



Food and Agriculture
Organization of the
United Nations



POLICY ANALYSIS OF NATIONALLY DETERMINED CONTRIBUTIONS IN EUROPE AND CENTRAL ASIA

REPORT 2024

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Required citation:

FAO. 2025. *Policy analysis of nationally determined contributions in Europe and Central Asia – Report 2024*. Budapest. <https://doi.org/10.4060/cd6404en>

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ISBN 978-92-5-139994-1

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FOREWORD

Agrifood systems are both a main source of greenhouse gas (GHG) emissions and highly vulnerable to climate change and its impacts. Climate change has both direct and indirect negative effects on agricultural production and productivity. The impact of climate change manifests itself in various ways, including altered rainfall patterns; increased frequency and severity of droughts, storms and floods; and more frequent and less predictable plant, pest and disease outbreaks. In the Europe and Central Asia (ECA) region, according to the World Meteorological Organization, warming is occurring at double the rate of the global average. Such climate impacts threaten to undermine food and nutrition security, poverty eradication and sustainable development.

At the same time, in many countries within the region, agriculture is the second-largest contributor to national GHG emissions, after the energy sector. In several ECA countries, agriculture also is the primary source of methane, which has accounted for about 30 percent of global warming since pre-industrial times. These estimates typically include only direct emissions from agriculture, often excluding emissions from other parts of agrifood systems (e.g. transport, energy and waste), leading to a potential underestimation of the sector's total emissions.

Considering that it is both a contributor to climate change and susceptible to it, agriculture must be part of the solution. The introduction and use of sustainable practices and technologies can reduce and remove GHG emissions, mitigate and reduce climate risks, and build resilience within the sector. Combating climate change requires a comprehensive approach that combines mitigation, adaptation and risk-reduction interventions.

It is crucial for countries to accurately reflect their mitigation and adaptation ambitions and progress in the agricultural sector for several reasons: demonstration of political will and support of global efforts, alignment of national and sectoral policies with international commitments, and compliance with such international climate frameworks as the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, the Kunming-Montreal Global Biodiversity Framework, and the 2030 Agenda for Sustainable Development.

Building on the 2021 edition, this report is the third in the FAO series “Policy analysis of nationally determined contributions in Europe and Central Asia”. It reviews countries' progress towards their climate change mitigation (CCM) and climate change adaptation (CCA) commitments as outlined in their nationally determined contributions (NDCs), national policies and legislative frameworks.

While countries are increasing their climate ambitions, challenges remain. These include the need to develop indicators, align national policies and measures, Long-Term Low-Emission Development Strategies, NDCs and National Adaptation Plans (NAPs), as well as accurately assess the required support.

Addressing these challenges is crucial to fully realize the potential of the agricultural sector in contributing to climate change mitigation and adaptation and accelerating progress towards achieving global climate, biodiversity, and land degradation neutrality goals while also advancing broader sustainable development objectives.

Viorel Gutu

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ACKNOWLEDGEMENTS

This publication was prepared by the Food and Agriculture Organization of the United Nations (FAO) as part of efforts to support countries in Europe and Central Asia in the implementation of their commitments in the context of the United Nations Framework Convention on Climate Change, focusing particularly on areas of the FAO mandate.

This analysis was coordinated by FAO under the overall guidance of Evetta Zenina and Jeremy Schlickenrieder. The main authors are Gamze Celikyilmaz and Tamara van't Wout from FAO. Valuable research and inputs were provided by Juliette Baralon, Anastasia Kvasha, Virag Nagypal, Daniela Mangione, Krystal Crumpler, Giulia Galbiati, Priti Rajagopalan and Zehra Zaidi from FAO and Animesh Kumar and Xuan Che from the United Nations Office for Disaster Risk Reduction.

The report was reviewed by Martina Duncan, Virag Nagypal, Juliette Baralon, Oksana Sapiga and Igor Slavkoski, all from FAO.

Editorial support was provided by Matthew Anderson, and Olha Samsonenko provided graphic design and layout.

The document was developed under the guidance of Raimund Jehle, FAO Regional Programme Leader for Europe and Central Asia, who supports the technical teams in the region assisting FAO Members in their efforts to tackle climate change as one of the biggest challenges facing the agricultural sector and agrifood systems.

