Food security and the transition region

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WORKING PAPER
prepared under the FAO/EBRD Cooperation
for presentation at EBRD's Grant Planning Meeting
London, 29 November 2011

European Bank
for Reconstruction and Development

Food and Agriculture Organization
of the United Nations

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ACRONYMS

ALP	Agricultural Labor Productivity
CIS	Commonwealth of Independent States
EBRD	European Bank for Reconstruction and Development
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IFI	International Financing Institution
IKAR	Institute for Agricultural Market Studies
MDER	Minimum Dietary Energy Requirement
OECD	Organization for Economic Co-operation and Development
R&D	Research and Development
USA	United States of America
VAT	Value Added Tax

ACKNOWLEDGEMENTS

The main authors of this report are Johan Swinnen, Professor of Development Economics, and Kristine Van Herck, Research Assistant, both from the Catholic University of Leuven (*Katholieke Universiteit Leuven*), Belgium. The authors would like to thank the following people for their advice and constructive guidance: Heike Harmgart, Principal Economist, Office of the Chief Economist, EBRD; Eugenia Serova, Senior Advisor to the Director, and Emmanuel Hidier, Senior Economist, both from FAO's Investment Centre Division; and David Sedik, Senior Agricultural Policy Officer; Regional Office for Europe, FAO. Françoise Trine and Dorjee Kinlay, Economists, both from FAO's Agricultural Development Economics Division, provided useful comments. The authors are also grateful for the remarks and suggestions made by the participants of the Food Security Business Forum at EBRD's 2011 Annual Meeting, during which an early version of the report was presented and discussed.

PREFACE

The dramatic price rises and volatility witnessed in food markets during the 2007-2008 food crises, and again in 2010-2011, can no longer be viewed as a temporary phenomenon. Projections indicate that, on current trends, both demand and supply factors are likely to exert pressure on the level of food prices and volatility. Demand for animal protein and bio-fuel is rising, global food stocks are at alarmingly low levels, resources used for food production, particularly water, are stressed, and climate change has caused more uncertainty for food availability. The global food crisis response has mainly focussed on the demand side and not on the supply side of food markets, a natural consequence of its focus on public sector stakeholders. However, food production is first and foremost a private sector activity. Thus, setting the right incentives and creating the right environment for the private sector is the crucial ingredient for long-term food security. This is largely overlooked in the current discussion. To feed the world in these challenging circumstances, the global agricultural production needs to increase by 70 per cent over the next 40 years. The EBRD transition region – ranging from Central Europe to Central Asia – includes three key global grain exporters – Russia, Ukraine and Kazakhstan – with a potential to contribute to servicing this rising global food demand. If Russia, Ukraine and Kazakhstan alone were to realise their productive potential today, these countries could supply almost half of the world's traded grain needs. But in Ukraine only, investment needs to achieve the targeted food supply increase are estimated at USD 80 billion. Only the private sector is able to realize such substantial investments, but private investments depend upon transparent, predictable and coordinated public policies. And the last few years have shown a series of rather unpredictable, protectionist, ad hoc public policy interventions in these regions, deterring much needed private investment.

This report is motivated by the need to understand the specific bottlenecks that the transition region is facing in fulfilling its potential, both on the domestic as well as the global food market. The key questions this report sets out to answer are: What are the key impediments to improving productivity along the whole food value chain? What can the role of the private sector be in unlocking the region's agricultural potential? And what has been the impact of recent public policies measures on food prices and how can international organizations such as the EBRD help to improve public private dialogue to achieve better policies?

Heike Harmgart, EBRD

EXECUTIVE SUMMARY

Population growth, accelerated urbanization and higher incomes are expected to lead to an increase in food demand by about 70 per cent by 2050– involving 1 billion extra tons of cereals and 200 million extra tons of meat. The transition region, which ranges from Central and Eastern Europe to Central Asia, can play a significant role in meeting this challenge. The region, with 17 per cent of global arable land, produces only 11 per cent of global crops and 6 per cent of global meat. In contrast to most other regions in the world, yields have stagnated in the region since the 1970s. Estimates show that average yields in the region could be increased by 75 per cent. Additionally, up to 13 million ha of extra land could be brought into production.

In order to finance such productivity gains, it is foreseen that two thirds of the investments at stake will come from the private sector. One of the main comparative advantages of the EBRD is its ability to mobilize investments from the private sector and address policy challenges that constrain private sector productivity growth.

This report has two objectives: (1) to analyse internal food security issues in the transition region, in particular in relation with policy measures taken by governments to ensure domestic food security and (2) to discuss the potential role that the region and in particular the main grain producing countries can play in increasing global food security by unleashing its production potential. Finally, we provide policy recommendations which include (i) overarching policy messages/directions for governments in relation to food security; (ii) broad directions for IFIs, including EBRD, to support their countries of operation in tackling the issue of food security; (iii) key roles that the private sector can play to unleash the region's agricultural potential.

Threats and opportunities of the food crisis

In 2007 and the first semester of 2008, the region was confronted with rising food prices as a consequence of a global increase in food prices. An increase in food prices offers threats and opportunities for the countries in the region and their population. In general food exporting countries are expected to gain from increasing food prices, net exporting countries are expected to lose. Within countries, an increase in food prices tends to hurt (urban) consumers of food and benefits (rural) producers. However, in reality the effects may be more complex. The size of the benefits/losses will also depend on factors, such as local policies, institutions, the food chain organization, etc. For example, in the presence of market imperfections farmers may have difficult access to the market or may receive a lower price than the one observed on the market. Moreover, within rural areas not all households may benefit from increasing food prices. In some countries there is a group of very small household farms, who do not cultivate enough land for self-production and are in fact net food buyers. The net household effect of increasing food prices depends on their net consumption status. These (semi-) subsistence farmers may represent a substantial part of the rural and even total population.

In summary, it is crucial to take in account all these effects and the heterogeneity of the impact. Moreover, since rural poverty is significantly higher than urban poverty, high food prices may have important consequences for poverty and food security in the region. A key issue is how policy makers can make sure that rural households can benefit from high food prices.

Food security in the transition region

Food security is a flexible concept and over the years there have been different attempts to define it. The most recent definition, which can be found in The State of Food Insecurity 2001, published by 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". The definition of food security is built on four pillars: access, utilization, availability and stability.

In our analysis of food security in the transition region, we focus on the poorest countries in the region (Caucasus and Central Asia). The countries in Central and Eastern Europe and the Western Balkan are in general richer and the state of food security is less problematic. Nevertheless, we will touch upon the situation in these countries where it is relevant. In addition, we discuss the role that the main grain producing countries (Russia, Ukraine and Kazakhstan) can play in supplying food to world, and thus contributing to global food security.

Food security in the transition region before the food crisis

Access to food is strongly correlated with poverty. Since the beginning of the 2000s, all countries in the region experienced economic growth. In addition to the direct effects, inhabitants of the poorer countries in the region are importantly benefited indirectly from economic growth in the EU and the richer countries in the region, where many of them migrated to work and which resulted in a substantial increase in remittances.

However, despite this positive evolution some countries still have a large amount of poor in their population. For example, in Uzbekistan 77% of the population has an income lower than 2$ per day and also in Tajikistan (51%) and Georgia (32%) a large share of the population is living below the poverty line. However, there are large disparities within countries and especially, in the rural areas in the region, as in most of the rest of the world, there is a disproportionate share of poor households.

As poverty, undernourishment in the transition region decreased substantially in the past decade. For example in Azerbaijan and Georgia which had a high prevalence of undernourishment in the mid-1990s, respectively 27% and 19%, undernourishment almost vanished by 2007. In countries, with even higher undernourishment, such as Armenia (36%) and Tajikistan (42%), the situation improved significantly, undernourishment was still at more than 20% of the population in 2007.

Diets in Azerbaijan, Tajikistan, Turkmenistan and Uzbekistan are very monotonous and the majority of energy is obtained from the consumption of starch and cereals, while animal and livestock products represent only a small proportion of the diet.

Especially the poorest income groups have a monotonous diet. For example, in Uzbekistan, for the poorest income group gets 73% of their daily calorie intake is from cereals and only 10% from animal products (dairy and meat). The richest income group has a more balanced diet and gets 48% of its daily calorie intake from cereals and 29% from animal products.

Poor nutrition is also reflect in three commonly used health indicators (stunting, wasting and vitamin A deficiency). Results show that children in Uzbekistan and Tajikistan have the worst scores for all three indicators. For example, in 2010, 33% of the Tajik children is stunted, 9% has weight loss due to undernourishment and 13% has not sufficient vitamin A in their diet.

Impact of the food and financial crises on food security

In 2008, the combination of increasing food prices and the global financial crises exposed the region to significant adverse economic and social impacts. The economies in Eastern Europe and Central Asia were forecasted to experience the deepest contraction among all emerging and developing economies. The impact in 2008 and 2009 was indeed severe: economic growth slowed down and real GDP decreased in all countries in the region in 2009. However in 2010 there was strong recovery and real GDP growth was already strongly positive in 2010.

Around the same time of the fall in real GDP, food prices increased. The impact of this likely differs between food exporters and importers; and within countries between farmers, farm workers and consumers. Interestingly, however, when we consider the evolution of the real wages, food prices and retail prices in different countries, we find that wages have increased substantially between mid-2000s and 2009. Moreover, the increase in real wages exceeds the increase in food prices and retail prices in all countries – even during 2008 and 2009. Hence, these data suggest – somewhat remarkably – that the slow-down and decline 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 with wage increases.

This suggests that rural households may have benefited from high food prices while those employed in formal jobs may have been shielded by wage inflation. Possibly the most sensitive population were households without formal wage income, who are strongly dependent on falling remittances, and net consumers of food.

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

Responses to the food crisis

In general, exporting countries banned, taxed or restricted the exports of food and importing countries reduced import tariffs. An FAO survey found that 33% of the surveyed countries in the region imposed export restrictions in some form, while the same number of countries reduced import taxes.

All major grain exporters in the region (Russia, Ukraine and Kazakhstan) implemented export restrictions to secure their domestic supply of grain and protect their local consumers from increasing food prices. However, studies found that the impact for domestic consumers is limited, while at the same time there are large losses for domestic grain producers. Given that in particular the poor, rural population is involved in farm activities, the export restrictions may even increase poverty instead of decreasing poverty as they are not able to benefit from high output prices.

In addition, export restrictions are also expected to affect the poorer countries in the region which rely heavily on imports from Russia, Ukraine and Kazakhstan for their food consumption. In 2008, the impact on the total food supply in the poorest importing countries was rather limited because of a rapid shift towards more import of flour and other cereals. It is still unclear which impact the export restrictions that Russia imposed in the second half of 2010 had as in 2010 not only wheat but also flour and other cereals were affected by export restrictions such that substitution was less evident.

Grain importing countries reduced import 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% VAT on imported grains.

Throughout the region governments also intervened in other ways to minimize food price inflation. For example, in Ukraine, the government imposed limits on mark-ups on flour prices and retail price limits on the bread price. In 2008, the Russian government implemented price controls on the prices of various food products, such as bread, milk, sunflower oil and eggs. In Kyrgyzstan, the government sold bread and other primary products at lower prices to the poor. In Georgia, the Tbilisi municipality has opened groceries giving a 20% discount on basic products for vulnerable households. In Uzbekistan, the government is keeping prices low by selling more flour from state resources.

Agricultural production and export potential

The transition region includes several countries with major potential for agricultural production and exports, in particular for cereals.

After a decrease in wheat production in first years after transition, wheat production started to increase again and currently the transition region is one of the most important wheat producers in the world, producing 115 million tons of wheat (or 21% of the worlds' wheat production in the period 2007-2009).

Also in terms of trade, the transition region is a major player on the international wheat market as it represents 24% of global wheat exports, which is almost the same share as the EU15 or the USA (both 22%).

Within the region, the major wheat exporting countries are Kazakhstan, Russia and Ukraine. In these three countries, exports have increased substantially compared to the beginning of the 1990s (driven by lower demand for animal feed), but exports

are still extremely volatile compared to the other major grain exporting countries, such as the EU or USA. This volatility in exports is an important constraint for the region to contribute to global food security.

FAO/EBRD and IKAR (Institute for Agricultural Market Studies) have calculated that cereal production in the three major grain producing countries in the region (Kazakhstan, Russia and Ukraine) could increase up to 230 million tons (or an increase of 80% compared to the 2004-2006 production level). This corresponds to a total increase of 102 million tons of which 15 million tons in Kazakhstan (107%), 49 million tons in Russia (64%) and 38 million tons in Ukraine (103%). Most of the potential production increase would come from an increase in grain yields (52% of the increase), while an increase in land use would only account for 18% of the increase (or 13 million of abandoned land brought back in production).

Land use and productivity

Since the transition from a centrally planned economy to a more market orientated economy, agricultural land use substantially decreased in most countries. In the major grain producing countries, such as Kazakhstan ,Russia and Ukraine, arable land use decreased by respectively 35%, 8% and 3%. Overall, these findings on arable land use suggest that there is a scope to increase arable land use in the region, in particular if agricultural prices remain high.

Yields have rebounded in the past decade. In the first years of transition, agricultural yields of the major arable productions in the region decreased strongly in all countries. For example, between 1990 and 1995, grain yields in Kazakhstan decreased by more than 10% per year. However, since the beginning of the 2000s, yields started to increase and currently they exceed the pre-reform level in almost all countries.

Despite the recent increase in yield, wheat yields in the main producing countries in the transition region are still substantially below yields in other major grain producing countries in the world, where there are similar climatological conditions.

A further increase in yields can happen through increased investment and better management and technology. Such yield increase will depend, of course, on incentives to invest, which in turn depends on a variety of market (prices), policy, infrastructure, and institutional conditions.

Climate change is also likely to affect yields. It is expected that by 2050, agricultural yields in the north of the transition region (Baltic States, Russia and Kazakhstan) will increase, while in the southern countries (Western Balkans, Ukraine, Uzbekistan and Turkmenistan) yields are expected to decrease.

Agricultural labor productivity

Agricultural labor productivity (ALP) is an important indicator of farm incomes and thus of rural poverty. Overall, ALP declined in the first years of transition, except for Central Europe. In Central Europe, a rapid decrease in agricultural employment has been the main driver behind the increase in ALP. Later, in the beginning of the 2000s, ALP also increased in the Balkans and the Baltic States.

In the CIS region (European CIS, Caucasus and Central Asia), agricultural employment strongly increased during the first years of transition. In several poorer countries, such as Armenia, Kyrgyzstan and Uzbekistan, agriculture provided a buffer role during transition, both in terms of labor allocation and in terms of food security. More recently, agricultural employment started to decrease in most countries in the region. However, in some of the poorest countries, such as Tajikistan and Turkmenistan, agricultural employment is still increasing.

Role of investments

An important driver behind recent productivity growth in other transition and developing countries have been foreign direct investments (FDI). While FDI in the agricultural sector is relatively limited, FDI in the food industry (manufacturing sector) is more important. In general the CIS region is lagging behind compared to the more advanced transition countries in Eastern Europe.

Investments in the agro-food industry in the more economic advanced transition countries, such as the new member states of the EU, have been one of the, if not the, main engine behind productivity growth, quality improvements, and enhanced competitiveness through the introduction of vertical coordination mechanisms in the supply chain.

While investment in the agricultural sector itself is only a fraction of FDI in the agro-food industry, domestic investments in the agricultural sector are more important. Over the past two decades, there have been large changes in capital use in the agricultural sector and currently capital use is still substantial lower than in the communist era. Fertilizer use followed a similar pattern as tractor use, but the decline was even more dramatically.

The cost and availability of agricultural credit are important determinants for making investments, especially for investments in machinery. In general, access to credit will depend on the state of reform in the financial sector and profitability in farming. With higher food prices, one should expect access to credit and investments to increase, if there is a functioning rural credit system.

