Food and Agriculture Organization
of the United Nations

Regional Strategic Review Paper

Europe and Central Asia

Regional Strategic Review Paper

Europe and Central Asia

15 March 2016

Prepared by

Kateryna Schroeder

Research Scientist at the Food and Agricultural Policy Research Institute

University of Missouri

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Budapest, 2016

ISBN 978-92-5-109410-5

Table of Contents

Acknowledgements

The Regional Strategic Review Paper for Europe and Central Asia was prepared by Kateryna Schroeder, Research Scientist at the Food and Agricultural Policy Research Institute at the University of Missouri, under the guidance of the Regional Strategic Thinking Team led by senior officers from the FAO Regional Office for Europe and Central Asia.

Inputs in the form of stimulating discussions, written contributions and comments are greatly acknowledged for the Advisory Board members including Vladimir Bautin, Natalija Bogdanov, Csaba Csaki, Bakhodur Eshonov, Thomas Herzfeld, Ulrich Koester, Zvi Lerman, William Meyers, Roman Mogilevskii, Dorothy Rosenberg, Natalya Shagaida, Jozef Turok, Vardan Urutyan, Renata Yanbykh.

Gratitude is owed for the information on the medium-term prospects for EU agricultural markets and income 2015-2025 (Box 2) received from the Joint Research Centre of the European Commission.

I. Introduction and Background

During 2012-2013, a corporate Strategic Thinking Process (STP) was used to review FAO's Strategic Framework. The STP resulted in a much more focused set of priorities and a monitoring framework for measuring the results and impact of FAO's work. This was reflected in a Medium Term Plan (MTP) 2014-17.

FAO is currently preparing a new Medium Term Plan for 2018-2021 based on a review of the existing Strategic Framework. In order to link this process to a regional level review, the organization has initiated a structured Regional Strategic Thinking Process, the aim of which is to achieve more concrete results, particularly at the country level.

The overall objective of the Regional Strategic Thinking Process (RSTP) is to effectively incorporate regional specificities into the review of the Strategic Framework and preparation of the MTP 2018-2021 with clear results-based outcomes and outputs. In this regard, the process will provide substantive inputs for the agendas and documentation of the 2016 Regional Conferences, particularly in the identification of the special problems of the respective regions and priority areas of work for FAO.

The process will help bridge country demands and global issues under a regional umbrella, focusing on challenges best tackled at regional level. It will ensure that regional specificities are clearly reflected in FAO's work on priority issues such as nutrition, climate change and the Sustainable Development Goals. It will also provide a good basis for FAO to develop partnerships and facilitate resource mobilization.

The Regional Strategic Thinking Process will prepare a comprehensive overview for each region including its development objectives, major constraints, and country specificities. It will identify major regional trends and their implications with regards to major challenges at regional and national levels. It will review existing FAO regional initiatives and other activities in the region. It will also identify key regional themes of focus for FAO. This comprehensive overview **should take into consideration not only the immediate trends, but also a perspective beyond the timeframe of 2018-2021.**

II. FAO's Strategic Framework

Member states approved FAO's Results Framework in June 2013 constituting three main global goals: 1) the eradication of hunger, food insecurity and malnutrition; 2) the elimination of poverty and the driving forward of economic and social progress for all; and, 3) the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations.

Taking into account major global trends, the main development challenges, along with FAO's basic attributes, core functions and comparative advantages, FAO has developed five Strategic Objectives (SOs) as part its Strategic Framework. These represent the main areas of work on which the Organization will concentrate its efforts in striving to achieve its vision and global goals.

SO 1: Help eliminate hunger, food insecurity and malnutrition: FAO's mandate is to support members in their efforts to ensure that people have regular access to enough high-quality food. We can help by supporting policies and political commitments that promote food security and good nutrition and by making sure that up-to-date information about hunger and malnutrition challenges and solutions is available and accessible.

SO2: Make agriculture, forestry and fisheries more productive and sustainable: The world's population is predicted to have increased to 9 billion by 2050. Growth in the agricultural sector is one of the most effective means of reducing poverty and achieving food security. We must ensure that increased productivity does not only benefit the few, and that the natural resource base can provide services (pollination, nutrient cycling in soils, quality water, etc.) that enhance sustainability.

SO3: Reduce rural poverty: Most of the world's poor live in rural areas. Hunger and food insecurity above all are expressions of rural poverty. FAO strives to help smallholders improve farm productivity whilst also aiming to increase off-farm employment opportunities and, through social protection, find better ways for rural populations to manage and cope with risks in their environments.

SO4: Enable inclusive and efficient agricultural and food systems: With increasing globalization, agriculture, as an independent sector will cease to exist, becoming instead, just one part of an integrated value chain. This poses a huge challenge for smallholder farmers and agricultural producers in many developing countries where even the most economically viable smallholders can easily be excluded from important parts of the value chain. Increasing their participation in food and agricultural systems is critical to achieving FAO's goal of a world without hunger.

SO5: Increase the resilience of livelihoods to threats and crises: Each year, millions of people who depend on the production, marketing and consumption of crops, livestock, fish, forests and other natural resources are confronted by disasters and crises. They can strike suddenly, like an earthquake or a violent coup d'état, or unfold slowly, like drought-flood cycles. These emergencies threaten the production of, and access to, food at local, national and, at times, regional and global levels. FAO's mission is to help countries govern, prevent and mitigate risks and crises and support them in preparing and responding to disasters.

FAO strives to achieve its goals in the region through focusing on its core functions, including (FAO, 2013d):

1) Supporting countries in the development and implementation of normative and standard-setting instruments, such as international agreements, codes of conduct, technical standards and others;
2) Assembling, analyzing, monitoring and improving access to data and information;
3) Facilitating, promoting and supporting policy dialogue at global, regional and country levels;
4) Advising and supporting capacity development at country and regional level to prepare, implement, monitor and evaluate evidence-based policies, investments and programs;
5) Advising and supporting activities that assemble, disseminate and improve the uptake of knowledge, technologies and good practices in the areas of FAO's mandate;
6) Facilitating partnerships for food security and nutrition, agriculture and rural development, between governments, development partners, civil society and the private sector;
7) Advocating and communicating at national, regional and global levels, in areas of FAO's mandate.

III. Articulating FAO's Corporate Strategic Framework with regional specificities

In Europe and Central Asia (ECA) FAO has responded to the challenges identified at the 2014 Regional Conference[1] by focusing its work on five priority areas that are aligned with the Strategic Objectives (SOs) introduced in the previous chapter. The regional priority areas include:

1. Strengthening food security and nutrition in a sustainable manner (contributing to SO1);
2. Providing policy advice to governments in support of sustainable agricultural production intensification for smallholders (contributing to SO2, SO3, SO4);
3. Managing natural resources, including climate change mitigation and adaptation (contributing to SO2, SO3, SO5);
4. Controlling animal diseases, plant pests and food safety hazards (contributing to SO2, SO4, SO5);
5. Providing policy and institutional support for the entry of Member States into regional and global trade, standard-setting and organizations of regional economic cooperation (contributing to SO4).

The priorities are implemented through two Regional Initiatives and other major areas of FAO work. The **Regional Initiative on Empowering Smallholders and Family Farms (RI-1)** uses a complex, multidisciplinary and area-based development approach with the overall goal of addressing the key problems of rural people by empowering smallholders and family farms to improve their livelihoods. Eliminating rural poverty, improving the resilience of rural populations (with a focus on smallholders) and promoting inclusive growth for rural economies based on the sustainable use of natural resources are the basic principles of the Initiative.

The work focuses equally on technical issues (animal health, production, phytosanitary) and social, economic and environmental aspects. Inclusiveness – with respect to gender and vulnerable groups, for example – is also a key principle. The Initiative tackles two main areas: (1) policy, institutions and governance, and (2) farms and communities.

Priority actions include strengthening governance and policies, building capacities, enhancing participatory approaches, supporting smallholders in sustainable production technologies, supporting land consolidation processes and income diversification, and improving smallholder access to markets, rural finance and value chains.

The **Regional Initiative on Agri-food trade and regional integration (RI-2)** focuses on strengthening national and regional capacities in Europe and Central Asia to effectively deal with the challenges posed by greater trade integration. It does this by developing better evidence on trade implications, improving the capacity of countries to use this evidence, facilitating neutral forums and dialogues on trade agreements, and supporting the design and implementation of appropriate trade policy at country level.

The first component of the *Initiative* is to develop capacity for implementing the main trade agreements in the region. The World Trade Organization (WTO) agreements form a basis for global

[1] ERC/14/REP/ Rev 1

trade rules, and are thus a key element of any program to improve the policy environment for exports. The initiative will build the capacity of civil servants and private industry in the region on WTO issues, including market access, domestic support measures, sanitary and phytosanitary (SPS) issues, technical barriers to trade, trade dispute resolution and trade facilitation.

The second component of the *Initiative* relates to the standards and good practices that make up a great deal of modern agricultural global markets. Under this component the initiative will develop capacity to implement global food quality standards. Global agricultural markets have become increasingly complex in the past two decades, and a large part of this complexity is down to the increasing scope and complexity of food standards, particularly those relating to food safety.

The third component of the *Initiative* focuses on country-level work on fostering a supportive policy environment for export diversification for food products. This component will involve identifying potential export commodities, analyzing selected value chains in selected countries with recommendations for facilitating exports, and assisting in the preparation of export promotion campaigns for food products.

Other major areas of FAO work in the region included **strengthening food security and nutrition** under the scope of SO1 in the region focusing (i) on the development and management of governance mechanisms such as food security strategies, policies and programs both at national and regional levels and (ii) supporting evidence based decision making by increasing capacities on related analysis and increasing the availability of food security related data and information.

Another major area of work is **natural resource management (including fisheries, forestry) and climate change mitigation and adaptation**. Work in this field falls under SO2 and SO5 with three main components. First is FAO's work related to climate change with a focus on supporting the development of more resilient production systems through capacity building in natural resource management, particularly in water management. Second, FAO has supported the implementation of international instruments related to sustainable agricultural production systems. Finally, evidence building in natural resource management has been supported by developing monitoring, assessment and analysis capacities.

In the field of supporting **control of animal disease, plant pests and food safety hazards and emergencies,** the work focuses on animal and plant health (SO4) as well as risk and emergency management (SO5). As part of animal and plant health, FAO helps public sector institutions improve their capacity to design and implement better policies and regulatory frameworks in line with international standards. FAO has also supported the participation of countries in the standard setting work of the International Plant Protection Convention (IPPC), the international standard setting body in the field of plant health.

In terms of **increasing the resilience of livelihoods to threats and crises in the region**, FAO has provided multidisciplinary technical and operational support and expertise under SO5 to assist member countries in crisis response (e.g. Bosnia and Herzegovina, Serbia and Ukraine). It has also helped countries reduce multi-hazard risks and improve crisis management capacities (e.g. Armenia, Bosnia and Herzegovina and Serbia). FAO's response has focused on support for reducing risks and vulnerability, strengthening preparedness and crisis response to natural hazards and disasters such as frosts, droughts, floods and locusts, which local communities and farmers are most vulnerable to.

IV. Global trends and their regional manifestation

The FAO Regional Strategic Thinking Process for the Europe and Central Asian region has identified two categories of agents of change that should have a significant impact on how agriculture develops in the near future. Section IV of this review outlines regional trends that are external to the food and agricultural sectors in ECA countries, but that have a direct influence on their development. It is followed in Section V by a description of the internal drivers of agricultural and rural development in the Europe and Central Asian region. Regional priority areas for FAO action in the region are then derived from these two sets of drivers.

This analytical approach has been adopted from the 2013 FAO Global Trends paper, which was the basis for the Medium Term Plan 2014-17. In January 2012, the FAO Director-General launched a Strategic Thinking Process to determine the future strategic direction for the Organization. The process was undertaken as part of a revision of the existing Strategic Framework 2010-19, and for the preparation of the new Medium Term Plan 2014-17, as well as the Programme of Work and Budget 2014-15. The purpose of the exercise was to analyze global trends and challenges in food and agriculture that shape the environment in which the organization operates and to which the organization should respond in 2010-19.

The FAO global strategic thinking paper outlined a number of trends external to the global food and agriculture economy, but that will directly influence its development (population, GDP, financial and unemployment forecasts), as well as ten global trends which were thought to represent "internal drivers of agricultural production and rural development" (see box 1). Most of these trends are relevant to Europe and Central Asia (ECA) countries, albeit to varying degrees. The discussion below focuses on how these global trends are manifested in the Europe and Central Asian region.

Box 1. Global trends and future challenges for the work of the organization

Global trends analyzed in the FAO 2013 paper on global strategic thinking:

Trend 1: Food demand is increasing while patterns of food consumption are changing towards more livestock products, vegetable oils and sugar

Trend 2: Growing competition and diminishing quality and quantity of natural resources and loss of ecosystem services

Trend 3: Energy security and scarcity – the landscape and trends

Trend 4: Food price increases and price volatility

Trend 5: Changing agrarian structures, agro-industrialization and the globalization of food production

Trend 6: Changing patterns in agricultural trade and the evolution of trade policies

Trend 7: The growing impact of climate change on agriculture

Trend 8: Science and technology as a main source of agricultural productivity and production increases is progressively becoming a private good and the processes are dominated by the private sector

Trend 9: Evolving development environment: increased recognition of the centrality of governance and a commitment to country-led development processes

Trend 10: Increased vulnerability due to natural and man-made disasters and crises

Source: FAO (2013)

1. Overview of the region

Extending from Lisbon to Vladivostok and from the Arctic Circle to the Pamir Mountains of Central Asia, no region is more vast or diverse than FAO's Europe and Central Asia region. More than half of the 53 FAO member countries in the region are European Union member states (28). Geographically, the report focuses on non-EU countries as it is these countries that FAO's technical assistance is directed towards. The aim of the report is also to identify Priority Areas for FAO's Actions (Chapter VII).

Nevertheless, considering the significant number of EU countries in the region, there is a short sub-section of the report that summarizes the main trends and perspectives that are expected in the EU agricultural commodity markets. The section was prepared based on the European Commission's medium term outlook for agricultural commodity markets from an EU perspective, which is a contribution to the subsequent global agricultural outlook prepared by the OECD and the FAO.

Box 2. Medium-term prospects for EU agricultural markets and income 2015-2025 (EU Commission, 2015a)

In the context of low energy and commodities prices, the outlook for EU agriculture is characterized by a relatively good forecast which can be summarized as follows. Concerning cereals, if prices decrease following several consecutive good harvests and replenishment of stocks, the strong world and EU demand should result in higher price levels than the historical average. EU feed demand and export prospects are particularly good for wheat and barley. The oilseed complex is also characterized by a stronger feed demand and a stabilization of the demand for biofuel purposes, implying a shift towards more imports of soybeans and soybean meal, as well as more stable rapeseed and sunflower production. Protein crop production will benefit from a favorable policy environment linked to greening measures. The expiry of sugar quotas will result in an approximation of EU sugar prices with those on international markets, and the increase in EU production will turn the EU into a net exporter. Most of the moderate increase of biofuel consumption will stem either from EU non-agricultural feedstock or from imports.

The world import demand of most animal products is expected to grow steadily. Together with an increased domestic demand for dairy products, this will support significant growth in EU production and exports of dairy products. We should also see the EU gaining market shares in world trade, taking advantage of a good potential to increase production, despite growing environmental restrictions within the EU. EU meat consumption should continue a downward trend, which should result in growing pig and poultry meat exports. Conversely, beef production remains mainly driven by dairy herd developments and should decrease, although at a slower rate than it has historically.

Without specifically analyzing the EU countries it still needs to be emphasized that the ECA region is vast and diverse and includes countries with different economic, political, and demographic contexts.[2] For example, the region encompasses countries rich in oil, natural gas, and metals, including Azerbaijan, Kazakhstan, Russia, and Turkmenistan. The region also includes the poorer

[2] To highlight some of the differences among these countries, in this report, the ECA region is divided into three following sub-regions and their corresponding countries: *Caucasus and Central Asia (CCA)* - Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan; *European CIS* - Belarus, Republic of Moldova, Russian Federation and Ukraine; and South-*Eastern Europe (SEE)* - Albania, Bosnia and Herzegovina (B&H), Kosovo (under UNSCR 1244), Montenegro, Serbia, The former Yugoslav Republic (FYR) of Macedonia, and Turkey.

countries of Central Asia whose economies are agrarian-based (Kyrgyzstan, Tajikistan, and Uzbekistan), Moldova, and Albania.