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AfDB	African Development Bank
AFOLU	agriculture, forestry and other land use
CAP	Common Agricultural Policy
CCA	climate change adaptation
CCM	climate change mitigation
CIS	Commonwealth of Independent States
COP	Conference of the Parties
DRM	disaster risk management
DRR	disaster risk reduction
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
EFTA	European Free Trade Agreement
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GST	Global Stocktake
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
LT-LEDS	Long-Term Low Emission Development Strategy
LULUCF	land use, land-use change and forestry
NAP	National Adaptation Plan
NDC	nationally determined contribution
NEXT	Nationally Determined Contribution Expert Tool
SDG	Sustainable Development Goal
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
WMO	World Meteorological Organization

EXECUTIVE SUMMARY

Climate change is a pressing global crisis threatening the environment, human and animal health and agrifood systems. The Europe and Central Asia (ECA) region faces climate challenges, including rising temperatures and decreasing precipitation, with varying effects across subregions.

Agrifood systems in the region are major sources of greenhouse gas emissions and are highly vulnerable to climate change, which jeopardizes food security by threatening crop yields and livestock health, contributing to changes in the occurrence and patterns of pests and diseases, degrading soil and reducing water resources. Extreme weather events such as droughts, floods and storms impact agricultural productivity across all sectors. Climate change, warming oceans and changing freshwater systems affect fish populations and distributions. These impacts severely affect the livelihoods of millions of smallholders, farmers, fishers, women and youth.

Agriculture, particularly due to methane emissions from livestock, is the second-highest-emitting sector, after energy, in many ECA countries. In the context of climate change and as the global population increases, agrifood systems must transform to become more sustainable, resilient, efficient and inclusive, at the same time enhancing productivity and reducing emissions.

This publication provides a comprehensive analysis of mitigation and adaptation actions for agrifood systems in the nationally determined contributions (NDCs) of Europe and Central Asia, focusing on progress since the latest NDC Policy Analysis Report from the Food and Agriculture Organization of the United Nations (FAO) in 2021. This third report in the FAO series “Policy analysis of nationally determined contributions in Europe and Central Asia” updates the region’s progress towards the climate commitments outlined in the NDCs and shares information on national policies and legislative frameworks with a view to supporting the revision and submission of updated NDCs expected in 2025.

The report also offers an update on GHG emissions for each country, spotlighting the highest-emitting categories within the agricultural sector. It highlights recent developments in national climate change mitigation (CCM) priorities, policies and legal frameworks, showcasing how countries are adapting to meet their commitments. It also provides a thorough analysis of how effectively adaptation measures, particularly those related to agriculture, are integrated into NDCs.

Additionally, the report assesses the prioritization of adaptation in sectoral policies, the progress made in developing NDCs and the availability of climate finance to support these efforts.

The following sections constitute the backbone of the analysis:

Targets and pledges in climate mitigation and adaptation of NDCs in the ECA region

Since FAO’s latest regional NDC report in 2021, several countries in the ECA region have submitted updated NDCs. The revised NDCs demonstrate varying levels of increased ambition across the board. Notably, there is an increase in the inclusion of economy-wide GHG reduction targets, encompassing countries’ entire economies rather than focusing on specific sectors.

Another noteworthy shift is observed in the increasing number of NDCs that incorporate unconditional GHG emission reduction targets, which are not contingent on international support.

But while ambition is increasing, it is not sufficient to meet the goals of the Paris Agreement. When it comes to considering the impact of agrifood systems, most of the countries in the ECA region do not currently have quantified emission reduction or specific adaptation targets or measures in the agricultural sector. This is in part due to limited data availability, capacity gaps and the overall fragmentation of the sector as well as the complexity of measuring and addressing agricultural emissions.

However, a rising trend can also be observed regarding the inclusion of adaptation in general as a priority in the updated NDCs, as it was included by 17 countries of the total 24.^a

Moreover, 15 countries have indicated that agriculture is among the sectors most adversely

^a These include the updated NDCs of 23 countries and the updated NDC from the European Union.

affected by climate change. The updated NDCs also included 50 percent more agriculture-relevant adaptation and risk reduction measures than the first NDCs. The types of interventions most included were disaster risk reduction/climate change adaptation (DRR/CCA) agricultural good practices and technologies at farm level, climate risk proofing of grey infrastructure, followed by agroclimatic and disaster risk information systems and climate and disaster risk governance.