Only a small proportion of domestic credit in the private sector is allocated to the agricultural sector, but in general this is in line with the share of agriculture in GDP. There are substantial differences between countries: while in Georgia, Azerbaijan and Kyrgyzstan less than 5% of total credit supply was used in the agricultural sector, this is more than 20% in Armenia and Moldova.

Conclusions and policy recommendations

Promote overall economic growth and development

The best strategy to reduce poverty, improve food security and enhance agricultural productivity in the past, has been an increase in economic growth. Since the beginning of the 2000s, rapid economic growth in the region has resulted in an increase in domestic employment alternatives and wages, but, especially in the poorer countries in the region, also a rapid increase in remittances from migrants, mainly working in the EU and the richer countries in the region.

In addition, economic growth has a positive impact on agricultural productivity as it will pull surplus labor out the agricultural sector, which enables individuals that stay in the agricultural sector to increase their agricultural income.

Enhance social safety nets for food insecure and vulnerable households
In order to limit the effect of the food and financial crisis and ensure food security for the poorest individuals, governments should increase their spending on social assistance, especially in the poorest countries in the region. Currently, total spending on social assistance varies between 0,5% in Tajikistan and 2% in Ukraine, which is substantially below the average in the OECD countries (2,5%).

In addition to the total spending, governments should also strive to improve the coverage rate (share of poorest households reached by social assistance) and targeting accuracy (share of benefits going to the poorest households) of social assistance programs. For example, in Tajikistan only 1% of the households in the poorest quintile receive social benefits.

Improve the policy environment
In general, the reform process in the CIS region towards a market economy is still incomplete. There are still substantial distortions in production, pricing, and marketing of "strategic" products, and the systems of institutions and instruments of planned economies have not yet been fully dismantled in most countries.

Moreover EBRD noticed that in most countries in the region the reform process slowed down as a result of the financial crisis. Despite the financial difficulties caused by the crisis, it will be important for the governments in the region to continue with the reform process. Economic and institutional reforms in all sectors of the economy, not only in the agricultural sector, are crucial to create a more stable economic, political, institutional and legal environment, which is crucial not only to attract domestic and foreign investments, but also to encourage the growth of more productive firms. In the agricultural sector, reforms are necessary to increase agricultural productivity and hence agricultural incomes.

In the context of food security, special attention should be paid to trade policies: since the start of the food crisis in the 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 (farmers) to benefit from high food prices.

Promote investment in the agricultural/ food industry
Increased investments are crucial for productivity growth.
In Central and Eastern European countries, investments in the agro-food industry has been a major driver behind productivity growth throughout the agri-food chain, including in farming. In order to attract more investments, some countries in the CIS region, such as Tajikistan, Russia, Uzbekistan and Ukraine, lowered the corporate tax. In principle, this should boost both domestic and foreign investment, but one might expect that the impact of a fiscal measure is limited as long as the countries do not first tackle their institutional problems. Hence, in order to attract investments governments should improve the political, institutional and regulatory climate in their countries. This also relates to the trade policy of the countries: currently

there is large volatility in food exports and governments interfere (ad hoc) by imposing export restrictions and price controls. This creates an unstable business environment, largely dependent on political decisions, which may discourage potential investors in the export market.

An important constraint for investment in the agricultural sector is the availability of rural credit. To encourage investments in fixed assets (e.g. tractors), and ease access to working capital (e.g. fertilizer), it is important to facilitate the supply of (rural) credit to farmers, e.g. by strengthening of the overall financial sector.

An important constraint to get access to credit is that farmers often lack the required collateral as in most countries, the existing farming material and buildings are old and there are unclear property rights on land or land markets do not function such that land cannot be sold. In order to address these problems, rural credit suppliers could substitute the conventional credit requirements, such as land or buildings, with alternative securities, such as future cash flows from the sales of commodities. For example, in a recent initiative EBRD supported the Serbian foreign-owned bank, Société Générale Serbia, in extending financing to local agribusinesses using warehouse receipts as collateral.

Second, in addition to credit provision through the traditional channel (financial institutions), governments should also encourage credit provision (especially for working capital) through more innovative channels, such as vertical coordination mechanisms. Private investors can play a leading role in rural credit provision through interlinked contracts. In order to facilitate the development of these vertical coordination mechanisms, the governments should implement policies that stimulate investments in the agro-food industry and create an institutional and legal climate in which such contract arrangements are possible.

Enhance public investment in infrastructure and education

A key constraint for growth in the agricultural sector is the poor rural infrastructure. For example, in the Central Asian countries in the Aral Sea Basin, where irrigation is necessary to ensure the agricultural production, water management institutions have weakened and infrastructure maintenance has in many places come to a standstill since the collapse of the Soviet Union. Many canals, gates and pumps are damaged or bad maintained, which resulted in land salinization and waterlogging. Investments in public goods, such as irrigation, but also road infrastructure are crucial to guarantee viability in the rural livelihoods.

Investments in rural infrastructure have two important effects on the agricultural sector. First, they connect farmers to markets by reducing the transport costs. This will help to integrate smaller farmers in modern supply chains. The investments in the rural infrastructure also constrain farmers in delivering the quality demanded by modern supply chain. Second, investments in rural infrastructure improve the access of rural labourers to urban areas and attract more off farm employment, including foreign investors. Hereby investments efficiently reduce the over-employment in the agricultural sector and stimulate pro-poor economic growth.

Besides investment in physical capital also investment in human capital can play an important role in increase (agricultural) productivity. The overall level of education is relatively low, which not only affects agricultural productivity through reduced intersectoral labour mobility (inadequate education reduces employment alternatives in the non-agricultural sector), but also constraints the adoption of new technologies in the agricultural sector. Specifically with respect to enhancing human capital within the agricultural sector, investment in agricultural R&D and extension services will be crucial. Optimally, in an environment where vertical integration plays a more important role, investments in R&D in the agricultural sector are joint private-public investments, which also take in account the demands of private investors. In this perspective also technical assistance to strengthen public standards testing and certification schemes are becoming more important to help farmers integrate in modern supply chains.

1. Introduction

Population growth, accelerated urbanization and higher incomes are expected to lead to an increase in food demand by about 70 per cent by 2050 – involving 1 billion extra tons of cereals and 200 million extra tons of meat. FAO estimates that 90 per cent of this increase will have to come from gains in yield and cropping intensity and only 10 per cent from the expansion of arable land.

The transition region in which EBRD is active and which ranges from Central and Eastern Europe to Central Asia, can play a significant role in meeting this challenge.[1] The region, with 17% of global arable land, produces only 11% of global crops and 6% of global meat. In contrast to most other regions in the world, yields have stagnated in the region since the 1970s. Estimates show that average yields in the main grain producing countries could be increased by 75 per cent. Additionally, up to 13 million ha of extra land could be brought into production.

In order to finance such productivity gains, it is foreseen that two thirds of the investments at stake will come from the private sector. For the Commonwealth of Independent States (CIS region) alone, it means approximately USD 50 billion additional private investments.[2]

One of the main comparative advantages of the EBRD is its ability to mobilize investments from the private sector and address policy challenges that constrain private sector productivity growth. The Bank is particularly well placed to address financing challenges that result from the particular risk profiles of investments in the food chain. Additionally, the regional focus of EBRD meets the specific institutional challenges that stem from the legacy of planned economies and which continue to shape food supply in the region. The EBRD can play a constructive role in leveraging its investor position to engage in policy dialogue inducing regulatory and institutional change in areas such as the collateralization of soft commodities, the improvement of commodity trading, risk management and quality standards.

This report has two objectives: (1) to analyse internal food security issues in the the region, in particular in relation with policy measures taken by governments to ensure domestic food security and (2) to discuss the potential role that the region, and in particular the main grain producing countries, can play in increasing global food security by unleashing its production potential.

Finally, we provide policy recommendations which include (i) overarching policy messages/ directions for governments in relation to food security; (ii) broad directions for IFIs, including EBRD, to support their countries of operation in tackling the issue of food security; (iii) key roles that the private sector can play to unleash the region's agricultural potential.

1 The transition region includes the countries in which EBRD is active: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Estonia, FYR Macedonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

2 The CIS region includes Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

2. Threats and opportunities of the food crisis

In 2007 and the first semester of 2008, the region was confronted with rising food prices as a consequence of the global increase in food prices (Figure 1).

An increase in food prices offers threats and opportunities for the countries in the region and their population. In general food exporting countries are expected to gain from increasing food prices, net exporting countries are expected to lose. Within countries, an increase in food prices tends to hurt (urban) consumers of food and benefits (rural) producers. However, in reality the effects may be more complex. The size of the benefits/losses will also depend on factors, such as local policies, institutions, the food chain organization, etc. (Swinnen, 2010). For example, in the presence of market imperfections farmers may have difficult access to the market or may receive a lower price than the one observed on the market. Moreover, within rural areas not all households may benefit from increasing food prices. In some countries there is a group of very small household farms, who do not cultivate enough land for self-production and are in fact net food buyers. The net household effect of increasing food prices depends on their net consumption status. These (semi-) subsistence farmers may represent a substantial part of the rural and even total population.[3]

In summary, it is crucial to take in account all these effects and the heterogeneity of the impact. Moreover, since rural poverty is significantly higher than urban poverty (Macours and Swinnen, 2008) (see section 3.2.), high food prices may have important consequences for poverty and food security in the region. A key issue is how policy makers can make sure that rural households can benefit from high food prices.

3 A World Bank study found that that in 2003, 20% of the population in Georgia and 40% in Moldova, rely mainly on subsistence farming for their own consumption (Alam et al., 2005).

Figure 1
Food price index (2002-2004=100)

Source: FAO

3. Food security in the transition region

3.1 Defining food security

Food security is a flexible concept and over the years there have been different attempts to define it. The most recent definition, which can be found in "The State of Food Insecurity 2001", published by 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).

The definition of food security is built on four pillars:

- Access: having sufficient resources (entitlements) to obtain a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources);
- Utilization: appropriate use based on knowledge of basic nutrition and health care, as well as adequate water and sanitation such that all physiological needs are met;
- Availability: sufficient quantities of food available on a consistent basis, supplied through domestic production and/or imports (including food aid);
- Stability: at all times access to adequate food and no risk to lose access to food as a consequence of sudden shocks (e.g. economic crisis) or cyclical events (e.g. seasonal food insecurity).

Most empirical work focuses on food sufficiency. However, food sufficiency does not necessarily imply food security. It is possible that there is sufficient food available, but that there are significant shortfalls in the diet (e.g. imbalances in the consumption of calories, proteins or fat) which may result in "undernourishment" and "protein energy malnutrition" (Barrett, 2002). Undernourishment is defined as a situation that exists when caloric intake is below the minimum dietary energy requirement (MDER), which is the amount of energy needed for light activity and to maintain a minimum acceptable weight for attained height. This may vary by country and from year to year depending on the gender and age structure of the population. Malnutrition is a complex concept, because it is influenced by many other variables as well, such as for example health status and energy expenditure in work (Behrman and Deolalikar, 1988; Strauss and Thomas, 1998). Furthermore, malnutrition can reflect insufficient intake and absorption of micronutrients (vitamins and minerals), even if the balance of macronutrients and total energy intake are satisfactory.

The concept of food security should be analyzed at the individual level as its foundation is built on the individual's right to have, at all times, sufficient nutrients to live a healthy and active life. However, until the work by Sen (1981), who emphasized the importance of the individual-specific character of the concept "hunger", most researchers focused on analyzing food insecurity on a more aggregate level, e.g. at the level of the household, income class, region or nation. These analyses generally measure food security indirectly, based on food balance sheets and national income distribution and consumer expenditure data. However, aggregation tends to ignore and may lead to substantial underestimation of the food-insecure population (Popkin, 1981; MacLean, 1987). However, often aggregate data are the only data available.

In the next sections we present and analyze indicators of food security in the region. First, we discuss the evolution over the past decade and then we analyze impact of the recent financial and food crises. Given that there is substantial variation in economic performance between the different countries in the region, we focus our analysis mainly on the poorest countries in the region. In particular, we focus on the countries in the CIS region. The countries in Central and Eastern Europe and the Western Balkans are in general richer and the state of food security is less

problematic. Nevertheless, we will touch upon the situation in these countries where it is relevant, but we will not include all these countries in all our figures and tables. Finally, we summarize the policy measures that different countries have taken in the light of the crisis in an attempt to ensure domestic food availability.

3.2 Food security in the transition region before the food crisis

Since the beginning of the 2000s, the economies in the region were recovering from the macroeconomic and institutional problems that characterized the region since its transition from a centrally planned to a more market orientated economy in the beginning of the 1990s. The economy started booming, which was reflected by a strong increase in GDP in all countries (Figure 2). This had a positive impact on poverty and hunger.

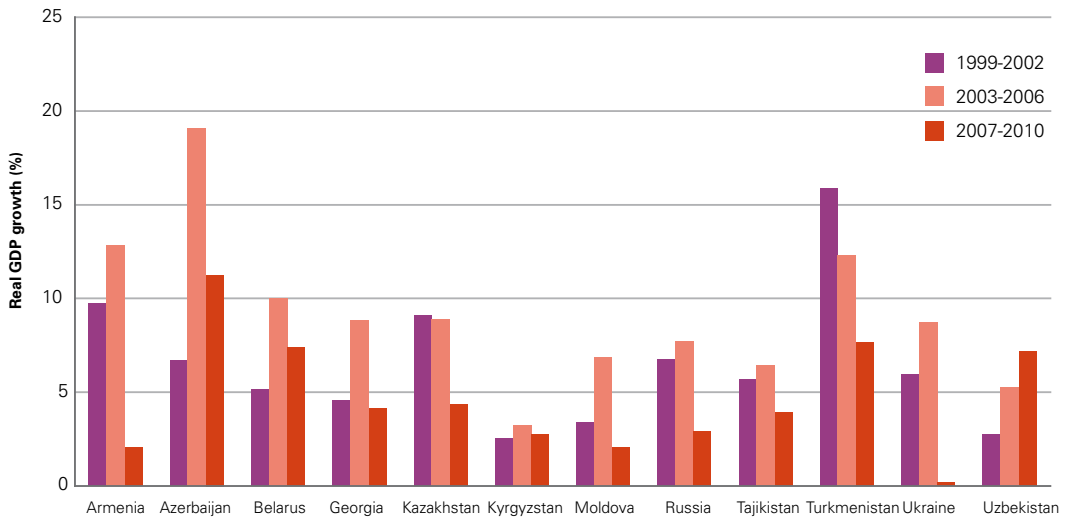
Poverty and access to food

Access to food is strongly correlated to poverty. Since the beginning of the 2000s, all countries in the region experienced economic growth. However, despite this positive evolution some countries still have an important poor population. For example, in Uzbekistan still 77% of the population has an income lower than 2$ per day and also in Tajikistan (51%), Georgia (32%) and Kyrgyzstan (29%) a large share of the population is living below the poverty line (Figure 3).

In addition to direct benefits from strong economic growth, inhabitants of the poorer countries in the region benefited directly from economic growth in the neighboring, resource-rich countries in the region, where many of them migrated to work (Swinnen and Van Herck, 2009). For workers from most countries in Central Asia, such as Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, the major destinations to find employment are Russia and Kazakhstan, whereas workers from the Western Balkans and Moldova mainly leave for the European Union. Over the years, both remittances and the outflow of labor in the poorer countries in the region have increased substantially (Table 1) and in some countries, remittances even are even one of the most important sources of income for households (Table 2).

