

Regional Fortification in the Central Asian Republics: Lessons Learned

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Executive Summary

This report examines previous large-scale fortification efforts in the Central Asian Republics to ascertain the lessons that can be learned from their successes and failures. Major regional and national projects which were reviewed for this report include the following:

1. UNICEF regional salt iodization projects during the 1990s¹.
2. UNICEF wheat flour fortification projects during the 1990s in Kyrgyz Republic and Turkmenistan.
3. ADB and JICA regional salt and wheat flour fortification initiatives in 2001 and 2005².
4. 2005 GAIN, World Bank, and UNICEF national-level wheat flour fortification in Uzbekistan.
5. 2008 GAIN/UNICEF social mobilization project to scale up wheat flour fortification in Kazakhstan.

Major lessons learned from these projects include the following:

Understanding the nature of regional trade. Regional trade is highly integrated and dynamic, especially as it concerns wheat and wheat flour. Kazakhstan is the major producer of both wheat and wheat flour in the region and thus, the production and trade context there will impact the entire region. Trade constraints contribute to changing prices of wheat versus wheat flour that are imported and exported, requiring a more joined-up, regional fortification strategy.

Constantly renewing political support. Political will is a necessary element in the design and throughout implementation of fortification legislation, requiring advocacy at the highest levels of government, creation of a strong sense of national ownership, and knowledge of the potential impact of fortification.

Building regulatory and enforcement capacity. A large, decentralized industry and a busy food control agenda leads to weak enforcement on the part of regulatory agencies including a reduced ability to monitor domestic production. Monitoring imports is also difficult considering that a high proportion of markets and trade are informal.

Engaging with stakeholders from multiple sectors. Fortification does not naturally sit within any one sector and therefore successful fortification efforts require cooperation among various government Ministries, NGOs and civil society, and the private sector. Clear institution structures, roles and responsibilities must be identified and followed. Central Asian Republics have struggled to find a balance between maintaining state control and promoting public-private partnerships.

Incentivizing industrial partners. The milling industry in the region has the technical capability to fortify, but not enough financial incentive to do so. Although consolidating, there are still many industry players competing for market share and operating with little profit margin which makes investments in premix and equipment difficult to justify without guaranteed sales. There are various mechanisms which can be put in place alongside an enforcement component to better incentivize fortification for industry.

Communicating to create demand. Marketing messages and nutrition/fortification communication must include all parts of the supply chain, not just the end consumer. While social mobilization should be community based and involve community leaders, effective communications must also be provided along the value chain to consumer associations, retailers, wholesalers, and industry and should adapt to local realities of supply, demand, nutrition knowledge, and consumption patterns.

¹ Included Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

² Included Azerbaijan, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan.

Introduction

The Central Asian Republics have seen a deteriorating nutrition situation since the breakup of the Soviet Union, when food subsidies and Soviet development aid ceased and distribution networks for fortified foods failed to be maintained. Micronutrient deficiencies in the area, particularly of iodine and iron, are higher than in many other developing regions for geographical and socio-economic reasons. The region contains low soil iodine and being a landlocked region, diets are scarce in salt-water fish, an important source of iodine. Drinking tea, something almost all adults and children in the region do during and after meals, inhibits bodily absorption of non-heme iron, the type found in plant-based and fortified foods. Additionally, areas that became poorer after the Soviet breakup decreased the amount of meat, dairy, fruits, and vegetables in their diet. The region thus has one of the highest proportions of wheat consumption globally, accounting for 37-60% of the population's caloric intake.

Staple food fortification has had a significant impact on population-wide micronutrient deficiencies, specifically in the West and Latin America, and is highly cost effective, especially when implemented through centralized and developed food industries. The Copenhagen Consensus lists fortification among the most cost-effective development investments as part of a comprehensive nutrition program. Similarly, the Asian Development Bank has estimated that iron, iodine, and vitamin A deficiencies waste 5% of GDP, but cost only 0.3% of GDP to address comprehensively and sustainably.

Three major regional projects to date have been undertaken in the Central Asian Republics that included large-scale fortification to combat micronutrient malnutrition. During the 1990s, UNICEF undertook a series of salt iodization projects that included donation of iodization equipment and potassium iodate (KIO₃). While the national and regional advocacy aspect of the project was successful in creating public demand and government support, the iodized salt industry faced obstacles in sustaining production and supply. This project thus concluded that financially supporting technology and input procurement were not enough to incentivize ongoing iodized salt production. Early flour fortification, on the other hand did face challenges in maintaining consumer appeal; perceived and real changes to the sensory properties of fortified flour resulted in a poor reputation for fortification throughout the region.

In Kyrgyz Republic, early fortified flour used ferrous sulfate to increase iron content, which turned some flour rancid. Although ferrous sulfate is no longer used, consumers still remember this flour more than ten years later.

The Asian Development Bank, with funding from JICA, completed two major regional fortification projects. The first piloted a regional network of marketing, distribution, and rules of trade for iodized salt and fortified wheat flour. The second was designed to reinforce and sustain progress made through greater attention to supply channels, demand creation, and regulation. Both projects showed some success in sentinel sites and in gaining political motivation for the issuance of mandatory fortification legislation. However, these projects also suffered from a lack of critical investment in the regulatory monitoring and stakeholder engagement necessary for sustained fortification. Indeed, some countries in the region, such as Tajikistan, have since stopped fortification altogether.

