

FOOD FORTIFICATION INITIATIVE

FUNDING OPPORTUNITIES

enhancing grains for healthier lives

OCTOBER 2020



Enhancing Grains for Healthier Lives

The global health burden of vitamin and mineral deficiencies is profound.

Over 2 billion people are affected by vitamin and mineral deficiencies. Vitamins and minerals, such as iron and folic acid, used in fortification prevent birth defects of the brain and spine as well as anemia caused by nutritional deficiencies.

[The Food Fortification Initiative](#) (FFI) is a public, private, and civic partnership that provides technical assistance to governments, regional bodies, food producers, and implementing agencies in the promotion, planning, implementation, and monitoring of sustainable grain fortification programs as a means of addressing this global burden of vitamin and mineral deficiencies.

Globally, 86 countries have legislation to mandate fortification of at least one industrially milled cereal grain. Of these, 85 countries mandate fortification of wheat flour alone or in combination with other grains. A [2017 study](#) found that 50,270 birth defects of the brain and spine were prevented in one year due to flour being fortified with folic acid—an average of 137 healthier babies every day.

Despite recent strides, however, billions of people do not receive enough vitamins and minerals to reach their full potential. **More needs to be done.**



Photo: Arjun Claire



Photo: Icaro Cooke Vieira



Photo: Russell Watkins



\$28,053,988

TOTAL FUNDING GAP (USD)



1.5 billion

TOTAL TARGETED
POPULATION OVER 5 YEARS

This document outlines additional opportunities for FFI to reach **1.5 billion more people** over the next five years **with adequately fortified grains** and the required funding amount needed to fill this gap. The activities and subsequent funding gaps are broken down by geographic region.



Reach **400 million** people with fortified wheat flour and rice

INDIA: WHEAT AND RICE



With a high prevalence of anemia and preventable birth defects as well as high consumption of both wheat flour and rice, the potential health impact of fortifying cereal grains in India is immense.

Twenty-four Indian states report [anemia prevalence](#) of 26 to 65% among married women; the average is 50%. The World Health Organization considers anemia prevalence over 40% a severe public health concern as it causes debilitating fatigue, lowers productivity, and contributes to maternal deaths.

Anemia can be caused by many things, including deficiencies of iron and vitamins B9 (folic acid) and B12. The typical vegetarian diet in India provides very little iron and vitamin B12, which are most commonly found in animal-based food sources.

In India, [45 of every 10,000 births](#) (live births and stillbirths) have a birth defect of the brain or spine. With [25.6 million](#) annual births, this equates to 115,390 birth defects of the brain or spine every year. Adequate intake of vitamin B9 could lower the prevalence to [6 per 10,000 live births](#).

Spina bifida is an example of these birth defects. It has varying degrees of severity and can cause lifelong disability. Another example is anencephaly, which is always fatal. Of infants born with a birth defect of the brain or spine, [75% die](#) before their fifth birthday.



Many vegetables include vitamin B9, but it is very difficult to reach the recommended daily intake of this essential vitamin from unfortified food alone.

At 190 grams per person per day, rice is the most widely available cereal grain in India according to the Food and Agriculture Organization of the United Nations. Wheat flour availability is 166 grams per person per day.

FFI has identified 18 states in India with potential for fortified rice or wheat flour in various market channels. Wheat flour fortification in the government's Public Distribution System (PDS) has successfully moved forward in the state of Haryana. FFI has provided technical support in Haryana by conducting a wheat supply chain analysis, calculating the costs for the government to supply fortified wheat flour in the PDS system, and ensuring consumer acceptance of the fortified product.

