Tajikistan Wheat Flour Fortification Assessment

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Contacts

Lead Author: David McKee, davidmckee59@msn.com

Co-Author: GAIN: Greg S. Garrett, Director, Large Scale Food Fortification

ggarrett@gainhealth.org

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A. EXECUTIVE SUMMARY

USAID Tajikistan commissioned the Global Alliance for Improved Nutrition (GAIN) to assess the wheat sector in Tajikistan and identify opportunities for strengthening flour fortification with micronutrients. This report follows a desk review and interviews in October 2013, a mission to Kyrgyzstan, Kazakhstan and Tajikistan in late October to November 2013 and analysis of feedback from national stakeholders in early 2014.

Wheat flour is the main staple in Tajikistan. It provides about 70% of the daily energy requirements. This is one of the highest per capita flour intakes in the world, 350-400 grams/day. Judging by the reported extraction rate of 70%, it is deduced that this flour is refined, and therefore the content of mineral-absorption inhibitors (e.g. phytic acid) is low. **These conditions make wheat flour an ideal vehicle for fortification with critical micronutrients such as iron and folate. In addition, this assessment found positive trends in relation to the milling industry, overall production and imports and consumption trends - as well as a foundation of knowledge and experience among millers and public health officials - upon which to launch a new effort for flour fortification.**

There have been successes in decreasing anemia rates from 41% in 2003 to 25% in 2011.[i] This can be attributed in part to vitamin and mineral supplementation for women that is subsidized or provided free by the government and donors. Anemia has dropped from the second leading cause of childhood death 10 to 15 years ago to the eighth leading cause now mainly because of more eggs and milk in children's diets.[ii]

Changes in wheat flour consumption and production in the last several years indicate that a renewed national flour fortification program could lead to even greater decreases in anemia rates as well as increased intakes of folate. Per capita wheat flour consumption remains high at around 360 grams per day. **Significantly, in the poorest rural regions such as Khatlon province, there has been an increase in the consumption share of industrially milled flour which can be targeted for fortification. This means there is now a greater potential for fortified flour coverage of the lower economic groups with the highest levels of micronutrient**

deficiencies. This report outlines recommendations which aim to improve national nutrition programming and specifically to strengthen flour fortification in the country.

B. FLOUR SECTOR REVIEW

Background

There have been previous efforts to introduce wheat flour fortification in Tajikistan as a standard milling practice, beginning in the late 1990s with UNICEF pilot projects, and in 2002-2007 as part of an Asian Development Bank (ADB) regional project funded with a grant from the Japan Poverty Reduction Fund. While these efforts produced some positive results, flour has not been fortified by the domestic milling industry since 2007-2008.

The wheat milling industry, which is entirely privately owned, is critical to food security in Tajikistan. Along with private traders who import wheat flour they account for the importation of wheat and wheat flour equivalent to over 700,000 tons of wheat flour or more than two thirds of Tajikistan's annual consumption of 1.1 million tons. This means that over 40% of total national caloric intake is supplied from Kazakhstan by these private mills and traders. Furthermore bran as a byproduct of the imported wheat is a major source of feed for the expanding livestock industry.

Total wheat flour consumption is around 1.1 million tons per year. Per capita wheat flour consumption is approximately 365 grams per day. Wheat flour thus likely accounts for two-thirds of total caloric intake (based on 2100 calories per day).

Village milled wheat flour may be less than 10% to 15% of consumption for the whole country with the highest share in Khatlon. There is a clear trend in Tajikistan and particularly in Khatlon province toward consumption of industrially milled wheat flour while consumption of village milled wheat flour has probably fallen below 20%. **This is a positive trend which would facilitate national-level flour fortification.**

Nationally the share of domestically milled flour has been increasing while wheat flour imports from Kazakhstan decline. The center of the milling industry has shifted to Sogd district with much new construction of mills. Over capacity means a highly competitive industry with low profit margins especially for marginal producers. There has also been a steady rise in the consumption of domestically milled flour versus imported wheat flour, which now represents about 20% of total consumption. **Experience in other countries indicates that regulating fortification of imported wheat flour can be challenging. Therefore a decline in its share increases the potential for greater access to fortified flour by the population.**

In the last five years the center of balance of the Tajikistan milling industry has shifted from the central Dushanbe region to Sogd province in the north where many new mills have been built to bring the total number to at least 40 mills with capacity exceeding 50 tons of wheat per day. These mills receive wheat shipments from Kazakhstan and send most of their wheat flour southwards to Dushanbe, Khatlon province and the GBAO.

Milling in Tajikistan is highly competitive. Producers compete on price and quality. The consumer benefits and government mostly leaves the milling industry alone aside from some limited market intervention. Millers look at the added cost of premix in relation to their profit margins not the total price of flour. Even efficient mills may have a profit margin of only $40 per ton of flour, such that a $2 per ton premix cost would be 5% of net profits, a cost most mill owners are not willing to pay even though it is only 0.5% of the current $500 per ton price of wheat flour.

Consequently a national advocacy campaign will be useful to work with the business sector to build ownership and support, as they did successfully in 2007-2008, when a draft law signed by the president was sent to parliament. As evidence in other lower and middle income countries indicates, mandatory legislation supports sustained coverage of the population for the intervention to have a public health impact in terms of reducing anemia in women of childbearing age and improving critical folate intakes.

In the interim prior to establishing the mandatory law, a voluntary flour fortification program focused on one region like Khatlon province could be designed. WFP has the option of buying 5500 tons of flour for its Tuberculosis and Food for Work programs

locally if it is fortified. This would be an effective way of reintroducing flour fortification to the Tajikistan milling industry as a first step.

Social marketing in food fortification – while important to create acceptance – is not generally effective as a sole means to create widespread consumer choice to buy only fortified products on a national scale, particularly wheat flour.Nevertheless, based on further market research such a program could be attempted for Khatlon province. The advantage is that in Khatlon perhaps 90% of households buy wheat flour in 50 kg bags, if they do not grind their own wheat themselves, and bake flat bread at home. Thus they are very aware of the flour brand they are purchasing and see the markings on the bags.

If market research confirms that at least two-thirds of the flour shipped into Khatlon province is produced by just 10 to 15 mills, then it would be recommended to work with this group providing feeders, premix and training. At the same time a social marketing campaign should be undertaken to educate consumers about the need for fortified flour.

