



GREEN **economy**

Organic Agriculture A step towards the Green Economy in the Eastern Europe, Caucasus and Central Asia region

**Case studies from Armenia,
Moldova and Ukraine**

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**“Organic farming is not only added
value for the farmer, but also a good
investment for the future”**

Key messages

- In the Eastern Europe, Caucasus and Central Asia (EECCA) region organic agriculture could play a catalyst role in green economy transformation by re-vitalizing the farm and food sector and creating employment that provides better returns on per unit of labour input all along the value chain. It could increase income and food security for rural communities; create business opportunities for investors and increase the contribution of agriculture to the national economies by, inter alia, reducing import bills for farm inputs, boosting exports of organic products and reducing costs to society that result from the negative externalities of industrial farming.
- Conventional industrial agriculture produces high yields per hectare by using external inputs such as fossil fuel, synthetic fertilizers and pesticides that result in higher levels of greenhouse gas emissions, land degradation and depletion of natural capital. When externalities – such as soil erosion; reduced natural resistance of crops to pests; loss of human health and life (caused by pesticides and other chemicals); loss of biodiversity, ecosystems and ecosystem services; contamination of water; and costs associated with climate change – are accounted for, the cost inflicted by intensive industrial farming on a country and its population outweigh its benefits.
- In contrast, organic agriculture offers the EECCA region the opportunity to maintain and enhance its natural capital stock by reducing emissions, creating carbon sinks, preserving soil organic matter and increasing biodiversity. The value of public benefits and services from organic production has been estimated at US\$40 per hectare per year for carbon sequestration; and a further US\$30 per hectare per year for other biodiversity services. In addition, by avoiding negative externalities, including soil erosion and pesticide contamination, organic agriculture saves in the range of US\$150-200 per hectare per year compared to conventional production. In total, organic agriculture yields environmental advantages valued at US\$220-270 per hectare per year. In addition, land value can increase substantially from better soil management.
- Organic agriculture requires significant investments in capacity and skills development of farmers and the whole value chain as well as institutional strengthening and infrastructure development. These investments provide good economic, social and environmental returns.
- The organic sector merits public sector support in terms of policy reforms and investment as many of the benefits of organic agriculture are passed on to society as a whole rather than staying with just the farmers and private investors.
- A mix of regulations and incentives can drive the growth of organic production. This can be seen in countries such as Moldova, which experienced a three-fold increase in the number of organic farmers between 2006 and 2009, and now 11 per cent of its agricultural export is organic produce.
- This report suggests that attaining an organically managed area in the range of 5 to 10 per cent of the region's whole agriculture area is desirable and possible within a decade. EECCA governments can gradually stimulate organic production by setting ambitious growth targets, making organic action plans, adapting policies to support organic agriculture and facilitating public and private investments in the sector.
- Economic incentives to reward supply chains for responsible and green behaviour need to be put in place, including linking them with relevant international mechanisms such as international payments for ecosystem services, Reduced Emissions from Deforestation and Forest Degradation (REDD) and REDD+.
- Finally, governments need to implement “polluter pays” (e.g. for nutrient runoff) and “user pays” (e.g. for water) principles in agriculture. The first priority should be to remove distorting policies, such as subsidies for agro-chemicals or policies that hinder long-term land tenure by farmers or farming communities.

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Executive Summary

There is no other sector that touches so many important aspects of the green economy as agriculture. It represents the most important source of income for the majority of people in the world; it produces most of the food we need; and it uses approximately 40 per cent of the global land area and 70 per cent of freshwater used by mankind is for farming. In addition, agriculture provides a number of key goods and services needed for society; it also provides some ecosystem services while destroying even more. It is second only to the energy sector as a source of greenhouse gas emission; it is the driver of a nine-fold increase of active nitrogen in the biosphere and it is a main source of water pollution. Therefore, agriculture plays a pivotal role in the transformation of societies to green economies. This report explores how organic agriculture can help in the transition to a green economy in the Eastern Europe, Caucasus and Central Asia (EECCA) region, consisting of the countries Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. The report is mainly based on case studies in Armenia, Moldova and Ukraine.

Agriculture's share of GDP in EECCA countries is high compared to the Organisation for Economic Co-operation and Development (OECD) average of 2.2 per cent, ranging from 5.3 per cent in Russia to 30.7 per cent in Uzbekistan. The agriculture and food sector in EECCA has had a difficult transition to a market economy. Agriculture productivity is low measured both per unit area and per unit of labour. Farming in EECCA countries causes significant environmental problems, such as soil erosion; eutrophication; nitrates in drinking water; water-logging and salinity; pesticide contamination; biodiversity degradation and rangeland degradation. In addition to those caused by farming itself, other environmental problems that impact negatively on farming include contamination of farmland (e.g. radiation from Chernobyl and obsolete industries); deforestation; biodiversity loss and climate change.

Organic agriculture is still in a rather early stage of development in EECCA. The country with the highest proportion of agricultural land under organic management is Moldova, where it extends to 1.9 per cent of the farmland and represents 11 per cent of all agriculture exports. Other EECCA countries fall far behind. Even in Ukraine, which has an impressive 270,000 hectares under organic management, only around 0.5 per cent of the agricultural area is organic. The export market is clearly the driver, even though there are attempts to develop the local market and there is a growing interest among consumers. Price differentials between exported organic and conventional products depends on the product type, its quality, lot volumes, delivery basis, whether the product has other certifications and many other parameters. The typical premium difference is 10-20 per cent above conventional price level, but organic products are sometimes paid three or four times more than conventional.

Among the three countries studied, the effect of a positive government is best illustrated in the development of the organic sector in Moldova. The Moldovan Government has employed most of the tools that are available to a government; these include regulations, institutional development, subsidies, investments and capacity-building including measures such as financial support for farmers in conversion; the establishment of the Department for Organic Agriculture and Renewable Resources; and a 20 per cent government subsidy for 600 tons of vegetables sold on the local market. Two units producing organic wine were supported as well as twelve thousand hectares of organic grape production.

The economic benefits of organic farming largely fall into three categories:

1. Direct commercial benefits from the organic production system and markets, i.e. higher profitability as a result of lower costs or higher income or both.
2. Substantially reduced externalities, i.e. savings for the public sector and future generations. Organic farming incurs substantially lower external costs resulting from damage to the environment, ecosystem services and human health.
3. Production of public benefits such as ecosystem services. Organic agriculture can be deployed to produce valuable ecosystem services such as biodiversity conservation, landscape preservation and carbon sequestration.

To capitalize on the opportunities and overcome the challenges, organic agriculture needs to reach mainstream policies and be seen as a pivotal strategy. Setting ambitious growth targets, ranging from 5 to 10 per cent of agricultural land to be reached within a decade, would be helpful and signal a committed and concerted effort by government, donors, NGOs, farmers and entrepreneurs. If the sector is to grow it is imperative it reaches economies of scale in the whole value chain, from input supplies to retail and exports.

A starting point for government engagement is *to give recognition and encouragement* to the organic sector. An *organic policy* should be linked to the overarching objectives of the country's overall development objectives, whether focused on achieving Millennium Development Goals (MDGs) or commitments for addressing climate change. It should also be linked to the country's agricultural policies in order to make them mutually supportive. *Organic action plans* and projects should develop from the overall organic policy. Critical for development is that bottlenecks are identified and that all the aspects of development – such as production, marketing, supply chain, training, research – are considered. Organic agriculture requires significant *investments in capacity and skills* development of farmers and the value chain.

Stimulation of *private investment* is an important part of a government policy. Tools that a government can use to encourage private investments include various forms of matching funds or public-private partnerships; mapping investment possibilities; showing long-term commitment to the sector; and tax rebates. It is very important for agricultural investment that land tenure is secure.

A *market for public goods*, such as carbon sequestration, biodiversity conservation and water purification, should be developed. This would not be unique for organic agriculture, but the sector should play an important role, and its multifunctional facets should be taken into account. Finally, governments need to implement “polluter pays” (e.g. for nutrient runoff) and “user pays” (e.g. for water) principles in agriculture. The first priority should be to remove distorting policies, such as subsidies for agro-chemicals, or policies that hinder long-term land tenure by farmers or farming communities.

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The report is based on three country studies written by Nune Darbinjan (Ecoglobe-Armenia), Viorel Gherciu (Proruralinvest-Moldova), and Eugene Milovanov (Organic Federation of Ukraine-Ukraine), as well as other sources of information on the EECCA region. The country studies were preceded by and benefited from discussions that took place during the following national consultations:

In Armenia (Yerevan), consultations took place on 13 April and 9 July 2010 and were organized by Ecoglobe;

In Ukraine (Kyiv), they took place on 6 April and 6 July 2010 and were organized by the Information Center Green Dossier;

In Moldova (Chisinau), they took place on 5 May and 30 June 2010 and were organized by NGO "ProRuralInvest".

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Acronyms

CIS	Commonwealth of Independent States
EASC	Euroasian Interstate Council for Standardization, Metrology and Certification
EECCA	Eastern Europe Caucasus and Central Asia Region
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FiBL	(Swiss) Research Institute for Organic Agriculture
GTZ	German Technical Cooperation Agency
IFOAM	International Federation of Organic Agriculture Movements
ISO	International Organization of Standardization
NGO	Non-governmental organization
SME	Small and medium sized enterprises
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
USDA	United States Department for Agriculture
USDA NOP	USDA National Organic Program
WTO	World Trade Organization

Exchange rates: Currency values have been converted to US dollars according to exchange rates in July-August 2010. The majority of figures in Euros have been converted to US dollars at the exchange rate of 1.3. However, European Union expenses and trade data on transactions have been left in Euros.

1. Organic Agriculture, the Green Economy and the Eastern Europe, Caucasus and Central Asia Region

“Organic farming is not only added value for the farmer, but also a good investment for the future”, Valeriu Cosarciuc, Minister of Agriculture and Food Industry of Moldova.¹

Introduction to the report

The stakeholders in Eastern Europe, Caucasus and Central Asia region recognized that there are significant opportunities for promoting organic farming in EECCA countries, given the low level of pesticide and fertilizer use since 1994, the significant share of small farms, and the availability of agricultural labour (UNEP-EEA 2007). There are also export opportunities given the close proximity to European Union (EU), which is one of the biggest and fastest growing markets for organic products.

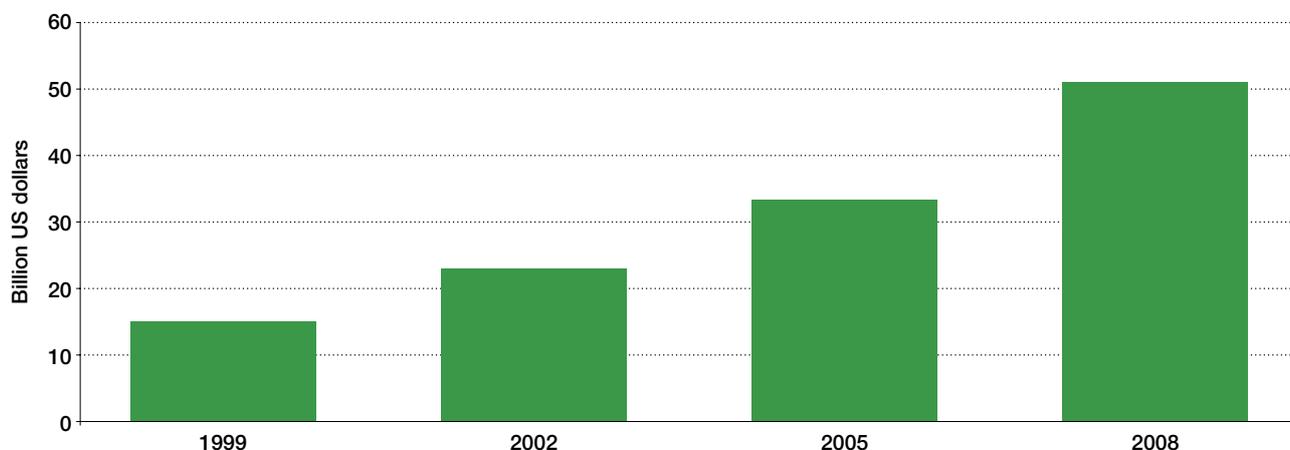
This report is about the contribution that organic agriculture can make in the EECCA region in the context of the green economy. It is mainly based on three national case studies, Armenia, Moldova and Ukraine. Information was collected, two workshops were held in each country and a national report was produced for each country. Based on those case studies and other sources this regional synthesis is offered, recognising that the EECCA region is very diverse and experiences from Moldova are not fully applicable in, for example, Turkmenistan. The first chapter introduces organic agriculture, the concept of the green economy, the EECCA region and the agricultural conditions in the region. In the second chapter, the current status of the organic sector in the EECCA is described, and the final chapter is a discussion on how organic agriculture can contribute to the green economy and what are the opportunities and challenges. In addition, a number of recommendations are made.

Organic agriculture in the world

The International Federation of Organic Agriculture Movements (IFOAM) defines organic agriculture as: *“Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.”* Since the 1970s, organic agriculture has developed into a market concept, with standards, certification and finally, government regulation in most developed countries. Organic agriculture standards are harmonized on the private sector level by IFOAM and between governments in the joint FAO/WHO Codex Alimentarius Committee. Global markets in organic food and drinks were estimated to be worth around US\$50 billion in 2008 (Willer and Kilcher 2010), and the market has continued to grow throughout the recession in most countries. Organic products mostly command market premium prices of between 10 and 100 per cent, with most products in the range of 15 to 25 per cent.² Five countries or territories (French Guiana, Sweden, Switzerland, Austria and Lichtenstein) have more than 10 per cent of their land under organic management (Willer and Kilcher 2010). There are approximately 500 certification bodies in the world offering organic certification (TOS 2009).

¹ Speech to participants in workshop in Chisinau, 30 June 2010.

² Price premiums are not guaranteed, however, and occasionally organic products are sold for the conventional price.