Country-level projects in the region have also worked to improve upon the gains made during the regional fortification efforts. In 2005, GAIN, the World Bank, and UNICEF worked to build upon the political, consumer, and industry groundwork during the ADB projects to scale up wheat fortification in Uzbekistan. In 2008, GAIN and UNICEF focused on advocacy and social mobilization of the private sector millers in Kazakhstan to increase fortified flour production. Even before mandatory legislation was enacted in Kazakhstan, this project was able to encourage over fifty wheat flour mills to fortify.

This report can help new initiatives ensure better coverage of fortified foods throughout the region including Afghanistan. In Quarter 4 of 2014, GAIN initiated a new USAID-funded regional fortification

project which aims to build on past and ongoing efforts in the region and to ensure adequate micronutrient fortification of flour is consumed, including imported wheat flour into Afghanistan (primarily from Kazakhstan) and edible oil which is imported into Afghanistan (primarily from Pakistan).

Understanding the Nature of Regional Trade

Figure 1: Central Asia Regional Wheat Trade



Wheat markets in Central Asia are well-integrated and function effectively and flexibly, considering the complexities of geographic location and political tensions throughout the region. Kazakhstan is the largest wheat producer in the region and one of the largest wheat exporters worldwide, exporting 40-50% of its wheat, mainly to other Central Asian Republics and Afghanistan. Thus, Kazakhstan's wheat production, markets, and trade flows have a significant impact on production and trade flows, regionally. Domestic wheat production in all Central Asian Republics, including Kazakhstan, is highly dynamic due to changing weather patterns. Changes in harvests and national and regional wheat prices are rapidly translated into fluctuations in domestic market share versus the volumes of legal

and smuggled wheat and wheat flour imports. However, little progress has been made in promoting the regional trade in *fortified* flour, likely because of inadequate infrastructure, resource constraints, and weak institutions.

Kazakh wheat and flour producers are known internationally for their high quality and baking properties. The large proportion of wheat designated for export means that producers are highly driven by consumer demand and the requests for specific grades of flour for import. Most countries in the region grow, import, and export some amount of wheat and wheat flour. The largest wheat importer in the region is Afghanistan, with little domestic wheat production. The map in Figure 1 shows the regional trade flows.

Many countries prefer Kazakh flour to that milled domestically. Despite the growth and technical competence of the milling industry in Tajikistan, Tandoor bakers in Dushanbe still rely exclusively on imported Kazakh wheat flour because of greater trust in its quality. This has sparked an issue of counterfeit Kazakh flour sold in reused or faked Kazakh flour sacks.

Three constraints face regional trade for fortified products. First, tariffs and quotas often do not promote trade in fortified products. During times of high prices or reserve shortages, Kazakhstan and Russia have both imposed export bans that impact the availability and cost of flour throughout the region. To promote economic growth, import barriers such as taxes were decreased in Tajikistan for wheat, but the same was not true of wheat flour. This changes the trade dynamics, especially around the import of wheat versus wheat flour, as millers tend to switch between the two depending on prices and quality to stay competitive. While tariffs can be useful to stimulate the targeted import of specialized goods, such as fortified flours, some countries, such as Kyrgyz Republic, have used tariffs to

restrict fortified flour imports in favor of importing wheat and milling domestically. This has led to an increase in unofficial, and likely unmonitored, cross-border trade in wheat flour to avoid import duties.

Second, standards and requirements for fortificant amount, type, and quality are not regionally aligned. For example, Afghanistan requires the import of fortified flour with a different composition of B-complex vitamins than Kazakhstan's production standards require. Kyrgyz Republic and Kazakhstan have recently modified their standard for the type of iron fortificant to be used, as per WHO requirements, but most of the other countries have not followed suit. Thus, a regional fortification effort is the only effective strategy since wheat flour consumption in a given location and time can be sourced either regionally or domestically and may or may not be fortified to the same standards.

Third, transportation constraints throughout the region impede the rapid movement of wheat flour. Road travel in some areas can be impossible during the winter months and there are many remote regions without ready access to transportation networks that regularly carry commercially produced foods. There is a significant rail network throughout the region, but the shortage of shipping containers makes timely delivery difficult. Likewise, the region is large and the great length of delivery (ten weeks or more to some areas) to the ultimate consumer provides an opportunity for product degradation, especially of flours. Wheat flour has a shelf life of nine to twelve months, depending on the extraction rate, type of packaging, and storage. Some fortificants, especially soluble iron, can cause oxidation and rancidity before six to nine months. Transportation fees and political tensions, especially on Russian-owned rail lines, drastically increase transport costs and influence the amount and timing of product shipments. Although Kazakhstan once provided rail transport subsidies, these were discontinued to obtain membership in the WTO. These constraints increase the transportation cost and time for fortified foods within Kazakhstan and throughout the region, leading to issues of quality and affordability for poorer consumers.

Political tensions, especially in Tajikistan and Uzbekistan, have resulted in high tariffs and bottlenecks that prevent the development of efficient trade routes throughout the region.

