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Food Security: Challenges and Opportunities for Eastern Europe and Central Asia

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INTRODUCTION

Population growth, accelerated urbanization, and higher incomes are expected to increase food demand by about 70 percent by 2050—involving 1 billion extra tons of cereals and 200 million extra tons of meat (FAO 2009a). The region of Eastern Europe and Central Asia includes major food producing countries, particularly Russia, Ukraine, and Kazakhstan. These countries produce 15 percent of the world's wheat and export almost as much as the USA and the EU. In this regard, the region could potentially play an important role in meeting the challenge of global food security. Yet, it has been underperforming. In contrast to most other regions in the world, yields in Eastern Europe and Central Asia have stagnated since the 1970s. Some estimates suggest that average yields could be increased by 75 percent and that an additional 13 million hectares (ha) of land could be brought into production (FAO 2008).

The increase in food prices in recent years should be good news, stimulating more interest in achieving potential yield increases. It offers both opportunities and threats for the countries in the region and their population. On the average, food exporting countries (Russia, Ukraine, and Kazakhstan) are expected to gain from food

price increases, whereas net importing countries (most Central Asian countries) may lose. Within countries, an increase in food prices tends to hurt (urban) food consumers and to benefit (rural) producers. In reality, however, the effects may be more complex. The size of benefits and losses depend on such factors as local policies, institutions, and the organization of the food supply chain (Swinnen 2010). For example, in the presence of market imperfections, farmers may have difficulty accessing the market or may receive a lower price than the one observed in the market. Moreover, not all households within the rural areas may benefit from increasing food prices. In some countries, very small household farms do not have enough land to cultivate in order to produce surplus, and are, therefore, net food buyers (Alam et al. 2005).

Still, since rural poverty is significantly higher than urban poverty in Eastern Europe and Central Asia (Macours and Swinnen 2008), high food prices may have important consequences to poverty and food security in the region. A key issue is how policymakers can make sure that rural households benefit from high food prices.

This paper first analyzes how food security in Eastern Europe and Central Asia has evolved and then discusses the potential role that the

region, in general, and the main grain producing countries, in particular, can play in increasing global food production.

FOOD SECURITY IN THE REGION

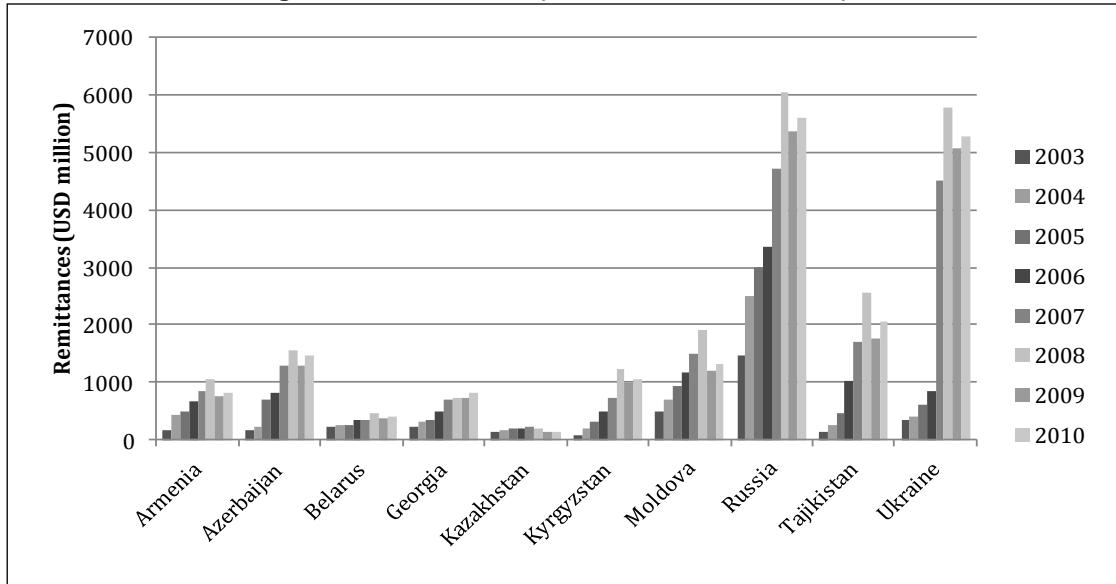
Before the Food Crisis

Food security is strongly correlated with poverty.¹ Since the beginning of the 2000s, all countries in Eastern Europe and Central Asia have experienced economic growth. In addition to the growth's direct effects, inhabitants of the region's poorer countries have benefited indirectly from economic growth in the EU and the richer countries in the region, where many of them migrated to work, resulting in a substantial increase in remittances (Swinnen and Van Herck 2009) (Figure 1).

Despite this positive evolution, however, some countries still have high poverty rates. For example, 77 percent of Uzbekistan's population have incomes lower than 2 US Dollars (USD) per day; Tajikistan, 51 percent; and Georgia, 32 percent (Figure 2). As in most of the rest of the world, there are large disparities within countries, especially in the rural areas where there is a disproportionate share of poor households (Macours and Swinnen 2008). For example, Kyrgyzstan's poverty rate is 40 percent among the rural population but only 24 percent among the urban population (World Bank 2011a).

