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The impacts of the global financial and economic crisis on the agro-food sector of Central and Eastern European and Central Asian countries

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Abstract

This paper assesses the impacts of the global financial and economic crisis on the agro-food sector of Central and Eastern European, Caucasus and Central Asian countries on the basis of research conducted in Hungary, Ukraine, Armenia and Kyrgyzstan. The objective of the study was to propose policy options to the Food and Agriculture Organisation of the United Nations and other public authorities which can be applied to lessen the undesirable effects of the current or future crises in the sector. Results of interviews of stakeholders were analysed in the context of primary economic data and sixteen policy recommendations were formulated.

Keywords

financial and economic crisis, agro-food sector, Central and Eastern Europe, the Caucasus and Central Asia

Introduction

This paper assesses the impacts of the global financial and economic crisis, hereinafter 'crisis', on the agro-food sector of Central and Eastern European, Caucasus and Central Asian countries on the basis of research conducted in four representative countries, namely: Hungary, a central European country and a member of the European Union (EU); Ukraine, a large eastern European country occupying a strategic position between the EU and the Russian Federation; Armenia, located in the Caucasus region on the border of eastern Europe and western Asia; and Kyrgyzstan, located in central Asia.

Among developing regions, Eastern Europe and Central Asia has been hit hardest by the global crisis. For several countries, a combination of international support, adjustment programmes, and perhaps even private sector debt restructuring will be needed to avoid large-scale defaults. Growth plummeted from 7.6% in 2007 to 4.7% in 2008, and was projected to be -5.6% in 2009 driven by a collapse in capital inflows, a sharp deterioration in terms of trade, and contraction in both domestic and external demands. The robust domestic demand that supported growth throughout 2007 and through the first three quarters of 2008 began to wane at the height of the crisis in September 2008. In several countries with data available for the first quarter of 2009, output deteriorated further on a year-on-year basis. Economic activity continued to shrink in Hungary (4.7%), Lithuania (13.6%) & Latvia (17.9%), while Romania and Russia recorded negative growth for the first time (6.4% and 9.4%, respectively). Poland, the only economy to show resilience, posted a GDP increase of 1%. See World Bank (2009) for a comprehensive overview of the financial and economic crises in the region.

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Agriculture in Hungary has been losing its share of Gross Domestic Product since the change of regime in 1990 because it has developed at a slower rate than other sectors of the economy. In 2008 agriculture, forestry and fishery produced 3.7% of GDP, while a further 2.3% was contributed by food processing, figures which are close to the data of the developed EU member states. The share of GDP of the agro-food industry together with input manufacturers and different supporting services is estimated at over 8%. In 2008, 174 thousand employees worked in agriculture and 127 thousand people in food processing together representing 7.8% of the active population. In both sectors employment declined by over 10% in five years. There are regions though where the agro-food sector is still one of the major employers. Agricultural and food products account for about 6-8% of Hungarian exports and 4-6% of imports. In 2008 the value of agro-food exports exceeded EUR 5.7 billion, while the value of imports was over EUR 3.8 billion. The surplus in trade is an important contribution to the state fiscal balance. National self sufficiency is assured for most products but, because of the unstable supply chains and the low competitiveness of food processing, imported products have been increasing their share of the Hungarian market since the EU accession in 2004. Due to the favourable weather and high prices agriculture performed well in 2008, but in 2009 a strong correction was expected. According to the first official estimates of the Economic Accounts for Agriculture, agricultural output value was forecast to decrease in 2009 by 19% as a consequence of 9% lower prices and 11% lower volume.

Ukraine's agrarian sector is the only branch that has not worsened its performance during the crisis. According to the State Statistics Committee of Ukraine, aggregate output of agricultural products in Ukraine in all entity categories grew by 3.3% over January-September 2009 compared to the same period of 2008, including by 6.1% at agricultural enterprises and by 1.4% in private farms. Output of plant growing products has increased by 3.4% over the first nine months of 2009 as compared to the same period of the previous year (including by 4.1% at agrarian enterprises and by 2.9% in private farms), mainly due to accelerated rates of harvesting of sunflower and sugar beet as well as owing to greater output of vegetable, fruit and berry products. The total output of animal breeding products during January-September 2009 increased by 3.2% as compared to the same period of 2008, including a 9.8% rise at agrarian enterprises and 0.9% decrease in private farms (SSC, 2009). However, whereas the sector looked rather successful in comparison to the entire Ukrainian economy, agrarian nongovernmental organisations, some politicians and agrarian scientific institutions point to considerable problems in Ukraine's agro-food sector that have aggravated under the crisis and can become yet sharper in the future. These problems concern financing and lending for all the actors of the agro-food supply chain, their operating performance, assets renovation and engagement of investments, expansion of sales markets, etc.

Armenia, being an in-transition nation, greatly depends on agriculture. The share of agriculture in the GDP for the last five years (2004-2008) averaged about 18.8% (Agrolratu, 2009). About 46% of employment in Armenia and about 60% of income in rural areas was due to the agricultural sector over the past five years. During that period (2004-2008), the average annual growth in agriculture was about 7.4%. This helped the case of food self-sufficiency, which in 2008 increased to 60% in the country. The local demand for plants, potatoes, main fruits, grapes and veal is 98% satisfied by the local production, whereas the self-sufficiency level is quite low for wheat (40%), other grains (50-55%), poultry (15-17%) and pork (50-55%). All these just point to the fact that agriculture is critical for Armenia. Specifically, improving agriculture could lead to poverty reduction, food security, increase in quality of life especially in rural areas, stability, and strategic improvement of the other sectors.

Although only 7% of the land area is of Kyrgyzstan is suitable for productive agriculture, at least 80% of the country has been classified as range-land suitable for grazing. Agricultural land covers 10.6 million hectares with arable land accounting for 1.1 million ha. Agriculture, hunting and forestry make 29% of the total GDP of Kyrgyzstan, with crop production making 58% of the total agricultural output (2008). However, agriculture growth thus far has been driven more by the desire of rural households to increase food security then as a response to market incentives. Agricultural reforms led by the government and supported by various donors have so far focused on creating new public institutions and infrastructure. Productivity is very low, there is a lack of knowledge and technologies at farmer levels, markets are not developed and access to existing markets is limited. Inputs and outputs are limited and vulnerable to changes in prices and demand.

In summary, therefore, Ukraine and Hungary are both net exporters and maize and sunflower exports of the latter are significant even on the world market. Both countries are considered to be very vulnerable to the effects of the crisis. Hungary is supported by and in some ways also trapped by the Common Agricultural Policy (CAP) of the EU. Armenia is an open economy entering the crisis after recent spectacular economic development and the impact of the crisis here might be the most adverse in terms of decline in GDP. The shift from subsistence to market oriented farming is almost finished but the country is still highly dependent on food imports. Kyrgyzstan is a small, closed economy in comparison, where agriculture is based on traditional household farming where the majority of production is for self consumption. In recent years the country's total agricultural trade has come close to balance. Dairy products account for half of agricultural exports, representing 7% of foreign trade; however only 7.1% of the milk produced is exported.

The objective of the study was to propose policy options to the Food and Agriculture Organisation of the United Nations (FAO) and other public authorities (including those in countries represented in the study) which can be applied to lessen the undesirable effects of the current or future crises in the agro-food sector. As the data available to assess the impacts of the crisis on the sector in the region are limited, the research took the form of interviews of stakeholders in selected supply chains, the results of which were analysed in the context of primary economic data. The research also sought to gather useful country-specific, qualitative information on rural incomes, poverty and food insecurity/malnutrition, on exports and on other factors beyond the supply chain. Factors which were independent from the crisis (i.e. legal environment, weather, etc.) have of course also contributed to the state of the agro-food sector in every country. As far as possible, their impacts have been distinguished from those of the crisis. Although the results of the study are not necessarily applicable to all of the agro-food sectors and countries in the region, they are indicative of the present trends and thus provide an adequate basis for drawing conclusions and recommending policy options.

Methodology

Summary of the research questions

The research focused on the effects of the economic downturn, indirect or direct credit constraints, trade and trade credit impacts on production and consumption. Credit issues included trade financing, payments, investments and foreign direct investment. Partly through the choice of supply chains and partly through the structure of the interviews, the impact of the crisis on poor farmers was taken into account. The overall research questions addressed in the study were therefore: (a) what are the key factors affected by the financial and economic downturn; (b) to what degree have the key factors been affected; (c) has the downturn affected different sectors or different parts of the

supply chain in different ways; and (d) what policy options can be recommended. To address these questions, a common framework was adopted for all interviews, as follows:

- What is the current state of the agro-food sector compared to three years ago (i.e. 2006)?
- What are the principal factors causing changes to the state of the agro-food sector?
- What strategies have businesses adopted to cope with these changes?
- How is the situation likely to change?
- Policy responses and recommendations
- Other issues

Rationale behind the choices of supply chain

It was anticipated that the crisis would have different effects in the different agro-food supply chains in the four countries. Therefore it was planned that the study would cover at least one crop supply chain and one livestock supply chain in each. The supply chains were selected as having a significant share in the country's production output, or of its trade. The fact that the choice of supply chains should facilitate the analysis of the impact of the crisis on poor farmers was also taken into account. It was also decided that that one commodity for which supply chain information is available from all four countries would be included. The obvious candidate was wheat, a major crop in all four countries which is widely traded internationally. Due to its importance (food security, social aspects, rural livelihoods, etc.) wheat production is one of the few sectors which are subsidised by government. As wheat products are a significant component of the household food budget in all four countries, its study would also offer insights into food insecurity and poverty.