Transportation to Afghanistan is especially difficult. Two major routes exist, both with their own challenges. The first is through the Friendship Bridge in Uzbekistan to Mazar-i-Sharif. Social and political instability in Uzbekistan means that ensuring transportation remains open and issues are resolved is not guaranteed; while in Mazar-i-Sharif, current rail lines cannot accept commercial loads and transport must be made by truck. The second is through Turkmenistan via the Turagundi border town north of Herat. In Afghanistan, rail lines do not continue past Turagundi, but a rail line in Turkmenistan has been completed in 2013 that connects Turagundi to the Kazakhstan rail network without crossing the Uzbek border or utilizing the often irregular ferries in the Caspian Sea. In addition to these two routes, it is speculated that there are a large number of unofficial border crossings and the amount of smuggled wheat and wheat flour to the country is high. As the region's largest buyer of Kazakh flour, the real challenge will ultimately be ensuring adequate fortification at the borders, regardless of how it arrives.

Renewing Political Support

Despite abundant global evidence for fortification, lawmakers in Uzbekistan are reluctant to modify regulations concerning fortificant levels and duty exemptions. Fear of reigniting concerns that delayed salt iodization laws means that these modifications are unlikely to happen until after the mandatory fortification legislation has been passed.

The regional approach of past fortification efforts has worked well, since there are vast similarities in the governance, institutional, and operational arrangements throughout the Central Asian region. The countries share a history of regional cooperation and governmental

mainstreaming in the areas of food, nutrition, child welfare, and poverty reduction efforts. Ensuring industrial compliance has likewise shared operational processes, as most countries in the region retain the use of the State Sanitary Epidemiological Surveillance Services (SES), a Soviet-era legacy agency responsible for monitoring and enforcing food quality and safety regulations, including inspections for fortified foods.

If health is a main concern of the country, then the state should take more responsibility for implementation of fortification programs. Sustainability can be achieved through government purchase of premix for all millers on a permanent basis.

-Evgeniy Gan, Kazakh Millers Association

At the same time, however, there are critical political issues that will need to be addressed for fortification efforts to become sustainable and successful. Most important may be the economic decline that the region endured in the post-Soviet era that continues to erode tax revenues and direct any surplus towards the reduction of budget deficits. This may impair the financial capacity of governments to fully undergo the reforms and funding necessary for appropriate industry regulation and enforcement, including budget allocations for inspectors and laboratories. There is concern that political stability and nationalistic sentiments may impede effective regional cooperation and sustained efforts, especially when combined with an already corrupt and weak system of governance. However, it is also recognized that regional cooperation and regional demand for fortified exports can help to encourage the harmonization of fortification regulations and standards, including those for imports and exports.

Constant turnover both at the political level and within the government's decision-making bureaucracy is a serious issue that hinders sustained political will for fortification. It is often the case that fortification strategy implementers and program developers are different individuals with diverging views on content and process. Likewise, after funding for the ADB projects ended, many participating countries reduced or discontinued their fortification efforts. These examples point to the need for consistent renewals of political will, institutionalization of fortification, and an adequate funding through established national budget lines for implementation.

Likewise, there have been many missed opportunities to mainstream staple food fortification into national safety net programs. In Kyrgyz Republic, a suggestion to procure fortified flour from public funds to support health and education institutions was not supported in local authority budgets due to a lack of understanding about the health importance of fortified flour. Similarly, in Tajikistan, government authorities did not mandate the fortification of wheat released from strategic reserves targeted to the poor when prices rise. The Social Flour program of Kazakhstan, which ran from 2008 to 2013, also did not specify fortification in its subsidized sales of wheat for bakers to supply low price bread. These all were opportunities to guarantee markets and good profitability for millers to encourage fortification, but were not financially supported at the highest levels of government.

Lessons learned from past projects suggest that the renewal of political support requires several key elements. First, advocacy efforts must be directed to government officials at the highest level, especially in the Central Asian region where decisions are often centralized within the Presidency. This will allow fortification, food, and nutrition issues to remain on the agenda and become key components to national development policies. Making an economic case for fortification through a cost-benefit analysis has helped to hasten the process of moving the agenda forward in many countries globally since economics often carries more weight than health within the governmental bureaucracy. Second, strong national ownership must be built through close collaboration between all stakeholders,

Quick wins in responding to the immediate needs of women and children in Afghanistan have jumpstarted government willingness, infrastructures, and national capacities for responding to more long-term needs.

strengthened national capacity, leadership, and technical support. Open, transparent, and persistent communication, and involvement of high-level officials in all aspects of project planning and implementation will be critical for developing ownership. Quick successes have also been important in the past to leverage stakeholder support and promote government advocacy efforts. Finally, the use of regional workshops and meetings create a platform for governments to share successes and challenges, while making promises that allow for peer accountability throughout the region.

Strong political support and national ownership also requires a strong knowledge and evidence base. Information gaps significantly hampered previous fortification initiatives. Gaps in regional baseline micronutrient status meant that leadership was not able to make informed decisions about the types of nutrition projects that would best suit the needs of the population. Likewise, gaps in understanding the organization of the food industry and the market situation for various products led to challenges in reaching the most vulnerable population groups. For example, several grades of flours are readily available in Central Asia. Lower grades were often produced by smaller mills and were often excluded in previous fortification efforts. However, it is the lower grades of flour that are cheapest and more likely eaten by rural and poorer populations. In Uzbekistan, between 20-65% of the population consumes second grade flour, though only first grade flour was targeted during GAIN's fortification project. Uzbekistan also tends to import premium grade flour from Kazakhstan, which is not subject to fortification legislation, and mixes lower unfortified grades of flour with the domestically fortified first grade flour for bread baking purposes.