For the remaining 17 states, FFI proposes examining the current political environment to determine which states have leadership willing to support grain fortification with at least iron, vitamin B12, and folic acid. For the identified states, FFI would conduct an assessment to include:

- Industry capacity to fortify flour and/or rice using published reports and interviews with millers
- Current wheat flour and rice consumption patterns based on existing survey data
- Potential distribution channels such as the PDS and open market, and the reach of each distribution channel

Next, FFI would present results of this assessment to state leaders and, building on the successful Haryana model, collaboratively develop practical, operational plans to fortify grains in each state. Activities would include:

- Promote mandatory fortification so that costs and health benefits are shared equally
- Create awareness about nutritional deficiencies, their consequences, and benefits of fortification
- Generate commitment among influential multi-sector leaders to support fortification
- Train millers to fortify their wheat flour and rice according to national standards
- Develop sustainable procedures for internal and external monitoring to ensure compliance with India's fortification standards
- Share the strategy with other nutrition groups in India to avoid duplication of efforts

FFI's vision is for mandatory, sustainable grain fortification to be implemented and monitored in all 18 states.



US\$ **12,000,000** over 5 years



Reach **86.7 million** people with fortified wheat and maize flour

AFRICA: WHEAT AND MAIZE

Tremendous progress has been made across Africa in terms of wheat and maize flour fortification over the years; however, significant gaps still remain. This includes countries that have a demonstrated nutritional need and the presence of political will but do not yet have national programs in place. In addition, there are numerous countries that have programs in place but are struggling with effective implementation and adequate monitoring. Supporting these countries would ensure that an additional 86.7 million people across the African continent have access to adequately fortified grains. Countries would include:

- Algeria (no current grain fortification program in place)
- Angola (no current grain fortification program in place)
- Botswana (no current fortification program in place)
- Mauritius (no current grain fortification program in place)
- Morocco (difficulties with implementation and monitoring)
- Mozambique (difficulties with implementation and monitoring)
- Namibia (no grain fortification fortification program in place)
- South Africa (difficulties with monitoring)
- Uganda (difficulties with monitoring)
- Zimbabwe (difficulties with implementation and monitoring)

FFI would:

- Collaborate with national leaders to secure buy-in for a comprehensive national grain fortification program.
- Support drafting of national standards that would identify the type and level of nutrients to be added to wheat flour and/or maize flour based on current consumption patterns and nutritional needs.
- Support millers and government inspectors in the scale-up for fortification.
- Support millers and government in the design of effective monitoring frameworks for the fortification program.



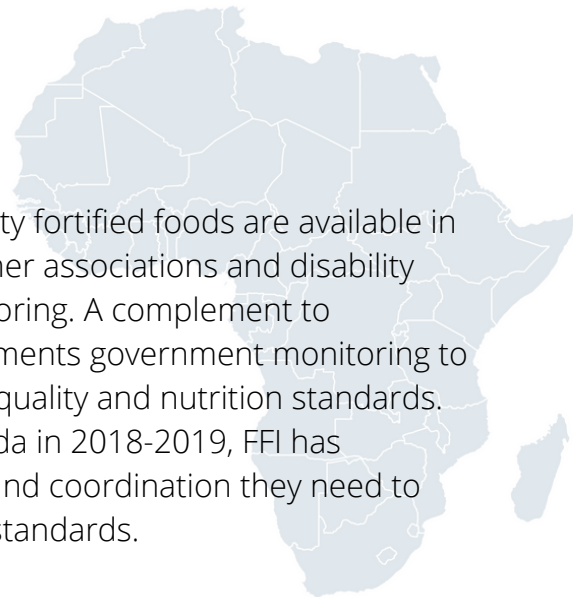
US\$ **2,000,000** over 5 years



Reach **101 million** people with fortified wheat, maize flour, and cooking oils

AFRICA: PULL STRATEGY

One of FFI's innovative approaches to ensure high-quality fortified foods are available in Africa is a grassroots Pull Strategy that engages consumer associations and disability groups to become part of program performance monitoring. A complement to government-led "push" strategies, the Pull Strategy augments government monitoring to increase the volume of fortified staple foods that meet quality and nutrition standards. With pilot implementation projects in Malawi and Uganda in 2018-2019, FFI has provided local advocates with the technical assistance and coordination they need to encourage food producers to comply with fortification standards.



WHAT ARE PUSH AND PULL?

