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# A REGIONAL VIEW OF WHEAT MARKETS AND FOOD SECURITY IN CENTRAL ASIA

WITH A FOCUS ON AFGHANISTAN AND TAJIKISTAN

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development, the United States government, or the World Food Programme.



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## EXECUTIVE SUMMARY

This paper reviews wheat market dynamics in the Central Asia region. As a region whose countries experience perennial food deficits, trade plays a central role in ensuring adequate food availability. The paper is the result of fieldwork undertaken in spring 2011 to establish a better understanding of the dynamics, structure, trends, and constraints confronting the wheat marketing sector in the region, and to better understand the role that wheat trade plays in ensuring food security for the region.

For the purposes of this study, the Central Asia region includes Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan, and the Islamic Republic of Iran. The major findings are summarized below.

1. Wheat markets in the region function relatively effectively and are relatively well-integrated, considering the challenges of geography, infrastructure, political tensions, and friction that beset countries in the region.
2. Though regional wheat markets function effectively, export bans at different periods by Pakistan, Kazakhstan, and Russia have had a significant impact on regional wheat markets' ability to function effectively.
3. The region shows a high degree of dependence on wheat. This commodity dependence is indeed higher than in many countries in other parts of the world, notably East and West Africa.
4. The study found little evidence of non-competitive market structures that would impede the flow of wheat grain from food surplus to food deficit areas. Price differentials between regions, under most circumstances, appear to reflect transportation costs, tariffs and customs, and related marketing costs. The study does not find evidence of excessively large marketing margins or excess profits accruing to actors along the marketing chain.
5. The small size of the chronically food-insecure countries relative to the large wheat-producing countries (Pakistan, Iran, and Kazakhstan) exacerbates their vulnerability. Specifically, changes in internal production and trade for the two large countries, Pakistan and Iran, have a strong impact on wheat trade dynamics and availability in the region. Changes in available exports from Kazakhstan, the third-largest wheat-producing country in the region, have a strong impact on prices and overall grain availability.
6. There is a broad and heterogeneous mix of policy environments for wheat production and trade among countries in Central Asia. Afghanistan and Kyrgyzstan have limited government intervention in the wheat sector, whereas there is strong public-sector control over wheat production and marketing in Uzbekistan and Turkmenistan. Other countries are somewhere in between: Kazakhstan's government provides support for production, and Pakistan's exerts periodic control over marketing and trade. In some cases, these policy interventions have a strong impact on the dynamics of wheat trade, as was the case during Pakistan's ban on wheat exports in 2008.
7. For the purposes of food security monitoring and early warning, the study finds that wheat markets in northern Kazakhstan and the Punjab area of Pakistan are key markets to watch in relation to regional wheat market dynamics and regional wheat availability.



# I. INTRODUCTION

In Central Asia, a region of perennially food-deficit countries, trade in food commodities plays a critical role in ensuring food security. As landlocked countries with difficult access to international export markets and fragile regional trade linkages, frequently facing large swings in domestic food crop production, Central Asian countries are highly vulnerable to breakdowns in food trade flows that can severely affect the food security of their populations.

The region was seriously hit by the food price crisis of 2008, when global food commodity prices spiked and exporters that traditionally supply the region closed their borders. Poor local production conditions compounded the effect of these disruptions in imports. Under these circumstances, staple-food prices increased steeply, with the poor bearing the brunt of the high cost of food.

In the post-crisis environment, several factors have contributed to maintaining a precarious balance between food commodity supply and demand in the food-deficit countries of Central Asia. Rising fuel and transportation costs, along with strong demand growth and rapid inflation, have pushed real and nominal prices up. Also placing upward pressure on prices are the episodic trade blockages from Uzbekistan to Tajikistan, Pakistan's wheat export ban, and, more recently, wheat export bans in Russia and quotas in Ukraine. In addition, political turmoil and an ethnic conflict in Kyrgyzstan in 2010 brought about civil insecurity and uncertainty about the stability of the local business environment.

In the present context of heightened prices and volatility in international cereal markets, a better understanding of how Central Asian wheat markets function is critical for monitoring and early detection of threats to food security. Improved understanding will also enable effective food assistance planning and development programming. This paper evaluates the structure, function, and performance of wheat markets and trade at the regional level to better understand the drivers and risk of food insecurity in Central Asia. The paper focuses on Afghanistan and Tajikistan as the countries that confront the most significant food insecurity problems in the region.

This study builds on previous studies on food commodity markets in the region. Under the Famine Early Warning Systems Network (FEWS NET), Schulte (2007) conducted a survey of wheat traders and millers in northern and western Afghanistan, finding that populations in urban centers and in some rural areas increasingly consumed imported wheat flour, because the availability of local wheat was inadequate to meet consumption needs and the milling industry was insufficiently developed. That study highlighted the need to better understand market linkages between Kazakhstan, Uzbekistan, and Pakistan. Similarly, Khan (2007) investigated trade linkages with Pakistan, and Chabot and Dorosh (2007) assessed linkages between wheat markets in Afghanistan and Pakistan. Robinson (2008) described the regional food commodity trading system between Tajikistan, Uzbekistan, Kyrgyzstan, and Kazakhstan. In addition, two WFP market studies on Afghanistan and Tajikistan, conducted in 2005 to profile markets and to support food assistance programming, are good sources of detailed information.

The rest of this paper is structured as follows: Section II provides an overview of socioeconomic and food-security contexts in Central Asia. Section III looks at recent trends in wheat production and trade for Central Asian countries. Section IV describes the wheat-producing areas and the flows of wheat in the region. Section V reviews government policies affecting wheat production, trade, and marketing. Section VI assesses market integration and wheat market performance in the region. Section VII consolidates recommendations for early warning, presenting indicators and suggesting steps for strengthening the market monitoring system.



## II. SOCIOECONOMIC AND FOOD-SECURITY CONTEXTS

### 2.1 Socioeconomic Data

The Central Asia region is in large part sparsely populated, with the exception of Pakistan and the fertile plains and valleys of the southern region. Pakistan is inhabited by about 170 million people, making it the most populous country included in this study. Afghanistan has 30 million people, the second-largest population in the region, followed by Uzbekistan, with about 29 million people. Kazakhstan, Tajikistan, Turkmenistan, and Kyrgyzstan, have small populations in comparison to those three countries (see Table 1).

**Table 1. Population, Wealth, and Livelihood Indicators**

	Population in 2010 (millions)	Average Annual Population Growth (%)		Per-capita GNP in 2009, PPP Adjusted (current \$)	Population <\$1.25/day, PPP Adjusted (%)	Agriculture as a Percentage of GDP	Rural Population Share in 2009 (%)	Agricultural Employment in 2008 (% of Total Employment)
		1990-2009	2009-2015					
Afghanistan	30.2	2.5	2.7	860	N/A	29	76	N/A
Tajikistan	7.6	1.4	1.8	1,950	21.5	25	74	44.7 <sup>a</sup>
Kyrgyzstan	5.4	1.0	1.3	2,200	< 2	29	64	36.3
Kazakhstan	16.1	-0.2	1.0	10,320	< 2	6	42	N/A
Uzbekistan	28.5	1.6	1.4	2,910	46.3	21	63	N/A
Pakistan	166.5	2.4	2.2	2,680	22.6	20	63	43.6

*Sources:* Asian Development Bank, Basic Statistics 2011 (population and fertility rate); International Monetary Fund, April 2011 World Economic Outlook (population for Afghanistan and Iran); World Bank, World Development Indicators 2011 (average annual population growth, per capita gross national product, poverty rates, rural population, and agricultural employment).

The demographic dynamics are different among Central Asian countries. In the south, populations are increasing faster. From 1990 to 2009, populations in Afghanistan and Pakistan grew at 2.5 and 2.4 percent per year on average, respectively. Between 2009 and 2015, average annual population growth rates for Afghanistan and Pakistan are projected at 2.7 and 2.2 percent, respectively. Tajikistan is also forecasted to have a significant population increase through 2015. In the other countries, population growth trajectories have been more moderate.

Central Asia is a mix of low- and middle-income economies. Kazakhstan, the region's wealthiest country, had a per-capita gross national product (GNP) of \$10,320 in 2009, adjusted for purchasing power parity (PPP), ranking just ahead of Brazil. Uzbekistan and Pakistan have much lower PPP-adjusted per-capita GNPs of \$2,910 and \$2,680, respectively; the World Bank classifies them as lower-middle-income economies. Kyrgyzstan, Tajikistan, and Afghanistan are all low-income countries, according to World Bank classifications. Kyrgyzstan and Tajikistan are comparable to Nigeria in terms of PPP-adjusted per-capita GNP, whereas Afghanistan, with a PPP-adjusted per-capita GNP of \$860, ranks among the poorest countries in the world. Poverty rates are high in the low-income countries of region. Indicators show that they are also high in the lower-middle-income economies of Uzbekistan and Pakistan, presumably due to strong income inequalities.

In all the Central Asian countries in Table 1 except Kazakhstan, most of the population lives in rural areas. Afghanistan and Tajikistan exhibit the highest shares of rural population. In Kazakhstan, the most economically developed country, most of the population is urban. In most Central Asian economies, the agricultural sector still represents a large share of the wealth generated and is a large source of employment. High shares of agricultural output in GNP are seen in Afghanistan, Kyrgyzstan, and Tajikistan. Turkmenistan and Uzbekistan are also large producers of natural gas, and

the foreign exchange earnings from natural gas sales provide them with the means to import large quantities of food.

Central Asian economies have grown at robust rates over the past five years (see Table 2). With the exception of Uzbekistan, most were hit by the global economic crisis of 2008, but have seemingly recovered since then. Afghanistan posted the strongest average annual growth rate in the region between 2005 and 2009, although the Afghan economy grew erratically, with growth coming to a halt in 2007 and 2008. Uzbekistan and Tajikistan have grown relatively rapidly.

**Table 2. GDP Growth in Central Asia, 2005-2009**

	2005	2006	2007	2008	2009	Average 2005-2009
Tajikistan	6.7	7.0	7.8	7.9	3.4	6.6
Afghanistan	14.5	11.2	-0.2	2.3	14.8	8.6
Kyrgyzstan	-0.2	3.1	8.5	8.4	2.3	4.4
Kazakhstan	9.7	10.7	8.9	3.3	1.2	6.8
Uzbekistan	7.0	7.3	9.5	9.0	8.1	8.2
Pakistan	7.7	6.2	5.7	1.6	3.6	5.0

*Source:* World Development Indicators 2010, World Bank.

Like other fast-growing economies, Central Asian countries have seen fairly high inflation in recent years. This inflation has been driven largely by rapidly rising commodity prices in international markets, particularly oil and food products.

## 2.2 Wheat Consumption and Food Insecurity

In Afghanistan and Tajikistan, bread is the main staple food. The poor generally eat bread at every meal, and bread provides most of the calories in their diet. In Central Asia in general, consumption of wheat-based foods is high compared to other regions of the world. Wheat-equivalent consumption across Central Asian countries ranges from 138 kg to 174 kg per capita annually, except in Pakistan, where per-capita annual wheat consumption stands at 106 kg. By comparison, wheat consumption for the Asia region as a whole is 66 kg per capita annually. Based on data from the food balance sheets from the Food and Agriculture Organization (FAO), presented in Table 3, wheat provides between 37 percent and 60 percent of the dietary caloric intake in Central Asian countries, and is thus the major source of calories by a considerable margin.