Figure 1 Global growth of organic markets

Source: Willer and Kilcher 2010

Organic agriculture is also practiced and promoted as a sustainable farming system regardless of marketing, in which case it is rarely certified and is often less well documented. This occurs both in developed and in developing countries. There is also so-called “default” organic farming, which occurs in unorganized situations where farmers use no pesticides or agro-chemicals as they have no need or cannot afford them. This occurs in many countries and certainly in the EECCA countries.

Public recognition

Increasingly, organic agriculture is recognized by governments to be an economically viable and environmentally sustainable form of agricultural production. Thus, many governments now actively support organic agriculture and have set growth targets for the sector (see Table 1).

Table 1 Organic action plans in selected EU countries

Country	Targets
Austria	20% organic land area by 2010.
Bulgaria	8% organic land area by 2013.
Czech Republic	10% organic land area by 2010.
Denmark	12% organic land area by 2003.
France	6% organic land by 2012; 20% organic products in government canteens by 2012.
Germany	20% organic land area, no target year.
Netherlands	Annual growth of 10% in consumer spending; Annual growth of 5% of the organic land area; 10% of the research money for policy support research allocated to organic farming.
Sweden	20% organic land area by 2010; 25% of the food in public canteens organic.

Source: (ORGAP 2008)

In 2007 Ukraine set an official target of 10 per cent of the country's agricultural production to be organic by year 2015 (Milovanov 2010). Governments of a number of developing countries are also promoting organic agriculture. For example, Bhutan and Dominica, and the states of Kerala and Sikkim in India, have declared a vision that all farming shall be organic in their territory. Tanzania has set a target of 10 per cent of the land area to be organic. To achieve their targets governments support organic agriculture in various ways: direct subsidies for producers; subsidies for certification costs, or free certification; free advisory services; and marketing or investment programmes. In 2005 government support committed to agri-environment measures amounted to a total of €3.83 billion for the whole of the EU (EU-25), of which €0.66 billion (17.2%) was devoted to organic agriculture.³ In the period 2004-2006 less than half of the organic area in the EU-25 benefited from support, however, the level of this support varied significantly between Member States, with more than 90 per cent in Finland and less than 10 per cent in the United Kingdom (EU 2010).

The green economy

The green economy initiative is designed to assist governments in “greening” their economies by reshaping and refocusing policies, investments and spending towards a range of sectors, such as clean technologies, renewable energies, water services, green transportation, waste management, green buildings and sustainable agriculture and forest management. A green economy can be defined as an economy that results in improved human well-being and reduced inequalities over the long term, while not exposing future generations to significant environmental risks and ecological scarcities (UNEP 2010).

Organic agriculture and the green economy

There is no other sector that touches so many important aspects of the green economy – as defined above – as agriculture. It still represents the most important source of income for the majority of the world's population; it produces most of the food we need; uses approximately 40 per cent of the land area; provides a number of key goods and services needed by society; provides some ecosystem services while destroying even more. It is only second to energy as a source of greenhouse gas (GHG) emission; is the driver of a nine-fold increase of active nitrogen in the biosphere and is the main cause of water pollution, just to mention a few (MEA 2005). Therefore, agriculture plays a pivotal role in the transformation of societies to green economies.

The benefits of organic agriculture in the context of the green economy fall into a number of categories, of which a few are listed below:⁴

1. Direct economic benefits for the farmer, trader and processors from the production itself, e.g. the higher price and/or lower costs.
2. Economic benefits for society in the form of employment (in the whole value chain).
3. Economic benefits for society in the form of increased exports, e.g. organic products, and/or decreased imports, e.g. energy and agro-chemical.
4. Direct economic benefits for the producer from selling public benefits or services, e.g. carbon sequestration, biodiversity conservation and landscape management.
5. Long term benefits in the building up of natural capital, in particular in soils.
6. Associated business opportunities, e.g. eco-tourism, educational farms and inputs such as biological pest control or waste composts.
7. Reduced costs for society, e.g. for water purification and health care.
8. Increased social capital, e.g. cooperation between farmers, pride of doing something that is appreciated, increased trust in the value chain, and better understanding between consumers and producers.

³ This can be contrasted with the total volume of the EU agriculture budget, which is in the range of €45 billion, i.e. the direct support to organic production represents just a small fraction of the support to agriculture (organic farmers can of course benefit also from other kinds of support).

⁴ Later in the report we discuss what this means or can mean for the EECCA countries.

Organic and poverty alleviation

A range of other reports have demonstrated the potential of organic farming to alleviate poverty and contribute to food security, often by a combination of increased income, increased diversity on the farm, reduced costs and increased efficiency (AgroEco and GroLink 2008, Giovannucci 2005, Bolwig and others 2008, United Nations 2008). Organic farming is also a very cost-effective way of combating poverty. The World Bank estimates that the cost of achieving the MDG of halving the percentage of households in poverty totals around US\$554 to US\$880 per head. A study from the Asian Development Bank Institute, based on case studies in the People's Republic of China (PRC), Sri Lanka and Thailand, found that the cost of moving a household out of poverty through engaging farmers in organic agriculture could be as low as US\$32 to US\$38 per head (Markandya and others 2010).

External costs of farming

External costs of farming in the United Kingdom reached around 1.5 billion pounds in 2000, corresponding to US\$400 per hectare, according to very cautious estimates⁵ (see Table 2). Of course, organic production causes some external costs, but they are substantially lower; the “savings” from converting to organic methodology is in the range of US\$300 per hectare (Pretty and others 2005). There are similar calculations from USA and Germany. As farming in the EECCA countries is, on average, more extensive it is reasonable to expect that the savings made from converting to organic systems are less than in the British example, perhaps in the range of US\$150-200 per hectare per year.

Table 2 Estimated external costs of agriculture in the UK in 2000, and the effect on a full-scale conversion to organic management

(£ million ⁶ per year) Cost category	Actual cost	Scenario: organic
Pesticides in water	143	0
Nitrate phosphate, soil Zoonoses (esp. Cryptosporidium) in water	112	54
Eutrophication and pollution incidents (fertilizers, animal wastes, sheep dips)	79	20
Monitoring and advice on pesticides and nutrients	13	13
Emissions of methane, ammonia and nitrous oxide	421	173
Emissions of carbon dioxide	103	32
Organic matter and carbon dioxide losses from soils	59	24
Biodiversity and landscape losses	150	19
Damage to human health: pesticides	1	0
Damage to human health: micro-organisms and other disease agents	432	50
TOTAL	£1,514	£385

Source: Pretty and others 2005

⁵ For instance, the report assigns very low costs to the effect of pesticides on human health. The reality is likely to be much worse, see the other data.

⁶ In 2000 the approximate exchange rate between the British pound and US dollar was 1.5.

The Eastern Europe, Caucasus and Central Asia region

The Eastern Europe, Caucasus and Central Asia region (EECCA) consists of the following countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

Table 3 Some key economic and agriculture indicators for EECCA countries

Country	Agriculture value added per worker US\$ 2003-2005	Agriculture as share of GDP 2003-2005	GDP per capita	Proportion of population below US\$2 per day	HDI (Human Development Index)
Armenia	2,340	23.0	5,693	31.1	0.798
Azerbaijan	484	11.9	7,851	33.4	0.787
Belarus	1,797	10.0	10,841	<2.0	0.826
Georgia	1,062	18.4	4,662	25.3	0.778
Kazakhstan	1,137	7.6	10,863	16.0	0.804
Kyrgyzstan	549	34.1	2,006	21.4	0.710
Moldova	1,091	20.0	2,551	20.8	0.720
Russian Federation	2,037	5.3	14,690	12.1	0.817
Tajikistan	210	24.2	1,753	42.8	0.688
Turkmenistan	793	19.9	4,953	n/a	0.739
Ukraine	1,035	11.7	6,914	4.9	0.796
Uzbekistan	486	30.7	2,425	<2.0	0.710

Sources: World Bank 2007b, UNDP 2009⁷

Poverty

Poverty is prevalent in some of the EECCA countries and rural populations are to a large extent poorer than urban populations. By 2003, 43 per cent of the population of Armenia was classified as poor, of which 7.4 per cent were very poor, compared with 55 per cent and 23 per cent respectively in 1998/99. An important observation emerging from Armenia's recent poverty data is that the gains from high economic growth rates have not been equally distributed within the population, nor has it spread across different regions of the country. Growth has mostly benefited the capital Yerevan, and, to a lesser extent, other cities, while poverty reduction among the population living in rural areas has been almost stagnant (Darbinjan 2010). The gap between the poorest and wealthiest groups of society has increased in much of EECCA and is significantly higher than it was pre-transition. For example, in Russia in 1991 the poorest 20 per cent received 12 per cent of total national income, while the richest 20 per cent received 31 per cent. By 2003 the income gap had widened significantly with the poorest 20 per cent receiving only 6 per cent and the richest 20 per cent receiving 47 per cent (UNEP-EEA 2007).

Agriculture in the EECCA

General

Agriculture's share of GDP in EECCA countries is high compared to the OECD average of 2.2 per cent, ranging from 5.3 per cent in Russia to 34.1 per cent in Kyrgyzstan. Fifty-eight per cent of the inhabitants of Moldova live in rural areas; 55 per cent of the active labour-force is in rural areas; and 32 per cent of the active-labour force is employed in agriculture. Agriculture and agro-processing activities account for about one-third of GDP

⁷ In order to ensure the figures are comparable the same sources have been used for each column. The EECCA was hit by the financial crisis in 2008/2009, and in 2010 the GDP is actually lower in many countries.

and agricultural products make up about three-quarters of the total exports (Gherciu 2010). Agriculture provides almost 45 per cent of the employment in Armenia (Darbinjan 2010). Agricultural productivity is low, both when it is measured per unit area and per unit labour (see Table 3). Added value per worker in high-income countries was, on average, US\$24,438 (up to US\$39,220 in France), which is ten to a hundred times higher than it is in EECCA countries (World Bank 2007b). In Ukraine in 2008 average potential yields were 3.46 tons of grain per hectare, whereas in EU countries average grain yields were 5.16 tons and in the USA 6.54 tons per hectare. Likewise, milk yield per cow in Ukraine was 3,793 kg per year, whereas it was 6,107 kg in the EU (Strategy of economic reforms for Ukraine 2010-2014). The main reasons for the low productivity of Ukrainian farms are poverty, lack of investment, insecure land tenure and the inefficient use of natural resources. In addition, rainfall is scarce in some parts of EECCA and the length of the growing season is short, particularly in Northern Russia. However, it is worth noting that the soils in large parts of the EECCA region are good, in particular the famous black soils, *chernozem*, of Russia, Ukraine and Moldova. In many cases, though, land is degraded and badly managed. See more about the agricultural conditions in the EECCA in Annex 1.

Within the EECCA there is a significant diversity in land use between the countries, with Moldova and Ukraine having predominantly agricultural areas (74 and 72 per cent, respectively) and Georgia, Kazakhstan and Tajikistan having less than 40 per cent of their territories under agriculture (37, 33 and 32 per cent, respectively). The proportion of grassland (intensive pastures and meadows) compared to cultivated crops also varies significantly between the countries: more than half of the territories of Turkmenistan and Uzbekistan (63 and 50 per cent, respectively) and as little as 10, 12 and 13 per cent in Moldova, Russia and Ukraine, respectively (WWF 2006).

Farm structure

Today, most EECCA countries have privatized land or at least land available for long term leases. In Armenia land privatization resulted in 340,000 farms being established. The farms have an average size of 1.4 ha of farmland, including 1.1 ha of arable land, a situation that is not conducive to the efficient management or use of new technologies and machinery. Furthermore, 32 per cent of the arable land is not used for its target purpose. Part of this land is in the dangerous land mined zones near Armenian-Azerbaijani border, while other land is too remote from the settlements or too small to farm (Darbinjan 2010). In Moldova, there are 1,550 large farm enterprises and over 390,000 household farms; in addition there are 600,000 individual small plots. Almost 20 per cent of the agricultural land in Moldova is currently not cultivated (Gherciu 2010). The situation in Ukraine is similar with a small number of huge agricultural enterprises and a very large number of small plots and micro-farms for subsistence living; “family farms”⁸ and unused land are not common. In several Central Asian countries, unused agricultural land is common, especially in mountain areas (Arbenz 2010).

Table 4 Distribution of farmland in Ukraine

	Farm lands (hectare)
Rural residents (individual households)	15,604,000
Agricultural enterprises	17,252,000
Private family farms	4,031,000

Source: Milovanov 2010

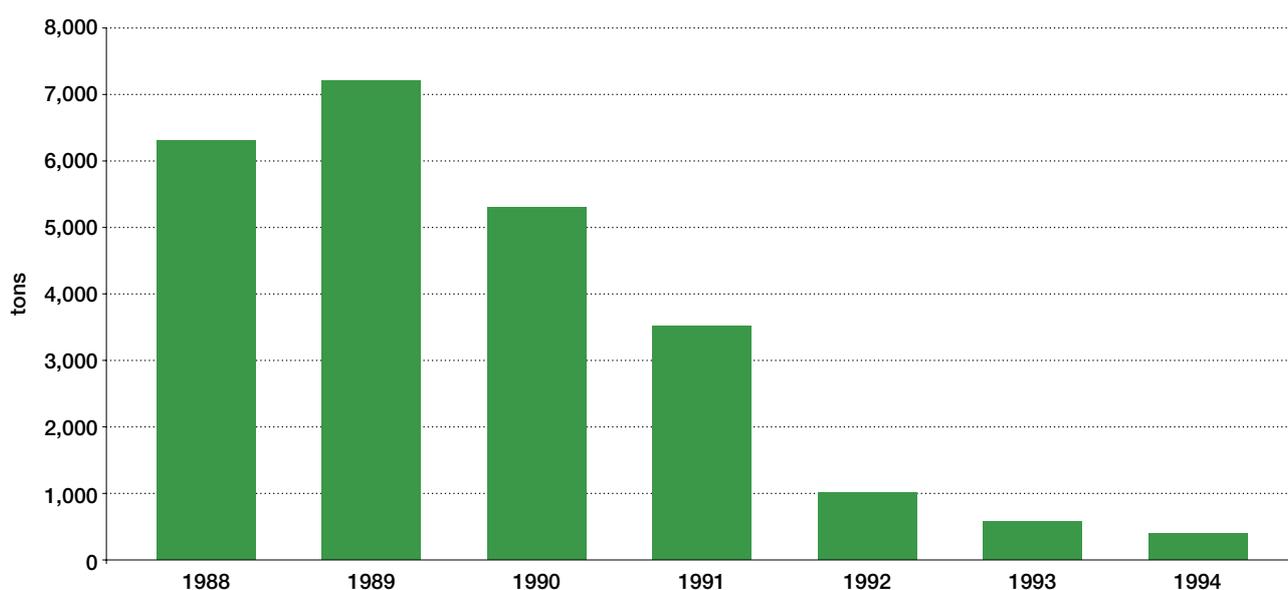
In Ukraine, the majority of fruit and vegetables as well as most livestock are produced by small household farms (Milovanov 2010). In 2002, of the 220 million hectares of agricultural land in the Russian Federation, 138.1 million ha was privately owned (used by agricultural companies, and for individual use) and 81.9 million ha was public land (used by municipal enterprises and land included in the land reserve). The average size of the agricultural enterprises was 3,000-7,000 ha, private farms averaged 10-100 ha and household plots were typically about one ha (WWF 2006).