Other limited measures could be taken as well where government is in a position to dictate. For example wheat released from the government strategic reserve for milling and sale as a market intervention should be fortified as a matter of policy since it is targeted to help poor consumers when prices rise. There are just four or five mills that grind wheat in this manner for the government. The total quantity may be a maximum of 50,000 tons per year, but much less on average depending on market prices.

Wheat flour consumption

Macro-economic data reveal a near doubling in overall wheat use in Tajikistan to over 1.8 million tons (wheat production, wheat imports and wheat equivalent of flour imports: see table in “wheat production” section) from less than one million tons in 2001. In addition to direct human consumption, increases in wheat use can be attributed to feed, distilling and possibly some exports of wheat flour to Afghanistan.

Wheat flour per capita consumption is 134 kg per person per year or 365 grams per day. This estimate is based on two thirds of domestic wheat production milled at an extraction rate of 70% (the remainder is feed and seed), plus imported wheat milled at an

extraction rate of 75%, plus imported wheat flour, all divided by a population of 8 million. Total wheat flour consumption is therefore around 1.1 million tons.

In January 2014, the Government of Tajikistan released new estimates of food consumption that put per capita human consumption of all grain-based food including pulses and legumes at 147 tons per year. Since there is little consumption of grains other than wheat, the above estimates agree with the new government consumption norms[iii].

Official data put flour production for the first 9 months of 2013 at 640,000 or an annual rate of 850,000 tons. Combined with official wheat flour imports of 232,000, the total is close to 1.1 million tons estimated for annual consumption.

Wheat flour consumption nationally is 90% in the form of bread. Pasta consumption has been increasing and is increasingly substituted for more expensive rice in "plov" type dishes. There is a significant amount of biscuit consumption as well. An EU survey in 2010 estimated daily pasta consumption at 22 grams per capita or about 8 kg per year.

Flat bread (nan) baked in tandoor ovens is mainly consumed in rural areas. In Dushanbe 20% to 30% of bread consumption may be square the Russian style loaves mostly produced in large commercial bakeries.

About half of the households in Dushanbe bake their own "nan" (non) in outdoor tandoor ovens. The other half buy nan in stores and markets. People who live in central Dushanbe, mostly, buy flat bread and those living in the outer areas in homes with courtyards mostly bake their own.

In the northern province of Sogd (1.8 million) it is estimated that only 10% of wheat flour consumption is village milled compared to close to half 8 years ago when the lead consultant visited, a positive trend for ensuring fortified industrially milled flour reaches populations in Sogd province.

In the Gorno-Badakhshan Autonomous Region (GBAO) where little wheat is grown, almost all wheat flour consumed is industrially milled originating in Sogd province,

Dushanbe or Kazakhstan. There is one mill in Khorog city of GBAO that mill wheat from the government reserve for market intervention.

Wheat production

Table: Wheat production and imports

Year	Production	Wheat Imports
2013	901.7	640.2
2012	812.6	747.1
2011	726.9	442.5
2010	1033.1	442.8
2009	1088.6	413.1
2008	659.1	258.1
2007	649.3	183.9
2006	640.3	291.2
2005	618.5	283.5
2004	631.3	127.2
2003	660.2	143.9
2002	544.6	291.6
2001	387.3	264.0

Source: FAO data to 2011. TajStat 2010 - 2013 for wheat.

Wheat is by far the most important cereals crop, accounting for 65% of 70% of all grain production. Production in the most recent crop year was about 902,000 tons (get final government figure).

Wheat flour consumption in Khatlon province

Khatlon is a rural province covering the entire southwest of Tajikistan with a population of about 2 million and has high rates of poverty relative to the rest of the country. Wheat flour is the main staple food used to make flat bread (nan) in villages and square loaves in cities. If 400 grams daily per capita is estimated, then total annual consumption by the population of 2 million is around 300,000 tons of flour.

Eight to 10 years ago anecdotal information and a brief field visit suggested that around 70% of the wheat flour consumed in Khatlon including nearly all wheat flour consumed in villages came out of village mills. The author did a study of the milling industry at that time.

In October 2013 the lead consultant revisited Khatlon. Some key findings based on field interviews are:

- The proportion of industrially milled flour had surpassed 70% for the entire oblast.
- At least two-thirds of the small village mills had ceased operating in the last 5 to 10 years. There is now only one mill in most villages or a single mill for 2 or 3 villages that often operate just part of the year in the months following harvest.
- Most households simply purchase industrially milled wheat flour in the bazaar.
- This flour is produced mostly in Sogd province in the north of the country where there is a large cluster of new commercial mills using wheat imported from Kazakhstan.
- There are 3 industrial mills in Khatlon province but they do not operate much of the time.
- A decreasing share of the wheat flour consumed in Khatlon is imported from Kazakhstan.
- The only households in Khatlon that consume predominantly village-milled wheat flour are ones that grow their own wheat, about 25% of total households and declining.
- Most households in Khatlon and other rural areas have at least one family member working in Russia who sends home remittances amounting to a few hundred dollars a month, sufficient to buy high quality wheat flour in the market. Many such families have ceased growing wheat on their own small plots for their own consumption, planting orchards or growing vegetables instead. If they continue growing wheat many now use it as animal feed rather than consuming the low quality wheat resulting from village milling.

Significance for flour fortification: Since only industrially milled flour can be fortified, the reduction in village milled flour means a greater chance to increase the rural population's consumption of fortified flour through working with large mills.

Planted area was 296,000 ha in 2013, a decrease from 304,000 ha the previous year, and from 316,000 in 2011. The government has a-five year program with subsidies and support to encourage planting of orchards (apricots mainly) on marginal sloping land where wheat had been grown. Orchard area has increased by about 10,000 ha per year and wheat area has declined by the same amount.

Wheat production has increased steadily from 387,300 tons in 2001. Replacement of cotton with wheat planting is one reason. Another reason is better yields thanks to use of improved seeds and fertilizer though the use of improved seed still remains limited.

Overall wheat yields are not as variable as in Kazakhstan. Both winter wheat and spring wheat are planted in dryland and irrigated zones respectively making the total annual wheat crop less subject to weather extremes. About two thirds of the planted area is dry land winter wheat with yields in the range of 2.0 to 2.5 tons per ha. One third of planting is spring wheat irrigated with snow-melt via large network of canals, mainly in Khatlon. Yields are around 5 tons per ha.