Improper understanding of WTO membership requirements and concerns about the membership application led the President of Kazakhstan to veto the mandatory flour fortification law in 2007, even though awareness of the advantages and availability of fortified flour was high.

Governments and decision-making bodies are more likely to have strong support when there is convincing data that depicts the magnitude of malnutrition, the economic and health costs compared to the financial benefits of fortification, and proof that interventions can work within the local context. Thus far, however, there have been limited efforts to improve scientific insights on the benefits of fortification, specific to the Central Asian development context. The GAIN project in Uzbekistan had intended to analyze the blood samples of non-pregnant women of reproductive age as part of an impact assessment on anemia status. Analyses of these samples were significantly delayed, which set back gains in advocacy and parliament support. While technology transfer and technical support to governments have helped to spur the investment for pilot testing, there are still knowledge gaps in identifying effective enforcement measures, regional trade promotion, and market analyses.

Building Regulatory and Enforcement Capacity

At the time, the ADB projects worked well to improve political will and oversight, including the creation of appropriate legal instruments and procedures as well as increased monitoring and inspections by regulatory authorities. However, these efforts were not sustained and one of the major reasons for the discontinuation of fortification programs cited in past project reports is an unwillingness or inability to build and maintain a strong government regulatory and enforcement capacity.

Three major reasons for this unwillingness to enforce fortification legislation arose in previous projects. First, some countries had difficulties in translating laws into regulations that were actually implemented and followed by regulatory agencies. Mechanisms for implementation and enforcement must be designed from the beginning and the management of inspectors within regulatory agencies must become a top priority. It was cited in past projects that creating an environment of successful regulatory monitoring was better achieved through supportive, incentive- and performance-based frameworks to encourage better service, rather than through prohibition and penalization. Of significant concern is the

low level of compliance with mandatory fortification legislation in Kazakhstan, due to absent or lax implementation and enforcement. This sets an example for other countries in the region, making it difficult for them to support mandatory legislation.

Second, some countries had difficulty in closing legal loopholes. As an example from salt iodization, laws in Tajikistan prohibit the sale of non-iodized salt, though not the production of non-iodized salt. This made it challenging to hold producers accountable as there were always avenues for informal sales of the cheaper, non-iodized product throughout the region. Similar examples exist for flour fortification:

- Legislation in Kazakhstan specifies that flour designated for domestic use must be fortified, but the same is not true for flour destined for export.
- In Uzbekistan, laws enacted to protect private enterprises make it difficult to allow laboratory staff to do frequent random sample checks.
- The phrasing of Kyrgyz Republic's law specifies that flour purchased from the government grain reserve must be fortified, but wheat purchased directly from the private sector does not.

Third, financial barriers prevent countries from breaking free of donor support. Cost sharing by the industry and the regulatory agencies is critical for sustainability and donor dependency was cited as a reason for prior flour fortification and USI failures.

EXTERNAL REGULATORY MONITORING

Several countries in the region currently have accredited laboratories that participate in the CDC EQUIP certification program for iodine testing and analysis.

Government regulatory agencies not only need the willingness to enforce fortification legislation, but also the capacity to do so. The lack of lab services and inspection personnel are consistently cited as barriers to effective regulatory monitoring. Building enforcement capacity also includes promoting clear regulations that providing an enabling environment for effective monitoring. In many countries throughout the region, inspectors are only given legal clearance to visit producers and/or markets on an annual basis. In Tajikistan and Uzbekistan, these inspections must also be announced once month in advance, factors that make it impossible to enforce quality standards and stop illegal sales.

Regulatory authorities are also known to resist serious food inspection, allowing false labeling of products to continue un-penalized. At the same time, government adaptation to industry feedback and new technology is slow. Many industrial partners have commented that the SES takes too much of a punitive approach to monitoring and is not helpful, suggesting the establishment of a new regulatory system. Governments have so far been unresponsive to this suggestion, even in light of suspected rent-seeking behavior within the SES and bribe collection to overlook quality and compliance violations. Such behavior has prompted governments to limit the SES to one plant inspection annually, leading to issues in data management as various other agencies and organizations conduct factory audits and inspections in place of the SES to get around this restriction. Likewise, governments have been slow to adapt to technological advances, such as rapid testing equipment (iCheck, WYD Iodine Checker, and others), preferring to rely on more time consuming methods for certification.

Mongolia and Uzbekistan have made great strides in registering all of the numerous small salt producers with the Ministry of Health and/or respective Food Inspection Agencies, but they lack the resources to regularly monitor them.

Some solutions have been devised to improve the quality of fortified products while also promoting their sale and consumption. In Kyrgyz Republic, retailers that were engaged in testing their salt for KIO_3 were more active in promoting and selling iodized salt. In Mongolia, the Women's Federation

cooperated with local food inspections officers to test iodized salt at local markets, helping to reach more remote areas more efficiently. And in many countries, involving school children and teachers in the testing of fortified products helped in the promotion of fortification at the community and household level.

