Fortification Initiative (FFI). Smarter Futures. Atlanta, USA: FFI; 2022. Available from: www.ffinetwork.org. Accessed on: 16.02.2022.
5. www.smarterfutures.com/about

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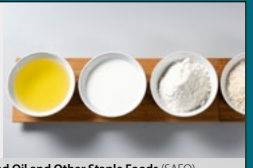

PARTNERSHIP PROFILE

## Strategic Alliance for Fortified Oil and Other Staple Foods (SAFO)

Fortifying commonly consumed staple foods and condiments with essential micronutrients, such as minerals and vitamins, offers untapped potential to help scale up access to nourishing diets for millions of people affected by malnutrition.

There is growing recognition among governments, donors and large corporations that the local millers and food processors who are responsible for fortifying staple foods in most countries play a crucial role in reducing malnutrition, and that more needs to be done to support and unlock their vital contribution.

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### Introduction to the initiative

The Strategic Alliance for Fortified Oil and Other Staple Foods (SAFO) was a public-private partnership that was initiated in 2008 under the German develoPPP.de program. The main partners of the initiative included the chemical company BASF and the German Development Cooperation GIZ. The objective of SAFO has been to reduce vitamin A deficiency and reach 100 million people by adding vitamin A to staple foods, mainly edible oils. Initially scheduled for three years and with operations in eight countries, the implementation of the initiative was extended in 2012 for three more years with a main focus on three countries, namely Bolivia, Indonesia and Tanzania ("SAFO 2").[1, 2]

SAFO was designed as a catalytic, multi-stakeholder initiative to strengthen the ecosystem for food fortification. The initiative's approach was structured around four dimensions: policy advice and advocacy, economic and technical implementation, testing arrangements for monitoring systems (QA/QC), and legally mandatory fortification. SAFO was designed to maximize the comparative advantages that each partner brought to the alliance. On the public sector side, GIZ as a credible and trusted development partner, worked closely with government and civil society actors. BASF contributed its deep technical expertise around fortification processes and its experience in capacity development of local food processing companies.

This case study specifically looks at the process, results and insights of SAFO in Indonesia, highlighting the role of private sector partners.[3] SAFO's formal involvement in Indonesia began in 2009 and main additional partners included the Indonesian non-profit Nutrition Foundation for Food Fortification (KFI), the Indonesian Ministry of Health, the National Authority of Drug Control, national food labs, the German product-innovation company for diagnostics and food testing BioAnalyt, and large and small national oil processors.

SAFO was a well-timed initiative in Indonesia and was welcomed by both the government and the national private sector. In 2009, the Indonesian government announced a five-year strategy with the goal of reaching more than 200 million Indonesians with fortified cooking oil. Food fortification was not new in Indonesia. The government had successfully instituted mandatory fortification of salt with iodine and flour with iron and B vitamins over the past years. As the largest producer of palm oil

1. For the sake of simplicity and because of the similar nature of SAFO and SAFO 2, we subsidize all activities under the term "SAFO".
2. GIZ (2014).
3. For a detailed description on the role of GIZ in SAFO, see GIZ (2014).

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PARTNERSHIP PROFILE

## Strengthening African Processors of Fortified Foods (SAPFF)

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### Introduction to the initiative

Strengthening African Processors of Fortified Foods (SAPFF), a public-private partnership, has sought to increase the availability of high-quality fortified foods in Nigeria, Tanzania and Kenya. The initiative has focused on enabling fortification excellence among industry leading larger mills with significant market share. This case study focuses on the project activities and results in Nigeria. At present, in Nigeria, it is mandatory to fortify flour, salt, sugar and edible oil with the necessary micronutrients.[1]

The staple foods fortified as part of the initiative have varied from country to country. In Nigeria, the initiative has covered wheat flour, edible oil and sugar. Combining the strengths of private sector partners, SAPFF has provided customized technical support to local millers, enabling them to comply with national fortification standards. Moreover, the provision of practical solutions to strengthen fortification and quality assurance/quality control (QA/QC) processes of fortifying mills has helped to increase their profitability and competitiveness, and in the process, has strengthened the business case for food fortification by ensuring fortification benefits for millers outweigh the costs.

SAPFF has also provided a platform for engagement with relevant stakeholders within the fortification ecosystem, such as government ministries, industry associations and NGOs, to create an enabling and sustainable market environment for food fortification.

The initiative was funded by the Bill and Melinda Gates Foundation over the period of 2016-2022. Key partners of SAPFF comprised its implementing partners TechnoServe and the Global Alliance for Improved Nutrition (GAIN). Bühler, a provider of food processing technologies, provided access to its African Milling School. SAPFF has also engaged with Partners in Food Solutions (PFS), a consortium of international companies that provide expertise on food processing, and with local milling associations in respective countries to facilitate industry coordination and alignment with relevant government bodies. The total overall budget allocated to the initiative was $10 million over the 2016-2022 period.

1. www.nafdac.gov.ng/wp-content/uploads/Files/Resources/Regulations/Nigeria_Food_Fortification_Regulations_2019.pdf

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