**Table 3. Food Consumption Patterns  
(percent of total daily dietary caloric intake)**

	Wheat	Rice	Maize	Pulses	Sugar	Vegetable Oils	Meat	Milk	Fruits	Vegetables
Afghanistan	59.5	7.3	2.7	1.5	4	10.3	0.9	5.7	1.7	1.3
Kazakhstan	37.3	2.6	0.2	0.1	9	8.4	9.9	12.4	0.9	2.7
Kyrgyzstan	40.5	1.1	4.1	0.5	8.7	5.4	7	8.3	2	3.9
Pakistan	36.8	6.5	2.8	3.4	10.2	10.8	2.6	12.1	2.1	1.1
Tajikistan	53.9	2.2	3.7	0.5	6.9	12.4	3.8	4.8	1.2	2.3
Uzbekistan	52.5	2	1.3	0.8	3.0	11.2	6.2	9.2	3.0	4.3

*Sources:* FAO Food Balance Sheets 2007; for Afghanistan, the 2003 National Risk and Vulnerability Assessment.

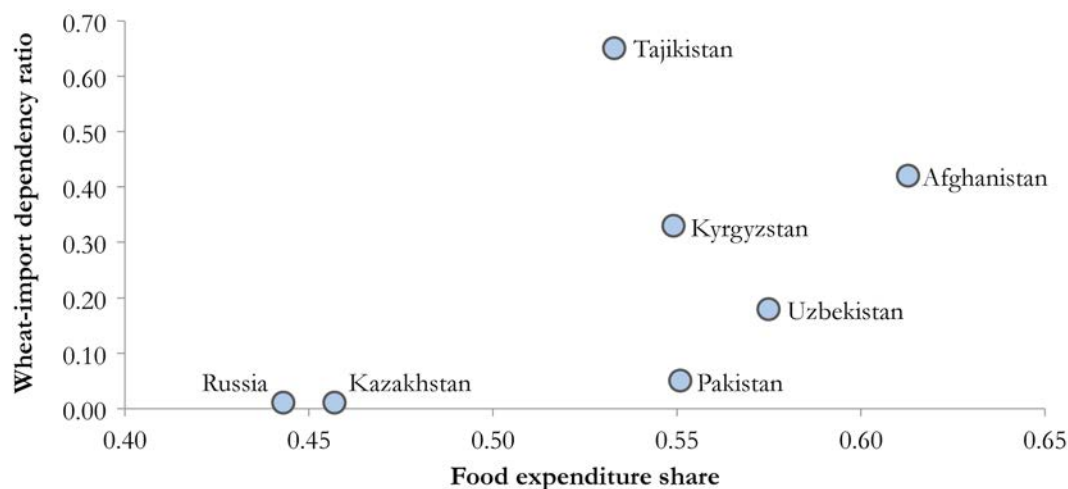
*Note:* Data in the columns do not all add to 100 percent, because not all food products are included.

Central Asia's dependence on a single commodity — wheat — for food security is considerably higher than in other regions that are vulnerable to food insecurity. For example, in Niger, a West

African country prone to food insecurity, the most commonly consumed staple grain (millet) accounts for 39 percent of calories consumed on average, with sorghum, rice, wheat, and maize comprising an additional 20 percent of calories. A variety of pulse crops supply an additional 17 percent of total calories. In Kenya and Tanzania, to use an East African example, the predominant staple, maize, comprises only 33 percent and 26 percent, respectively, of total calories on average. Thus, although West and East Africa may be prone to problems of food security, they do not have the degree of commodity dependence of populations in Central Asia. It is for this reason that the current study focuses so heavily on wheat, at perhaps the expense of other food products.

Trade in wheat is at the center of this study, because Central Asian populations rely heavily on cross-border flows of this commodity to satisfy their food consumption needs. Figure 1 shows the shares of food expenditures in total household expenditures, an indicator of vulnerability to food-price increases, against national wheat import dependency ratios (total imports as a percentage of total consumption for the years averaged between 2005 and 10), a proxy for vulnerability to food availability shortfalls at the national level.

**Figure 1. Household Food Expenditures and Wheat Import Dependency Ratios (total imports as a percentage of total consumption, 2005-2010)**



As Figure 1 illustrates, Tajikistan and Afghanistan have the highest combination of wheat import dependency and share of food in total household expenditures. Kyrgyzstan also has a relatively high level of dependency on wheat imports. For these three countries, trade in wheat from wheat-surplus producing areas in Central Asia is critical to ensuring their food security.

Several countries of Central Asia face significant levels of chronic food insecurity, particularly Afghanistan and Tajikistan, the poorest countries. Based on data from United Nations organizations for Central Asian countries excluding Afghanistan, Tajikistan has the highest level of undernourishment. This indicator of food insecurity is also high in Pakistan. Uzbekistan and Turkmenistan show moderate levels of undernourishment. Underweight among young children is most prevalent in Pakistan, followed by Tajikistan, and small levels of underweight are observed in the other Central Asian countries. According to the Global Hunger Index, calculated by the International Food Policy Research Institute, which combines these two indicators of food insecurity with a third, mortality among young children, Pakistan and Tajikistan are the most chronically food insecure countries in the region, excluding Afghanistan. Table 4 (next page) lists food security indicators for Central Asian countries.

**Table 4. Food Security Indicators**

	Proportion of undernourished in the population (%)	Prevalence of underweight among children under 5 (%)	Mortality rate among children under 5 (%)	Global Hunger Index
Afghanistan	N/A	N/A	25.7	N/A
Iran	4	4.4	3.2	3.9
Kazakhstan	1	4.9	3.0	3.0
Kyrgyzstan	3	2.7	3.8	3.2
Pakistan	23	25.3	8.9	19.1
Tajikistan	26	15.0	6.4	15.8
Turkmenistan	6	8.0	4.8	6.3
Uzbekistan	13	4.4	3.8	7.1

*Source:* International Food Policy Research Institute.

*Note:* The Global Hunger Index is the average of the percentage of undernourished in the population, where undernourishment refers to a dietary caloric intake deficiency, the percentage of underweight among children under five, and the percentage of children dying before the age of five. The 2010 Global Hunger Index is based on data from 2003-2008. Higher index values indicate higher levels of food insecurity.)

Based on the child mortality indicator, which reflects a high level of food insecurity, and other information, Afghanistan should appear at or near the top of this list. The problems of chronic food insecurity in southern Central Asia indicate a lack of availability or access to food, and/or inadequate utilization. However, other factors may also explain the level of these indicators, such as the quantity and quality of antenatal and postnatal nutrition, which are related to child mortality rates and the prevalence of underweight children. Although wheat availability issues may only explain a small part of food insecurity in this region, the prevailing levels of chronic undernourishment and child malnutrition render the population all the more vulnerable to shortages in wheat supplies and rising wheat prices, given the importance of this staple food in their diet. This context provides a large part of the rationale for the current study.



### III. TRENDS IN WHEAT PRODUCTION AND TRADE

Central Asia shows tight internal trade linkages relative to linkages with external countries, due to geographical factors, transportation costs in particular, and political factors, given the poor relationships between Pakistan and India to the east and between Iran and Iraq to the west. Thus, the available aggregate trade statistics may be seen as accurately reflecting regional trade flows. Table 5 (next page) presents an overview of wheat production and trade figures for Afghanistan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan over the past decade

In six of the last 10 years, Central Asia has been a net exporter of wheat. Wheat production is unevenly distributed across countries, and intra-regional trade is critical for balancing supply and demand within countries.

Pakistan is the largest wheat producer in the region, followed by Kazakhstan and Iran, but with a population of 167 million, Pakistan also consumes a large amount of wheat. These three countries typically account for more than 75 percent of the region's wheat production. Kazakhstan is by far the largest wheat exporter in the region, with an average 82 percent share of annual exports between 2001-2002 and 2010-2011. It exports mainly to other countries in Central Asia (although its exports to China might be rising). In contrast, Iran, with its 75 million people, is usually a net importer, sometimes importing large quantities of wheat.

Kazakh and Pakistani wheat production and exports have apparently matched the increased import demand in the region. Except during the production shortfall of 2010-2011 in Kazakhstan and Pakistan's export ban of 2008-2010, wheat production and exports have increased for both countries. As additional evidence of adequate medium-term availability, the region was a net exporter during most of the past decade, and its wheat stocks-to-use ratio has been relatively stable, in contrast to the declining worldwide ratio.

The region's other countries are small wheat producers; typically, these countries import wheat. Afghanistan is a major wheat importer. Its wheat production has risen irregularly in the past 10 years, with a long period of stability in the 2000s. Its wheat imports have also increased in the same period. Tajikistan and Uzbekistan also rely on wheat imports, although their smaller populations mean they import less. Kyrgyzstan and Turkmenistan import small quantities of wheat and seem to play a minor role in regional wheat trade. Wheat production in Central Asia's small importing countries has generally remained flat over the past decade, increasing steadily only in Uzbekistan. Because its imports have increased more rapidly in the past few years, Uzbekistan may compete more aggressively for supplies with Afghanistan and Tajikistan.

**Table 5. Wheat Production, Imports, and Exports (in Thousand Metric Tons of Wheat Grain-Equivalent, not Including Durum Wheat)**

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
<b>Production</b>										
Afghanistan	1,597	2,686	3,550	2,293	3,500	3,100	3,350	2,100	4,250	3,700
Iran	9,459	12,450	13,440	14,568	14,308	14,664	15,887	7,957	13,485	15,500
Kazakhstan	12,707	12,700	11,537	9,937	11,198	13,460	16,467	12,538	17,052	9,700
Kyrgyzstan	1,191	1,306	1,100	1,000	950	890	710	720	1,100	900
Pakistan	19,024	18,227	19,183	19,500	21,612	21,277	23,295	20,959	24,000	23,900
Tajikistan	387	545	660	650	550	530	530	350	700	500
Turkmenistan	1,200	1,200	1,200	1,500	1,600	1,600	1,600	900	1,200	1,200
Uzbekistan	3,400	5,000	5,400	5,250	5,800	5,850	6,200	6,000	6,200	6,500
<i>Totals</i>	<i>48,965</i>	<i>54,114</i>	<i>56,070</i>	<i>54,698</i>	<i>59,518</i>	<i>61,371</i>	<i>68,039</i>	<i>51,524</i>	<i>67,987</i>	<i>61,900</i>
<b>Imports</b>										
Afghanistan	1,000	500	450	1,000	1,000	1,400	2,300	3,800	2,500	2,000
Iran	5,296	2,075	766	200	380	1,100	200	6,800	5,000	600
Kazakhstan	15	27	10	17	40	29	35	119	57	25
Kyrgyzstan	178	114	69	144	243	333	443	539	350	400
Pakistan	235	185	162	1,415	924	66	1,493	3,149	170	200
Tajikistan	503	450	360	597	773	903	981	986	872	1,000
Turkmenistan	42	51	25	25	25	45	299	462	95	100
Uzbekistan	481	254	199	445	623	1,090	990	1,440	1,677	1,500
<b>Exports</b>										
Iran	42	0	0	0	50	50	50	50	100	1,000
Kazakhstan	3,977	6,238	4,217	3,039	3,817	8,089	8,181	5,701	7,871	5,000
Kyrgyzstan	25	25	25	25	25	25	25	25	25	25
Pakistan	495	1,185	193	600	600	700	2,200	2,100	300	1,000
Uzbekistan	0	0	450	100	100	200	200	200	400	400

*Source:* USDA Foreign Agricultural Service's Production, Supply and Distribution online database (imports do not include food aid).