Challenges also arise in the vast informal markets that are difficult to regulate and continue to provide cheaper, non-fortified products to local consumers. In Mongolia, Tajikistan, Kazakhstan, and Uzbekistan, local open salt deposits provide easy and inexpensive access to unprocessed and therefore non-iodized salt. Some progress has been made in closing these deposits off from local residents, but these are often in remote areas without much governmental oversight and control.

Tajikistan has recently shifted to domestic milling and fortification, choosing to import wheat instead of wheat flour. This presents an opportunity for greater access to fortified flour since the regulation of imports is often more difficult than regulation of domestic production.

Tajikistan and Kyrgyz Republic also have remote areas where domestic wheat is grown and processed in small mills without fortification capacity. While it may be difficult or impossible to completely prevent these informal markets from occurring, it is important to note that these are likely to be the staple food sources for more rural, poor, and vulnerable households who have the most to gain from fortification. In Tajikistan, there has been a recent trend towards commercialization of wheat flour; the poorest rural regions have increased their consumption of industrially milled flour and less than 20% of the population still consumes unfortified village milled flour.

IMPORT CONTROL

The regional approach pioneered during the ADB fortification projects enabled the establishment of common standards and enriched interregional cooperation in developing trade regulations. However, since the projects have ended, many countries throughout the region have adopted newer standards that better reflect international consensus and the needs of their populations. The current number of varying international, regional, and national standards and methods for assessing quality makes it difficult for a key exporter, such as Kazakhstan to understand and comply with each importing country. Consistency and harmonization will be critical for both the uninterrupted flow of regional trade and to allow for a larger, collective voice from regional importers to demand fortified flour. In this regard, Kazakhstan requires a clear strategy for the development of exports to satisfy this demand as well as its domestic political and industrial interests. In 2009, Kazakhstan took a step in this direction by establishing technical regulations for food quality and safety, which include requirements for production, storage, transport, and sale, harmonized with international standards. These will likely need to be adapted to include requirements for fortification as well.

In Tajikistan, most flour imported passes from only 10-15 millers in Kazakhstan through 1-2 import and distribution companies in Tajikistan. This presents a clear opportunity to centralize and control fortified wheat flour imports.

In Mongolia, coordinating efforts with the National Iodine Deficiency Disorder Council resulted in the effective implementation of an IDD prevention program and USI legislation, which eliminated the import of non-iodized salt from China.

For importing countries, the capacity of inspectors at border crossings will need to be bolstered to eliminate imports of non-fortified staple foods. Significant proportions of cross-border shipments to Tajikistan, Kyrgyz Republic, and Afghanistan are informal and continue to be unregulated. Legislation for the regulation of imports, exports, and trans-regional trade of fortified foods remains incomplete throughout the

region, contributing to the failure of border inspections to consistently restrict the flow of both unfortified and also adulterated or poor quality imports more generally. Improving import control will require a concerted and coordinated effort with multiple stakeholders.

Engaging with Stakeholders from Multiple Sectors

Fortification does not naturally sit within any one sector and therefore, successful fortification efforts require cooperation among various government Ministries, NGOs and civil society, and the private sector. This will require the identification of clear institution structures, roles, and responsibilities for all stakeholders with corresponding mechanisms in place for them to be regularly followed.

An often stated lesson learned in many development projects is the engagement and cooperation with stakeholders on all aspects of the project from the very beginning in order to ensure strong national ownership and to achieve results at scale. In fortification projects, this is even more relevant as it requires both the cooperation among various governmental bodies as well as cooperation with external stakeholders. For fortification efforts in Central Asia, broad cooperation with the private sector is critical to motivate investment and increase consumer demand; a regional partnership is critical to stimulate policy and trade reforms; and collaboration with various governmental bodies, civil society, and NGOs is important for social marketing and education efforts. Key areas of collaboration include the production and support of communications and media messages; the M&E and reporting agenda; and the harmonization of complementary resources.

In Mongolia, the efficient cooperation between two Ministries (Health & Food/Agriculture), who co-chaired a fortification steering committee, allowed for cooperation with local nutrition teams in remote areas that were able to help adapt national level project targets into the local environment and reality.

The opportunity for regional networking has also been an important success factor in previous fortification projects. Regional trainings facilitated access to practical guidance on legislative, regulatory, and technical issues while allowing participants to share best practices. Coordinated communications strategies at the regional level ensured that the right messages were available to consumers of fortified foods and other stakeholders at the right time, motivating all towards the project goals. Additionally, the use of a project website was useful as a major information channel to share experiences, lessons, and activities regionally in between networking sessions.

In the past decade, the Tajikistan Government has reduced the number of international consultants and the level of involvement of international NGOs working in the country with the goal of retaining project control and increasing benefits for Tajik individuals.

NGOs can be a powerful resource because of their ability to respond to local needs and their existing relationships with local communities. In prior regional fortification projects, NGOs were shown to be highly committed and participatory in the project efforts. Care must be taken, however, to build a relationship between NGOs and governments. In many countries, governments are reluctant to work with NGOs in order to avoid the development of parallel systems and to maximize governmental control. Avenues that promote greater understanding and responsiveness on both sides will have to be identified and utilized early in the project.