Like poverty, undernourishment in the region had decreased substantially in the past decade (Table 1). For example, undernourishment was highly prevalent in Azerbaijan (27%) and Georgia (19%) in the

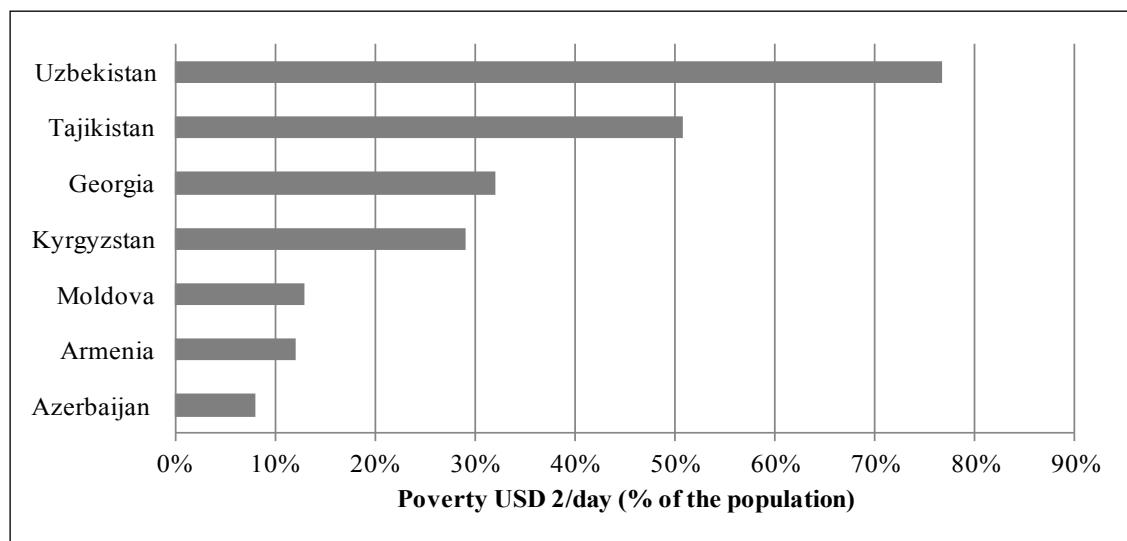
Figure 1. Remittances (USD million, 2003–2010)



Source: World Bank

1 In its State of Food Insecurity in 2001, FAO defines food security as "a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO 2002). This definition is built on four pillars: access, utilization, availability, and stability.

Figure 2. Poverty in Eastern Europe and Central Asia
(% of population with less than USD 2/day PPP)



Source: World Development Indicators, (latest year for which data were available)

Table 1. Changes in the prevalence of undernourishment (% of the population)

	1997	2002	2007	Change 1997–2007
Armenia	36	28	22	-39
Azerbaijan	27	11	5	-81
Georgia	19	12	5	-74
Kyrgyzstan	13	17	10	-23
Moldova	10	10	6	-40
Tajikistan	42	46	30	-29
Turkmenistan	9	9	6	-33
Uzbekistan	5	19	11	120

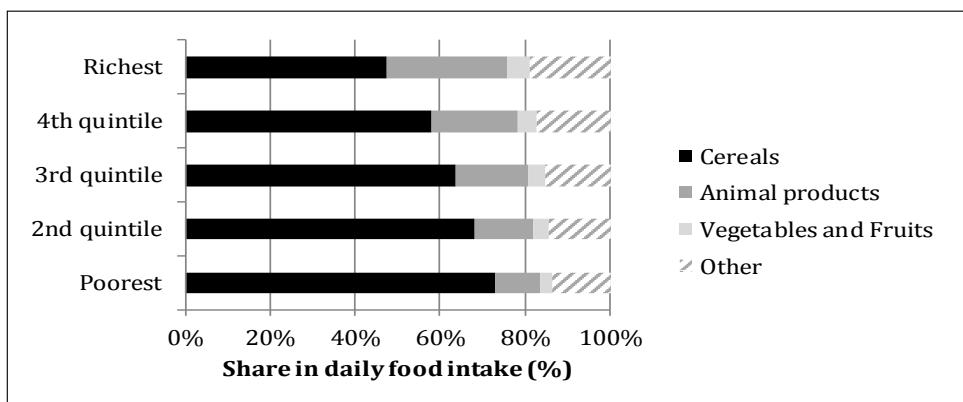
Source: World Development Indicators 2011

mid-1990s, but it almost vanished by 2007. In countries with even higher undernourishment, such as Armenia (36%) and Tajikistan (42%), the situation had improved significantly, although the level had remained high at more than 20 percent of the population in 2007.

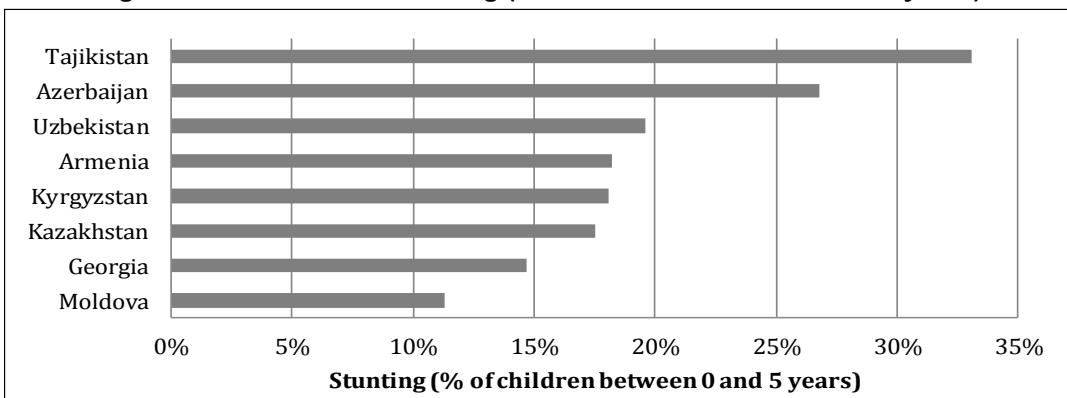
Diets in Azerbaijan, Tajikistan, Turkmenistan, and Uzbekistan are monotonous: energy is mostly obtained from starch and cereals, and animal and livestock products represent only a small proportion of the diet. The poorest income groups have an especially

monotonous diet. For example, in Uzbekistan, the poorest income group gets 73 percent of its daily calorie intake from cereals and only 10 percent from animal products (dairy and meat). The richest income group has a more balanced diet: 48 percent of its daily calorie intake is from cereals and 29 percent from animal products (Figure 3).