Irrigated wheat tends to be lower in gluten versus dry land wheat, and is less desirable for baking nan. Consequently, it is likely that a greater share of wheat grown in Khatlon province goes for animal feed (mainly poultry). This would correspond with data showing large increases in egg production and consumption.

There is no official data on the amount of wheat fed to chickens and other livestock. But in order to reconcile the large increase in wheat production with equally large increases in wheat and wheat flour imports the only likely explanation is that an increasingly greater share of domestic wheat production is either going to animal feed or to distilling. There is also the possibility that a certain amount of the wheat flour imported by Tajikistan is being re-exported to Afghanistan, or that wheat or wheat flour produced in Tajikistan is being exported to northern Afghanistan most likely through the Pamir region.

Much of the wheat devoted to feeding is for layer hens as demand for eggs is such that there is still major importation of eggs from Iran via Afghanistan as well as from Russia

and Uzbekistan. According to the newly released consumption data, the average Tajik now consumes 180 eggs per year. One egg costs $0.20 in the market.

Official data show there are 315,000 “dekhan” commercial farmers who by definition received plots from former Soviet and collective farms that were disbanded and divided up after independence in 1991. This class of farmers accounts for most wheat production.

Significance for flour fortification: There appears to be a trend toward commercialization of wheat production meaning fewer smallholders growing wheat and grinding it for self-consumption. This expands the possible share of fortified flour in total consumption, particularly in Khatlon province.

Wheat imports

Even while wheat production has steadily increased so have wheat imports, almost entirely from Kazakhstan. Wheat imports climbed from a low of 127,200 tons in 2004 to 747,100 tons in 2012 before dropping off to 640, 200 tons in 2013. Wheat imports depend on the size of the domestic harvest versus the wheat harvest and wheat prices in Kazakhstan that in turn depend partly on international prices despite distance to ocean ports.

There was a sharp rise in wheat imports in 2009. A presidential decree in November 2008 reduced the VAT on imported wheat from 18% to 10%, effective from January 2009, while holding the taxes and duty on imported wheat flour steady at 18%. This policy change resulted from a recognition that Tajikistan could not become self-sufficient in wheat, and that import barriers to protect its own wheat growers could cause higher food prices and did not promote economic growth.

Table: Tajikistan total wheat use

Year	Wheat Production	Wheat Imports	Flour imports wheat equivalent	Total wheat used
2013	901.7	640.2	309.7	1,851.6
2012	812.6	747.1	169.6	1,729.3
2011	726.9	442.5	538.3	1,707.7
2010	850.1	442.8	514.4	1,807.3
2009	850.1	413.1	546.8	1,810.0
2008	659.1	258.1	755.5	1,672.7
2007	649.3	183.9	694.1	1,527.3
2006	640.3	291.2	530.4	1,461.9
2005	618.5	283.5	507.6	1,409.6
2004	631.3	127.2	370.8	1,129.3
2003	660.2	143.9	262.0	1,066.1
2002	544.6	291.6	166.5	1,002.7

Source: To 2011, FAO. 2009- 2013, Goskomstat, Tajikistan (wheat production)

As a result of the change in import duties on wheat, beginning in 2009 there has been a trend toward increased wheat imports and declining wheat flour imports. Private wheat milling companies and traders account for almost all wheat imports. The government does little to regulate or control the trade, and only collects import duties. Often milling companies will switch to wheat flour imports if they cannot be competitive against imported wheat flour by importing wheat and grinding it despite the lower duty on wheat.

The government has maintained for many years a strategic grain reserve that purchases a certain quantity of wheat per year from Kazakhstan for storage in the concrete grain elevators left over from the Soviet period, mainly at two elevators in Sogd province. Public information about these purchases is not available, but reportedly they are small in to relation the total private sector imports of wheat.

Customs data shows that there were 63 firms that imported either wheat or wheat flour in the last year. About half are processors and half are traders. The traders deal in both wheat and wheat flour as well.

Along with a total increase in wheat imports there has been a change in the transportation routes that has reduced costs. Most wheat is now being brought to Sogd province in the northern Tajikistan by rail where it is received by the large number of mills there, or the wheat is transferred into bulk trucks in Nao district for further transport over the two mountain passes to mills in Dushanbe and elsewhere. The transit distance in Uzbekistan from the Kazakh border to the Tajikistan border near Nao district in Sogd province is 800 km.

Some wheat and wheat flour is still brought in via the circuitous rail route through Uzbekistan (2000 km) to Dushanbe but much less than before the increases in Uzbekistan railway tariffsto $0.18 per ton per km, and the rise of Sogd province as the main center for milling in Tajikistan.

Wheat milling

Up to one million tons of wheat is industrially milled in Tajikistan per year. This includes the average of 700,000 tons of imported wheat over the last two years, and a maximum of 300,000 tons of the 800,000 ton domestic crop.

There is much construction of new milling capacity in Tajikistan for milling of wheat imported from Kazakhstan to replace imports of Kazakhstan wheat flour. Most of this has been in Sogd province because of the competitive advantage buying Kazakh wheat for delivery there.

Milling capacity now far exceeds consumption demand in Tajikistan such that there is likely to be consolidation in the milling sector with less efficient, financially unstable mills closing over the next several years.

- Wheat milling in Sogd province

Sogd province is by far the most important center of the wheat milling industry in Tajikistan thanks to major new mill construction in the last four years, with projects still going on.

Assuming 80% of the wheat imported by Tajikistan is now being milled in Sogd province, and that mills are still blending in 25% domestic wheat grown in the province, then total wheat flour production can be estimated at around 700,000 tons.

There are now said to be 30 mills operating in Sogd province with capacity in excess of 50 tons per day. At least 15 of these mills, belonging to about ten companies, have daily wheat grinding capacity of at least 120 tons per day. There are still new mills completing construction but no new mills are likely to be started due to over capacity.

Table: Largest milling companies in Sogd province

Company	City/Town	Mill sites	Total Capacity
Zernovaya Companiya	Khujand	1	440 tons per day
Barakat / GallaiSugd	Khujand	2	260
Farovon	Kayrokum	2	280
Azil	Spitamen	1	160
Shakhira	Chkalyovsk	1	120
Charkhi Gandumin	Kayrakum	1	120
Others	Sogd province	7	840

Increased rail tariffs in Uzbekistan for the longer route to Dushanbe and the improvement in the Khujand – Dushanbe highway over the mountains are major reasons for the shift in the center of gravity of the milling industry northwards. The large number of mills also benefit from a reliable electricity supply in Sogd province.