PUSH: Government legislation to require millers to fortify is a "push" or top-down approach to fortification. Though push is the most common approach, it may not lead to nationwide fortification compliance in certain countries.

PULL: Consumer demand to encourage millers to comply with standards is a "pull" or bottom-up approach to fortification.

FFI proposes continued support in Malawi and Uganda as well as Kenya, Tanzania, and Zambia to:

- Conduct initial landscape analyses and market share size and value analyses.
- Support and train stakeholders to conduct a simple, sentinel-type market assessment and commercial monitoring of fortified foods.
- Coordinate analyses of sampled foods at national laboratories.
- Liaise with public, private, and civic stakeholders to create commercial monitoring report and media strategy.
- Support millers and government in the design of effective monitoring frameworks for the fortification program.



US\$ **756,000** over 2 years



Reach **90 million people** with fortified wheat flour

AFRICA: EGYPT

During the COVID-19 pandemic, the uncertainty of supply chains, increased premix prices, and trade restrictions have led some countries to scale back efforts to fortify grains with vitamins and minerals that strengthen individual health and whole economies. Yet the Egyptian government's commitment to the health of its citizens is clear: despite challenges posed by a pandemic, Egypt has partnered with FFI to restart the country's wheat flour fortification program, which ended in 2014.

Malnutrition from micronutrient deficiencies is a pressing public health issue in Egypt: 20-30% of women are anemic, birth defects are three times what they could be if women had adequate intake of folic acid, and losses in gross domestic product due to vitamin and mineral deficiencies are over US \$800 million annually.

But the potential for fortification to dramatically improve Egyptians' nutritional status is even greater. Through an initial situation assessment, FFI found that, if the government enacts mandatory fortification for subsidized wheat flour as well as wheat flour sold on the open market, fortified wheat flour will reach 90% of the population (90 million people) providing a tremendous opportunity for Egypt to address persistent health and economic challenges.

FFI has also completed a comprehensive situation and mill assessment that found 80% of Egyptian mills have the readiness, technical capacity, and timeline to commence fortification of flour. With additional funding, FFI would:

- Collaborate with public, private, and civic champions to secure buy-in for a comprehensive national fortification program.
- Support drafting of national standards.
- Support millers and government inspectors in the scale-up for fortification.
- Support millers and government in the design of effective monitoring frameworks for the fortification program.



US\$ **500,000** over 2 years



Reach **146 million** people
with fortified rice

WEST AFRICA: RICE

The highest per capita consumption of rice outside of Asia is in West Africa. Specifically, 12 West African countries present an opportunity to reach an additional 146 million people with fortified rice. These are countries in which there is limited volume of industrially milled domestic rice but high volumes of imported rice. Several countries in West Africa already fortify wheat flour, salt, and cooking oil. These countries understand why fortification is important and why mandatory fortification is necessary. Fortifying rice would fill a nutrition gap not being addressed by existing programs. However, several countries would need to collectively mandate rice fortification to make it economically feasible.

FFI's proposed activities and milestones would occur in three phases over three years:

BASELINE

1-6
MONTHS

ACTIVITIES

- Develop advocacy and knowledge toolkits for partners and policy makers
- Assess export supply chains in key rice origin countries (India, Thailand, Viet Nam, and Pakistan)
- Develop and promote minimum nutrient standards
- Develop linkages with regional and national bodies
- Engage partners on strategies to add rice fortification into policies and legislation

MILESTONES

- Export supply chain analyses completed in four rice origin countries
- Advocacy and knowledge toolkit developed and finalized

ACTIVITIES

- Plan, coordinate, and hold meetings for policy makers; map legislative process
- Raise awareness with public, private, and civic sector partners and provide technical assistance as necessary
- Assess national import control systems
- Develop and activate communications strategy
- Add rice fortification to regional and national nutrition agendas by increasing awareness at targeted nutrition-related events

MILESTONE

- Secured commitment from country governments for national and regional legislative action plans for mandatory and social safety net fortification