In accordance with the World Bank (2015) classification, most countries in the ECA region are developing middle-income economies, with the exception of the Russian Federation, which is classified as high income country. Kazakhstan, Ukraine, and Russia are three of the world's most important grain exporters. On the other side of the spectrum, there are countries with a high (and rising share) of food imports, including Armenia, Tajikistan, and Kyrgyzstan. All countries, except for Turkey, have been through a transition of institutions and governance since the 1990s. However, the initial conditions, pace, and direction of reforms and restructuring has varied greatly across the countries.

An important characteristic of all the countries of the region is their greater reliance on agriculture compared to developed OECD economies. In the Caucasus and Central Asian countries, agriculture value added as a percentage of GDP averages 11 percent (Table 1). However, there are substantial deviations from country to country. For example, in Tajikistan and Armenia, agriculture value added in GDP exceeds 20 percent, while in Kazakhstan and Azerbaijan it averages 5 percent. Within the European CIS sub-region, agriculture plays a more important role in Ukraine and Moldova (11.8 percent and 15.2 percent agriculture value added as a percentage of GDP, respectively), and to a lesser extent in Belarus and Russia (8.8 percent and 3.9 percent of agriculture value added as a percentage of GDP, respectively). In the SEE countries, in terms of national income agriculture is the most significant for Albania (22.7 percent) and the least significant for Bosnia and Herzegovina (7.6 percent).

Table 1. Population, wealth, and livelihood indicators in ECA countries

	Population, million	Average population growth, annual %	Share of population >60 y.o., % of total	Per capita GDP, current USD	Average GDP growth, annual %	Projected GDP growth, annual %	Unemployment rate[3], % of total labour force	Agriculture value-added, % of GDP
	2014	2010-14*	2015	2014	2010-14*	2020 *Projections*	2014	2014
World	7 259.7	1.19	12.3	10 739	2.5	3.8	5.9	3.1*
EU-28	507.9	0.18	24.5	36 448	1.4	1.5	10.2	1.6
Caucasus and Central Asia								
Armenia	3.0	0.3	19.2	3 620	4.1	3.5	17.1	20.8
Azerbaijan	9.5	1.3	11.3	7 884	3.2	3.3	5.2	5.7
Georgia	4.5	0.4	22.9	3 670	5.6	5.0	13.4	9.2
Kazakhstan	17.3	1.4	11.8	12 276	6.0	4.2	4.1	4.6
Kyrgyzstan	5.8	1.6	8.0	1 269	3.7	5.3	8.1	17.3
Tajikistan	8.3	2.3	5.6	1 114	7.1	5	10.1	27.4*
Turkmenistan	5.3	1.3	7.7	9 032	11.0	6.9	10.5	14.5*
Uzbekistan	30.7	2.0	8.4	2 038	8.2	6.5	10.6	18.8
European CIS								
Belarus	9.5	-0.1	23.9	8 040	3.5	0.5	5.9	8.8

[3] Unemployment refers to the share of the labour force that is without work but available for and seeking employment (World Bank, 2015).

Moldova	3.6	-0.1	18.8	2 234	5.4	4	3.4	15.2
Russian Federation	143.8	0.1	23.1	12 736	2.8	1.5	5.1	3.9*
Ukraine	45.4	-0.3	26.0	3 083	-0.17	4.0	7.7	11.8
South-Eastern Europe								
Albania	2.9	-0.2	20.2	4 619	2.3	4.5	16.1	22.7
Bosnia and Herzegovina	3.8	-0.1	25.8	4 805	0.8	4	27.9	7.6
Kosovo	1.8	0.7	n/a	3 990	3.3	3.5	n/a	14.5
FYR Macedonia	2.1	0.2	n/a	5 456	2.3	4	27.7	10.2
Montenegro	0.6	0.1	23.1	7 371	1.5	3.3	19.1	10.2
Serbia	7.1	-0.5	28.1	6 153	0.4	4	22.2	9.7
Turkey	75.9	1.3	12.6	10 530	5.4	3.5	9.2	8.0

*latest available

Source: World Bank, 2015; IMF, 2015; UN DESA, 2015a

ECA countries also differ with respect to their allotment of land and forest resources (Table 2). Overall, countries in the region account for 17.5 percent of the world's land area. Kazakhstan, Moldova and Ukraine have the highest share of agricultural land relative to total land at 77.5 percent, 74.8 percent and 71.3 percent, respectively. The smallest share of agricultural land is in Russia at 13.1 percent (Table 2). Across the region, the proportion of agricultural land in total land has remained largely unchanged in recent years (FAO, 2014a).

The availability of forest resources varies across ECA countries. The Russian Federation has by far the most forested land in the region (Table 2); in 2011 it had 800 million hectares under forest cover, which accounted for almost 20 percent of global forested area (FAO, 2014a). Other countries in the region with forest cover above 40 percent of total land area include Bosnia and Herzegovina (42.8 percent), Belarus (42.7 percent), and Montenegro (40.4 percent). Kazakhstan is the country with the smallest share of forested area relative to total land area (1.2 percent). With respect to the ownership of forest resources, they are predominantly publicly owned in ECA countries, with the exception of Serbia (47 percent of forests are privately owned), Kosovo (40 percent), Montenegro (28 percent) and Bosnia and Herzegovina (21 percent) (Pulla *et al*., 2013).

Table 2. Agricultural land and forestry resources in ECA countries, 2011

	Total land area, million ha	Agricultural land	Forest cover	Composition of agricultural land area	
		% of total land area	% of total land area	*Arable land*, % of agricultural land area	*Meadows and pastures*, % of agricultural land area
Caucasus and Central Asia					
Armenia	3	60.1	9.1	25.1	71.7
Azerbaijan	8	57.7	11.3	39.5	55.7
Georgia	7	35.5	39.4	16.8	78.6
Kazakhstan	270	77.5	1.2	11.5	88.5
Kyrgyzstan	19	55.3	5.1	12.0	87.3
Tajikistan	14	34.7	2.9	17.5	79.8
Turkmenistan	47	69.5	8.8	5.8	94.0
Uzbekistan	43	62.7	7.7	16.1	82.5
European CIS					

Belarus	20	43.7	42.7	62.3	36.3
Moldova	3	74.8	11.9	73.6	14.3
Russian Federation	1638	13.1	49.4	56.4	42.7
Ukraine	58	71.3	16.8	78.7	19.1
South-Eastern Europe					
Albania	3	43.8	28.3	51.8	42.0
Bosnia and Herzegovina	5	42.2	42.8	46.7	48.5
FYR Macedonia	3	44.3	39.8	37.0	59.8
Montenegro	1	38.1	40.4	33.6	63.3
Serbia	9	57.9	31.6	65.1	29.0
Turkey	77	49.7	14.9	53.7	38.2

Source: FAO (2014a)

As mentioned previously, there are a number of trends that are external to the food and agriculture economy of the ECA region, that are, nevertheless, directly influence its development. They include demographic, macroeconomic, geopolitical, and climate change trends.

2. Demographic trends

Across ECA countries, changes in the agricultural and rural economy are largely driven by external phenomena. Changing population dynamics is one example. In general, ECA countries have been characterized by relatively stagnant population growth, though these dynamics have varied by sub-region (see Table 1). The CCA countries have been experiencing positive population growth, including in rural areas, with an average growth rate of 1.5 percent annually since 2010. Within the European CIS sub-region, Belarus, Moldova, and Ukraine have been experiencing population shrinkage. Russia is the only country in this sub-region that has seen some slow positive growth in the most recent past. Since 2010 the population of SEE countries has been slightly decreasing at a rate of less than 1 percent in Albania, Bosnia and Herzegovina, and slightly increasing in Kosovo, Macedonia and Montenegro. Turkey has had the highest population growth in the sub-region at an average of 1.3 percent in 2010-2014. According to the World Bank (2015), between 2015 and 2050 the largest population decline (more than 20 percent) will occur in Serbia, Belarus, Ukraine and Moldova.

The age composition of the population in the region has also been changing over time. Currently, the share of the population older than 60 averages at 22 percent for the SEE countries and at 23 percent for the European CIS countries. For CCA countries it is estimated at 12 percent. According to UN DESA (2015), by 2050, the share of the population older than 60 in the ECA region will average approximately 33 percent: 26 percent in CCA countries, 36 percent in European CIS countries, and 40 percent in the SEE countries.

3. Macroeconomic and geopolitical trends

There are also a number of macroeconomic and geopolitical trends that are expected to have implications for the agricultural and food sectors of the ECA region in the short to medium run. While short-run economic growth is expected to be strong for the world's advanced economies, economic growth in emerging and developing countries, including China, is projected to slow down together with investment and total factor productivity growth. An increase in interest rates by the

U.S. Federal Reserve could exert further downward pressure on foreign investment and result in the outflow of foreign capital from ECA countries (World Bank, 2016).
In ECA countries in 2010-14 average GDP growth was 4 percent and exceeded average world GDP growth by 1.3 percent. This has been primarily driven by economic growth in the CCA sub-region, which has experienced high annual GDP growth ranging from 3.2 percent in Azerbaijan to 11 percent in Turkmenistan in this time period. Other countries in the region have experienced lower and less consistent growth in recent years (Table 1). By 2020, however, the IMF (2015) projects that the majority of CCA and European CIS countries (barring Kyrgyzstan and Ukraine) will have experienced a slowdown in economic growth as compared to 2014. Notably, most of this drop will be driven by a significant decline in growth prospects for 2015 and 2016. Starting in 2017, growth in per capita GDP is expected to pick up across both sub-regions, yet it will not reach pre-2015 levels by 2020. SEE countries, on the other hand, are projected to experience a significant increase in economic growth between 2014 and 2020 (Table 1).

Economic slowdowns can potentially lead to increase in unemployment rates. Currently, in the ECA region, unemployment rates vary across sub-regions and individual countries (Table 1). At the sub-region level, the highest unemployment rate is in the SEE sub-region (20 percent) with the highest rate observed in Bosnia and Herzegovina (27.9 percent) and the lowest in Turkey (9.2 percent). In the CCA sub-region the average unemployment rate is 10 percent, with Armenia and Georgia registering the highest rates at 17.1 percent and 13.4 percent, respectively. What is particularly troubling for all sub-regions is youth unemployment,[4] which ranges from 12.5 percent in European CIS countries to 40.6 percent in SEE countries. While not unique to the ECA region, high rates of youth unemployment and underemployment limit the possibilities of young people to develop skills and can force them into low-paying, insecure jobs, and keep them in poverty. Limited job opportunities incentivize emigration, as young people leave to find employment abroad (FAO, 2013c).

For the large commodity exporters in the region, weak commodity prices, including agricultural commodities, metals, and particularly oil, have already resulted in a decrease of foreign currency reserves, currency depreciation processes, and increases in budget deficits. These are expected to persist in the medium run. Furthermore, the economic slowdown in Russia caused by the combination of international sanctions and lower prices for oil and gas is generating negative spillovers to the rest of the region through both investments and remittances (World Bank, 2016). These effects will be discussed in more detail in the next section of the report.

Several factors will continue to shape economic integration processes in the region. For the SEE countries, these will be largely determined by the EU pre-accession processes that these countries are currently undertaking. Consequently, they will also continue to shape the development of their agricultural sectors to a larger extent through continuous institutional and regulatory reforms, the availability of pre-accession funds and assistance for agriculture and rural development, migration, and agricultural trade opportunities. At the same time, however, observations of the enlargement process show that there has been a slowdown, as some of the original dynamics have disappeared due to the unclear accession perspective for some of the SEE countries. As economic and political

[4] Youth unemployment refers to the share of the labour force ages 15-24 without work but available for and seeking employment (World Bank, 2015)

challenges within EU have deepened in recent years, the future intensity of the enlargement processes remains unclear.

Central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) are largely landlocked and their remoteness results in high transit costs, which will continue to constrain their trade integration into world markets. However, there are prospects that China's increasing economic ties with CIS and EU countries and the development of transit routes through Central Asia will improve linkages with outside markets. The recent economic slowdown in China raises questions about the extent to which this will take place in the short run though. Also of consequence are the political tensions between Russia and Ukraine, Western sanctions against Russia, and the Russian ban on food imports from a number of (primarily EU) countries. These have an immediate and direct effect on trade relationships among ECA countries and with their respective international trade partners.

Furthermore, global trade integration processes, such as agreements within the World Trade Organization, Trans-Pacific Partnership, and Transatlantic Trade and Investment Partnership, are expected to shape the international trade arena in the short run, although their immediate effects on the ECA region are uncertain.

The possible intensification of geopolitical tensions is one of the major risks that the ECA region faces in the near future, according to the World Bank (2016). An escalation or failure to resolve the conflict in eastern Ukraine would both continue to hurt the Ukrainian and Russian economies and could potentially lead to tougher sanctions against Russia. Similarly, the possibility of intensified violence and instability in Syria could deepen the refugee crisis, which would have a direct impact on the EU and SEE countries both in the short- and long-run (IMF, 2016). Possible reintroduction of border controls within the EU would negatively impact the movement of people, goods, and services, as well as overall economic activity in the Schengen zone (France Strategie, 2016). In turn, more barriers to labour movement within the EU will likely have negative repercussions for unemployment in countries bordering the EU, as well as in EU accession countries.

4. Climate change trends

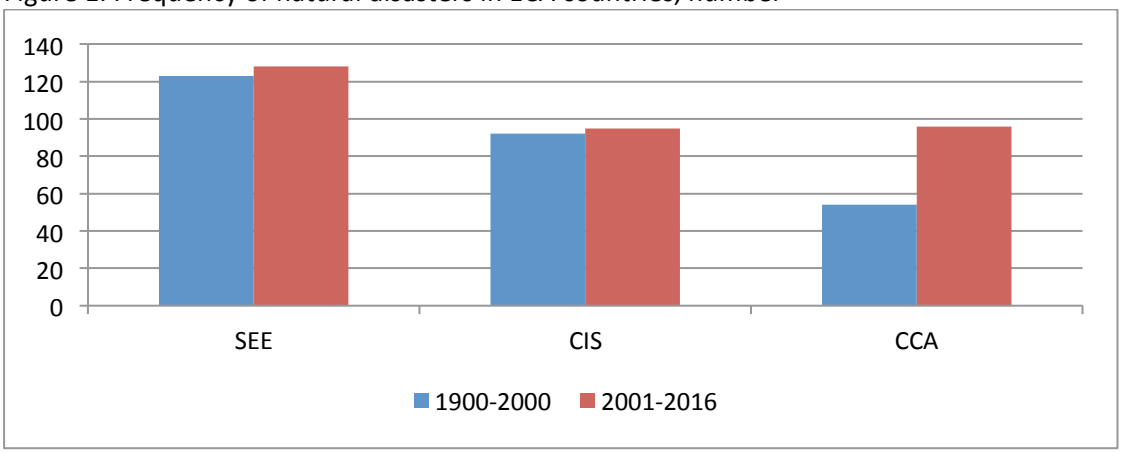
Climate change processes constitute another risk factor for the ECA countries with their direct implications for agricultural and rural economies. Climate change is expected to magnify regional differences within ECA countries in terms of agriculture and forestry over Central and Southern Europe as well as Central Asia. Many climate-related hazards are projected to increase in frequency and intensity, but with significant variations within the region (IPCC, 2014). Moreover, according to the 5th IPCC AR, agriculture and forestry will face two complex challenges caused by climate change, both to reduce emissions and to adapt to a changing and more variable climate (Lavalle *et al*., 2009; Smith and Olesen, 2010).

Average temperatures across ECA countries have already increased by 0.5 °C in the South and 1.6 °C in the North of the region since the early 1990s. Further increases of up to 2.6 °C are expected by 2050 across ECA countries. Rising temperatures can potentially lead to heat extremes and changing precipitation patterns and may further exacerbate the above events. The increased number of extreme weather events and natural hazards, such as floods, droughts and landslides, are already intensifying in the region.