Climate change mitigation and adaptation/disaster risk reduction legislation and policy framework in agriculture

In the ECA region, some legislative measures and policy frameworks directly aim at reducing GHG emissions within agrifood systems, while others, such as policies related to rural development or environmentally friendly value chains, have indirect yet significant impacts in this regard. Several countries have economy-wide strategies for emission reduction that do not fully integrate sectoral policies. Thirty countries in the ECA region, plus the European Union, have submitted a Long-Term Low-Emission Development Strategy (LT-LEDS) that includes ambitions for GHG mitigation in agrifood systems.

On the adaptation side, significant progress also was observed regarding the number of developed National Adaptation Plans (NAPs) and national adaptation strategies in the ECA region. Sixteen countries – as compared to four countries in the 2021 report – have now established and adopted NAPs and national adaptation strategies.

Challenges and solutions for nationally determined contribution implementation and monitoring

Countries of the region face various obstacles when implementing the GHG mitigation and adaptation targets and policies outlined in their NDCs. The region encompasses countries with varying levels of economic development; some rely heavily on oil and gas as primary energy sources, and several are major global producers and exporters of fossil fuels.

Noticeable gaps exist in the levels of climate ambition and action across the ECA region. While some countries have made significant progress, others dither in defining and implementing effective climate measures, particularly in the agricultural sector. This divergence highlights the urgent need for enhanced international coordination and cooperation on climate initiatives.

In some cases, adaptation action is prioritized over mitigation action. This is due to many reasons, including the sector's vulnerability to the impacts of climate change. Although the agricultural sector is the second- or third-largest source of GHG emissions in all ECA countries, direct emissions attributed to the sector are often underreported in national GHG inventories. The entirety of agrifood systems contains significant emissions sources that are often not reflected as coming from the agricultural sector but rather from other sectors, such as transportation, energy and waste.

Key challenges for implementing mitigation and adaptation goals may include policy challenges (e.g. weak legal frameworks), limited institutional and technical capacities, issues with access to data and methodologies, low awareness of the climate impacts of agricultural practices among farmers, and a lack of resources, whether financial or technological, to implement sustainable practices.

With regards to adaptation, 13 of the 16 countries that included adaptation in their NDCs cited challenges linked to implementation and monitoring, while eight included challenges related to financing.

Support mechanisms for nationally determined contribution implementation and monitoring

Several international programmes, initiatives and support mechanisms help developing states and emerging economies with the implementation and monitoring of NDC mitigation and adaptation ambitions in the agricultural sector.

The United Nations Framework Convention on Climate Change (UNFCCC) supports capacity-building initiatives aimed at enhancing countries' abilities to effectively implement their NDCs. The UNFCCC also establishes guidelines and mechanisms for monitoring, reporting and verifying countries' progress in implementing their NDCs as established and mandated by parties to the convention. FAO facilitates knowledge-sharing and awareness-raising activities

to disseminate information on CCA and CCM measures through programmes and tools such as the FAO eLearning Academy and the Nationally Determined Contribution Expert Tool (NEXT).

The NDC Partnership is a global coalition of over 200 members, including more than 120 countries (both developed and developing) and over 80 institutions working together to enhance support for countries in implementing their NDCs. It provides technical assistance, knowledge sharing and capacity-building support tailored to the needs of individual countries for mitigation and adaptation.

Climate finance is provided via such sources as the Global Environment Facility (GEF), the Green Climate Fund (GCF) and the Adaptation Fund, in addition to bilateral and multilateral development agencies and multilateral development banks, the private sector and national budgetary resources.