7-18
MONTHS

ENGAGEMENT



Photo: Anouk Delafortrie

STRATEGY IMPLEMENTATION

19-36
MONTHS

ACTIVITIES

- Support local partners and policy makers to introduce mandatory fortification
- Conduct training as needed to support a robust regulatory monitoring system
- Provide technical assistance as necessary to rice importers
- Provide technical assistance as necessary to national rice millers developing industrial capacity
- Identify gaps and opportunities for improved import control

MILESTONES

- Mandatory legislation drafted
- Effective national/regional standards set
- Regulatory monitoring systems developed
- Implementation of fortified rice



US\$ **3,054,000** over 3 years



Reach **121 million** people with fortified wheat flour and rice

ASIA-PACIFIC: BANGLADESH

In recent years, consumption of foods made with wheat flour in Bangladesh have significantly increased. In the first quarter of 2020, FFI assessed the feasibility of wheat flour fortification to determine how well the milling industry can integrate fortification practices into their existing operation. According to the study, FFI estimates that approximately 78% of the wheat flour in Bangladesh will be industrially milled in 1-2 years and can be feasibly fortified by its large, modern mills.

Fortifying all industrially milled flour through mandatory fortification is expected to primarily reach the urban population of 59 million individuals (37% of the country's population). Social safety net fortification of wheat flour is currently possible under two mechanisms, Open Market Sales and Vulnerable Group Feeding, which reach Bangladesh's most vulnerable. Yet, as these social safety net programs only reach around 3% of Bangladesh's total population, mandatory fortification of industrially milled flour presents a tremendous opportunity.

Rice is Bangladesh's most consumed staple grain. With recent large capital investments to build industrial capacity, FFI estimates that 65% of rice consumed in Bangladesh is industrially milled, suggesting a significant opportunity to deliver life-saving micronutrients to a large percentage of the population through rice fortification. A thorough supply chain diagnostic needs to be done to understand the feasibility.



Wheat flour and rice fortification provide an immense opportunity to improve the health of all Bangladeshis. With legislation and standards already in place for mandatory oil and salt fortification, there is legislative precedence and demonstrated interest by the Government of Bangladesh. Unlike fortified oil and salt, however, fortified wheat flour and rice deliver larger and more varied amounts of essential micronutrients, making them ideal vehicles to build a smarter, stronger, and healthier future for Bangladesh.

With additional support, FFI would:

- Analyze the rice supply chain to inform feasibility.
- Evaluate the wheat flour and rice supply chain analyses to determine sustainability, fortified food coverage, and the potential to improve health.
- Collaborate with national leaders to secure buy-in for a comprehensive national wheat flour and rice fortification program.
- Support drafting of national standards that would identify the type and level of nutrients to be added to wheat flour and rice based on current consumption patterns and nutritional needs.
- Assess all current efforts in supplying fortified grains through social safety net programs and, if effective, encourage safety net programs to provide fortified wheat flour and rice.
- Provide technical support to national laboratories to develop protocols and testing validation for analysis of fortified grains.
- Support millers and government inspectors in the scale-up for fortification.



US\$ **467,000** over 3 years



Reach **1.4 billion** people with fortified wheat flour and rice

ASIA-PACIFIC: CHINA

Certain provinces in China have some of the highest observed rates of birth defects of the brain and spine in the world. Though several studies have demonstrated that fortified wheat flour improves nutrient status in Chinese communities, the government has yet to make wheat flour fortification part of its national nutrition program. Some businesses in China voluntarily fortify products, but this has not led to a widespread health impact.

In China, 212 grams of rice are available for human consumption per person per day, followed closely by wheat flour at 173 grams per person per day according to the Food and Agriculture Organization of the United Nations. Fortified rice, to FFI's knowledge, has not yet been discussed in China. FFI's five-year action plan is in three stages:

ENGAGEMENT

YEAR
1-2

ACTIVITIES

- Seek endorsement by the National Health Family Planning Commission to support achieving mandatory wheat flour and rice fortification
- Organize high-level advocacy meetings to engage with policymakers at regional and national levels
- Review legal regulatory framework in China for introducing and enforcing mandatory fortification
- Secure political commitment to introduce fortification legislation and supporting standards
- Collaborate with the National Health Family Planning Commission to develop multi-year workplans with planned transition to government counterparts