An important issue for the region is that wheat production shows a considerable degree of inter-annual variability, a key source of acute food insecurity. This variability reflects a high frequency of adverse production conditions — droughts and harsh winters in particular — where there are few strategies to cope with bad growing conditions. Wheat production variability is highest in Afghanistan, with a coefficient of variation for wheat production of 0.27 between 2001/2002 and 2010/2011. Variability is also high in Tajikistan, Kyrgyzstan, and Kazakhstan, ranging between 0.19 and 0.21. Table 6 lists coefficients of variation for each country for the same period. By comparison, the coefficient of variation for wheat production was 0.12 for the United States and 0.15 for Canada.

**Table 6. Coefficient of Variation for Wheat Production in Central Asia (2001/2002 to 2010/2011)**

Coefficient of Variation	
Afghanistan	0.31
Tajikistan	0.21
Kyrgyzstan	0.20
Kazakhstan	0.19
Pakistan	0.10
Iran	0.15
Uzbekistan	0.16
Turkmenistan	0.18

Shocks that affect large exporters or importers or the region as whole can have severe impacts on wheat availability and prices. For instance, in 2008-2009, wheat production was poor throughout the region, dropping from 68 million to 52 million metric tons. That year, exports from Kazakhstan dropped while imports of Iran and Afghanistan surged, with some rise in imports of Pakistan, Kyrgyzstan, Turkmenistan, and Uzbekistan. This situation caused prices to remain high in the region, even as prices in international markets dropped.

Iran experienced a similar situation in the early 2000s, importing large amounts of wheat after an episode of poor production. In such times, increased demand for imports from large, typically self-sufficient countries can put considerable pressure on exportable supplies, to the detriment of low-income, food-deficit countries in the region. Specifically, when Kazakhstan's wheat production is low, the region's wheat importers find themselves under strain, as in 2010-2011. If Iran maintains its self-sufficiency in wheat, there will be less pressure on exportable supplies from Kazakhstan.

Trade's role in buffering supply shortfalls relies on production not being correlated between countries; it has limited ability to absorb widespread, simultaneous shocks. A correlation analysis of wheat production among Central Asian countries shows that Afghanistan, Iran, Pakistan, Tajikistan, and Uzbekistan generally experienced similar variations in wheat output between 2001 and 2010. Countries in southern Central Asia often found themselves competing for exportable supplies. Production in Kazakhstan and Kyrgyzstan is not correlated with production in the other countries.

Iran and Pakistan's relatively good access to international export markets through their sea ports means they are better able to cope with poor regional production. Uzbekistan and Turkmenistan, which have significant foreign exchange earnings from natural gas exports, can also cope fairly well with regional production shortfalls. However, landlocked and food-deficit Afghanistan, Kyrgyzstan, and Tajikistan, which also lack significant income from natural resources, face greater hurdles to satisfying food import requirements when regional wheat production falls short.



## IV. GEOGRAPHY OF WHEAT PRODUCTION AND TRADE

### 4.1 Wheat Production

Wheat in Central Asia is produced under a wide range of agro-ecological growing conditions. The plains of northern Kazakhstan constitute the largest wheat-producing area. This area, shown in Figure 2, stretches over the *oblasts* (provincial administrative units) of Akmola, Kostanai, North Kazakhstan, part of Pavlodar, and the north of Karaganda<sup>1</sup> and extends north into Russian territory. The land in the rest of the country is not appropriate for crop production.

Most of the wheat grown in northern Kazakhstan is rain-fed spring wheat. Because of the dry climate, northern Kazakhstan produces good quality hard wheat; however, frequent droughts (two years in every five, on average) lead to reduced harvested area and yield losses. Poor rainfall and heat during the May-August growing season are important causes of production shortfalls. Some winter wheat is grown in southern Kazakhstan, but accounts for a minor share of the country's wheat production.

**Figure 2. Important Wheat-Producing Areas in Central Asia**



Source: FEWS NET.

In southern Central Asia, winter wheat is the more common wheat crop. This part of Central Asia receives little rainfall and most wheat production is from irrigated crops in the plains bordering

<sup>1</sup> The oblasts of Akmola, Kostanai, and North Kazakhstan produce about 70 percent of Kazakhstan's wheat output.

mountains and along rivers (see Figure 2). Wheat-growing areas include northeast Uzbekistan's Ferghana valley; northern Tajikistan; western and southern Kyrgyzstan; and in the irrigated areas along the Amu Darya and Syr Darya Rivers in the south and east of Uzbekistan, southern Tajikistan, and northern Afghanistan. Like in the north, southern Central Asia experiences frequent droughts that cause large production shortfalls. In Afghanistan and Tajikistan, where agriculture is least modernized and farmers do not have access to improved cultivars, and effective inputs, the consequences of inadequate moisture can be severe.

Afghanistan's most important areas of wheat production are in the north. The provinces of Baghlan, Takhar, and Kunduz tend to have the largest wheat surpluses because of the availability of water for irrigation. In years with adequate precipitation, areas that produce wheat surpluses extend to the neighboring provinces of Samangan, Sar-e Pul, Faryad, Badghis, and Herat, where the wheat crop is more rain-fed. Provinces around Kabul, a major deficit area, also produce wheat, but do not produce a significant surplus. In Tajikistan, the most important wheat-surplus area is in the south, in Khatlon province. Wheat is also grown in the north, in the Ferghana valley.

In Pakistan, where the main wheat crop is hard wheat, most wheat is cultivated in Punjab province, in the northeast. Punjab typically accounts for more than 75 percent of domestic output (Quartermaine Bastin, Sarwar, and Asadullah Kazmi, 2008). Sindh province also produces a significant quantity of wheat (more than 10 percent of domestic production). Wheat is mostly grown on irrigated land, with rain-fed wheat accounting for less than one-fifth of total production. As a result, wheat production is less variable in Pakistan than in the rest of Central Asia.

## **4.2 Trade Routes, Infrastructure, and Logistics**

Kazakhstan, by far Central Asia's largest wheat exporter, exports wheat grain and wheat flour mainly to countries of the Commonwealth of Independent States (CIS)<sup>2</sup> and to Tajikistan, Uzbekistan, Kyrgyzstan, and Russia in particular. Outside the CIS, Afghanistan is a major destination for Kazakh wheat. Kazakhstan also supplies Iran with large quantities of wheat when production in Iran is low. Beyond these areas, Kazakhstan exports only small quantities of wheat, although China is presumably another important destination for Kazakh wheat. From Kazakhstan, wheat is exported to Iran and the South Caucasus through the Caspian Sea, to the Middle East through Russia and the Black Sea, and to Eastern Europe through Russia. And although the Kazakh wheat sector has a diversified array of export markets regionally, the most significant markets remain southward in the food-deficit countries of Central Asia.

Besides the location of wheat production, Central Asia's natural geography and the transport infrastructure that was built around it explains, in large part, the pattern of trade in wheat. Mountainous topography has severely limited the development of transportation corridors and infrastructure in Afghanistan, Kyrgyzstan, and Tajikistan. In addition, remoteness from the large population centers of East Asia, South Asia, Eastern Europe, and Russia has limited access to major markets. Landlocked Afghanistan, Kyrgyzstan, and Tajikistan confront formidable challenges in accessing international food commodity markets. The closest major sea ports are Bandar Abbas in Iran and Karachi in Pakistan on the Arabian Sea.

The railway network linking the Central Asian republics with one another and with the rest of the former Soviet Union is a critical piece of infrastructure supporting the regional wheat trading

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<sup>2</sup> The CIS includes the Republic of Belarus, the Russian Federation, Ukraine, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Turkmenistan, Tajikistan, and Uzbekistan.

system.<sup>3</sup> The railway system in Central Asia functions reasonably well with links to Kazakhstan, Russia, Ukraine, the Caucasus, and Iran. Because of the cost of transportation compared to the value of wheat, very little wheat is shipped by road across borders, except in Afghanistan, where there are few rail connections. The map in Figure 3 (next page) shows the railroad network.

The tormented history of political relationships among Central Asian and neighboring countries also determined the wheat trading system. The convolutions of national borders, particularly in the Ferghana valley, create further impediments to trade. Political tensions with neighboring countries, namely between Pakistan and India, have prevented the development of certain trade routes.

For this study, the trade route of primary interest is from Kazakhstan to southern Central Asia, in Tajikistan and Afghanistan in particular. From the grain elevators of northern Kazakhstan, wheat is transported southward by rail, through Astana and Karaganda, to Shymkent, in southern Kazakhstan, near the Kyrgyz border, and then to Tashkent, Uzbekistan, or westward to the Caspian Sea, Ukraine, Russia, or the Black Sea. From the south of Kazakhstan, wheat can also be shipped eastward to China, through Druzhba, and to Kyrgyzstan in the direction of Bishkek.

From Tashkent, Kazakh wheat can be transshipped through Uzbekistan and the Ferghana valley, either eastward to Khujand, northern Tajikistan, and Osh, Kyrgyzstan, or southward through Samarkand and then Termez, toward Dushanbe, Tajikistan, or Mazar-e Sharif, Afghanistan. Along the southern route, the rail line crosses the Uzbek-Turkmen border and then returns to Uzbekistan, adding significant distance for wheat shipments. Another rail line goes through Bukhara, Uzbekistan, to Turkmenistan, and then to Iran.

Across the Amu Dayra River from Termez, the town of Hairatan is the entry point into Afghanistan from Uzbekistan. Cargoes are hauled from Termez to Hairatan by truck or train over the Afghanistan-Uzbekistan Friendship Bridge, or across the river by barge. From Hairatan, merchandise is transported to Mazar-e Sharif, about 90 km to the south, and then to the rest of the country. Mazar-e Sharif is a major commercial city and a major marketplace for local and imported wheat in Afghanistan, amidst the surplus-producing areas of northern Afghanistan.

Until recently, the rail line ended at the freight terminal of Hairatan, but in early 2011, a railway linking Hairatan to a freight terminal near Mazar-e Sharif was completed<sup>4</sup>, although it was not in operation for commercial freight at the time of this report. Wheat arriving in Termez or Hairatan has so far been transported to Mazar-e Sharif and other places in Afghanistan by truck.<sup>5</sup> Once the railway begins to operate, trade capacity will increase, transportation costs should decrease, and the efficiency of the marketing system at this level should improve significantly. There is no railway network within Afghanistan, so wheat and flour are hauled by truck. In the last decade, the road network has been significantly improved and the transport sector has developed, facilitating internal wheat trade.

The rail line from Turkmenistan to the Afghan border town of Towraghondi, north of Herat, is a secondary transportation link for Afghanistan, but it is significant because it connects Afghanistan to Turkmenbashi on the Caspian Sea. Turkmenistan usually does not export its own wheat to Afghanistan; however, wheat from Kazakhstan and Uzbekistan was transshipped through Turkmenistan to Afghanistan before 2001, when the Uzbek government blocked access to the Friendship Bridge. That rail line functions well and there are reportedly numerous storage facilities in Towraghondi, which the WFP used for its response to the crisis in 2001 and 2002.