Undernourishment and poor diet result in poor health, which is reflected in three commonly used health indicators: stunting (Figure 4), wasting (Figure 5), and vitamin A

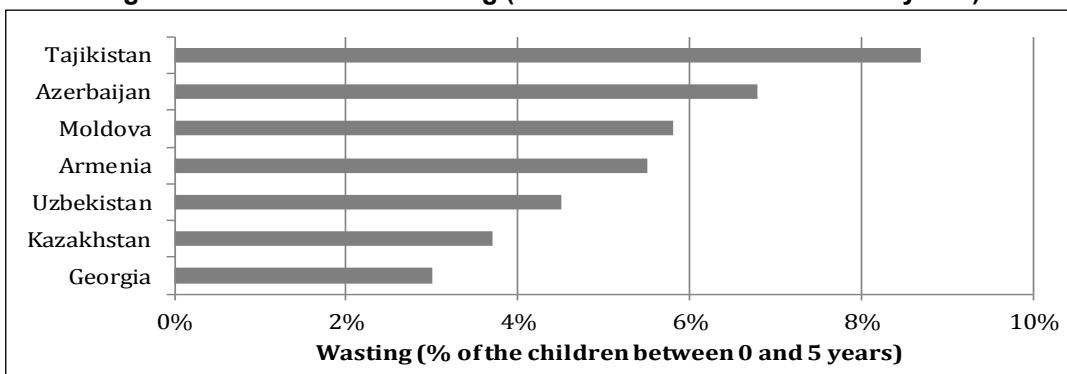
Figure 3. Source of daily calorie intake by income groups in Uzbekistan

Source: Musaev, Yakhshilikov, and Yusupov 2010

Figure 4. Prevalence of stunting (% of children between 0 and 5 years)

Source: World Development Indicators 2011

Note: Data are from the latest year available: 2005 for Armenia, Georgia, Moldova, and Tajikistan; 2006 for Azerbaijan, Kazakhstan, Kyrgyzstan, and Uzbekistan.

Figure 5. Prevalence of wasting (% of children between 0 and 5 years)

Source: World Development Indicators 2011

Note: Data are from the latest year available: 2005 for Armenia, Georgia, Moldova, and Tajikistan; 2006 for Azerbaijan, Kazakhstan, and Uzbekistan.

deficiency (Figure 6). Children in Tajikistan and Uzbekistan were observed to have the worst scores for all three indicators. Particularly in Tajikistan, 33 percent of the children were stunted, 9 percent had weight loss due to undernourishment, and 13 percent had insufficient vitamin A in their diet in 2010.

Impact of the Food and Financial Crises

The combination of increasing food prices and the global financial crises in 2008 exposed Eastern Europe and Central Asia to adverse economic and social impacts. The economies in the region were forecasted to experience the deepest contraction among all emerging and developing economies (European Bank for Reconstruction and Development [EBRD] 2009). The impact in 2008 and 2009 was indeed severe: economic growth slowed down and real gross domestic product (GDP) decreased in all countries in the region in 2009. However, in 2010, real GDP growth was already strongly positive.

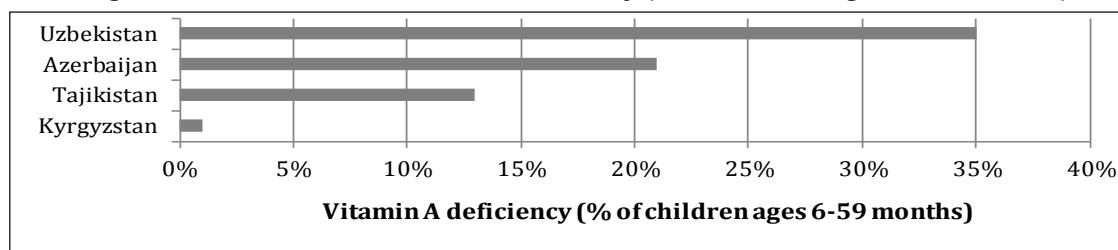
Around the same time of the fall in real GDP, food prices increased. The impact is likely to be different between food exporters and importers as well as among farmers, farm workers, and consumers. Interestingly, when the evolution of real wages, food prices, and retail prices in

different countries are considered, wages have actually increased substantially between mid-2000s and 2009. Moreover, the increase in real wages exceeded the increase in food prices and retail prices in all countries—even during 2008 and 2009 (Figure 7). These data indicate—somewhat remarkably—that the slowdown in GDP in 2008-2009 was not reflected in wages, and that any negative impact of the food price increase on food security may have been offset by wage increases.

This suggests that rural households may have benefited from high food prices whereas those employed in formal jobs may have been shielded by wage inflation. Possibly the most vulnerable population were households without formal wage income, who are strongly dependent on falling remittances, and net consumers of food. Households in Armenia and Tajikistan, for example, were reported to have been strongly affected by declining remittances (World Food Programme 2009, 2010).