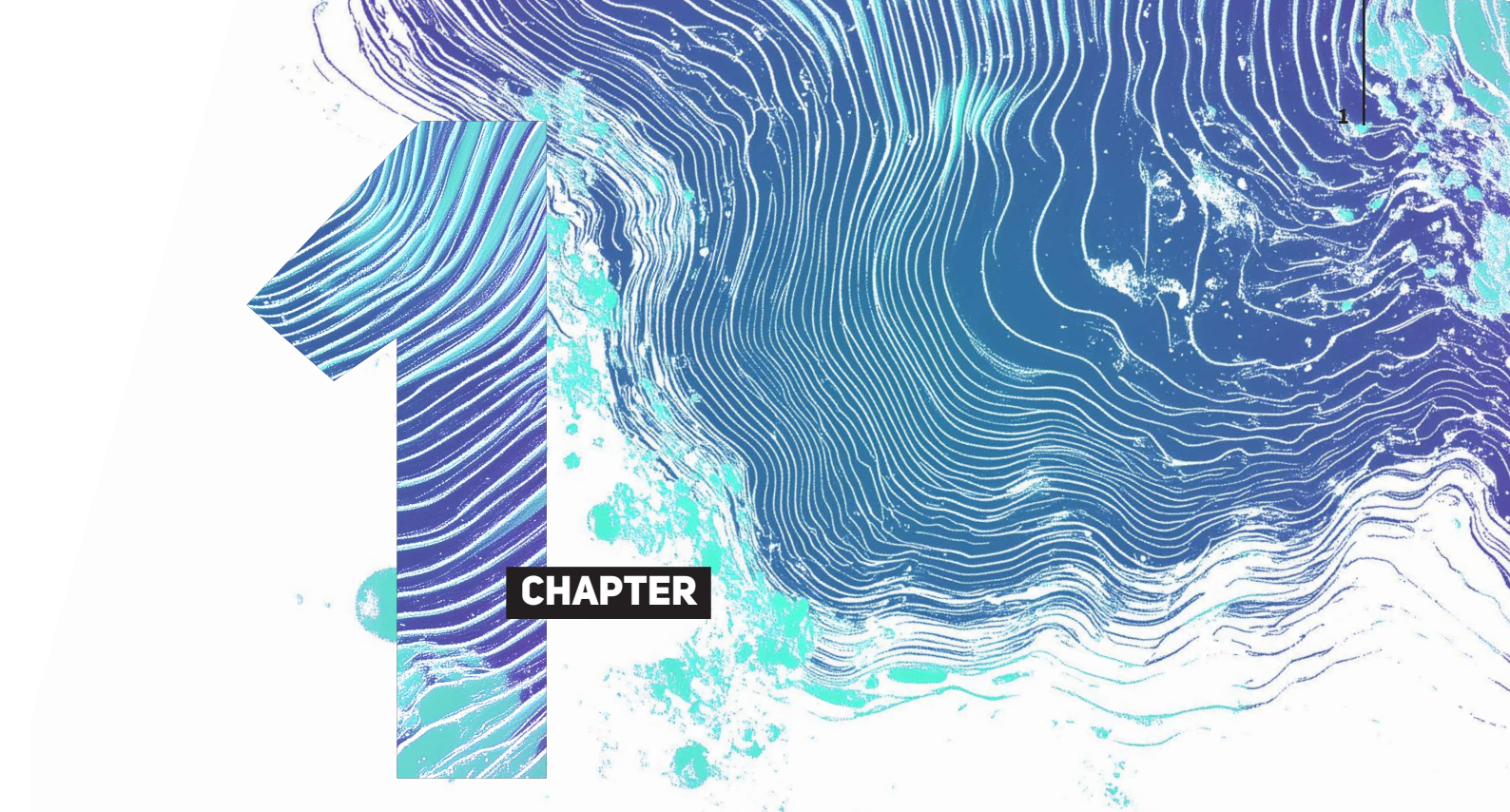
The Paris Agreement expanded the commitment to assisting developing countries in their climate actions. At UNFCCC COP29 in November 2024, parties agreed to a new collective quantified goal (NCQG), which calls on actors to scale up financing to developing countries for climate action from all public and private sources to at least USD 1.3 trillion per year by 2035, while setting a goal of at least USD 300 billion per year by 2035 for developing countries' climate action.