One of the most important stakeholders to engage with throughout a fortification project is the private sector. Much like in the case for NGOs, Central Asian governments are still cautious in working with emerging private industries and in navigating their degree of control over the sector. Private-public partnerships have had mixed results in the region during previous projects. During GAIN's project in

Uzbekistan, the primary targets were mills of the state-owned UzDonMakhsulot conglomerate. This resulted in a limited project impact as these mills control less than half of the wheat flour market. A lesson learned from this project is that any further investment in fortification must include private sector mills and better control of imports that constitute the remaining half of the flour market.

Engagement with the private sector means bringing key decision makers to the table. When industrial partners sent technicians to regional meetings instead of factory managers, no real progress could be made and the economic benefits of fortification could not be properly transferred to industrial leadership. A major flaw in the creation of the flour fortification law in Kazakhstan was that the government did not have the strong involvement or support of the milling industry, one of the reasons for the law being temporarily rescinded. This had a strong ripple effect throughout the region, leading to challenges in passing mandatory fortification laws elsewhere. Thus, success in building relationships between governments and private sector is due in part to clarity in roles and responsibilities delineated on paper signed by all parties, joint leadership roles for both sectors, and continued communication and collaboration throughout the initiative, especially in creating fortification policy.

UNICEF conducted advocacy sessions with millers where factory managers and workers tested their own blood for anemia to better understand the deficiency's scope and their role in combating it.

Many positive outcomes have occurred in fortification projects thanks largely to the strong public-private partnerships created at the outset. Partnerships with industry associations were especially successful and key as they had influence within the private sector and were able to act as a mediator, identifying problems within their industries and working with governments to find solutions. This has been especially important in Kazakhstan, where consistent engagement with the private sector is difficult due to the size of the country and the location of the mills that export the bulk of the flour. Successful examples include:

- Kazakhstan's League of Grain Producers and Bakers actively advocated for a regional flour millers association. In 2007, its leader was elected to be the first board president of the new Eurasian Branch of the International Association of Operating Millers.
- In Kyrgyz Republic and Mongolia, the involvement of associations of food producers in program activities helped to increase knowledge of micronutrient disorders and encourage program ownership among producers.
- In Tajikistan, a civil society forum attended by senior government officials, community leaders, food producers, and NGOs adopted joint activities to work towards banning the production and sale of non-iodized salt from open deposits, resulting in the decreased use in non-iodized salt.

Incentivizing Industrial Partners

In addition to involvement and engagement, industrial partners also require incentives for their initial and continued participation in fortification efforts. Fortification and related quality and regulatory needs can be expensive investments that, without the promise of increased profits or other political and economic incentives, make industries reluctant to put in the resources and effort. In order to be successful, however, incentives should be supported by governmental regulatory frameworks that include legislation, regulations, standards, and enforcement strategies. To provide the appropriate incentives for industrial enterprises, a clear understanding of the industry's organization and technical capacity are necessary.

“It is important to acknowledge that small-scale, remote, low-technology, and low-quality providers will be unable to compete with high-performance large enterprises. National policies that keep such enterprises afloat do not promote self-sufficient and sustained achievements [for fortification].”

- Frits van der Haar, 2004

Throughout Central Asia, food processing industries are made up of a large number of small, decentralized mills and factories. During the post-Soviet decades millers were one of the fastest growing industries in the processing sector; in Kazakhstan, there were over 2,000 individual flour milling enterprises by the late 1990s. Recently, there has been a shift towards consolidation and a drastic decline in the number of mills; recent estimates suggest only 40 mills will be operating in Kazakhstan a decade from now. This consolidation is due to slow population growth and increasing diet diversification with rising incomes. This

has resulted in a milling industry that is highly competitive and dynamic with most mills running at half capacity or less with low profit margins. Consolidation suggests that those mills that do survive will be better managed, more profitable, more technically capable to fortify, and easier for regulatory agencies to monitor. It is also important to note that other countries in the region have recently begun building high-production capacity mills. In 2014, Uzbekistan began construction of new mills on the Afghan border, and Tajikistan has been constructing new mills since 2007 that supply most of the flour consumed domestically today. These new mills have replaced older ones, many of which were targets of previous fortification projects. The whereabouts of provided fortification equipment during these projects is thus unknown and needs further investigation.

Government control also plays a role in the production and trade of fortified products. Throughout the region, the government’s level of involvement in supporting and regulating markets and trade varies. In Afghanistan, government intervention is limited and markets, both formal and informal, operate freely. In Kyrgyz Republic and Tajikistan, the government only modestly participates in industry, and in Kazakhstan, industry is privatized but the government is able to exert control over production, marketing, and export to maintain stable prices of staple foods.

JICA’s work with small-scale enterprises showed that much of the Western business model was new to factory workers. Unable to completely abandon the Soviet-era mindset, producers complained about the receipt of payments after production, the complex procurement and shipping procedures, and the rigorous quality standards needed.

On the other side of the spectrum, the governments of Uzbekistan and Turkmenistan have strict control over production and exert political interference that significantly affects trade dynamics. In Uzbekistan, the state-run mills first procure the wheat and flour it needs before private mills are allowed to procure. Thus, in years with low harvests and/or high prices, private mills often cannot obtain grain to mill or fortify, shutting down for several months at a time. This occurred during the GAIN fortification project, resulting in only 3 out of 13 targeted private mills being able to obtain grain, wasting the provided equipment and training in the remaining ten mills. In Uzbekistan, the practice of toll-milling also must be factored into project decisions. Toll-milling occurs when smaller mills that cannot afford to operate bring their grain to larger, state-owned mills and pay a fee to have them mill it. If extra premix is available, the resulting flour may be fortified, though it is more likely that all toll-milling requests are completed at the end of the month when fortification equipment is dismantled for cleaning.

