EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT

Directorate G – International
G.4 – Neighbourhood, enlargement and pre-accession assistance

Commission internal workshop on climate change and the transition to sustainable agriculture in enlargement countries

Summary

This summary presents the main experts' findings of an internal Commission workshop on the impact of climate change and the transition to sustainable agriculture in enlargement countries, organised by DG AGRI on 21 November 2024. External experts[1] were invited to share their knowledge on the expected impacts of climate change and the environmental challenges in connection with the agricultural sector in the enlargement countries. This summary reflects the presentations and discussions held under Chatham House rules. It does not necessarily reflect the opinion of the Commission. The workshop was chaired by DG AGRI, with participants from different Commission services.

1. Overall impact of climate change in Europe

Europe is the fastest-warming continent, with climate risks rapidly growing as global temperatures approach 1.5°C. These risks threaten ecosystems, water resources, food and energy security, infrastructure, financial stability, and public health. Food production faces key challenges, including reduced water availability, heat stress, specific weather events (e.g. late frosts, heavy rain), pests and diseases, and deterioration of the ecosystem. These developments are accompanied by continued declines in agricultural biodiversity and soil health. Southern Europe, alongside low lying and most outermost regions are particularly vulnerable.

Crop production in Europe is already under significant climate stress, with Southern Europe facing critical risks from prolonged drought and excessive heat. While yields of wheat, maize, sunflower, and sugar beet have been rising in the past decades, recent years have shown signs of stagnation or decline due to adverse weather conditions. Water-intensive food production and sectors reliant on imported fodder are particularly vulnerable to climate change.

Future projections highlight regional differences for key crops like wheat and maize. By mid-century, wheat yields in Southern Europe are expected to decline, while Northern Europe may see stable but more variable yields due to extreme weather. Maize is at greater risk, with most EU regions facing yield losses, except for a few northern areas with high uncertainty. Limited water for irrigation, particularly during maize's growing season, could severely impact production across Europe, making maize cultivation in southern regions nearly impossible.

Data on climate change impacts for enlargement countries is limited, however it is possible to make reasonable predictions based on trends in neighbouring countries. For example, Ukraine's yields for

[1] Daniel Mueller, Tudor Robu, Maria Diachuk, Andrea Toreti, Frank Dentener

crops such as soft wheat, sunflower and maize show strong correlation with Romania's. More complex extreme events, such as flash droughts, and concurrent droughts and floods, are expected to emerge, with their impact increasing in enlargement countries, posing higher risks and having severe long-term impact.

By the end of the century, climate change will result in declines in the viability of certain crops in the current EU and enlargement countries. This may also affect the effectiveness of current EU mechanisms in supporting countries facing losses from such extreme weather events. While adaptation is possible, it will require transformative solutions across supply chains and enhanced cooperation.

The EU emits approximately 400 million tonnes of CO2 equivalent, with several hotspot regions. Enlargement countries are not hotspots but would add about 10% more GHG emissions to an enlarged EU, with Ukraine accounting for 60% of these additional emissions. For enlargement countries, about half of these emissions come from the livestock sector, and the other half from crop fertilisation. The emission intensity (emissions per hectare) is lower in the Western Balkans, Ukraine, and Moldova than in the EU-27.

The EU LULUCF sector currently offsets around 10% of the EU GHG emissions, with little change expected from enlargement countries as they are a small and stable carbon sink. Western Balkans have hilly terrain and significant forest coverage but face increasing wildfire risks. Countries like Ukraine, Moldova, and Albania have low forest coverage (less than 20%) but hold significant GHG mitigation potential through agroforestry, afforestation, landscape management, and carbon farming. While Ukraine has rich and deep organic soils with high water retention, its sustainable biomass potential per land area is modest. It has nevertheless large overall land resources.

Adaptation measures will be crucial. A simple and cost-effective approach is integrating tailored climate services to inform farmers. This could improve mean yields but may increase interannual variability. Adaptation should be considered not only at farm level but also at regional or EU level. For example, crops that are more evenly distributed tend to have less yield variation compared to those concentrated in specific regions. Nonetheless, without mechanisms to stabilise farm incomes and market fluctuations, this could lead to market instability. If global mitigation targets are not met, adaptation costs will rise. Large-scale supply chain adaptation will require significant investment and cooperation.

As some areas become unsuitable for certain crops, production may need to shift to regions with increased suitability. However, the areas gaining suitability will be fewer than those losing it, requiring an optimal solution from an economic perspective. This will also involves relocating the entire supply chain, which is a more complex activity than growing a different crop in a new area. In this context, enlargement countries, particularly Ukraine, could play a stabilising role, helping to counterbalance both internal EU impacts of climate change and external climate change effects in other parts of the world.