⁸ In this context family farms are defined as a farm where the farming household gets most of its income from farming and where the family is the pre-dominant source of labour.

Use of agro-chemicals

During Soviet times the use of chemical fertilizers and pesticides was high. In Azerbaijan, use of pesticides reached 33 kg/ha by the late 1980s. In Georgia, average fertilizer use was 240 kg/ha, with average pesticide use at 30 kg/ha (CEO 2002). These inputs were heavily subsidized and farmers used them indiscriminately. The combination of a general decline in farming and the fact that farmers had to pay market prices for all inputs made the consumption fall dramatically in the transition period as can be seen in Figure 2 using Armenia as an example. Uzbekistan uses more than three-quarters of the fertilizer used in the whole of Central Asia, but a large part of this is for cotton rather than for food production. Uzbekistan is the world's second largest exporter of cotton and government subsidies are available for fertilizers. In all other countries of Central Asia, by 2002 fertilizer input was very low at between 0.6 and 6 kg/ha. For example, in Kazakhstan and Tajikistan, fertilizer use fell by a factor of six and four, respectively, between 1992 and 2002. Belarus has the highest fertilizer consumption at 84 kg/ha, though this is down from a high of 148 kg/ha in 1992. In contrast, Moldova's fertilizer consumption, which dramatically dropped from the high consumption rate of 53 kg/ha prior to the transition (UNEP-EEA 2007), is now is 20 times lower at just 4 kg/ha. Fertilizers and pesticide use is now slowly increasing, but it is still low when compared internationally. Recent efforts in Armenia to increase food production have led to an increase in pesticide use (UNEP-EEA 2007). In all countries of the EECCA there are many farmers that use no chemical fertilizers at all and rarely any pesticides. This is particular the case for most of the small household farms that were established in the early stages of privatization.

Figure 2 Use of pesticides in Armenia from 1988 to 1994



Source: Ministry of Nature Protection of RA and UNECE EPR report Armenia, 2000.

Extension system

Virtually none of the EECCA countries had an effective public farm advisory service according to the World Bank (2007b). The previous system of top-down directives to collective farms is no longer relevant but has yet to be replaced, in most cases, with a fully operational extension system. Governments are reluctant to shoulder the full cost of an extension system, but realize the urgency of addressing the need for advice on business planning and marketing – all new concerns for farmers who are now supposed to act as entrepreneurs. Consequently, a number of innovations are being tried, often with outside support (World Bank 2007b, Arbenz 2010). Many want to make farmers pay for the service, but apparently that does not work for most small farms, either because the farmers' attitude means they are disinclined to use it or because they simply cannot afford it. If the advice is oriented towards the issues affecting the public good, e.g. protection of biodiversity or waterways, it is reasonable that society shoulders the costs.

Other transitional issues

In many cases markets are still not at all well developed. Public investments and maintenance of important infrastructure such as roads, electricity and irrigation deteriorated after the introduction of a market economy. In Moldova, the area of irrigated land in 1990s was 308,000 ha, but this dropped to 16,000 ha by 2005 (Gherciu 2010). Ambiguous land tenure and political instability present additional challenges.

The transformation of the farming system to market oriented farming in a global context

Market-based farming, fuelled by external energy sources and industrial methods, is a rather recent phenomenon, just over a hundred years old. Today almost all farms function within that system. Production methods of the poorer farms are still, to a large extent, similar to the methods in use a hundred years ago because the farmer simply cannot afford to invest in production. The majority of farmers in the world are, in fact, victims of the increased efficiency – and competition – in the agriculture sector. This is not necessarily a problem if there are other employment or livelihood opportunities available for them. This was largely the case in the countries that industrialized first, but it does not seem to have happened in those countries in the later waves of industrialisation. Because farming has such a profound impact on society, culture, food security, economy and environment, almost no government is willing, or interested in, letting the farm sector be fully unregulated. Extensive government intervention in the farm sector is also very common in countries that are champions of the market economy. This means that the transition from a centrally planned economy to a market economy is not a simple or straight-forward process with a defined final stage.

The introduction of market prices for inputs,⁹ energy, and farm products greatly altered production, often to less input-intensive production – which has generally benefited the environment. For the same reason, combined with a reduced consumer demand, livestock numbers and production have declined, resulting in there being less pressure on natural resources. For example, manure production in Russia declined by two-thirds, or almost 400 million tons, in the transition period up to the mid 2000s. However, as economies improve the demand for meat and dairy products is expected to grow, possibly approaching levels now observed in Western Europe (World Bank 2007b).

Investment in agriculture

Investments in EECCA agriculture is picking up, both by foreign and by domestic investors. There are some substantial foreign operations buying (or leasing) agricultural land, in particular the good black soils in the Russian Federation and Ukraine, which is very cheap from an international perspective. Notably many of the investors are speculating on the increase of land value rather than agricultural production as the profit-maker. The investment climate varies considerably in the EECCA countries, e.g. the “ease of doing business” ranking, appraised by the World Bank, puts Georgia at eleventh place, while Tajikistan ranks 150th (Doing Business 2010).

Investing in soil

Black Earth Farming Ltd. is a farming company publicly listed in Stockholm, Sweden, and operating in Russia. It acquires, develops and farms agricultural land assets, primarily in the fertile Black Earth region in southwest Russia. Black Earth Farming has gained a strong market position in the Kursk, Tambov, Lipetsk, Samara, Voronezh and Ryazan areas, controlling some 330,000 hectares of what perhaps is the world’s most fertile soil (www.blackearthfarming.com).

⁹ Some EECCA governments still have a long way to go here – as have many governments throughout the world.

The main investments of the private sector in Moldova have oriented towards high-value crops:

- Modernization of wine production factories: 34 modern grapes processing units with the total investment of US\$80 million; of these two units produce organic wine.
- Planting new vineyards – 12,000 ha, with total investments of US\$120 million; half of the vineyards are certified as organic.
- Planting new orchards– about 10,000 ha under intensive production with a total investment of US\$100 million (Gherciu 2010).

Environment and agriculture in the EECCA

The environmental problems caused by farming in EECCA countries include soil erosion; eutrophication; nitrates in drinking water; water-logging and salinity; pesticide contamination; biodiversity and rangeland degradation, as well as the degradation of other ecosystem services. Environmental problems that impact negatively on farming, apart from those caused by farming itself, are the contamination of farmland (e.g. radiation from Chernobyl and obsolete industries); deforestation; biodiversity loss and climate change (World Bank 2007b).

The EECCA region is home to ecosystems of global importance, including the Caucasus region, the Black Sea wetlands complex and the Central Asian Mountains. However, biodiversity conservation efforts are being hampered in protected areas by the unfinished transition from an enforcement approach in land management to a stakeholder involvement approach. Outside these areas the insufficient integration of biodiversity concerns into natural resources management has hampered conservation attempts. Financial support for biodiversity management has declined and collapsed in many cases (UNEP-EEA 2007). Both Ukraine and Moldova are characterized by having an exceptionally high proportion – almost three-quarters of their total area – that is agricultural land. Most of this land was originally part of the Pontic-Caspian steppe, i.e. natural grasslands roamed by wild animals.

In Central Asia 78 per cent of the water is polluted by discharge from irrigated lands, excessive mineralization, and pesticide and chemical fertilizer pollution. In the agricultural regions of Ararat and Oktemberian in Armenia, agrochemicals are found in high concentrations in the soil, water and food, and have accumulated in mothers' breast milk (UNEP-EEA 2007). Over the past decades in Ukraine, some 20,000 tons of improper or banned pesticides and other agricultural chemicals have been stock-piled. Poor storage conditions have led to toxic pesticides being released into environment, including waterways, groundwater and the air (Milovanov 2010). The Russian Federation has 100,000 tons of obsolete pesticides in store (World Bank 2007b). Livestock farming is also responsible for a considerable pollution of surface and ground waters. In many mountain ecosystems, livestock are the principal farming activity, but most farms have poor or non-existing systems for the collection, storage and treatment of manure. In many EECCA countries, overgrazing has resulted in erosion and desertification (UNEP-EEA 2007).

The lake that disappeared

Formerly one of the four largest lakes of the world, with an area of 68,000 square kilometres, the Aral Sea has been steadily shrinking since the 1960s after the rivers that fed it were diverted into irrigation projects. By 2007, it had declined to 10 per cent of its original size. By 2009, the south-eastern area of the lake had disappeared and the south-western section had retreated to a thin strip at the extreme west of the former southern sea. The region's once prosperous fishing industry has been virtually destroyed, bringing unemployment and economic hardship. The Aral Sea region is also heavily polluted, with consequent serious public health problems. The retreat of the sea has reportedly also caused local climate change, with summers becoming hotter and drier, and winters colder and longer (Wikipedia 2010).

Climate change and agriculture in EECCA

Effects of climate change

Undoubtedly, climate change will have a dramatic impact on agriculture in EECCA countries, especially in the large areas that are already subject to severe climatic limitations. For instance, it has been estimated that the average air temperature in Armenia will increase by 1.7°C and the precipitation will decrease by about 10 per cent in 2100. Under these conditions, yields are likely to be reduced by 8-14 per cent, and the number of cattle will drop by 30 per cent. For the next 100 years a shift of the landscape-zone borders up the mountain of 100-150m is projected. It is expected that the desert/semi-desert zone area will expand by 33 per cent (Darbinjan 2010).

Coping with climate change

Cover crops and crop residues that protect soils from wind and water erosion, legume intercrops, and manure and composts that build soils rich in organic matter are ways of increasing water infiltration, improving the water holding capacity of the soil, and making nutrients more accessible to the plant. Increasing organic matter is the most important factor in making soils more resistant to drought and able to cope better with less and more erratic rainfall (Greenpeace 2010). Organic farms, which work with biodiversity and are knowledge-intensive rather than chemical input-intensive, might present the most resilient option under a drier and more erratic climate. In its strategies for adaptation to climate change, the Government of Moldova has identified a number of measures that are an integral part of organic agriculture, such as measures to combat soil erosion; gradual replacement of agro-chemicals with organic products and adapting a concept of “land use according to the ecological limits of the territory” (Gherciu 2010).

Mitigating climate change through agriculture

Under the Kyoto Protocol, Ukraine has the obligation to reduce greenhouse gases by of 20 per cent 2010, and Armenia has made voluntary commitments. Agriculture influences greenhouse gases in several ways. The carbon sink capacity of the world's agricultural and degraded soils is estimated to be 50-66 per cent of the historic carbon loss from soils, or some 42-78 gigatons of carbon. Restoring the health of the soil on large areas of degraded land could, thus, compensate for significant amounts of global carbon emissions. Dryland pasture soils, such as many soils in southern and south-western part of the EECCA area are prone to degradation and this has led to a dramatic reduction in soil organic matter (FAO 2009).

Carbon finance: carbon markets and climate change

There are many ways of reducing carbon emissions, and effort has been put into promoting activities that help to store and remove carbon. This has made carbon a valuable economic commodity. To find a common unit for this commodity all greenhouse gases are converted to carbon dioxide equivalents. They are traded on carbon markets with the “currency” carbon credits. In the carbon trade an agreement is made between a buyer and a seller of carbon credits. Those who reduce emissions or sequester carbon, receive payments from those who need to offset their emissions. The price received for one ton of carbon dioxide varies considerably, and depends on the type of market and the type of carbon offset project. During 2009 the price ranged from €1.90 to €13 per ton of carbon dioxide-equivalents (FAO 2010).

Soil organic matter is the largest pool of carbon in the terrestrial biological system. Changes in soil organic matter results in changes in the level of carbon dioxide in the atmosphere. If soil organic matter breaks down, carbon is released into the atmosphere in the form of carbon dioxide. The reverse is also true; increasing soil organic matter will lead to a reduction of carbon dioxide in the atmosphere. The relationships are like this:

- Soil organic matter contains 58% carbon (C).
- There is 1 ton of carbon in 3.67 tons of carbon dioxide (CO₂).

Therefore, 1 ton of soil organic matter corresponds to 2.1 tons (3.67 tons times 58%) of carbon dioxide. Consequently, farmers could earn carbon credits by increasing the organic matter content of their soil, which could then be sold. In addition to carbon sequestration in soils, there are other ways that farmers can either avoid emissions (using less energy, not burning crop residues, improved manure handling) or sequester carbon (planting trees). Notably, farming is still not part of the Kyoto Protocol, so any carbon credits earned for carbon sequestration in soils are gained in the voluntary carbon market.

Organic agriculture and climate change

Organic farming uses less energy than conventional farming, mainly through the non-use of nitrogen fertilizers, which are very energy consuming. Organic farms use 10 to 70 per cent less energy per unit area and even per harvested unit, this is because energy efficiency in organic farming is higher (Pretty and Ball 2001). Organic agriculture, thus, both saves the costly use (and imports) of chemical fertilizers and reduces GHG emissions. In Argentina energy costs were calculated to be 43 per cent of production costs in 2006 (Baltzer and others 2008), and most of these costs were from chemical fertilizers.