Zernoya Companiya has a large pasta plant for its Buona brand, probably the biggest in the country. There are a number of smaller pasta producers as well. Most of the larger milling companies in Sogd province have also invested in steel silo grain storages mostly on rail sidings at their mill sites, such that bulk wheat can be delivered directly from Kazakhstan in hopper cars. These storages will enable the mills to procure larger amounts of wheat immediately after the harvest in the fall when grain prices are lowest. They will also be able to hold larger stocks to guard against interruptions in supply from

Kazakhstan due to railcar shortages, difficulties with transit of grain across Uzbekistan, or sudden price rises due to international market conditions.

There is no official data on the total capacity of grain storage built by the private sector. There may be a total of 20 mills with an average of 3 grain bins each holding an average of 2,000 tons for a total of 120,000 tons storage capacity. The amount of storage capacity available in the two former government grain elevators in Sogd province located at Kayrakum town (45,000 tons) and Nao district (50,000 tons) is 95,000 tons.

Completion of two major tunnels and a road within the last 3 years under the two mountain passes between Sogd province to Dushanbe has made the transport of wheat and wheat flour by truck southwards more feasible, despite high tolls. The highway is now open all winter and road time for trucks carrying 30 tons of wheat flour is 8 to 10 hours in good weather. The mountain passes now remains open most of the winter even during snowstorms. Avalanches and landslides only close the passes for a few days per year.

Three of the largest mills in Sogd province report sending 60% of their output to Dushanbe and other southern regions. Azil mill reported selling 40% of its production in the south. However they were unable to provide a breakdown of sales to Khatlon province which is handled by representatives and dealers in Dushanbe.

Significance for flour fortification: Concentration of wheat imports and milling in Sogd province increases the feasibility of monitoring wheat flour production and implementing a fortification program.

- Wheat milling in the Central region and Dushanbe

There are 15 to 20 mills operating in the zone extending from Hissor district in the west to Dushanbe and Vakhdat town to the east where there is one of the major concrete grain elevators for the government's grain reserve. These mills are subject to long periods of shutdown due to the competition of mills in Sogd province and the expense of receiving wheat directly by rail from Kazakhstan due to higher rail tariffs in Uzbekistan. By some reports all wheat imports now enter Tajikistan via the north, and mills in

Dushanbe are obligated transfer bulk wheat at the rail yard in Spitamen district from rail hopper cars to trucks.

Some of the Dushanbe wheat mills are part of vertically integrated companies that also produce loaf bread, pasta, biscuits and other products under well-known brands. The two largest are Makolli and Makviolli. The mills of these companies run more consistently since they are using the wheat flour for their packaged products, but at times these companies may import wheat flour rather than importing wheat based on relative prices in Kazakhstan.

Other leading milling companies in Dushanbe and the central region include Stella / Shams (new mill started in 2013), Justcombe Invest, and LLC Jazur in Vakhdat town.

- Wheat milling in Khatlon province

There are just three industrial mills in Khatlon province, but they operate infrequently. The mills in Kolkhozobod (OJSC Somon) and Kulob town are part of complexes where government's strategic wheat reserve is kept. Both mill wheat flour for market intervention when the government orders it. On average, they work just 4 days every 2 months according to our source.

There is a privately owned commercial mill in Kurgan-Tyube town that has been shut down for over a year. The same owner has a mill in Dushanbe that is also shut down, but his mill in Sogd province has been expanded to 120 tons per day with a new Turkish plant.

The number of village mills has declined as households now prefer to buy high quality wheat flour in the bazaars. Many households blend lower cost locally milled flour with high quality flour from Kazakh wheat.

Significance for flour fortification: Assuming a household whose members consume per capita 350-400 grams per day uses a blend of half industrially milled fortified wheat flour and half village milled flour to bake nan at home, average consumption of 200 grams of fortified flour should be enough to have to make a difference according to WHO norms. However the higher level of bran in the

village milled flour increases the importance of using NaFeEDTA iron as in the premix, since higher bran (phytate) content interferes with iron absorption.

Wheat flour imports

Table: Tajikistan Flour Imports (tons '000s)

Year	Total Flour Imports	Kazakh Flour Imports
2013	232.3	
2012	127.2	242.5
2011	403.7	294.5
2010	385.8	367.0
2009	410.1	327.3
2008	566.6	460.7
2007	520.6	463.0
2006	397.8	377.4
2005	380.7	355.3
2004	278.1	
2003	196.5	
2002	124.9	
2001	54.5	

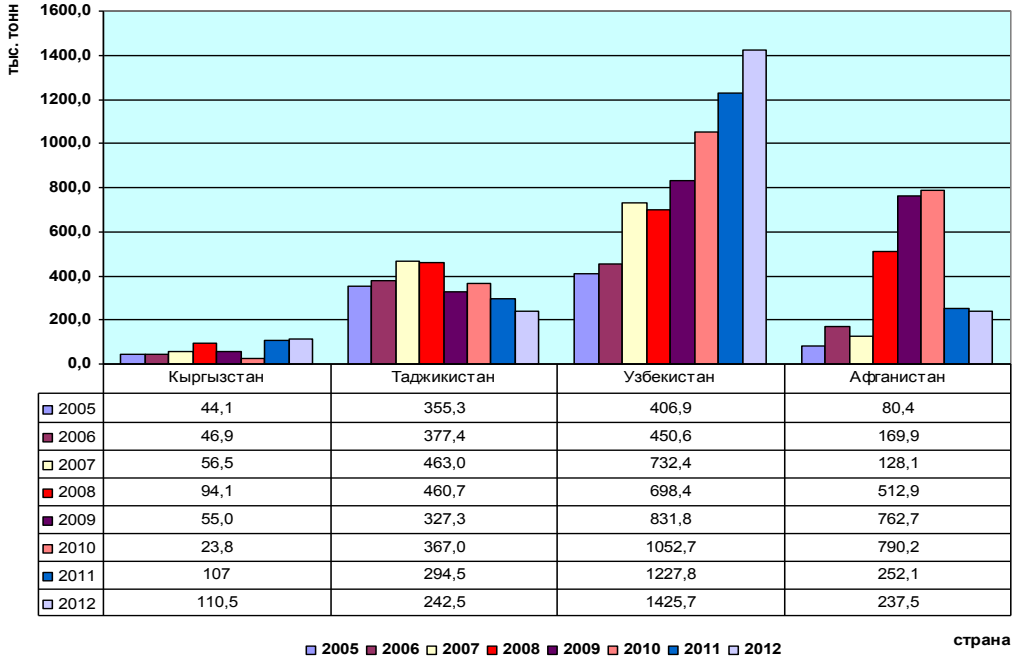
Sources: FAO for Total Flour, and the Union of Grain Processors of Kazakhstan for imports from Kazakhstan

Despite the construction of new mills and the lower VAT and import duty on wheat, wheat flour imports are still a major part of wheat flour consumption. Flour imports in 2013 totaled about 232,000 tons and have averaged 350,000 tons over the last five years according to FAO data.