In Hungary in 2008, wheat production represented 29.5% of the total agricultural output. Since livestock production in Hungary is dominated by the pig and poultry sectors, part of the harvested wheat (0.7-1.2 million tons a year) is used for feed. Wheat deliveries alone represented EUR 464 million of the EUR 5.7 billion of Hungarian agro-food exports in 2008. Growing grain crops provides more than 20% of Ukraine's gross annual agricultural production output and accounted for 38.6% of the export of agro-food commodities in 2009. In 2008, 4.088 million tonnes of wheat were exported (MAPU, 2009). The share of winter wheat production is: agricultural enterprises: 66%; personal peasant farms: 21%; private farmers: 13% and the bread market is tightly regulated. Armenia depends heavily on wheat imports, with the level of self-sufficiency being as low as 31-43% (NSS, 2008), and is very vulnerable to price fluctuations. In 2008, the government developed a programme for wheat self-sufficiency which could be implemented by bringing in high value seeds, providing agricultural machinery and subsidising lands for wheat production. In Kyrgyzstan wheat occupies about 42% of arable land. Over 95% of wheat is produced by private farms: in 2008 there were just under half a million farms registered with arable land growing wheat. 650-800,000 tonnes are produced annually in Kyrgyzstan and a further 300,000 tonnes are imported from Kazakhstan and Russia. Flour and flour goods account for more than 36% of household expenses for food.

Sunflower in Kyrgyzstan was selected for this study as the crop is produced at the small household level (mostly on farms with less than 5 ha of arable land). Having become a significant support for the poor, which is mostly rural dwellers, homemade sunflower oil production has been increasing from year to year. There are prospects for replacement of imported sunflower oil by locally produced oil but there is a problem that the home-made products are not completely refined. A by-product of production, cake, is used as a fodder additive for livestock.

Following land privatisation, farmers in Armenia destroyed most of the vineyards and wineries stopped their production. In recent years, however, grape production has been revitalised and

grapes are produced not only by individual, small-scale farmers who own 95% of the 35,000 ha of vineyards in the country, but also by large farms. The total annual grape supply in the country (160,000-230,000 tonnes) is mainly produced locally and Armenia is 98-100% self-sufficient. Most goes to brandy production. Armenian brandy accounts for 90% of exports of alcoholic beverages.

Pig breeding is one of the most important traditional sectors both in Hungary and Ukraine. In Hungary, pig meat has about a 45% share in both meat production and meat consumption. Many smallholders and households are still active in pig breeding and rearing (although the numbers have declined dramatically in recent years) while the processing industry is predominantly supplied by large scale producers. In December 2008, the registered 3.4 million pigs were divided between slightly more than 530 agricultural enterprises possessing two thirds of the livestock and over 260,000 private holders and households with the rest. In Ukraine the share of pork now is equal to about 35% (or 620,000 tonnes) of the total production of meat of all kinds. Since 1990, the stock of pigs has declined by 2-3 times and the structure of pig raising has changed. Before disintegration of the Soviet Union the major part of livestock were concentrated in public sector, while now about 63% of pigs are kept in private farms. Issues include ageing of equipment, distortion of infrastructure and meat markets and increased competition from imports.

Livestock is one of the major parts of the rural economy in Kyrgyzstan and 87% of the territory is occupied by meadows and pastures. Milk is an important element of the diet, with almost 90% of households reporting to consume it. Most milk is produced by smallholders who generally own two or three cows and who sell excess production to processors either directly or through local traders or collected by the processors themselves of which there are more than 390 in the country. In Armenia, milk production and milk processing have increased significantly during the last eight years. All 42 former state-owned dairy factories were privatised during the 1990s and many small plants emerged. No single dairy processing company dominates the market. Farmers have gradually integrated into market relations and switched from subsistence to commercial farms.

Interviewee target groups

Interviews were conducted with representatives from all tiers of each supply chain. Besides agricultural producers, the impacts of the crisis were discussed with input suppliers, processors, integrators, traders and retailers. Participants of the survey were major players in these supply chains with respect to market share, annual income etc. and the interviewees were key informants who were able to provide an overview of the chain. The selection of interviewees was the responsibility of the country representatives, since they have the specific local knowledge, and preference was given to companies that are vertically integrated in the supply chain.

Representatives of banks and government officials were also interviewed in each country. The government sector covered those who are related to policy making and implementation, especially government officials, and also decision makers and/or government advisors. Some additional guidelines given to project partners were as follows:

- Farmers were to be representatives of business oriented entities
- A small number of NGOs (e.g. farmers' organisations) may also be included (possibly one per sector), as may a representative of a consumer organisation
- Banks can also include foreign investors and international donor money (if appropriate)

Results

Wheat and sunflower supply chains (four countries)

The crisis had no significant impact on grain production in most countries in the 2008/09 crop year. Although it became more difficult to obtain money from the banks even if credit applications were approved, wheat farmers, in general, were still able to finance their businesses. But consecutive above-average world wheat crops in 2008/09 and 2009/10 boosted supplies while use was constrained by the slow-down in the global economy, deteriorating farmer confidence significantly in comparison with the first half of 2008. However, in most cases, this had more to do with the decline of producer prices or the general macroeconomic environment than with the crisis directly.

However, as farmers became less sure of their financial situation (partially due to the decrease of remittances in some countries) and the scant precipitation failed to support crop growth in most regions of Central and Eastern Europe and Central Asia during the last months of the 2008/09 crop year, sales volumes of all inputs, in particular of fertilisers and crop protection products, started going down. In most Central and Eastern European countries, the demand for agricultural machinery was noted to have dropped back significantly too. In some Central Asian countries, even the purchase of fuel for the harvesting and the following sowing season represented a problem.

Due to the limited selling opportunities and to the bearish wheat market outlook, arable farmers favoured further cost saving production technologies in the first half of the 2009/10 crop year. Grain producers began to look for cheaper seeds and agrochemicals and some changed their crop rotation to reduce the need for inputs. Land lease contracts were terminated, mostly on less fertile parcels in marginal areas. The aims at cost savings were not only reflected in the choice of technology but also in production decisions: in the autumn of 2009, winter wheat plantings declined in many of the Central and Eastern European and Central Asian countries.

Most market leading multinational input suppliers and traders use EUR or USD based credits provided by their parent companies with substantially lower interest rates than bank credits in national currencies. The increase in interest rates of parent company credits was described as insignificant during 2008 and 2009. As opposed to the multinationals, domestic input distributors, integrators, processors and traders as well as arable farmers who sell their grain on the market largely depended on external credits. These stakeholders reported the review and modification of already approved credit applications, the re-evaluation of their collaterals, stricter credit conditions and increased credit charges in all countries. In general, banks prolonged the process of credit approvals, carried out more cautious risk analyses and shifted decision making to a higher level. Notwithstanding these changes in the procedures, credit applications were more often declined, even when the value of offered collaterals was several times above that of the credit amount. The funds of some banks shrunk to such an extent that even their customers with high reputation and excellent credit history faced difficulties in accessing credits. Banks preferred not to finance grain inventories any more, and even refused public warehouse receipts as collateral (e.g. in Hungary).

The bulk of the individual wheat farmers tried to exist without credit. These market players usually took short-term loans from integrators to cover their variable costs but, due to the crisis, these external financial sources became more expensive too. Smallholders use financial lease and bank credits almost exclusively for implementing relatively large-scale investments (i.e. buying a new machine or constructing a new grain store, etc.). Integrators often claimed that, as a consequence of the increasing liquidity problems, low crop prices and weak demand, payments by farmers

were overdue by far more than a month. Distributors became more careful about which producers to supply and put tough audit checks in place.

Increased foreign exchange risks represented a serious challenge for most businesses in the wheat supply chain of every country. Outside the EU, notably in Central Asian countries, input prices are often set and credits are often provided in USD, whereas the revenues of farmers and processors are in national currencies.

Vertically integrated enterprises with strong business ties and sufficient capital reserves were said to be less impacted by the financial and economic crisis. Agricultural holdings were also thought of as die-hards since their structure allows for expenses and financial flows to be optimised and funds to be redistributed when necessary.

In both the Central and Eastern European and the Central Asian region, most stakeholders in the wheat supply chain postponed their investments. However, in the new EU member states, farmers and processors tried to complete their already running investment projects partially financed from EU funds, but within an extended time period, whenever it was possible. Despite the cold investment climate, to secure their future market positions, some of the large agricultural holdings in Ukraine were desperate to spend more especially on the development of their logistics (new river terminals, grain stores, etc.) while well managed bakery firms in Hungary pursued product development and strengthened their marketing efforts. Large and financially sound enterprises were expected to carry out acquisitions of the weaker ones with attractive regional sales markets, raw materials base, storage facilities, etc.

Due to their liquidity problems, processors preferred to buy grains and flour on a daily basis and held smaller stocks, thereby trying to transfer the cost of storage on to stakeholders upstream. To reduce costs, many input suppliers and processors shortened working weeks, sent workers on paid or even unpaid leave, or cut wages. The major agrochemical factories in Ukraine were reported to operate at only half capacity. More attention was paid to energy use and outdated machinery was disposed of whenever it was possible. Millers and bakers turned towards cheaper low quality raw materials such as feed wheat. As a consequence, the quality of most bakery products, in particular of bread in the low price segment declined significantly, especially in Ukraine.