A general feature of organic farming is its attention to soil organic matter, i.e. the soil's humus. A soil with a higher organic matter content will be more resilient to adverse growing conditions, in particular to drought, and, in general, crops will do better in soils with a higher organic matter content. This attention to soil organic matter is also behind the substantial opportunities there are for carbon sequestrations in soils. A recent review of 39 comparative studies of soil carbon levels identified that soils under organic management have much higher soil carbon levels than soil from conventional agriculture. On average, the review found that organic agriculture produces 28 per cent higher levels of soil carbon compared to non-organic agriculture in Northern Europe, and 20 per cent higher for all countries studied (in Europe, North America and Australasia). This implies that there would be a substantial level of soil carbon sequestration on cultivated land following conversion from conventional to organic agriculture. For instance, an average sequestration rate of 560 kg C/ha/year for twenty years was calculated for the UK and the US (Azeez 2009).

2. Organic Agriculture in the EECCA region

Overview

Organic agriculture is still in a rather early stage of development in EECCA. Even in Ukraine, with an impressive 270,000 hectares under organic management, this represents only around 0.5 per cent of the agriculture area. The country with the highest proportion of organic land is Moldova where it extends to 1.9 per cent. Table 5 shows an overview of the organic sector in the EECCA region based on the three country studies; *The World of Organic* 2010 (Willer and Kilcher 2010); *The Organic Certification Directory* (TOS 2009) and a few other sources.

Table 5 Development of organic agriculture in EECCA countries

Country	Stage of organic development	Organic indicators (area organic, number of producers, organic regulation, other organic policies, local certification body, government support)
Armenia	Early	1,500 ha 38 producers Regulation in draft 1 local certification body Little government support
Azerbaijan	Early	21,240 ha 312 producers Regulation exists, not fully implemented No local certification body
Belarus ¹⁰	Initial	No data exists A few NGOs promote organic
Georgia	Early	251 ha 49 producers Substantial wild collection (2.7 million ha) Regulation implemented 1 local certification body
Kazakhstan	Early	87,563 ha No local certification body
Kyrgyzstan	Growing	9,869 ha and 846 producers in an organic cotton project No local certification body

¹⁰ Based on Palutskaya 2007

Country	Stage of organic development	Organic indicators (area organic, number of producers, organic regulation, other organic policies, local certification body, government support)
Moldova	Growing	32,102 ha 210 producers 1.7% of land is organically managed Organic exports more than 11% of agriculture exports Regulation exists 2 local certification bodies Substantial government support
Russian Federation	Early	46,962 ha (0.02% of land) No local certification body No regulation
Tajikistan	Initial	70 ha 39 producers No local certification body
Turkmenistan	Initial	No data exists
Ukraine	Growing	270,193 ha 121 farms Law in early stages 1 local certification body An official target of 10 per cent organic production by 2015
Uzbekistan	Early	2,530 ha No local certification body

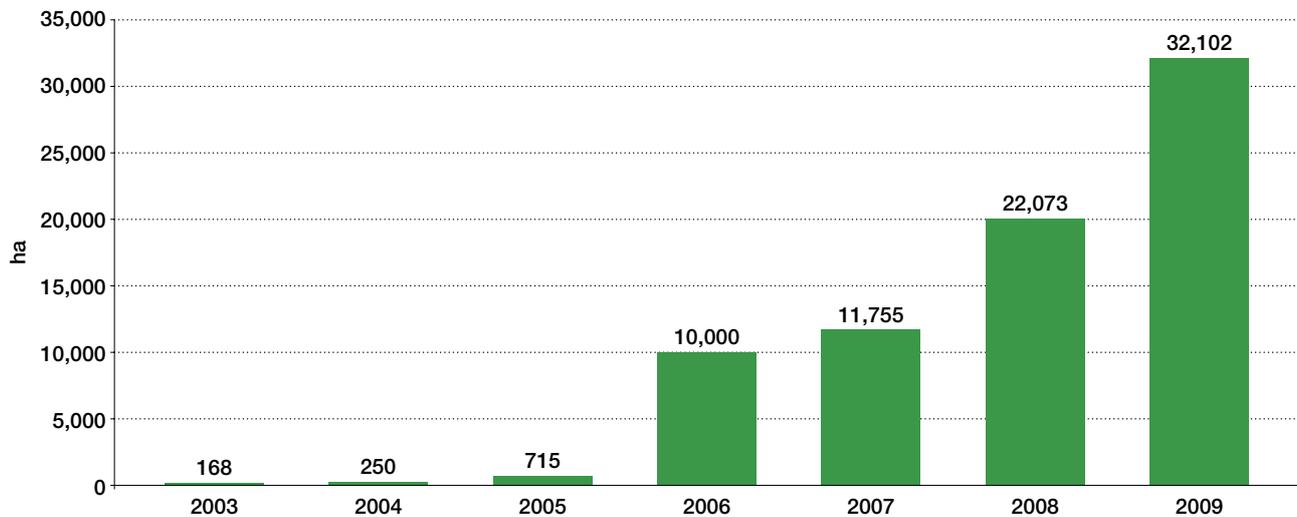
Compared to most other regions in the world, organic agriculture is at a very early stage of development in the EECCA region. However, there are exceptions, Ukraine ranks at number 21 in the world as per the area of land devoted to organic farming, and the more than 11 per cent organic share of all agricultural exports in Moldova is certainly impressive. Below is a snapshot of the situation for organic agriculture in Armenia, Moldova and Ukraine. Further on, specific aspects are discussed individually.

Armenia

In Armenia, the first organic initiatives started in the early 2000s, mainly by some NGOs, but marketing of organic products did not start until 2008. The extent of organic farming is still small. Government involvement has also been very limited. Most initiatives have been NGO driven with support or even initiatives from foreign donors. The certification body, Ecoglobe, is one of the two certification bodies in the whole EECCA region that has achieved international recognition (acceptance in both EU and US markets). The domestic market is very poorly developed. There is an organic market law, but the subsequent regulations have not been developed. Extension capacity for organic agriculture is limited to a few projects, while the public extension service is not involved in organic production at all.

Moldova

Moldova is the country in the EECCA region with the most developed organic sector, both commercially and in terms of policy and government involvement. The organic sector does not have a long history, but combined efforts by NGOs, private investors and the Government of Moldova has led to Moldova exporting around 32,000 tons of organic produce at a value of US\$48 million in 2009, representing 11 per cent of its total agricultural exports, and all this accomplished in seven years. The area of certified organic land represents almost 2 per cent of the total arable area. Moldova has had an organic marketing law and the implementing regulations since 2006. There are two local certification bodies. What is striking is the high level of government support, surpassing even many Western European governments and featuring unique interventions such as government support for marketing 20 per cent in value of domestic sales. The domestic market is still not well developed.

Figure 3 Growth of organic sector in Moldova 2003-2009.

Source: Gherciu 2010

Ukraine

Organic activities started in Ukraine in the 1970s (see box below). In the late 1990s the first organic farms were certified for export to the Netherlands, Germany and elsewhere, and today there is more than 200,000 hectares of organic land in the country. Compared to Moldova and Armenia, the organic land area is huge, even though the proportion of organic land is less than in Moldova. A big difference is that in Ukraine some organic farms are very large. Organic agriculture in Ukraine is oriented to arable crops such as grains and oil seeds. There is one local organic certification body, Organic Standard, while 15 foreign certification bodies are active. The Government of Ukraine has had very little involvement with organic farming. There is, in the *State Program of the Ukrainian agriculture development until 2015*, which was published in 2007, an official target that 10 per cent of the production should be organic by 2015. However, the subsequent measures to make this happen were never implemented. A third attempt to pass an organic market law is currently in Parliament. Foreign donors, in particular the Swiss and German development agencies, have been very active in the promotion of the organic sector in Ukraine.

Organic origins in Ukraine

In his book, *New System of Agriculture* (1898), the Ukrainian scientist and farm manager, Ivan Ovsinsky, was one of the first in the world to announce that usage of mineral fertilizers is a danger to the soil. Developing Ovsinsky's methods and following modern organic principles of agriculture, Semen Antonets, with the scientific support of Mykols Shykula, established the first organic farm in Ukraine in 1977. Through a joint project between the farm, the company Ukragrofin and Swiss partners this farm of 7,000 ha in the Poltava Region was certified as organic in 2000. Organic grain is exported to the Netherlands, Germany and elsewhere (Milovanov 2010).

Production

Few of the farmers in the EECCA region use best practice in organic farming because of lack of resources, experience and knowledge. Nonetheless, organic farms are often better managed than comparable conventional farms, partly as a result of the demands in organic standards, but mainly because organic farms are managed by

better educated, younger, better resourced and more entrepreneurial farmers.¹¹ In many of the OECD countries, organic farmers were the early drivers of the organic sector. They were the ones developing the markets, promoting, advocating, developing standards and certification and, finally, organizing the sector (Källander and Rundgren 2008). This is not the case in the EECCA countries, however, where the organic farmers are less proactive and, with few exceptions, tend to let others represent them.

Markets and trade

Organic traders have initiated organic production in many developing countries and countries in transition. Earlier, when there was a consistent lack of most organic products, importers invested quite extensively in securing a resource base, a pattern that seems still to apply in some of the EECCA countries, e.g. Ukraine. Today, companies based in the exporting countries are more likely to initiate new projects, which is the case in all three studied countries. The EU market is particularly accessible due to its proximity and because it has many close ties with the region. A huge number of people in the diaspora (two-thirds of the Armenians live outside Armenia) live in the EU or are in temporary employment in EU countries – according to the Migration Policy Institute (2010) there are some 700,000 Moldavians working outside of the country, of which 87 per cent are in the EU.

Export markets

The export market is clearly the driver. However, trade data is difficult to obtain, and is mainly limited to anecdotal information. This is not unique to EECCA countries; most global market data for organic trade is based on rather rough monitoring. Organic produce does not have a unique customs codes in the international system and international trade in organic products is, therefore, not covered in public statistics. One source of information could be the trade certificates issued by certification bodies, which often include details on the volumes involved, but almost never on prices. Certification bodies, however, are reluctant to share the information, both because of the work involved and for confidentiality reasons. In Moldova customs share their information with the Ministry of Agriculture, so that it can monitor the volumes sold. In total, Moldova exported 32,374 tons of organic products for US\$46 million, representing 11 per cent of the country's total agricultural export value in 2009.

Table 6 Organic products exported from Moldova to Germany in 2009

Products	Quantity (tons)
Walnuts shelled	963.7
Cherries provisionally preserved	135.5
Plums	214.8
Dried apples	213.9
Dried cherries	62.6
Sunflower oil	2,190.7
Dried berries	182.0

Source: Gherciu 2010

The main organic products exported from Ukraine are grain, beans, oil seeds, berries, essential oils, mushrooms, nuts, and fruit juice concentrates (Milovanov 2010). The total value of its organic export market has fluctuated around US\$40 million annually for the last five years.

¹¹ This aspect of organic farms is also apparent in the European Union. Organic farms are on average bigger than conventional farms and only 16 per cent of organic farmers are above 65 years old, compared to 32 per cent of conventional farmers (EU 2010).

Table 7 Organic products exported from Ukraine

Year	Million Euros
2005	30.8
2006	38.1
2007	27.2
2008	14.6
2009	37.6

Source: Milovanov 2010

Exports from Armenia started as late as 2008, and so far only wild products and apricots are exported (Darbinjan 2010). Many producers participate in the annual Biofach fair in Nuremberg, Germany, which is the largest organic fair in the world. All the EECCA countries are oriented to exporting to the Russian Federation and other Commonwealth of Independent States (CIS) countries, but there is little demand for organic produce in these markets. Therefore, producers look towards the European Union market. There is hardly any regional trade of organic products in the EECCA region, even if there are opportunities, e.g. Ukraine could supply huge quantities of grains and animal feed while Moldova and Armenia could trade high-value crops, honey and wine.

Domestic markets

In the EECCA countries organic products have still not really entered the mainstream markets, although outside the formal retailers networks organic products are sold on a small scale. The organic items that are sold in the mainstream markets tend to be imported products mainly from EU countries. The scale of the domestic market is small, but growing fast.

In Moldova, a total of 15,000 tons of organic products are estimated to be sold in the domestic market (Gherciu 2010). In 2008, the total Ukrainian market of organic products was estimated to be US\$0.75 million, in 2009 it was US\$1.5 million and it is expected to reach at least US\$3 million by the end of year 2010 – a growth rate of 100 per cent per annum. The main distribution channels for organic products in Ukraine are small shops selling natural and organic products in bigger cities (Milovanov 2010). Supermarkets (for example, Mega Market and Silpo) have started to sell certified organic products from both domestic producers and imported goods. In addition, luxury shops, such as Delight-Ukraine, now have some organic products on their shelves. The price differential, however, between domestic and imported organic products can be very large, with some imported goods cost ten times that of domestic products (Huber 2010).

The lack of interest among the main retailers to promote organic sales on a large scale is often stated to be a major limitation to organic market development. On the other hand, if these retailers tried to develop an organic market there would be no supply or infrastructure to support it (DZI 2010). There seems to be few commercial actors interested in the development of local markets, but without an efficient system of intermediaries or farmers' cooperatives it is difficult for domestic markets to grow. Most farms are far too small to be able to market their produce on their own but, unfortunately, the Soviet legacy brought with it distrust in cooperative arrangements. Other barriers to the development of domestic markets are: lack of trust in the organic claim; low consumer awareness; poor appearance of organic products; and the high price (DZI 2010). There are some indications that there are some unsubstantiated or fraudulent "organic" market claims; expressions like "environmental", "ecological", "bio" and "nature-friendly" are used, which confuse consumers. While this is frustrating for the serious actors, the fact that these claims are being made is an indication that consumers are demanding such products.