The inconsistency for total wheat flour imports between 2011 and 2012 when there was a sharp drop off probably has to do with shipments that were recorded at the end of 2011 instead of 2012. The Kazakhstan data is more consistent with a gradual decline in total flour imports.

Tandoor bakers in Dushanbe are said to still rely almost exclusively on imported wheat flour from Kazakhstan since they do not trust the quality of domestically produced flour even from Kazakhstan wheat. This is likely to change in the future as the large Sogd province mills demonstrate their technical proficiency to new customer groups. The average tandoor baker in Dushanbe uses 4 to 5 sacks of Kazakh flour per day.

There are large amounts of counterfeit Kazakh flour on the market in reused or specially produced Kazakh flour sacks. In some cases just the top layer of flour may be genuine. Over the 8 years to 2012 Kazakhstan accounted for about 85% of the total imports. Russia ships about 7,000 tons per year of fortified flour to Tajikistan to supply school lunch programs in 2000 rural schools feeding administered by WFP. USAID made a one off shipment of 9000 ton of fortified wheat flour in 2009 after a very severe winter in 2008 and at a time when world wheat prices at skyrocketed.



	Кыргызстан	Таджикистан	Узбекистан	Афганистан
2005	44,1	355,3	406,9	80,4
2006	46,9	377,4	450,6	169,9
2007	56,5	463,0	732,4	128,1
2008	94,1	460,7	698,4	512,9
2009	55,0	327,3	831,8	762,7
2010	23,8	367,0	1052,7	790,2
2011	107	294,5	1227,8	252,1
2012	110,5	242,5	1425,7	237,5

Tajikistan remains the third most important export market for Kazakhstan wheat flour after Uzbekistan and Afghanistan. Kazakhstan is the world's number one wheat flour exporting country.

There are probably 10 to 15 milling companies in Kazakhstan that regularly export wheat flour to Tajikistan. Most of them sell through one or two Tajikistan importers who act as their flour distributors.

Some wheat flour imports still come to Dushanbe, but most of the wheat flour arrives in railcars with 68 tons each in Nao / Spitamen district, the main customs entry point by rail to Sogd province from Uzbekistan. The importers immediately transfer the wheat flour to Kamaz trucks carrying up to 30 tons each for movement over the mountain pass to the wholesale bazaar Hissor, 80 km west of Dushanbe, where local traders buy it for further distribution to shops and markets in Dushanbe, Khatlon and the GBAO.

Capacity of milling industry to fortify

The capacity of the Tajikistan milling industry to begin fortification of its wheat flour production is weak for a number of reasons. Many of the 20 mills that were part of the ADB project removed the feeders from their production lines and put them in storage. Other mills that were participated in the program have stopped operating or work just a few months of the year or a few days per month.

The mills now accounting for the largest share of flour production have been built in the six to seven years since the ADB project ended. These mills have no experience with fortification. However most of these mills have procured micro-feeders with their new milling plants.

Another potential shortcoming in the ability of the mills to start fortification is that just threeor fourof them are using micro-feeders to dose flour improvers (enzymes) to their flour in the plant, unlike in Kazakhstan where addition of flour improvers with micro-feeders is a standard practice. However, the largest mills in Sogd province have all stated their intention to use more flour improvers with feeders.

Significance for flour fortification: for flour fortification to be restarted in Tajikistan someof the new mills and several of the older ones would have to acquire feeders and be trained in their use as well as in QC procedures. On the other hand, most of the new mills are larger and technically sophisticated with

competent managers. Procurement, installation and/or recalibration of feeders should be a simple task for them.

Current wheat flour fortification

There has been no domestic fortification of wheat flour in Tajikistan since 2007 when the ADB project concluded. It ran from 2002 to 2007 and involved about 20 mills that received feeders and premix. Five had received feeders from UNCEF in the pilot project that preceded ADB's involvement by four or five years. When the project officially ended most of the mills returned their remaining stocks of premix since it had passed the expiration date after an extension. This premix, amounting to at least eight tons out of the original lot of about 20 tons that was received through ADB, is now in storage in a couple of locations including the Nao Melkombinat in Sogd province and at a mill outside of Dushanbe. The iron and zinc is still useable but most of the vitamins have degraded.

The only wheat flour that is fortified for consumption in Tajikistan presently is that supplied by WFP for its school feeding programs that require about 12,000 tons per year. About 7,000 tons of this is donated directly by Russia and fortified according to WFP specifications. The remainder WFP procures via tenders in Russia with cash from the Russian Federation.There may be small amounts of flour imported from Kazakhstan mills that which are randomly fortified.

C. REGULATORY ASSESSMENT

Fortification Standard

Tajikistan does have a national standard for the voluntary fortification of wheat flour that was adopted in conjunction with the ADB salt iodization and flour fortification project that ran from 2002 to 2007.

The premix formula under the standard is called KAP Komplex, consisting of electrolytic iron, zinc, folic acid and the B vitamins riboflavin, thiamin and niacin, and calls for addition of 120 grams of premix per ton of first grade wheat flour.

Table: KAP Komplex

	Original formula (120 g/MT)
Nutrients	**ppm**
Thiamin (B_1)	1.6
Riboflavin (B_2)	2.4
Niacin (B_3)	8
Folic Acid (B_9)	1.2
Iron (Electrolytic iron)	40
Zinc (zinc oxide)	17.6

Changing the fortification standard to replace electrolytic iron with NaFeEDTA iron due to its superior bio-availability should be considered as a first step in a renewed flour fortification initiative.