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<sup>3</sup> Railway transportation in Central Asia is coordinated by the Council for Rail Transport of CIS States, to plan the use of rail cars towards destination and back and regulate tariffs.

<sup>4</sup> This railway was built by Uzbekistan's national railroad company.

<sup>5</sup> As reported by Schulte (2007), fees collected on the Uzbek side of the bridge for the passage of trucks were high.



**Figure 3. Central Asia's Railroad Network**



Source: FEWS NET.



When Pakistan's wheat production is good, the country has a large export capacity. It traditionally exports to Afghanistan, as well as to the Middle East, East Africa, and East Asia. Wheat flour from Pakistan enters Afghanistan through two border points. The first one is from Quetta to Kandahar through Chaman, in Pakistan, and Spin Boldak, in southern Afghanistan. Wheat flour is traded through this route to Kandahar, where it is then distributed. The second entry point is from Peshawar to Kabul via Torkham, on the Pakistani side, and Jalalabad in Afghanistan. Numerous industrial mills in Pakistan, near the Afghan border, facilitate the flow of flour to Afghanistan.

Pakistan's railway network links the port of Karachi to Peshawar, near Jalalabad, and through another rail line to Chaman. However, none of those lines enters Afghanistan; only roads. There is no direct rail or road link between Pakistan and Tajikistan, although there is a road link through Afghanistan to Gorno-Badakhshan province in Tajikistan.

As explained by traders interviewed in Tajikistan, the logistics of importing wheat rely on the long-term relationships they have with suppliers or traders in Kazakhstan. Some importers even have agents based in Kazakhstan. Schulte (2007), who surveyed traders in Afghanistan, described a similar organization of the import supply chain. Afghan importers have agents based in Uzbekistan, Kazakhstan, and Pakistan, whose role is to search market information and identify supply sources, negotiate transactions, and organize logistics for shipments and monitor transactions. Typically, the process starts with the passing of an order by an importer. Then, transportation is arranged with a private freight forwarder. According to Tajik traders, a contract between a supplier and a buyer may specify that the wheat is delivered free on board (on rail cars) in Kazakhstan. In other cases, the wheat is delivered in Shymkent or in Saryagash, at the Kazakh-Uzbek frontier, under the responsibility of the supplier, while the buyer contracts a freight forwarder to transport it in Tajikistan. Lead times (the time between an order and delivery of the order) vary, but are relatively short, usually a few weeks. Administrative procedures in Tajikistan may lengthen the process. A lead time of 10 days for imports from Uzbekistan to Afghanistan was previously reported.

### 4.3 Transportation Costs

Transportation tariffs collected from private freight companies during the fieldwork suggest that the cost of transporting wheat grain or wheat flour from Kazakhstan to Afghanistan and Tajikistan is relatively high. Table 7 presents price quotes for shipping wheat flour from Kokshetau and Karaganda in northern Kazakhstan to southern Central Asia.

**Table 7. Wheat Transportation Tariffs from Kazakhstan to Southern Central Asia (\$/ton)**

	Karaganda	Kokshetau
<b>Uzbekistan</b>		
Tashkent	22	26
Termez (Uzbek-Afghan border)	50	55
<b>Tajikistan</b>		
Khujand	46	51
Dushanbe	93	98
Kurgan-Tyube	94	99
<b>Iran</b>		
Sarakhs (Turkmen-Iranian border)	71	76
<b>Kyrgyzstan</b>		
Osh	55	60
Bishkek (Alemedin)	21	26

*Source:* Personal communication, Globalink Logistics Group.

The costs of shipping wheat flour from Karaganda and Kokshetau to Tashkent are \$22/ton and \$26/ton, respectively, whereas shipping to Termez costs \$50/ton and \$55/ton, respectively, or an additional \$28/ton and \$29/ton for a distance that is not considerably greater. Similarly, shipping costs for Dushanbe and Kurgan-Tyube via southern Tajikistan are nearly \$100/ton, meaning that the incremental costs of transportation between Tashkent and those destinations are about \$70/ton for what is a relatively shorter distance. The cost of shipping flour to Iran, at the Sarakhs entry point, southeast of Ashgabad, is less than the cost for Dushanbe, and is ostensibly a greater distance. Finally, the shipping cost for Bishkek, Kyrgyzstan, which can be reached from southern Kazakhstan without passing through Uzbekistan is much lower, at \$21/ton and \$26/ton, respectively. These cost differentials suggest that Uzbekistan is somewhat of a “bottleneck” for grain transshipment in the region. These transportation routes, along with cost data are represented in the map in the appendix.

Central Asia’s geography makes it difficult to transport commodities, and its rail infrastructure, despite functioning well, is aging and inadequate in some places. Some traders interviewed mentioned that there are not enough locomotives in Tajikistan<sup>6</sup>; this could be a constraint and a source of excessive market power. In addition, concerns have been raised about the capacity of the railway equipment and operations in Uzbekistan. However, freight forwarders, traders, and government representatives in Tajikistan did not report significant capacity constraints for the transshipment of cargo through Uzbekistan. They did report that transportation had been increasing relatively rapidly in recent years.

Policy barriers to trade might be the main culprit behind the high transportation costs for transshipments through Uzbekistan (see Section V). As reported in the 2005 Central Asia Human Development Report (UNDP, 2005), trade costs are high in Central Asia because of high customs duties, fees, and administrative barriers to trade (stringent customs regulations, opacity of trade laws and regulations, arbitrary enforcement, and corruption), impediments to the movement of persons through visa procedures, and political and civil security issues. In general, reducing trade costs will help the private sector move food commodities more efficiently, stabilize prices and availability, and reinforce food security.

#### **4.4 Trader Behavior and Trade Flows**

In Tajikistan, more than 90 percent of all imported wheat and flour comes from Kazakhstan. There is no wheat imported from Uzbekistan. As one trader put it, “We could more easily buy wheat from the United States than from Uzbekistan.” The same trader community reported that, during Kazakhstan’s 2008 export ban, wheat sourcing from suppliers in Russia and Ukraine increased.

In Afghanistan, data on the origin of wheat and flour imports are difficult to obtain. During the fieldwork for this study, the team conducted a short survey of traders in Mazar-e Sharif and Kabul to get broad estimates of the sources of imported wheat and wheat flour. The results of this survey are presented in columns 1 and 2 of Table 8 (next page). Columns 3, 4, and 5 present the survey results of the trader survey conducted by Shulte in 2007.

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<sup>6</sup> Tajik locomotives are substituted for the Uzbek locomotives of the trains entering Tajikistan.

**Table 8. Countries of Origin for Wheat and Wheat Flour in the Afghan Market**

Origin	1 Kabul <sup>a</sup>	2 Mazar-e Sharif <sup>a</sup>	3 Mazar-e Sharif <sup>b</sup>	4 Herat <sup>b</sup>	5 Afghanistan <sup>c</sup>
Afghanistan	7	14	5	5	N/A
Kazakhstan	28	72	40	20-30	17
Iran	0	0	N/A	5	3
Pakistan	64	2	5	60-70	56
Turkmenistan	0	0	0	0	N/A
Uzbekistan	1	12	50	5	22

*Sources:* Columns 1 and 2 report estimates obtained from interviews with traders in and around Kabul and Mazar-e Sharif in April 2011. These numbers were calculated by averaging the estimates given by traders. Columns 3-5 report information Schulte (2007) collected through a survey of traders and millers and from customs data as point estimates or intervals.

<sup>a</sup> Wheat and wheat flour supplied in the domestic market.

<sup>b</sup> Wheat flour supplied in the domestic market.

<sup>c</sup> Wheat and wheat flour imported.

Traders in Mazar-e Sharif reported that, on average, 14 percent of the wheat flour in the market was domestic. They estimated that nearly three-quarters of the wheat and flour in the market was from Kazakhstan, with only minimal quantities from Pakistan were reaching this part of Afghanistan. These interviews were conducted in April, shortly before the beginning of the harvest, so the market share of Afghan wheat flour might have increased in the months that followed.

By comparison, Schulte (2007) reported that about 50 percent of the flour in Mazar-e Sharif was from Uzbekistan. The authors of this study could not corroborate this statement. There is a strong possibility that a significant portion of this flour is Kazakh wheat flour being re-exported through Uzbekistan. For the current (2011) survey, only 12 percent of wheat flour was found to be from Uzbekistan.<sup>7</sup> In addition, interviews with informants in Uzbekistan and Afghanistan revealed a strong consumer preference for Kazakh wheat flour over Uzbek wheat flour, which has Uzbek wheat flour trading at a considerable discount.

In Kabul by contrast, respondents on average estimated that only slightly more than one-fourth of wheat flour in the market was from Kazakhstan, while approximately two-thirds of it was originating in Pakistan. The figures from this study and those of Schulte (2007) are approximately the same for the market share of Pakistani wheat and wheat flour imported to Kabul.

Data in the table corroborate observations that markets in northern Afghanistan and markets in eastern and southeastern Afghanistan are separated by a physical barrier — the Hindu Kush mountain range — that affects suppliers' transportation costs. As a result, Kazakhstan supplies the northern part of the country, while Pakistan is the primary supplier of the eastern and southern markets. In both markets, there was no wheat reported to be coming in from Turkmenistan or Iran.

The fieldwork for this study did not include the western part of Afghanistan. Reportedly, there, a sparsely populated region, imported grain sources are more mixed, with grain coming from Iran, Pakistan, and Kazakhstan. In Herat, at the time of Schulte's study, most flour in the market came from Pakistan, through Kandahar. The flour from Kazakhstan, coming through Turkmenistan, represents a significant market share. Though the team did not visit this area, flows from Iran are

<sup>7</sup> Because most of the Kazakh flour transits through Uzbekistan, it is probably difficult to track the origin of the product sold on markets in Afghanistan. Also, like in Uzbekistan, some of the flour sold in Afghanistan might be a mix of Kazakh and Uzbek flour (mixed to enrich the protein content). Uzbekistan is a large supplier of wheat to Afghanistan, mostly in the form of flour (Schulte, 2007). Some of the wheat flowing from Uzbekistan to Afghanistan is re-exported, and some is grown in Uzbekistan and exported in Afghanistan. Milling capacity in Uzbekistan appears to be adequate, but its equipment is aging. The quality of wheat flour from Uzbekistan is lower than that of Kazakhstan.

most likely small (given its small surplus), although they could grow if Iran consolidates its self-sufficiency in wheat and not impose export bans.

Cross-trade in wheat across the Uzbek-Afghan, Turkmen-Afghan, and Uzbek-Tajik borders is essentially formal. The Afghan-Pakistani border is much more porous, with a significant quantity of flour smuggled through that border, especially when Pakistan established trade restrictions. With Pakistan's heavily regulated wheat production, marketing, and trade the country appeared to be a stable, responsive source of flour, at least before the 2008-2010 export ban. The informal trade has mitigated the impact of past export restrictions on flour prices and availability in Afghanistan.