Value chains and processing

In general, the value chains for agricultural products and more specifically for organic products, are badly organized, especially in the domestic market. This is associated with a lack of economic skills among the actors and their resistance to using contracts to regulate business deals. In addition, the infrastructure is poorly developed,

including limited storage facilities and not enough vehicles. The level the produce processed is rather low, and often only the first processing step carried out within the country, e.g. in Moldova walnuts are dried and graded and, thereafter, sold in bulk; in Armenia apricots are pulped before being exported. In general, the companies are export-ready, although there also exists several that are not. There are general limitations (i.e. not specific to the organic sector) in export opportunities for honey and livestock products due to deficiencies in the sanitary systems, e.g. Armenia is not approved by the EU for export of honey or livestock and Russia has not approved Moldovan wine, ostensibly for quality reasons.

Prices

Prices differ between exported Ukrainian organic and conventional products, depending on the product type, its quality, volumes, delivery terms and other parameters. Typically, the premium is 10-20 per cent above the conventional price level (Milovanov 2010). It was reported in Armenia that organic products get substantially higher prices compared to the similar conventional products. As an example, the processing companies in 2008 paid US\$0.16 to US\$0.20 for 1 kg of conventional apricot and between US\$0.50 and US\$0.66 for 1 kg of organic apricot (Darbinjan 2010). In Moldova, the price for conventional soybeans in the local market was about US\$0.36/kg in November 2009, at the same time organic producers received US\$0.53/kg for soybean exported to Italy, 46 per cent more than for the conventional products. The organic price for sunflower seeds was 23 per cent higher than the conventional counterparts. In Moldova, farmers can get a 20 per cent government top-up on the price of organic products in the local market (Gherciu 2010). There are claims that farmers actually receive a small share of the premium prices in the market, however, it has not been possible to ascertain the actual division of the premiums. Notably, processors or exporters often pay for certification costs, and sometimes for extension services, various inputs and other costs, which means that they are paying comparatively more than if they were just dealing in the commodities.

More than double the price for organic apricots

In 2000-2001, Shen, an Armenian NGO, helped people in two Armenian villages, Lusakn and Argina, by leasing land and planting organic apricot and peach orchards, totalling 120 ha. In 2006, when the orchards became organic certified, they started producing fruit commercially. The market pays two to four times more for organic apricots. The farmers have learned the methods of organic production and their economic conditions and quality of life has improved. Communities have built a medical unit, and developed a supporting infrastructure such as an irrigation system and solar dryers for the fruit. Farmers realize that farming organically is sustainable and improves their life and the prospects for their children. The number of buyers grows and they can make their own choices and decisions on which market to use. Today, organic fruit from both villages are successfully processed and sold to domestic and international markets. Organic farmers extend their experience to neighbours who are now interested (Darbinjan 2010).

Standards and certification

Private organic standards have been developed in Ukraine by a local NGO, Biolan, and in Armenia by Ecoglobe, the local certification body. The standards belonging to Ecoglobe are also used in Georgia (see box on page 35). Moldova has public standards enshrined in a regulation. In all cases, however, exported products have to be certified to the standards of the importing country;¹² the EU Regulation for produce going to the EU, and to some extent the US National Organic Program or other private standards for export to the States and elsewhere.

Certification for the export market has mainly been accomplished through foreign-based certification bodies. In Ukraine, 15 foreign certification bodies are reportedly active. Of the local certification bodies, Ecoglobe in Armenia has achieved international accreditation and recognition, this despite there being no organic regulation

¹² This might change with the new EU Regulation. The EU has explicitly said that it does not think its standard should be used directly outside the EU. Ecoglobe in Armenia has now sought approval by the EU, based on its own standard. A decision is forthcoming in late 2011.

implemented in Armenia. Organic Standard, the local certification body in Ukraine (see box below), is accredited against ISO 65. Despite having a regulation for many years, and two local certification bodies, organic producers in Moldova still need the certification of foreign bodies to reach export markets.¹³ The local certification bodies in Moldova and Ukraine each have a cooperative agreement with foreign-based certification bodies, which means they are able to assist certified producers with export market access.

Organic Standard – a local certification body in Ukraine

Organic Standard Ltd was set up within the framework of the project “Organic Certification and Market Development in Ukraine”, which was financed by the Government of Switzerland and implemented by FiBL. Registered in 2007, Organic Standard Ltd (OS) is the first Ukrainian organic certification body. Nine players in the organic market in Ukraine own the limited liability company. Since the very beginning, staff got know-how and technical expertise from the certification organization, IMO in Switzerland. OS inspects and certifies according to the private standard of Biolan (Ukraine), which is based on the IFOAM standard. Since being accredited against ISO 65 in October 2009, OS offers full inspection and certification services against EU Organic Regulations (834/2007, 889/2008). Currently, OS offers organic inspection and certification for crop production, animal husbandry, beekeeping, wild collection, processing and trading. In 2009, OS had 64 clients in 19 regions within Ukraine. It certifies 56,680 ha as organic and has six fulltime employees (Milovanov 2010).

Government policies

Market regulation

The process of developing organic market regulations¹⁴ similar to the EU and the USA has been slow. In Ukraine a draft organic law has been prepared in the Parliament for the third time.¹⁵ Moldova has had an organic regulation since 2006. It has been revised to follow the EU rules and is now due for a major overhaul. The regulation has not meant actual market access to the EU as Moldova has not been approved by the EU as a country with an equivalent system. In Armenia a law for organic labelling has been passed by its Parliament, but the necessary by-laws have not been completed, and are currently under revision.

Moldova – the Government sets an example

Many countries have developed a substantial organic sector, even those countries where the sector has largely been ignored by their government. However, it appears they are better developed in countries where the farm sectors are more “liberalized”. In these countries, organic development is not as dependent on active government endorsement as it is in countries where the government is a strong actor (UNCTAD 2008). The government plays, or can play, several roles:

- Regulator, mainly through organic marketing regulations.
- Facilitator, through support programmes, subsidies, information, advisory service.
- Promoter, through an advisory service, setting policy objectives and speaking up.

¹³ Organic regulations in export markets are mostly developed with the idea that they will facilitate market access, but this is often not at all the case, see more in Rundgren 2007.

¹⁴ The organic market regulations are mainly concerned with regulating the marketing claim for organic products, i.e. to ensure that anybody bringing produce to market has followed certain standards and is working under the control of the government or government approved certification bodies. In some countries, these regulations are also the basis for government support to the sector. However, these factors are not necessarily closely linked. It is possible to have government support of the organic sector without having a marketing regulation, a marketing regulation that is fully functional without having any government support, or both. In many countries, including the EECCA countries, these factors are confused, which leads to badly informed decision. The sector might lobby for a regulation in order to get support and end up with a regulation for the market and no support. This seems to be what has happened in Armenia, and possibly in Ukraine as well. In Moldova the two have gone hand in hand.

¹⁵ This was approved by the Parliament in April 2011, but vetoed by the President.

In the countries in transition, the population often still turns to the government for approval when new things develop, which makes the government more important than in the older market economies.

In the three countries studied, the effect of government support on the organic sector is best shown in Moldova. Here the Government has employed most of the tools that are available to it to support its organic sector: regulations, institutional development, subsidies, investments and capacity building:

- An organic market regulation was passed in 2006.
- There is conversion support for organic farmers of US\$56/ha in the first year, followed by US\$32/ha and US\$24/ha in the second and third years respectively.¹⁶
- A Department for Organic Agriculture and Renewable Resources has been established in the Ministry of Agriculture. In addition, regional agricultural departments have specific staff responsible for dealing with the promotion of organic agriculture. The Agricultural University opened a branch of organic agriculture within the structure of its agronomy faculty.
- 600 tons of vegetables have been sold on the local market with a 20 per cent government subsidy.¹⁷
- Through the Law on Public Acquisitions, 200 tons of organic produce were purchased by the state for public catering.
- Courses on organic agriculture for farmers and advisors are organized annually by the Ministry of Agriculture.
- Agricultural research institutions manage demonstration plots to display organic technologies, and organize field days and courses for know-how transfer.
- Organic operators also receive financial support from government programmes established to support other sectors, e.g. the wine industry. Out of 34 grapes processing units, which received a total modernization investment of US\$80 million, two units produce organic wine. Likewise, US\$120 million has been invested in supporting the planting of new vineyards and 12 thousand hectares – half of the plantations – are certified organic (Gherciu 2010).

Up to now the Governments of Armenia and Ukraine have done less to support their organic sectors, and certainly nothing close to Moldova's systematic approach. As mentioned earlier, Ukraine has a goal that 10 per cent of its farming should be organic by 2015, but it has not taken any measures to stimulate this to happen. In 2008 the Government of Armenia awarded US\$1 million to one organic processor to establish plantations to supply organic produce. This support was within the framework of an SME support programme. It has also identified organic agriculture as compatible with National Parks (Darbinjan 2010). In Ukraine many regional governments, e.g. Lviv, Khmel'nitsky and Poltava, have development programmes for organic businesses, in particular for local promotion and market development (Milovanov 2010).

Land tenure

Long-term land tenure for farms or for communities is a pre-condition for sustainable practices. Without assured land tenure, farmers rarely carry out long-term improvements on soil fertility or biodiversity on their farm. Private ownership is the simplest and most straightforward way of ensuring a commitment, it also the best way of attracting investments. Other than for grazing land, communal ownership or tenure tends to be relatively unattractive to producers in former communist countries.

Distorting policies

Policies that encourage the use of agro-chemicals or that subsidize use of a natural resource (e.g. irrigation schemes where cost is covered by the government), lead to non-optimal use of resources, and can put organic farming at a disadvantage. This is clearly the case in Ukraine where chemical fertilizers are subsidized. Uzbekistan

¹⁶ 700 lei, 400 lei and 350 lei respectively

¹⁷ Farmers normally sell at the conventional price and get another 20% from the government when they can document the sales

also subsidizes chemical fertilizers. Other than this point, the national reports do not identify any particular policies that are more problematic for organic than for conventional farms.

Support structures

In most countries, NGOs pioneered the early development of the organic sector, and this is certainly the case for the EECCA countries, clearly illustrated in the three national studies. NGOs come in many forms, including associations of organic producers; publicly-oriented interest groups and environmental or consumer organizations. Some groups intend to be movements with a broad membership, although in reality almost all are project-oriented with a handful of members, mainly operating as consultancy companies. Most have activities that are financed by foreign donors. NGOs play an important role in raising awareness among consumers, through promotion, advocacy and by providing information.

The agricultural establishment of most countries has generally been resistance to organic agriculture; and this has certainly been the case in Western Europe and the USA. This is also exacerbated by the fact that companies selling inputs to farmers are increasingly financing research and it is not in their interest to fund research that helps farmers to use local resources more efficiently. Research institutions have played a more positive role in several countries in the Eastern part of Europe, e.g. in Lithuania and Serbia (Källander and Rundgren 2008). However, very few of the research institutions in the EECCA countries are engaged or have any knowledge of organic production. The Center for Applied Pedology in Moldova is an exception to this (Gherciu 2010). In Ukraine organic agriculture is included as a subject at five agriculture colleges and at the National Agricultural University, although most educational establishments still ignore it altogether (Milovanov 2010).

Advisory and training facilities, as well as education programmes in organic farming are available in Moldova through the Ministry of Agriculture and Food Industry, the NGO Proruralinvest and others. Moreover, several organic institutions (associations, traders and companies that supply farmers with inputs) offer organic seminars, field days and produce informative publications. However, despite the nationwide development of organic farming, there is still a lack of an advisory service that offers training and information (Gherciu 2010). In Ukraine, organic farmers are provided advice through project activities and a few private consultants working on a freelance basis. In addition, about ten large organic producers have their own agronomists. In Armenia, the only advice available to organic farmers is through existing organic projects.

Input suppliers

Organic farming is often understood as a system that uses no inputs such as fertilizers and pesticides. The reality, however, is more complex. In particular, in horticulture farmers normally use both organic and mineral fertilizers and plant protection products permitted for use in organic agriculture. Farmers also need organic seeds and in some cases special equipment developed for organic farms such as flame-weeders and better row cultivators. Those needs create new business opportunities and in some countries the input suppliers have themselves been very active promoters of organic farming. An example of this is the producer of Effective Micro-organisms in Japan. The Institute of Biological Plant Protection, in Moldova produces 28 pheromones for biological plant protection and is producing ten biological preparations for plant protection that can be used by local producers as well as be exported as well.

Integrated Pest Management in Uzbekistan

In Uzbekistan, growing concern over chemical pesticide application in cotton cultivation in the 1980s gave rise to research on biological pest control methods. Now nearly 900 laboratories, 40 per cent of which belong to the private sector, produce 12 tons of wasps and other insects per year. Biological controls are used on 90 per cent of cotton fields, where effective pest management has been achieved. Not only has chemical pesticide use been reduced by 75 per cent in the last five years, but biological methods have the added advantage that they cost less than 50 per cent than the chemicals (World Bank 2007b).

Donors

Initially, a handful of national donors, from Germany, the Netherlands, Sweden and Switzerland supported the development of organic agriculture in developing countries and in countries with economies in transition. Gradually, international donors and intergovernmental organisations started to accept the value of organic farming and, today, almost all donors have at least some activity in their portfolio supporting the organic sector. Donors have played a big role in implementing and financing many organic projects in the countries in transition, and this is certainly the case in the studied countries, although less in Moldova than in Armenia or Ukraine. Most organic projects funded by donors are implemented by local or international NGOs, although a few have been implemented by the governments. Many organic projects today are in the format of a public/private partnership.

Foreign donors support organic in Armenia

Organic farming started in Armenia in 2002. Several international initiatives and projects supported this movement in the following years, and two important projects are now completed. These are the *Development of Biological Agriculture and Bio Certification in South Caucasus Project*, supported by Swiss Development Cooperation and Swiss Interchurch Aid 2002-2010, with contributions and support from GTZ in capacity building, and *Organic Chain Development Project in Caucasus and Moldova*, supported by the Dutch Ministry of Foreign Affairs and Avalon Foundation (2005-2009). There were also several SMEs and agricultural development initiatives, supported by USDA, USAID, FAO and UNDP, that were instrumental in the development of organic agriculture (Darbinjan 2010).