According to IPCC 5th AR, Central Asia is expected to become warmer in the coming decades and increasingly arid, especially in the western parts of Turkmenistan, Uzbekistan, and Kazakhstan (Lioubimtseva and Henebry, 2009; Hijioka, Y. *et al*., 2014). Some parts of the region could be winners (cereal production in parts of Kazakhstan, Russia and Ukraine could benefit from the longer growing season, warmer winters, and a slight increase in winter precipitation), while others could be losers (particularly western Turkmenistan and Uzbekistan, where frequent droughts could negatively affect cotton production, increase already extremely high water demands for irrigation, and exacerbate the already existing water crisis and human-induced desertification).

Central Asia's glaciers are already melting, which in turn is threatening to decrease long-term water availability in Uzbekistan and Turkmenistan, and cause changes to land cover, cropping systems and livestock grazing distribution (Sedik and Lerman, forthcoming, 2016; World Bank, 2009; UNISDR and World Bank, 2009). Russia, Turkey, Uzbekistan, Tajikistan, Kyrgyzstan, and Albania have the highest risk of exposure to natural hazards, including earthquakes, floods, and droughts (INFORM[5], 2015). This is largely consistent with earlier findings in the World Bank report, "Adapting to Climate Change in Europe and Central Asia" (2009). In the last 15 years, all sub-regions in the ECA region have recorded more natural disasters than in the previous hundred years. Increases in the number and severity of natural disasters[6] were particularly high in the CCA countries, as compared to other sub-regions. In particular, in Georgia, Kazakhstan, Kyrgyzstan and Tajikistan the number of natural disasters more than doubled in the stated period, primarily driven by the increase in the number of floods (Figure 1).

Figure 1. Frequency of natural disasters in ECA countries, number



Source: EM-DAT, 2015

The effects of climate change on agricultural and rural economies, however, depends not only on the degree to which they are exposed to climate change, but also on their resilience levels. The INFORM index offers an assessment of ECA countries' vulnerability to natural disasters that consists of an

[5] INFORM is a composite indicator developed by the EU Joint Research Center that measures three dimensions of the risk of a humanitarian crisis (both natural and human-made events), including 1) hazards and exposure to them, 2) vulnerability or susceptibility of communities to those hazards, and 3) lack of coping capacity (lack of resources that can alleviate the impact).

[6] Disaster types included droughts, wildfires, extreme temperatures, floods, landslides, and storms.

assessment of vulnerable groups and an assessment of socio-economic vulnerability[7] that can serve as proxy measures for 'resilience deficit'. While all countries in the ECA region have been performing well with respect to the "socio-economic vulnerability" indicator, Azerbaijan, Ukraine, Bosnia and Herzegovina, Serbia, and Turkey have fallen into the high-risk category with respect to the "vulnerable groups" category (see Table 3 for details on other countries in the region). Furthermore, all of these countries, with the exception of Azerbaijan and Serbia, have seen a decline in their score for this category over the past five years (Table 3).

The INFORM index also measures the institutional component of country's capacities to make decisions about prevention preparedness and response to natural disasters. It quantifies the government's priorities and institutions for the implementation of disaster risk reduction activities. The "infrastructure" component measures communication networks, physical infrastructure, and accessible health systems, primarily focusing on the early warning phase, as well as on response and recovery. As can be seen from Table 3, half of the ECA countries are in the high-risk zone with respect to the institutional component of the coping capacity category.

Table 3. Assessment of ECA's vulnerability to natural hazards and humanitarian crisis, index, 2015[8]

	Natural	Human	Social-Economics Vulnerability	Vulnerable Groups	Institutional	Infrastructure
Caucasus and Central Asia						
Armenia	3.8	0.1	2.4	3.6	**6.6**	2.7
Azerbaijan	3.8	0.5	1.8	**6.5**	**6.5**	2.9
Georgia	3.9	3.7	3.0	5.7	4.6	2.2
Kazakhstan	3.5	0.6	1.5	0.5	5.2	2.6
Kyrgyzstan	**5.4**	1.1	3.4	1.0	5.3	3.8
Tajikistan	**5.6**	1.8	3.0	2.9	**6.1**	4.5
Turkmenistan	4.5	1.3	2.7	2.1	**8.0**	4.2
Uzbekistan	**5.9**	2.8	2.0	1.6	5.1	3.7
European CIS						
Belarus	1.8	1.3	1.0	1.3	4.9	1.5
Moldova	3.8	3.2	2.9	1.5	**6.2**	2.9
Russian Federation	**6.1**	**7.0**	2.3	4.1	**6.5**	2.4
Ukraine	2.8	**9.0**	1.6	**6.4**	**6.9**	2.7
South-Eastern Europe						
Albania	**5.1**	0.3	2.3	1.0	**6.2**	3.1
Bosnia and Herzegovina	3.8	1.8	2.6	**6.5**	**6.0**	2.8
Macedonia FYR	2.8	1.3	2.5	2.9	4.6	2.7
Montenegro	3.9	0.1	2.2	2.8	4.7	2.4

[7] Socio-economic vulnerability is a weighted arithmetic average of a human development index, multidimensional poverty index, inequality, and aid dependency. The 'vulnerable groups' category refers to the population that is at a higher risk of needing humanitarian assistance than others, or being excluded from financial and social services, usually more poor people.

[8] A country with a score higher than 4.7 is assigned to a high-risk category with regards to the exposure to natural hazards. For this and other categories, high-risk results are bolded in the table.

Serbia	4.6	1.7	2.0	**6.4**	5.3	2.7
Turkey	**5.9**	6.7	2.8	**6.5**	3.5	3.1

Source: INFORM, 2015

According to the 5th IPCC AR, agriculture and forestry face two complex challenges under climate change, both to reduce emissions and to adapt to a changing and more variable climate (Lavalle *et al*., 2009; Smith and Olesen, 2010). In arable production systems, adapting to climate change by increasing the resilience of crop yields to heat and to rainfall variability would also positively impact mitigation by reducing soil erosion, as well as soil organic carbon and nitrogen losses. Improving soil water retention by adding crop residues and manure to arable soils, or through diversifying crop rotations, could contribute both to adaptation and to mitigation (Smith and Olesen, 2010). There are synergies and trade-offs between mitigation and adaptation options for soil tillage, irrigation, and livestock breeding (Smith and Olesen, 2010).

While climate change is to a large extent an external driver for the development of agricultural and rural economies, it is the resilience[9] of the food and agricultural systems to climate change that will determine how the latter affects agricultural production and rural livelihoods. In other words, resilience is the ability of people, communities or systems that are confronted by disasters or crises to withstand damage and to recover rapidly. FAO seeks to develop the capacities to avoid (prevention) or limit (mitigation and preparedness) the adverse effects of disasters and to provide timely and reliable hazard forecasts (Disaster Risk Reduction – DRR). DRR is a corporate priorities of FAO and is expressed in FAO's Strategic Framework 2010-2019. FAO's specific commitment to DRR is stated in the four Organizational Outcomes under its Strategic Objective 5 (SO5), "Increase the resilience of livelihoods to threats and crises".

5. Sustainable Development Goals

In September 2015 the United Nations Sustainable Development Summit adopted the 2030 Agenda for Sustainable Development, comprised of 17 Sustainable Development Goals and 169 targets on a variety of issues, including ending poverty, malnutrition and inequality by 2030. These SDGS are expected to guide the development agendas of international organizations and national government over the next 15 years, including in the ECA region. In accordance with the SDGs' goals and targets, ECA countries now have a framework in which to assess their development priorities and determine national and regional targets, formulate national and regional strategies and policies, implement programs and projects, and monitor their progress.

SDGs that are particularly relevant for agricultural and rural development in Europe and Central Asian countries and have a strong overlap with the FAO's strategic framework include:

Goal 1 – End poverty in all its forms everywhere. Given that most of the poor live in rural areas, it is clear that SDG Goal 1, eradication of poverty, cannot be achieved without increasing rural

[9] FAO defines resilience as "the ability to prevent disasters and crises as well as to anticipate, absorb, accommodate or recover from them in a timely, efficient and sustainable manner. This includes protecting, restoring and improving livelihoods systems in the face of threats that impact agriculture, nutrition, food security and food safety."

employment and rural incomes. This would necessitate raising agricultural productivity and incomes, as well as a significant expansion of rural non-farm employment.

Goal 2 – End of hunger, achieve food security and improved nutrition and promote sustainable agriculture. Targets with special relevance to the ECA include:

- Target 2.1: Hunger and undernourishment
- Target 2.2: Malnutrition
- Target 2.3: Productivity and incomes of small-scale food producers
- Target 2.4: Sustainable food production systems and resilient agricultural practices

Goal 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. The relevant target is 8.5 on achieving full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

Goal 13 – Take urgent action to combat climate change and its impacts. As mentioned above, climate change is an important risk factor for ECA that needs to be paid close attention to. An increase in the number of extreme weather events and natural hazards, changes in water resource availability, natural resource degradation and loss of biodiversity are important factors for agriculture and rural development in the ECA.

Goal 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development. This goal might be relevant for countries including members of the European Union. Given its past record, the European Union should maintain its position as the world leader in the area of sustainable management of marine resources and share its experience.

Goal 15 – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Forests are important across the region providing important contribution to the economy as well as to the employment. Sustainable Forest Management has a key role in achieving this goal and the European Union's experience provides valuable experience to the entire region.

V. Regional drivers of agricultural and rural development in Europe and Central Asia

This section identifies and describes *internal* socio-economic forces that are driving changes in agricultural and rural economies in the ECA region. These drivers alter the economic characteristics of agricultural and rural economies, and affect both the agricultural policy agenda in ECA countries and FAO's work in the region. The relative influence of different drivers varies by sub-region and country and such differences are highlighted in this report.

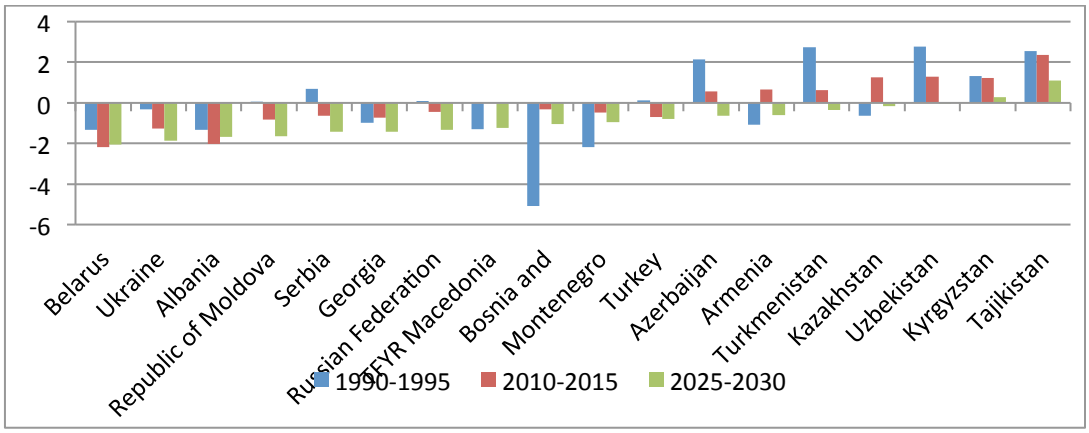
Driver 1: Rural livelihoods and rural poverty

Rural demographics

In most ECA economies the share of both agricultural employment[10] in total employment, and rural population in the total population remain substantially higher than the average for developed OECD economies. Currently, on average 45.4 percent of the ECA population lives in rural areas[11] - 53.5 percent in CCA countries, 42.5 percent in SEE countries, and 34 percent in the European CIS. Women constitute on average about 50 percent of the rural population throughout the region, though some differences can be observed across sub-regions. The greatest shares of women among rural populations are found in European CIS countries. For example, in Belarus and Ukraine women constitute more than 53 percent of the rural population.

According to the IMF (2015), by 2030 the share of people living in rural areas will drop by only 2 percentage points, to an average of 43 percent throughout the region. The pace of change, however, differs across countries (Figure 2). Between 1990 and 2015, unlike in the European CIS and SEE sub-regions, all the countries in the CCA sub-region experienced an increase in the rural population. This growth is expected to slow across the sub-region by 2025-30, except for Kyrgyzstan and Tajikistan, which will still experience positive rural population growth. However, even in these countries rural population growth will be below the rate of overall population growth.

Figure 2. Rural population change rate,[12] %



Source: UN DESA, 2014

Differences in population growth dynamics and age profiles across the ECA sub-regions pose different challenges and opportunities for agricultural and rural economies. In most CCA countries (barring Georgia and Armenia) the share of the rural population younger than 60 is well above 90 percent of the total rural population. From one side, a younger and growing population tends to increase the strain on natural resources. At the same time, a young labour force in rural areas creates an opportunity to revive such areas. Younger people tend to be more innovative and open to

[10] Employment is defined as persons of working age who were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period or not at work due to temporary absence from a job, or to working-time arrangement. The agriculture sector consists of activities in agriculture, hunting, forestry and fishing (World Bank, 2015)

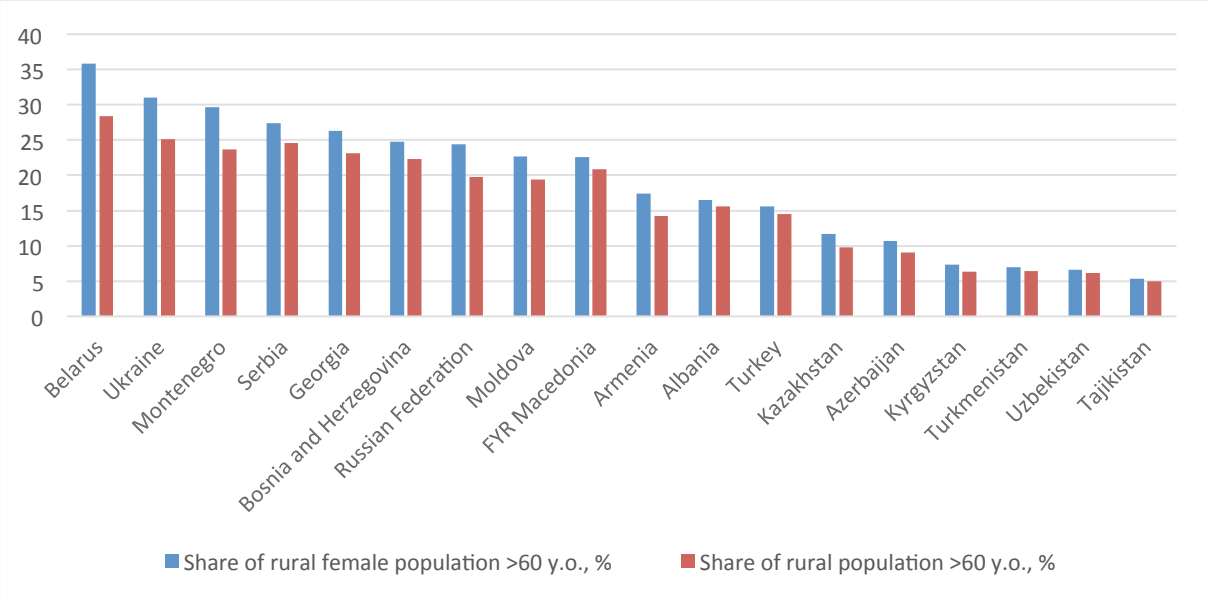
[11] Temporary migration is not captured in the statistics on rural population presented by the World Bank. Therefore, shares of rural population in total population are likely to be somewhat lower than presented here. This is particularly relevant for the CCA countries, where migration from rural areas has particularly accelerated since 2000s.

[12] Countries are ranked by change rates projected for 2025-30

adopting new technology in the farm sector, and can engage in more labor-intensive farming practices. Unfortunately, across CCA countries poorly functioning land markets, a lack of market, social and physical infrastructure and a lack of employment opportunities often disincentivize young people to stay in rural areas.