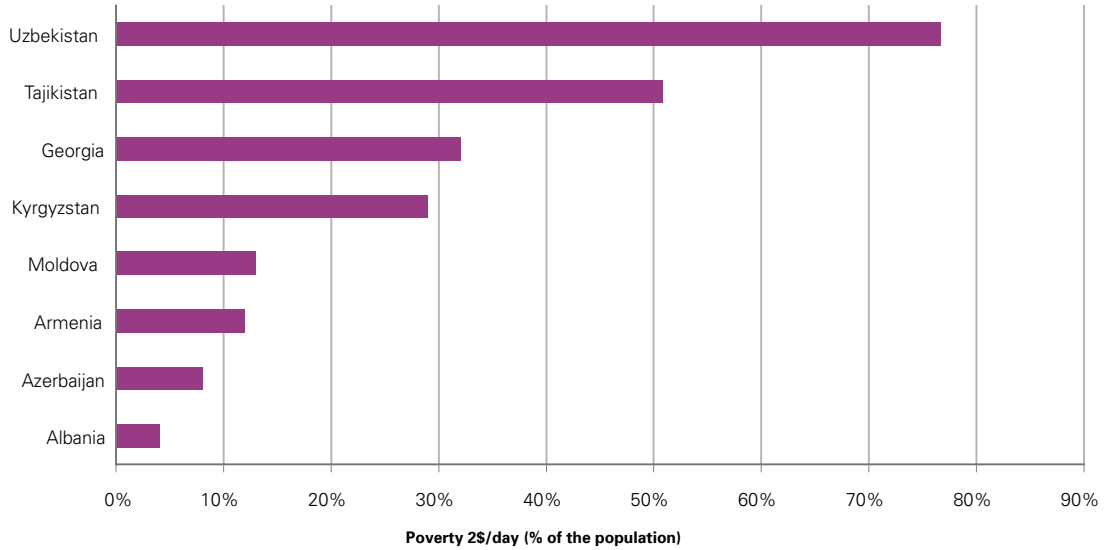
However, there are large disparities within countries and especially, in the rural areas in the region, as in most of the rest of the world, there is a disproportionate share of poor households. In general, poverty rates are higher in rural areas than in the capital city or other urban areas, although there is large variation across countries. Rural headcount ratios, based on 2000 PPP, range from less than 1% in Hungary to almost 80% in Kyrgyzstan in 2002 (Macours and Swinnen, 2008) (Table 3). Especially for Russia and Kazakhstan the differences between rural and urban headcounts

Figure 2
Annual average Real GDP growth in some selected countries (%)



Source: International Monetary Fund, World Economic Outlook Database

Figure 3
Poverty in CIS (% of the population with less than $2/day PPP)



Source: World development indicators (latest year for which data were available

Table 1
Workers remittances (US $ million)

	2003	2004	2005	2006	2007	2008	2009	2010e
European CIS								
Belarus	222	257	255	340	354	448	358	375
Moldova	487	705	920	1182	1498	1897	1211	1306
Russia	1453	2495	3012	3344	4713	6033	5359	5477
Ukraine	330	411	595	829	4503	5769	5073	5595
Caucasus								
Armenia	162	435	498	658	846	1062	769	832
Azerbaijan	171	228	693	813	1287	1554	1274	1404
Georgia	235	303	346	485	695	732	714	808
Central Asia								
Kazakhstan	147	166	178	187	223	192	124	132
Kyrgyzstan	78	189	322	481	715	1232	992	1160
Tajikistan	146	252	467	1019	1691	2544	1748	2032
Turkmenistan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Uzbekistan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
West Balkans								
Albania	889	1161	1290	1359	1468	1495	1317	1296
Bosnia and Herzegovina	1749	2072	2043	2157	2700	2735	2081	1913
Croatia	1085	1222	1222	1234	1394	1602	1476	1513
FYR Macedonia	174	213	227	267	345	407	381	406
Serbia	2661	4129	4650	4703	5377	5538	5406	4896

Source: World Bank

Table 2
Importance of remittances for the receiving households

Income quintile	Poorest	Poor	Middle	Rich	Richest
Armenia (2003)					
Share of receiving households	17%	16%	16%	18%	21%
Remittances/Consumption	50%	54%	30%	36%	31%
Georgia (2002)*					
Share of receiving households	3%	2%	2%	2%	3%
Remittances/Consumption	145%	77%	52%	53%	40%
Kyrgyzstan (2003)					
Share of receiving households	1%	2%	1%	3%	7%
Remittances/Consumption	10%	6%	7%	21%	14%
Tajikistan (2003)					
Share of receiving households	8%	10%	9%	9%	8%
Remittances/Consumption	35%	27%	25%	22%	16%

* Quarterly data
Source: Quillin et al. (2007)

are significant. In those countries the ratio of rural on urban headcount is higher than 1.5, meaning that poverty risk is more than 50% higher in rural than in urban areas. In contrast, rural poverty is lower than urban in Belarus and in Armenia and Azerbaijan, and this finding is consistent across years and indicators. In terms of non-income poverty indicators, infant mortality in rural areas is the highest in Bulgaria, Romania, Russia, and in Central Asia (Kazakhstan, Kyrgyzstan, and Uzbekistan). Further, Macours and Swinnen (2008) find that in the period 1998-2003, both rural and urban poverty declined substantially. Nevertheless, rural poverty is not catching up and therefore grows in relative importance.

Undernourishment and access to food

Similar to poverty also undernourishment in the region decreased substantially. The only country where undernourishment increased compared to the beginning of the 1990s is Uzbekistan (Table 4). In some countries, such as Azerbaijan (27%) and Georgia (19%) which had a high prevalence of undernourishment in the mid-1990s, undernourishment almost vanished by 2007. In other countries, such as Armenia (38%) and Tajikistan (42%), the situation improved slightly, they but did not manage to decrease the prevalence of undernourishment below 20% of the population in 2007.

Diets

With respect to undernourishment, it is important to consider people's diet since it is possible that individuals have access to sufficient food, but the balance of macronutrients and/ or micronutrients is not satisfactory, which results in an unhealthy diet.

Figure 4 compares the share of different components in total energy consumption for selected countries in the region. In the poorer countries individuals strongly depend on staple food, such as cereals and starch, for their energy intake. A higher ratio of energy consumption from staple food to all foods consumed indicates a low diversity of diets.

Diets in Azerbaijan, Tajikistan, Turkmenistan and Uzbekistan are very monotonous and more than 60% of the energy is obtained from the consumption of staple food. In contrast, the proportion of energy derived from animal and livestock products in these countries is very low. For example in Tajikistan less than 10% of an individuals' energy intake is derived from the consumption of animal or livestock products. In addition, it is important to note that these are average numbers. Especially the poorest income groups have a monotonous diet. For example, in Uzbekistan, the poorest

Table 3
Rural income and non-income poverty

	International poverty line: Headcount ratio		National poverty line Headcount ratio	% in lowest quintile	Mortality rate (infants under 1 year)	
	Rural	Rural/urban	Rural/urban	Rural/urban	Rural	Rural/urban
European CIS						
Belarus	1,9	0,8	–	1,47	10,2	1,46
Moldova	60,6	1,3	1,48	2,29	14,6	0,97
Russia	13,7	2	1,94	1,75	19	1,17
Ukraine	3,7	1,3	1,07	–	11,4	1,01
Caucasus						
Armenia	50,9	0,9	0,74	0,74	14,2	0,85
Azerbaijan	4,8	0,9	0,76	0,65	14,2	1,28
Georgia	55,6	1,3	0,84	0,9	10,4	0,59
Central Asia						
Kazakhstan	35,4	1,9	2,13	1,75	15,7	0,87
Kyrgyzstan	79,5	1,3	1,38	1,64	18	0,64
Tajikistan	76,4	1,1	1,09	1,25	–	–
Uzbekistan	46,9	1,4	1,36	1,45	17,1	0,8
Western Balkans						
Albania	27,1	1,5	1,47	1,54	–	–
Bosnia and Herzegovina	4,6	1	1,44	1,45		
Croatia	–	–	1,74	–	7,9	1,23
Kosovo	–	–	1,09	1,11	–	–
Macedonia	4,5	1,1	2,52	–	9,8	0,93
Serbia and Montenegro	9,1	2,2	1,82	1,56	–	–
Central Europe						
Bulgaria	16,6	1,6	3,82	2,04	16,9	1,41
Estonia	5	1,2	–	–	5	0,83
Hungary	0,3	1	1,62	1,43	7,6	1,1
Latvia	4	1,9	2,55	–	12,9	1,59
Lithuania	8,8	4,5	–	2,44	9,7	1,43
Poland	3,2	1,4	2,34	2,27	8,5	0,92
Romania	24,4	3	2,33	2,63	19,8	1,37
Slovakia	–	–	–	–	8	1,1

Source: Macours and Swinnen (2008)

income group gets 73% of their daily calorie intake from cereals and only 10% from animal products (dairy and meat) (Figure 5). The richest income group has a more balanced diet and gets only 48% of their daily calorie intake from cereals and 29% from animal products.

Food security and health

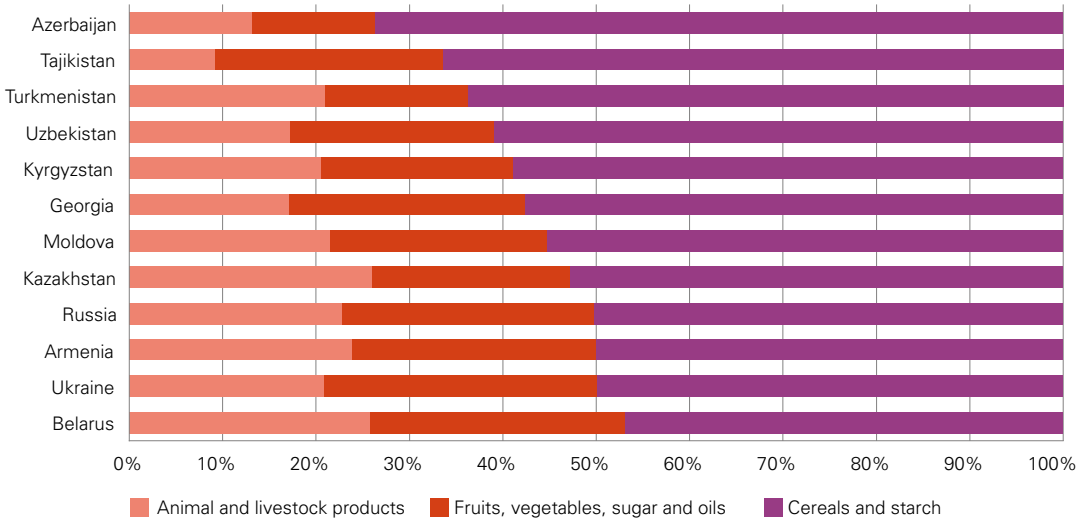
Undernourishment and a poor diet may result in poor health. For example, in Tajikistan and Uzbekistan, respectively 33% and 19% of the children under five years are significantly smaller than the average for their age group as a result of an inadequate diet (stunting) (Figure 6), respectively 8,5% and 4,5% of the children suffer from severe weight loss as the result of starvation (wasting) (Figure 7) and for respectively 13% and 35% of the children between 6 and 59 months their diet does not contains sufficient vitamin A (Figure 8). Also in Albania and Azerbaijan, there is a relative higher prevalence of stunting and wasting.

Table 4
Evolution of 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%

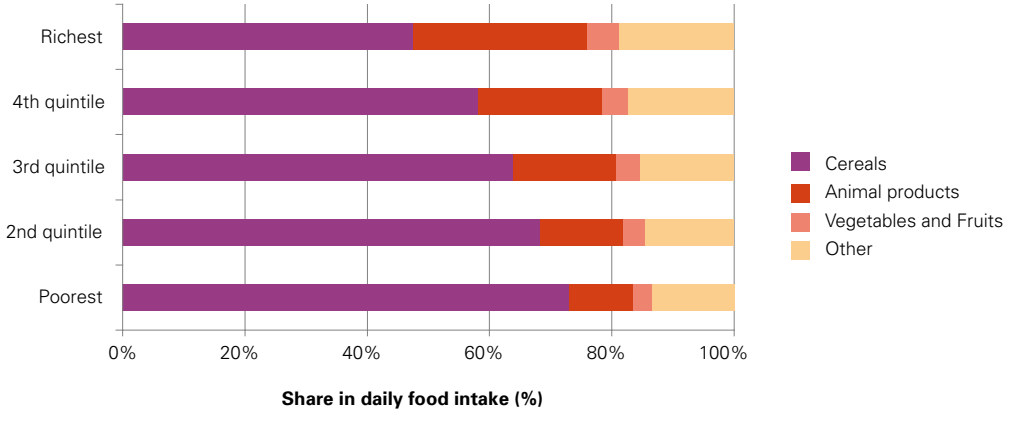
Source: World Development Indicators 2011

Figure 4
Composition diet in 2007 (% of each component in total energy intake)



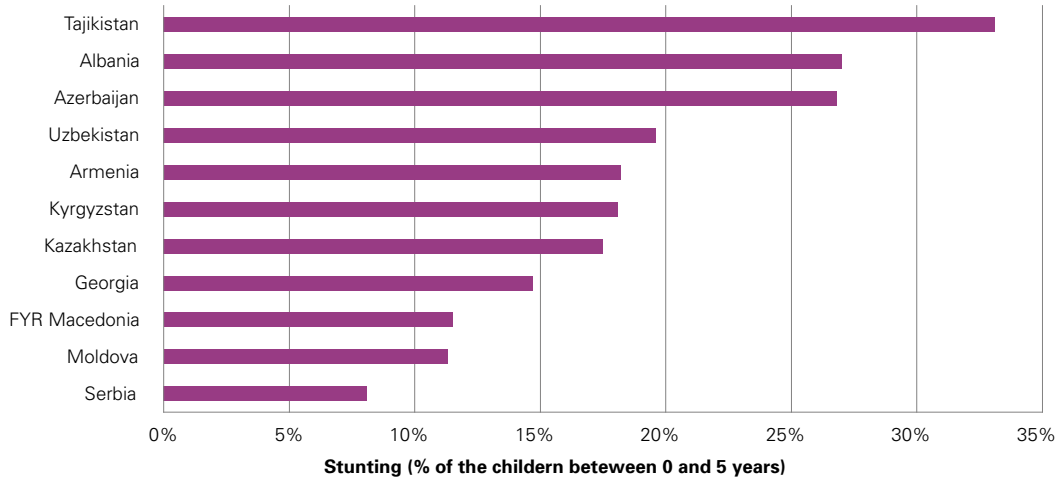
Source: FAOstat 2011

Figure 5
Source of daily calorie intake by income groups in Uzbekistan



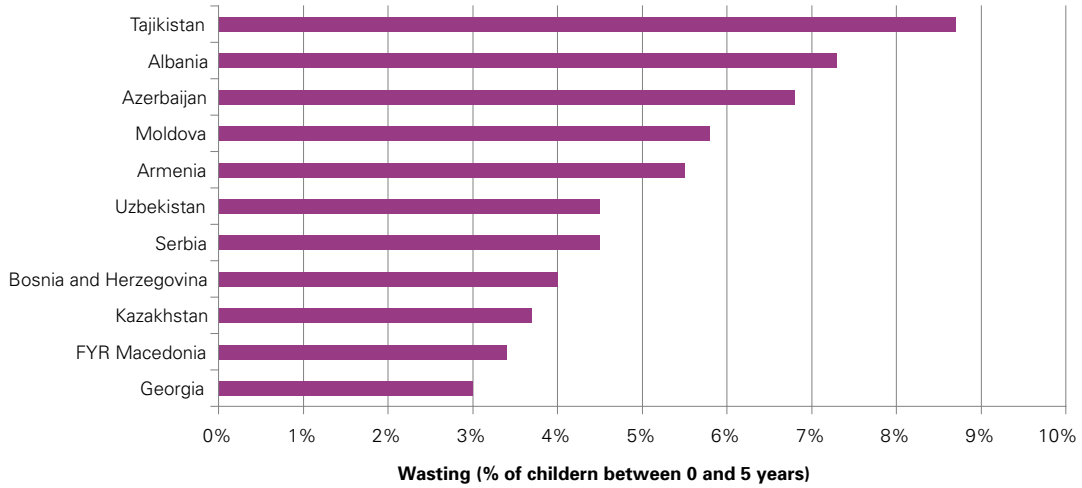
Source: Musaev et al. (2010)

Figure 6
Prevalence of stunting (% of children between 0 and 5 years)



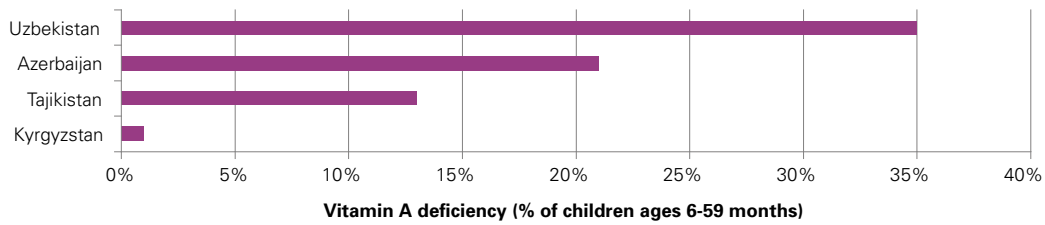
Source: World Development Indicators 2011

Figure 7
Prevalence of wasting (% of children between 0 and 5 years)



Source: World Development Indicators 2011

Figure 8
Prevalence of vitamin A deficiency in 2009 (% of children ages 6-59 months)



Source: World Development Indicators 2011

3.3 Impact of the food and financial crises on food security

In 2008, the combination of increasing food prices and the global financial crises exposed the region to significant adverse economic and social impacts. The economies in Eastern Europe and Central Asia were forecasted to experience the deepest contraction among all emerging and developing economies (EBRD, 2009). The impact in 2008 and 2009 was indeed severe: economic growth slowed down and real GDP decreased in all countries in the CIS region in 2009. However, in 2010 there was strong recovery and real GDP growth was already strongly positive in 2010 (Table 5).[4]

Hence, the medium term impact of the food and financial crisis is expected to the be limited as economic growth rapidly recovered after a substantial decline in real GDP growth in 2009.