Investors

While data regarding the production of organic produce is easily collected from local certification bodies, data on investments is, at best, widely scattered. In the case of government support to investments, public data is often generated, but in other cases only interviews with stakeholders can give information and even then most commercial actors are reluctant to share financial data. It is, therefore, very difficult to ascertain both the level of investments and who the investors are.

Historically, other than the producers and traders themselves, investors have not played a big role in the development of the sector. Increasingly, however, investors are financing organic operations in developing countries and countries in transition. Organic agriculture and sustainable agriculture attracted about US\$40 million in 2008, which is around 1 per cent of the total investments in the Ukrainian agricultural sector. Most investors are Ukrainian businessmen, with a growing interest from Dutch, Polish, Swiss, German and French investors. In 2008, more than 90 per cent of the total organic investments were made in crop production (grain, oilseeds, and pulses), including seeds, machinery, cleaning machines, transport, fuel and inputs, among others. However, the majority of organic investments supported processing, wild collection, inspection and certification services and consultancies. Only since late 2008 has there been any investment in organic retail (Milovanov 2010).

Investment in agriculture and land in Armenia is growing. Foreign investment is mainly sourced from the considerable Armenian Diaspora¹⁸ in Russia, USA and Europe. In addition, processing companies are purchasing or leasing land so that they can grow their own crops and have a reliable supply of raw materials.

18 About 7 million Armenians, i.e. double the current Armenian population, live outside Armenia. The biggest groups are in Russia, USA, Turkey and France.

Organic walnuts, Moldova

Nova Nut is a German-Moldovan joint venture for organic walnuts, where the German partner is engaged in the marketing and the Moldovan partner in the supply. They have contracted 2,152 farmers, most of which just have a few trees. With a good tree yielding around 100 kg a farmer with three trees can earn around US\$600 per year, a substantial contribution to the family's livelihood in a country as poor as Moldova. In order to keep certification costs low – which otherwise would be prohibitive – the operators maintain a group certificate with an internal control system, by which they themselves visit all farmers and make inspection reports. The external certification body verifies the efficiency of this internal control. Total production is 300 tons of kernels graded into many different qualities and vacuum packed (Gherciu 2010).

Investors typically exaggerate the risk of potential losses caused by pests.¹⁹ Likewise, they tend to lack an understanding of the specifics of the organic market, and have unrealistic expectations of the organic markets.²⁰ In addition, issues related to organic standards, e.g. that land has to undergo a conversion period of 2-3 years, may not be fully understood. The long-term aspect of investments in soils and in pioneering markets is often a deterrent. Organic production is generally a long-term investment and some of the capital is not properly accounted for. For example, the natural capital gained from an improved soil will only result in a slow return, either through being able to increase the annual rent or in a higher land prices when the land is sold. Because of this long-term perspective, investment in organic farming is even more dependent on stable rules, and in particular on greater stability in land tenure arrangements than in conventional farming, a feature that is still lacking in some EECCA countries.

Most investments in the farm sector are traditionally made by the farming families themselves, possibly by borrowing money from the bank. Their attitude to an investment is often quite different to that of an external investor. Farmers normally invest to secure a livelihood for their families rather than for rent-seeking.

Regional cooperation

Three drivers promote harmonization: alignment to EU standards; alignment with WTO and international standards, such as Codex Alimentarius, the ISO and regional cooperation within the Commonwealth of Independent States (CIS). Within CIS there are regional standardization efforts in the Interstate Council for Standardization, Metrology and Certification. The ISO recognizes the Interstate Council for Standardization as the Euroasian Interstate Council for Standardization, Metrology and Certification (EASC). Its role is to coordinate the works in the field of standardization, metrology and certification and to define the main directions of the interstate standardization, metrology, certification and accreditation in stated fields of activities (EASC 2010). There are no efforts to achieve EECCA regional harmonization in organic agriculture standards or legislation. In the private sector there is a joint regional organic standard used by the certification bodies Ecoglobe in Armenia and Caucascert in Georgia.

Green Caucasus – a regional initiative

The organic certification body, Ecoglobe LLC, and its Georgian partner, Caucascert LLC, have entered into a close cooperative arrangement. They developed a voluntary private regional standard and created a joint certification programme. They have registered a joint trademark, “Green Caucasus”, and an operational standard under the same trademark. This was within the framework of the project *Development of Biological Agriculture and Bio Certification in South Caucasus*, supported by the Swiss Development Cooperation and Swiss Interchurch Aid (2002-2010). Ecoglobe has been accredited by the German public accreditation body since 2008 and by the USDA NOP since 2009. Since 2008 products certified by Ecoglobe have found their way into the EU and other markets. The service offered by Ecoglobe is multilingual (Armenian, English and Russian are the operational languages), so countries using Russian as their communication language can be certified by Ecoglobe (Darbinjan 2010).

19 In reality losses due to pest are mostly limited in organic, even more so in extensive systems.

20 The belief is often that it is enough to have an organic product and it will sell itself.

There have been three conferences for organic agriculture in the EECCA region, all organized by Organic Services²¹ and the Organic Federation of Ukraine with varying partnerships. The Dutch Avalon Foundation implemented a regional cooperation project for the Caucasus and Moldova in 2005-2009.

How does organic compare to conventional?

Research from Moldova shows comparable yields from the major field crops when using manure as a fertilizer as when using chemical fertilizers (Gherciu 2010). The weakness in the research is that both kinds of fertilizer were applied at rates considerably higher than actually used by the farmers.²² The country study from Ukraine concludes *“Yield of organic products depends on the region, varieties, fertility of the soil, [and the] year of the conversion from conventional production to organic agriculture. In practice, yield is decreasing within 2-3 years of conversion period for 20-30 per cent. After these 3 years major part of the farms have more or less the same yield as conventional neighbouring farms.”*²³ According to many experts, *the most professional organic farmers have 20-30 per cent higher yields than their conventional neighbours.*” (Milovanov 2010). Experiences from other parts of the world indicate that when the starting level is low-intensity farming with low use of external inputs, such as the situation in most EECCA countries, yields may be higher when farmers convert to organic methods, but when the starting point is a very intensive farming system yields might drop (United Nations 2008, Badgley and others 2007).

It is difficult making general statements about the profitability of organic farming compared to non-organic, and the shortage of data makes it is even harder to do so for the EECCA countries. A recent (2009) analysis by the FAO concluded that organic farms are more profitable, despite frequent yield decreases, due to premium prices and predominantly lower production costs. *“The major difference in the profitability of the two systems is very often determined by the different management skills of the farmers thus, accounting for these seems to be fundamental for correct interpretations of results”*, (Nemes 2009). Profitability is highly dependent on government policies, which “distorts” a comparison between the two systems. Not only do yields vary substantially between farms; costs vary as well. Some report considerably higher labour use on organic compared to non-organic farms; others say labour is more or less the same. This is, of course, dependent on the crop. Overall, horticulture,²⁴ fruit, pork and egg production are normally more labour intensive in organic than non-organic production. Some buy in costly organic inputs, others do not. Certification cost is an additional expense for organic producers.²⁵ In commercial farming, certification costs normally stay within 0.5 to 2 per cent of the product value, which should be put in relation to typical premium prices of 10 to 25 per cent. Certification costs are mainly a deterrent in the initial years. Pricing also varies a lot; organic products generally fetch good prices, but sometimes they do not.

The increase in the number of organic farms worldwide, and the uptake by farmers who are not so ideologically convinced about organic methodology are perhaps the best indirect indicators measuring relative profitability in organic farming; if it was not profitable, they would not continue.

21 A German-based organic consultancy company.

22 There are many difficulties in making comparisons between organic and non-organic farming. Trials in research stations are mostly short-term and, therefore, do not really reflect differences in the systems, just in a particular crop under certain circumstances. There are a few long-term research plots where some changes in systems over the years have been measured, e.g. the DOK trials in Switzerland and the Rodale trials in USA. But even long-term research will not reflect actual farm situations where farmers adapt their crop rotations to market demands, subsidies or other ever changing external factors that are part of being a farmer. Comparisons between real farms is more meaningful, but it is very difficult to find matching farms, and the skills and resources of the individual farmer has more impact on the results than whether he or she uses organic or non-organic methods. This means any meaningful study has to compare a large set of farms.

23 Notably this description could be from any part of Northern or Western Europe as well.

24 In many countries, vegetables are the pioneering organic products and, therefore, the situation for organic horticulture is taken as a proxy for organic production in general. Organic vegetable production is considerably more labour intensive, and is also much more sensitive to pest problems than most other production types. To extrapolate the situation in one kind of production to others is not possible.

25 Some argue it is unfair that the farmers who chose to NOT use dangerous inputs have to pay the cost to prove they do not, while those who use such inputs have no extra costs. It could be argued that it should be the other way around. The same discussion can also be held for labelling costs, which are higher for organic products.

3. Organic Agriculture and the Green Economy in the EECCA

The three country studies, which provided the majority of the information for this report, and some other sources have together provided an indicative basis for developing conclusions. However, many assumptions still have to be made in order to translate the findings into measurable economic and environmental indicators. Below is an illustration of how organic agriculture can contribute to the green economy rather than any scientific statements. The benefits largely fall into three categories:

1. Direct economic benefits from the organic production system and markets, i.e. higher profitability, creation of jobs, fostering business growth for organic farming and processing.
2. Substantially reduced externalities, i.e. savings for the public sector and future generations.
3. Production of public goods such as ecosystem services.

Commercial benefits

The most immediate *economic* opportunities are listed below.

- Profitability of organic farming tends to be good. Organic products command high prices, typically some 20 per cent higher than conventional produce, while costs may remain same. It can, thus, increase farmers' incomes and give new life to rural communities.
- Organic production links farmers to stable markets in integrated modern value chains and, therefore, demonstrates lower transaction costs, better control, better information flow and less redundancy in the chain.
- Organic farms use fewer inputs (fertilizers, pesticides and energy) and can, thus, reduce production costs, while relieving the countries from costly imports. In Moldova it is calculated that if a lucerne (alfalfa) crop was always grown before winter wheat and winter barley the savings in reduced use of mineral fertilizers would amount to some US\$23 million annually (Gherciu 2010).
- Organic production requires new inputs, such as biological pest control agents, machinery and equipment appropriate for organic farming, and new knowledge and services. All these create new business opportunities.²⁶
- Organic agriculture creates more employment:
 - Organic farms often use some more labour than conventional farms and thus create more employment.
 - The organic market is a quality market that creates more employment in the subsequent steps in the value chain, e.g. in processing, grading and packaging.
 - Organic farming is, in general, knowledge-intensive and in need of qualified support in the form of certification staff, advisory workers and other experts.

²⁶ This study has not investigated potential obstacles for new business, such as difficult registration requirements.

- Development of associated businesses that fit into the organic concept. These would include eco-tourism, educational services and renewable energy, e.g. bio-gas production.

Some of the benefits enjoyed by the organic sector are a consequence of its small size. As the sector grows, therefore, these benefits may not scale up proportionally. For example, it is not clear whether the current market premiums for organic products would hold if organic production grew from less than 1 per cent of the world market to, say, 25 per cent.²⁷ Organic agriculture is also subject to the same competitive forces as non-organic agriculture, including economies of scale and the vagaries of the global market. Consequently, organic agriculture will – especially if it becomes mainstream – respond to the same economic logic as the rest of the farming sector. Employment gains that would result from a transition to organic agriculture could be negated by a general decline in agriculture employment.²⁸ On the other hand, some of the economic potential benefits have still not been utilized because the sector is too small to form the basis of commercial investments. This is the case for special inputs, new technologies for organic agriculture, most of the market chain and for processing technologies specifically adapted to organic standards. Growth in the sector will bring costs down considerably.

Reducing externalities

Very important additional benefits to society can arise from avoidable costs of externalities such as pollution, GHG emissions, loss of biodiversity, and negative effects on human health. As discussed earlier external costs of farming can reach several hundred dollars per hectare per year. Therefore, to integrate environmental considerations into farming is not a luxury but a necessity. For example, salinity in Uzbekistan is estimated to cost US\$1 billion per year and soil erosion in Moldova at least US\$40 million (World Bank 2007b). A loss of soil organic matter at a rate of 1 ton per year is reported from Ukraine (Milovanov 2010). This represents costs of carbon emissions of US\$40 per hectare²⁹ per year and a loss of fertility of soil of perhaps another US\$30, which in total corresponds to US\$2.8 billion per year for all Ukrainian farmland (see Figure 4 below). On a worldwide scale, the external costs of pesticides alone has been estimated to be between US\$8 and US\$47 per hectare of arable land, or on average, US\$4.28 per kg of pesticide active ingredient applied in Germany, UK, US and China (on rice only). In the Chinese case, these external costs actually exceed the market value of the pesticides – for every US\$1.0 worth of pesticide applied, cost to society in the form of health and environmental damage averaged US\$1.86 (Pretty and Waibel 2005). Around 300,000 people die each year and millions are harmed by the use of pesticides (World Bank 2007a). By rejecting them completely, organic agriculture not only saves lives, but also reduces suffering and releases resources that otherwise has to be spent on medical care.

Public goods

The long-term and greatest benefits of organic agriculture are associated with *the increase of natural capital and the production of public goods and services*. The contributions made by organic agriculture include:

- Improvement of soil organic matter. This is of critical importance both to the fertility of the soil and to the role of the soil in carbon management (see Figure 4)
- Conservation and sustainable use of agricultural biodiversity and conservation of high nature value farmland.
- Natural regulation of carbon, nitrogen and phosphorus cycles.
- Water purification.
- Animal welfare.

27 On the other hand, this has been said for decades already and there is no sign of drops in organic producer prices even in the countries where organic production has reached more than 5% of the market share. Consumer prices drops as a result of more efficiency in the market.

28 Agriculture employment in the EECCA countries is bound to fall drastically in the coming years in a business-as-usual scenario, as a result of structural transformation of the sector and the economy. A large-scale conversion to organic systems would only slow down the decline in employment and not reverse it.