There is an Agency on Standardization, Metrology, Certification and Trade Inspection of Tajikistan, (Tojikstandard) http://standard.tj, that is a successor organization to the Soviet era Gosstandard, with well-established procedures for adoption of new standards and revisions. It also plays a role in enforcement of salt iodization.

Significance for flour fortification: if a flour fortification project is launched again, changing the iron standard to NaFeEDTA, though critical for reducing anemia, should be done in a step-wise fashion ensuring no delays in start-up in fortification using current standard.

Fortification Legislation

With support from the ADB project, a draft law requiring fortification of all domestically produced and imported wheat flour was signed by the president of Tajikistan and submitted during its 2007-2008 session to the lower chamber of parliament, which failed to act on the legislation reportedly due to concerns that flour prices would rise as a result. Unfortunately, the fortification law was submitted during a time of the global food price crisis. Since the ADB project was closed in 2008 there have been no further

significant attempts to revive the legislation or to bring forth new mandatory wheat flour fortification legislation.

Working groups with guidance from international experts usually develop new public health legislation. Legislation must be prepared by November when parliament convenes. Often the working group completes its final effort in an organized retreat of three days that brings the needed focus. There is a note on enriching wheat flour in the government's 2010-2012 Poverty Reduction Strategy (see Annex 1).

Quality Control and Monitoring

The main governmental bodies that would play a role in designing, adopting, implementing and enforcing a regulatory framework for wheat flour fortification include: Tojikstandard; the Sanitary and Epidemiology Service (SES) under the Ministry of Health and Social Protection; the State Unitary Enterprise "Korporatsiya Khurokvori" the Ministry of Industry and New Technologies; and the Customs Administration under the Ministry of Finance.

A wheat millers association was formed at the time of the ADB project grouping all the companies participating, but it ceased having any function when the project ended in 2007. The mill manager who headed the association and interacted with the mills on fortification issues unfortunately passed away a couple of years ago. His company, Justcombe Invest, received one of the two spectrophotometers provided by the ADB grant.

SES personnel received training under the ADB project in monitoring wheat flour fortification through analysis of samples with a spectrophotometer (supplied by project) and use of the iron spot test. Given the voluntary nature of the program, it is currently unclear to what extent protocols were established for mill audits and sampling flour from the market.

There is no national food laboratory where micronutrient content of various foods can be analyzed. A QC monitoring system for fortified wheat flour would consist of the following activities: sampling of wheat flour from mill warehouses, markets and bakers; audits of

mill premix purchase vs. production records; analysis of premix in mills; checking for fortification certification of imported flour shipments. Special measures will be needed to ensure government food inspectors do not accept payments to overlook violations.

An assessment of Tajikistan government's effectiveness in enforcement of salt iodization, which has been mandatory for several years, would be one means to gauge how to improvecurrent capacity to monitor and enforce wheat flour fortification. The most recent survey conducted in 2013 has shown that over 79% of salt in Tajikistan households is still not iodized and/or is under-iodized.

A strategy used with some success in Kyrgyzstan using Retail Rapid Test Kit to check levels of iodization of salt in the market, is now being introduced to Tajikistan by GAIN and UNICEF with USAID support. Lastly, Tojikstandard has taken on the role of distributing potassium iodate to the salt industry.

Control of Imports

Imported wheat flour accounts for about 20% to 25% of total consumption in recent years. A strict regime for monitoring fortification of imported flour, either at point of entry or in wholesale and retail markets would be one way to achieve a higher level of coverage of fortified product in the market.

Most wheat flour shipments are delivered by rail to Spitamen, Sogd province. These are central locations where the fortification levels could be controlled by Customs Committee and SES.

There is a limited but changing group of 10 to 15 wheat flour mills in Kazakhstan that regularly supply wheat flour to Tajikistan through an established set of local importer / distributors. If required to do so by these importers, these mills almost all of which already have feeders, could easily procure premix from distributors of flour additives in Kazakhstan for fortification of their export shipments.

D. RECOMMENDATIONS AND NEXT STEPS

In order to achieve sustainable wheat flour fortification in Tajikistan, commitment from all involved stakeholders including government, international and national partners, and the milling industry should be obtained. The millers themselves can be strong advocates for a mandatory fortification law as seen in other countries. The situation is improved today compared with past efforts incomes and food security has improved and less flour is imported than before.

While the program moves to mandatory fortification, a voluntary fortification program in Khatlon could be designed based on social marketing and working with a limited number of mills providing adequate coverage to Khatlon in order to create a public health impact.

Stakeholders should advocate with the government to require fortification of flour ground from wheat released from the government grain reserve, and design a limited project involving micro-feeder and premix supply and training for the mills involved in order to support this policy change.

As has already been done in Kyrgyzstan and other countries, Tajikistan's fortification standard could be changed from electrolytic iron to NaFeEDTA iron due the latter's superior bio-availability which more than offsets the higher cost.

Specific steps include:

- Position flour fortification as a nutrition policy priority.
- Review and revise as needed national voluntary standards.
- Advocacy meetings with Ministry of Health and Social Protection to put in place a policy requiring fortification of wheat flour distributions from the state grain reserves even before mandatory legislation.
- Further build support of the milling industry at the earliest stage for mandatory legislation through a series of advocacy visits to leading mills to build knowledge of fortification and willingness to comply under new legislation.
- Establish a working group to prepare new mandatory fortification legislation for submission to parliament in November.
- Find champions in parliament to support the passage of legislation.

- Develop a system to ensure a sustainable supply of premix to millers through a revolving fund or other mechanism.
- Work with primary mills including those supplying to Khatlon to fortify and procure premix.
- Develop a capacity building plan to support the enforcing capabilities (inspection andsample analysis) of the government. Similarly, assess the national food laboratory to perform all types of food analysis in addition to micronutrients in wheat flour.
- A recommended solution for sustainable premix would be a revolving premix fund similar to the revolving funds used to supply potassium iodate to the salt industry.
- Advocacy for the program should go beyond the reduction of anemia; it is also important to include decrease of the prevalence of neural tube defects and correction of other micronutrient deficiencies. Incorporation of other micronutrients, such as vitamins A, D, and B12, may be assessed because flour could be used as their carrier, and this investment is preferable than considering these of NaFeEDTA for a refined flour.
- It is important to establish from the beginning an epidemiological monitoring system that confirms that this intervention has benefits, such as following the evolution of the reduction of neural tube defects, reduction of anemia, as well as biomarkers associated with other micronutrients (vitamin A, vitamin D, vitamin B12, and other micronutrient concentrations in serum).
- As flour is a product that rarely is purchased by the final consumer based on its nutritional qualities,social marketing should be directed to avoid rejection and educate rather than for promotingconsumption. Targeting to key influencers (politicians, community leaders, journalists, and the like)for supporting this intervention would be a good use of funds in this area.
- In terms of external support required for establishing a sustainable flour fortification program in Tajikistan and implementing the abovementioned recommendations, estimated costs are provided in Annex 3 and calculated at just over $2 million for three years.