Around the same time of the fall in real GDP, food prices increased. The impact of this likely differs between food exporters and importers; and within countries between farmers, farm workers and consumers. Interestingly, however, when we consider the evolution of the real wages, food prices and retail prices in different countries, we find that wages have increased substantially between mid-2000s and 2009. Moreover, the increase in real wages exceeds the increase in food prices and retail prices in all countries for which we have data – even during 2008 and 2009 (Figure 9). Hence, these data suggest – somewhat remarkably – that the slow-down and decline in GDP in 2008-2009 was not reflected in wages. This suggests that any negative impact of the food price increase on food security may have been offset with wage increases.

Hence, rural households may have benefited from high food prices while those employed in formal jobs may have been shielded by wage inflation. Possibly the most sensitive population were households without formal wage income, who are strongly dependent on falling remittances, and net consumers of food. For example, in Tajikistan, 50% of the households with migrants reported to have not received any remittances in the first three months of 2009 and among the remittances receipts, 60% reported to have received less than usual. As a result, 43% of the households estimated their economic situation in 2009 to be worse than in the year before, while only 1% of the households indicate that their situation is better (World Food Programme, 2009). Also in Armenia, households

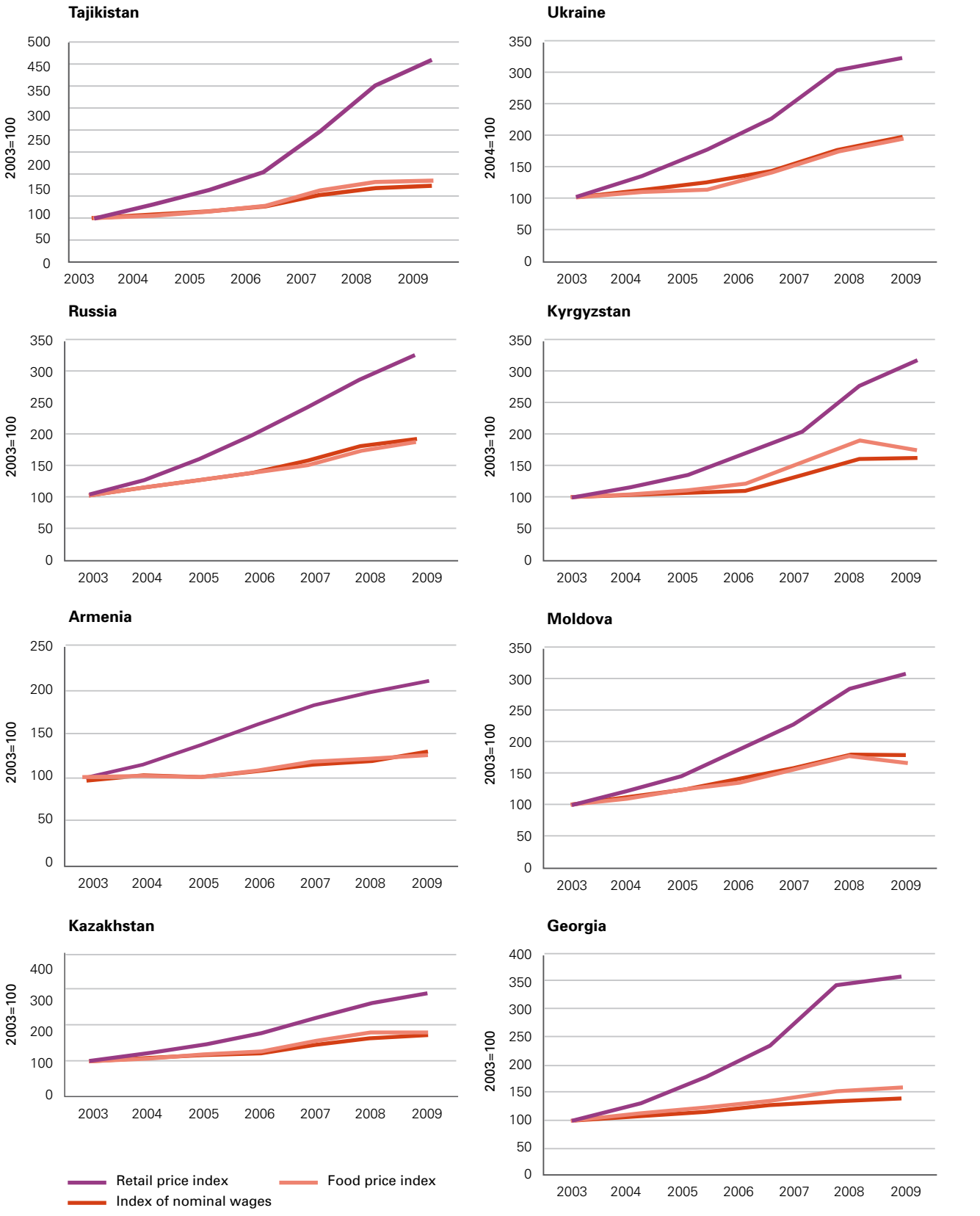
4 A similar pattern is observed in the evolution of remittances, which also declined in all countries in 2009 (Table 1).

Table 5
Real GDP growth in the CIS countries

	2003	2004	2005	2006	2007	2008	2009	2010
Central Asia								
Kazakhstan	9,3	9,6	9,7	10,7	8,9	3,2	1,2	6,0
Kyrgyzstan	7,0	7,0	-0,2	3,1	8,5	8,4	2,3	-3,5
Tajikistan	10,2	10,6	6,7	7,0	7,8	7,9	3,4	5,5
Caucasus								
Armenia	14,0	10,5	13,9	13,2	13,7	6,9	-14,2	4,0
Azerbaijan	11,2	10,2	24,3	30,5	23,4	10,8	9,3	9,0
Georgia	11,1	5,9	9,6	9,4	12,4	2,1	-4,5	2,0
Europe								
Belarus	7,0	11,4	9,4	9,9	8,2	10,0	0,2	6,6
Moldova	6,6	7,4	7,5	4,8	3,0	7,8	-6,5	-
Russia	7,4	7,2	6,4	8,2	8,5	5,2	-7,9	4,4
Ukraine	9,6	12,1	2,7	7,3	7,9	2,1	-15,1	4,0

Source: IMF

Figure 9
Real increase in wages, food prices and retail prices (index)



Source: Sedik (2011)

in migrant areas reported to be affected by reduced remittances (World Bank Programme, 2010a).[5]

These hypotheses are consistent with the fact that official measures of undernourishment have been rather stable. Recent data (2010) show that undernourishment is, respectively, high and moderately high in Tajikistan and Armenia. In Turkmenistan, Uzbekistan and Kyrgyzstan, undernourishment is moderately low and it is in Azerbaijan, Georgia and Kazakhstan very low (Figure 10).

5 In addition to crisis periods also violence affected food security in the recent years. In Georgia the 2008 war displaced around 130.000 people. An assessment on food security and nutrition of the conflict-affected population in March 2010, showed that 99% of the refugees are food insecure and depend heavily on external assistance to meet their basic food needs. A significant proportion of the households depends on a very monotonous diet (World Food Programme, 2010b). More recently, the ethnic violence in southern Kyrgyzstan against the minority population of Uzbeks resulted in the displacement of more than 300.000 people (World Food Programme, 2010c). The majority of the refugees were food insecure. For example, in 2010, 27% and 40% of the bread consumed by food insecure households came from respectively humanitarian assistance and food gifts and also for potatoes (56%) and vegetables and fruits (47%) food insecure households largely depend on humanitarian assistance and food gifts (World Food Programme, 2010c).

3.4 Responses to the food crisis

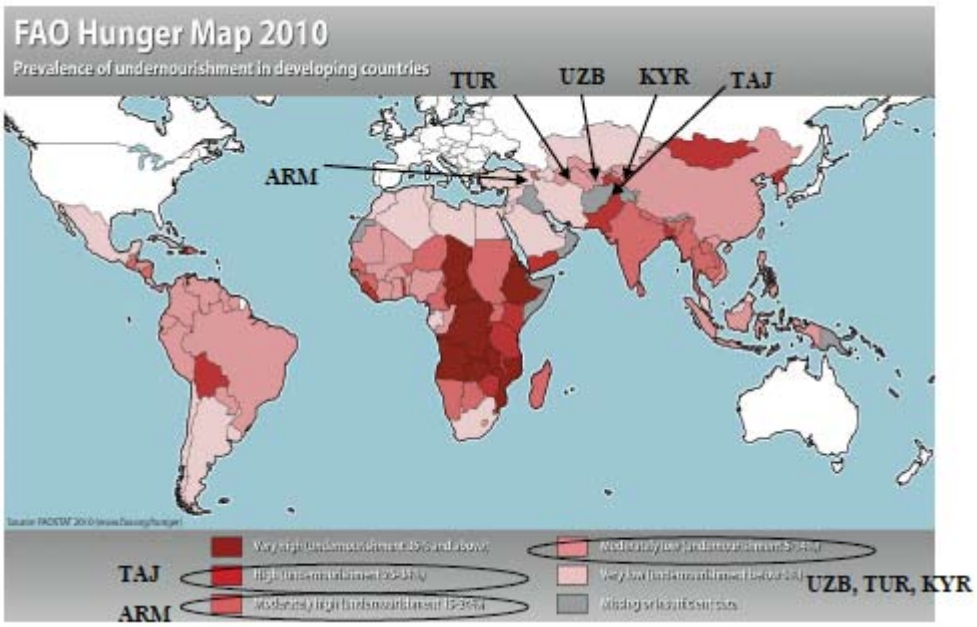
In almost all countries, the global food crisis triggered several policy actions to ensure domestic food security (Figure 11). In general, exporting countries banned, taxed or restricted the exports of food and importing countries reduced import tariffs. An FAO survey found that 33% of the surveyed countries in Europe and Central Asia imposed export restrictions in some form, 33% reduced import taxes (Figure 11)

All major grain exporters in the region (Kazakhstan, Russia and Ukraine) implemented export restrictions to secure their domestic supply of grain and protect their local consumers from increasing food prices (Table 6).[6]

Already on September 28 2006, the Ukrainian government introduced a system of licenses for grain exporters, which was subsequently replaced with a quota system for barley, corn and wheat exports (Von Cramon and Raiser, 2006). In

6 Note that also other countries introduced export restrictions for wheat. For example, Tajikistan introduced an export restriction for locally produced wheat to neighbouring countries (World Bank, 2011).

Figure 10
Undernourishment in 2010 (% of the population)



Source: FAO (2010)

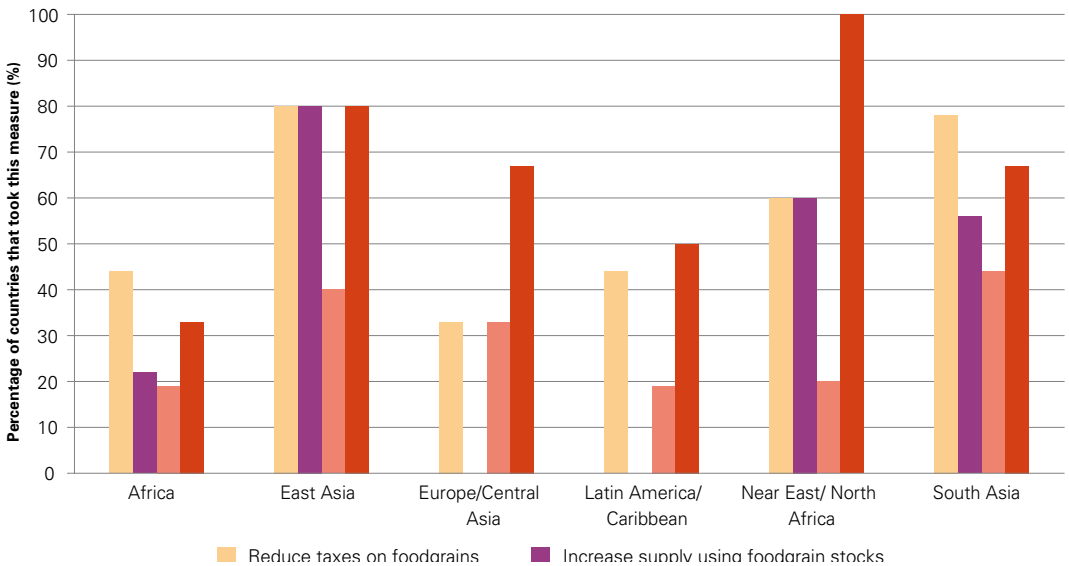
May 2007, the Ukrainian government decided to abandon the export quota for wheat, but in July 2007 it reintroduced export quota for the next 12 months. In fact, the introduced wheat export quotas were so low such that export was quasi-banned. In May 2008, the government relaxed the export quota for wheat. However, in the fall of 2010, Ukraine reintroduced export quota on wheat and in addition also introduced export quota on barley and corn.

In Russia, the government imposed in January 2008 a prohibitive export tariff of 40% on wheat exports outside of its customs union. In February 2008, Russia tightened the export restraint, extending the export tax to its customs union to prevent the circumvention of the tariff by export through Kazakhstan or Belarus. In July 2008, the Russian government reduced the export tariff. Following the 2010 drought, the Russian government introduced a ban on flour, wheat, barley and corn exports in September 2010.

Kazakhstan imposed an export tariff on wheat in early 2008 and in April 2008 they even imposed an export ban on wheat (Dollive, 2008). In September 2008, the Kazakh government abolished the export ban on wheat, but in September 2010, they introduced an export ban on the exports of oilseeds, vegetable oils and buckwheat.