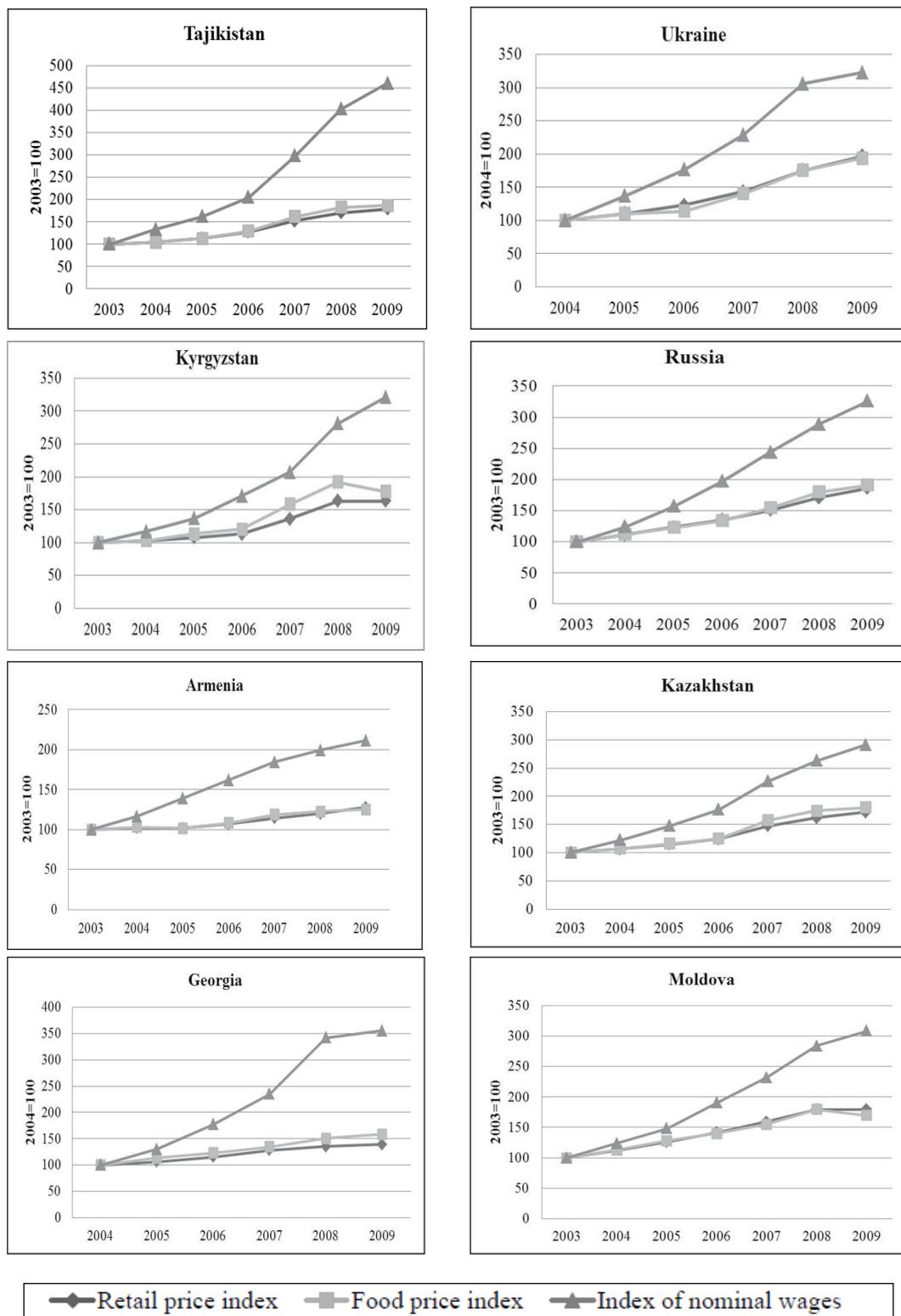
These hypotheses are consistent with the fact that official data on undernourishment have been rather stable. Recent data show that undernourishment is high in Tajikistan and moderately high in Armenia. It is moderately low in Turkmenistan, Uzbekistan, and Kyrgyzstan and very low in Azerbaijan, Georgia, and Kazakhstan.

Figure 6. Prevalence of vitamin A deficiency (% of children ages 6–59 months)



Source: World Development Indicators 2011

Note: Data are from the latest year available: 2005 for Armenia, Georgia, Moldova, and Tajikistan; 2006 for Azerbaijan, Kazakhstan, and Uzbekistan.

Figure 7. Real increase in wages, food prices, and retail prices (index)

Source: Sedik 2011

Responses to the Food Crisis

The global food crisis triggered several policy actions in almost all countries in Eastern Europe and Central Asia, aimed at ensuring domestic food security. In general, exporting countries banned, taxed, or restricted food exports; and importing countries reduced import tariffs. A survey by the Food and Agriculture Organization (FAO) of the United Nations found that 33 percent of the surveyed countries in the region imposed export restrictions in some form, and the same number of countries reduced import taxes (FAO 2009b).

All major grain exporters in the region (Russia, Ukraine, and Kazakhstan) implemented export restrictions to secure domestic grain supply and protect local consumers from increasing food prices (Table 2). However, studies on Ukraine (Von Cramon and Raiser 2006) and Russia (Jones and Kwiecinski 2010) found that the impact on domestic consumers has been limited, whereas domestic grain producers and exporters suffered large losses. Given that the rural population, particularly the poor, is involved in farm activities, the export restrictions may increase poverty instead of decreasing it as rural producers are not able

Table 2. Export restrictions in the main grain exporting countries in the region

		Ukraine			Russia					Kazakhstan	
		Barley	Corn	Wheat	Barley	Corn	Wheat	Milling Wheat	Flour	Oilseeds, Wheat	Buckwheat
2007	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
2008	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
2009	1-12										
2010	1-8										
	9										
	10										
	11										
	12										

Source: Sedik 2011

Notes: Black = prohibitive taxes; Dark grey = export ban; Medium grey = export quotas; Light grey = export taxes

to benefit from high output prices. In addition, export restrictions affect several of the poorer countries, which rely heavily on grain imports from Russia, Ukraine, or Kazakhstan. For example, Georgia and Armenia imported more than half of the cereals they consumed in 2000–2008 almost exclusively from Russia, Ukraine, and Kazakhstan.