2. Transition to sustainable agriculture – challenges and opportunities

a. Western Balkans

Agriculture in the Western Balkans is highly diverse due to the region's heterogeneous landscape. In Serbia's northern region Vojvodina, fertile and flat land supports large-scale intensive farming. In contrast, the Albanian plains south of Tirana are dominated by small, fragmented farms, often semi-subsistent with low-intensity crop and livestock production. Over time, marginal areas have experienced land degradation, and large areas were abandoned in the early 2000s. Suitable regions, particularly those with irrigation, have seen intensification, notably in fertile areas where greenhouse vegetable production is growing.

Climate change is one of the major challenges that the region faces, as it increases production risks and yield variability. Rising temperatures and more frequent heatwaves are already causing the region to warm faster than others. Summer temperatures are rising faster, while both summer and winter precipitation are decreasing, and droughts are becoming more intense. The combination of heat and water scarcity makes agriculture particularly vulnerable. In the future, production may shift to higher altitudes, but mountains have poor soils, weak infrastructure, and low population. Additionally, mountains function as water towers, storing snow that provides water for irrigation. Reduced precipitation will affect snowpacks, leading to lower water runoff and complicating irrigation.

Between 1992 and 2020, average temperatures rose by 1-2°C, with a more significant increase in the Dinaric Mountains. While overall precipitation has increased, the frequency of consecutive dry days and extreme rainfall events are rising, with fewer but more intense storms. The rise in extreme heat days (above 35°C) is concerning, as crops show negative yield responses at these temperatures.

Adaptation challenges in the Western Balkans include changes in growing seasons, with earlier planting due to higher spring temperatures. Weather extremes will significantly impact yields, prompting farmers to switch to new crops and reduce input use. Climate change will require adjustments in crop structure and cultivation methods to deal with pests. Heavy rainfall events may lead to floods, dam breaks, erosion, and landslides, impacting agricultural areas, with increased flooding already observed in lowlands in the Western Balkans. Combating forest fires and managing grasslands will become crucial in climate risk management. Additionally, water supply from mountains will become increasingly unpredictable.

A key barrier to climate change adaptation and the green transition in the Western Balkans is the lack of reliable data, with most information available at the country level and little at the regional level. Hydrometeorological data is lacking, hindering the development of climate and yield models. Agricultural statistics and socio-economic indicators are often poor or unavailable. There are no independently validated land-cover maps for crops or forests, and a lack of data on species distribution complicates biodiversity monitoring. Capacity in academia and research institutions is also relatively limited.

Reforestation, afforestation, and the restoration of degraded forests are key components of the region's green agenda. Nature-based solutions, sustainable food production, and transforming food systems to meet EU standards have been also emphasised by countries in the region. However, significant work remains to be done on the ground.

Developing place-based adaptation strategies will be crucial for addressing climate change challenges in the Western Balkans, but it is hindered by the lack of reliable data. Other key actions include fostering knowledge exchange, building regional capacity, raising awareness of climate-biodiversity links and improving monitoring systems (meteorology, remote sensing, and agricultural statistics). Improving landscape resilience to water scarcity and enhancing water storage will also be crucial, particularly in the plains, which hold significant potential if irrigation is available.

Technological advancements, such as drought and heat-resistant crop varieties, crop monitoring systems, and precision agriculture, can help ease pressures on the region. Supporting farmers through insurance, diversification, and the development of region-specific plant varieties is also essential. Nature-based solutions, such as soil conservation, agroforestry, and forest restoration, can provide benefits such as emission reduction and climate adaptation.

There are however some positive developments in both lowlands and mountains in the Western Balkans, with entrepreneurial efforts driving agricultural change and farm consolidation.

b. Moldova

Moldova's agricultural production levels have become inconsistent due to extreme weather events like droughts and heatwaves, which are increasingly severe and frequent across the region. While the country is small, its climate varies from north to south, with lower temperatures in the north and warmer, drier conditions in the south. The southern region is particularly impacted by climate change, especially drought.

Moldova has rich flora but limited forest cover, representing only 17% of its territory. About 25% of Moldova's arable land is eroded, with 4.2% unrecoverable for agriculture. Land degradation is driven by climate and poor agricultural practices.