The alignment of climate finance needs with NDCs is critical for assessing the true requirements for implementing policies and measures. However, many countries still need to better integrate this information according to their specific needs. NDCs indicate significant needs for reforestation, crop diversification, land management and livestock management.

Climate finance in the ECA region has been on the rise since the early 2010s. During this period, financial resources allocated to agrifood systems have increased from around 10 percent to a range of 15–20 percent of the total funds allocated across all sectors. Estimates suggest that in 2021, agricultural and food systems in the region benefited from approximately USD 1.54 billion, while the total allocation across all sectors amounted to around USD 10.4 billion. The proportion of financing allocated to the agricultural sector in the region seems to correspond with the sector's emissions share, as categorized by the Intergovernmental Panel on Climate Change (IPCC). However, this does not reflect additional emissions from agrifood systems accounted for under other sectors (e.g. energy, waste and transportation).

Key recommendations from the report :

- Increase ambition in agriculture and wider agrifood system emission reductions: ECA countries should set clear and quantifiable emission reduction targets specifically for the agricultural sector, reflecting the sector's significant contribution to GHG emissions, and ensure that these targets are incorporated in NDCs and relevant national policies and strategies and budgets.
- Strengthen synergies between mitigation and adaptation: Countries should promote the integration of CCA and CCM actions within agrifood systems, ensuring that strategies to reduce emissions are balanced with those addressing climate adaptation and resilience.
- Support enhanced monitoring and reporting: Countries should strive to improve data collection, reporting and verification mechanisms for mitigation and adaptation action as well as climate finance and climate finance needs, including covering agriculture. International organizations can provide support to countries through capacity building and the development of methodologies and systems.
- Increase climate finance for agrifood systems transformation: Countries should develop sector-specific budgets and investment plans for agrifood systems transformation, based on identified needs and opportunities. Countries should increase the allocation of domestic climate finance, making use of a range of instruments and ensuring private-sector participation – for example by enhancing agri-value chains and supporting agricultural entrepreneurs and cooperatives. At the international level, multilateral development banks, donors and private-sector actors should also step up the amount of finance that is dedicated to sustainable agrifood systems, in line with country requirements and investment plans.
- Strengthen regional collaboration and knowledge sharing: International and regional organizations, including United Nations entities and other institutions, should strengthen cooperation across the ECA region by sharing best practices on policy frameworks, adaptation and mitigation strategies, effective approaches and technologies through regional platforms and networks.



1

CHAPTER

INTRODUCTION

Agrifood systems encompass the full spectrum of actors and interconnected activities that add value to agricultural production and related off-farm processes, such as food storage, aggregation, post-harvest handling, transportation, processing, distribution, marketing, disposal and consumption.³

These systems are a major source of greenhouse gas (GHG) emissions, considering the global shares of each Intergovernmental Panel on Climate Change (IPCC) sector – 22 percent for agriculture, forestry and other land use (AFOLU); 15 percent for transport; and 34 percent for electricity and heat production.⁴ In many countries of the Europe and Central Asia (ECA) region, agriculture is the biggest source of methane emissions and often ranks as the sector with the second-highest emissions, after energy. Agrifood systems contribute to GHG emissions through the use of agricultural machinery and equipment, enteric fermentation from ruminant animals, the application of chemical fertilizers and pesticides, and rice cultivation and other agriculture-related processes. As the global population keeps growing and consumption patterns change – with greater demand for meat and dairy products – agrifood systems must meet the needs of increased

productivity and enhanced nutritional value while generating fewer emissions.

In addition to being a major source of emissions, agrifood systems are extremely vulnerable to the impacts of climate change, which poses threats to crop yields and quality, increases the spatial distribution of plant pests and diseases, affects soil health, reduces the quantity and quality of water resources, jeopardizes food security and negatively affects nutritional quality. Forecasts indicate a rise in the frequency and intensity of extreme weather events (e.g. droughts, floods and storms), with significant impacts on productivity and yields in the agricultural subsectors, including crops, livestock, forestry, fisheries and aquaculture. Climate change can cause heat stress on livestock, reducing productivity and reproductive performance and increasing mortality rates. Warming oceans and freshwater systems, as well as altered water conditions, can reduce fish populations and modify species distributions. These devastating impacts already have had – and will continue to have – heavy consequences for the livelihoods of the millions of smallholders, farmers, women and youth who depend on those sectors for their income and food security.