Von Cramon and Raiser (2006) argued that Ukrainian consumers gained little from the quota introduced in 2006. They argue that although wheat prices have been constant, prices for flour and bread increased since the quota's introduction as wheat prices contribute only to a certain percentage to the final bread price. For similar reasons, the impact of lower feed prices on the prices of meat and dairy is expected to be very limited. At the same time, the quota system imposes large losses on grain producers and significantly affects export revenues. In fact, the estimated reduction in farm gate prices of approximately USD25/ton would lead to a cumulative revenue loss in wheat production alone of USD350 million during the 2006/2007 marketing year. Given that in particular the poor, rural population is involved in farm activities, the export restrictions may even increase poverty instead of decreasing poverty as farmers are not able to benefit from high output prices. In addition to farm income, the authors also found that the export restrictions hurt the grain traders, who have invested in grain storage and other

Figure 11
Policy actions to address high food prices in 2008



Source: FAO (2009) obtained from (Meyers and Kurbanova, 2009)

logistics to facilitate exports.[7] In fact, the main beneficiaries of the quota are flour millers and animal feed producers.

Also for Russia, Jones and Kwiecinski (2010) argue that the impact of the export restrictions on food prices seems to be limited as consumers were not shielded from the rising food prices. This also reflected in the evolution of the wheat flour price in Russia (exporter of wheat) compared to Armenia and Kyrgyzstan (importers of wheat) (Figure 12)

Several of the poorer CIS countries in the region rely heavily on imports from Russia, Ukraine and Kazakhstan for their food consumption.

For example, for cereals, which are one of the main components in the diet of all countries in the region, more than 50% of the domestic cereal consumption in Georgia and Armenia was imported in the period 2000-2008, almost exclusively from Russia, Ukraine and Kazakhstan (Figure 13 and Figure 14).

Hence, export restrictions by the major grain producers in the region are expected to have a negative impact on the grain importing countries in the region.[8] However, Sedik (2011) argues that the impact on total food supply the poorest importing countries was rather limited because

7 Note that the sector is important in the Ukrainian economy and generated more the $300 million foreign direct investment in the recent years (Von Cramon and Raider, 2006).

8 Also net grain importing countries introduced trade policies to discourage (prevent) exports in order to ensure the domestic food supply. For example, in June 2009, the Kyrgyz government introduced export duties on wheat, flour, vegetable oil and some seeds and also in Belarus the government imposed an export tax (40%) on wheat (FAO, 2011).

Table 6
Export restrictions in the main grain exporting CIS

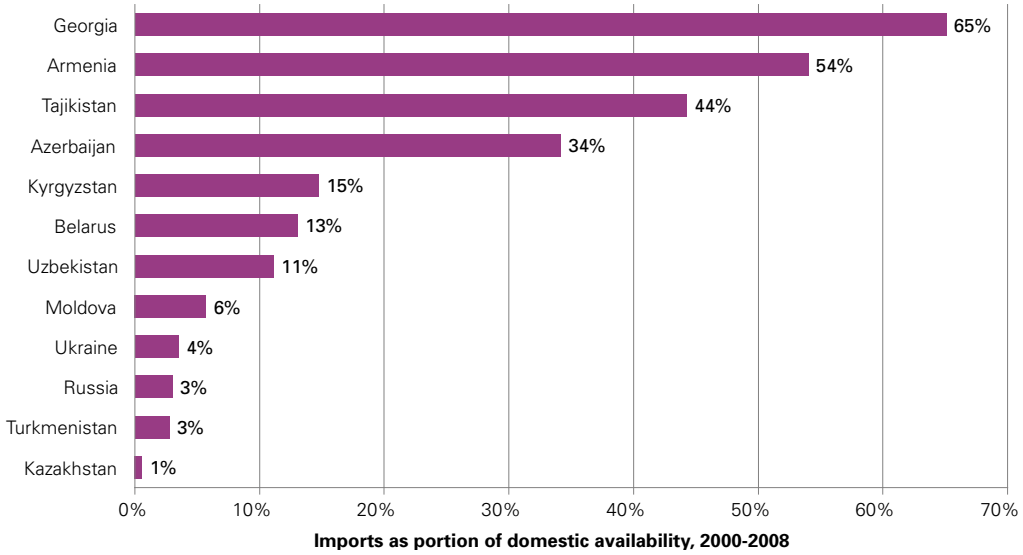
		Ukraine			Russia					Kazakhstan	
		Barley	Corn	Wheat	Barley	Corn	Wheat	Milling wheat	Flour	Oilseeds, buckwheat	Wheat
2007	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
2008	1										
	2	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

* Black=Prohibitive export taxes; Dark grey=Export ban; Light grey=Export quotas; Stripes=Export taxes
Source: Sedik (2011)

Figure 12
Wheat flour prices adjusted for inflation in Russia, Kyrgyzstan and Armenia

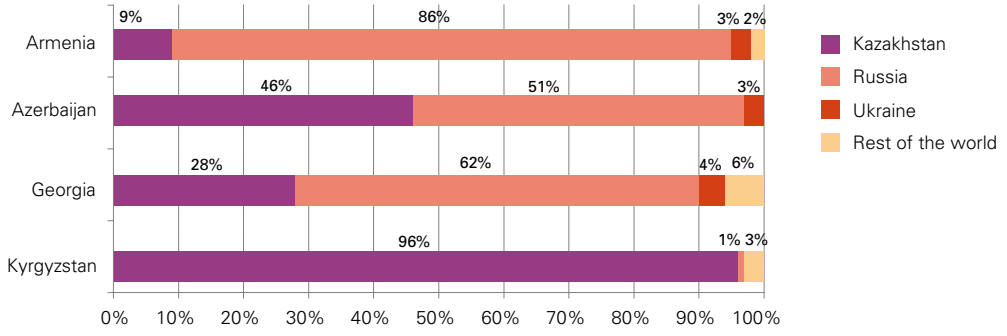
Source: Sedik (2011

Figure 13
Import dependency for cereals (% of domestic availability, av. 2000-2008)



Source: FAOstat 2011

Figure 14
Wheat import by source country (% of total wheat import, av. 2006-2008)



Source: FAOstat 2011

of a rapid shift towards more import of flour and other cereals (Table 7).

It is still unclear which impact the export restrictions that Russia imposed in the second half of 2010 will have as in 2010 not only wheat but also flour and other cereals are affected by export restrictions such that substitution is less evident.

Grain importing countries reduced import constraints to facilitate grain imports. For example, in May 2008 the Azerbaijan government removed customs on grain and rice imports. In Moldova, the government removed the import duty (5%) on wheat and the 20% VAT on imported grains (FAO, 2011). These measures have similar effects as the export restrictions imposed by exporting countries: in the short-run they are expected to lower domestic prices, while on the world market they lead to higher prices.

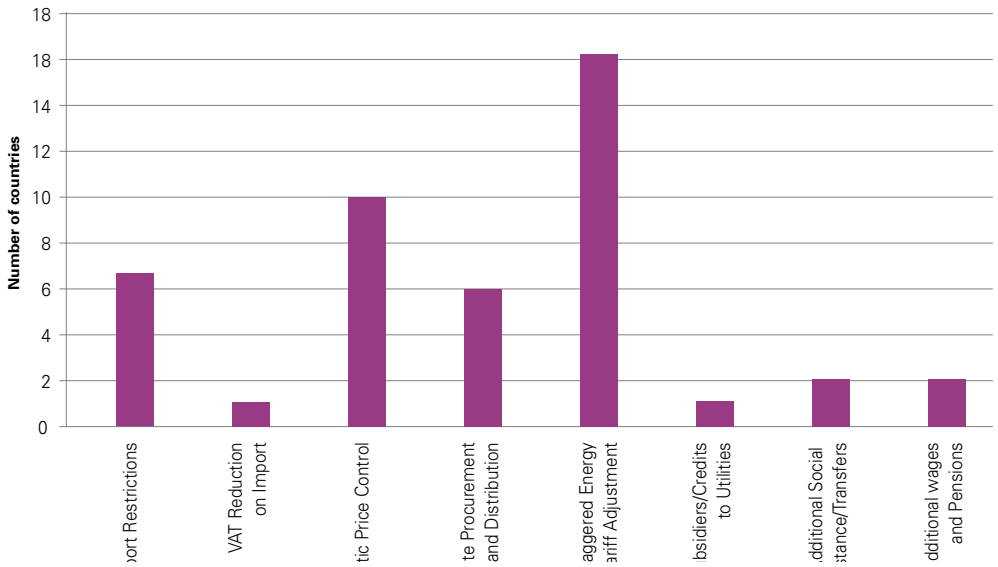
Finally, throughout the region governments intervened also in other ways to minimize food price inflation. An FAO survey found that 67% of the countries in the region took actions to reduce prices for consumers (Figure 11) (FAO, 2009). These findings are confirmed by data from World Bank, which consider a more wider range of policy measures, such as additional social assistance and state procurement and distribution (Figure 15).

Table 7
Evolution of imports in 2007-2008 (% change in import quantities)

	Wheat	Flour of wheat	Total cereals
Armenia	-40%	507%	-34%
Azerbaijan	-10%	2309%	4%
Georgia	-51%	31%	-32%
Kyrgyzstan	-27%	70%	-7%
Tajikistan	-9%	9%	5%

Source: FAOstat 2011

Figure 15
Policy actions to address high food prices and energy prices in Eastern Europe and Central Asia



* Note that in addition to policy actions in response to increasing food prices, these figures also include actions taken in response to increasing energy prices.
Source: World Bank (2011)

For example, in Ukraine, the government put mark-up limits on flour prices and retail price limits on the bread price (OECD, 2009). In 2008, the Russian government implemented price controls on the prices of primary products, such as bread, milk, sunflower oil and eggs (OECD, 2009). In Georgia, the Tbilisi municipality has opened groceries giving a 20% discount on basic products for vulnerable households (World Bank, 2011). In Kyrgyzstan, the government sold bread and other primary products at lower prices to the poor (Suiumbaeva, 2009). In Uzbekistan, the government is keeping prices low by selling more flour from state resources (World Bank, 2011).

4. Agricultural production and trade in the transition region

The agricultural sector in all countries in the region has been affected by the transition to a more market-orientated economy in the beginning of the 1990s. The liberalization of the sector caused dramatic changes in agricultural output and productivity, which had a long lasting effect on the sector. Therefore, it is impossible to analyze the potential role that the region can have in increasing the world food production, without giving an overview what has happened in the sector in the past decades. We will first discuss the evolution and the current state of agricultural production in the region. Then, we discuss the role of the region in agricultural trade and hence global food security.[9]

4.1 Current situation of agricultural production

In the first years of transition gross agricultural output strongly decreased in all sub-regions (Figure 16). In the poorer countries in Central Asia, such as Kyrgyzstan, Uzbekistan and Turkmenistan, the decline in agricultural output was limited, whereas in the Baltics and the European CIS, agricultural output declined by more than 40%.

Despite differences in the magnitude of the decline of agricultural output, there were also differences in the time until recovery and speed of it between countries. In the Central Asian countries, agricultural output started to increase again at the end of the 1990s and by the mid-2000s agricultural output exceeded the pre reform level. Later, in beginning of the 2000s, also output levels in the region started to recover such that by the end of the 2000s, agricultural output was approximately 10% below the pre-reform level.

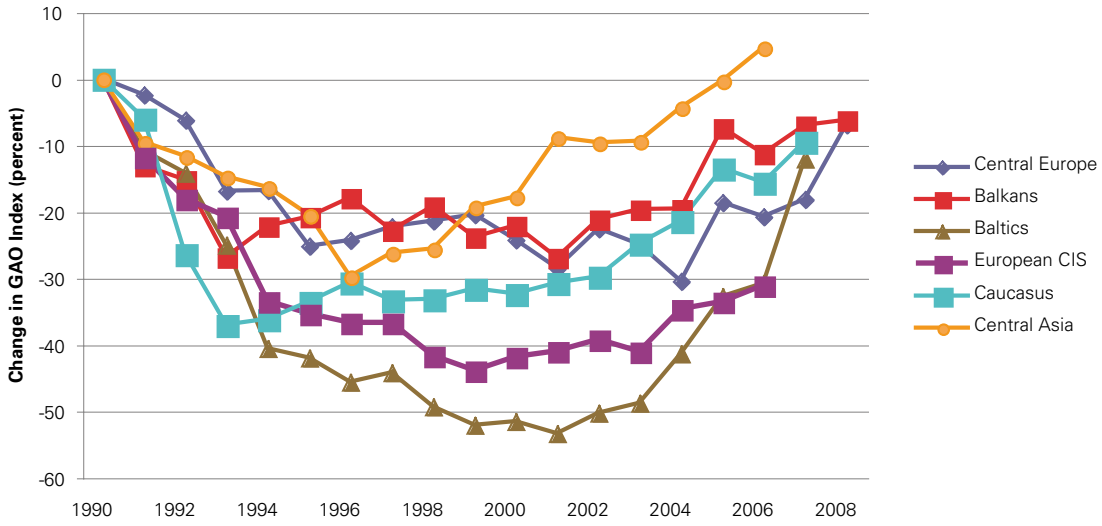
Despite the slow recovery in several of the major producing countries, there are large differences between the different commodities. For example, since the beginning of 1990s, wheat production in the region increased from 108 million tons to 120 million tons and the increase was more spectacular when one considers the increase between the end of the 1990s and now in the main producing countries (Russia, Ukraine and Kazakhstan) (Table 8). This makes the region one of the major food producers in the world and in the period 2007-2009, the region accounts for 21% of the worlds' wheat production (Figure 17).

However, for meat and milk, production did not recover from the substantial decline in the years after transition. While in the period 1992-1994, the region produced 23 million tons of meat, this decreased at the end of 1990s to 17 million tons and is currently 19 million tons (Table 9). This is substantially lower than other major agricultural producers, such as China, the EU15 and the USA (Figure 18). The same findings hold for dairy production in the region: in the period 1992-1994, the region produced 115 million tons of milk, this decreased to 93 million tons at the end of the 1990s and 99 million tons in the period 2007-2009 (Table 10). Nevertheless, the region still accounts for 14% of the worlds' milk production, compared to 18% in the EU15 and 12% in the USA (Figure 19).

However, in this context it is important that emphasize that the decline in meat and milk production is not necessary a negative evolution. One should keep in mind that the level and composition of agricultural output in the beginning of 1990s was reflecting the pre-reform situation, which was in general not based on the comparative advantage of the region, but on production allocations set by the central government. Therefore, it is important to keep in mind that this evolution does not necessary indicates that there are constraints for meat and milk production in the region, but may mainly reflect a shift towards the

9 In order to increase the clarity of the figures, we distinguish different sub-regions within the transition region: the Central Europe (Czech Republic, Hungary, Poland and Slovakia), the Baltics (Estonia, Latvia and Lithuania), the Balkans (Bulgaria, Romania, Slovenia), the Western Balkans (Albania, Bosnia and Herzegovina, Croatia, FYR Macedonia, Kosovo and Serbia), the European CIS (Belarus, Moldova, Russia and Ukraine), the Caucasus (Armenia, Azerbaijan, Georgia) and Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan).