## **4.5 Domestic Wheat Marketing Concerns**

In Afghanistan, only a small share of domestically produced wheat is sold in the market; most of it is consumed by farm households, used to pay land rents or repay debts, shared with landlords, or bartered (Schulte, 2007). In addition, demand for local wheat is limited due to the small number of industrial mills. Most of the flour produced in Afghanistan is produced by the many small-scale mills (in rural and urban areas), a relatively inefficient marketing system that produces low-quality flour.

In both Mazar-e Sharif and Herat, Schulte found that the large majority of wholesalers market wheat flour, not wheat. Those selling wheat source it from producers in their regions. In places such as Herat, in the northwest, the marketable surplus of local wheat represents a minor share of the wheat and flour on the market. Other evidence points a similarly small market share for wheat, compared with wheat flour, in urban centers.

Another constraint to the functioning of the wheat markets in Afghanistan is the primitive state of storage infrastructure, especially for wholesalers (bags are typically stored under a shed), associated with the scarcity of large storage facilities (Schulte, 2007). As a consequence, inventories are relatively small and losses during storage are sizeable. Industrial millers have larger storage facilities, but their turnover is typically short. Only a few traders have the financial means and storage capacity to hold inventories for several months and take advantage of price increases during the marketing year.

## V. POLICY ENVIRONMENT

The characteristics of the wheat trade, the importance of trade for food security, and constraints to regional wheat flows all have an impact on Central Asia's wheat markets, as discussed in the previous sections. How wheat markets function also depends on government policies. This section briefly describes these policies, highlighting those that are most significant for food security and early warning.

### 5.1 Marketing and Trade Policies

Central Asian governments intervene to differing degrees in wheat production, markets, and cross-border trade, as summarized in Table 9. In Kazakhstan, the wheat sector is mostly privatized but, because it is a strategic sector of the country's economy, the government wields control over wheat production, marketing, and exports. The government's objective is to keep flour and bread prices stable, and it uses public stocks to do so. In addition, each year the government announces a target for exports, although it is not clear whether this target is enforced. In Kyrgyzstan and Tajikistan, the governments are moderately involved. Afghanistan's government has very limited interventions, with markets operating relatively freely.

In contrast, the governments in Pakistan, Uzbekistan, and Turkmenistan are heavily involved in supporting and regulating wheat markets. (In Turkmenistan, for example, the government exerts a strong level of control over both production and marketing.) Policy interventions can have a significant impact on wheat trade dynamics, as was the case when Pakistan placed a ban on wheat exports in 2008, and Kazakhstan banned exports of wheat grain in the same year). Similarly, policy shifts concerning grain public sector controlled grain imports to Iran can also have a strong impact on regional grain demand.

**Table 9. Overview of Central Asia's Grain Policies**

Policy Summary		Comments
<b>Afghanistan</b>	<ul style="list-style-type: none"> <li>Limited or no intervention in food markets.</li> <li>A "strategic reserve" for grains has been proposed, but there has been limited progress in this area.</li> </ul>	It is not clear whether a reserve (proposed at 200,000-300,000 MT) would have a meaningful impact on food availability and food security in Afghanistan.
<b>Tajikistan</b>	<ul style="list-style-type: none"> <li>No clear government intervention in staple crop markets.</li> <li>Strong interventionist policies on cotton production would affect incentives to staple crop production.</li> </ul>	Allegedly, state orders for cotton production have been eliminated or reduced; however, it is not clear that this policy is being applied at the farm level.
<b>Kyrgyzstan</b>	<ul style="list-style-type: none"> <li>Limited government intervention in food markets.</li> <li>No support structures or taxation policies with respect to staple crop production.</li> </ul>	
<b>Uzbekistan</b>	<ul style="list-style-type: none"> <li>Significant state intervention. State production orders in place; significant state control over procurement and marketing of grain and cotton.</li> <li>State control over products transshipped through Uzbekistan is less clear.</li> <li>Anecdotal evidence suggests government involvement is an impediment to trade.</li> </ul>	This study experienced challenges in obtaining detailed information about policies on grain transportation and trade. As opportunities present themselves, this would be an area for further analysis.

Policy Summary		Comments
<b>Turkmenistan</b>	<ul style="list-style-type: none"> <li>• Strong intervention and control over cereal markets.</li> <li>• Government policies on production targets and state procurement and distribution.</li> </ul>	Turkmenistan's role in grain trade for the region is as a transshipment point for exports of grain from Kazakhstan to Afghanistan.
<b>Kazakhstan</b>	<ul style="list-style-type: none"> <li>• Limited government intervention.</li> <li>• Government involved in price stabilization.</li> <li>• State provides subsidies to farmers for farm inputs (fertilizers, seeds, pesticides, herbicides, and fuel) and periodically intervenes through restrictions on wheat grain or wheat flour exports in the name of domestic food security.</li> <li>• Custom union with Russia since 2010.</li> </ul>	Development of market monitoring for the Kazakhstani grains sector would be an effective near-term step for food security monitoring in the region. Further policy dialogue on agricultural trade policy with the government of Kazakhstan would also be an effective activity.
<b>Pakistan</b>	<ul style="list-style-type: none"> <li>• State intervention in staple markets.</li> <li>• Nature of intervention will change depending on domestic production conditions and other factors.</li> </ul>	Pakistan's interventions on the trade of staple food products have a clear impact on increasing volatility and uncertainty in regional grain markets. Policy dialogue would be useful for efforts toward a more open trade regime.
<b>Iran</b>	<ul style="list-style-type: none"> <li>• Heavy state involvement in staple food commodities. Domestic production oscillates significantly, apparently in response to shifting state policies.</li> <li>• Iran's longer-term grain production strategies are not known.</li> </ul>	Policy shifts and infrastructure development have the potential to significantly alter and impact future food trade dynamics.

### The Importance of Pakistani Wheat for Afghan Food Security

Pakistan's policy environment is worth highlighting, because imports of Pakistani flour are critical for food security in Afghanistan.

In Pakistan, the cereal sector is heavily regulated. The government procures a large share of the domestic wheat crop from farmers at a fixed "procurement" price as a way to support farmers' income and generate sufficient stocks for distribution, and for contingencies. The government fixes a national procurement price and sets quantity targets; this procurement policy is then implemented by provincial governments and a national state enterprise. Wheat grain is sold to millers at fixed "issue" price (the procurement price, plus handling and storage costs) that is generally lower than the market price. Millers then sell wheat flour in the market, accruing rents because of the subsidized price of wheat grain. The government has also supported consumers by controlling retail prices, to maintain the availability and affordability of wheat for poor households.

Trade between provinces is often restricted, to allow provincial governments to fulfill their targets for procurement and stock levels. As a result, wheat prices in Pakistan have been relatively stable. In the past, when the government's stocks were high after a good harvest, it provided subsidies to export the surplus. In years of poor production and high prices (in 2004 and 2008, for example), the Punjab government restricted the movement of wheat to other provinces. Between 2004 and 2007, Pakistan had an embargo on wheat exports. This embargo was temporarily lifted between April and May 2007 to take advantage of high prices and make sales to India.

The instability of grain trade policies in Pakistan is a factor of risk of food insecurity in Afghanistan, although informal trade mitigates this risk. Millers regularly smuggle flour to neighboring countries; for instance, the increase in international prices in 2007 and 2008 created incentives for smuggling wheat to Afghanistan and India.

As Pakistan became self-sufficient in wheat in the early 2000s, domestic prices remained below import-parity prices, except during the poor harvests in 2004 and 2005. In addition, subsidies to mills

and the large number of mills in Pakistan (as a result of subsidies for construction), have resulted in low prices, which benefit poor consumers but are disincentives to wheat production and milling in Afghanistan, where the industry cannot compete with Pakistan's modern millers. The Pakistani government aims to increase wheat production to 30 million tons by 2015.

### Tariffs and Customs

Table 10 presents tariffs, customs, and related trade expenses for importing wheat grain and wheat flour to Afghanistan and Tajikistan. Overall tariff rates do not seem high enough to drive trade out of formal channels, although the 18 percent import tariffs for wheat flour imports to Tajikistan could have a substantial impact on consumer prices.

**Table 10. Import Duties and Tariffs**

	Tajikistan		Afghanistan	
	Wheat Grain	Wheat Flour	Wheat Grain	Wheat Flour
Customs	5%	5%	—	—
Import Tariffs	10%	18%	4%	6%

Figures 4 and 5 (see Section VI) show wheat grain prices trending upward since the middle of 2010. In summer 2010, the Russian Federation's decision to place a ban on wheat trade — in response to a drought, exacerbated by widespread wildfires — reduced wheat production to a degree that the government of the Russian Federation decided to restrict exports. This policy decision had an immediate impact on grain markets worldwide, and may have contributed to upward pressure on wheat price levels in Central Asia, although, there is very little wheat exported from Russia to Central Asian markets. As a major exporter, Kazakhstan holds a significant cost advantage for exports to Central Asia; Russian policy around grain exports should have a relatively muted effect on markets in Central Asia.

This does not appear to be the case, however. Figure 4 shows that wheat prices in northern Kazakhstan have increased steeply in the last six months. Two plausible explanations for this increase are: (1) increasing price levels in global wheat markets; and (2) increasing demand for Kazakh grain exports from previously Russian-supplied markets. The second explanation is likely to have a follow-on impact on price levels in Central Asian markets.

## 5.2 Political Issues

As mentioned in Section 4.3, transportation through Uzbekistan is a constraint in the supply chain. The situation is exacerbated by the recent tensions between Uzbekistan and Tajikistan over construction of the Rogun dam and hydroelectric power plant on the Vakhsh River in southern Tajikistan. Uzbekistan is concerned that the project will reduce the amount of water available downstream for irrigation, and responded by blocking rail cars transporting cement and building materials to Tajikistan for a time in 2010. Such blockages allegedly have not included shipments of food products; the Uzbek government appears to recognize that the social instability resulting from increased food insecurity in Tajikistan would most likely have negative consequences for Uzbekistan. Given the current political environment, issues with the transshipment of food commodities through Uzbekistan might be difficult to address.





## VI. MARKET STRUCTURE, CONDUCT, AND PERFORMANCE

This section assesses the level of integration of wheat markets in Afghanistan and Tajikistan with wheat markets in key surplus areas in the region, northern Kazakhstan and northern Pakistan. The measurement of market integration is important for evaluating the performance of markets, because market integration<sup>8</sup> may be evidence of adequate trade flows from surplus areas to deficit areas.

### 6.1 Market Structure

The supply chains for wheat and wheat flour in Afghanistan and Tajikistan are similar. Because the market share of imported wheat flour, and to a lesser extent of wheat, is large in both countries, importers have an important role in the supply chain. Importers supply imported wheat flour (primarily) and wheat to wholesalers, wheat to domestic industrial mills, and sometimes, wheat flour directly to bakeries. They may also trade local wheat. Industrial millers procure imported wheat directly, in addition to buying local wheat. Importers may be vertically integrated as importers/millers. Wholesalers procure wheat flour from importers and from local industrial mills, imported wheat from importers, and local wheat from local farmers. They then distribute flour to retailers and bakeries, and sometimes sell directly to consumers. They market some wheat as well. Millers sell flour to wholesalers and also to retailers and bakeries. Finally, retailers sell wheat flour and some wheat to consumers, procuring these products from wholesalers and local industrial millers.