MILESTONES

- Political commitment secured to introduce mandatory fortification of wheat flour and rice
- Implementation work plans endorsed by National Health Family Planning Commission

ACTIVITIES

- Engage with private sector to create awareness of value of fortification and train for internal monitoring
- Address potential concerns over sensory changes

MILESTONES

- Private sector successfully integrated fortification quality control and quality assurance steps into milling practice
- Public sector successfully integrated fortification regulatory practices into food control system

YEAR
3-4

STRATEGY IMPLEMENTATION



Photo: Steve Evans

TRANSITION

YEAR 5

ACTIVITIES

- Transition oversight of the program to the government
- Provide focused support for sustainability as needed

MILESTONE

- Government demonstrated commitment of resources to continue program implementation

\$

US\$ **9,139,988** over 5 years



Reach **3 million** people with fortified wheat flour

ASIA-PACIFIC: MONGOLIA

FFI support to partners in Mongolia in 2017 and 2018 resulted in the country passing a law on fortified foods in May 2018.

FFI is eager to continue to provide support to Mongolia as it introduces supporting regulations and standards to implement its mandatory fortification program.

FFI would:

- Train mill staff to set up equipment and to implement and monitor fortification.
- Guide regulatory authorities to practice a sustainable monitoring program.



US\$ **150,000** over 1 year



Reach **8 million** people with fortified wheat flour and rice

ASIA-PACIFIC: PAPUA NEW GUINEA

Key improvements to Papua New Guinea's national mandate for rice fortification would increase the program's nutritional benefits for consumers. The National Department of Health, UNICEF, and University of Papua New Guinea are engaged partners, but they lack technical expertise to improve the existing fortification program.

FFI would work with the National Department of Health to make the following changes:

- Specify the use of rinse-resistant kernels so that the nutrients are not removed when rice is washed before cooking.
- Include additional essential nutrients such as folic acid in fortified rice.
- Fortify wheat flour as well as rice.
- Support the legislative process to pass the proposed Food Act update and corresponding updates to Food Sanitation Regulations.
- Work closely with import food control agencies to improve efficiency and quality of the regulatory monitoring system, including integration of routine monitoring for fortified foods.

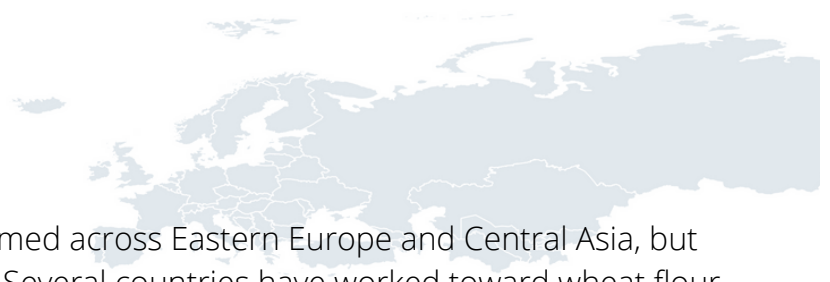


US\$ **500,000** over 3 years



Reach **56 million** people with fortified wheat flour

EASTERN EUROPE



Bread and pasta are commonly consumed across Eastern Europe and Central Asia, but very little wheat flour is fortified there. Several countries have worked toward wheat flour fortification in the past but have not finished the work. Advocacy is needed to complete the projects.

In Ukraine, Georgia, Kazakhstan, and Tajikistan, FFI would:

- Establish an online portal to report progress and future plans.
- Provide technical input into standards and regulatory frameworks of countries.
- Support capacity development on monitoring and surveillance.
- Continue advocacy and awareness creation for an enabling environment on food fortification.