Figure 16
Evolution of gross agricultural output (% change)



Source: National Statistics and FAOstat

Table 8
Wheat production (three-year average in million tons)

	1992-1994	1995-1997	1998-2000	2001-2003	2004-2006	2007-2009
European CIS	60,00	53,64	44,55	59,87	63,60	79,34
of which Russia	40,61	36,43	30,82	43,90	46,01	58,29
Ukraine	18,40	16,07	12,91	15,17	16,72	20,24
Caucasus	1,14	1,11	1,30	2,06	1,91	1,99
Central Asia	15,43	12,29	14,90	20,86	21,83	24,97
of which Kazakhstan	12,97	7,71	8,35	12,31	11,53	15,35
Central Europe	16,81	17,84	18,45	18,65	18,99	18,65
Balkans	8,49	9,97	8,65	8,93	8,02	8,81
Baltics	1,13	1,03	1,05	1,33	1,52	1,49
Western Balkans	4,57	4,97	4,29	4,18	4,25	4,41
Argentina	10,38	13,58	14,74	14,18	14,51	10,86
Australia	13,39	19,81	22,99	20,19	19,30	18,88
Canada	26,68	26,36	25,85	19,88	25,27	25,06
China	102,43	112,02	107,75	90,22	99,29	112,24
EU15	81,94	89,44	97,66	91,28	100,18	99,56
India	57,58	65,74	71,33	69,40	70,05	78,35
USA	65,18	62,97	64,18	53,50	55,05	61,38

Source: FAOstat 2011

Table 9
Meat production (three-year average in million tons)

	1992-1994	1995-1997	1998-2000	2001-2003	2004-2006	2007-2009
European CIS	11,52	8,19	6,92	7,03	7,48	9,02
of which Russia	7,53	5,33	4,49	4,70	5,05	6,15
Ukraine	2,96	2,09	1,69	1,63	1,64	1,91
Caucasus	0,26	0,25	0,26	0,28	0,31	0,30
Central Asia	2,13	1,67	1,49	1,63	1,86	2,05
of which Kazakhstan	1,26	0,85	0,63	0,67	0,77	0,87
Central Europe	5,19	5,13	5,23	5,28	5,22	5,11
Balkans	1,95	1,69	1,56	1,37	1,20	1,27
Baltics	0,58	0,35	0,32	0,30	0,38	0,36
Western Balkans	1,18	1,27	1,21	1,13	1,14	1,17
Argentina	3,83	3,87	3,98	3,72	4,35	4,44
Australia	3,30	3,28	3,65	3,84	3,88	4,12
Canada	2,92	3,19	3,82	4,23	4,54	4,46
China	40,56	50,34	60,44	64,49	70,60	74,38
EU15	33,63	34,67	36,33	36,15	35,71	36,55
India	3,75	3,86	3,96	4,07	4,21	4,35
USA	31,62	34,39	36,95	38,43	39,63	41,97

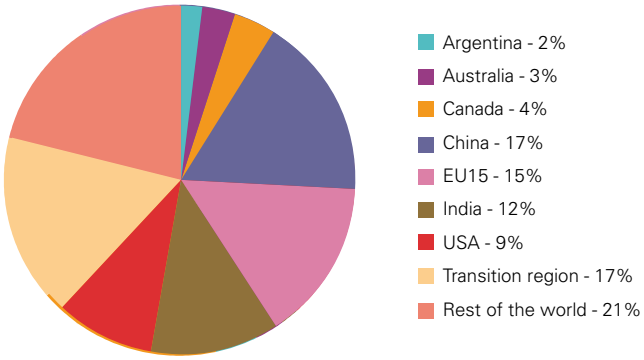
Source: FAOstat 2011

Table 10
Milk production (three-year average in million tons)

	1992-1994	1995-1997	1998-2000	2001-2003	2004-2006	2007-2009
European CIS	70,52	57,83	51,28	52,35	51,37	51,05
of which Russia	45,31	36,42	32,61	33,26	31,59	32,36
Ukraine	18,54	15,62	13,26	13,74	13,57	11,88
Caucasus	1,61	1,82	2,08	2,35	2,57	2,68
Central Asia	11,11	9,23	9,31	10,90	12,51	13,85
of which Kazakhstan	5,38	3,86	3,54	4,12	4,74	5,19
Central Europe	17,45	16,02	16,21	15,81	15,81	16,18
Balkans	5,84	6,49	6,41	6,45	7,45	7,37
Baltics	4,18	3,53	3,31	3,22	3,34	3,42
Western Balkans	3,85	4,20	4,33	4,34	4,66	4,84
Argentina	7,34	9,09	10,20	8,92	9,50	10,22
Australia	7,61	8,92	10,15	10,72	10,10	9,40
Canada	7,63	7,97	8,18	7,93	7,92	8,17
China	8,30	9,91	11,38	17,91	31,84	40,19
EU15	124,83	126,02	126,58	126,31	124,09	123,82
India	58,89	68,20	77,34	84,95	95,34	107,44
USA	68,81	70,37	73,75	76,47	80,08	85,40

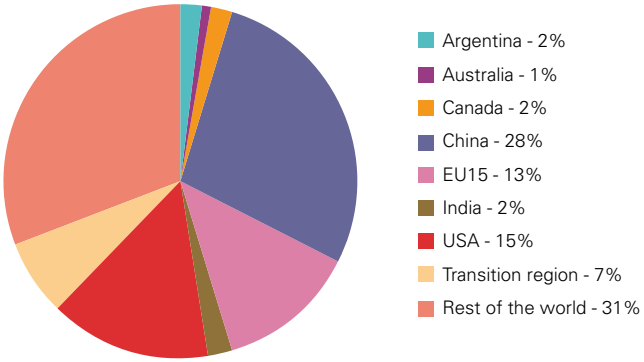
Source: FAOstat 2011

Figure 17
World wheat production (based on average over the period 2007-2009)



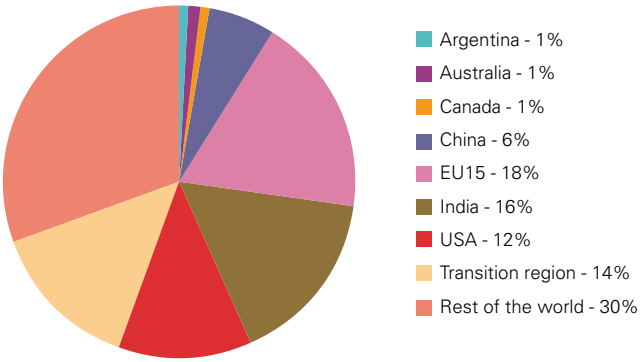
Source: FAOstat

Figure 18
World meat production (based on average over the period 2007-2009)



Source: FAOstat 2011

Figure 19
World milk production (based on average over the period 2007-2009)



Source: FAOstat 2011

comparative advantage of the region (Liefert, 2002; Liefert et al. 2010)[10].

4.2 Role of the transition region in agricultural trade

The region represents only a limited share in the global agricultural trade. It only represents 8% of the world imports in value and 9% of the world exports. This is remarkable lower than the EU15 and the USA, who represent respectively 39% and 8% in the global import value and 41% and 11% in the global export value of agricultural trade.

However, these aggregate data hide important differences between commodities. For specific commodities, in particular wheat, the region is a major player on the international market. The region represents 24% of global wheat exports, which is close to the share of the EU15 or the USA (both 22%) (Figure 19). Within the region, the major wheat exporting countries are Kazakhstan, Russia and Ukraine, which account for almost all exports (Table 11). In these three countries, exports have increased substantially compared to the beginning of the 1990s. Figure 20 shows that exports are more volatile compared than in the other major grain exporting countries, such as the EU or USA. This volatility in exports is an important constraint for the region to contribute to global food security as the importing countries cannot rely on a stable level of imports.

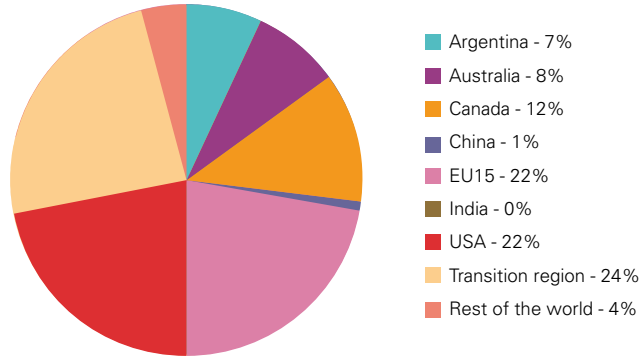
10 In the early 1970s, the Soviet government began to expand its livestock sector using large budget subsidies to producers and consumers. When in the 1990s, subsidies were eliminated and the CIS countries were integrated into the world markets, it became clear that these countries were not cost-competitive in livestock production, and that, in particular, Russia had a comparative disadvantage in the livestock sector. The contraction of the livestock sector during transition is one of the reasons why Kazakhstan, Ukraine and Russia moved from an import to an export position in grain.

Table 11
Wheat export in the period 1992-2008 ('000 tons)

	1992-1994	1995-1997	1998-2000	2001-2003	2004-2006	2007-2008
European CIS	1237	1680	3624	10798	12920	18408
of which Russia	321	439	1048	6764	8491	13590
Ukraine	912	1239	2547	4024	4428	4810
Caucasus	4	8	20	68	77	47
Central Asia	3272	2687	3912	4507	4222	7841
of which Kazakhstan	3266	2651	3877	4497	4091	7825
Central Europe	1122	2431	2008	2252	3244	3474
Balkans	162	1216	1243	924	1435	2141
Baltics	46	76	199	561	812	1480
Western Balkans	251	310	242	457	234	662
Argentina	5953	6900	10636	8940	10136	10516
Australia	10203	14064	16807	13554	16142	11771
Canada	21326	17681	17771	14152	16177	16955
China	283	577	292	1512	1211	1878
EU15	36963	33396	35215	32735	31527	32133
India	46	1155	418	4164	1031	30
USA	34819	30757	28849	25833	27676	31953

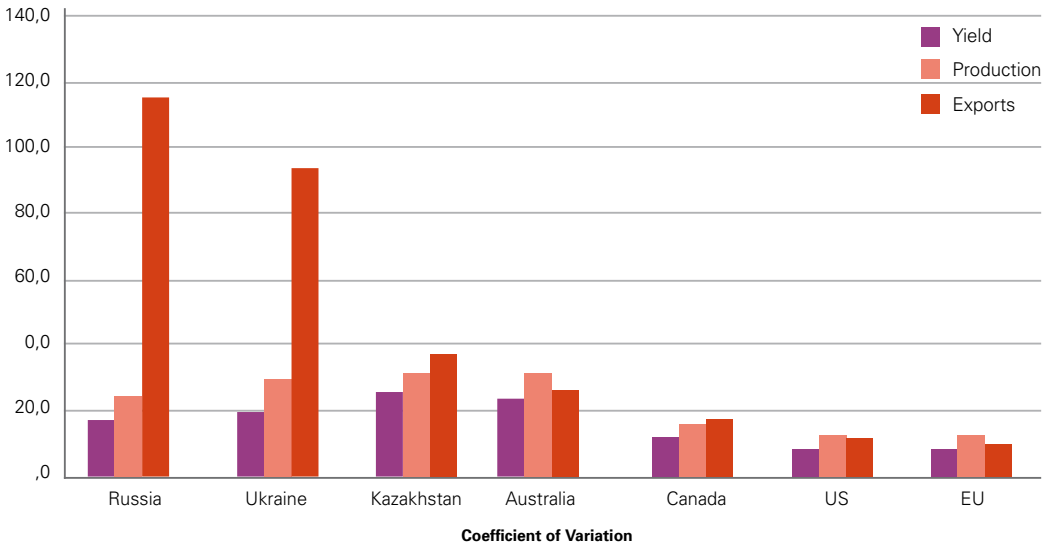
Source:FAOstat 2011

Figure 20
World wheat exports (based on average over the period 2007-2009)



Source: FAOstat 2011

Figure 21
Volatility of wheat yield, production and exports



Source: Sedik (2011)

5. Potential of the region

FAO/EBRD and IKAR have calculated that cereal production in the three major grain producing countries in the region (Kazakhstan, Russia and Ukraine) could increase up to 230 million tons (or an increase of 80% compared to the 2004-2006 production level) (Table 12).[11] This corresponds to a total increase of 102 million tons of which 15 million tons in Kazakhstan (107%), 49 million tons in Russia (64%) and 38 million tons in Ukraine (103%).

These estimates are based on the potential for an increase in land use and an increase in land productivity. First, they estimate that 13 million hectares of abandoned land could be returned to production and devoted to grain production.

Second, they estimate that grain yields in Kazakhstan could reach the same level as in Australia as both regions have similar dry climates. Grain yields in Russia and Ukraine could reach levels similar to Canada and France, respectively, although yields may be lower because of lower precipitation in Russia and Ukraine (based on available FAO Aquastat precipitation information). The estimates assume that there will be no changes in the crop distribution (oilseeds vs. grain and other crops) for land that is already cultivated. As Table 12 indicates, most of the potential production increase could come from an increase in grain yields (52% increase). Land use could increase with 18%. In combination, these increases would yield an aggregate potential increase in production of 80% for the three countries.

11 However, given that one of the main drivers behind the large increase of grain exports has been a lower demand for fodder, it is unclear whether this increase can be obtained if Russia continues its plans to expand its livestock sector, which will trigger an increased demand for fodder. In addition, it is still unclear how feed efficiency will evolve over time (comment by FAO reviewer David Sedik).

Table 12
Estimated Maximum Cereals Potential (IKAR, EBRD and FAO)

	Maximal potential	Difference between max. potential and 2004-2006	Change (%)
Area Harvested (mio ha)	82	13	18%
Kazakhstan	19	4	27%
Russia	47	6	15%
Ukraine	17	3	21%
Yields (ton/ha)	2,8	0,96	52%
Kazakhstan	1,6	0,58	59%
Russia	2,7	0,82	44%
Ukraine	4,5	1,85	71%
Production (mio ton)	230	102	80%
Kazakhstan	29	15	107%
Russia	126	49	64%
Ukraine	75	38	103%

Source:FAOstat 2011

In the next sections, we discuss land use and productivity in the region in greater detail and discuss the existing constraints to increase them. Finally, we also discuss the role of investments can play in play increasing productivity.

5.1 Land use

Since the transition, agricultural land use substantially decreased in the major grain producing countries, such as Kazakhstan, Russia and Ukraine. In these countries, arable land use decreased by respectively 35%, 8% and 3% . Overall, these findings on arable land use suggest that there is a scope to increase arable land use in the region, in particular if agricultural prices remain high. While it is difficult to compare the current situation with the situation at the start of transition as this reflects inefficiencies in land use during communism, experts have estimated that of the 23 million hectares of the abandoned arable land in Russia, Ukraine and Kazakhstan, between 11 and 13 million hectares of non-marginal land, could be returned to production.

5.2 Land productivity

In the first years of transition, agricultural yields of the major arable productions in the region decreased strongly in the different sub-regions. For example, between 1990 and 1999, grain yields in the European CIS decreased by more than 35% (Figure 22).

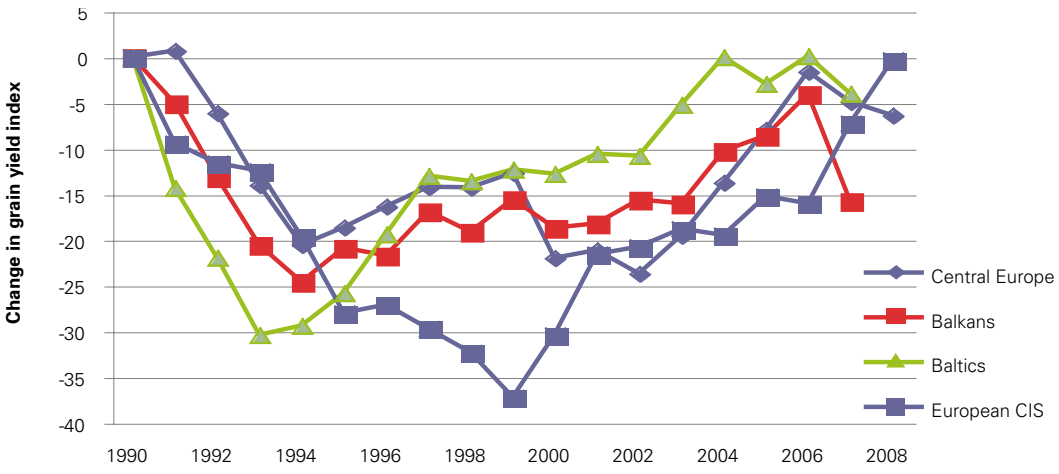
At the end of 1990s, grain yields reached a low in the major grain producing countries. However, since the beginning of the 2000s, yields started to increase and currently they are at approximately the pre-reform level in all regions.

Despite the recent increase in yield, wheat yields in the region are still substantially below yields in other major grain producing countries in the world (Figure 23). For example, if one compares regions with a similar climate (such as Kazakhstan and Australia), average wheat yields in Kazakhstan were 1,15 ton/ha in the period 2007-2009, while it was 1,42 ton/ha in Australia (or a difference of 23%). Similarly, when comparing Russia (2,29 ton/ha) and Canada (2,65 ton/ha), we find a difference of 16%. Even more striking is the difference between Ukraine (3,03 ton/ha) and the EU15 (6,13 ton/ha) which is slightly more than 100%.