Schulte (2007) drew a profile of participants in wheat and flour markets in Mazar-e Sharif and Herat. Herat has a few large import-export companies importing wheat, flour, and other food commodities. Mazar-e Sharif has a larger market, and therefore more import-export companies. They have representatives or partners in other countries in the region and are able to quickly procure wheat to respond to the demand in Afghanistan. In recent years, the number of importers has increased, while some have exited the market and moved to more profitable sectors. In Mazar-e Sharif, the number of wholesalers buying flour from importers is large. In Herat, a larger number of wholesalers source Pakistani flour from merchants in Kandahar. Based on this evidence and the fact that profit margins were reported to be small, Schulte (2007) inferred that wheat markets were relatively competitive. In this respect, there are similarities in the recent evolution of market structures for imported wheat and wheat flour in Afghanistan and Tajikistan.

Markets observed during the 2011 assessment in Tajikistan and Afghanistan are characterized by a relatively large number of traders, although traders deemed to be “large” held less than a 10 percent share of total grain coming into the market. The assessment found little evidence of markets being dominated by a small number of organizations that might result in non-competitive market structures. The higher volatility in the markets during the past several years seems to have resulted in more traders hoping to earn profits from wheat.

In northern Afghanistan and Tajikistan, most traders importing wheat from Kazakhstan are paid up front, in either U.S. dollars or Kazakh Tenge. Most prices are quoted in dollars per ton. By contrast, sales on credit in some instances seem to dominate some Kabul markets for wheat imports from Pakistan, perhaps due to the fact that traders have stronger family or personal ties with business associates in Pakistan than they do with those in Kazakhstan.

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<sup>8</sup> Two markets are integrated when a change in price in one entails a change in price in the same direction in the other, provided that the unit cost of trade between these markets is smaller than the price differential that would prevail in the absence of trade. Market integration is an aspect of market efficiency.

## 6.2 Price Seasonality

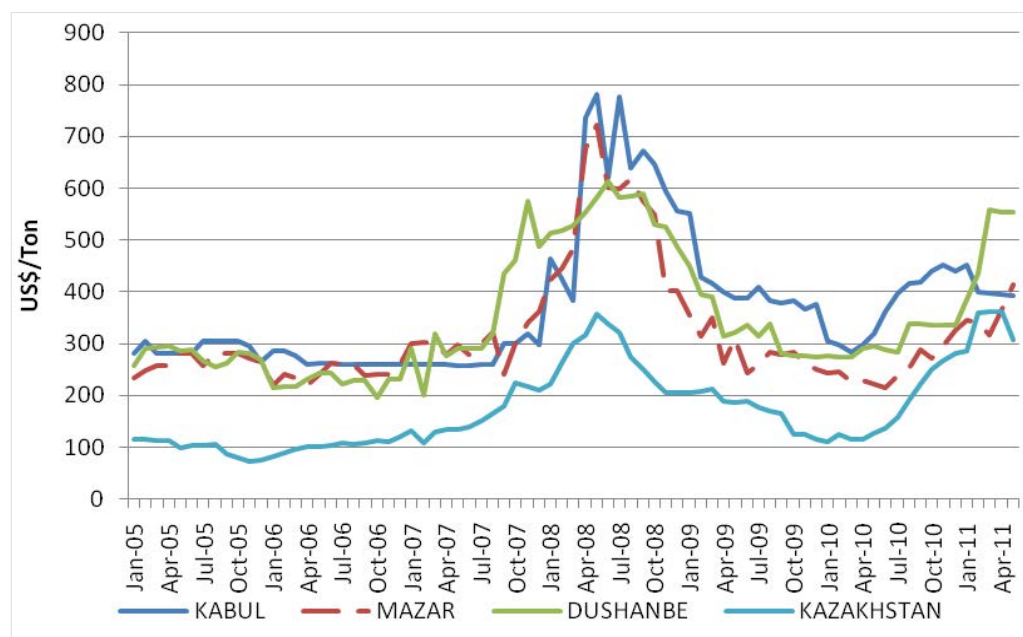
Seasonal factors influence wheat prices in Central Asia, with major spring harvests putting downward pressure on prices. Perhaps more importantly, the desire of households to accumulate enough grain to last through the cold months (December to February) puts upward pressure on prices. However, data on wheat prices between 2005 and 2011 (Figures 4 and 5) do not indicate strong discernable seasonal trends in price levels, particularly in contrast to staple food markets in other regions of the world. Price levels are influenced by seasonal factors, but they are clearly also strongly influenced by factors that do not have seasonal elements.

In export markets, no strong seasonal pattern can be observed. In Kazakhstan, a large storage capacity helps mitigate seasonal variation in supply and demand at the regional level.

## 6.3 Market Integration with the Market of Northern Kazakhstan

Figure 4, below, shows retail wheat grain prices in the markets of Kabul and Mazar-e Sharif, Afghanistan, and Dushanbe, Tajikistan. These markets were selected because they are in major urban centers and important hubs for wheat trade flows. The figure also shows the wholesale price of wheat in Kokshetau, northern Kazakhstan. Table 11 (next page) presents correlation coefficients<sup>9</sup> for these same markets.

**Figure 4. Wheat Grain Prices in Kabul, Mazar-e Sharif, Dushanbe, and Kokshetau (current \$/ton, 2005-2010)**



Source: WFP for prices in Afghanistan and Tajikistan; KazAgroMarketing for prices in Kazakhstan.

Note: Prices in local currencies were converted to U.S. dollars using exchange rates from [www.oanda.com](http://www.oanda.com).

<sup>9</sup> Correlation coefficients measure the degree to which two price series move together. A correlation coefficient of 1 indicates perfect co-movement between two prices; a coefficient of 0 indicates no co-movement at all.

**Table 11. Correlation of Wheat Grain Prices  
among Kabul, Mazar-e Sharif, Dushanbe, and Kokshetau**

	Kabul	Mazar-e Sharif	Dushanbe	Kokshetau
Kabul	1	0.86	0.77	0.73
Mazar-e Sharif	0.86	1	0.83	0.72
Dushanbe	0.77	0.83	1	0.86
Kokshetau	0.73	0.72	0.86	1

Between 2005 and 2010, it appears that the relationship between wheat grain prices in the markets of Kabul, Mazar-e Sharif, Dushanbe, and Kokshetau has been reasonably strong, but not particularly so. The correlation coefficients among these markets range from 0.73 to 0.86, with Dushanbe and Kokshetau and Kabul and Mazar-e Sharif having the strongest correlations. As a comparison, correlation coefficients using data from the International Grains Council for their standard price quotes for U.S., Canadian, and Argentine markets and were found to range between 0.92 and 0.95. By that measure of comparison, the level of integration between these Central Asian markets is rather lower than those in major international grain markets. The relatively high correlation coefficient between Dushanbe and northern Kazakhstan, however, indicates a particularly strong relationship between these markets.

It is also clear from Figure 4 that the 2008 commodity price spike that affected cereal markets around the world also had a strong impact on commodity markets in Central Asia. Though prices were relatively stable between January 2005 and December 2007, ranging from \$200/ton to \$300/ton, they spiked in spring 2008, reaching more than \$700/ton in Kabul. Moreover, it also appears that these relatively high prices lasted considerably longer in Afghanistan and Tajikistan than they did in Kazakhstan. In Kazakhstan, prices began to fall again immediately after the spike in April 2008, and had receded by the end of the summer. (This mirrors what happened in world grain markets). By contrast, prices in Kabul and Dushanbe did not begin to recede until the beginning of 2009. This circumstance would have had a strong impact on consumer prices for wheat flour and bread, and would have contributed to poor food access in both Afghanistan and Tajikistan during that period.

After subsiding for a period, prices have been increasing again since summer 2010, in part because of a very poor harvest in Kazakhstan; production declined more than 40 percent from the previous year. International wheat prices also trended higher during the period, putting further upward pressure on wheat prices in the region. Prices in Dushanbe have increased sharply since the start of 2011, suggesting problems of grain availability in Tajikistan. In the current environment, prices are higher than longer-term averages, but have not reached 2008 levels.

#### **6.4 Marketing Margin Estimate and Import Parity**

Table 12 (next page) lists estimated transportation costs and related expenses for marketing wheat from northern Kazakhstan to Dushanbe, Tajikistan, using field data collected in spring 2011.

**Table 12. Marketing Margin for Wheat Trade from Northern Kazakhstan to Dushanbe**

Item	Cost (in \$/ton)
Wheat price in northern Kazakhstan at elevator	200
Transport to Saryagash and customs duties	35
Wheat price delivered at frontier in Saryagash	235
Transport through Uzbekistan	55
Transit tariff increase (as of April 2011)	8
Wheat price in Kulyagash (Uzbek-Tajik border)	303
Import duties for wheat grain of 10%	20
Customs duties of 5%	10
Transport from Kulyagash to Dushanbe	11
Import parity price in Dushanbe	344
Price differential	144

*Source:* Personal communication, Globalink Logistics Group.

Based on the data available to date, total marketing expenses appear to be relatively close to the price differential of about \$150/ton observed between northern Kazakhstan and Dushanbe. This suggests that price differentials are not excessively high, due to non-competitive market conduct and excess profits accruing to particular market participants in the marketing chain. However, this marketing margin estimate is considerably higher than Schulte's 2007 estimate. More specifically, Schulte's analysis estimated transportation costs from northern Kazakhstan to southern Uzbekistan at \$30-35/ton, in contrast to the current estimate of about \$56/ton for the same route. This difference indicates that transportation costs have been increasing in the region and putting upward pressure on the differential in prices between countries.

**Figure 5. Kokshetau Import Parity Wheat Price Graphed with Dushanbe and Mazar-e Sharif Wheat Prices**

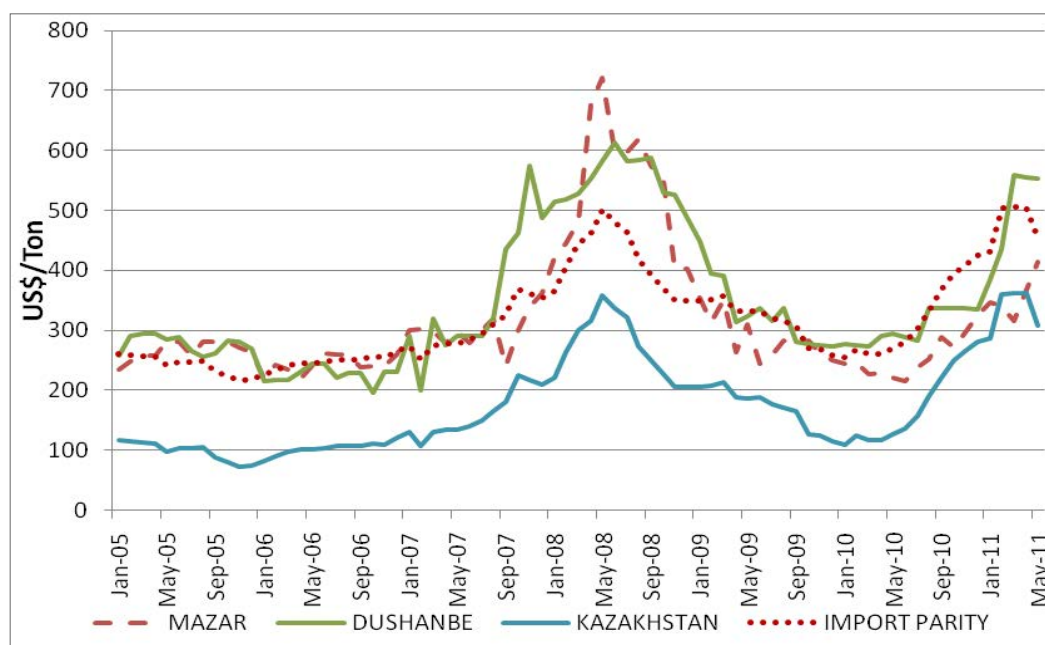


Figure 5, above, uses the marketing expense differential derived in Table 12 and graphs a derived import parity price for grain shipped from Kokshetau to Dushanbe. The derived import parity price tracks the actual price in Dushanbe and the price series in Mazar-e Sharif quite closely, suggesting that, in most instances, differences in prices between these markets are largely a function of