Grain importing countries in the region reduced constraints to facilitate grain imports. For example, in May 2008 the Azerbaijan government removed the customs on grain and rice imports. In Moldova, the government removed the import duty (5%) on wheat and the 20 percent value-added tax (VAT) on imported grains (FAO 2011).

Finally, governments throughout the region also intervened in other ways to minimize food price inflation. Ukraine's government, for instance, imposed limits on flour price markups and retail price limits on the bread price (Organisation for Economic Cooperation and Development [OECD] 2009). In 2008, the Russian government implemented price controls on various food products, such as bread, milk, sunflower oil, and eggs (OECD 2009). In Kyrgyzstan, the government sold bread and other primary products at lower prices to the poor (Suiumbaeva 2009). In Georgia, the Tbilisi municipality opened groceries that give vulnerable households a 20 percent discount on basic products (World Bank 2011b). The Uzbekistan government has been keeping prices low by selling more flour from state resources (World Bank 2011b).

AGRICULTURAL PRODUCTION AND TRADE POTENTIAL

Recent Developments

In the first years of Eastern Europe's and Central Asia's transition to a market-oriented economy in the 1990s, gross agricultural output

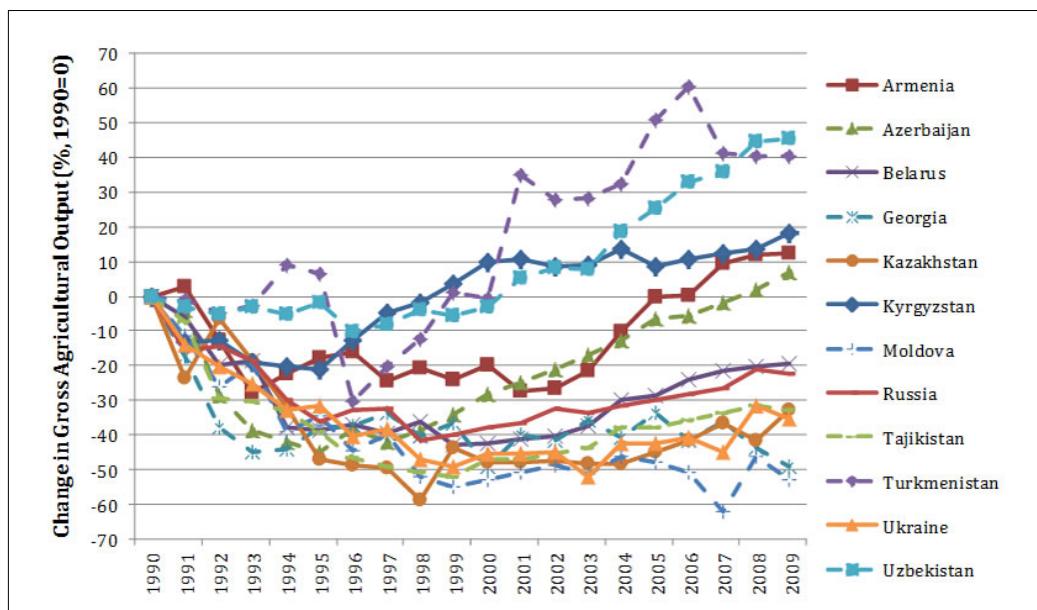
strongly decreased in all the countries of the two regions (Figure 8). The decline was limited in the poorer Central Asian countries (e.g., Kyrgyzstan, Turkmenistan, and Uzbekistan), whereas it was more than 40 percent in Eastern Europe. Agricultural output stabilized by the end of the 1990s. In some Central Asian countries (e.g., Kyrgyzstan and Uzbekistan), it started to increase such that by the mid-2000s, it exceeded the pre-reform level. However, in other countries, such as in Eastern Europe, the recovery has been slow.

The rate of recovery has been different for various commodities, particularly cereals. After decreasing in the first years of transition, wheat production started to increase again. Currently, the region is one of the most important wheat producers in the world, producing 108 million tons of wheat (16% of the world's wheat production) in 2007–2009 (Figure 9, left panel).