E. CONCLUSION

Wheat flour is the main staple in Tajikistan. It provides about 70% of the daily energy requirements. This is one of the highest per capita flour intakes in the world, 350-400 grams/day. Judging by the reported extraction rate of 70%, it is deduced that this flour is refined, and therefore the content of mineral-absorption inhibitors (e.g. phytic acid) is low. These conditions make wheat flour an ideal vehicle for fortification with critical micronutrients such as iron and folate. In addition, this assessment found positive trends in relation to the milling industry, overall production and imports and consumption trends - as well as a foundation of knowledge and experience among millers and public health officials - upon which to launch a new effort for flour fortification.

Estimation of the additional intake of micronutrients by women of child-bearing age at 300 grams of consumption and based on formula presented would be significant and is presented in the Table below:

Nutrient	Additional intakes of nutrients		
	Absolute amount (mg/d)	% Estimated Average Requirement (EAR)[1]	% Recommended Nutrient Intake (RNI)[2]
Thiamin (B_1)	0.3	35 %	29 %
Riboflavin (B_2)	0.6	67 %	56 %
Niacin (B_3)	1.7	16 %	12 %
Folate (B_9)	0.3	158 %	126 %
Iron (electrolytic)	12.0	59 %	27 %
Zinc (zinc oxide)	5.3	129 %	108 %

[1] Used as the reference point for diets of populations; WHO/FAO EAR values.

[2] Used as the reference point for diets aimed to individuals; WHO/FAO RNI values.

A mandatory flour fortification law in Tajikistan should increase the potential for health benefits of flour fortification to most of the population. This would be dependent on effective enforcement of the law for both domestically produced and imported flour. Tajikistan's history with salt iodization to identify the strategies that produced the results could be replicated as flour fortification is introduced.

Wheat flour fortification in Tajikistan has been tried in the past and was unsustainable due to lack of commitment and championship among key stakeholders. The keys to achieving sustainable wheat flour fortification in Tajikistan are gaining support of the milling industry at the earliest stage for mandatory legislation, finding champions in parliament to ensure the passage of the law, ensuring legislation includes funding and a plan for regulatory monitoring and enforcement, facilitating premix supply to the millers, and educating consumers, millers, and parliamentarians about fortification's benefits.

Today the food security situation is much better, incomes have improved, less flour is imported and government budgets are larger, making the situation more favorable to seek mandatory legislation again. This time, a small group of parliamentarians should be recruited as advocates of mandatory legislation that would be proposed by the milling industry and endorsed by multiple ministries including Ministry of Health and Social Protection, Ministry of Economic Development and Trade, and Ministry of Finance. In 2013, Tajikistan joined the Scaling Up Nutrition (SUN) movement, which is also a sign of a more favorable environment to advocate for improved nutrition policies.

Annexes

Annex 1: Food fortification policy documents

Poverty Reduction Strategy of the Republic of Tajikistan (2010-2012) Section 5.1 Food Security and Development of the Agricultural Sector states: (the strategy serves as medium-term program for the implementation of the National Development Strategy up to 2015). 10. Task 6, which relates to ensuring proper nutrition**,** aims at reducing the incidence of food- related illnesses and strengthening the legislative and laboratory bases. It includes the following package of measures: drafting and/or adapting the recommended, temporary, national, physiological and sanitation standards for food quality and safety; providing equipment for information collection and evaluation in order to implement **the Law "on Salt iodization";** enriching processed flour with iron; addressing medical problems related to nutrition; supporting scientific research to supply laboratory equipment for food safety assessment; and supporting scientific and practical research to ensure proper nutrition, taking steps to prevent and treat malnutrition.

Implementation of these measures will reduce the incidence of the food-related illnesses, particularly among the vulnerable segments of the population.

Annex 2: Meetings and visits

UNICEF

Mutribjon Bakhruddinov, Nutrition Officer

mbakhruddinov@unicef.org

World Food Program

Andrea Bagnoli, Deputy Country Director

Andrea.bagnoli@wfp.org

Saidamon Bodamaev, Programme Officer

Saidamon.bodamaev@wpf.org

USAID/CAR/Tajikistan

Aviva Kutnick, Agriculture Development Officer

Malika Makhambaeva, Health Officer

Ministry of Industry and New Technologies

Tagoimurod Amurovich Sharipov, Chairman, State Unitary Enterprise “Galla”

Abdurazok Majidov, non-grain food industry specialist

Tel +992 981094567

The State Scientific Research Institute of Nutrition

Dr. Jahon Azonov, Director

(under the State Unitary Enterprise “Korporatsiya Khurokvori” of Ministry of Industry and New Technologies)

Ministry of Health

Abdusalom Vokhidovich Vokhidov, Deputy Director

Republican Scientific-Clinical Centre of Pediatrics and Children’s Surgery

(former coordinator ABD flour fortification and salt iodization project)

avokhidov@hotmail.com

Milling companies

Shams 80 / Stella
92/2 N. Karabaeva Street apt. 80
Dushanbe
Kharizov Aslamkhudja Nazarovich, Director
Shams-selina.84@mail.ru

LLC Gallai Sugd, Khujand
Farkhod Tokhirovich Kurbanov, Director
farkhod.kurbanov@sugdgrain.com
Nurulllo Gaibullaev, Director of Marketing
nurullo_5555@list.ru

Azil mill, Spitamen, Sogd province
Idris Vokhidov, owner

ZernovayaCompaniya, Chalyovs, Sogd province
Sergei Rakhimov, Director

OOO “Faravon -1”, Kayrakum, Sogd province
BakhadurBabajanov, Director
B_babajanov@faravon.tj