29 With CO₂ value fixed at US\$20 per ton.

If societies choose to place a value on the supply of these public goods – whether through a direct government payment (such as the environmental payment given to farmers in the EU) or by trading in a market (such as carbon trading, or wetland banking) – substantial commercial opportunities would become available (FAO 2007). For example, if 10 per cent of the land were farmed organically in Ukraine, opportunities for carbon credits would be in the range of US\$400 million³⁰ per year. If Armenian farmers received compensation in the range of US\$100 per hectare for managing ecosystems as well as preserving natural resources, a 10 per cent conversion to organic agriculture would increase farmers' yearly income by US\$30 million.

Carbon in soils – commercial opportunity, public goods and reduced externalities

If soils are improved by organic management the land will, on average, increase in value by at least 20 per cent. Today the average price for one hectare of medium quality agricultural land in Moldova is about US\$500. If 100,000 hectares are grown organically this means an increased land value of US\$10 million (Gherciu 2010). These figures are cautious, and land prices in Moldova are very low in an international context; in Ukraine, land prices are at least three times higher. Shifting soil management from an annual loss of organic matter to annual gains could mean increased profitability of more than US\$100 per hectare per year³¹ (see Figure 4).

Figure 4 Effect of increased or decreased soil organic matter

The economics of changes in soil organic matter

Loss of soil organic matter
+ 1 ton / ha / year

Building soil	<p>value of carbon sequestration: US\$20-40 per year increased productivity of land: US\$10-30 per year (translates into higher income and increased land value)</p>
Soil erosion	<p>decreases productivity of land: US\$10-30 per year (translates into lower income and decreased land value) cost of carbon emission: US\$20-40 per year</p>

- 1 ton / ha / year
Loss of soil organic matter

Author's own estimates

Other benefits

Organic agriculture can also play a role in the re-shaping of social capital, which is especially important in the EECCA countries where social capital is low. Organic farming provides farmers, rural communities and consumers scope for joint action; the creation of an organic movement; and the building a consumer-driven, trust-inducing certification system. Certification introduces producers in quality management systems, making it easier to implement social, economic and environmental managements systems. Such systems have proven to decrease the cultural gap between rural and urban citizens and, thereby, promote societal cohesion. Finally, organic farming and the consumption of organic food, which relates to the most fundamental of human needs, is a catalyst for change in behaviour, attitudes and values that reaches much further than the agricultural sector, e.g. organic consumers are more likely to make environmentally benign choices in other market segments, to recycle their garbage and to save energy.

³⁰ 4 million hectares times US\$40 per year.

³¹ Note that there will be diminishing returns over time. Soil organic matter will, after a while, reach a new equilibrium depending on the cultivation practices, after which gains will be hard to achieve. Also, productivity increases with increased soil organic matter, but only up to a certain level.

Opportunities and challenges for the organic sector

This section discusses the main opportunities, barriers and threats to the future development of the organic sector in Armenia, Moldova and Ukraine.³² It is likely that the same factors are pertinent in the other EECCA countries.

Opportunities

The main elements that constitute an opportunity for the sector are:

- Increasing local consumer demand for organic products (particularly in UA).
- Sustained global demand for organic products (all).
- Development of regional trade (all).
- Conventional farming becoming less appealing as energy prices increase³³ (all).
- Eco-tourism (mainly AM).
- Increased attention and opportunities for ecosystem services, e.g. climate regulation, watershed management and biodiversity conservation (all).
- Potential to deliver large volumes (particularly UA).
- High value crops and wild collection (mainly AM and MD).

Abandoned land – an opportunity?

Land is a resource that is abundant in most of the EECCA region. Abandoned farmland presents its own sets of opportunities and challenges. Land was abandoned due to war or other dramatic events, as a result of unclear ownership and deteriorating infrastructures such as irrigation, but mostly because it simply reflects the unprofitable nature of farming in the area. Abandoned farmland is often marginal land with low (natural) productivity.

Land abandonment has been a marked feature in most countries where an agricultural society has transformed into an industrial, market oriented model. Almost all high-income countries have reduced their area of agricultural land, and all have increased their forest cover (Sedjo and Waggoner 2006). This pattern has been repeated in the transformation of agriculture in the EECCA states. Land that has been abandoned may have substantial potential for the future, particularly in countries where agriculture land is scarce, e.g. in Armenia.

The presence of large tracts of abandoned farmland is often regarded as an opportunity for organic farming, due to the simple fact that unused land does not have to undergo a conversion period in order to qualify as organic. However this reasoning is questionable. While it might be possible to get the land certified, the land is often poor, in addition it is often infested with aggressive weeds. In general, it is wishful thinking that farmland that was unprofitable to manage with non-organic methods miraculously becomes profitable when farmed organically. If abandoned land is to become attractive – and profitable – it will not be with a strategy of “do little and get it certified” but rather the opposite. Intensification, with well-designed crop rotations, soil improvement measures and good nutrient and water management, is a precondition for this strategy to be successful. Such intensification means that substantial capital investment, which will be converted into increased natural capital, is necessary.

Household farms

As a result of privatization, most EECCA countries have many “micro-farms”, which are household farms with less than a hectare of land. Most of these farms do not produce for the open market and farmers are, therefore, not interested in participating in the formal organic sector. The majority, however, have a production system that is

³² AM=Armenia, MD=Moldova, UA=Ukraine

³³ Energy costs can easily accrue to between 15 and 40 per cent of production costs at current energy prices. Energy used in the manufacture of chemical fertilizers is the biggest component in this. With increasing energy prices this proportion will rise and the use of chemical fertilizers will become less and less profitable. Though energy is scarce in all the three focus countries, some of the other EECCA countries, such as Kazakhstan and Russia are energy rich.

close to organic, and they contribute a significant proportion of the county's production. Some of these farms may act as the nucleus of a new commercial farm, especially in horticulture, but many farmers will retain a small piece of land to continue smallscale production for their own livelihoods. From an environmental perspective these farms can make an important contribution, especially to biodiversity. Rather than adopt a market orientation stance, it is the potential to develop natural and social capital, as well as benefit the local community and the public good in general, that is the entry point for working with most household farms.

Livestock production

Many parts of the EECCA have extensive livestock production systems, based on free ranging animals; this is particularly the case in parts of Caucasus and Central Asia. Organic management and marketing, combined with the restoration of degraded pastures and other biodiversity measures and with breeding programmes oriented to robustness and local adaptation, could be a winning formula.

Ecosystem service

There are many opportunities for the organic sector within the field of ecosystem services. Armenian environmental legislation identifies organic agriculture as an economic activity permitted to take place in its national parks. In Armenia 28 nature protected areas – three reserves, two national parks and 23 reservations – have been established by the state. Their total area covers 10 per cent of the country's territory (Darbinjan 2010). Similar initiatives could be taken in other EECCA countries. It would also be easy to combine this approach with the commercialization of natural resources (such as honey, herbs, mushrooms and berries) managed according to organic standards. Implementation of the *Access and Benefit Sharing*³⁴ is also readily combined with organic agriculture. High Nature Value farmland is mainly managed by extensive methods making the programme very suitable for linking with organic programmes (WWF 2006).

Cultures

The EECCA is very rich in cultures and traditions, including rich food traditions. Linking the organic sector with these traditions could be a beneficial strategy, both for the development of a local market as well as for the branding of EECCA products in international markets. In addition, the link could be used to pursue strategies for branding products with Geographic Indications or appellations, e.g. for Moldovan wines or Armenian honey.

Associated business

There are many possible spin-offs and associated businesses that could be developed on organic farms. Eco-tourism has already been mentioned. Other opportunities are bio-energy production, in particular bio-gas (see box below), and educational services, such as bringing schools to the farms for educational purposes.

Money from manure in Georgia

A project in western Georgia reports significant benefits from the installation of 350 biodigestors. A biodigestor is a simple device used for the collection, storage, and processing of manure (or other biomass). They are easily installed and can be used for producing biogas (methane) for cooking and biomass to improve soil structure and replace mineral fertilizers. Each biodigestor can be sized to fit different sized livestock operations, including very small ones of three to ten cows. The results of the project include an annual production of 180–200,000 m³ of methane, which replaced about 2,000 m³ of fuel wood. Between 2002 and 2007 mineral fertilizer costing about US\$106 per farm was replaced by organic fertilizer produced on farm from manure and other waste. The cost of firewood and liquid gas consumption was reduced by US\$321 per farm over the same period of time. Green house gas emissions were obviously also reduced, but this was not included in the calculations (World Bank 2007b).

34 A concept under the Convention on Biological Diversity, for more information see <http://www.cbd.int/abs/intro.shtml>.

Challenges, barriers and threats

While the prospects in general are very good for the organic sector, there are barriers and potential threats to its development. Below, only those issues specific to the organic sector are discussed, the problems for agriculture in EECCA countries in general are not considered.³⁵

There are several barriers to organic development:

- Land tenure arrangements are insufficient as a basis for long-term investments (UA).
- Lack of knowledge and capacity on most levels and the lack of service providers (extension and consultancy) (all).
- Common misconceptions within the agriculture sector that organic farming methods are old-fashioned and low-yielding (all).
- Resistance from the agri-business establishment that sees the organic sector as a threat (all).
- Lack of interest from governments (AM, UA).
- Undeveloped marketing infrastructures and weak and disorganized supply chains. There is a shortage of storage facilities; the processing industry is poorly developed with no efficient intermediary sector; and supply for the interested buyer is limited (all).
- The farm-input supply sector is badly organized or non-existent (all).

Fraud in the organic market place, as well in the conformity assessment system, could reduce consumers' confidence in organic products, as has been reported in the country studies. This is even more critical for the export markets and there have been a few cases of rather blatant fraud in the EU market where products from EECCA countries have been implicated.³⁶ A further threat to the sector is overregulation. There are many examples of how premature or overly bureaucratic organic regulations have harmed the development of a country's organic sector (UNCTAD 2008). The large scale introduction of GMOs could pose severe contamination problems for organic products and could also damage the countries' image in export markets. International competition remains a challenge for a sector that is very dependent on exports for its growth.

Organic agriculture and food security

Recent models (Badgley and others 2007; Halberg and others 2006) of a hypothetical global food supply grown organically indicate that organic agriculture could produce enough food on a global basis for the current world population. This also coincides with practical experiences and the general observation that food shortages are more related to social, political and economic conditions than to production as such. There should be little worry that organic production would pose a threat to food security in EECCA when there is plenty of unused land and when the production from the used land is far below its potential. Under the current conditions in all three countries studied, and in the EECCA region in general, there are no indications that yields would go down with a widespread conversion to organic agriculture. In addition, organic soils and farms are more resilient to adverse weather conditions, which are expected to increase with climate change. Indeed, it is highly likely that a greater area under organic management would contribute to local food security by increasing incomes and providing employment for the rural poor.

Winners and losers

There will be winners and losers. Clearly the producers and distributors of chemical fertilizers and pesticides will be harmed by a large-scale transition to organic farming. On the other hand some businesses have also become engaged in the production and distribution of organic inputs. Marketing and food processing require the same infrastructure for organic products as for conventional, with the exception that some processing methods are not allowed under organic regulations. At the farm level, the losers will be those farmers that have invested in

³⁵ For instance, SPS requirements for exports are the same for organic and non-organic.

³⁶ Notably the fraud has been in the trade and not in the production.

an infrastructure that is not compatible with organic farming, such as, cages for layers, housing where sows are tethered, or systems that deny livestock access to the outdoors. Extension workers need to be re-trained so they are familiar with the organic methodology, and can present a positive picture of the “organic market”. Researchers that have devoted their work to chemical fertilizers will see their worth deflate compared to the rising stars working on biological nitrogen fixation.

What needs to be done?

Recognition by the government of the potential of organic agriculture sector and its benefits to society is an essential first step. EECCA governments should stimulate their organic sectors by setting ambitious growth targets, in the range of 5 to 10 per cent of agricultural production within a decade. They should then adopt policies to accomplish their target. A demonstrated commitment to the sector by the government sends an important political message to the farm sector and gives investors confidence.

Mainstreaming the organic sector, i.e. lifting the perspective from an interesting niche to a strategic component of agricultural development, is essential if the full benefits of organic agriculture are to be reaped. This also means scaling up successful initiatives and integrating them into mainstream agriculture, instead of having them as separate, often foreign-funded, initiatives.

There is a clear need for investments, correct policies, research, capacity building and concerted action by all stakeholders. The development of a vibrant organic sector and the flow of essential investments will not happen by itself. National governments can play a pivotal role in this process, much like the Government of Moldova has already set out to do.

Coordination

Establishing a National Organic Council, which acts as a central coordinating body where private sector actors and the relevant government agencies can discuss developments, has proven to work well in other countries. However, central coordination can also be counter-productive if there are many conflicts within the sector or if such coordination is used for domination rather than true coordination. Therefore, a coordinating body should be based on its own merits and the support of the stakeholders and not be imposed upon the sector, e.g. by government regulation.

Government policies

Considering the impact governments have on the agriculture sector, predictable and stable government policies are of utmost importance. Below recommended policy actions are identified.

A starting point for government engagement is to *give recognition and encouragement* to the organic sector. This includes recognising existing organic sector organizations and maintaining a close cooperative relationship with them. Governments should take an enabling and facilitating role rather than a controlling one. In particular, governments should not embark on premature or overly bureaucratic domestic organic market regulations, as this may stifle development instead of stimulating it (UNCTAD 2008, Rundgren 2007).

An *organic policy* should be linked to, or be part of, the overarching objectives of the country’s agricultural policies so that they are mutually supportive. Organic agriculture should be viewed as a key sub-sector rather than a market niche. The contribution of organic agriculture to the overall objectives needs to be emphasized. Similarly, current policies should be assessed to understand their impact on organic agriculture, and this ideally should lead to the removal of all obstacles and biases against organic agriculture.

Organic action plans and projects should flow from the overall organic policy. Critical for development is the identification of all bottlenecks. In addition, every aspect of development – such as, production, marketing, supply chain, training and research – should be considered. The development of an action plan can be used to coordinate the efforts of all parties, including foreign donors. An action plan should be developed through a participatory process and needs to carefully balance “push” (driving supply) and “pull” (driving demand).