While large processors had to cut production, many of the smaller ones were forced to close their businesses[2]. Due to the financial and economic downturn, the unfavourable macroeconomic and legal environment, many tried to avoid paying taxes and social contributions (e.g. in Hungary). Processors faced extra difficulties in countries still in transition where the importers of raw materials are few and have a strong bargaining power (e.g. in Armenia), because the decrease in world market prices were not transmitted entirely. Mills in Ukraine tried to limit the increased risks in the flour business by pursuing other, mostly unrelated business activities which are good examples of diversification.

As regards grain trading, in 2009, the prompt buying of grains became dominant, while forward contractors preferred deliveries in 3-6 months rather than 6-12 months as before. This made markets more nervous and greatly increased price volatility. Many of the foreign buyers aimed to cover their needs from their domestic markets as much as possible, thereby minimising grain imports. Large grain importers in some countries, also within the EU, became more sensitive to swings in the foreign exchange rates and cancelled tenders more often than before. This made the organising of logistics very difficult for exporters. In addition, business trust between farmers and

[2] As for the sunflower sector in Kyrgyzstan, where processing is extremely fragmented about 60% of the oil mills had been closed within 18 months since 2008.

traders weakened considerably. With the creditability of buyers declining, and due to their liquidity problems, most suppliers demanded pre-payment or other guarantees. Banks and thus traders too turned their attention from country risk to individual company risk. Regarding risk management, traders, in general, aimed to reduce credit risk on clients, to secure payment conditions and to use credit insurance whenever possible. Traders experienced difficulties in obtaining credit to cover the cost of their stocks, therefore, in most countries, only limited quantities of grain were procured in the 2009/10 crop year and these could be stored for only a short time. Not only were grain prices low but, due to their increased fluctuations, and also because of the exchange rate volatility, banks valued grain inventories of traders considerably below their futures markets quotations.

Although traders, due to weakened bargaining position of farmers and integrators, were quite often referred to as winners in the crisis situation, opportunist grain dealers, whose number increased in recent years when prices were high, were expected by professional market players to go out of business as they were less able to pay to producers and finance inventories even at low prices. This was thought to be beneficial for most of the stakeholders because transaction costs may decline; however, many individual arable farmers could suffer from being cut off from their main source of financing. Indeed, in some countries (e.g. Armenia) buyers' payments were several months overdue.

In Ukraine, local authorities can set limits of profitability for production of lean-formula bread (flour, yeast, salt, water) weighing over 500 g as well as limits of trade mark-ups to the wholesale price of that bread's producer. About 50% of bread made in Ukraine is subject to such regulation.

Grape/brandy supply chain (Armenia)

Farmers were generally affected by the higher prices of inputs. Those who were able to market their produce stated that prices were much lower in 2009 compared to 2008. However, there were many farmers who were not able to sell because of the limited demand by processors. Moreover, the processors often failed to make timely payments and farmers needed to obtain loans to continue farming and the availability of these was limited by the banks. Hence, most of the farmers used up all their personal funds living at a subsistence level.

Due to the crisis, processors and traders were affected by an approximately 30-50% decline in the sales volume of cognac and other processed goods. All the grape processors sell over 90% of their production outside of Armenia, particularly to Russia, hence the decline in sales volume was mainly a result of reduced foreign demand. One the one hand, the AMD depreciation helped most of the grape processors as a large portion of their products was exported. On the other, many processors stated that their costs increased due to high raw material prices, high inventory costs and expensive credit. Many small companies which were not major players went out of business or were on the verge of bankruptcy, while the big players in the market were surviving with hope. The outlook for the sector as a whole was uncertain and largely dependent on the global economic situation. The long term outlook for those that survived the crisis was good, however, because of the vanished small-scale competitors from the market.

Pigmeat supply chain (Hungary and Ukraine)

Although the pre-crisis situation of the pig breeding sector was different in Hungary and in Ukraine the perception of the crisis was similar and at most points in the chain the impact has been somewhat less so far than most stakeholders expected. In Hungary a significant increase in pig prices, 14% in the first half of 2009, and the demand driven market put producers in a favourable

position. The compound feed price dropped by 24% and energy prices by 7%. Even though veterinary products are partly imported, as in Ukraine, producers paid only 8% more for them at the start of 2009 than a year previously. The input suppliers interviewed had not noticed a big decrease in the domestic demand for their products but they did note astonishing price volatility and an unpredictable income situation. The perceived problem was the solvency of some domestic buyers, apparently because the banks were not financing production. On the other hand, expensive or lacking financial sources did not allow suppliers to finance producers as before. Their response to the crisis was not to supply customers who were considered to be a risk, as well as cost-cutting.

In Ukraine the situation was slightly different. Input suppliers to the pig breeding sector, producers of compound feed and suppliers of veterinary preparations found themselves in a difficult position. Before the crisis, their services were used mainly by small pork producers and households. Large pig-breeding complexes had their own veterinary units and compound feed plants. However, the sudden devaluation of the UAH slashed demand from small pork producers in early 2009. This concerned both veterinary preparations, which are almost completely imported, and mixed feeds that include valuable imported components and additives (minerals and vitamins, proteins, amino acids). A move by small entities away from mixed feeds to simple grain in pig raising made feed plants alter their recipes towards lower costs and poorer quality. However, even those products did not secure much increase in demand. As a result, feed plants curtailed production, shut down, cut staff or moved workers to part-time work, and reoriented towards production of feed for poultry.

Hungarian pig farmers were expecting serious consequences when the economic-financial crisis developed but in fact seasonality, i.e. the classical pig cycle, had a stronger impact than the crisis. There was a significant deficit in the market and feed prices had declined, resulting in higher prices and higher margins for pig farmers in the first three quarters of 2009. Though prices were at an acceptable level, buyers began to delay their payments, thereby weakening the liquidity of pig farmers towards input suppliers who were requiring prompt payments. In order to avoid using credit, some farmers extensified their production and owed more to input suppliers. Concerning streamlining of operations and cost cutting in production, adjustments in such a short time were not possible for pig farmers. However, on the input side salaries were frozen and people were laid off. The feeding of on-farm produced grain and scraps became more common. Whenever possible farmers preferred cash transactions because money transfers had been delayed. Investments were postponed, even EU regulated compulsory investments for manure storing and handling, which are the conditions of future operation. Those who were not capable of financing these investments were expected to quit farming in 2009. The pig stock in June 2009 was 14% less than a year earlier, 10% less enterprises and 20% less individual farms were holding pigs than in the previous year. By contrast, the number of pigs raised by private households was thought to have increased. Those who endure believed if the necessary investments can be completed, their competitive disadvantages will not become greater. There were worries that stakeholders operating illegally would benefit from the crisis. Interviewees were not aware of any specific government policy measures which had been taken in response to the crisis.

Livestock changed in the opposite way in Ukraine. The pig population as of 1 October 2009 had increased by 8.0% over the previous year, to 7.462 million. The growth of pork output by Ukrainian agricultural producers was promoted by a considerable decrease in meat imports due to the dramatic devaluation of the UAH. Besides, controls on meat smuggling were rather tough. As a result, imported pork, which created competition in the domestic market, decreased. This secured a growth in meat prices and a higher demand for meat produced by domestic manufacturers. Despite the decline in people's purchasing power, pork prices in Ukraine remained high: as of 1 October

2009, the purchase price of pigs in live weight was 10-15% higher than 12 months earlier. A drop in demand in early 2009 was temporary and was rather easily survived by most producers, especially agro-holdings. The profitability of pig farming was minus 27-20% in 2007-2008 whilst in 2009, positive profitability (2-4%) was forecast for the entire branch. Agricultural enterprises and complexes could increase their pig population in Ukraine, as of 1 October 2009 the number was 17.4% greater to the same date last year. Rural households also reacted flexibly. Cheap feeds encouraged pig population growth in household backyards. As of 1 September 2009 the pig population in households had increased by 1.6% compared to the same period of 2008.

The crisis impacted the supply of raw materials for Hungarian processing. Processors reported that not only the pig market but also the entire meat sector was in a better and more stable situation than the crisis would suggest. It seemed that the consumption of basic food did not decrease to the same extent as of other products, therefore the drop in consumption had a smaller effect on producer prices. The supply of live slaughtering pigs had been decreasing in Europe independently of the crisis and prices jumped from HUF 240 to 330 HUF per kg in the year to August 2009. The peak producer price was unrealistic and in the Hungarian pig market live-pig imports started to increase again in the second half of 2009.

The vast majority of processors agreed that retailers' private label products undoubtedly benefited from the changes in consumer behaviour (consumers had become even more price sensitive). In the retail chains, the share of private label products was growing and was thought to have reached 60% of the total sales. Although it was recognised that banks have had to re-evaluate credits, none of the processing companies in the survey had been significantly affected, but they consider that they had good credit histories. Some processors who were already struggling before the crisis failed at the end of 2008. Retailers tried to delay payments a bit more often. Processors cut back on spending where possible, but invested in improving efficiency. They laid off some employees but recognised that if they were to expand production in the future, it could be extremely difficult to find skilled and experienced work force on the labour market. The increase in the rate of VAT was to the advantage of the illegal market players in the food supply chain. Processers and traders also claimed that in Hungary the retail sector was in favour of the financial crisis because they had a stronger negotiating position with the suppliers.