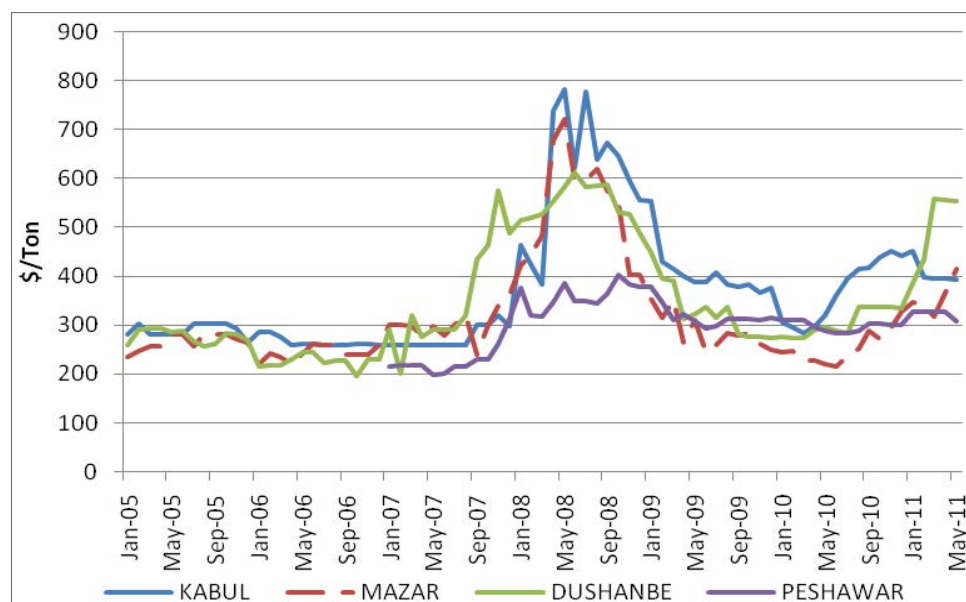
transportation costs and related marketing expenses. Once again, the notable exception to is the 2008 period during which prices in both cities were considerably higher than the derived import parity price, with the difference in prices being the cost or distortion created by trade barriers.

In sum, for the data available in the present analysis, though the level of market integration between these four major wheat markets in the Central Asia region appears to be relatively good, it could be better. It is also clear that all markets in Afghanistan and Tajikistan were severely affected by the commodity price spike of 2008. After this spike, price levels remained higher in these regional markets longer than they did in major commodity markets in the developed world. This likely had an adverse impact on consumers in the region and adversely affected food security. Since this large price spike, it also appears that there has been a considerably greater degree of volatility in these markets, while the differential between Afghan/Tajik and Kazakh wheat grain prices appears to have increased. Finally, all markets are trending upward since the summer of 2010, in line with global market trends, indicating an increasingly problematic and challenging situation for grain markets and food security in the region. In terms of food security monitoring and early warning, this analysis strongly indicates that export prices in northern Kazakhstan and transportation costs have a strong influence on wheat prices in Afghanistan and Tajikistan. As such, these are two important variables for food security monitoring.

## 6.5 Market Integration with the Market of Pakistan

As a corollary exercise, the same price data for Kabul, Mazar-e Sharif, and Dushanbe was compared to with price data for Peshawar Pakistan. For this exercise, data from Pakistan were only available from January 2007 to November 2010. A graph comparing wheat prices and a table with corresponding correlation coefficients are contained in Figure 5 and Table 13, below.

**Figure 6. Wheat Grain Prices in Kabul, Mazar-e Sharif, Dushanbe, and Peshawar (current \$/ton, 2005-2010)**



Source: WFP Afghanistan, Pakistan, and Tajikistan. (

Note: Prices in local currencies were converted to U.S. dollars using exchange rates from [www.oanda.com](http://www.oanda.com).

**Table 13. Correlation of Wheat Grain Prices  
among Kabul, Mazar-e Sharif, Dushanbe, and Peshawar**

	Kabul	Mazar-e Sharif	Dushanbe	Peshawar
Kabul	1	0.86	0.77	0.78
Mazar-e Sharif	0.86	1	0.83	0.55
Dushanbe	0.77	0.83	1	0.57
Peshawar	0.78	0.55	0.57	1

These data indicate that wheat markets in Pakistan are less well-integrated with those in Afghanistan and Tajikistan, compared with Kazakh wheat prices. Correlation coefficients were considerably lower, ranging from 0.79 for Peshawar/Kabul to 0.55 for Peshawar/Mazar-e Sharif.

Wheat prices in Pakistan did not experience the same sharp increase as wheat prices in Afghanistan and Tajikistan in 2008. The government's heavy intervention in internal wheat markets accounts for a more muted increase in wheat prices over the period. Specifically, Pakistan placed a ban on wheat grain and wheat flour exports to Afghanistan in 2007. The ban had a severe impact on the supply of wheat available to Afghanistan, resulting in a large price differential between Pakistani and Afghan markets that surpassed \$300 per ton for much of 2008. This price differential came down substantially in 2009. The price differential between Peshawar and Mazar-e Sharif and Dushanbe is negative for much of 2009 and 2010, suggesting that there was little incentive to export wheat grain to these locations. This corroborates Tajik import data that there is very little wheat grain being imported into Tajikistan from Pakistan.

For both price charts, price levels in Mazar-e Sharif since the spike in 2008 have been lower than those in Kabul, possibly because grain markets in Mazar-e Sharif (in northern Afghanistan) rely more heavily on grain from Kazakhstan. Kabul, which relies more on grain exported from Pakistan, appears to have experienced greater price increases during the period.

These findings are similar to those of Persuad (2009), who also found a significant divergence in Pakistan and Afghan wheat prices between 2008 and 2009. There is relatively clear evidence that trade policies implemented since 2008 have resulted in decreased level of market integration in the region, resulting in higher consumer prices for wheat flour and bread. This circumstance also suggests that increased and sustained efforts toward maintaining open trade flows for food products would have a significant impact on maintaining price stability and improved food security for Afghanistan and Tajikistan. It also suggests that trade policy is also an important variable to monitor in relation to regional trade and food security.

## 6.6 Integration with International Markets

This study also evaluated correlation coefficients between Kazakhstan and Pakistan and major international wheat markets to determine how strong the relationship is between these major supplying markets and international wheat markets. Table 14 (next page) presents the results of this evaluation.



**Table 14. Correlation of Wheat Grain Prices among Kazakhstan, Pakistan, the U.S. Gulf, Canada, and Argentina**

	Kazakhstan (Kokshetau)	Pakistan (Peshawar)
U.S., Gulf	0.87	0.38
Canada, St. Lawrence	0.85	0.31
Argentina, upriver	0.87	0.18

As seen in the table, Kazakhstan's wheat prices are far more integrated with international markets than Pakistan's. In fact, there appears to be no relationship between Pakistani and international wheat prices. By contrast, with the relatively strong relationship between Kazakhstan and international wheat prices, shifts in international wheat prices will be transmitted to Central Asian prices. Given these findings, it will be important to monitor major international wheat markets in terms of how they may affect market dynamics in Central Asia.

## 6.7 Subnational Market Integration in Afghanistan and Tajikistan

As an additional exercise, Table 15 lists correlation coefficients for the major markets evaluated in this study, adding Khujand and Kurgan-Tyube in Tajikistan and Herat and Kandahar in Afghanistan to evaluate the level of market integration in these secondary markets relative to larger markets in each country.

**Table 15. Correlation of Wheat Grain Prices among Markets in Afghanistan and Tajikistan**

	Kabul	Mazar-e Sharif	Herat	Kandahar	Dushanbe	Khujand	Kurgan-Tyube	Kokshetau	Peshawar
Kabul	1								
Mazar-e Sharif	0.89	1							
Herat	0.94	0.95	1						
Kandahar	0.96	0.84	0.92	1					
Dushanbe	0.82	0.87	0.87	0.81	1				
Khujand	0.77	0.73	0.75	0.80	0.89	1			
Kurgan-Tyube	0.72	0.85	0.79	0.67	0.92	0.82	1		
Kokshetau	0.85	0.90	0.87	0.83	0.92	0.86	0.88	1	
Peshawar	0.79	0.55	0.72	0.85	0.57	0.63	0.41	0.54	1

A review of these correlation coefficients indicates that in Tajikistan, the subnational markets in Khujand and Kurgan-Tyube are somewhat less integrated with regional markets than the major market, Dushanbe. Subnational markets in Afghanistan (Kabul, Mazar Sharif, Herat and Kandahar) appear to be relatively well-integrated, but one cannot say definitively that the major market of Kabul is better integrated with regional markets than are subnational markets. Rather, subnational markets in Afghanistan are internally well-integrated, while markets in the northern part of the country show a considerably higher degree of integration with Central Asian markets to the north than they do with Pakistani markets. These results would corroborate earlier survey data and fieldwork, which also indicated such an orientation for markets in this part of the country.

The data in the table also indicate that although there are many strong relationships between different markets in the region, markets in Peshawar and Kokshetau — the region's two most distant locations — show a very weak relationship.





## VII. RECOMMENDATIONS FOR MARKET MONITORING AND EARLY WARNING

Wheat trade is critical for ensuring adequate food availability in the food-deficit countries of Central Asia, particularly for Afghanistan and Tajikistan. This study found that markets function relatively well within the region, although cross-border transportation logistics and associated costs, in addition to uncertainty in the business environment, present constraints. This section summarizes indicators that should be monitored in relation to wheat availability and the performance of regional trade for food security and early warning purposes.

### 7.1 Agro-climatic Monitoring for Wheat Crops in Central Asia

A wheat crop calendar is a basic tool that can serve to determine when to monitor agro-climatic conditions and crops during the growing season and to evaluate actual and expected supply conditions in different parts of Central Asia (see Figure 7). At the regional level, growing conditions in Kazakhstan and in Pakistan are key parameters to monitor. In northern Kazakhstan, spring wheat planting usually starts in late May and ends by mid-June. The use of an indicator of plant vigor such as Normalized Difference Vegetation Index (NDVI) obtained from satellite imagery is most relevant between late May and July, a period of rapid growth of the wheat crop in a normal year. In northern Kazakhstan, flowering takes place in July, which is typically when temperatures are highest and the wheat crop is most vulnerable to heat stress. In northern Afghanistan and southern Tajikistan, early-warning practitioners should pay close attention to precipitation levels as early as October, when wheat planting begins. Then, while the wheat crop is in dormancy in the winter months, it is crucial to monitor accumulated snowfall, which later determines the availability of water for irrigation. NDVI and temperature indicators are useful in March through May. There is also some spring wheat in Afghanistan and Tajikistan, which is planted in the early spring when moisture is adequate.