Organic agriculture requires significant *capacity and skills development* of farmers, the value chain and the whole support system. Training both civil servants and private sector actors should also be given a high priority. Organic agriculture should be integrated into the curricula of agricultural colleges and other vocational educational institutions.

Access to business support service, in particular extension and certification³⁷ services for organic production, should be supported by the government. The availability of such services is often limited, and in many cases simply not available or are too costly.

There also many *practical and logistical* issues that need to be addressed in order to develop the sector, e.g. the lack of an efficient distribution system and marketing channels in the domestic market can be a serious hurdle. Similarly, access to useful inputs is more often a distribution and information problem than a lack of availability. If governments want to stimulate development faster, *hands-on* initiatives to solve these practical problems in the value chains should be initiated and supported rather than allowing the market place to sort it out on its own.

Stimulation of *private investment* is an important part of a government policy. Tools that a government can use to encourage private investments are various forms of matching funds or a public-private partnership; mapping investment possibilities; showing a long-term commitment to the sector; and tax rebates. It is very important for agriculture investments that land tenure is secure. Macro-economic stability and the rule of law or similar are as important for organic investments as for any other investment.

General agricultural policies impact organic agriculture, both positively and negatively. *A market for public goods*, such as carbon sequestration, biodiversity conservation and water purification, should be developed. This would not be unique to organic agriculture, but the organic sector should play an important role, and its multifunctional facets should be taken into account.

Finally, governments need to implement “*polluter pays*” (e.g. for nutrient runoff) and “*user pays*” (e.g. for water) principles in agriculture. The first priority should be to remove distorting policies, such as subsidies for agro-chemicals or policies that hinder long-term land tenure by farmers or farming communities.

Investment needs

None of the three country studies give much guidance on the size of investment needed in the organic sector. However, the Ukrainian study does state that the annual investment needed to reach a growth target of 3 per cent is estimated to be 90-100 million Euros. In comparison, Sweden’s public spending (including EU funds) on its organic sector amounted to approximately 70 million Euros annually in the mid 2000s (Grolink 2009), and the private sector certainly invested substantial amounts as well.

Research needs

There is sufficient information and indicators available to draw the conclusions listed above. However, solid scientific data is lacking for a number of pertinent issues, such as the health effects of organic farming; methane emissions from organically-managed ruminants compared to non-organic; best practices for increasing and maintaining high soil organic matter content (thus maximizing its carbon sequestration potential); and resilience to climate change of organic versus conventional production systems. More research would also be advantageous on the intricate relationship between employment and the impact a shift to organic farming would have on poverty levels. Finally, a deeper analysis on how overall policies, including energy, land tenure and environment policies, affect organic farming and the competitiveness of organic market would be valuable. The issues mentioned above are mainly research-based aimed at informing policy makers. Organic producers need research and technology to help them improve their production. Research institutions, governments, the private sector and other stakeholders should identify research priorities and design ways of dealing with them. Linkages to international research organizations are useful. Clearly this research will need public funding.

³⁷ Certification service is available everywhere, but in some countries is not as accessible in terms of costs and documentary and management requirements, or the service is only available in foreign languages.

Interventions by donors and intergovernmental organisations

Donors have played a big role in the development of the organic sector in the three countries study, in particular in Armenia and Ukraine. It is important that they also engage the respective governments in the process, challenging them to match donations with their own resources and to integrate and mainstream the organic sector into their overall policies. Practitioners report that it is often very difficult to obtain this type of engagement, and experience from a number of other countries shows that organic issues are often set aside once it has, supposedly, been integrated into general agricultural development programmes. Consequently, caution is merited. Intergovernmental organizations can assist in policy development, capacity development and in regional projects; they can also aid the exchange of experiences within and between regions.

Candidates for regional projects are ones aimed at capacity building. Areas where capacity building is needed are extension services, inspection and certification services, research and marketing. In addition, the policy-makers themselves as well as key implementers – whether they are in government, NGOs or business associations – will benefit from such projects.

Considering the difficulties many of the countries have in forming a policy environment conducive to the development of the organic sector, a regional project at the policy level, focussing on the concept of organic policy and action plans could be very useful. Linked to such a project, other associated studies should be commissioned. For examples, research on how organic agriculture could play a strategic role in biodiversity conservation in the region, how public programmes can be designed to compensate farmers, and investigations into carbon sequestration would be very valuable.

Regarding organic standards and regulation, capacity is very low and the level of development within the EECCA region variable. There might be scope for harmonization, such as the development of a regional standard. The first step here would be to conduct a feasibility study for regional harmonization and to install a regional working group of people involved in standards, certification and regulation, including both governmental and private sector representatives. A survey of investment opportunities and the production and dissemination of information materials for investment opportunities are other candidates for regional efforts. For other forms of production, in particular those that are “new” and innovative, such as eco-tourism and organic pastoralism, there is scope for regional cooperation. In general, regional projects can draw on existing organizations, experts and experiences in the region, supplemented by international expertise and experiences.

References

- Agroeco and Grolink. (2008). Organic Exports – a way to a better life? G. Rundgren (ed.), Grolink
- Arbenz, M. (2010). Personal message.
- Azeez, G. (2009). Soil Carbon and Organic Farming. Soil Association, November 2009. <http://www.soilassociation.org/climate.asp>
- Badgley C., Moghtader, J., Quintero, E., Zakem, E., Chappell, J., Avilés-Vázquez, K., Samulon, A and Perfecto, I. (2007). Organic Agriculture and the Global Food Supply. Renewable Agriculture and Food Systems. June 2007
- Baltzer, K., Hansen, H. and Lind, K. M. (2008). A Note on the Causes and Consequences of the Rapidly Increasing International Food Prices. Institute of Food and Resource Economics, University of Copenhagen
- Bolwig, S., Gibbons, P. and Jones, S. (2008). The economics of smallholder organic contract farming in tropical Africa. Danish Institute for International Studies, Copenhagen
- CEO (2002). Caucasus Environment Outlook Report, Available at www.gridtb.org/projects/CEO/full.htm
- Darbinjan, N. (2010). Armenian country study 2010 (draft)
- Doing Business. (2010). <http://www.doingbusiness.org/rankings> accesses 28 October 2010
- DZI (2010). Ukrainian organic market through the eyes of retailers
- EASC (2010). Euro Asian Council for Standardization, Metrology and Certification <http://www.easc.org.by/>, accessed 12 July 2010
- EU (2010). An analysis of the EU organic sector, http://ec.europa.eu/agriculture/analysis/markets/organic_2010_en.pdf
- FAO (2007). Paying Farmers for Environmental Services, The State of Food and Agriculture 2007, FAO.
- FAO (2009). Review of evidence on dryland pastoral systems and climate change. FAO
- FAO (2010). Carbon Finance Possibilities for Agriculture, Forestry and Other Land Use Projects in a Smallholder Context. FAO
- Gherciu, V. (2010). Moldova country study 2010 (draft)
- Giovanucci, D. (2005). Organic Agriculture and Poverty reduction in Asia. IFAD, Rome
- Greenpeace (2010). Ecological farming: Drought-resistant agriculture, University of Exeter, UK, GRL-TN 02/2010
- Grolink (2009). Organic Agriculture Development. ed. G. Rundgren, Grolink
- Halberg, N., Alroe, H.F., Knudsen, M.T. and Kristensen, E.S. (2007). Global Development of Organic Agriculture: Challenges and Prospects. CABI Publishing.
- Huber, B. (2010). Personal message
- Källander, I. and Rundgren, G. (2008). Building Sustainable Organic sectors, IFOAM

- Markandya, A., Setboonsarng, S., Quao, Y. H. Q., Songkranok, R. and Stefan, A. (2010). The Costs of Achieving the Millennium Development Goals through Adopting Organic Agriculture, ADBI No. 193 January 2010 <http://www.adbi.org/files/2010.02.09.wp193.cost.mdg.organic.agriculture.pdf>
- MEA (2005). Ecosystems and Human Well-being. Millennium Ecosystem Assessment
- Migration Policy Institute (2010). Remittances Profile: Republic of Moldova, <http://www.migrationinformation.org/datahub/remittances/Moldova.pdf>
- Milovanov, E. (2010). Ukraine country study (draft)
- Ministry of Nature Protection of Republic of Armenia and UNECE EPR report Armenia. (2000), quoted in Darbinjan 2010
- Nemes, N. (2009). Comparative analysis of organic and non-organic farming systems: a critical assessment of farm profitability, FAO 2009
- ORGAP (2008). Organic Action Plans in Europe – Compilation of results from the EU funded research project ORGAP, http://www.orgap.org/documents/action_plan_targets.pdf
- Palutskaya, N. (2007). Organic agriculture in Belarus – Does such a thing exist? at <http://www.ccb.se/documents/OrgagriBe.pdf>
- Pretty, J. and Ball, A. (2001). Agriculture Influences on Carbon Emissions and Sequestration: A Review of Evidence and the emerging Trading Options. University of Essex, March 2001
- Pretty, J. and Waibel, H. (2005). Paying the price: the full cost of pesticides. In: The Pesticide Detox. Towards a more sustainable agriculture. Earthscan
- Pretty, J., Ball, A. S., Lang, T. and Morison, J. I. L. (2005). Farm Costs and Food Miles: An Assessment of the Full Cost of the UK Weekly Food Basket, Food Policy Volume 30, 2005
- Rundgren, G. (2007). Best practices for organic marketing regulation, standards and conformity assessment: Guidance for developing countries, International Task Force on Harmonization and Equivalence in Organic Agriculture.
- Sedjo, R.A and Waggoner, P.E (2006). Returning forests analyzed with the forest identity, Proceedings of the National Academy of Sciences <http://www.pnas.org/content/103/46/17574.short>
- Strategy of economic reforms for Ukraine 2010-2014.
- TOS (2009). The Organic Certification Directory 2009. The Organic Standard, www.organicstandard.com
- UNCTAD (2008). Best Practices for Organic Policy, UNEP&UNCTAD, United Nations, New York and Geneva, 2008
- UNDP (2009). Human Development Report 2009, Overcoming barriers: Human mobility and development.
- UNEP-EEA (2007). Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia, Joint UNEP-EEA publication
- UNEP (2010). The Green Economy Initiative, <http://www.unep.org/greeneconomy/>, accessed 2010-07-06
- United Nations (2008). Organic Agriculture and Food Security in Africa, UNCTAD/DITC/TED/2007/15
- Wikipedia (2010). Aral Sea, http://en.wikipedia.org/wiki/Aral_Sea accessed 28 October 2010
- Willer, H. and Kilcher, L. (eds.) (2010). The World of Organic Agriculture
- World Bank (2007a). World Development Report 2008, Agriculture for Development
- World Bank (2007b). Integrating Environment into Agriculture and Forestry, Volume 1
- WWF (2006). High Nature Value farming in the EECCA countries, Final report for Workshop on High Nature Value farming in the EECCA countries 16-17 November 2006, Chisinau, Moldova

Annex 1: Agriculture characteristics of the EECCA region³⁸

Within Eastern Europe, Belarus, a mainly flat country, has generally good conditions for the production of food, although large stretches of the country require drainage to support agriculture. About one-fourth of its agricultural land is also contaminated by the radioactive fallout from the Chernobyl disaster. Moldova is one of the most productive agricultural areas of EECCA as a result of rich soils and a temperate continental climate. Russia has a wide variety of habitats, but much of its area contains agricultural land and pastures favourable to food production. Ukraine is made up mostly of fertile plains, steppes and plateaux crossed by rivers, with one-quarter of the country being classified as “very productive”. The country suffers from a lack of water in the south.

Within the Caucasus, Armenia has many high-rolling plateaus and wide river valleys, with sharp mountains from the southern edge of the Caucasus. Food production is constrained by limited agricultural resources. Azerbaijan is also a mountainous country characterized by a great variety of landscapes and climate zones. Georgia also has a variety of landscapes, with forests covering around 40 per cent of its territory. Around 75 per cent of the summer pastures lie in sub-alpine and alpine regions, favouring certain types of livestock.

In Central Asia, Kazakhstan has favourable conditions for agricultural production, and grain and livestock are the most important agricultural commodities. However, the country has been affected by two well-known ecological disasters, namely, the reduction of the Aral Sea and the radioactive disaster of Semipalatinsk. The food sector in Kyrgyzstan is shaped by the Tien Shan Mountains that divide the country; and inadequate precipitation prevents most crop production without irrigation. Due to its limited arable land, livestock represents a large food production activity in the country. Tajikistan is one of the most mountainous countries in the region – 93 per cent of its territory is mountainous with peaks reaching over 7,000 meters. Agriculture is dominated by cotton production on irrigated lands with food production taking second place. Turkmenistan is predominantly dry with most of its arable land and pastures being subject to desertification. Uzbekistan is also a dry country, with 60 per cent of its land characterized by arid landscapes. These are focused on cotton production around the Aral Sea in the north of the country with less land dedicated to food (UNEP-EEA 2007).

³⁸ This text is copied verbatim from the UNEP-EEA report, *Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia* (UNEP-EEA 2007).



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Around the world, evidence is mounting which suggests that sustainable forms of agricultural production present viable alternatives to existing (and unsustainable) farming practices, and pathways for green economy transformation – an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.

Sustainable agricultural systems offer various opportunities, including: competitive economic returns, the supply of essential and life-supporting ecosystem services, the creation of decent jobs and livelihoods, a smaller ecological footprint, increased resilience to climate change, and enhanced food security.

This publication summarizes the analysis, results and recommendations of country studies from Armenia, Moldova and Ukraine. It makes use of available evidence and data from other countries and regions to demonstrate the potential of the organic sector in Eastern Europe, Caucasus and Central Asia region (EECCA) to contribute to poverty reduction and sustainable development and to take its role at the forefront of the eventual transition to a Green Economy.

The report also identifies the challenges facing the sector and encourages decision makers in both the public and private sectors to reshape the future of agriculture by introducing policies and making the necessary investments to increase supply side capacity and overcome trade barriers.