Due to the decline in people's income and aggravation of the economic situation in Ukraine, meat demand and consumption in 2009 declined by about 5-10%. Additionally a sharp shift towards less expensive poultry meat occurred. An especially acute diminution in demand for meat was seen in the first ten months of 2009 which caused a decline in pork output. By the middle of the year, people adapted themselves to the new conditions and the demand for pork slightly increased. Processing enterprises found themselves in a somewhat worse position relative to pork producers. First of all, demand for products in more expensive and more profitable segments had dropped. On the other hand, meat products in the low-price segment and, to a considerably lesser extent, in the medium-price segment, became highly sought after in 2009. The devaluation of the UAH, together with higher energy prices, resulted in a considerable increase of costs of meat product output (almost 50% of raw meat and all ingredients such as spices, additives, casing, etc. for sausage production were imported). However, processing enterprises could not adequately increase prices of their products since a change of prices of cheap meat products was subject to endorsement by the State Price Inspectorate (c.f. also wheat). As a result, the profitability of processing enterprises fell to a minimum. According to managers of processing enterprises, most pork producers supplied pigs for processing only against prepayment, while retailers delayed payments for meat products sold.

In response to the crisis, suppliers tended to replace quality meat with cheap chicken products and reduced support personnel. Their product range also changed. For example, the output of prepared meat products decreased by 30% (because people cook much more foodstuffs at home). According to estimates by Ukrmyaso National Association of Meat and Meat Product Makers, up to 50% of meat-processing enterprises were expected to be shut down in 2009 because of shortage of finance. Small and medium-sized enterprises facing a lack of floating assets could be especially affected.

Milk supply chain (Armenia and Kyrgyzstan)

The dairy supply chain was largely impacted by the crisis. Dairy farmers and processors were affected by higher input prices and declining demand in both local and international markets. The price of milk and dairy products at the retail chains did not drop as compared to 2008, while the procurement price for milk from farmers went down at least two times. Interviewees claimed that to alleviate the adverse affects of the crisis, no significant policy measures were introduced.

In Armenia, the crisis had perhaps the most impact on agricultural producers. Most of the dairy farmers operated at a loss. The price of milk declined by about 20% relative to 2008 and there was still a large surplus in the market. It was not only the case that farmers were paid less for milk, but payments were delayed by up to three months. Farmers looked for alternatives to make a profit from their cattle, thus most of the remaining cows were held rather for the production of calves. This was more cost efficient and farmers hoped to profit more from meat than from milk. Without any government support dairy farmers were thought to give up production in large numbers, threatening the whole dairy supply chain which has strategic importance in the country.

In Kyrgyzstan, smallholders, who produce the bulk of the milk and who generally own two or three cows, complained about the price of milk falling two times in 2008-2009, and that even direct sales at local markets were often unprofitable. Whilst there may be regional differences, households generally consume about 40% of their milk production and sell the remaining 60% (during the summer). During the winter, with yields falling heavily, most households consume all their own milk. The sector employs some 1,400 workers, principally in a number of large dairy farms around Chui Oblast, which supply 80% of exports. These large farms were also impacted by the crisis.

Although the milk prices declined in Armenia compared to last year, some of the processors, being socially responsible, purchased milk at higher prices than the competitors. Many milk processors stated that their cost increased due to the high cost of utilities, raw material prices and interest rates. In addition, the raw material prices increased in AMD as a result of the 3 March exchange rate policy. The major investment most of the interviewed firms consider was the acquisition of modern technology that was energy efficient and will cut utility costs. On top of all the problems already threatening the operations of processing firms, actions by government were not matched with what is needed under the current crisis situation. However, they were optimistic about the future.

There are more than 390 dairy processing enterprises in Kyrgyzstan but the sector was dominated by several medium and large enterprises. These companies processed 85-88% of the milk which came onto the market and the remaining share is processed through small local companies. Generally, in the past few years, the output of the dairy industry had been decreasing. Exports of milk decreased in 2008 in comparison to 2006 almost six times. The stakeholders most affected by the global financial and economic crisis were thought to be dairy farmers. Traders and processors also experienced problems but their losses were partly covered by farmers.

The demand for Armenian dairy products on the export markets decreased. Russia, the main export destination of Armenian dairy products, was highly impacted by the crisis. The restriction of dairy products shipped to Russia through Georgia as a consequence of the recent war created additional problems for Armenian dairy exporters. Dairy products had to be transported either through Iran or by air which increased transport costs significantly.

Retailing

As a consequence of the crisis, consumer purchasing power declined drastically in many countries in the region. This is illustrated by the example of Tesco Global Kft. in Hungary where FMCG (fast moving consumer goods) sales dropped by 12% year on year in November 2009[3]. In Ukraine, one out of every five retail chains, including giants like Velyka Kyshenya, had to close their less profitable stores as a consequence of increasing accounts payable, growing energy prices, rents and credit charges, and dearer utility services[4]. On the other hand, most of the discount chains (e.g. Ukrainian Retail, ATB-Market, etc.), targeting consumers with average or below average income levels, and some of the large multinational retail chains, offering a wide choice of private label products or pursuing an aggressive expansion policy, were able to strengthen their market positions. Nota bene: retail chains targeting high income level consumers, such as Yeritsyans and Sons in Armenia, were less impacted by the economic downturn because the preferences of the social strata they provide service for changed little. In Armenia, the demand for flour decreased by 20-30%.

Price is the most important factor in the purchasing decisions of consumers and it became even more so in the crisis. Thus, in general, the crisis impacted first the demand of goods/brands which can easily be substituted by less expensive alternatives. Many food products belong to this category and, in general, consumers at least in Central and Eastern Europe are believed to be less loyal to brands than their Western European counterparts. For these reasons, and also because competition was very tough due to the presence of many retail chains in some of the countries, the choice of relatively cheap food products increased and special price offers became more frequent. Consequently, suppliers of low priced mass products had to deliver greater volumes while others needed to change their production structure. The demand for private label products increased considerably, and these will definitely have a larger share of turnover in the future. It was also underlined that, due to the crisis, consumers were spending less on high value added processed goods, while the demand for basic foods (e.g. flour, sugar, many lower value added bakery products, fruits and vegetables) remained rather stable.

Quite often, the calls for tenders by multinational retail chains for the production of private label food products are international. Experience in Central and Eastern Europe showed that suppliers in Poland and the Czech Republic were less affected by the crisis than in Hungary or Slovakia, where the impacts were more severe either due to the macroeconomic instability, or to the introduction of the euro. Retailers claimed that contract terms and conditions with suppliers did not alter, and stakeholders were expecting no major changes in front and back margins in the near future. It was pointed out that in some sectors, production and processing had long been facing difficulties and thus the decline of production and sales was only partly due to the crisis.

In some countries, protectionist and even nationalist rhetoric has inevitably gained some popularity. For example in Hungary, to increase the proportion of domestically produced goods on the shelves of retail chains, and to regulate contract conditions, a new Ethical Codex was drafted by

[3] Food product sales represent about 70% of the turnover of Tesco in Hungary. According to CSO data, the total food and non-food turnover of the retail sector in Hungary was 3.5% lower year on year in the first half of 2009.

[4] According to SSCU data, the total turnover of the retail sector and the restaurant business declined by almost 20% year on year to UAH 144.6 billion during January-August 2009.

the Ministry of Agriculture and NGOs, and signed by most of the stakeholders. However, the initiative did not prove to be effective and thus remained a mere symbolic step towards farmers and the processing industries battered inter alia by the crisis, mainly because the Codex failed to provide a clear definition of 'domestically produced' goods. (It was also heavily criticised by the Hungarian Competition Authority). Notwithstanding the failure of efforts like this, the preference of domestic goods by consumers increased in 2009, mainly due to the devaluation of the national currencies. This trend was observed in Hungary as well as in Ukraine.

In many countries (including Hungary, Ukraine, Armenia, Kyrgyzstan), the direct marketing of agricultural goods increased substantially. This was particularly true for milk and basic dairy products, in which case the declining purchasing power of the consumer and the oversupply on the dairy market shortened the distribution chain, especially in rural areas. Another development has been a reversal in the decline in the number of pigs kept by rural households as part of a move towards greater economic self-sufficiency, and this has negatively impacted on retail sales.

Banks and lending institutions (four countries)

Owing to the varying degrees of integration into the world economy of the four countries in the study, the different ownership profile of the banks and the contrasting fiscal approaches of national governments, in this section developments in the four countries are reviewed separately.

Banks in Hungary tended to lower their credit/deposit ratio. They looked more carefully at the total credit portfolios of enterprises and required a much higher share of own sources (at least 10-15% for the financing of 20-25% of a project), even when an investment was supported from EU funds. The placing of investment credits declined by 5-10%. The total debt of the agribusiness sector had dropped by around 5-10% by mid-2009, but started to increase again in August. Credit conditions were made tougher and the maximum amount of credit per hectare land was cut from HUF about 100,000 (EUR 374) to HUF 70,000 (EUR 262). Credit costs increased markedly, by 2.0-2.2% to 12-14 %. With the devaluation of the HUF, there was an increase in loan defaults, especially with those in foreign currencies (e.g. CHF). Banks cleared their portfolios and lowered their operational costs by quitting their less profitable activities and cutting their staff. Many did not take on new customers but they were not worrying about the crisis radiating to the agro-food sector. According to the interviewees, small enterprises will be excluded from credit granting in the future. Banks reckoned the market environment would be unpredictable for the next 2-3 years, thus the returns on most investments could be judged as rather dubious.