International negotiations

The Paris Agreement aims to keep the increase in global average temperature well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C. The agreement establishes five-year cycles wherein parties commit to enhancing ambitions regarding climate action, reflecting this in their nationally determined contributions (NDCs). These NDCs are instrumental in ensuring incremental mitigation and adaptation efforts over time to fulfil the overarching objective of the Paris Agreement.

The 2023 Emissions Gap Report^b from the United Nations Environment Programme (UNEP) underscores a critical reality: Even if countries adhere to the commitments outlined in their NDCs, the world is on track to experience a global temperature rise of more than 3 °C above pre-industrial levels, with extensive and destructive consequences for natural ecosystems. Consequently, there is an imperative for stronger commitments to initiate a substantial transformation of economies and societies. As a major contributor to climate change and a cornerstone of global economies, agrifood systems must play a pivotal role in driving the necessary transformation.

The work of FAO on climate change is guided by the FAO Strategy on Climate Change 2022–2031^c and the 2022–2025 Action Plan for its implementation.^d The FAO Regional Office for Europe and Central Asia has developed a regional action plan framework that aims to steer all activities related to climate mitigation and adaptation in the region for 2024–2025. As outlined in the regional plan, FAO supports countries in data collection and analysis, including monitoring and reporting on NDCs, to enable evidence-based climate action for sustainable agrifood systems.

The majority of the countries within the ECA region have submitted updated NDCs with mitigation and adaptation targets reflective of their existing capacities and formulated policies. These incorporate a wide spectrum of GHG emissions, emission reduction potentials, adaptation aims and priorities, vulnerabilities, exposure, and mitigation and adaptation strategies within all key areas and sectors, including the

agricultural sector. The information included in these NDCs is important for determining where countries stand in terms of reaching the Paris Agreement goals and identifying the existing barriers they face regarding the implementation, monitoring and financing of their mitigation and adaptation objectives.

1.1 ABOUT THIS REPORT

OBJECTIVE

The primary goal of this publication is to offer an extensive analysis of climate mitigation and adaptation priorities relating to agrifood systems in Europe and Central Asia as identified via examination of the countries' latest NDCs and of existing national policies and measures that guide climate action in the agricultural sector, both in mitigation and adaptation.

The analysis also aims to guide the development of the next round of NDCs by providing an overview of the most updated NDCs in the region, including how comprehensively they address key climate change mitigation (CCM) and climate change adaptation (CCA) issues and how they reflect national policies and measures.

The report also assesses the countries' existing national policies and strategies, Long-term Low Emission Development Strategies, National Adaptation Plans (NAPs) and other documents.

In this report, the focus is on capturing efforts and progress made by countries in addressing the challenges posed by climate change in the context of agriculture and broader agrifood systems.

SCOPE

The report features an update on country-level GHG emissions based on the latest national inventories, with a focus on the agricultural sector and the most important emitting categories within this sector. The

^b This document is available online at <https://www.unep.org/interactives/emissions-gap-report/2023/>

^c This document is available online at <https://openknowledge.fao.org/server/api/core/bitstreams/f6270800-ee77-498f-9887-6d937c4f575a/content>

^d This document is available online at <https://openknowledge.fao.org/items/1d94e946-646e-4a2b-9b8c-396bb6f9b53b>



2021 edition of this report focused on the energy sector, as the primary emission source of most countries, while this iteration looks more closely at the agriculture and land use, land-use change and forestry (LULUCF) sectors, to the extent possible.

National GHG inventories often categorize emissions from various sources within agrifood systems under such sectors as energy, transport and waste. Consequently, throughout this report, discussions about agriculture emissions focus on emissions caused by agricultural production (including livestock and fisheries) rather than encompassing the whole agrifood system, which includes the entire agriculture value chain (including transport and food processing). This limitation stems from the design and preparation of national GHG inventories. To fully understand the impact of agrifood systems on global emissions, a more comprehensive calculation that includes all agrifood systems-related emission sources would be necessary.