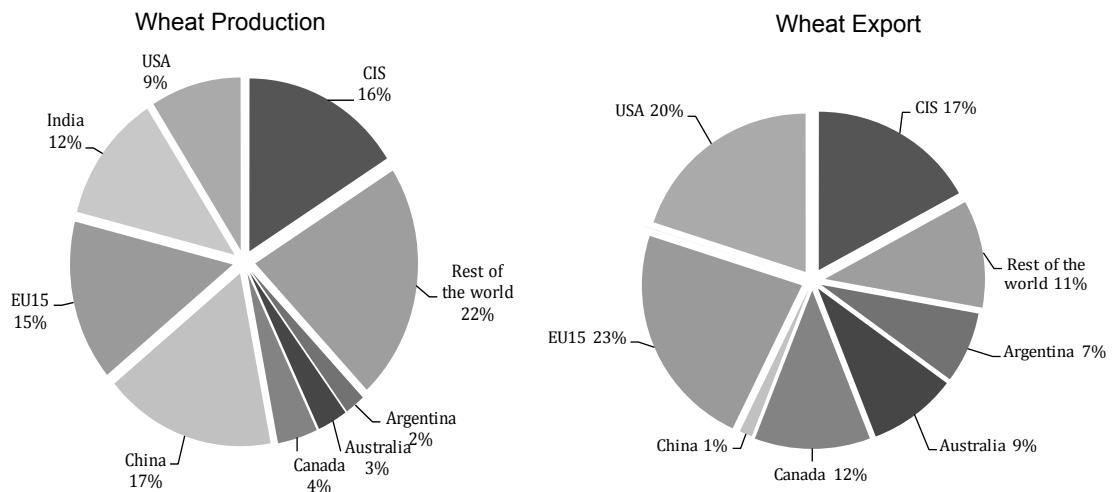
In terms of trade, the region is a major player in the international wheat market, accounting for 17 percent of the global wheat exports, which is comparable to the share of the EU15 (23%) and the USA (20%) (Figure 9, right panel). The region's major wheat exporting countries are Kazakhstan, Russia, and Ukraine. However, although the exports of these three countries have increased substantially compared with levels in the beginning of the 1990s (driven by lower demand for animal feed), they are still extremely volatile compared with those of the other major grain exporting countries, such as the EU or USA. This volatility is an important constraint to the region's capacity to contribute to global food security (Figure 10).

Future Potential

The FAO, EBRD, and the Institute for Agricultural Market Studies (IKAR) have estimated that cereal production in Kazakhstan, Russia, and Ukraine could increase up to 230 million tons (or an increase of 80% compared

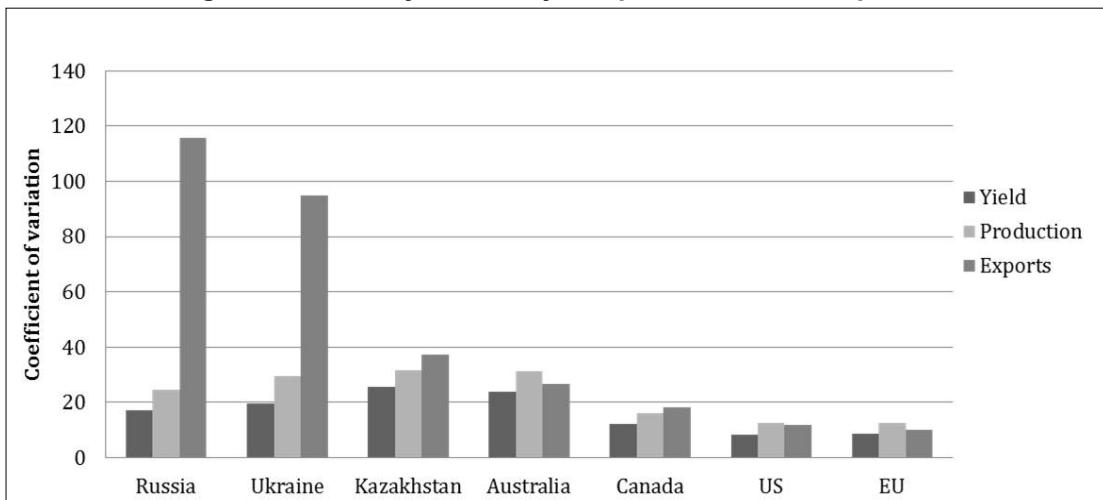
Figure 8. Changes in gross agricultural output, 1990–2009 (% change)

Source: Author's calculations based on National Statistics and FAOSTAT

Figure 9. World wheat production and export (average over the period 2007–2009)

Source: FAOSTAT

Figure 10. Volatility of wheat yield, production, and exports



Source: Sedik 2011

with the 2004–2006 production level) (Table 3). This corresponds to a total increase of 102 million tons: 15 million tons in Kazakhstan (107%), 49 million tons in Russia (64%), and 38 million tons in Ukraine (103%). This increase comes partly from increased land use and from increased land productivity.

Since the region's transition from a centrally planned economy to a market-oriented economy, agricultural land use has substantially decreased in most countries. In the major grain producing countries of Russia, Ukraine, and Kazakhstan, arable land use decreased by 35 percent, 8 percent, and 3 percent, respectively (FAOSTAT 2011). Overall, this suggests that there may be a scope to increase arable land use in the region, particularly if agricultural prices remain high. The FAO, EBRD, and IKAR estimate that in Russia, Ukraine, and Kazakhstan alone, approximately 11–13 million of abandoned land was brought back to production (FAO/EBRD and IKAR estimates from FAO 2008).

In the first years of transition, yields of the major arable lands in the region decreased strongly in all countries. For example, between

1990 and 1995, grain yields in Kazakhstan decreased by more than 10 percent per year (Figure 11). By the second half of the 1990s, grain yields reached their lowest in the major grain producing countries. Yields have rebounded in the 2000s, although wheat yield levels in the region's main producing countries are still substantially below than those in other major grain producing countries in the world that have similar climatic conditions (Figure 12).