The influence of regional academic institutions, such as the Kazakhstan Academy of Nutrition also play a role in fortification efforts. Conflicting information has previously been received from such institutions regarding the necessity for fortification. In Tajikistan, for example, KAN declared that there was no need to fortify second-grade flour since the iron content was naturally high.

Unlike in Tajikistan, Kazakh mills have used feeder technology as a standard practice to dose flour improvers, such as enzymes, making the transition to dosing premix easy. Kazakh millers have had no problem in fortifying when they have received special orders to do so, such as from WFP tenders or government purchases for institutions.

It is often assumed that only the largest flour mills would have the technical capacity to fortify. Indeed, only those mills with a production capacity greater than 150-200 metric tons per day were prioritized for equipment provision and start up premix during the ADB projects. However, it is now understood that many of the large, older mills are being replaced by smaller (production capacity between 20-200 metric tons per day),

more efficient ones, with newer equipment well suited for fortification. Additionally, many of the mills included in previous projects may have since been replaced, losing the provided equipment and technical knowledge gained. Technical constraints among producers were also identified during the ADB projects, leading to a need for a greater focus on issues of production and processing technology. Such constraints include QA/QC, data collection, controlling waste, premix dilution and addition via micro-feeders, adequate maintenance, and procurement of poor quality raw materials. It will therefore be crucial to undertake an in-depth situation and context analysis of the milling organization and capacity to ascertain what knowledge and equipment has been retained from previous fortification projects, which mills are producing which types and grades of flour, and what is being consumed from domestic production versus imported flour.

The costs of fortification can be an important disincentive for industrial partners to start and continue to fortify. While premix is relatively inexpensive, costs do add up, especially for large mills that produce 250 tons of flour per day, amounting to an annual cost upwards of \$60-70 thousand. Economies of scale also play a role; where fortification costs may average \$1 per ton in large mills, small mills average nearly double, or \$1.72 per ton.

In the face of ever-changing weather patterns that affect wheat availability and price and rising costs of raw materials and fuel, industrial partners need to be assured that there is an even playing field among competing flour producers, there is a sustainable procurement strategy for fortification premix, and there is substantial demand creation to enable economies of scale. Mandatory fortification laws, still not existing in many countries

Zernovaya Industriya in Kostanai is one of the largest millers in Kazakhstan. Though it has significant economies of scale advantages, it has continued to procure premix and fortify despite the gaps in mandatory legislation because fortification has been mainstreamed as standard practice. This can be seen as a success story to demonstrate feasibility and encourage other millers to comply.

regionally, will be necessary to encourage industrial partners to fortify and level the playing field if complementary monitoring, enforcement, and import control regulations are in place. In Uzbekistan, despite vast incentives that included contractual arrangements to receive grain, free installation of feeders, and premix without pre-payment, only four out of the targeted 13 mills fortified any flour by the end of the GAIN project. There are various mechanisms that can be put in place to better incentivize fortification for industry, but more research is needed to determine what the best incentives would be for the private sector in the Central Asian Republics specifically.

Financing the long-term procurement of fortification premix requires a cost-sharing mechanism from the project's beginning. The purchase of premix and other fortification equipment can be initially subsidized or given tax exemptions, but unless food producers understand that premix procurement must eventually be funded solely from sales to consumers, it will be difficult to achieve long-term success. Innovative financing mechanisms began during the ADB projects, including a revolving fund in Tajikistan for smaller producers to procure KIO₃ ahead of iodized salt sales. A flour premix revolving fund

was established in Uzbekistan during the GAIN project; while there are significant issues of non-payment or delayed payments to the fund from the mills, overall the revolving fund has been deemed a success. It has been suggested that this fund could be used for other countries in the region, though it would require determining whether the premix amounts required would be worth solving the bureaucratic hurdles of harmonizing the borders and customs duties for importing into and re-exporting premix.

The ADB projects also showed that producers have the capacity and political will to absorb these necessary expenses as an evaluation showed that 33% of fortificant costs were reimbursed by the producers by the end of the projects. A final solution to alleviate difficult procurement is to develop local premix producers. In 2007, a company in Kazakhstan began producing premix for regional fortification efforts, but fortification never reached the necessary volumes to make local production of premix cost-effective enough to compete with premix producers in Germany and Turkey. This may change, however, as a 2013 customs union with Russia increased the import duty for premix originating in the European Union and Turkey.

Using the collective bargaining power of manufacturers' associations may be a helpful solution for maintaining fairly priced supplies of industry inputs, including premix. In Kyrgyz Republic, however, multiple small milling associations exist that hinder the implementation of such bargaining agreements or premix revolving funds.