Charkhi Gandumim, Kayrakum, Sogd province
M. D. Saidboev, Director
Mudin4888@4888mail.ru

Nao Melkombinat, Spitamen, Sogd province
Tursunaliev, Chief miller

Annex 3: Suggested three-year budget for donors for a national flour fortification program

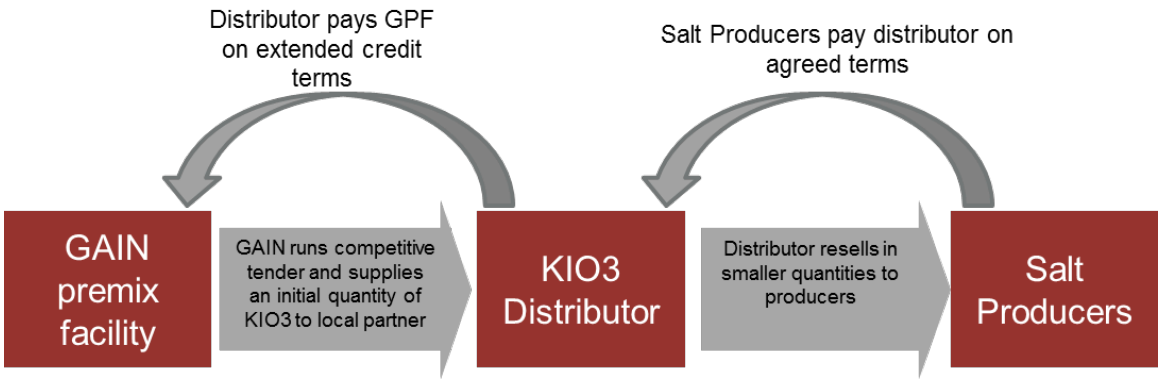
Component	Proposed budget	Description
Premix subsidy for initial seed stock and establishing supply system	$720,000	Fortification 300,000 tons flour dosage rate of 200 grams per ton at $12 per kg premix
Final subsidy for flour premix	$120,000	Fortification of 50,000 tons with dosage of 200 grams per ton at $12 per kg premix
Micro-feeders	$ 50,000	20 feeders at $2500 each
Standards and legislation	$100,000	Working group and advocacy with parliamentarians.
Social marketing	$300,000	Campaign via community health groups in Khatlon province
Quality Control	$100,000	6 devices at $5000 each plus 6,000 vials at $8 each. Training.
Birth defects register	$100,000	25 maternity hospitals
Project implementation unit	$150,000	Staff to administer feeder installation and premix distribution, and set up a revolving premix fund. One vehicle.
International Technical Assistance (e.g. in QA/QC)	$350,000	Project supervision and TA over 3 years. E.g. Internal QA/QC: training on techniques and processes on blending, calibration of feedersand testing. External QA/QC: support to food control on establishing a total quality approach to regulatory monitoring.
Monitoring &	$100,000	Including market-based

Evaluation(coverage and utilization)		testing of samples and coverage survey to model impact and RNI contribution.
Total	$2,090,000	

Annex 4: Models for Effective Fortification

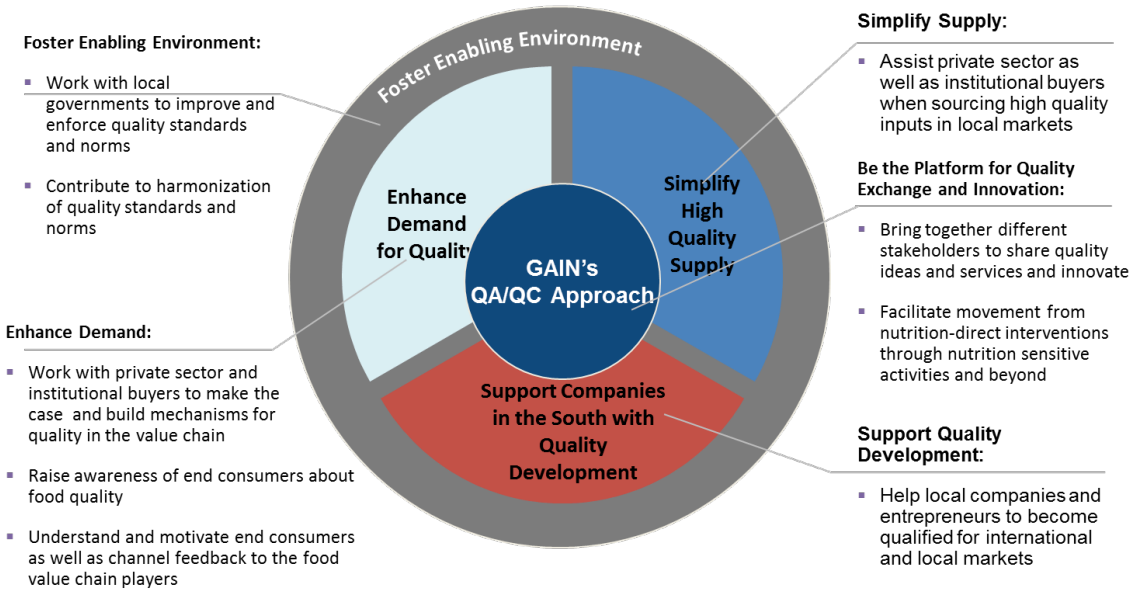
A. Premix Revolving Fund

GAIN has developed an innovative model for the establishment of sustainable KIO3 procurement and distribution systems which has led to sustainable systems in Ghana and Kyrgyzstan is currently being built in Ethiopia, Afghanistan and Bangladesh. This mechanism can be used to establish a revolving fund for premix procurement for as Tajikistan wheat flour fortification program. Through the GAIN premix facility (GPF), high quality and low cost premix is supplied through a revolving mechanism to a local distribution partner who then resupplies the local market. The model creates a tailored and sustainable system of supply for premix.



B. Quality Assurance & Quality Control

In order for food fortification to be effective, foods must be adequately fortified. Compliance continues to be a major challenge on mandatory fortification programs in Africa and Asia. GAIN is improving quality, with an overall goal to increase effective reach of fortified foods by 50% in supported countries by March 2015.



[i] UNICEF 2014

[ii] According to Dr. Vokhidov, Deputy Director of the Institute of Pediatrics

[iii] For which the methodology has not been provided.