The report also provides a thorough analysis of adaptation in agrifood systems, evaluating the impacts of climate change on agriculture and the extent of agriculture-related loss and damages in the NDCs.

The requirement of updating NDCs with increased ambitions for both mitigation and adaptation has brought an encouraging influence for new legislative and policy frameworks in many countries. Therefore, this report includes an overview of national CCM and CCA policies, along with key sectoral policies and measures that have been newly developed or revised. It provides a detailed overview of each country's existing national policies, measures and strategies for CCM and CCA, disaster risk reduction, and agriculture and sustainable development. This includes not only the policies and strategies with the primary objectives of CCA and/or mitigation but also the policies and measures that may yield climate-related outcomes even if they are not specifically aimed at addressing climate change.

Moreover, the report covers some of the challenges, constraints and capacity-building needs related to NDC implementation and monitoring while also outlining existing international initiatives, programmes and financing sources that can support countries in the region.

In summary, the report aims to highlight recent developments in the ECA countries concerning their updated NDCs, as well as the latest changes in their policy and legislative frameworks designed to achieve the targets and goals set in these NDCs. It provides a framework to understand each country's commitment to global climate change efforts through their NDCs and national and sectoral climate change policies.

As a whole, the 27 Member States of the European Union (EU-27) have been considered primarily as one country (as a party to the UNFCCC), while the rest of the countries have been assessed individually. The FAO programme countries are Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, North Macedonia, Republic of Moldova, Serbia, Tajikistan, Türkiye, Turkmenistan, Ukraine and Uzbekistan.

- The report covers the ECA region, including the following five subregions:
- the Caucasus (Armenia, Azerbaijan and Georgia)
- Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan)
- CIS Europe and Ukraine (Belarus, Republic of Moldova, Russian Federation and Ukraine)
- EU-27, the United Kingdom and EFTA (Iceland, Liechtenstein, Norway and Switzerland)
- Southeastern Europe (Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia and Türkiye)

1.2

GLOBAL CONTEXT OF CLIMATE CHANGE MITIGATION TARGETS AND STOCKTAKING

THE NATIONALLY DETERMINED CONTRIBUTION FIVE-YEAR CYCLE

NDCs are pledges made by countries under the United Nations Framework Convention on Climate Change (UNFCCC), with commitments focused primarily on reducing GHG emissions (mitigation goals) and, in many instances, adapting to the impacts of climate change (adaptation goals).

NDCs outline the specific climate actions that countries plan to undertake in alignment with the Paris Agreement's overarching goals. The first NDCs, with objectives through 2025 or 2030, typically included comprehensive and quantified emission reduction objectives that indicated the nation's emission trajectory. Additionally, many NDCs encompass non-GHG goals, such as attaining a specific proportion of renewable energy production or undertaking forest restoration efforts. Most NDCs also outline precise measures or policies intended to realize stated objectives.

The Paris Agreement's five-year cycle is designed to enhance commitment levels and achieve outlined objectives, and NDC submission is integral to this cycle. In the time since the 2021 FAO NDC policy analysis, several countries have updated their NDCs with more ambitious emission reduction and adaptation targets (Table 1).

Table 1. Nationally determined contribution submission dates for countries in Europe and Central Asia

Country	First NDC	Updated NDC	
Albania	21/09/2016	12/10/2021	-
Armenia	23/09/2017	05/05/2021	-
Azerbaijan	09/01/2017	10/10/2023	-
Belarus	21/09/2016	11/10/2021	-
Bosnia and Herzegovina	16/03/2017	20/04/2021	-
European Union (EU-27)	05/10/2016	18/12/2020	19/10/2023
Georgia	08/05/2017	05/05/2021	-
Iceland	21/09/2016	18/02/2021	-
Kazakhstan	06/12/2016	27/06/2023	-
Kyrgyzstan	18/02/2020	09/10/2021	-
Liechtenstein	20/09/2017	-	-
Montenegro	21/12/2017	15/06/2021	-
North Macedonia	21/09/2016	12/10/2021	-
Norway	23/09/2017	05/05/2021	-

Source: NDCs. See References.

Table 1. (Cont.)