This simple comparison suggests that an increase in yields is possible in the region. A part of this change can happen through increased investment and better management and technology. Such yield increase will depend, of course, on incentives to invest, which in turn depends on a variety of market (prices), policy, infrastructure, and institutional conditions.

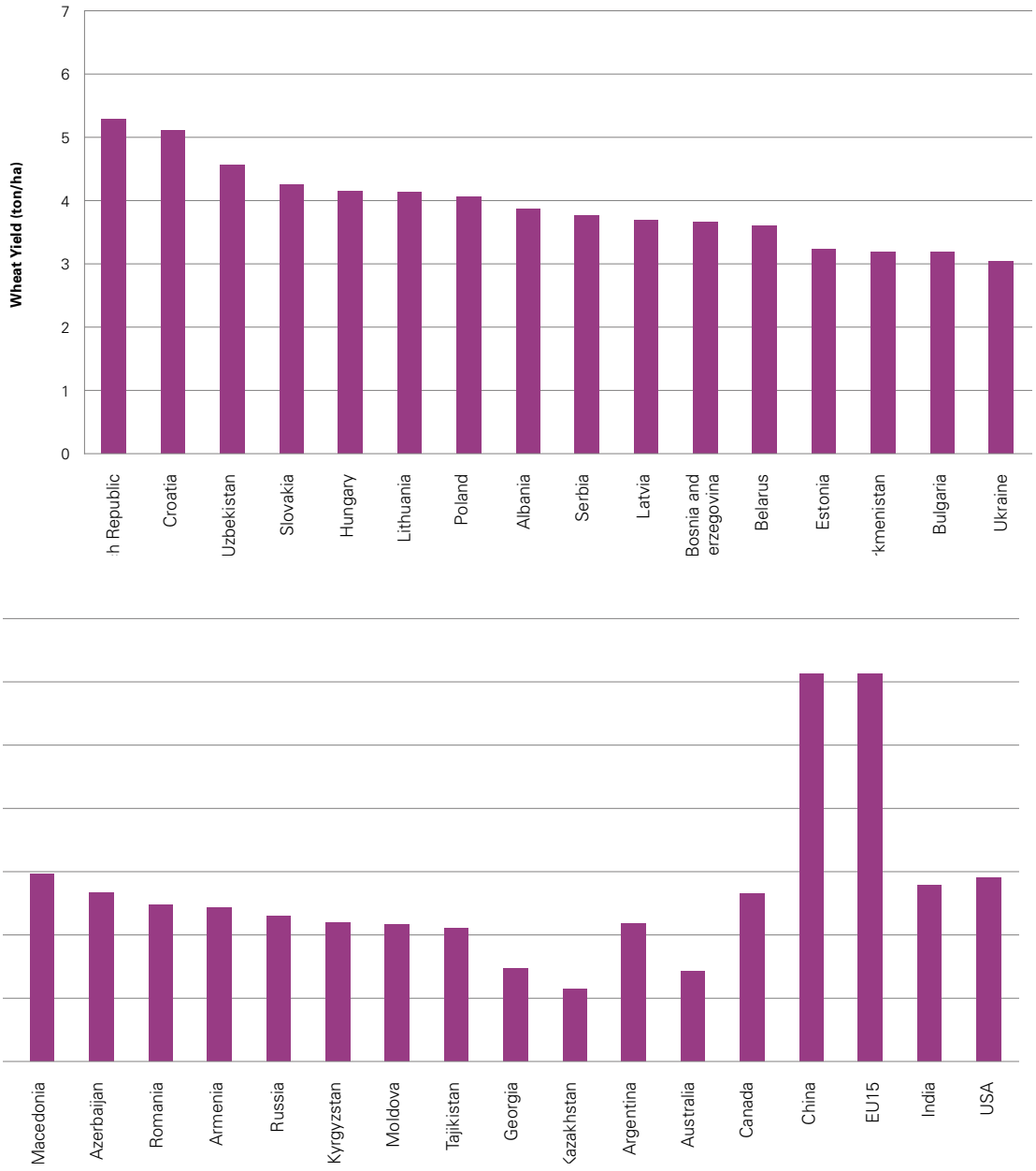
Climate change is also likely to affect yields. One important element is water availability. The World Bank expects that in the north of the transition region (Baltic States, Russia and Kazakhstan)

Figure 22
Evolution of grain yields in all countries in the region(index, 1990=0)



Note: The grain yield index is based on a three-year moving average of grain yields.
Source: FAOstat 2011

Figure 23
Wheat yield (ton/ha)



Note: Wheat yields are based on a three-year average over the period 2007-2009.
Source: FAOstat 2011

water availability will increase (5-15%), while in Uzbekistan and Turkmenistan, two countries which face already serious constraints related to water availability for agricultural purposes, the average annual runoff of water will even decrease as a result of climate change (-5- -30%). Also in the Western Balkans, Romania and Bulgaria, average annual runoff is expected to decline in the future (-5- -30%) (Figure 24).

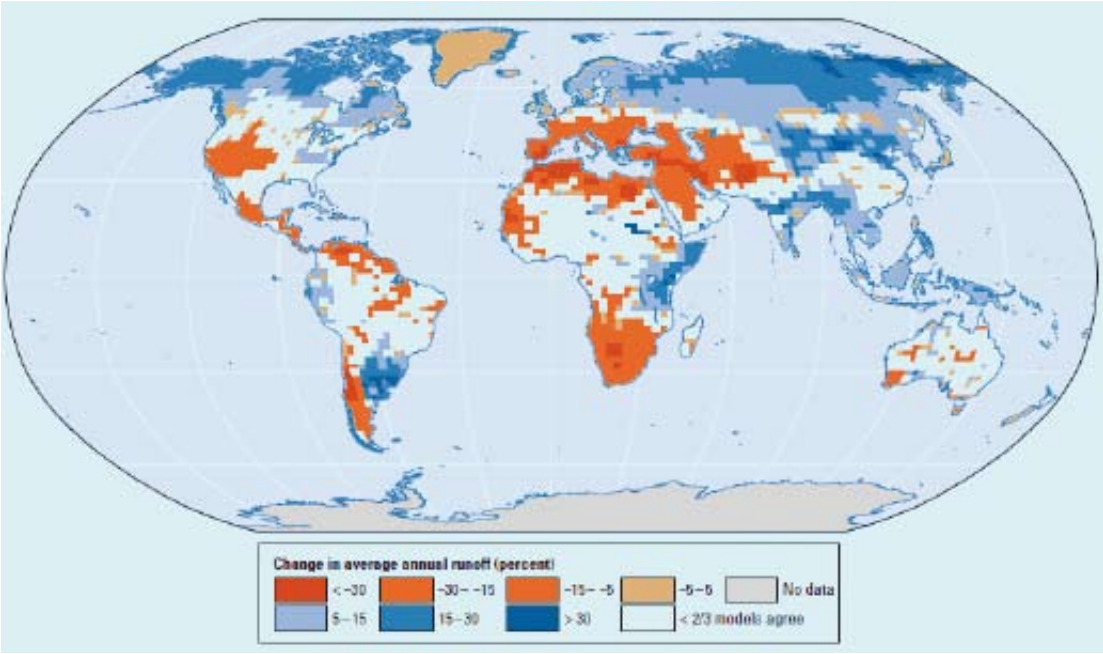
In combination with a warmer climate, these changes in water availability will affect agricultural yields. It is expected that by 2050, agricultural yields in the north of the transition region will increase (Figure 25). In Central Europe, the Baltic states, Belarus and Russia yields are expected to increase by approximately 20% between now and 2050. Also in Kazakhstan yields are expected to increase (approximately 5%). However, in the southern countries yields are expected to decrease. In Ukraine, the third large producer of grain, yields are expected to decrease as a result of climate change (approximately -15%). Similar figures are found for the Western Balkans, Bulgaria and Romania and also in Uzbekistan (-5%) and Turkmenistan (-10%), yields are expected to decrease.
However, given the fact that Russia, by far the largest of wheat producer in region, is expected to experience a substantial increase in yield as a result of climate change, the aggregate impact of climate change on production will be positive in the transition region. However it is important to realize that the aggregate increase coincides with disparities within the region. Climate change is expected to reduce water availability and yields in the poorer, southern Central Asian countries and the Western Balkans, while the richer European CIS and Central European countries are expected to benefit from climate change in terms of agricultural yields. Hence, it is expected that climate change is likely to aggravate the disparities that already exist between countries in the region.

5.3 Labor productivity

In addition, to land productivity, there is also potential for a substantial improvement of labor productivity in the region.

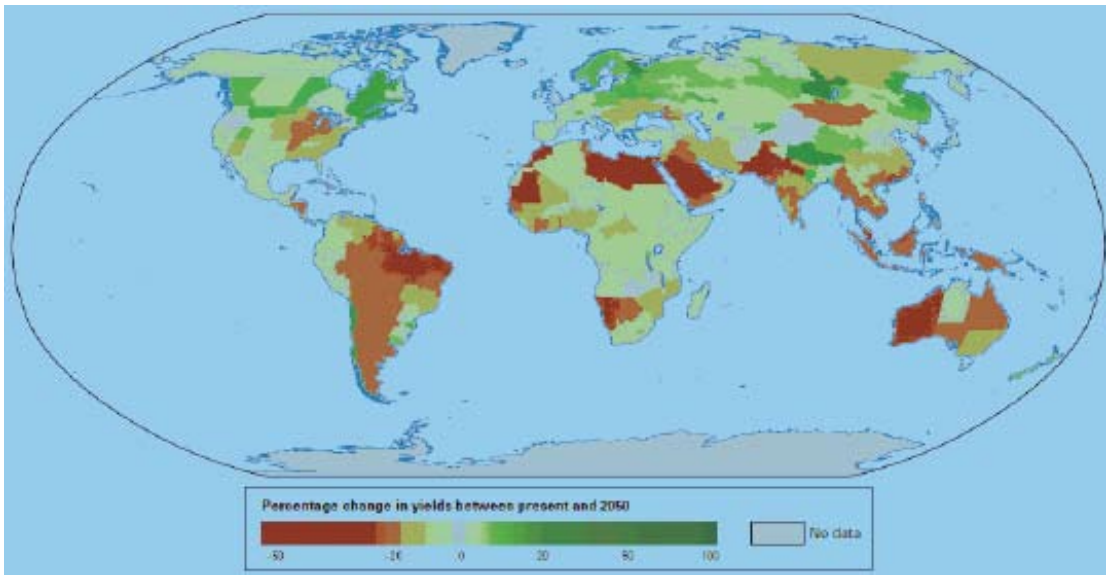
Labor productivity is an important indicator of farm incomes and thus of rural poverty. Overall, ALP declined in the first years of transition, except for Central Europe (Figure 26). In Central Europe, a rapid decrease in agricultural employment has been the main driver behind the increase in ALP. Later, in the beginning of the 2000s, ALP

Figure 24
Expected change in water availability as a consequence of climate change



Source: World Bank (2010)

Figure 25
Expected change in yields as a consequence of climate change e



Source: World Bank (2010)

also rapidly increased in the Balkans and the Baltic States. In the CIS region (European CIS, Transcaucasia and Central Asia) the growth in ALP is still substantially lower as the outflow of agricultural labor is still rather limited.

In fact, agricultural employment increased during the first years of transition in several countries in the region, such as Armenia, Kyrgyzstan and Uzbekistan. In these countries, agriculture provided a buffer role during transition, both in terms of labor allocation and in terms of food security (Seeth et al. 1998). More recently, agricultural employment started to decrease in most countries in the region. However, in some of the poorest countries, such as Tajikistan and Turkmenistan, agricultural employment is still increasing.

5.4 Role of investments

Foreign direct investments

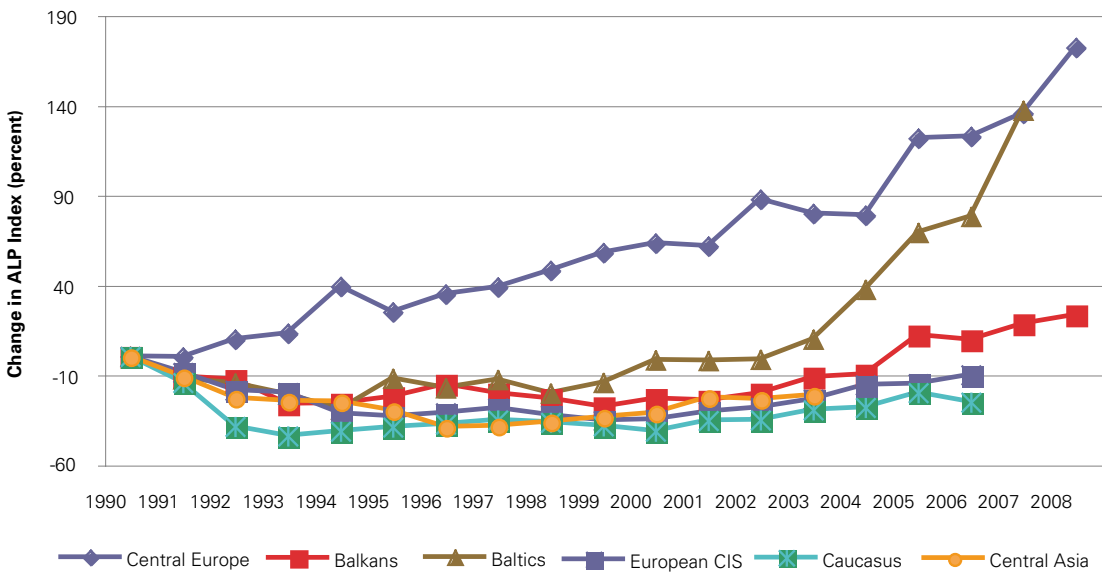
An important driver behind productivity growth in the Central Europe and the Balkan countries and has been FDI. While FDI in the agricultural sector is relatively limited, FDI in the food industry (manufacturing sector) is more important (Table 13). For example, in 2007, FDI in the Russian agricultural sector was only 624 million EUR, while FDI in the food industry was six times higher (3744 million EUR).[12] In addition, we find that FDI in the agricultural sector in Russia is higher than in the more advanced transition countries in Eastern Europe and also in terms of FDI in the food industry Russia seems attractive for foreign investors as only Poland managed to attract more FDI in the food industry.

However, when we take in account the size of the country, we find that both Russia and Ukraine are still lagging behind compared to the more advanced transition countries in Eastern Europe. For example, in Latvia, the European country that attracted the least FDI in the food industry, FDI per capita was still approximately three times higher than in Russia and Ukraine. Compared to the Czech Republic, the European country that managed to attract most FDI in the food industry, FDI per capita in the Russian and Ukraine food industry, was respectively nine and ten times lower. Compared to the Western Balkans, FDI in Russia and Ukraine is higher than in Albania and Serbia, but substantially lower than in Croatia, Bosnia and Herzegovina and FYR Macedonia.

Investments in the agro-food industry in the more economic advanced transition countries,

12 There exists only limited data on FDI in the different sectors of the economy and therefore we cannot provide information on all CIS countries.

Figure 26
Agricultural Labor Productivity (ALP) (index, 1990=0)



Source: National statistics, ILO 2011, Asian Development Bank 2011, FAOstat 2011

such as the new member states of the EU, have been one of the, 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 have been triggered by FDI in the agro-processing industry, but horizontal spillovers have been arisen as domestic companies rapidly started copying 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 Gow et al., 2000; Dries et al., 2009; Van Herck, et al. 2011).