Countries in the SEE and European CIS sub-regions, on the other hand, are deal with a different set of problems. In these countries, there is a trend towards ageing populations in rural areas, and people older than 60 constitute more than 20 percent of the total rural population. In Belarus, this share is close to 30 percent. Across all ECA countries, the share of the rural female population older than 60 exceeds the average share of the rural population over 60. This difference is particularly significant in the SEE and European CIS countries (Figure 3). From one side, as older people withdraw from the labour force, there is a smaller labour pool from which the agricultural sector can draw. An ageing farm population is also less likely to adapt to technological changes and to invest in land preservation. On the other hand, in most ECA countries the share of agricultural jobs in total employment far exceeds what agriculture contributes to GDP, which is a sign of low agricultural productivity levels. In these circumstances, an ageing population and an overall decrease in the rural population may contribute to the consolidation of farm size and increased productivity.

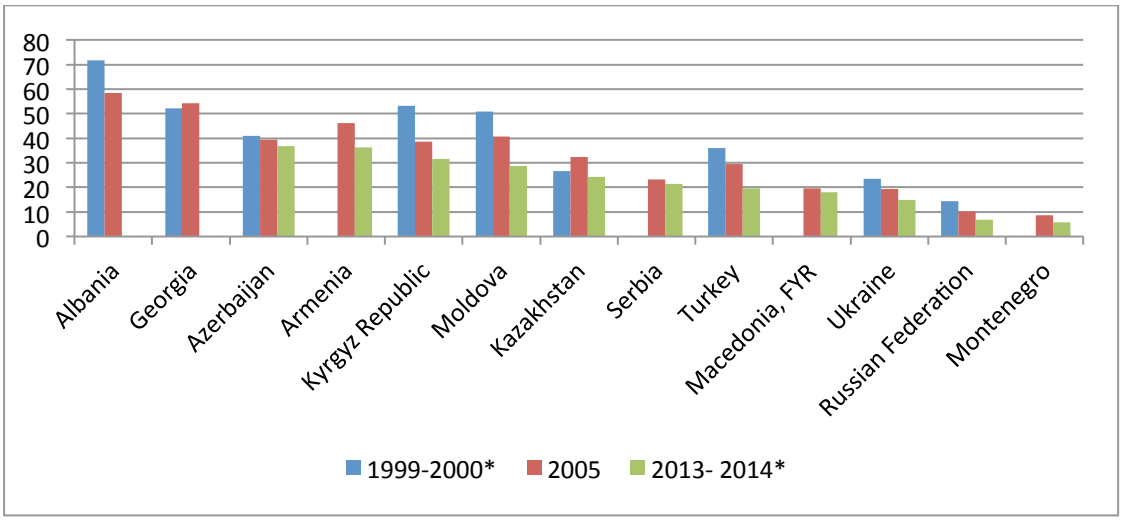
Figure 3. Ageing trends in rural female population in ECA countries, 2015



Source: United Nations Population Division, 2015.

Agricultural employment constitutes a large share in total employment across ECA countries, but has been decreasing over time (Figure 4). Based on the available data, Azerbaijan, Armenia and Kyrgyzstan have the highest share of agricultural employment in total employment. In terms of gender distribution, there are differences in the male to female ratio in agricultural employment across the ECA countries. In 2013-14, significantly more females were employed in agriculture than men in Armenia, Azerbaijan and Turkey. The opposite was observed in Moldova (Figure 4).

Figure 4. Role of agricultural employment in the ECA countries, percent of total



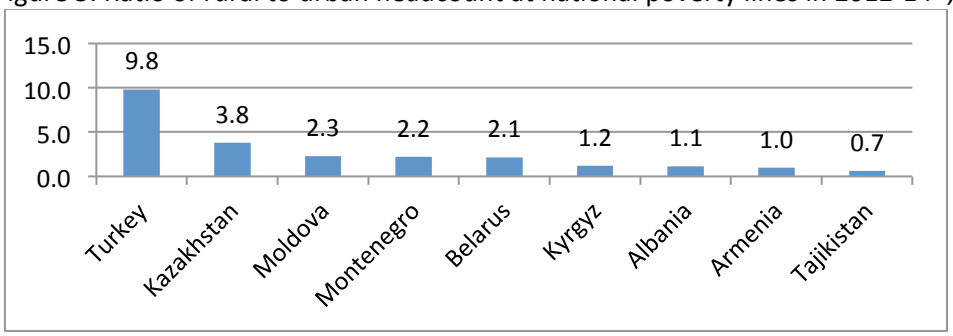
*latest available

Source: World Bank, 2015

The rural-urban divide

A further important driver of change in the region is the rural-urban difference in income, poverty and educational and professional opportunities. After the collapse of the Soviet Union, rural areas were better able to compensate the initial economic shock of transition thanks to their food production capacity. However, the subsequent recovery was highly concentrated in urban areas. This is vividly reflected today in the wide gap between urban and rural poverty. This trend is particularly prevalent in Central Asian countries. According to the Global Multidimensional Poverty Index (2014) developed by the Oxford Poverty & Human Development Initiative, in 2014, 62.8 percent of the poor in ECA countries lived in rural areas. Those living in rural areas experience both a higher prevalence and intensity of poverty relative to urban dwellers. According to poverty headcount rates using national poverty lines, for the countries for which data is available, only in Tajikistan does urban poverty exceed rural poverty (Figure 5) (World Bank, 2015).

Figure 5. Ratio of rural to urban headcount at national poverty lines in 2012-14*, %



*latest available

Source: World Bank, 2015

Inequality between rural and urban people is seen not only in terms of lower incomes in rural areas, but also in terms of available services and existing opportunities. Rural households (and particularly poor rural ones) tend to have much more limited opportunities for obtaining education relative to urban households. For example, the UNESCO report (2015) suggests that prospects for entry, progression and completion of primary school are closely linked to children's household circumstances. In the ECA, children from poor and rural households (or those that belong to ethnic minorities) face higher risks of dropping out of primary school. Similarly, secondary school attendance and completion are strongly influenced by poverty and location. For example, in Ukraine the urban poor are 1.7 times more likely to complete secondary education as the rural poor. According to FAO (2014), rural women tend to be disadvantaged in comparison with their urban counterparts and rural men when it comes to their participation in education and training courses in some ECA countries. For example, in Turkey the highest educational attainment for 65 percent of rural women does not exceed lower secondary education (compared to 36 percent for men). Similar gender gaps in rural areas exist in Tajikistan and Azerbaijan. Due to such unfavorable conditions, rural youth and women are the most vulnerable to exclusion from labour markets in rural areas (Bogdanov *et al*., 2015).

There has also been a decrease in a number of graduates from agricultural educational systems.[13] This has largely been caused by the decreasing prestige attached to careers in agriculture (Drozdz *et al*., 2015). Furthermore, agricultural educational and research establishments are often not adapted to modern agricultural practices, lack financing, and act in isolation from national agribusiness needs. This leads to a shortage of highly qualified specialists. This is a trend that ECA countries are already experiencing anyway (Koester *et al*., 2010).

Migration

Given the lack of opportunities in rural areas, rates of migration from rural areas (to urban areas and internationally) have been accelerating since 2000 for a majority of ECA countries (see Table 4 for international migration trends). Russia remains a key destination for migrants from the former USSR countries. According to the Migration Service of the Russian Federation, as of December 2014, about 4.5 million migrants from Central Asia were present in the country, mainly from Kyrgyzstan, Tajikistan, and Uzbekistan. This accounts for approximately 40 percent of all migrants residing in the Russian Federation (Malyuchenko, 2015). Between 2001 and 2011, more than 900 000 emigrants from Kyrgyzstan, Tajikistan, and Uzbekistan became citizens of the Russian Federation. Similarly, the vast majority of foreigners registered in Kazakhstan also come from the Central Asian republics (UNDP, 2015).

There are limited statistics available on age, gender, and origin of migrants coming from ECA countries. Household surveys conducted in Kyrgyzstan, Tajikistan, and Uzbekistan, however, do offer some insights. Migration flows from Tajikistan and Uzbekistan to Russia and Kazakhstan are dominated by males, who constitute 84 percent and 82 percent of total registered migrants respectively. Most of these migrants come from rural areas (UNDP, 2015). By contrast, male migrants from Kyrgyzstan constitute only 61 percent of the total and tend to come from Bishkek City and the Chui industrial region. Regarding the age distribution of Central Asian migrants, young people are predominant among migrants who leave their countries in search of the construction work. The share of middle-aged men is higher among agricultural workers (European University Institute, 2014).

Table 4. Migrant stock[14] dynamics in the ECA region, thousands

	Total migrant stock (% of total population)	Major destination (% of total migrant stock)	Total migrant stock (% of total population)	Major destination (% of total migrant stock)	Total migrant stock (% of total population)	Major destination (% of total migrant stock)
	2000		2010		2013	
Albania	790 (26)	Greece (52)	1 254 (43)	Greece (44)	1 250 (43)	Greece (46)
Armenia	691 (23)	Russia (69)	778 (26)	Russia (66)	777 (26)	Russia (66)
Azerbaijan	1 516(19)	Russia (55)	1 280 (14)	Russia (59)	1 280 (14)	Russia (58)
Belarus	1 805 (15)	Russia (52)	1 599 (15)	Russia (47)	1 571 (16)	Russia (47)
B&H	1 473 (48)	Croatia (28)	1 454 (42)	Croatia (32)	1 525 (41)	Croatia (33)
FYR Macedonia	439 (31)	France (18)	491 (39)	Germany (17)	515 (41)	Germany (17)
Georgia	914 (10)	Russia (68)	734 (11)	Russia (60)	739 (12)	Russia (59)
Kyrgyzstan	583 (19)	Russia (79)	724 (14)	Russia (80)	718 (13)	Russia (80)
Moldova	630 (16)	Russia (44)	805 (20)	Russia (36)	852 (20)	Russia (33)
Montenegro	262 (43)	Serbia (26)	266 (43)	Serbia (29)	283 (46)	Serbia (28)

[13] Reference is made to the following countries – Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Ukraine and Russia.

[14] Total migrant stock at mid-year

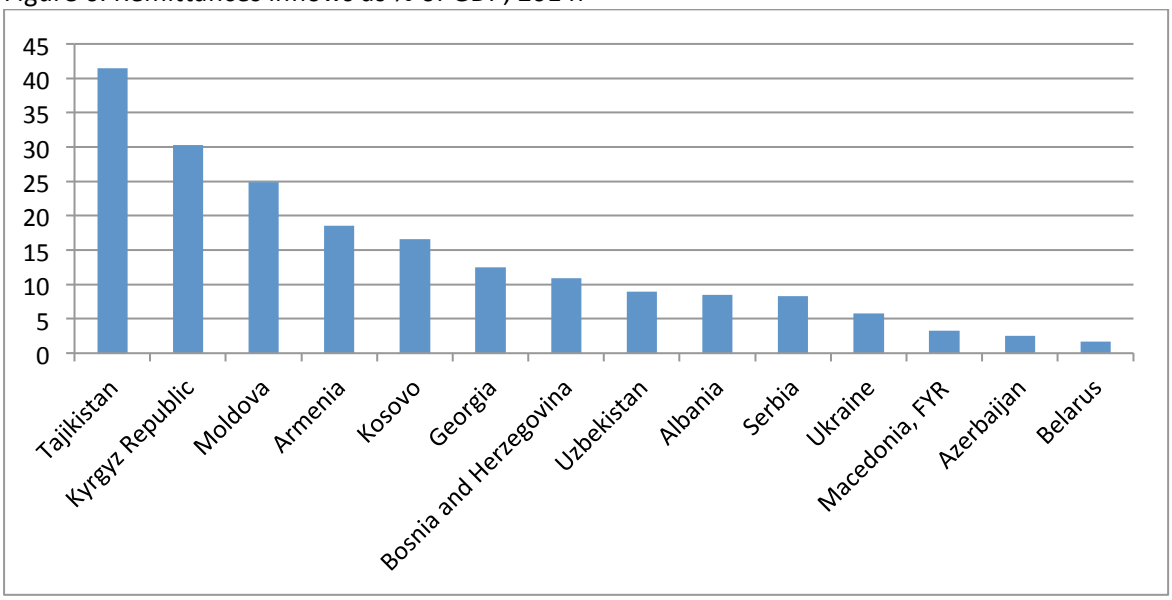
Serbia	1 587(21)	Germany (38)	1 230 (17)	Germany (15)	1 318(18)	Germany (14)
Tajikistan	511 (8)	Russia (75)	607 (8)	Russia (75)	603 (7)	Russia (75)
Turkmenistan	232 (5)	Russia (75)	247 (5)	Russia (74)	245 (5)	Russia (73)
Turkey	2 855 (5)	Germany (58)	3 010 (4)	Germany (51)	3 109 (4)	Germany (50)
Ukraine	5 715 (12)	Russia (62)	5 505 (12)	Russia (54)	5 560 (12)	Russia (53)
Uzbekistan	1 514 (6)	Russia (60)	1 888 (7)	Russia (60)	1 895 (6)	Russia (59)

Source: UN DESA, 2015

Following the economic slowdowns in Kazakhstan and the Russian Federation, and rigorously-enforced migration regulations in the latter, the number of migrants leaving CCA countries has decreased, while the number returning increased in 2014-15 (UNDP, 2015). Furthermore, in the CCA countries where remittances constituted more than 10 percent of GDP in 2013,[15] inflows decreased in 2014-15 (World Bank, 2015). As the macroeconomic situation improves in Russia and Kazakhstan, however, remittance inflows in CCA countries are expected to pick up again. Overall, whether longer-term international migration and remittance patterns from the CA countries will return to the pre-crisis levels depend on the labour market regulatory framework, demographic and labour market trends and the macroeconomic situations in both Russia and the Central Asian countries (UNDP, 2015).

Overall, migration is a complex issue with various economic and social implications for agricultural development and rural livelihoods. On the positive side, migration results in large inflows of remittances (see Figure 6) that can play an important role in reducing poverty in rural areas, under the condition that migrants return to their households. Household surveys conducted in Kyrgyzstan indicate that remittances reduce the national poverty rate by up to 7 percent (UNDP, 2015).

Figure 6. Remittances inflows as % of GDP, 2014f



Source: World Bank, 2015.

On the other hand, migration will keep posing human development costs and risks in these countries, such as the weakening of family and social cohesion and a decrease in human capital quality and quantity. Those leaving rural areas to seek employment and income in cities or overseas are usually younger, better educated and more skilled members of the family. Such trends coupled

[15] These countries include Tajikistan, Kyrgyzstan, Armenia, Georgia, and Uzbekistan

with the aging of the rural population and underdevelopment of rural advisory services, pose a serious threat for both traditional and modern knowledge capital of agricultural and rural practices. This knowledge deficit is particularly salient in transition economies, where the closure of inefficient socialist manufacturers and land reforms have brought back to farming a generation detached from rural activities and with no knowledge of agriculture. As ECA agriculture is already characterized by low productivity levels, outmigration from rural areas drives further deterioration of labour and land productivity and quality of rural livelihoods.

Furthermore, in those countries where men constitute a large share of migrants, the consequences of such migration are particularly negative for women and children, as it leads to an increased 'feminization' of the agricultural labour force and the informal employment of children.

Implications for FAO

In order to eliminate rural poverty, improve rural livelihoods and help lower the volume of distress migration from rural areas, economic growth and livelihood opportunities for different social, gender and age groups need to be created. FAO can assist by:

- Providing support to governments in the region in the form of policy advice and technical assistance for their effort to strengthen agricultural and rural development policies, programs and investment projects;
- Improving rural institutions, local producer and community organizations and supporting increased participation of farmers and rural communities in national development;
- Formulating and implementing legal framework and programs that ensure equitable access to productive resources by smallholders;
- Strengthening various forms of rural enterprise, including sustainable farm production and off-farm services;
- Improving smallholder access to markets, rural finance and value chains.