Photo: Tullia Baldassarri



US\$ **560,000** over 4 years



Reach **26 million** Hispanic American women with fortified corn masa flour

AMERICAS: UNITED STATES

In 1998, the United States (US) Food and Drug Administration (FDA) began to require that cereal grain products are fortified with folic acid to address micronutrient deficiency among women of reproductive age and prevent disabling birth defects of the brain and spine also known as neural tube defects (NTDs). Yet the law has a serious omission—it excludes a mandate to fortify corn masa flour and, as a result, excludes those who consume the most masa in the US: the Hispanic community.

The omission of masa from FDA regulations has been associated with Hispanic women being 21% more likely than non-Hispanic women to have a pregnancy affected by NTDs. Hispanics constitute around 20% of the US population and are a growing demographic of America; by 2050, demographers predict 30% of the total population will be Hispanic. Fortifying masa will ensure that nearly a third of America's next generation of children will live a healthier future.

In 2006, a public-private working group successfully petitioned the FDA to allow folic acid to be added to masa. A subsequent study found that 20 months after the policy was rolled out, there was little to no impact on fortification of masa products sold in Hispanic markets nationally.



FFI assumes the lack of folic acid in masa stems from (1) retailers' and consumers' lack of awareness of fortification's benefits and (2) food producers' reluctance to incur additional costs when, in fact, the true cost of fortification is 16 US cents per person per year—a miniscule cost for a tremendous outcome. The project will address both concerns with community-led, evidence-based engagement.

FFI proposes to engage a link of the masa supply chain that both sets and satisfies demand—retailers—to energize bottom-up and top-down drivers for change. Masa fortification will prevent birth defects and anemia, promote nutritional equity for both current and future generations of Hispanic Americans, and contribute to increased human potential and reduced healthcare costs.

FFI would:

- Conduct a thorough supply chain diagnostic and market analysis of masa and masa products to better understand the market and better address retailers' potential concerns or questions.
- Provide communication trainings for community members most directly impacted by folic acid deficiencies: parents of children with NTDs and neurosurgeons who treat children with NTDs.
- Connect community advocates with retailers in FFI meetings to insist that all masa, as well as any products containing 60% or more masa flour as a base, are fortified with folic acid.
- Provide technical assistance to food producers seeking to fortify.
- Assess effectiveness of advocacy efforts through nation-wide sampling.



US\$ **350,000** over 2 years



Reach **450 million** people with fortified wheat and maize flour

LATIN AMERICA: WHEAT AND MAIZE

Since 2009, the World Health Organization has published recommendations for the types of iron and the concentration levels of nutrients for wheat and maize flour fortification. Similar information for rice is now available from research led by the World Food Programme.

Nearly every country in Latin America was fortifying grains before these recommendations were available, however. Consequently, the fortification standards of many countries in this region are not using globally recognized effective forms of iron or amounts of other nutrients.

Further funding would allow FFI to:

- Lead two workshops (one in Spanish in South America and another in English in the Caribbean) to guide county leaders to harmonize their existing grain fortification standards with global recommendations. FFI has led such workshops in Asia, Africa, and the Middle East.
- Review quality control measures currently used in flour production facilities and government inspectors' food safety practices to ensure capabilities exist for monitoring the type and amount of nutrients added to flour.



Photo: Abe Kleinfeld



US\$ **230,000** over 2 years



Reach **321 million** people
with fortified rice

LATIN AMERICA: RICE

In Latin America, wheat flour and maize flour fortification is common in industrial mills, but rice fortification is not regularly practiced. In 13 Latin America countries, more than 75 grams of rice per person per day is available for consumption, making it a food worth considering for fortification. In eight countries (Costa Rica, Cuba, Dominican Republic, Ecuador, Guyana, Haiti, Panama, and Suriname), more rice than maize or wheat products is available, according to the Food and Agriculture Organization of the United Nations. Costa Rica and Panama already have legislation to fortify rice.

To assess other opportunities for rice fortification in this region, FFI would:

- Analyze the supply chain of wheat flour, maize flour, and rice.
- Determine the feasibility of fortifying rice based on industry capacity.
- Recommend whether fortified rice would add value to countries' existing fortification program.



Photo: Julio Pantoja



US\$ **120,000** over 1 year