Ukrainian banks and other financial institutions became hostages of a credit boom in foreign currency in 2006-2008. UAH devaluation caused failure to repay loans by many bank clients. This in turn led to banks in many cases not being able to return deposits. As a result, in late 2008 a moratorium on deposit refund obligations was introduced. Despite this measure, a number of banks went bankrupt. In 2009, banks provided UAH 3.3 billion (EUR 0.3 billion) worth of new loans to agrarian sector enterprises. Interest rates on bank loans increased to 16.5-30.0% (including loans for agricultural enterprises). The number of banks willing to grant credit to the agrarian sector decreased and the ones who still provided such loans demanded more rigid conditions. Due to the crisis, many agrarian sector borrowers faced debt servicing problems. According to the Ministry of Agrarian Policy of Ukraine, more than 3,400 applications on loan restructuring, amounting to almost UAH 12 billion (EUR 1 billion), had arrived from agrarian sector enterprises as of late summer 2009. Although bank revenues grew by 41.9% in the first eight months of 2009 compared to the same period of 2008, their expenditure increased by 88.9%. As of 1 September 2009, losses of Ukrainian banks amounted to UAH 20.5 billion (EUR 1.7 billion), whereas the same period in 2008 saw

a profit of UAH 6.9 billion (EUR 0.6 billion). Of Ukraine's 15 largest banks, only seven showed a profit in the third quarter of 2009.

The crisis reached Armenia through the real economy instead of the financial markets. Even so, all interviewed banks and lending institutions claimed that credit was less accessible than pre-crisis. In fact, most banks in Armenia stopped providing consumer credit. Banks tried to deal with increased default risk by raising interest rates, applying stricter conditions to potential debtors and giving preference to short-term loans. Although the number of depositors decreased, most banks were able to provide more loans to agri-businesses because the government provided funds specifically for the sector at a lower interest rate. In March 2009, the introduction of the floating exchange rate depreciated the AMD by about 20%. Although Armenian law prohibits it, banks provided credit mainly in USD and required loan payments in either USD or AMD equivalent. Therefore, many debtors had difficulties in making payments. There were also other discrepancies between the law and practice: banks provided the designated government loans to the agricultural sector at much higher interest rates. Although market conditions were tougher, the basic market structure remained unaltered. However, banks expect changes in the sector within a year or two, when big banks can resume their planned investments, potentially acquiring smaller banks.

Interviewed banking institutions in Kyrgyzstan cited the devaluation of the national currency, increase in the inflation rate, low rate of transfers from nationals living abroad as well as repayment of credit to financing institutions as major problems for the sector. In response to these, banks toughened their deposit policy and raised credit rates. The latter were increased to 22% for agricultural activities and to 27% for processing and other sectors in 2008. Credit conditions were also tightened: while previously only credit history was deemed relevant, clients had to go through The Central Collateral Registration Office if the amount of a loan exceeded KGS 30,000 (EUR 450). An important measure to help agriculture was to provide subsidised loans for farmers through banks. The interest rate of these loans was 22%, but if a farmer repaid the credit in time he received a 10% interest compensation. Credit was given in KGS in order to avoid exchange rate risk.

The government sector (four countries)

Governments in the four countries adopted different approaches to mitigating the effects of the crises in the agro-food sector. In Hungary, membership of the EU limited the space for manoeuvre, Ukraine introduced some short-term measures, Armenia was very exposed to external factors whilst the Kyrgyz government thought that the country may be less exposed to the crisis. In most if not all countries the communication of the existence of these measures to the supply chains was an issue.

Officials in Hungary shared the view that the financial and economic crisis impacted the agro-food sector significantly; however, to a lesser extent (at least in the first half of 2009) than some other sectors of the national economy. The negative effects of the crisis had been amplified by the inflexibility of the decision making and administration system of the EU, and the inefficiency and the weak communication of the national administration. Although most of the stakeholders appeared to be unaware of any agro-food sector specific action taken by the government in response to the financial and economic crisis, the list of the policy measures aimed to lessen the negative effects included guarantees for agricultural investments via the government-owned Hungarian Development Bank; advance payments to enterprises for which investment support from the EU Rural Development funds had been granted; working capital loan programmes for cereal producers and dairy farmers; abolition of milk quality analysis fees; additional coupled payments to dairy and cattle farmers tobacco farmers and fruit and vegetable producers from 2010; aid to wineries for the

distillation of excess wine stocks; earlier payment of EU direct support; and lower VAT on bakery and dairy products. On the other hand, the budget for cofinancing EU direct payments was cut in 2009, with a further cut due in 2010.

Agriculture in Ukraine was without any productive support until March 2009 when a law, inter alia, encouraging banks to roll over loans to agricultural producers came into force. To increase demand for grain, in late 2009 the government formed a financial pool used by the Agrarian Fund (a state organisation supervised by the Ministry of Agrarian Policy) to accomplish intervention purchases of grain, and established a Stabilising Anti-crisis Fund. All the measures were mainly short-term: producers obtained a financial resource at the Agrarian Fund's expense to secure current agricultural works, money from the Stabilising Fund went to subsidise compensation of bank loans for agricultural producers, cattle-breeding, agricultural machinery leasing, implementation of some investment projects, and partial reimbursement of expenses incurred for sowing of spring crops.

The government in Armenia set up several programmes intended to intensify the support to producers of agricultural products although in late 2009 the level of financing from the state budget was less than 40% of the projected level. They included seed development, plant protection, agricultural animal vaccination, state support to agricultural land users, provision of agricultural animals by the government on different payment terms, credit to agricultural enterprises and small-scale agricultural traders, credit for the economic development of rural areas, and requirement for dairy producers to include the proportion of milk powder and natural milk in the labels (to encourage consumer selection of natural products). The Armenian government is perceived to have neglected the sector in its policy making over a period of years, even although it publically stresses the importance of agriculture. The Ministry of Agriculture expressed intentions of helping the sector overcome the crisis, but the government appeared to favour the residential construction sector.

In Kyrgyzstan, the government initially announced that the global crisis would hit the economy. Later, it judged that since the country was not fully integrated into the global economy, it would not be hurt significantly. However, several actions were adopted to mitigate the impact of the crisis and ensure food security including a new Law on Food Security, several resolutions on socio-economic development, discussions with Russia and Kazakhstan on waiving quarantine on import of dairy products, and the Ministry of Agriculture initiated VAT exemption from home based processing of dairy products. Additional credit resources were provided to Aiyl Bank (former Agricultural Financial Corporation, recently established as a bank) for on lending to farmers and the state Agro-ProdCorporation (a state joint stock company set up in 2008 to regulate prices for wheat through market activities) bought wheat directly from farmers to offset their credits. However, interviewees in the supply chain claimed not to have noticed any significant support. For example, the wheat procurement mechanisms were not clear and transparent, whilst AgroProdCorporation is becoming a dominant player in the wheat sector and is pushing small and medium size mills out of the market.

Discussion

The current state of the agro-food sector

The crisis affected Eastern Europe and Central Asia only after some delay. The negative impacts were felt first in the construction, metallurgy and car-making sectors and until now more strongly than in the agro-food sector. The effects of the crisis on agriculture are still masked by the good conditions in the 2007/2008 season and in previous years. (Table 1.) The reaction of stakeholders will be apparent only later due to the uninterrupted biological nature of production. Not only was

the arrival of the crisis in the region late but it is now obvious that the recovery will also be slower than in the developed world, in India and in China. The economies of the latter showed the first early signs of growth in the third quarter of 2009, thanks to the enormous and effective monetary and fiscal stimuli, whilst the downturn in Eastern Europe and Central Asia is continuing. Since the demand for agricultural products is linked to purchasing power either on the domestic or on the export markets, it is still questionable what legacy the crisis will leave on the sector and on rural society.

Table 1

Change of GDP in the four countries in the study representing forecasts and estimations available in February 2010; volume index, previous year = 100

Sector	Country	2006	2007	2008	2009	2009/2007 %
National economy, total	Armenia	113.2	113.7	106.8	85.6	91.4
	Hungary	104.0	101.0	100.6	93.7	94.3
	Kyrgyzstan	103.1	108.5	107.6	102.3	110.1
	Ukraine	107.3	107.9	102.1	85.0	86.8
Agriculture	Armenia	100.4	109.6	101.3	99.9	101.2
	Hungary	93.5	78.7	154.3	81.1	125.1
	Kyrgyzstan	101.7	101.6	100.7	107.4	108.2
	Ukraine	101.1	115.6	135.6	101.9	138.2

Source: Country Statistical Offices

Growing unemployment, wage cuts, increased payments for loans, a shift to part time working as well as declining remittances from citizens working in more developed countries have led to a decline in overall consumption in the region. The decline was strongly driven by the psychological effect; initially people reduced their expenditure more than their income dictated. Since food has a relatively low price elasticity, the drop was less in the case of food products than other goods, and occurred to a different extent with different food items. The contraction was more noticeable for products with higher value added (e.g. Armenian brandy). Consumers are now even more price sensitive and demands for more expensive goods have been replaced by less expensive alternatives. Both feed and industrial non-food use of agricultural products are lower as a result of the slowdown. The usage of biofuels was expected to expand less rapidly as the sector matures.

The prices of agricultural commodities have declined from their peak in 2007 and early 2008. There is some agreement that this peak was caused by a number of temporary phenomena, such as a decline in global stock levels, poor weather conditions in core grain producing countries, temporary trading restrictions in some countries and, according to some analysts, the activity of market speculators investing in commodity futures. Input prices increased in parallel with the prices of products, but their decline appears to be much slower. In countries which are depending strongly on imported inputs (like Armenia and Kyrgyztan), this price increase has been even more harmful due to the devaluation of their national currency. As a result, input usage has dropped in the region and many farmers have been forced to extensify production.