Driver 2: Farm structure

Family farms in the ECA region account for the bulk of agricultural production, and thus play a critical role in both agricultural and rural economies. Across the CCA countries, the share of gross agricultural output produced by family farms ranges from 71 percent in Kazakhstan to 98 percent in Uzbekistan (Table 5). Furthermore, in ECA countries family farms tend to have higher land productivity than large corporate farms (Lerman and Sedik, 2009; Lerman *et al*., 2007; Lerman and Sutton, 2007), which is consistent with the performance of small and medium-sized farms in most countries around the world (FAO, 2014h).

Table 5. Dynamics of the land use and gross agricultural output (GAO) by family farms in selected ECA countries

	Share of arable land, %		Share of GAO, %	
	2005	2010	2005	2010
Azerbaijan	77	84	96	95
Kazakhstan	40	39	76	71
Kyrgyzstan	71	76	95	97
Tajikistan	77	86	85	91
Turkmenistan	*n/a*	93	*n/a*	*n/a*
Uzbekistan	73	98	*n/a*	98
Russia	26	31	64	56
Ukraine	45	49	72	60

Source: working materials of Zvi Lerman

Overall, in almost all ECA countries there are three main farm types – large corporate farms, mid-sized peasant farms and small household plots (Lerman and Sedik, 2009). The share of each farm type, however, differs across countries in the region. Russia, Belarus and Kazakhstan are characterized by predominantly corporate farming. Individual farms dominate in SEE and CCA countries, barring Kazakhstan, and agricultural production is split more or less equally between corporate and individual farms in Moldova and Ukraine.

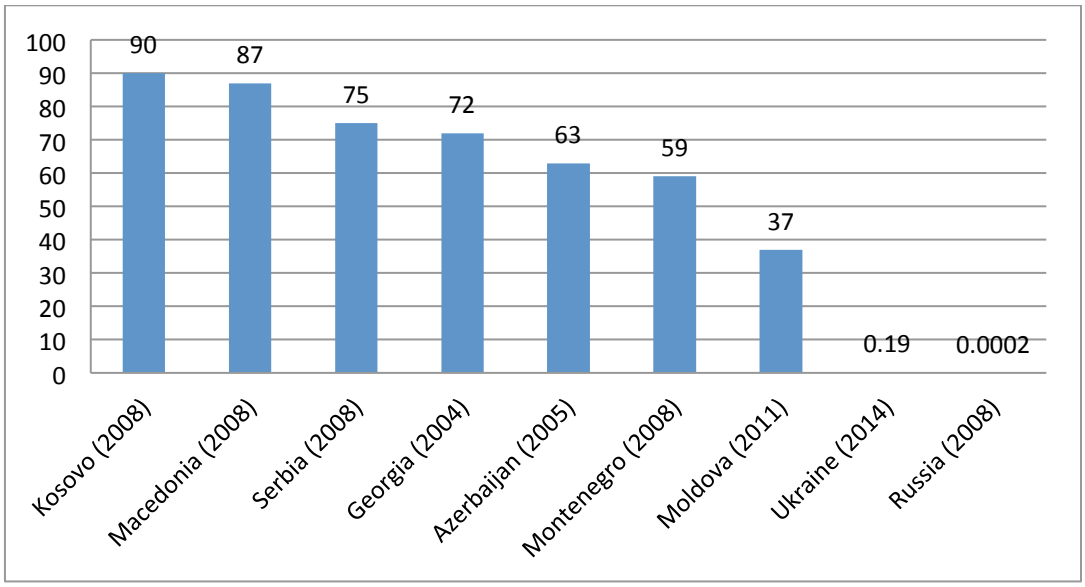
With regard to the farm size, in SEE and Caucasus countries farm structure is dominated by small subsistence farms with an average size of less than 5 hectares. The prevalence of such small holdings is most apparent in Kosovo[16] and FYR Macedonia. In Armenia, according to an estimate done by Urutyan *et al*. (2015), agricultural production is dominated by small family farms with an average size of about 3 hectares. Due to their size smallholders often lack lucrative opportunities. They often lack physical and economic access to markets, are constrained in their access to land, inputs and credit, and are largely unorganized. As a result, limited resources and opportunities make them more vulnerable to climatic and economic shocks.

Figure 7 shows a comparison of the significance of farms smaller than 10 hectares[17] in agricultural land cultivation in selected ECA countries for which data is available. For example, in the Caucasus and SEE countries, such farms cultivate more than 60 percent of all agricultural land (including 90 percent for Kosovo and 87 percent for FYR Macedonia). Among European CIS countries for which comparable data is available, Moldovan farms smaller than 10 hectares cultivate close to 37 percent of all agricultural land in the country (Figure 4). Meanwhile, farms larger than 500 hectares cultivate about 40 percent of agricultural land (Moroz *et al*., 2015). In Russia and Ukraine small farms of less than 10 hectares in size cultivate less than 1 percent of agricultural land. Farms larger than 10 000 hectares cultivate more than 21 percent of agricultural land in Ukraine and more than 62 percent in Russia (Ukrstat, 2014; Rosstat, 2008).

Figure 7. Share of agricultural land cultivated by farms smaller than 10 hectares, % of total agricultural land

[16] under UNSCR 1244

[17] Farm size of 10 hectares was chosen for data standardization purposes



Some of the changes to farm structure in ECA countries are still ongoing. In Kyrgyzstan and Tajikistan the number of family farms has been increasing, while the average farm size has been decreasing (Lerman, 2014). In Uzbekistan the pattern has been the opposite. In 2007-08 the government introduced a 'land optimization' program that led to a decrease in the number of farms and an increase in the average farm size. The overall share of arable land that family farms occupy in CCA countries has been increasing (Table 5). Furthermore, an ongoing trend of further land fragmentation has been observed in the SEE region (ARCOTRASS, 2006).

Kazakhstan, Russia and Ukraine have seen an opposite trend – a rapid accumulation (mainly through land leases) of farmland in the hands of mega-sized agroholding companies (often larger than 100 000 ha). These companies have been a conduit for substantial capital investments from outside the sector (both domestic and foreign), and are often vertically integrated into agroprocessing companies. However, agroholdings also pose risks for the rural areas in which they operate. First, they displace significant numbers of agricultural workers, which reduces employment and incomes in rural areas. Also, the major offices of such holdings are located in larger cities and not in the areas where the production takes place. Therefore, agroholdings pay taxes to the cities, leaving rural areas without tax revenues. This results in lower levels of financing of infrastructure and public goods provision in the rural areas of the countries where they operate (Goychuk and Meyers, 2013).

While family farms provide the backbone of agricultural systems in ECA countries, they also face many challenges. Family farms usually suffer from land fragmentation as they farm many small and often badly shaped parcels. They also often lack access to reliable and stable markets, inputs, financing and extension services, and tend to have low labour productivity. All this makes them largely uncompetitive in modern supply chains, and limits their ability to contribute towards increasing production and generating sustainable incomes.

Implications for FAO

In order to improve small producers' livelihoods, FAO's work in the region should focus on encouraging member governments to establish an enabling environment for the operations of the smallholder farmers. This should consist of FAO's assistance in establishing and implementing transparent policy and legal frameworks for land ownership and use, and supporting the

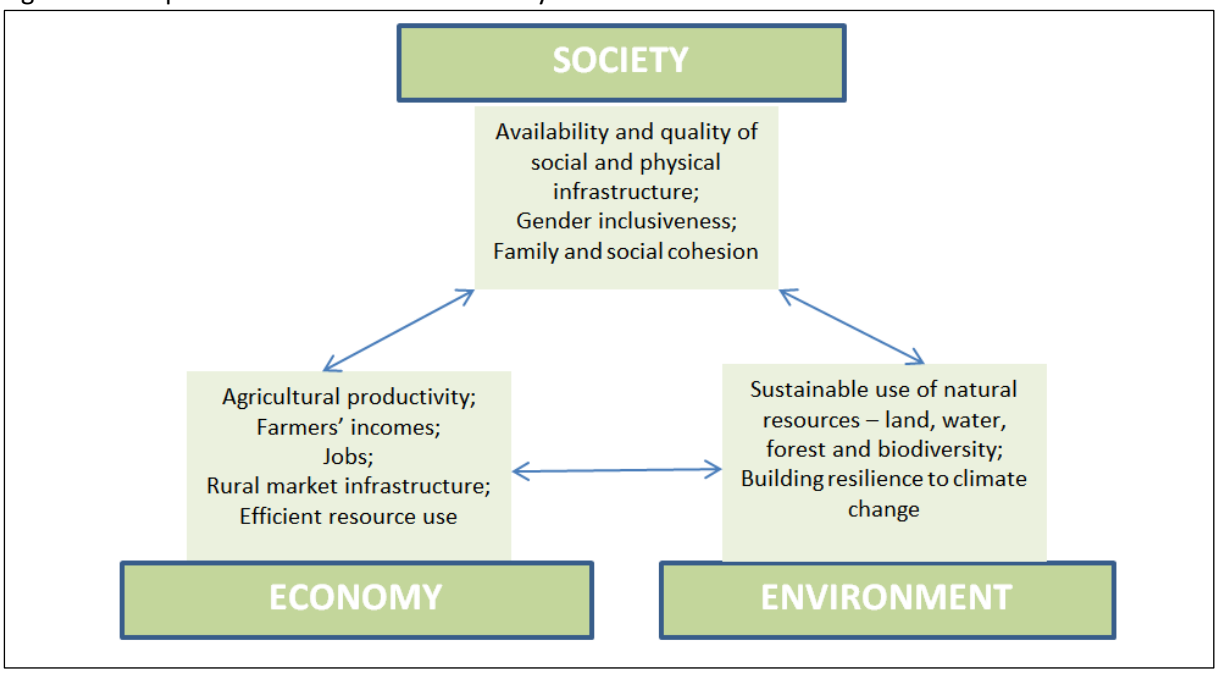
implementation of national land consolidation programs in order to maximize smallholders' access to land. Promotion of the VGGT[18] Guidelines should remain a key priority area of work. FAO should also advise the Members States on strengthening the organizations of small producers and family farms to increase their bargaining power, and improving smallholders' access to markets, rural finance and value chains.

Driver 3: Sustainability of food production and food systems

A food system encompasses all elements and activities as they relate to production, processing, distribution and consumption of food. A sustainable food system is "a food system that delivers food security and nutrition for all in such a way that economic, social and environmental bases to generate food security and nutrition for future generations are not compromised" (High Level Panel of Experts on Food Security and Nutrition, 2014). Its three dimensions include environmental integrity, economic resilience and social well-being (Figure 8) (FAO, 2014g).

[18] Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security

Figure 8. Components of a sustainable food system



Environmentally sustainable food systems start with environmentally sustainable agriculture, which has the goal of optimizing food production while ensuring preservation of biodiversity, renewability of natural resources and guaranteeing the integrity of ecosystems (FAO, 2014f). As for the majority of the rural poor in the ECA, natural resources often constitute their most important assets. Moreover, efficient use, conservation and enhancement of natural resources also becomes an important precondition for the existence of sustainable rural livelihoods.

The economic aspect of sustainability implies that food and agricultural systems allow for generating long-term and sustainable incomes and jobs for different market players over the long term. Economic sustainability of its agricultural systems is largely dependent on the existence of both farm and non-farm employment prospects in rural areas. It also presupposes producers' access to means of production, including equipment, capital and knowledge. Economic sustainability also implies economic resilience, suggesting that rural households have an opportunity to accumulate buffer assets to cope with shocks to the systems.

Finally, the social aspect of sustainability of food and agricultural systems implies fair access to fundamental rights and the requisite conditions decent livelihood. The latter is comprised of "the capabilities, assets (including both material and social resources) and activities required to meet the basic needs to maintain a safe, decent standard of living within the community and have the ability to save for future needs and goals" (FAO, 2014g). The availability and condition of physical and social infrastructure are also important pre-conditions for social sustainability. And so are gender and ethnic inclusiveness, inter-generational opportunities, and family and social cohesion.

Economic sustainability

The economic sustainability of food systems in ECA countries depends on two key drivers – changes ongoing on the demand side of food agricultural systems, driven by changes in food, feed and bioenergy demand, and the ability of the agricultural system to successfully adapt to these changes. The latter largely depends on both state of the rural economy in the region, and health of natural resources.

Just as in the rest of the world, on the demand side, development of food systems in the ECA region is expected to primarily be driven by population dynamics, economic growth and the pace of urbanization. Population and income growth tend to result in increased food consumption per capita, while income growth and urbanization rates lead to more diversified diets towards higher value foods, such as milk, meat, and vegetables. Increase in the demand for animal foodstuffs, also increases demand for feed

With regards to food consumption, on average, the ECA region is already characterized by rather high levels of daily food energy supply, with an average of 3 147 kCal per capita per day (Dietary Energy Supply (DES) average for the CCA sub-region is 2 885 kCal per capita per day). According to FAO projections, daily food energy supply levels could further increase to 3 441 kCal per capita per day by 2030 (2 983 kCal per capita per day in CCA) (Bruinsma, 2012). The CCA sub-region will experience an increase in per capita food consumption due to both positive population growth rates and lower levels of current DES averages compared to the rest of the region.

The changing composition of food demand, rather than its growth, is expected to be a predominant driver for the development of food systems in the ECA region. As people in ECA countries become wealthier and more urbanized they tend to change their dietary patterns from the consumption of cereal foodstuffs to higher-value items - such as milk, meat, vegetables, fruits, oils, and sugar. Table 6 shows the changes in consumption of the main food products that have already been happening in selected ECA countries.

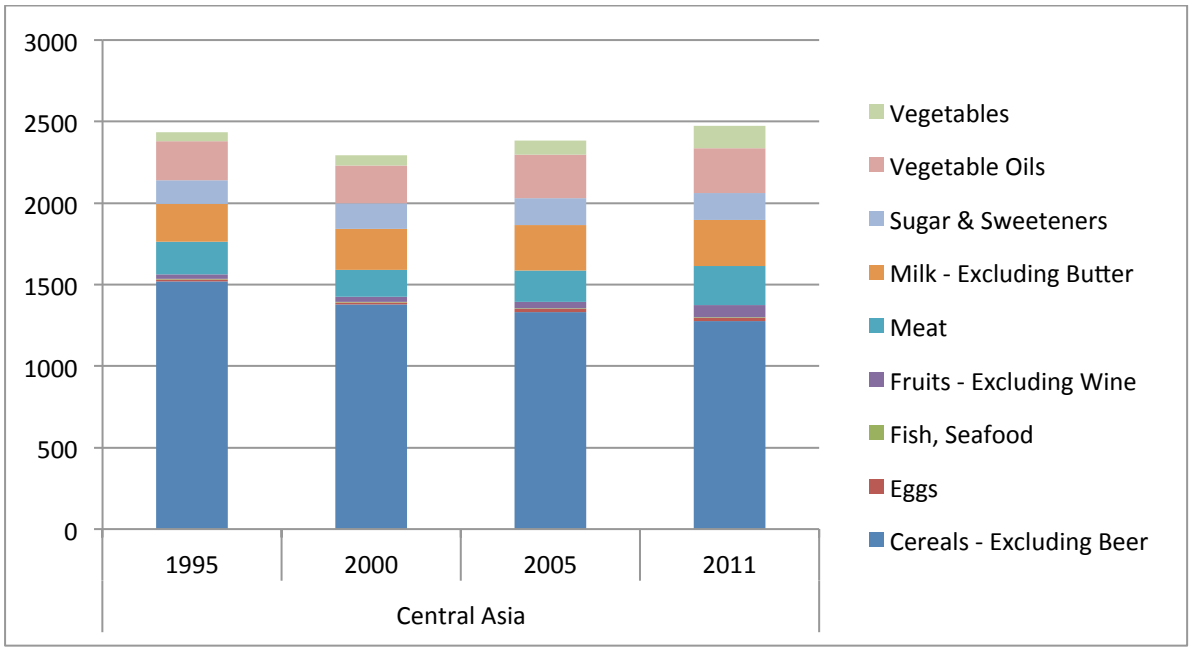
Table 6. Change in food consumption patterns in selected ECA countries, 2007-13

	Armenia	Azerbaijan	Belarus	Georgia	Moldova	Russia	Ukraine
Cereals	-11%	-1%	-7.6%	+1%	-6%	-2%	-6%
Fruits	+31%	+35%	+17%	n.a	+46%	+25%	+34%
Vegetables	+16%	-5%	+4%	-3%	+13%	+17%	+38%
Milk and milk products	+15%	+38%	+3%	-7%	-5%	+5%	-2%
Meat	+26%	+42%	+28%	-4%	+28%	+22%	+23%

Source: Drozdz *et al*., 2015

The progress towards more diversified diets, however, has been uneven across the countries and different income groups. Recent data shows that in many CCA and SEE countries, diets still remain rather monotonous, even though there has been an overall declining trend towards more diversity in diets (see Figure 9). The poorest income groups tend to have less diverse diets than the wealthier ones (Swinnen and Van Herck, 2011). In Uzbekistan, for example, the poorest income group obtains 73 percent of its daily caloric intake from cereals and only 10 percent from dairy and meat. The richest group, in contrast, enjoys a more balanced diet – 48 percent of daily caloric intake comes from cereals and 29 percent from animal products. The major consequence of monotonous diets is that they result in both macronutrient (proteins and fats) and micronutrient (vitamins and minerals) deficiencies.