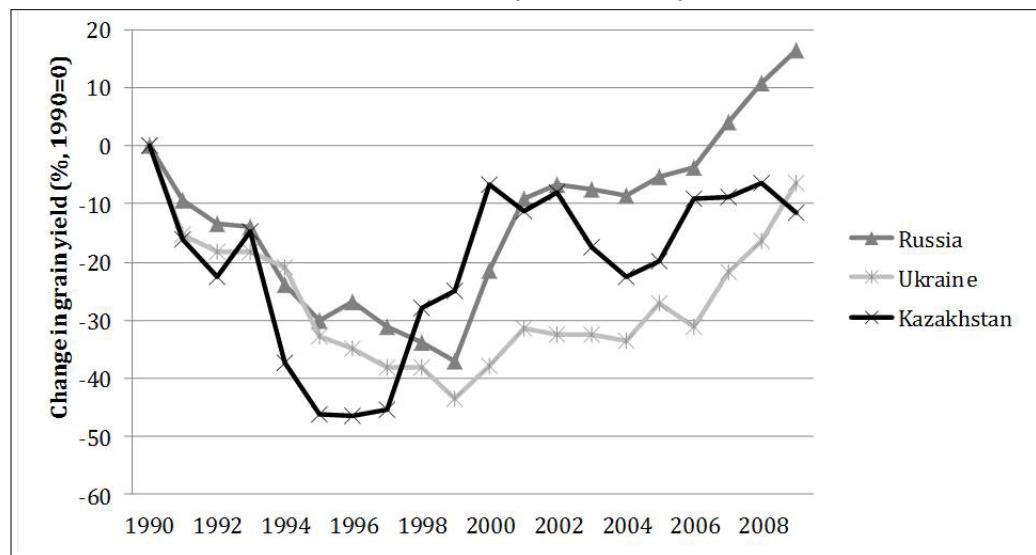
Climate change is likely to affect yields in the future. Overall, annual precipitation in the region is expected to increase by 29.9 mm (7.5%) to 52.9 mm (13.3%) by 2050 (Nelson et al. 2010). However, variations among countries are expected: water availability is likely to increase substantially in the northern region (Russia and North Kazakhstan) and to decrease in the southern countries (e.g., Turkmenistan, Uzbekistan, Kyrgyzstan, and Tajikistan). The region's average temperature is expected to increase by 2.20°C to 3.83°C by 2050; maximum temperature could increase by 1.9°C to 3.52°C. The combination of changes in water availability and average temperature is expected

Table 3. Estimated maximum cereals potential (IKAR, EBRD, and FAO)

	Maximal Potential	Difference between maximal potential and 2004–2006	Change (%)
Area Harvested (million ha)	82.00	13.00	18
Kazakhstan	19.00	4.00	27
Russia	47.00	6.00	15
Ukraine	17.00	3.00	21
Yields (ton/ha)	2.80	0.96	52
Kazakhstan	1.60	0.58	59
Russia	2.70	0.82	44
Ukraine	4.50	1.85	71
Production (million ton)	230.00	102.00	80
Kazakhstan	29.00	15.00	107
Russia	126.00	49.00	64
Ukraine	75.00	38.00	103

Source: FAO/EBRD and IKAR estimates from FAO 2008

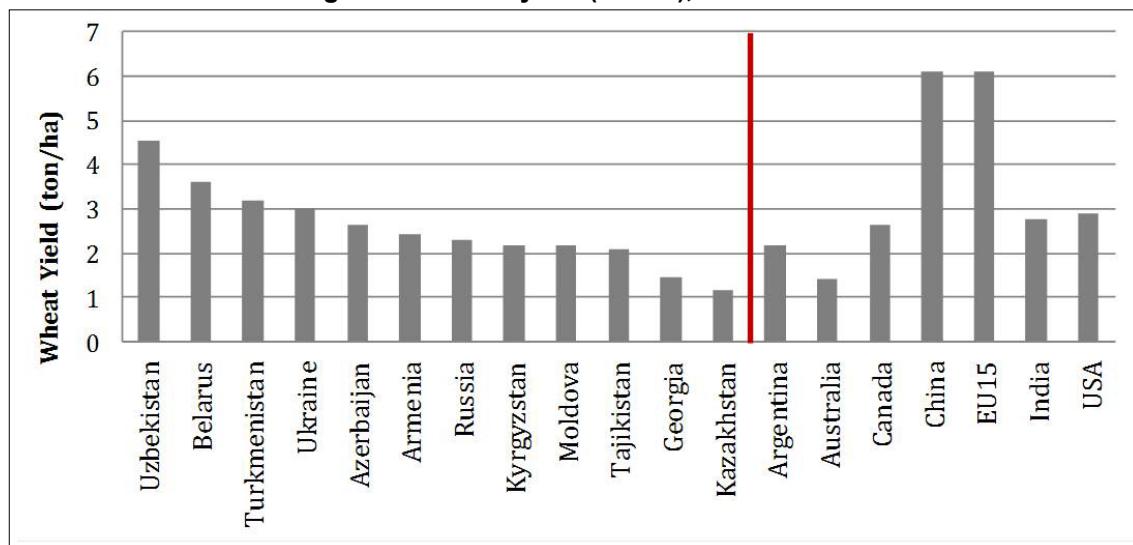
Figure 11. Changes in grain yields in all countries in the region, 1990–2008 (%, 1990=100)



Source: Author's calculations based on FAOSTAT

Note: The grain yield index is based on a three-year moving average of grain yields.

Figure 12. Wheat yield (ton/ha), 2007–2009



Source: FAOSTAT

Note: Wheat yields are based on a three-year average over the period 2007–2009.

to affect agricultural yields in the region. There are substantial differences among countries and even within a country. Wheat yields are expected to increase by more than 25 percent in north Kazakhstan. In contrast, wheat yields in southwest Russia, Ukraine, and some regions in south Kazakhstan are expected to decrease by 5–25 percent by 2050. In southern Turkmenistan and Uzbekistan, these are expected to decline by more than 25 percent (Nelson et al. 2010).

CHALLENGES AND POLICY REFORMS

Reforms are needed in order to realize the potential yield increases in Eastern Europe and Central Asia. Over the past two decades, there have been large declines in the use of capital in the agriculture sector. Current levels of fertilizer and tractor use remain substantially lower than those during the communist era. Moreover, most machinery in use is outdated (World Bank 2009).