Not only were the price changes adverse for farmers, but sales opportunities are now rare, too. This is in part a clear consequence of the lower demand, but it is also due there being fewer solvent and reliable partners. As increasing numbers of farmers, integrators and traders faced liquidity problems or went into liquidation leaving behind unpaid claims, business trust evaporated. Fewer transactions are now made and many of them on different terms than previously. Dairy and wheat

farmers in Kyrgyztan, dairy and grape farmers in Armenia and wheat farmers in Hungary all claimed that they had suffered increasing difficulties to market their products. Stocks in the supply chains have accumulated; wheat stocks at the end of the 2009/2010 crop year are estimated to be the highest in eight years, for instance. Dairy farmers turned to making cheese, processors invested in extending product shelf life, and underpriced imported milk powder pushed out dairy farmers.

Although agricultural trade was influenced by the crisis less than international trade overall, it could not provide as much help to reduce imbalances than it could in previous years. Trading flows were disturbed by unpredictable currency changes and by protectionism, sometimes hidden in the form of sanitary and food safety measures. Exchange rate change have helped exporters in Hungary and Ukraine and promoted domestic food processors, but the overall long term impact on national economies in the region is judged by experts as rather damaging.

Banks pulled out of financing agriculture when the crisis intensified and credit availability and credit conditions are now poor in all four countries in the research. Since all market oriented enterprises in the region can be considered "new" compared to other parts of the world, they are financially less stable and their dependence on credits is relatively higher. Due to the lack of financing, investments were postponed, trading flows have slowed, and the financing of stocks and purchasing of inputs have become more expensive. Shifting from subsistence to market oriented farming is now extremely difficult but by contrast financially strong companies and holdings, and well organised integrations have developed steadily and have extended their market share.

The principal causes of changes to the state of the agro-food sector

In recent decades, the agro-food sector has become not only more globalised through international trade (as it sources and sells across the globe) but also more integrated into the modern financial system. Consequently it is more subject to the exogenous fluctuations originating in the macro-economy. Impacts of the crisis on the specific agro-food sectors and countries have come to depend on the strength of their linkages to the financial system and the global economy (OECD, 2009).

Hence the state of the agro-food sector is mainly determined by the general macroeconomic, legal and social/cultural environment in each country, although in the countries of the EU the CAP is a major influencing factor. In the following we only focus on factors which are either derived from or have gained weight and importance due to the global crisis. These we believe to be as follows.

The crisis is one of confidence rather than the result of any abrupt change in the underlying dimensions of the economy: population and income growth, resource constraints and the world wide application of advancing technology that changes the relative values of labour, capital and land (RuSource, 2008). This lack of confidence is most clearly expressed through limited credit availability and consequent liquidity problems. Credit stimulates business and drives the economy. Reduced credit availability puts increased pressure on cash flow, sets back demand and trade, and hampers investments. The high level of interest rates impairs the competitive position of domestic enterprises both in the domestic and foreign markets. The consequences are the decline of production and services, the loss of jobs and increasing poverty. It could further weaken the food security of importer countries as they may become more dependent on financially stronger external suppliers, ultimately contributing to the strengthening of protectionism.

Differences between countries in their susceptibility to the crisis and in the responses of their governments have contributed to high foreign exchange risk which can scare off foreign capital from a country and obstruct growth prospects. In short, this risk impacts on the income of domestic

enterprises while increasing trade volatility and slowing down investments. Furthermore, increasing price volatility, i.e. the greater amplitude and speed of price swings, affects the income of all stakeholders of a particular supply chain. Dependence on commodities coupled with high volatility of prices results in significant fluctuations in trade. In general, trade volatility worsens income distribution, raises poverty and impedes economic growth and domestic investment.

The economic slowdown and global credit crunch have had serious implications for migrants and their families. The decrease in consumer incomes and remittances sent by migrant workers to their families at home (described in section 1.2.) suppress demand, thereby contributing to the shrinking of the economy and to the decline in production and services. Incidentally, the higher competition for jobs and economic resources by returning migrants can lead to social and political tensions in many local communities and increasing pressure on already fragile healthcare and social welfare infrastructure in many local communities (Abazov, 2008).

The crisis has directly impacted on the behaviour of stakeholders in the supply chains. There has been a loss of business trust as market transactions have shifted from a trust and credit base towards a cash base. This lack of trust weakens contract relations, renders integration and concentration, and impedes investments and technical progress. In a crisis situation, market players value trust more than property or money. Also, in order to make competitive offers and to remain in business, more stakeholders try to operate illegally. As with the lack of business trust, the black economy makes integration, concentration and professional consulting in the supply chains more difficult, as well as efficient representation and assertion of interests. Black marketers exercise huge pressure on buying and selling prices thereby forcing legally operating competitors out of business. The lack of information available to stakeholders in the supply chains restricted their ability to understand how the crisis was developing and therefore how to effectively adapt their business strategies. For example, farmers in Armenia faced two major challenges in the crisis: overestimation of demand of certain crops that encouraged risk-taking in purchase of inputs and problems with monopolies of wholesale purchasers and access to markets.

The economic slowdown resulted in a lower level of grain consumption in 2008/09, especially for feed and industrial uses (IGC). At the same time, consecutive above-average world wheat crops boosted the level of grain stocks. These were projected to fall slightly in the mid-term but the ample supply outlook should maintain them at comparatively higher levels thereby depressing prices.

Most of the discount retail chains, targeting consumers with average or below average income levels, and some of the large multinational retail chains, offering a wide choice of private label products or pursuing an aggressive expansion policy, have very strong market positions. Due to their bargaining power, retail chains have already or will soon become the ultimate price setters in most of the agro-food supply chains in most regions. The strong push towards mass production represents a huge challenge for the suppliers in many countries and has led to calls for restructuring.

Effects on stakeholders in the supply chain

Most of the negative effects on stakeholders were discussed in the previous section but little has been said about who may benefit from the situation. The crisis has exposed all the weaknesses of the sector and can be a turning point insofar as its impacts in the near future may act as a selection force which creates beneficiaries and losers among stakeholders in all tiers of the agro-food sector.

Although it is impossible to generalise which parts of the different supply chains gained the most from crisis, in most countries, the banks could certainly benefit a lot because (1) governments, especially in Europe, do not let banks go bankrupt, (2) banks not only enjoy support but have a chance to clean their portfolios and get rid of their troubled customers and (3) they could and have well overpriced the actual risks. Besides banks, market and price determining multinational trading companies were expected to strengthen their positions. This is due to their reputation, credit history, own equity, liquidity, ownership and to the speed at which they can react to market developments.

Subsistence farmers were thought to be less affected by the limited availability of financial resources, the rise in credit charges, the increased volatility of the exchange rates, etc. because they were less dependent on bank loans and less integrated into the supply chain. By contrast, smaller professional producers who are potentially more flexible but who did not have the financial resources to withstand the crisis have been lost, leading to concentration in the sector as larger companies, especially those whose input suppliers and buyers are few but financially stable, strengthen their positions. The crisis has strengthened the polarisation within the agro-food sector. In addition, credit access of businesses, the level of integration, production structure and management skills were also factors which made a difference in exposure to the crisis.

Whether retail chains benefited or not, it is difficult to answer yet. Undoubtedly, the share of private label products has increased which has placed them in an even better bargaining position; however, the margins are usually lower on these products and most chains have suffered a drop in demand and turnover. Are private labels the big winners of the crisis? The question cannot be answered with a simple ‚yes' or ‚no'. According to one survey, more than 70% of the consumers were convinced that the crisis will last longer than one year which means that they continued to adapt their purchasing behaviour accordingly. It is too soon to know how strong the shift back to more premium products will be. In many countries (including Hungary, Ukraine, Armenia, Kyrgyzstan), the direct marketing of agricultural goods has increased substantially; however, currently there are no guarantees that with the economies on the rise again, the demand for that will not shrink.

Impacts on rural poverty

Poverty and food security were improving strongly in Eastern Europe and Central Asia before the food and financial crises periods hit the region. In the first half of 2008, the region was confronted with rising food prices as the consequence of the worldwide food crisis. In the second part of the same year, effects of the worldwide financial crisis started to become apparent. Although the food and financial crisis developed from different underlying causes, they are interacting through their implications for financial and economic stability, food security, and political security. The financial crisis and the accompanying slow down of the economy reversed the increase in commodity prices (caused by the food crisis), yielding benefits for the food security and poverty of net consumers of food. However, at the same time, lay-offs across all sectors of the economies coupled with a decline in the use of agro-industrial capacity, a reduction in real wages and employment rates and a decline in remittances from migrant workers have negatively affected the income of households in the region and increased poverty and food insecurity.

Thus the financial crisis has caused an increase of overall poverty in the region, as reflected in the responses of the interviewees. The year 2009 even saw a small rise in the number of low-tech subsistence farmers (e.g. in Ukraine) to compensate for lost income through wages. This analysis is supported by Philippe Le Houérou, World Bank Vice-President for Europe and Central Asia who stated “The global financial and economic crisis has literally hit home in many parts of Emerging Europe and Central Asia ... What started as a financial crisis has become a social and human crisis.

The global crisis has come on the heels of the food and fuel crises, which had already weakened people in the region by reducing their purchasing power. Today, rising poverty and joblessness are pushing households into poverty and making things even harder for those already poor".

In addition to the direct impact on household income, the crisis has also negatively affected government budgets. Preliminary data from a few countries found a significant decrease in the number of social security beneficiaries between June 2008 and June 2009, the period when more households have become vulnerable. This could have a negative impact on government spending on social assistance programmes at a time when these programmes in fact need to be expanded (IMF, 2009).