Increasing consumer demand is another priority of industrial partners, as this is the only way to increase sales and achieve economies of scale in recuperating the initial investment costs for fortification without having to pass a significant price increase to consumers. Increasing consumer demand requires a harmonized marketing strategy on the part of food producers regionally. Industrial partners must be encouraged to see fortification as key opportunity to improve marketing and sales as a promotion of quality and standard of excellence in WHO-consistent fortified foods. This can be assisted by the use of a memorable brand or logo, such as the "Healthy Food" logo in Central Asia and the Ministry of Public Health seal in Afghanistan, to assist consumers in choosing a specific product. Care must be taken, however, in monitoring and managing the linkage between supply and demand generation. Demand creation will be frustrated by supplies that are inadequate, irregular, or lower-quality than expected. In the case of iodized salt in Tajikistan, this has drastically impaired, and in some areas even reversed, progress made in increasing consumer demand and acceptance of fortified products. Similarly in Uzbekistan, two-month gaps in premix procurement occurred on two separate occasions throughout

the project, one of which coincided with the biological and social survey designed to measure program impact. Not only did these procurement gaps reduce the availability of fortified flour, stalling progress in increasing consumer demand, they also reduced the effectiveness of



The "Healthy Food" logo facilitated Central Asian regional marketing efforts and improved the visibility of fortified products for consumers. Although it is still in use throughout the region, the products are not guaranteed to be fortified. Tajikistan has reported that premix has not been purchased for domestic fortification in the past five years.

monitoring and evaluation investments.

Communicating to Create Demand

Marketing of fortified products by industries and governments must be complemented by a harmonized communications strategy so that consumers know the advantages and availability of such products and health workers, religious leaders, educators, retailers, and consumer protection groups are also familiar with the products and can work to promote them effectively. These messages must be community-based and able to influence those individuals in communities with a high power to influence others. In Afghanistan, this may mean understanding and addressing the traditional practices that prevent people from adopting health behaviors, promoting the linkages between health and Islam, and ensuring the community, rather than the government, has a large stake and a call for accountability in what is provided. In Uzbekistan, this may mean involving the *Mahallas* or community leaders that, although would slow communications and social mobilization efforts, may be more effective and sustainable in the long run. It will be critical to understand the motivating factors that affect the participation of community influencers and the general public.

Success in improving public acceptance came from the insertion of topics such as micronutrient deficiencies, universal salt iodization, and food fortification into mass media, primary and secondary school lessons, textbooks, and curricula for teaching and medical students.

Kazakhstan can be seen as a success story in communicating to create demand. The Ministry of Health, co-organized several mass information campaigns, working with other Ministries, Mayoral Offices, National Millers Association, the Youth NGO Network, and UNICEF. These campaigns brought over one million people together to participate in Olympics-style sports, art, storytelling, and bread distribution, all designed to bring attention to the importance of a healthy lifestyle, including the consumption of fortified products. These information campaigns also created producer awareness and demand by including awards for various competitions, including one for fortified flour producers.

Communications messages need to move beyond logo recognition to some level of consumer nutrition education. In Uzbekistan, studies showed that while 35% of the population had seen the Healthy Food logo, only 3% knew the benefits of eating fortified flour and bread.

Mass media messaging has often been used to create consumer demand; however, the impact of these messages has been minimal in Central Asia due to poor messaging and coverage. In many countries, the media is highly centralized and NGOs are not permitted to use major media outlets for advocacy efforts. Additionally, many previous advocacy and communications efforts involved international consultants and tailored marketing efforts, which would be difficult to sustain within limited government budgets. Working with the media thus requires alignment with the policies and priorities of the Ministry of Health or other government stakeholders.

Media messages must be designed in a participatory manner, through coordination with governments, industry, civil society, and the media outlets. This will ensure communications efforts by different groups will be mutually reinforcing, share a common theme and style, and avoid conflicting messages that create confusion and a loss of enthusiasm from consumers. Communications messages should also follow a progression from awareness, to acceptance, trial, and finally sustained use. In Tajikistan, messages to promote consumption of fortified products were rendered ineffective throughout most of the country where households choose flour based significantly on price. A lesson learned is to focus social marketing on avoiding rejection and improving nutrition education, rather than by promoting consumption by flour brand or logo recognition alone. Monitoring of communications feedback should feed into a mechanism that allows for modification of the messages for the greatest impact.

Marketing messages and nutrition/fortification communication must include all parts of the supply and value chains, not just the end consumer. This includes advocacy and communication to consumer associations, retailers, wholesalers, and even industry, adapted to the local realities of supply, demand,

nutrition knowledge, and consumption patterns. In Kyrgyz Republic, coverage of iodized salt on the market rose from 60% to 90% through a campaign to empower both retail and communities to test their own salt and drive non-iodized salt out of the market. This was done through mass distribution of rapid test kits along with training on their use to retail outlets and village health committees. The kits contain a starch-based solution that, in the presence of iodine, results in a blue spot when a drop is added to a sample of salt. This method has proven highly effective in empowering vendors to verify they have received iodized salt from industry and wholesalers to sell; in empowering consumers to demand iodized salt and be assured that the salt sold to them is iodized; and in mobilizing markets, especially where consumer awareness is high, to displace non-iodized salt from markets and improve access to iodized salt supply.

Finally, it should be noted that the production and delivery of communication materials need to be harmonized with corresponding activities in increasing supply and creating demand. Delays in the provision of communications materials during the ADB projects substantially reduced the impact of training and education activities.

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Key Individuals Interviewed for their Perspectives

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