In order to attract more FDI, some countries, such as Tajikistan, Russia, Uzbekistan and Ukraine, have lowered the corporate tax.[13] In principle, this should boost both domestic and foreign investment, but one might expect that the impact of a fiscal measure is limited as long as the countries do not first tackle their institutional problems, which are expected to have a more important impact on investments than fiscal measures. A survey in four countries in the region (Ukraine, Moldova, Kyrgyzstan and Georgia) by Kadina and Jakubiak (2008) has indicated that not the fiscal climate, but the volatility of the political and economic environment, ambiguities in the legal system and corruption are the most important constraints for FDI in the region (Table 14). Additionally, they also mention a lack of infrastructure and low skill levels of workers as important constraints for increasing their investments in the region.

Domestic investments

Over the past two decades, there have been large changes in capital use in the agricultural sector and currently capital use is still substantial lower than in the communist era. For example, after 15 years of transition, tractor use in Russia decreased more than 60% and in Kazakhstan, it even decreased by 79% (Table 15). In addition to the decrease in the number of tractors, it is important to note that the tractors that are in use are old. In 2006, the proportion of tractors older than ten years was for example 86% in Russia, 80% in Kazakhstan and 80% in Tajikistan (World Bank, 2009c).

Fertilizer use followed a similar pattern as tractor use, but the decline was even more dramatically. In the first four years of transition, fertilizer use started to decline, but in the following years

13 In Tajikistan the government cut the corporate income tax rate from 25% to 15%, the Russian government reduced the corporate tax (from 24% to 20%) and also in Uzbekistan and Ukraine tax rates are reduced (Brownbridge and Canagarajah, 2009).

Table 13
Foreign Direct Investment (FDI) in the agricultural sector and food industry in 2007 (inward stock)

	Agriculture (mio EUR)	Food industry (mio EUR)	Agro-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 obtained World Investment Report (2009)

Table 14
Assessments of constraints faced by foreign investors)

	Ukraine	Moldova	Kyrgyzstan	Georgia
Volatility of the political environment	3,4	3,3	4,5	2,8
Uncertainty about the 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

Note: A higher number indicates that a given impediment is more important. Numbers are simple averages.
Source: Kudina and Jakubiak (2008)

Table 15
Capital use (index, 1990=100)

	Tractors				Fertilizer			
	1995	2000	2005	2008	1995	2000	2005	2008
Armenia	119	117	128	131	11	11	11	9
Azerbaijan	90	91	52	72	na	na	na	na
Belarus	92	58	43	39	25	38	39	55
Georgia	71	73	75	na	22	30	19	13
Kazakhstan	78	23	19	na	16	6	8	6
Kyrgyzstan	99	102	95	97	na	na	na	na
Moldova	93	78	73	67	42	2	4	6
Russia	82	58	37	28	11	9	8	11
Tajikistan	84	84	69	55	30	4	13	10*
Turkmenistan	80	54	na	na	40	32	na	na
Ukraine	92	62	69	66	24	12	17	33
Uzbekistan	94	94	na	na	34	53	na	na

Source: FAOstat 2011

Table 16
Domestic Credit for the Economy and for Agriculture, 2005

	Domestic Credit to Private Sector as % GDP	Agricultural GDP as % Total GDP	Agricultural Credit as % Total Credit	Agricultural Credit as % Agricultural Value Added	Financial Reform Indicator
Armenia*	7,0	20,8	25,7	8,5	2,7
Azerbaijan	9,5	9,9	4,4	4,6	2,3
Belarus	15,9	9,8	13,0	24,8	1,7
Georgia	14,8	16,7	1,6	1,6	2,7
Kazakhstan	35,7	6,8	5,0	27,6	3,0
Kyrgyzstan	8,0	31,9	4,4	1,2	2,3
Moldova	23,6	19,5	23,0	33,8	2,7
Russia	25,7	5,6	na	na	2,3
Tajikistan	17,2	24,0	na	na	2,0
Ukraine	32,2	10,4	6,5	22,9	2,7
Uzbekistan**	20,7	28,0	15,3	13,4	1,7

*2004, **2006
Source: World Bank (2009b) and EBRD (for the financial reform indicator)

the decline accelerated and by the mid-2000s fertilizer use fell to approximately 20% of the pre-reform fertilizer use. In some countries, such as Kazakhstan or Armenia, it declined to less than 10% of the pre-reform fertilizer use.

The cost and availability of agricultural credit are important determinants for making investments, especially for investments in machinery. In general, access to credit will largely depend on the state of reform in the financial sector (Table 16). A small proportion of domestic credit in the private sector is allocated to the agricultural sector, but in general this is in line with the share of agriculture in GDP. There are substantial differences between countries: while in Georgia, Azerbaijan and Kyrgyzstan less than 5% of total credit supply was used in the agricultural sector, this is more than 20% in Armenia and Moldova.

6. Conclusions and policy recommendations

In this last section, we provide policy recommendations which include (i) overarching policy messages/directions for governments and IFIs, including EBRD in relation to food security; (ii) broad directions for IFIs, including EBRD, to support their countries of operation in tackling the issue of food security; (iii) key roles that the private sector can play to unleash the region's agricultural potential.

To enhance food security in the region and to stimulate the region's contribution to global food security, it is crucial for the countries in the region to improve the functioning of the input markets (land, labor and capital) and the output market. However, in addition, it is to have policies in place to support those who do not, or not sufficiently, benefit from market developments. Several policy strategies are important for this, including:

1. Promoting overall economic growth and development
2. Enhancing safety nets for food insecure and vulnerable households
3. Improving the policy environment (including reducing restrictive trade policies and enhancing institutional reforms)
4. Promoting investment in the agricultural/ food industry
5. Promoting public investment in infrastructure and education

6.1 Promote overall economic growth and development

A key element to reduce poverty, improve food security and enhance agricultural productivity is an increase in economic growth. Since the beginning of the 2000s, rapid economic growth in the region has caused a large increase in domestic employment and wages. In the poorer countries in the region, increased remittances from migrants, mainly working in the EU and the resource-rich countries in the region, have played an important role. Moreover, in the past years, wages have increased more than food prices.

In addition, economic growth may also improve food security in the region through its impact on agricultural productivity. Growth of the non-agricultural economy will pull surplus labor out the agricultural sector, an evolution which is necessary to increase agricultural productivity and consequently increase agricultural incomes.

6.2 Enhance safety nets for food insecure and vulnerable households

In order to push the poor over the poverty line, social safety nets should be enhanced, especially for food insecure and vulnerable households. Currently, total spending on social assistance averages 1,7% of GDP in the region but there is substantial variation across countries, ranging from 0,5% of GDP in Tajikistan to 2,0 % in Ukraine, which is still substantially lower than in the OECD countries where social spending on average augments to 2,5% of GDP (World Bank, 2009c).

Besides the total spending, also the coverage and the targeting accuracy vary between countries. Coverage rates - the share of households in the poorest quintile of the population reached by social assistance programs - vary between 0 and 80 %. The targeting accuracy of social benefits - the share of benefits going to the poorest quintile of households - is rather poor in the region and in several countries the poorest quintile receives less than a third of the total social benefits.

Hence, in order to ensure that also the poorest individuals, who are often not able to benefit directly from increased employment alternatives and who are, in case they are net buyers of food, the most important victims of high food prices, it will be crucial to increase expenditures on social security nets and improve the targeting and coverage of social benefits in all countries in the region, but especially in the poorest and most food insecure countries.

6.3 Improve the policy environment

In general, reforms in the CIS region have proceeded at a much slower rate than reforms in the Central and Eastern Europe and some countries in the Western Balkan, although there are positive exceptions. Overall, there are still substantial distortions in production, pricing, and marketing of "strategic" products, and the systems of institutions and instruments of planned economies have not yet been fully dismantled in most countries.

In 2009, EBRD noticed that in most countries in the region the reform process slowed down as a result of the financial crisis (EBRD, 2009).[14] Despite the financial difficulties caused by the crisis, it will be important for the governments in the region to continue with the reform process. Economic and institutional reforms in all sectors of the economy, so not only in the agricultural sector, are crucial to create a more stable economic, political, institutional and legal environment, which is crucial not only to attract domestic and foreign investments, but also to encourage the growth of more productive firms. In the agricultural sector, reforms are necessary to increase agricultural productivity and hence also agricultural incomes.

In the context of food security, special attention should be paid to trade policies: since the start of the food crisis in the 2007, the major grain exporting countries have implemented restrictive trade policies, such as export quota, restrictive export taxes and export bans. Such measures have several disadvantages.

First, export restrictions imposed by the major grain exporters have a distortive effect on the world market price and lead to more volatility on the market. Hence, while they may have a positive impact on domestic food security, there are negative externalities for food security in the importing countries. In the CIS region, the grain importing countries (such as Armenia, Azerbaijan, Tajikistan) are expected to be affected by the export restrictions as they are for almost 100% of their wheat and flour imports dependent on Russia, Ukraine and Kazakhstan. However, the first evidence on the impact of the export ban introduced by Russia in the beginning of 2008 shows that the impact on food supply in the importing countries has been limited as importers switch from wheat imports to flour and other cereal imports for which there was no export ban. In 2010, the effects on aggregate food supply may be different as the export restrictions introduced in September 2010 include an export ban on wheat, flour and other cereals such that substitution is less straightforward.

Second, the introduction of export restrictions may benefit domestic consumers, but does not allow farmers to benefit from high food prices. In the short run, higher food prices increase the income of these farmers. In the long run, high food prices are not only be expected to increase agricultural incomes, but also to increase investments in the agricultural sector. This will positively affect productivity, as well as produce some indirect effects on non-agricultural rural income (e.g. trade and services). The size of this multiplier effect will of course depend on the share of the increased agricultural rents ultimately invested and spent in rural areas. In Ukraine, Von Cramon and Raiser (2006) calculated that with an estimated reduction in farm gate prices of approximately USD25/ton due to export measures during the 2006/2007 marketing year has led to cumulative revenue losses in wheat production alone of USD350 million.

Third, the impact of export restrictions is found to have only a limited impact on the domestic prices. For example, in Russia, the major grain exporter in the region, real food and retail prices increased between 2003 and 2009 by approximately 100%. This is similar to the price increase in Tajikistan and even substantially higher than in Armenia (25%) or Georgia (50%), which import more than 40% of their domestic grain consumption. In Ukraine, Von Cramon and Raiser (2006) find although wheat prices have been constant, prices for flour and bread increased since the country imposed restrictive quota on wheat exports at the of 2007. In fact, they find that the main beneficiaries of the quota system are flour millers and animal feed producers.

14 This slowdown in reforms can be explained by at least three reasons. First, most governments in the region have been "fire fighting" in order to mitigate the worst effects of the crisis and had no time to spend on more fundamental reforms. Second, reforms are usually accompanied with short term pain in order to achieve long term benefit. In an economic harsh period such reforms become politically more difficult to implement. Third, some reforms, such as privatization, require private investors, which are scarce and will offer a lower price in current environment (Swinnen and Van Herck, 2010).

6.4 Promote investment in the agricultural/ food industry

Investments in the agro-food industry in the more economic advanced transition countries, such as in Central and Eastern Europe and some countries in the Western Balkan, have been one of the, if not the, main engine behind productivity growth, quality improvements, and enhanced competitiveness through the introduction of vertical coordination mechanisms in the supply chain.

In order to attract more investments, some countries, such as Tajikistan, Russia, Uzbekistan and Ukraine, have lowered corporate taxes. Offering fiscal stimuli is a way to attract (foreign) investments. However, such measures put the government budget under pressure and are likely to have less positive effects as when the governments would take measures to improve the political, institutional and regulatory climate in their countries (see section 6.3). Additionally, in order to make the region more attractive for investments in the agro-food industry, the governments should invest in rural infrastructure, education and R&D in the agricultural sector (section 6.5).

Further, in order to encourage investments in fixed assets (e.g. tractors), but also in working capital (e.g. fertilizer), the supply of (rural) credit to farmers should be facilitated.

First, this can happen through the financial sector. The most substantial improvements will come from strengthening of the overall financial sector, but in addition there are also specific policy recommendations with respect to rural credit.

An important constraint for the agro-food industry is the lack of collateral as in most countries, the existing farming material and buildings are old and there are unclear property rights on land or land markets do not function such that land cannot be sold (OECD, 2011). In order to address these problems, rural credit suppliers could substitute the conventional credit requirements, such as land or buildings, with alternative securities, such as future cash flows from the sales of commodities. In this perspective, vertical coordination can play an important role as a contract with a down-stream partner (processing company, trader or retailer) can serve as a proof of future sales. In addition, the down-stream partner can also provide a third party guarantee for the loan, which could also facilitate farmers access to credit. For example, in a recent initiative EBRD supported the Serbian foreign-owned bank, Société Générale Serbia, in extending financing to local agribusinesses using warehouse receipts as collateral.

Second, in addition to credit provision through the traditional channels (financial institutions), governments should also encourage credit provision through more innovative channels, such as vertical coordination mechanisms. Private investors can play a leading role in rural credit provision through interlinked contracts. This can include the provision of working capital, such as high quality seeds and fertilizer, but also assistance in obtaining fixed assets, e.g. by providing bank loan guarantees. Case study evidence on the use of assistance programs in five CIS countries (Armenia, Georgia, Moldova, Russia and Ukraine) has shown that they have a significant positive impact on agricultural yields and product quality (Gorton and White, 2007). In order to facilitate the development of these vertical coordination mechanisms, the governments should implement policies that stimulate (foreign) investments in the agro-food industry) and create an institutional and legal climate in which such contract arrangements are possible.

6.5 Enhance public investment in infrastructure and education

A key constraint for growth in rural areas is the poor rural infrastructure. For example, in the Central Asian countries in the Aral Sea Basin, where irrigation is absolutely necessary to ensure the agricultural production, water management institutions have weakened and infrastructure maintenance has in many places come to a standstill since the collapse of the Soviet Union (Bucknall et al., 2003). Many canals, gates and pumps are damaged or bad maintained, which resulted in land salinization and waterlogging. Bucknall et al. (2003) finds that approximately 48% of the irrigated area in Central Asia is affected by salinization, ranging between 12% in Kyrgyzstan and 96% in Turkmenistan. These environmental problems have a substantial negative impact on agricultural productivity, but also create violent tensions in the region.

Investments in public goods, such as irrigation, but also road infrastructure are crucial to guarantee viability in the rural livelihoods. Investments in rural infrastructure have two important effects on the agricultural sector. First, they connect farmers to markets by reducing the transport costs. This will help to integrate smaller farmers in modern supply chains. The investments in the rural infrastructure also constrain farmers in delivering the quality demanded by modern supply chain. For example, in Azerbaijan, regular electricity interruptions constrain the production of food products that need to be cooled (World Bank, 2005). Second, investments in rural infrastructure improve the access of rural labourers to urban areas and attract more off farm employment, including foreign investors. Hereby investments efficiently reduce the over-employment in the agricultural sector and stimulate pro-poor economic growth.

Besides investment in physical capital also investment in human capital can play an important role in increase (agricultural) productivity.

First, overall level of education is relatively low and business surveys on the constraints of doing business show that compared to the first decade of transition the endowments of infrastructure and skilled workers have been deteriorating largely (EBRD, 2009; Kadina and Jakubiak, 2008). This is also reflected in relatively low public expenditures on education, especially in the poorest countries in the region. For example, in Tajikistan, the government spend only 2,8% on educational expenditures, while in Poland this is almost 6%. The low level of education of the rural population not only affects agricultural productivity through reduced intersectoral labor mobility (inadequate education reduces employment alternatives in the non-agricultural sector), but also constraints the adoption of new technologies in the agricultural sector.

Second, also investment in agricultural R&D and extension services will be crucial to enhance the human capital within the agricultural sector. Optimally, in an environment where vertical integration plays a more important role, investments in R&D in the agricultural sector are joint private-public investments, which also take in account the demands of private investors. In this perspective also technical assistance to strengthen public standards testing and certification schemes is important to help farmers integrate in modern supply chains, which are generally based on high-quality productions.

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Report No. 6 – October 2011