Figure 9. Dynamics of the food consumption patterns in Central Asian countries, kcal/capita/day



Source: FAOSTAT, 2016

Monotonous diets primarily stem from high shares of household income being spent on food, which limits a household's ability to diversify its diet. According to USDA (2014), households in the CCA countries, Russia, Belarus, and Ukraine spend more than 30 percent of their incomes on food. As incomes grow, however, it is expected that households will increase the diversity of their diets. There are, however, other reasons for a lack of diet diversification. These include the focus of agricultural policies on only a few major crops, a lack of knowledge about nutrition and healthy diets, and traditional consumption patterns.

A shift toward consumption of more high-value products is already being observed in the evolution of the food sectors in selected ECA countries. As can be seen from Table 7, oils, fats, meat and meat products constitute the fastest growing food sectors across ECA countries for which data is available. New consumption patterns also imply a more important role for processed foods (FAO, 2013c).

Table 7. The fastest growing food sectors in selected ECA countries, 2009-13

Country	Fastest growing food sectors
Armenia	Sugar, oils and fats, tobacco, beverages
Azerbaijan	Meat and meat products, sugar, dairy products, oils and fats
Belarus	Oils and fats, animal feed, meat and meat products, dairy products
Kazakhstan	Oils and fats, animal feed, beverages, meat and meat products
Moldova	Animal feed, alcoholic beverages, meat and meat products, dairy products
Russia	Meat and meat products, animal feeds, oils and fats, canned fruits and vegetables
Ukraine	Oils and fats, meat and meat products

Source: Drozdz *et al.*, 2015

Bioenergy consumption is another demand component shaping the ECA's agricultural systems, albeit to a lesser extent than food and feed demand. It primarily consists of two components – domestic wood fuel consumption and exports of biofuel feedstocks to predominantly Western European economies. According to the World Bank (2010), domestic bioenergy consumption in ECA countries

is projected to slightly decline by 2030. Driven by external demand from the EU, the region is projected to become a net exporter of biodiesel and wood pellets. Overall, given the relatively modest amount of bioenergy production in the region and limited projected increases in its demand, the economic effects of bioenergy production in the region will remain limited, though these effects will differ across countries. For example, in Ukraine the production of biofuel feedstocks can create income diversification opportunities for farmers. However, we also need to be aware of the risks of an increase in bioenergy demand, as this may lead to the displacement of local food production.

Changes in demand as described in this section create opportunities for the development of agricultural and rural economies in ECA countries, as they allow farmers to produce higher-value foodstuffs, such as livestock, and engage in additional income-generating activities such as food processing and bioenergy production. However, whether ECA farmers are able to take advantage of these opportunities largely depends on how effectively they can integrate into modern value chains.

Currently, rural economies across the ECA region are characterized by limited non-farm employment opportunities and income diversification sources, and stagnant entrepreneurial activity, leading to outmigration from rural areas. Smallholders are often uncompetitive on local markets, and even less so on national and export markets. Key reasons for this include a lack of access to market infrastructure, low factor productivity, limited access to credit resources and a lack of technical knowledge and bargaining power. As such, for many smallholder farmers, high adjustment costs and barriers to integrating into value chains remain prohibitive, particularly in the context of the increasing dominance of large agro-industrial firms and retailers in ECA countries, which is accompanied by the imposition of more stringent food quality and safety standards on suppliers.

How well smallholder farmers are able to adjust to changes in demand in the agricultural and food systems also depends on policy. Currently, in ECA countries the level of government intervention ranges from heavily controlled and managed agricultural markets in Belarus, to almost complete market deregulation in Armenia, Azerbaijan, Georgia, and Moldova. In Uzbekistan, for example, the government exercises extensive control over all aspects of cotton and wheat production, which can significantly limit farmers' production decisions and options for additional income generating activities (Golub and Kestelman, 2015).

Overall, according to the summary on policies in selected ECA countries (Armenia, Azerbaijan, Georgia, Kazakhstan, Belarus, Moldova, Ukraine, and Russia), prepared by Volk *et al*. (2015), agricultural policies tend to have a strong production-oriented character with the goal of achieving food security. Regarding specific agricultural policy instruments, input subsidies are prevalent across the countries examined. Tax concessions (e.g. in Ukraine and Azerbaijan), concessional credit, and bank guarantees (e.g. in Belarus) also play an important role (Volk *et al*. 2015). Other policy priorities – such as increasing competitiveness, productivity, efficiency, farm investment, export orientation, and food value chains – also appear in most policy documents albeit with differing emphases and suggested instruments. Rural development in terms of improvements to rural infrastructure, rural poverty reduction, and the consolidation of rural employment, tends to take low priority in the agricultural strategies across these countries (Volk *et al*. 2015).

Lack of agricultural R&D and extension services have also been impeding agricultural productivity growth and consequently economic sustainability of agricultural systems within the region. Both are

currently in a very poor state. According to the ASTI global assessment of agricultural R&D spending, in 2008, ECA countries were responsible for only 3 percent of total global agricultural R&D spending. Furthermore, in the same year, ECA countries spent less money on agricultural R&D than Brazil alone (IFPRI, 2012). Adequate financial instruments, including "pull mechanisms" to engage the private sector in public-private partnerships have not been widely developed and tested in the transition economies (World Bank, 2012). In addition to a lack of investments in R&D and extension, the framework of knowledge generation, adoption and sharing in agriculture in ECA countries requires a transition towards a more efficient, demand-driven, non-linear and participatory Agricultural Innovation System (FAO, 2015e) that recognizes the critical role that Integrated Landscape Management can play in up-scaling best practices and approaches.

Environmental sustainability

Achieving sustainability in food (and agricultural) systems is not possible without the sustainable use of natural resources, including land, water, forest and biodiversity resources. However, in the conditions of changing consumption patterns, accelerating urbanization in ECA countries together with increasing population and food demand (in CCA countries), demand for natural resources is also increasing. At the same time, degradation, depletion and over-exploitation of natural resources in conjunction with climate variability decreases the available natural resource base in ECA countries, as is particularly visible in water and land resource use.

The issue of sustainable irrigation and water use management is particularly important for sustainability of food systems in the CCA sub-region. Most of the Central Asian countries are subject to arid climatic conditions, characterized by low rainfall and droughts. As such, in four out of five Central Asian economies (except Kazakhstan), agriculture is highly dependent on irrigation (Table 8). This is partially driven by the widespread cotton production, which requires a lot of water resources, even though the cropping patterns have been gradually changing to increased cereal production.

Furthermore, Turkmenistan, Uzbekistan and Azerbaijan largely depend on water resources originating abroad. Bruinsma (2012) projects that area under irrigation and fresh water withdrawal for irrigation purposes in ECA countries will not change significantly by 2030, including in the CCA countries. However, coupled with the increased frequency of droughts in recent years in the CCA countries and growing anthropogenic pressures (Thurman, 2011), water use management calls for urgent improvements.

Table 8. Availability and use of water resources in CCA countries*

	Total renewable water resources per capita (m3/inhabitant/year)	Water dependency ratio, %	Agricultural water withdrawal as % of total renewable water resources (%)
	2013-17	2000-2015**	2005-2015**
Armenia	2 604	12	14.9L
Azerbaijan	3 645	77	29.1L
Georgia	14 650	8	1.7L
Kazakhstan	6 527	41	12.9K
Kyrgyzstan	4 199	1	30.06L
Tajikistan	2 606	17	47.7L
Turkmenistan	4 667	97	106.4L
Uzbekistan	1 666	80	103.1L

*L – modelled data; K – aggregate data

**Latest available

Source: FAO, 2015g; World Bank (2015)

As the Aral Sea basin is shared among all Central Asian economies, management of the regional water resources for the countries located in the basin relies on a highly complex political process involving numerous players. This process is complicated by a number of factors, including strain on water resources due to climate change and a growing population in the region. Hydropower development is another reason for growing tensions regarding water allocation among the Central Asian economies. While hydropower potential in Kyrgyzstan and Tajikistan, which lie upstream, offer opportunities for improving electricity supply in these countries, it conflicts with downstream water supply and irrigation scheduling. In such conditions, efficient regional cooperation regarding sustainable irrigation and water use management will be key for developing sustainable food and agricultural food systems in the short run (FAO, 2012).

Land degradation processes remain relevant for most countries in the ECA region, though their severity and causes differ among countries. In Russia, Belarus, Ukraine, and Turkey, the major reasons for soil degradation include the rapid intensification of agriculture consisting of both overexploitation of the most fertile soils and abandonment of less productive lands. Industrial, mining, and petroleum extraction contaminants also represent a potential danger to land resources in these countries (FAO, 2015d). These processes are expected to continue.

Central Asian countries, on the other hand, have been particularly affected by desertification, land degradation and drought. The major pressures on soil are caused primarily by unsustainable water and land management practices, further exacerbated by droughts and population growth. As a result, soil salinization and soil erosion will remain major threats to soil health in the sub-region in the near future. Losses from salinization have been estimated to be at least USD 2 billion per year (FAO, 2015d). It is estimated that 40-80 percent of irrigated land in Central Asia is salt-affected and/or waterlogged (FAO, 2015b). Such progressive aridization is projected to lead to greater risk of drought, and decreased land productivity.

Just as in other countries of the region, SEE countries are facing serious land degradation threats. Water erosion is the most widespread problem of land degradation in countries of the SEE sub-region (except for Turkey) (Blinkov *et al*., 2013).

The environmental (and economic) sustainability of agricultural and food systems can be adversely affected by food losses[19] that occur in these systems, as they lead to wasted natural and economic resources. Overall, causes for food losses and waste in different ECA countries differ and often depend on the country's level of economic development (Themen, 2014; FAO, 2014c). For example, in the region's middle- and low-income countries,[20] outdated and substandard technologies along the supply chain – including poor storage facilities, cooling systems, and processing facilities – and a lack of education and skills cause high levels of food losses. As a result, in these countries food losses occur predominantly in the production, post-harvest, and processing stages of the supply chain (Themen, 2014; FAO, 2014c).

Roots and tubers are the most frequently lost agricultural commodities in the low-income countries. Their loss rate stands at over 80 percent and largely occurs during the production and post-harvest stages of the value chain. For the middle-income countries, fruits and vegetables are wasted most frequently (more than 45 percent). Major losses occur during the production and consumption stages of the value chain. Between 30 percent and 40 percent of cereals are also lost in low- and middle-income countries.

As such, one of the major challenges for the sustainable development of food systems for the CCA countries rests on both sustaining agricultural productivity in vulnerable production landscapes (those affected by salinization and erosion) with the development of incentives for the adoption of resource use efficient and biodiversity friendly food and feed value chains, and sustainably increasing agricultural productivity of existing crops, together with transitioning away from monoculture farming to crop diversification (e.g. drought tolerant crops, salt-tolerant crops and halophytes) for providing the necessary adaptability and resilience. It is essential to recognize the critical role that Integrated Landscape Management can play in up-scaling best practices and approaches for not only addressing food security issues but also providing ecosystem services. According to the FAO's "Save and Grow" model of sustainable crop production intensification, in Central Asia, adoption of zero tillage, soil cover and crop rotation would help reduce soil erosion and improving agricultural productivity (FAO, 2015).

As described at the beginning of this report, climate change poses serious threats to the sustainability of agricultural and food systems in the region, particularly in the countries that are facing the problems of environmental mismanagement and under-investment in infrastructure. Nevertheless, the policy response to climate change processes has been limited in most ECA countries. In many instances, comprehensive strategies for improving the resilience and adaptability of agricultural systems to climate change are missing in practice, as are the public funds. At this point, however, there is limited or no inter-ministerial cooperation or initiatives for tackling climate change and implementing policy responses. Instead, policy interventions are predominantly aimed at

[19] Food losses are losses occurring in the production, harvest, post-harvest and processing phases of production.
[20] The given studies classify ECA countries in the following way: Low-income countries include Armenia, Azerbaijan, Georgia, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, and Uzbekistan. Middle-income countries include Belarus, Kazakhstan, Ukraine, SEE countries, and Turkey.

reducing the consequences and negative effects of weather extremes. Agricultural policies, on the other hand, often focus on production rather than on building resilience (Volk *et al*., 2015).

Response to climate change in the agricultural sector is further complicated by a lack of awareness among the public and decision makers about the concept, threats and consequences of climate change, by missing linkages between the economic costs of climate change and investment decisions and by underdeveloped and/or under-implemented risk management mechanisms as well as disaster risk reduction measures, among other things. At the household level, resilience to climate change requires both sufficient buffering capacity in the form of assets and income, and diversity of income sources. In rural areas, where households are poor, and employment opportunities are scarce, lack of resilience to climate change is particularly visible.

Social sustainability

After the dissolution of the Soviet Union and Yugoslavia in the early 1990s, state support for agriculture and rural development declined or ceased entirely across ECA countries, which led to the breakdown of physical, economic and social infrastructure in rural areas. This is immediately visible in the decaying conditions of roads, bridges, irrigation systems, food storage and processing facilities, as well as the dismal state of schools, hospitals and childcare facilities. Even now, more than 20 years after the transition processes started, rural development continues to receive low priority in agricultural strategies and policies across the ECA countries, while the funds allocated for rural development are low and unstable (Volk *et al*. 2015; Bogdanov *et al*. 2015; Csaki and Tuck, 2000).

Women and children have been particularly affected by the collapse of social infrastructure, especially in the countries of Central Asia and the South Caucasus. While the loss of employment forced young men into labour migration, women lost not only their earned incomes and social welfare benefits, but also child and elder care, education, health and transportation services, which made employment outside the home possible. The loss of social protection forced a retreat to older systems of risk sharing based on family and clan membership. While traditional relational hierarchies offer safety and solidarity, they also entail a loss of autonomy, especially for women. Furthermore, as women take on traditionally male responsibilities, they have less access to land or financial resources than their male counterparts. A UNDP study (2014) concludes that women in ECA countries score relatively well in terms of human development indicators compared to other regions in the world. However, high levels of gender inequality are observed in Central Asian countries, particularly in terms of incomes and access to labour markets.

Implications for FAO

FAO support of economically, socially and environmentally-sustainable and gender-inclusive agricultural and rural development needs to come in the form of policy advice and capacity building assistance in designing social protection programs that can both reduce rural poverty and alleviate food insecurity among rural populations, while providing stimulus to the rural economy and empower rural women. FAO needs to assist governments in their effort to reduce inequalities in access to productive resource and social services among various age and gender group in rural areas, and to promote rural entrepreneurship with a particular focus on generating youth employment.

Environmental sustainability and addressing challenges posed by climate change processes also remain a key focus of the FAO work in the region. The goal of the Organization should be to provide

the Member States with policy and technical assistance in sustainable natural resource management, combating land degradation and desertification including mitigation and adaptation to climate change.