Investments in the agri-food industry in the more economically advanced transition countries, such as the new member states of

the EU, have been one of the main engines (if not the main engine) behind productivity growth, quality improvements, and enhanced competitiveness through the introduction of vertical coordination mechanisms in the supply chain. A substantial part of these changes in the agricultural supply chain has been triggered by foreign direct investment (FDI) in the agri-processing industry, although horizontal spillovers have arisen as domestic companies rapidly copied these management innovations (Dries and Swinnen 2004). Besides horizontal spillover effects, vertical coordination also has important vertical spillover effects as it increases productivity and quality in the food supply chain (see for example Dries et al. 2009; Van Herck, Noev, and Swinnen 2012).

In general, the region is lagging behind the more advanced transition countries in Central and Eastern Europe. For example, Latvia, which attracted the least FDI in the food industry among the European countries, still has FDI per capita that is approximately three times higher than that of Russia and Ukraine. When compared with that of the Czech Republic, the

European country that attracted the most FDI in the food industry, FDI per capita in the Russian and Ukrainian food industry are respectively nine and ten times lower (Table 4).

Poor institutions and infrastructure are critical constraints to investments, as illustrated by a survey in four countries in the region (Georgia, Kyrgyzstan, Moldova and Ukraine). The survey shows that volatility of the political and economic environment, ambiguities in the legal system, and corruption are major constraints to FDI in the region (Kudina and Jakubiak 2008) (Table 5). Poor infrastructure and low skills levels of workers are likewise main constraints. Overall, institutional problems are found to be more important than fiscal measures—this explains why the recent decrease in the corporate tax in countries with poorly functioning institutions, such as Tajikistan and Uzbekistan, is expected to have only a very limited impact on attracting investments (Brownbridge and Canagarajah 2009).

More policy reforms are required to

address these weaknesses and constraints. First, although economic and institutional reforms have slowed down in most countries since the financial crisis (EBRD, 2009), it is crucial that governments continue the reform process as economic and institutional reforms in all sectors of the economy, not only in the agriculture sector, will create a stable economic, political, institutional, and legal environment. Such environment attracts both domestic and foreign investments.

Second, special attention should be paid to trade policies: since the start of the food crisis in 2007, the major grain exporting countries have implemented restrictive trade policies, such as export quota, restrictive export taxes, and export bans. Such measures prevent the poor rural population from benefiting from high food prices, thus hindering agricultural investment.

Third, in general, rural infrastructure is poor in most countries. Improvements in the public infrastructure may allow farmers to connect to markets due to reduced transport costs. In addition, investments in rural infrastructure

Table 4. Foreign direct investments in the agricultural sector and food industry in 2007 (inward stock)

	Agriculture (million EUR)	Food industry (million EUR)	Agri-food industry (EUR per capita)
Czech Republic	171	2359	245
Estonia	70	244	233
Hungary	336	1753	208
Latvia	121	179	132
Lithuania	57	441	147
Poland	505	5755	164
Romania	281	2207	115
Albania	1	32	10
Bosnia & Herzegovina	6*	286	76
Croatia	48	1017	240
FYROM	27	174	98
Serbia	15	105	16
Armenia*	3	-	-
Kazakhstan*	16	-	-
Moldova*	3	-	-
Russia	624	3744	31
Ukraine	379	1063	31

Source: Hunya (2009); Data with * are from World Investment Report (2009).

Table 5. Constraints to foreign investments

	Ukraine	Moldova	Kyrgyzstan	Georgia
Volatility of the political environment	3.4	3.3	4.5	2.8
Uncertainty about economic environment	3.3	3.4	4.4	2.9
Ambiguity of the legal system	3.9	3.5	3.5	2.7
Corruption	4.0	3.9	3.1	2.1
Bureaucracy	3.9	3.9	3.1	2.0
Lack of physical infrastructure	2.5	2.8	3.9	2.9
Backward technology	2.4	2.9	3.1	2.4
Lack of business skills	2.4	2.6	3.1	2.7
Finding a suitable partner	2.5	2.9	2.3	2.8
Problems in establishing clear ownership conditions	3.2	2.9	1.7	2.4

Source: Kudina and Jakubiak 2008

Note: A higher number indicates that a given impediment is more important. Numbers are simple averages.

improve access of rural laborers to urban areas, facilitating more off-farm employment and attracting foreign investors. Such investments efficiently reduce overemployment in the agriculture sector and stimulate pro-poor economic growth.

Fourth, besides investment in physical capital, investment in human capital can also play an important role in increasing (agricultural) productivity. Currently, the overall level of education is low, which not only affects agricultural productivity through reduced inter-sectoral labor mobility, but also constrains the adoption of new technologies in the agriculture sector. Specifically with respect to enhancing human capital within the agriculture sector, investments in agricultural R&D and extension services is crucial. In an environment where vertical integration plays a more important role, joint private-public investments in R&D in the agriculture sector are optimal because they take into account the requirements of private investors.

Fifth, availability of rural credit is also a key constraint to investments in the agriculture sector. To encourage investments in fixed assets and ease access to working capital, it is important to facilitate the supply of (rural) credit to farmers (e.g., by strengthening the overall financial sector), facilitate the development of interlinked contracts, and encourage innovative financing schemes (e.g., by substituting conventional credit requirements such as land and buildings with alternative securities such as future cash flows from the sales of commodities).

At the same time that the government is stimulating growth of the overall economy and the agriculture sector in particular, policies must be put in place to support those who do not, or not sufficiently, benefit from these market developments. Therefore, it is crucial to enhance social safety nets, especially for food insecure and vulnerable households. This has implications on the total spending as well as the targeting and coverage of social benefits.

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