**Figure 7. Calendar of Wheat Crops in Central Asia**

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Afghanistan					Harvest					Planting		
Kazakhstan					Planting			Harvest				
Pakistan			Harvest								Planting	
Tajikistan					Harvest					Planting		

Assessments of the wheat crop in the period immediately preceding the harvests are critical components of food-security monitoring systems. Their main purpose is to assess the future availability of wheat at the national and local levels. At the local level, crop assessments help early-warning practitioners appraise the quantity and diversity of food crops to which poor rural households will have access through their own production in the months following the harvest. Crop assessments can also apply to secondary crops, such as pulses and potatoes. In Afghanistan, the Ministry of Agriculture, Irrigation and Livestock (MAIL) develops crop production estimates, with assistance from FAO. Typically, FEWS NET, WFP, and other organizations undertake a pre-harvest crop assessment in April to assess early the size of the harvest. This differs from mission fulfilled by MAIL, which does not generate production estimates. In Tajikistan, the crop assessment is also led by the Ministry of Agriculture, with occasional support from international organizations.

Crop assessments also provide opportunities to interview stakeholders and key informants and to collect information on food commodity markets and labor markets. Grain traders in the vicinity of production areas can be helpful in appraising the magnitude of stocks at the end of the marketing year, understanding current procurement and marketing strategies, and eliciting their expectations about market conditions in the months following the harvest.

At the regional level, a key threat to food security is the possibility of widespread production shortfalls. As described above, output tends to be correlated among the countries of southern Central Asia and Iran. In 2008, for instance, production was low in most of those countries. As a consequence, prices in the region remained high well after mid-2008, when international prices had receded. In addition to Kazakhstan and Pakistan, food security analysts should consider Iran and Uzbekistan in their assessment of the region's wheat production. When these countries experience production shortfalls, they (especially Iran) can absorb significant shares of Kazakhstan's exportable supplies.

## **7.2 Regional Market Monitoring**

Domestic markets in Kazakhstan and Pakistan, as the major suppliers of wheat and flour to Tajikistan and Afghanistan, must be monitored closely from the standpoint of availability and prices. In Kazakhstan, the exportable surplus is concentrated in the northern oblasts, and it is most effective to monitor wheat prices there, for instance, in Akmola.<sup>10</sup> Wheat prices are collected by KazAgroMarketing, a public company that is part of KazAgro, the state-owned agro-complex. Price data are available commercially. In Pakistan, where most of the wheat is produced in the Punjab, the markets in Lahore and Faisalabad are the most appropriate to monitor. It is equally important to monitor pricing policies in Pakistan at the farm gate level and at the mill level. It is also important to monitor the market in Peshawar, which is a base for wheat exports to eastern and southeastern Afghanistan.

At the level of retail markets in urban centers in Afghanistan and Tajikistan, monitoring the price of flour might be more important than monitoring the price of wheat grain, whose market share is generally small. The price of wheat grain is a more important indicator in rural areas, where imported flour prices can be significantly higher. Price information collected at the retail level should be complemented with wholesale price information. Finally, because there is evidence that wheat prices in Kazakhstan are linked to international markets, price movements in international wheat markets, particularly Ukraine, Europe, Australia, and the United States, should be monitored. Their impact on prices in Kazakhstan, and eventually on retail prices in Afghanistan and Pakistan, should be tracked as well.

This study focused on trade and spatial price relationships. The authors calculated an import parity price for wheat shipped from northern Kazakhstan to Dushanbe, Tajikistan. This analytical tool is useful for evaluating whether markets and trading systems function efficiently, and can be used to evaluate whether there are trade barriers or structural aspects of markets that create inefficiencies in the marketing system. To do such an analysis on a regular basis, food security analysts should maintain a database of prices and exchange rates in the markets mentioned above, along with data on transportation costs, transit fees, import tariffs, taxes, and customary informal payments (such as bribes). These data would allow analysts to calculate import parity prices for key deficit areas in Afghanistan and Tajikistan and assess the level of integration of markets in real time

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<sup>10</sup> KazAgroMarketing confirmed that the price in the Akmola oblast is indicative of the price of wheat exported to Uzbekistan, Tajikistan, and Afghanistan.

Wheat stocks are key determinants of price levels, price volatility, and government policies on trade. Although this study has not focused on storage patterns, storage capacity, or stock monitoring in the region, this area warrants greater attention, whether for household stocks in rural areas in Afghanistan and Tajikistan, traders' stocks, or government-owned stocks. The government of Kazakhstan recently upgraded its grain stocks monitoring system. Information on stocks is publicly available through [www.stat.kz](http://www.stat.kz), and the website is updated on a monthly basis.

In West Africa, early-warning systems conduct market assessments in the period immediately following the harvest to assess the functioning of markets, particularly the replenishment of cereal stocks and flows of cereals from surplus areas to deficit areas. Given a pattern of production in a given year and the preceding years and current behavior among farm households and traders, a market assessment allows food security analysts to understand and anticipate market participants' behavior during the marketing year. One might argue that this approach is less important in Afghanistan and Tajikistan, because local wheat is largely consumed where it is grown, and major deficit areas are largely supplied by wheat and flour imported from Kazakhstan and Pakistan. Yet a comprehensive assessment of markets from a regional perspective conducted soon after the harvests in Afghanistan and Tajikistan could help better project food security conditions during the marketing year. Alternatively, market assessments could be done after the Kazakh harvest, a period that coincides with wheat stockpiling in Afghanistan and Tajikistan before the winter. Such an assessment would look at food balance sheets in the region, transport and logistics issues along the main trade routes, trader behavior and trade flows, policy issues, and price relationships.

In Central Asia, there is still a paucity of timely information on crop conditions and agricultural markets at a regional level. The regional organizations that have emerged in Africa (for instance, the East Africa Grain Council and the Food and Agricultural Market Information System of the Common Market for Eastern and Southern Africa) provide good examples of systems that international donors and food security-oriented donors' projects could support. This would facilitate the collection and dissemination of high-quality information for an audience of market participants, governments, and food security analysts.

As mentioned in Schulte's report (2007), where the national market information system is inadequate or nonexistent, food security analysts should develop relationships with market informants in the country and in the region. These informants might be found among stakeholders in the food marketing system in Afghanistan, Tajikistan, and other key countries of the region, including in provincial governments and among traders, millers, market managers/supervisors, transporters, and NGOs.

### **7.3 Trade Policy Monitoring**

This study found that past export bans in Pakistan, Kazakhstan, and Russia all had significant adverse impacts on food prices in Afghanistan and Tajikistan. Of the three countries, Pakistan may have the most changing trade policy stance. When prices are too high or availability is deemed too low, policy makers quickly impose export restrictions to maintain domestic prices at an acceptable level. Pakistan's 2007-2010 export ban resulted in limited imports to Afghanistan and made informally imported Pakistani wheat flour more expensive. Potential changes in trade policy in Pakistan must be monitored consistently. In this context, a significant share of cross-border trade into Afghanistan is informal. The monitoring of formal and informal flows of wheat flour into Afghanistan would add significant value to the market monitoring system in place.

Kazakhstan is less prone to banning wheat exports given its large surplus, although it has been willing to do so in some circumstances. The Kazakh government appears to be less involved in wheat

marketing, although it usually set a target for wheat exports. This target can be a useful indicator of the availability of exportable wheat supplies.

## **7.4 Concluding Remarks**

This study was undertaken in an effort to establish a better understanding of wheat markets in the Central and South Asia region. It has tried to detail the production and trade dynamics that affect wheat availability and food security for countries of the region. In addition, the study has attempted to highlight the policy issues and constraints that present challenges to the effective operation of the wheat trading system. For the work accomplished thus far, it is hoped that the information-compiled will serve as a resource for developing an enhanced understanding of grain market dynamics in Central Asia and South Asia that will result in improved food security monitoring for the region.

## REFERENCES

- Ayra, Aziz, “Afghanistan: Market Profile for Emergency Food Security Assessments,” GIEWS/FAO, 2005.
- Beuter, Thomas, “Tajikistan Market Profile,” WFP, 2007.
- Chabot, Philippe and Dorosh, Paul, “Wheat Markets, Food Aid and Food Security in Afghanistan,” *Food Policy*, 2007.
- Dorosh, Paul and Salam, Abdul, “Wheat Markets and Price Stabilisation in Pakistan: An Analysis of Policy Options,” Pakistan Institute of Development Economics, 2006.
- Dorosh, Paul; Malik, Sohail; and Krausova, Marika, “Rehabilitating Agriculture and Promoting Food Security following the 2010 Pakistan Floods: Insights from the South Asian Experience,” International Food Policy Research Institute, 2010.
- FAO, “Crop and Food Security Assessment Mission to Tajikistan,” 2009.
- FEWS NET, “The Contribution of Regional Markets to Afghan Wheat Supplies,” May 2007.
- FEWS NET, “Livelihoods Zoning ‘Plus’ Activity in Tajikistan,” 2010.
- Khan, Memoona Rauf, ‘Pakistan Wheat Markets and Food Security Desk Review’, FEWS NET, 2007.
- Khan, Shamsher, “Pakistan Wheat Subsector and Afghan Food Security,” FEWS NET, 2007.
- Liefert, William; Liefert, Olga; Vocke, Gary; and Allen, Ed, “Former Soviet Union Region to Play Larger Role in Meeting World Wheat Needs,” USDA/ERS, 2010.
- National Statistical Committee of the Kyrgyz Republic, “Food Security and Poverty Information Bulletin of the Kyrgyz Republic,” Bishkek, 2010.
- Patterson, Anna, “Labor Markets, Livelihood Strategies, and Food Security in Afghanistan,” FEWS NET, May 2007.
- Persuad, Suresh, “Price Volatility in Afghanistan’s Wheat Market,” USDA/ERS, 2010.
- Quartermaine Bastin, Geoffrey; Sarwar, Sadia; and Asadullah Kazmi, Zain, “Wheat flour industry,” Discussion Paper, Competitiveness Support Fund, Islamabad, 2008.
- Robinson, Ian, “Food Markets and Food Insecurity in Tajikistan, Uzbekistan, Kyrgyzstan and Kazakhstan,” WFP, 2008.
- Schulte, Bruce, “Northern Wheat Trader Survey and Afghan Food Security,” FEWS NET, 2007.
- WFP, “Tajikistan Monthly Risk Monitoring and Warning Report,” selected issues.
- WFP, Tajikistan Logistics Capacity Assessment, 2006.
- World Bank, “Enhancing Food Security in Afghanistan: Private Markets and Public Policy Options,” Agriculture and Rural Development South Asia Region Discussion Paper, 2005.
- World Bank, “Tajikistan Trade Diagnostic Study,” Europe and Central Asia Region Report No. 32603-TJ, 2005.





## APPENDIX. MAP OF WHEAT TRANSPORTATION TARIFFS IN CENTRAL ASIA