Driver 4: Food insecurity

Despite the impressive progress shown by ECA countries in meeting the MDG and WFS goals of cutting food insecurity in half in absolute and relative terms by 2015, malnutrition still persists in the region. Micronutrient deficiencies and over-nutrition in children and adults will remain major food security concerns in the near term future across ECA countries. Micronutrient deficiencies and over-nutrition both result in reduced human capacity and productivity losses. However, their causes differ. Micronutrient deficiencies primarily stem from low incomes and low education levels (FAO, 2015c), conditions that are often observed in the ECA rural areas. Growing rates of obesity are rather associated with higher incomes that allow for consumption of food products of higher caloric value coupled with reduced physical activity, and compounded by low levels of awareness about balanced diets. Consequently, policy responses need to focus on the underlying causes of each type of malnutrition.

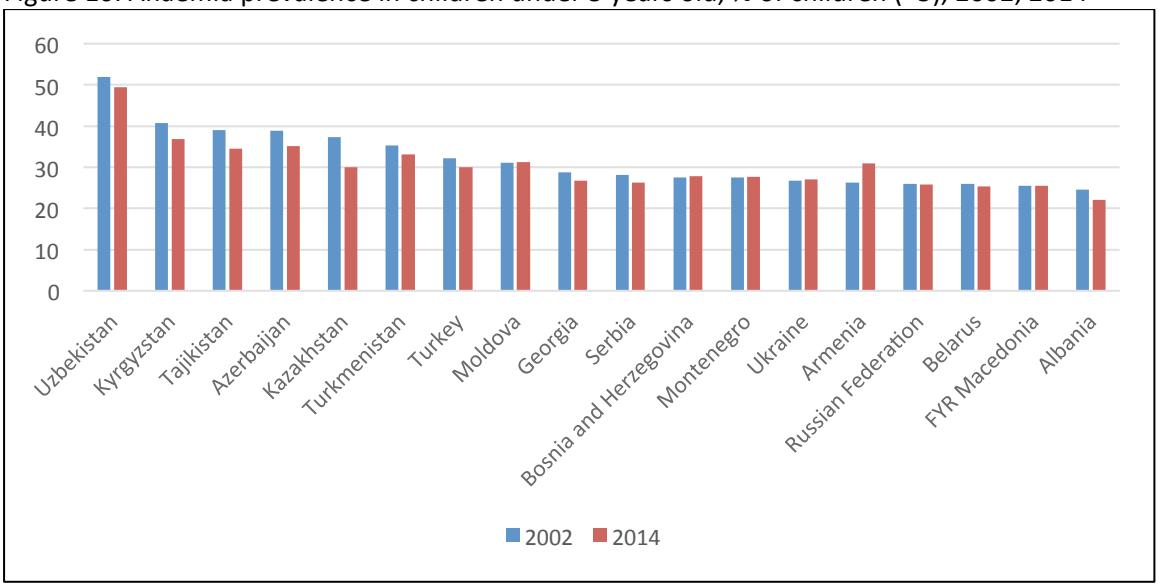
Micronutrient malnutrition

According to FAO (2014b), countries in the ECA region with persistent undernutrition and micro-nutrient deficiency problems, and relatively low over-nutrition issues include - Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Countries that experience the triple burden of malnutrition (i.e. simultaneous prevalence of undernutrition, micronutrient deficiencies and over-nutrition) are Albania, Armenia, Bosnia and Herzegovina, Kazakhstan, Macedonia, Moldova, Montenegro, Serbia and Ukraine.

With regards to micronutrient deficiencies, the highest risk is posed by deficiencies in vitamin A, vitamin D, folic acid, iodine, and calcium for all ages. For adults, micronutrient deficiencies are primarily caused by inadequate zinc, iron, selenium, copper, vitamin B12, and vitamin C (FAO, 2015c). For example, in Central Asia 39.1 percent of children suffer from iodine deficiencies and 38.3 percent of people (children and adults) are affected by severe vitamin A deficiency. The highest levels of iodine deficiency among children are found in Albania (91 percent), Belarus (81 percent), and Georgia (80 percent) (FAO, 2015c).

Anaemia in children under five is a prevalent public health problem across the region, despite falling in prevalence since 2002, with the notable exception of Armenia (see Figure 10). The highest level of anemia occurrence (>30 percent) has been observed in Uzbekistan, Kyrgyzstan, Tajikistan, Azerbaijan, and Armenia. Anaemia in pregnant women is also a serious public health problem across all sub-regions, with a prevalence ranging from 26.5 percent in Armenia to 38.4 percent in Uzbekistan (2014 est.). The prevalence of anaemia in pregnant women has been slowly decreasing across ECA countries, again with the exception of Armenia, where it has risen by 3 percent since 2002.

Figure 10. Anaemia prevalence in children under 5 years old, % of children (<5), 2002, 2014

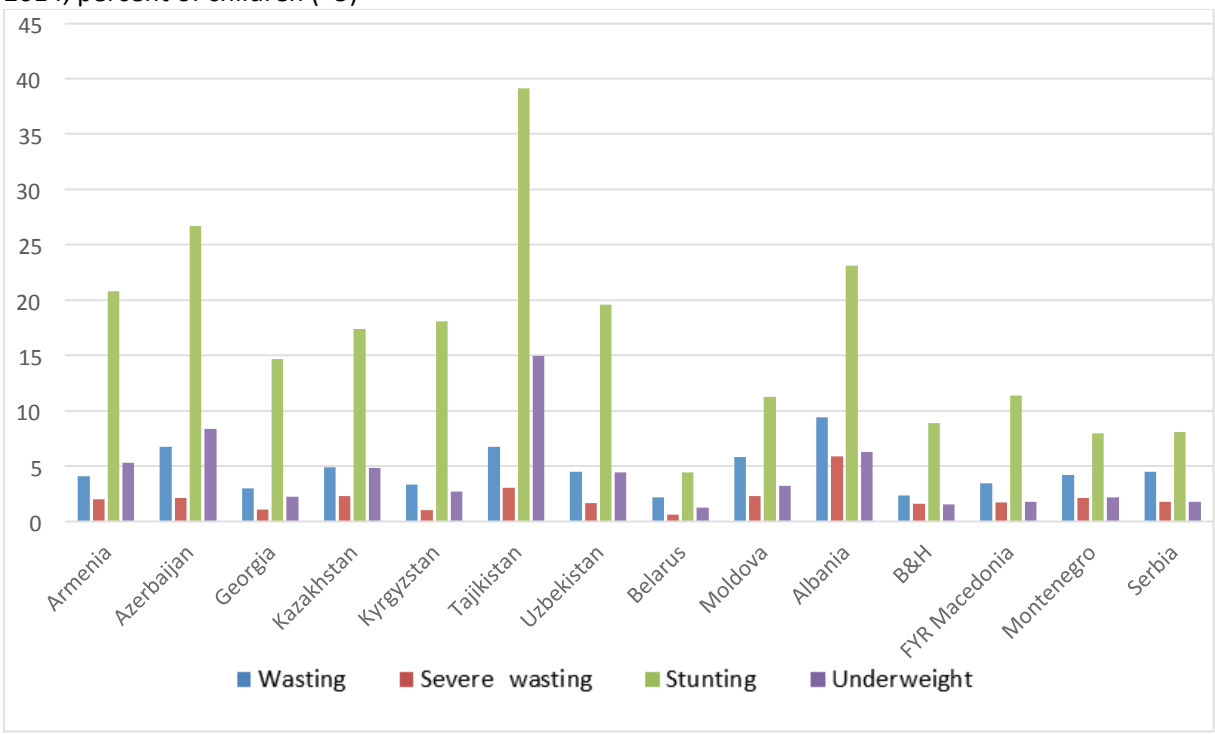


Source: FAO, 2014d.

Poor diets and micronutrient deficiencies have resulted in high levels of stunting in children,[21] even though there has been a slow downward trend across the region. Stunting is alarmingly high in Tajikistan, Azerbaijan, Albania and Armenia (see Figure 11). Overall, the average percentage of stunted children (under five years old) in the CCA sub-region is more than three times as high as that in the European CIS (average of 6 percent) sub-region (FAO, 2015a). Azerbaijan, Albania and Tajikistan also exhibit the highest levels of wasting[22] among children and underweight[23] children.

[21] *Stunted* are children whose weight for age is more than two standard deviations below the median for the international reference population ages between 0-59 months (FAO, 2014c);
[22] *Prevalence of wasting* is a proportion of children under five whose weight for height is more than two standard deviations below the median for the international reference population ages between 0-59 months (FAO, 2014c); *Prevalence of severe wasting* is a proportion of children under five whose weight for height is more than three standard deviations below the median for the international reference population ages between 0-59 months(FAO, 2014c);
[23] *Underweight* are considered children whose weight for their age is more than two standard deviations below the median for the international reference population ages between 0-59 months(FAO, 2014c);

Figure 11. Prevalence of underweight, stunting, wasting and severe wasting in children under 5 in 2014, percent of children (<5)

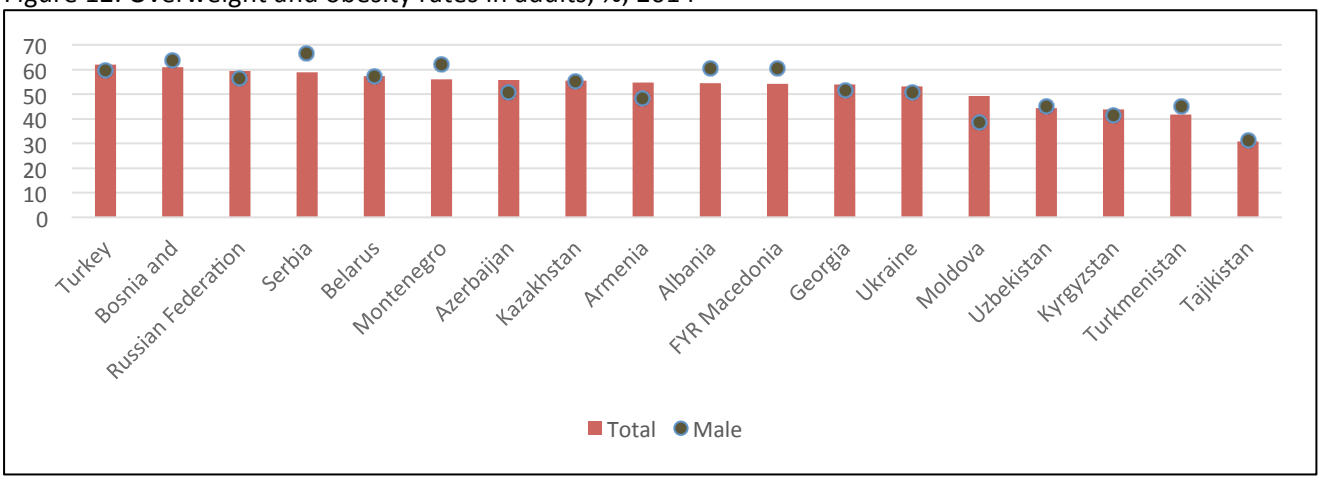


Source: FAO, 2014d

Prevalence of obesity

The problem of over-nutrition is relevant to most countries in all three sub-regions. This trend has resulted in a growing portion of the population being overweight or obese. The average portion of overweight and obese people (measured by the World Health Organization (2013) as a proportion of people whose body mass index exceeds 25 and 30, respectively) in all three sub-regions greatly exceeds the world's average (34.1 percent). As such, almost 48 percent of people in the CCA countries and more than 50 percent in both European CIS and SEE countries are considered overweight or obese. In Bosnia and Herzegovina and Turkey these shares exceed 60 percent (Figure 12). Male obesity is more prevalent in most of the SEE countries, and female obesity is mostly prevalent in the Caucasus, Central Asia, CIS and Ukraine.

Figure 12. Overweight and obesity rates in adults, %, 2014



Source: WHO, 2014

There is also an upward trend in child obesity. In all the SEE countries as well as in Armenia, Georgia, and Kazakhstan, more than 15 percent of children are overweight or obese. Kazakhstan, Macedonia, Azerbaijan and Armenia have seen a threefold increase in child obesity rates between 2002 and 2014, the fastest in the region (WHO, 2014).

FAO projections (Bruinsma, 2012) predict that less-developed countries in the ECA region are expected to have some of the highest rates of obesity in the world by 2050. For example, the number of obese people in the CCA region is projected to reach 20 percent by 2050, representing more than double the 2005-07 estimate of 8.7 percent. In the European CIS and SEE sub-regions the trend is similar. By 2050 the number of obese people will constitute almost 37 percent of the total population (Bruinsma, 2012). This anticipated trend increases the risk of diet-related, non-communicable diseases in all three sub-regions and would put increased pressure on healthcare facilities, especially in the poorer countries that have fewer financial resources at their disposal.

Implications for FAO

With its long-term commitment to battling hunger and malnutrition, FAO is uniquely positioned to assist ECA countries in strengthening their food security and nutrition by making their governance more inclusive, participatory and evidence-based. In the ECA region, key elements of FAO contribution need to address both under-nutrition and over-nutrition and should focus on strengthening capacities of the countries in planning, prioritization, development and implementation of food security strategies, policies and programs, while ensuring their consistency. Additionally, the Organization should help the countries to improve their ability to evaluate and monitor the food security and nutrition situation and develop mechanisms to effectively respond to instances of underperformance.

Driver 5: Agricultural trade policy

Trade and economic integration are expected to be major drivers for agriculture in the region for the foreseeable future. Currently, four important trade and economic integration processes dominate trade policies in the region:

WTO integration. Most of the ECA countries have now joined the World Trade Organization . On 30 November 2015, Kazakhstan joined the WTO and became its 162nd member. Other WTO members from the ECA region include Albania, Armenia, FYR Macedonia, Georgia, Kyrgyzstan, Moldova, Montenegro, the Russian Federation, Tajikistan and Ukraine. Azerbaijan, Belarus, Bosnia and Herzegovina, Serbia and Uzbekistan are still negotiating with WTO member countries on accession.

The WTO is based on the conviction that there are substantial global benefits in terms of income growth to be gained from further removal of barriers to trade, including in agricultural trade. In agriculture such barriers include trade distorting tariffs and agricultural support payments, as well as non-tariff barriers such as the use of sanitary, veterinary and phytosanitary standards and technical regulations for protectionist purposes. This sentiment explains why each WTO accession member country is obliged to agree to a schedule of tariff reductions and limitations on distortionary agricultural support payments, and to endorse the principles underlying the Agreement on Sanitary and Phytosanitary Issues and the Agreement on Technical Barriers to Trade as part of the accession process.

Consolidation and expansion of the Eurasian Economic Union (EAEU). The Eurasian Economic Union currently includes five members--Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation.

Continuation of the EU accession process with selected SEE countries (Albania, FYR Macedonia, Montenegro, Serbia and Turkey), including the eventual alignment of legislation to the acquis communautaire. The EU remains the main trading partner of countries in the SEE sub-region (except Turkey), receiving approximately 60 percent of its exports (EU Commission, 2015b). Under the EU accession process, trade integration constitutes an important priority for SEE countries. Within the Central European Free Trade Area (CEFTA), tariffs and quotas for agricultural products have been eliminated between the EU and the SEE countries (except Turkey). However, the latter are still in the process of aligning their legislation and standards with those of the EU, which is expected to dominate trade integration processes in the region in the medium term. Further, as was mentioned previously, as the EU experiences an increasing number of economic and political challenges, the future intensity of enlargement processes remains unclear.

Deep and Comprehensive Free Trade Agreements (DCFTAs) between the European Union and Georgia, Moldova and Ukraine. Deep and Comprehensive Free Trade Agreements are free trade areas established between the EU and Georgia (took effect in September 2014), Moldova (took effect in September 2014) and Ukraine (took effect in January 2016). It is anticipated that the DCFTAs will open new market opportunities in the EU for the countries in question, while higher production standards implemented as a result of the FTA agreements will spur investment in the agricultural sector and will stimulate its modernization and competitiveness.

Implications for FAO

By enabling greater job opportunities and incomes from agricultural production, processing and trade, appropriate agriculture trade policies can help alleviate poverty and hunger and improve rural livelihoods. FAO has a long-standing expertise in advising governments on developing such policies. In order to facilitate the processes of trade integration in the ECA region, the FAO priorities should center on providing support to the governments in aligning their trade policies, and SPS measures to meet the World Trade Organization commitments. FAO should also provide technical expertise in upgrading value chains for selected food products and ensuring their consistency with international food safety and quality standards.