Response strategies adopted by businesses, banks and government

Stakeholders throughout the supply chain suffered from loss of confidence and sought to cut their costs and reduce their dependence on credit. Arable farmers reduced their use of fertilisers and crop production products and purchases of machinery also declined. Crop rotations were sometimes altered, land lease contracts were terminated and in some cases farm-saved seed was used for sowing. Cuts in the use of inputs were particularly high in countries where the lower value of the currencies increased prices. Livestock producers began using home produced feeds, and/or extensified their production. Cattle farmers in Armenia fed the milk they produced to calves.

In response to concerns about the financial viability of some of their customers and an increasing tendency to delay payments, input suppliers became more careful about which farmers to supply and put tough audit checks in place. Most demanded pre-payment or other guarantees, partly to minimise risk and partly so as not to finance producers as in the past. Many input suppliers shortened working weeks, instituted unpaid leave or even cut wages. Animal feed plants reduced costs and reoriented production towards feeds for more prosperous supply chains e.g. poultry in Ukraine.

Contractors who normally make forward purchases of grain sought to do so more promptly and buyers aimed to cover their needs from domestic markets, thereby minimising imports and exposure to exchange rates. Due to liquidity problems, processors preferred to purchase on a daily basis and held smaller stocks, thereby trying to transfer the cost of storage upstream. Cheaper, lower quality raw materials were purchased, outdated machinery was disposed of wherever possible and more attention was paid to energy use. Many sought to cut their wage bills, but recognised the value of the skills of their employees and tried to retain staff, as recruitment as part of any future expansion could be difficult. Similarly, in Armenia, at least, some processors purchased milk at a higher price than their competitors in order to safeguard their supplies. Some processors and traders tried to limit risks by diversification, seeking out niche markets or diversifying into unrelated business activities.

Most stakeholders throughout the supply chains postponed their investments, even if, as sometimes in the case of pig farmers in Hungary, these were demanded by the EU, although efforts were made to complete ongoing investments particularly if co-financed by public sector funding. Stronger players, with a view to their future market position, maintained their investments and their marketing activities. Large and financially sound enterprises acquired their weaker competitors, particularly those with attractive assets such as real estate or good customer bases.

Retail supply chains further increased their shares of sales of private label products in response to the higher price sensitivity of consumers, and often strengthened their market positions. Retailers also tried to delay payments, but this was reported to occur more with national than with multinational companies. Less profitable stores were closed and special price offers became more frequent.

Banks cut back substantially on providing credit to the agro-food industry. Already approved credit applications were reviewed and modified, collaterals were re-evaluated, and stricter credit conditions and increased credit charges were imposed in all countries. In general, banks prolonged the process of credit approvals, carried out more cautious risk analyses and shifted decision making to a higher level. Credit applications were more often declined and even customers with high reputation and excellent credit history faced difficulties in accessing credit. Banks preferred customers who managed their risks with derivative market instruments (e.g. in Hungary).

Governments implemented a range of measures in response to local circumstances and there was a move towards protectionist measures. The EU reported that some 223 potentially trade restrictive and distorting measures, affecting around 5.2% of EU exports, were taken by the EU's main trading partners in the year to October 2009 (Agra Europe, 2009).

Assessment of future changes

Due to the central role of international trade in agriculture, the prospects of the sector depend on future global economic trends. Continued weakness in the general economy will further dampen commodity prices over the next 2-3 years, which should then strengthen with economic recovery. The reduction in agricultural prices, production and consumption, associated with lower incomes is likely to be moderate, as long as economic recovery begins within 2-3 years (OECD, 2009). The following factors could potentially have a negative impact on output and productivity in the region (Swinnen and Van Herek, 2009):

- An overall decrease in investments, because banks provide less credit to individual house-holds and (foreign and domestic) investors reduce their investments in the agro-food sector
- A decrease in demand for higher value agricultural products and a switch to basic products due to a decrease of the household's disposable income. Demand for higher cost livestock products, such as beef, pork and dairy, would be the most seriously affected.
- Government interventions could be positive if they boost investments. However, one should be careful it does not lead to a (partial) reversal of reforms in the agricultural sector, which could have a negative effect on efficiency.

Thus the recovery of consumer demand could play a key role, especially for high value-added food products. In Ukraine, for example, retail representatives expect greater consumer confidence already in early 2010; as a consequence, Auchan, a recent entrant to the Ukrainian market plans expansion in the near future. However, even with the return of demand to normal levels, the market structure will not stay unaltered: Armenia could see significant mergers between retailers, along with the disappearance of many small businesses.

In the coming ten years, the prices of agricultural commodities will remain at a higher average level than over the past decade, and will continue to remain volatile. This analysis suggests that income from farming and the price of food to consumers are likely to be subject to some fluctuation, and some uncertainty, this year and in the years ahead. This can only partly be attributed to the impacts triggered by the economic downturn, as there are other structural changes at play which will provide a stronger and longer lasting influence on farm management and farming income (CAP2020. 2009).

In the cereals and oilseeds supply chains, a consolidation process was foreseen to begin at the end of 2009 as a result of the bankruptcies and mergers at virtually all tiers. As the economies of Central and Eastern Europe and Central Asia rebound, the area sown to cereals and oilseeds is expected to expand again in the next five years, especially in the CIS countries.

On the production side, there is clearly room for optimism. Due to the relatively bearish wheat market tone during the first months of the 2009/10 season, winter wheat plantings declined in some countries in the region in autumn of 2009. However, as their economies rebound, the wheat area is expected to expand in the next five years, especially in the CIS countries. Although stocks were projected to fall slightly in the next five years, the more ample supply outlook should maintain them at comparatively higher levels (IGC). The planting of new, higher yielding varieties and the more intensive use of inputs will continue to boost global productivity in the next five years, with the strongest gains expected in the CIS countries. However, this growth could be hindered by land overuse and a lasting preference toward inexpensive but low-quality inputs (seeds and fertilisers).

The outlook for pig producers is relatively encouraging in Ukraine. Experts forecast a slight increase of pork output, mainly owing to pigs of bacon and meat breeds reared by specialised pig-breeding complexes. Hungarian pork breeders calculate with higher demand and prices, although the EC projects falling pig prices on the European market until May 2010.

As a consequence of the liquidity crunch and due to the loss of trust, it will be more difficult to reach deals and there will be more breaches of contracts and more bankruptcies in the short term. In the long term, a more selective financing of the agricultural businesses can be expected and the rigorous screening of the financial situation of the partners will not be eased, resulting in the decrease in investments referred to above. Government measures (loan compensations, direct subsidies, bank regulations) can be effective in easing credit accessibility and raising long-term investment attractiveness.

Relationships between surviving businesses will certainly be stronger but, in general, business trust will be restored only slowly. Farmers are expected to be more economical in the use of agricultural services (e.g. machinery, etc.) and more input suppliers and agricultural service providers may quit. Mergers are likely as small businesses both in production and retail exit the market. Market and price determining multinational trading companies could strengthen their positions, especially in the oilseeds markets. This is not only due to their reputation, credit history, own equity, liquidity, ownership, etc. but also to their access to information, to their structures and capabilities which makes them more efficient in processing and evaluating information, and to the speed at which they can react to market developments. Thus, officials in Hungary, for example, expect agriculture to become more specialised, a process which will include a further rapid decline in the number of semi-subsistence farms.

Policy recommendations

The proposed policy options are of necessity general (i.e. not always linked with agriculture) for several reasons, not least because (a) the roots of the macroeconomic shock lie outside the sector and (b) despite the similarities noted in this report in terms of the impacts of the crisis, the countries across the Eastern European and Central Asian region have widely differing economies and agro-food sectors. Responses should be implemented in the context of more global strategic objectives.

The relationship between the crisis and other issues affecting agriculture and food security is clear. The first Millennium Development Goal states that the United Nations „is to eradicate extreme hunger and poverty" and „agricultural productivity is likely to play a key role in this if it is to be reached on time". David Nabarro, coordinator of the UN secretary-general's task force on the global food security crisis, stated that the economic crisis further „complicates and exacerbates the situation ... price volatility and a global credit crunch are discouraging new planting and new investment, while food prices in many poor countries remain at historically high levels" (EurActive, 2009).

Thus, in formulating policy options, the financial crisis must be considered in the overall context of food security and poverty. We note that governments are claiming to give high priority to stabilising the macroeconomic and legal environment. However, Philippe Le Houerou, whilst recognising that the financing needs in Emerging Europe and Central Asia are the highest of any region of the world, recently stated that "as the impact of the stimulus packages dissipate at the global level, the private sector will need to take over as the engine of economic recovery and growth" (ECA, 2009).

By contrast, given the entrenched nature of global poverty, the arrival of peak oil, and the evidence that climate change will have a major impact upon food provision in the long term, there is growing concern that the world food crisis will deepen over the next decade (Lawrence et al. 2009). Thus when the most immediate effects of the financial crisis have passed, these issues will still remain to be addressed though government and trans-national interventions. Recommendations relating to these wider issues are beyond the scope of this report, but it should be stressed that it is necessary to avoid short-term policy responses which conflict with long-term development goals.

On the basis of the foregoing, we have sought to identify what steps governments could take, in addition to stabilising the macroeconomic and legal environment, in order to make the agro-food sector less exposed to future financial crises. It is not our place to offer recommendations to governments on how to lower interest rates, to modify the tax system or how to crack down on illegal operations although these issues were regularly raised by interviewees. However, governments need to agree on common goals in order to be better prepared for future shocks to the global food system, such as another financial crisis, and to devise coherent policies to achieve them, to monitor progress, to identify best practices and to draw up contingency plans.