Moldova is a minor emitter of GHGs, with agriculture accounting for 10% of emissions (6% from livestock). Moldova actively conducts assessments, with good data on climate change, temperature, GHGs, and policies. Farmers need to be more actively engaged in understanding their role in emission reduction efforts.

In recent years, Moldova has faced unusual, prolonged droughts with low precipitation during the most productive cropping seasons. Additionally, periodic frost and hail have damaged horticulture and vegetable production. Extreme heat in July 2024 caused a total loss of maize production in southern Moldova. Vegetables and cereals production volumes were severely impacted. Similarly, the 2022 drought led to a more than 30% decline in sunflower, sugar beet, and maize yields. Livestock farming was further affected, as it is heavily reliant on maize for animal feed. With limited feed, farmers faced higher costs and reduced livestock numbers.

While climate change brings some opportunities, such as better grape and fruit yields and lower costs for greenhouse farms, the negative effects outweigh these benefits. The limited availability and poor extension of advisory services hinder the adoption of changes in crop production and the use of new varieties. Water scarcity for irrigation is affecting agricultural production and deteriorating the irrigation system. The government is working to repair central pipelines for farmers' access, but significant investment is needed.

A key objective of the country's new agricultural strategy focuses on climate change and climate-smart agriculture, highlighting the government's priority in this area. There is also a national program for climate change adaptation, supported by the UN and FAO.

Key commitments include rehabilitating 880,000 ha of degraded land, creating green shelterbelts, increasing forest cover (the authorities plan to plant or rehabilitate 500,000 hectares of forests by 2032), and restoring contaminated sites. Conservation methods offer significant benefits for agriculture but are underutilised. The lack of a forest inventory and proper data collection is a key challenge and crucial for implementing the new afforestation and forest maintenance programme.

c. Ukraine

Nearly 70% of Ukraine's land is utilised for agricultural purposes, 17% are covered by forests and 4% are urban areas. Around 57% of the country's agricultural land is arable, 80% in certain regions. The expansion of arable land, especially on sloped terrain or areas of high natural value, has caused rapid degradation, even before the Russian full-scale invasion. Before the war, it was planned to reduce arable land to 44% by removing degraded land, with over 6.5 million hectares estimated as degraded.

Protected areas make up 6.9% of the land, growing slowly and increasing by just 0.33% over the past five years. The national goal is to designate 15% of the land as protected area by 2030. One of the reasons why nature protection in Ukraine progresses slowly is also the tensions between agriculture and biodiversity. The law on the Emerald Network has not been effectively adopted, and legislation does not safeguard adequately protected areas. For example, illegal ploughing often occurs in protected areas, and pastures and steppes in Southern Ukraine. Peatland drainage due to irrigation and energy crops also poses future threats.

These challenges are due to the low awareness of biodiversity protection among authorities, communities, and farmers, prioritising economic gains over long-term sustainability, and lack of financial incentives for conservation. There is ineffective control over land and environmental legislation compliance, particularly during martial law when public access to the cadastral map is restricted, making public oversight currently impossible.

Since 2014, and especially after the full-scale invasion in 2022, the war has added further challenges to sustainable development. Over 30% of Ukraine's land is considered now restricted from agricultural use due to the war.

Ukraine uses fewer fertilisers than EU countries, but inefficient nutrient use leads to nitrate pollution of surface and groundwater. The Nitrate Directive, which implementation started in 2017, has seen little progress. Delays in identifying nitrate-vulnerable zones are due to insufficient data.

Irrigation, particularly, is seen as a key solution to declining yields and climate change adaptation. Winter crops are mostly rain-fed, while summer crops (e.g.maize, soybeans) rely partly on irrigation, especially in the east (prior to the Kharkhovka dam destruction). However, Ukraine is water-scarce, and climate change is expected to reduce river water flow by 25-50%. The selection of crops that are economically viable in the face of climate change, especially those with low water requirements, is therefore essential for southern Ukraine.

Small farmers are interested in adopting environmental practices, particularly those focused on soil moisture conservation, soil protection, efficient fertiliser use, and managing agricultural by-products. Good practices are already in place, such as using cover crops to reduce fertiliser and pesticide use while promoting soil biodiversity. No-till farming, carbon farming, and organic farming are also gaining popularity.

Large agricultural companies have more resources and have already adopted some environmental standards. In contrast, small and medium-sized farmers require support and advisory services to implement these practices, as they often lack access to information, although a code of good agricultural practices exists.

Overall, Ukrainian agriculture is steadily advancing towards sustainability and environmental standards, driven largely by the EU accession process, with farmers increasingly recognising the importance of these requirements, particularly for smaller farms.