VI. FAOs Strategic Framework and Regional Priority Areas for FAO Action for the future

The global trends, the regional specific trends and particularly the regional drivers outlined in the previous section display the major challenges in the medium and long term in the European and Central Asia Region and will be used to define the priorities for the work of FAO in the Region.

An important consideration for the definition of the priorities for the organization in the Region is its comparative advantages, but also the implications of the Agenda 2030 for the Region.

The **overarching aim** of FAOs work in the future in the region is to **increase the wellbeing and livelihood of the rural population.** This includes **improved access to land and services by the rural population.**

In parts of the ECA region smallholders and family farms are the backbone of rural development and improvement of livelihoods. They account for the bulk of agricultural production and thus play a

critical role in employment creation, agricultural productivity, forestry and fisheries. Efforts are required to improve the situation for smallholders and family farms as a measure to revitalize rural areas or to reduce migration from rural areas. There is a lack of infrastructure for smallholders including limited access to advisory services, innovative practices and education facilities in order to increase the competitiveness of small holders. Equal access to land and the equal distribution of land is key.

The tenure systems make a crucial difference to livelihoods, and food security is linked to tenure security. The further application of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) represent an unprecedented consensus on principles and actions for improving tenure security for all, with an emphasis on vulnerable and marginalized people. The promotion of the VGGT Guidelines will continue to be a key priority area to support food security.

A larger proportion of women among the rural population and the constraints for equal access to resources for the rural population requires the strengthening of rural institutions to empower the rural population as well as the establishment of social protection systems that ensure equal access for rural men, women and young people.

Regional priority 1 for the Organization in the medium and long term future is the **support to member countries in their efforts to implement effective policies for sustainable and inclusive growth for farmers and the rural population with emphasis on smallholders and family farms but not exclusively.** In particular, existing FAO's Regional Initiative on Empowering Smallholders and Family Farms (RI-1) addresses key problems of rural people by empowering smallholders and family farms to improve their livelihoods**.**

The alignment of trade and sanitary and phytosanitary (SPS) policies to meet World Trade Organization (WTO) commitments is a key area for the region, which requires further attention by the organization in the medium and long term future. This goal includes strengthening of the institutional framework for food safety, plant and animal health and strengthening the capacity of member country food safety agencies to carry out analysis of food safety risks (risk management, risk assessment and risk communication).

In addition to capacity development for member country food safety agencies, there is a growing demand in the region for technical assistance in upgrading value chains for selected food products to ensure their consistency with international food safety and quality standards. Such capacity development to support food exports is most important for small and medium-sized enterprises, including farmers and food business operators. While large food processors have the resources to meet standards themselves, small businesses often do not. FAO's work on trade facilitation in the region should focus on both the institutional side as well as on technical assistance to assist exports of selected products for small and medium sized businesses.

Regional priority 2 for the Organization in the medium and long term future is to provide **support to countries in reaching new markets through alignment of their trade, food safety and SPS policies to meet World Trade Organization commitments and through value chain development to meet international food safety and quality requirements.**

Environmental sustainability and responding to the challenges and trends in climate change are key issues for the Region. The dimensions are different for the subregions, but water management, land degradation remains relevant for most of the countries of the Region. Water management requires attention in relation to sustainable land management practices such as conservation agriculture. Climate conditions also need to be considered, as parts of the region face arid climatic conditions, and thus low rainfalls and droughts. Maintaining biodiversity and reduction of over-exploitation of soils should be addressed as major contributors to environmental sustainability.

The integration of the forestry sector with agriculture is important for decreasing land degradation and should be linked particularly to increase sustainable land uses and particularly pasture and range management.

Climate Smart Agriculture is a key element of addressing these challenges by (i) increasing sustainable productivity and income growth, (iI) supporting adaptation across agriculture sectors to cope with the expected changing climatic conditions, (iii) making production systems and local communities more resilient to adverse and extreme weather conditions, and (iv) developing the potential for reduction of GHG emissions and increasing carbon sequestration from agriculture compared to past trends.

Regional priority 3 for the Organization in the medium and long term future is the **support to countries in sustainable natural resource management, combating land degradation and desertification, including mitigation and adaptation to climate change.**

The analysis shows that micronutrient deficiencies, over-nutrition and unhealthy diets for children and adults remain major malnutrition concerns in the region and will remain so in the medium and long term future based on current projections.

This requires support related to the development and management of inclusive governance and coordination mechanisms built on sustainable food security and nutrition strategies and programs, including increasing nutrition sensitivity of social protection as well as participation in related technical working groups. It is also important to strengthen evidence-based decision making by increasing capacities for analysis and to increase the availability of food security and nutrition related data and information.

Food security and nutrition related work will concentrate on policies, investment, programmes and legal frameworks such as the Food Security Laws and Food Security and Nutrition Programs.

Regional priority 4 for the Organization in the medium and long-term future is **supporting the countries in addressing food insecurity and decreasing all forms of malnutrition.**

VII. References

ARCOTRASS. 2006. Study on the State of Agriculture in Five Applicant Countries: Synthesis Report.

Asian Development Bank. 2009. Building Climate Resilience in the Agricultural Sector in Asia and the Pacific.

Blinkov, I., Kostadinov, S. and I. Marinov. 2013. Comparison of Erosion and Erosion Control Works in Macedonia, Serbia and Bulgaria. International Soil and Water Conservation Research 1(3): 15-28.

Bogdanov, N., Nikolic, A., Dimitrievsky, D. and A. Kotevska. 2015. Rural Areas and Rural Development Policy in Macedonia, Serbia, and Bosnia and Herzegovina. In: Kotevska, A. and A. Stojcheska (eds.) "The Impact of Socio-Economic Structure of Rural Population on Success of Rural Development Policy".

Bruinsma, J. 2012. "European and Central Asian Agriculture Towards 2030 and 2050", *FAO Regional Office for Europe and Central Asia.* Policy Studies on Rural Transition No. 2012-1, Budapest, Hungary.

Csaki, C. and L. Tuck. 2000. Rural Development Strategy: Easter Europe and Central Asia. World Bank, Washington D.C.

Drozdz, J., Golubevaite, L., Jurkenaite, N., Krievina, A. and A. Volkov. 2015. Macroeconomic context of the agri-food sector in the European Union's Eastern Neighbors. Report prepared under the EU 7th Framework Program AGRICISTRADE project.

EU Commission. 2015a. Medium-term outlook for the EU agricultural commodity market. Joint Research Center. Seville, Spain.

EU Commission. 2015b. Communications From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, Belgium.

European University Institute. 2014. Regional Migration Report: Russia and Central Asia. In eds: Di Bartolomeo, A., Makaryan, S. and A. Weinar.

EM-DAT. 2015. The International Disaster Database. Brussels, Belgium.

FAO. 2015a. The State of Food Insecurity in the World 2015. Rome, Italy.

FAO. 2015b. Status of World Soil Resources Report. Rome, Italy.

FAO. 2015c. Addressing social and economic burden of malnutrition through nutrition-sensitive agricultural and food policies in the region of Europe and Central Asia.

FAO. 2015d. Combating land degradation for food security and provision of soil ecosystem services in Europe and Central Asia – International Year of Soils 2015. Budapest, Hungary.

FAO. 2015e. Innovation in Family Farming in Europe and Central Asia. Budapest, Hungary.

FAO. 2015f. FAOSTAT. Rome, Italy.

FAO. 2015g. AQUASTAT. Rome, Italy.

FAO. 2015h. Save and Grow in Practice: maize, rice, wheat. A guide to sustainable cereal production. Rome, Italy.

FAO. 2014a. Statistical Yearbook 2014: Europe and Central Asia. Rome, Italy.

FAO. 2014b. Agri-Food Systems for Better Nutrition in Europe and Central Asia. Budapest, Hungary.

FAO. 2014c. Food Losses and Waste in Europe and Central Asia. Paper prepared for the 29th Session of the Regional Conference for Europe. Bucharest, Romania.

FAO. 2014d. Food and Nutrition in Numbers. Rome, Italy.

FAO. 2014e. Rural Women in Eastern Europe and Central Asia. Budapest, Hungary.

FAO. 2014f. The Eurasian Economic Commission and the Unified Market for Agricultural Commodities within the Customs Union. Seminar Background Studies. Moscow, Russia.

FAO. 2014g. Sustainability Assessment of Food and Agriculture Systems Guidelines. Version 3.0. Rome, Italy.

FAO. 2014h. The State of Food and Agriculture: Innovation in Family Farming. Rome, Italy.

FAO, 2014i. Russia's restrictions on imports of agricultural and food products: An initial assessment. Rome, Italy.

FAO. 2013a. Reviewed Strategic Framework. Rome, Italy.

FAO. 2013b. Irrigation in Central Asia in figures: AQUASTAT Survey – 2012. Rome, Italy.

FAO. 2013c. Global Trends and Future Challenges for the Work of Organization. Web Annex. Rome, Italy.

FAO. 2013d. The Director-General's Medium Term Plan 2014-17 and Program of Work and Budget 2014-15. Rome, Italy.

FAO. 2012. Mutually acceptable mechanisms for integrated use of water resources in Central Asia through applying a scenario approach". Rome, Italy.

France Strategie. 2016. The Economic Cost of Rolling Back Schengen. Paris, France.

Gitz, V. and A. Meybeck. 2012. Risks, uncertainties and resilience in the context of climate change. FAO, Rome.

Golub, S. and S. Kestelman. 2015. Uzbekistan's Cotton Value Chain. Report prepared for UNCTAD.

Goychuk, K. and Meyers, W.H. 2013. "Eastern European Agriculture." In: P. Thompson and D. Kaplan, eds., Encyclopedia of Food and Agricultural Ethics. Springer, New York (online)

High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. 2014. Food losses and waste in the context of sustainable food systems. Rome 2014.

Hijioka, Y., Lin, E., Pereira, J.J., Corlett, R.T., Cui, X., Insarov, G.E., Lasco, R.D., Lindgren, E., and A. Surjan. 2014. Asia. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional*

Aspects. Contribution of Working Group II to the Fifth Assessment Report on the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1327-1370.

IFPRI. 2012. ASTI global assessment of agricultural R&D spending: Developing countries accelerate investment. Washington D.C.

INFORM. 2015. http://www.inform-index.org/

International Monetary Fund. 2015. World Economic Outlook Database. Washington D.C.

International Monetary Fund. 2016. The Refugee Surge in Europe: Economic Challenges. IMF Staff Discussion Note. Washington D.C.

Intergovernmental Panel on Climate Change. 2015. Climate Change 2014: Impacts, Adaptation, and Vulnerability. Summary for Policymakers. [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32.

Koester, U., Empen, J. and T. Holm. 2013. Food Losses and Waste in Europe and Central Asia. A draft report prepared for FAO.

Koester, U., Schumann, C. and A. Lissitsa. 2010. The Agricultural Knowledge and Information System in Ukraine – Call for Reforms. Policy Paper No. 30. German-Ukrainian Policy Dialogue in Agriculture Institute for Economic Research and Policy Consulting. Kyiv, Ukraine.

Lavalle, C., Micale, F., Houston, T.D., Camia, A., Hiederer, R., Lazar, C., Conte, C., Amatulli, G. and G. Genovese. 2009. Climate change in Europe. 3. Impact on Agriculture and forestry. A review. *Agronomy for Sustainable Development*, 29 (3), 433-446.

Lerman, Z. 2014. Changing Land Tenure and Farm Structure in Central Asia. Paper presented at the regional conference 'Agricultural Transformation and Food Security in Central Asia', Bishkek, Kyrgyzstan.

Lerman, Z. and D. Sedik. 2009. Sources of Agricultural Productivity Growth in Central Asia. Selected paper prepared for presentation at the Agricultural and Applied Economics Association 2009 Annual Meeting. Milwaukee, Wisconsin.

Lerman, Z. and Sutton, W. 2008. Productivity and Efficiency of Small and Large Farms in Transition: Evidence from Moldova. Post-Soviet Affairs, 24(2): 97-120.

Lerman, Z., Sedik, D., Pugachov, N., and Goncharuk, A. 2007. Rethinking Agricultural Reform in Ukraine. Studies on Agricultural and Food Sector in Central and Eastern Europe, Vol. 38, IAMO, Halle, Germany.

Lioubimtseva, E. and G. Henebry. 2009. Climate and environmental change in arid Central Asia: Impacts, vulnerability, and adaptations. *Journal of Arid Environments*, 73 (11), 963-977.

Malyuchenko, I. 2015. Labour Migration from Central Asia to Russia: Economic and Social Impact on the Societies of Kyrgyzstan, Tajikistan and Uzbekistan.

Moroz, V., Stratan, A., Ignat, A. and E. Lucasenco. 2015. Country Report: Republic of Moldova. Report prepared under the EU 7th Framework Program AGRICISTRADE project.

Pulla, P., Schuck, A., Verkerk, P., Lasserre, B., Marchetti, M. and T. Green. 2013. Mapping the distribution of forest ownership in Europe. European Forest Institute. Torikatu, Finland.

Sedik, D. and Z. Lerman. forthcoming, 2016. Food Security—Prospects of the Farming Sector and Rural Development across the Eurasian Plain: The Case of Wheat Production Potential in the Belarus, Uzbek and Turkmen Republic, (EC/JRC).

Smith, P. and J.E. Olesen. 2010. Synergies between mitigation of, and adaptation to, climate change in agriculture. *Journal of Agricultural Science*, 148(5), 543-552.

Swinnen, J. and K. Van Herck. 2011. "Food Security and the Transition Region", Working paper, FAO Investment Center, Rome, Italy.

Themen, D. 2014. Reduction of Food Losses and Waste in Europe and Central Asia for Improved Food Security and Agrifood Chain Efficiency. Study prepared for the FAO Regional Office for Europe and Central Asia.

Thurman, M. 2011. Natural Disaster Risk in Central Asia: A Synthesis. UNDP.

UN DESA. 2014. World Urbanization Prospects: The 2014 Revision. New York, NY.

UN DESA. 2015a. World Population Prospects. New York, NY.

UN DESA. 2015b. Demographic Components of Future Population Growth. New York, NY.

UN DESA. 2015c. Global Migration Database. New York, NY.

UNDP. 2014. Poverty, Inequality, and Vulnerability in the Transition and Developing Economies of Europe and Central Asia.

UNDP. 2015. labour Migration, Remittances, and Human Development in Central Asia. Central Asia Human Development Series.

UNESCO. 2015. Education for all 2000-2015: Achievements and Challenges. Paris, France.

UNISDR and World Bank. 2009. Central Asia and Caucasus Disaster Risk Management Initiative: Risk Assessment for Central Asian and Caucasus.

Urutyan, V., Yeritsyan, A., and H. Mnatsakanayn. 2015. Country report: Armenia. Report prepared under the EU 7th Framework Program AGRICISTRADE project.

USDA Economic Research Service. 2014. Food Expenditure Series. Washington, D.C.

Volk, T., Erjavec, E., Rac, I. and M. Rednak. 2015. Policy Report. Report prepared under the EU 7th Framework Program AGRICISTRADE project.

Volk, T. 2010. Agriculture in the Western Balkan Countries, Studies on the Agricultural and Food Sector in Central and Eastern Europe, edited by Leibniz Institute of Agricultural Development in Central and Eastern Europe.

World Bank. 2009. “Adapting to Climate Change in Europe and Central Asia”. Washington D.C.

World Bank. 2010. “Bioenergy Development: Issues and Impacts for Poverty and Natural Resource Management”. Washington D.C.

World Bank. 2012. “Agricultural Innovation Systems: An Investment Sourcebook”. Washington DC:

World Bank. 2015. The World Bank Indicators. Washington D.C.

World Bank. 2016. Global Economic Prospects: Spillovers amid Weak Growth. Washington D.C.

World Health Organization. 2014. Global Health Observatory Data Depository.

ISBN 978-92-5-109410-5

9 789251 094105

I6102E/1/09.16