In all four countries, several measures have already been implemented but many interviewees were not aware of, or did not perceive, their existence. When they did, they frequently criticised them as being ineffective or incorrectly targeted. Equally, many stakeholders, with the exception of multinationals, called for measures such as more subsidies, more state intervention including price controls, more protectionist measures and even the creation of state owned monopolies, which we understand (as they arise from each respondent's particular vision of the situation and his/her perception of possible political solutions) but cannot support. They are examples of the short-term policy responses which can have negative impacts of rural poverty. Where governments do intervene in the market, they must ensure that they minimise the risk of causing market distortions.

A deteriorating economic situation may encourage protectionism and, for example, to delay the implementation of legislation and other efforts geared towards environmental sustainability. Any price movement due to the increased volatility of the market should not be interpreted as a trend, but may encourage protectionist responses amongst governments. Protectionist measures are not a way out of the crisis situation and are not able to avert the occurrence of crises in the future.

Similarly, state intervention, especially in pricing agricultural commodities, and state owned monopolies can discriminate against rural areas. Governments often keep prices of basic grain at such artificially low levels that semi-subsistence producers cannot accumulate enough capital to make investments to improve their production and are effectively prevented from getting out of their precarious situation. When a government monopolises trade, farmers may find that they are free to grow cash crops for export but, under penalty of law, are only able to sell their crops to government buyers at prices far below the world market price. The government then is free to sell the crop on the world market at full price, pocketing the difference. This creates an artificial "poverty trap", from which even the most hard-working and motivated farmers may not escape (EurActive, 2009).

Governments should distinguish between agro-economic priorities and social policy issues. Our recommendations focus on the establishment of resilient, economically viable, diverse, innovative agro-food chains which are capable of meeting changing market needs such as consumer desire for safe, healthy foods, perhaps coupled with issues such as lower environmental impact farming and improved animal welfare. In the longer term, rising food prices and an efficient and productive agro-food chain, the latter encouraged into existence in part by effective government measures, could, as envisaged by David Nabarro, help rural communities in some countries in the region to escape poverty by increasing farmers' incomes. We recognise that governments need to enhance social security safety nets to combat the consequences of developments such as the reduction in remittances and the return home of migrant workers, but as a quite separate issue.

Our recommendations, based on the frequent observation of interviewees that companies with adequate financial reserves for 1-2 years are not suffering from the crisis, and the ideas in the country reports, are as follows:

1. Target the limited funds for investment subsidies at the professional viable enterprises with a long-term business plan. Increased investments have been a major driving force behind the recent economic growth in the agro-food industry. However, as national budgets tighten, there will be implications for agricultural spending. The economic downturn may add further impetus for policymakers to re-evaluate the uses to which agricultural expenditure is put, and to re-focus it where it might provide the greatest level of benefit.

2. Support initiatives which can ensure more reliable access to credit. Access to credit was viewed as the key issue by many interviewees and the problem was compounded by a reduction in asset values which reduced stakeholders' capacity to borrow money. We agree that governments were right to avoid direct crediting to agricultural producers and processors in terms of loans, rather to use banks as the means of increasing financing for the agro-food sector. To maximise reliable access to credit, initiatives may include expanded credit guarantee funds and support for credit insurance in order to improve the financial circulation within the agro-food supply chains. Other possibilities include credit warrants, credit unions, cooperative banks, microcredit, an insurance system against natural disasters and better information about the availability of credit.

3. Avoid the offsetting of debts, taxes and other liabilities. Offsetting of debts etc. is never applied to the general population and the implementation of such measures in response to the financial crisis would further weaken business trust and increase political and legal risks perceived by stakeholders, would nurture corruption and weaken social integrity.

4. Improve technology. Many parts of the agro-food supply chain in the region are undercapitalised. This can lead directly to production losses. For example, many wheat farmers in Armenia ascribe around 15% crop loss to worn-out machinery. The greatest technical challenge to avoid soaring food prices is to develop and introduce more productivity increasing (or at least stabilising) farming technologies that are sustainable. New technology can increase gross value added (GVA) throughout the supply chain, ensure compliance with Health and Safety and other regulations, as well as allow new market opportunities to be exploited through new products. Government cofinancing should take into account not just the needs of the beneficiary but also the potential impact of the investment on the wider local economy.

5. Encourage horizontal and vertical integration along the agro-food supply chains in order to facilitate cooperation between stakeholders, to strengthen business relations and restore

business trust, to reduce transaction costs and to increase bargaining power. The means for achieving this include changes to the legal environment, preferential taxation, co-financing aid for investments, state guarantees, etc.

6. Encourage consolidation, rationalisation and specialisation, particularly but not only within the processing industries, in order to create viable market players which can competitively supply retailers with respect both to quantity and quality of products. In addition to full-scale mergers, farm associations, grain procurement cooperatives and export groups can strengthen the negotiating positions of their members through collective purchasing and selling. Capacity building measures are needed to help their establishment, plus changes to the legal environment and co-financing aid. Less formal cooperation could include the setting up of representative farmers' associations whose members could benefit from shared services. Such cooperation could be encouraged with tax incentives.

7. Increase spend on innovation and R+D. All tiers in the supply chain must continue to innovate both in terms of new products and production systems to maintain their economic viability and to access new markets. Whilst such innovation can often be led by the private sector, substantial investment in public sector agricultural research and development is also required, particularly in developing countries. Technological support to farmers and other stakeholders, including advisory services and effective animal and plant breeding programmes can help to strengthen the entire agro-food industry. Measures to promote information and technology transfer, particularly from the public to the private sector, are a crucial but frequently neglected component of this process.

8. Support marketing activities to strengthen the market position of the domestic processing industries. Tax simplification could encourage new entrepreneurs into the market.

9. Support the development of logistics to lessen the costs of handling, storing and transporting goods and thereby increase the competitiveness of the supply chain.

10. Provide risk management subsidies to farmers to help them to cope with increasing price volatilities. Governments should encourage the use of derivative market instruments such as commodity futures and option contracts, for example to manage the price risks which have increased due to the volatility of the markets. Before this happens, they should ensure that stakeholders have more information about the use of these instruments and also create an environment where market participants can accumulate the necessary capital to cover the costs of using such instruments and where regional commodity futures markets could perhaps emerge which would be able to attract liquidity (contract volume).

11. Improve the transparency of policy making and communication in order to restore government credibility. The process could be facilitated by involving NGOs in the decision making process. The trading environment for all stakeholders in the supply chain would be encouraged by more helpful public administration, respect for existing laws by public officials and other stakeholders, and transparency in government and government measures. Investors should not be faced with unnecessary political risks through unnecessary government intervention. Measures aimed increasing quality standards for imports and exports, and stronger food safety regulations in general are to be welcomed, but such regulations should not simply be a 'front' for trade barriers.

12. Facilitate the gathering, processing and disseminating of market information, and create reliable and accessible databases, thereby making shorter and more efficient the decision making

and adjusting process of enterprises. Improved market information services will help stakeholders to respond more quickly and effectively to any future crises, and could possibly be delivered through greater use of ICT.

13. Facilitate niche markets for speciality products. The consumer shift to cheaper products has clearly benefited own label brands and may have strengthened the position of the major retailers, who can call on strong negotiating positions and economies of scale, in the agro-food chain. However, some stakeholders have already responded to the crisis by exploiting 'niche' market opportunities. Support for producing goods with ‚added value', bearing in mind the longer-term trend towards safe, healthy foods mentioned above, may help smaller players in the supply chain to exploit new business opportunities.

14. Make more effort to educate consumers and children about agriculture, nutrition and kitchen culture. Whilst it might seem inappropriate to look beyond the issues of poverty and basic food security at a time when these are increasing, the gradual 'westernisation' of the diet has attendant health issues such as obesity. Healthy eating, including the greater consumption of so-called 'functional foods' can have both social (e.g. greater life expectancy) and economic (a healthier workforce) benefits.

15. Promote land reform. The process of land reform and land registration needs to be completed as secure tenure of farm plots is essential to allow farmers to invest with confidence in machinery and other equipment and if necessary to use the land as collateral in return for credit. Achieving this objective requires:

    - establishing a uniform state land cadastre in each country where this does not yet exist and creating a uniform state system of registration of titles for immovable property including for land plots
    - creating conditions for development of mortgage lending on the security of land
    - providing conditions for free purchase and sale of agricultural land plots

16. Support liberalisation of the land market. Several countries are amending their national laws to encourage the purchase or lease of farmland abroad, or to attract foreign land investors. In our research, interviewees in different countries held conflicting views on liberalisation, particularly with respect to foreign ownership. Gana (2009) stated that "Land rights alienation to foreign companies represents a major threat for farm and rural households (and) will increase the actuality and relevance of issues such as land rights, tenure systems, land reforms, land conflicts and struggles". We do not agree that it is a "major threat". Liberalisation can provide access to investment capital which can revitalise the economic performance of primary agricultural production which in turn is the basis of agro-food supply chains which can employ large numbers of people and contribute considerable GVA to the economy. Hence we support liberalisation of the land market implemented by each government in the form most appropriate to local conditions.

The key messages arising from the research are (a) the need to create prosperous, vertically and horizontally integrated agro-food supply chains which are more resilient to future financial crises and (b) to ensure more reliable access to credit. Our recommendations, while focusing on these issues, only address what to do, not how to do it. Inevitably their implementation would need to be adapted to fit with local needs and further research is needed regarding this. Such research should be conducted in the international sphere to allow cross-border identification and exchange of good practice. The FAO is uniquely well placed to drive forward this research agenda.

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