Country	First NDC	Updated NDC	
Republic of Moldova	09/01/2017	10/10/2023	-
Russian Federation	21/09/2016	11/10/2021	-
Serbia	16/03/2017	20/04/2021	-
Switzerland	05/10/2016	18/12/2020	19/10/2023
Tajikistan	08/05/2017	05/05/2021	-
Turkmenistan	21/09/2016	18/02/2021	-
Türkiye	06/12/2016	27/06/2023	-
Ukraine	18/02/2020	09/10/2021	-
United Kingdom of Great Britain and Northern Ireland	20/09/2017	-	-
Uzbekistan	09/11/2018	30/10/2021	-

Note: The information in this table is valid as of September 2024. The NDC Interim Registry of the UNFCCC is available online at <https://unfccc.int/NDCREG>

LONG-TERM LOW EMISSION DEVELOPMENT STRATEGIES

In Article 4, Paragraph 19, the Paris Agreement requires that each party develop and submit a Long-Term Low Emission Development Strategy, or LT-LEDS, that outlines goals extending to 2050, generally comprising a global outlook and objectives (e.g. pertaining to sustainable development, mitigation and adaptation) and sector-

specific trajectories aimed at realizing the strategy's goals, among other components. As of August 2024, 73 countries^e have submitted an LT-LEDS. So far, Europe and the Caucasus have the highest number of submissions compared to the other regions of the world, with 30 countries plus the European Union having submitted an LT-LEDS. In Central Asia, no country has officially submitted an LT-LEDS, but Kazakhstan^f and Uzbekistan^g have developed one.

Table 2. Status of Long-Term Low Emission Development Strategy Submissions

Subregion	Submissions
Caucasus	Georgia, Armenia
Central Asia	N/A
CIS Europe and Ukraine	Russian Federation, Ukraine
EU-27, United Kingdom and EFTA	European Union, ^h United Kingdom of Great Britain and Northern Ireland, Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland
Southeastern Europe	Bosnia and Herzegovina, North Macedonia, Serbia, Türkiye

Source: NDCs. See References.

^e All submitted LT-LEDS documents are available at UNFCCC LT-LEDS Portal: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

^f This document is available online at <https://adilet.zan.kz/rus/docs/U2300000121>.

^g This document is available online at <https://lex.uz/docs/4539506>.

^h Despite the European Union having submitted its LT-LEDS to the UNFCCC, each European Union Member also submits its national LT-LEDS as a party.

GLOBAL STOCKTAKE OF THE PARIS AGREEMENT AND OUTCOMES OF UNFCCC COP28

Global Stocktakes (GSTs) are designed to evaluate the implementation of the Paris Agreement, assessing the global community's advancement towards fulfilling the agreement's goals and objectives over a five-year period and guiding parties in enhancing and updating the actions and targets in their NDCs.

The first GST, which concluded at COP28 in 2023, urged parties to triple global renewable energy capacity and double energy efficiency improvements by 2030. It also called for accelerating the phase-down of unabated coal power, phasing out inefficient fossil fuel subsidies and implementing other measures to transition energy systems away from fossil fuels. In their next round of NDCs, due by 2025, parties are encouraged to propose ambitious and economy-wide emission reduction targets that cover all greenhouse gases, sectors and categories, aligning with the limit of a 1.5 °C global average temperature increase.

The Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action,¹ launched during COP28, highlights the crucial role of agrifood systems in addressing climate change. In endorsing this historic declaration, 160 world leaders agreed to mainstream agrifood systems into their climate action by adopting inclusive policies, mobilizing financial resources, encouraging innovations and enhancing international trade.

COP28 also placed an increased focus on methane emissions. The first GST recognized the need to substantially reduce methane emissions by 2030, though current discussions focus on methane emissions from the oil and gas sectors rather than from agriculture.

Following limited progress on the Sharm El-Sheikh Joint Work on Implementation of Climate Action on Agriculture and Food Security since its adoption at COP27, several entities – FAO, the COP28 United Arab Emirates Presidency, Consultative Group on International Agricultural Research (CGIAR), the International Fund for Agricultural Development (IFAD) and the World Bank – launched the three-year

Joint Agrifood Sharm El-Sheikh Support Programme to help unlock funds and provide assistance to farmers, food producers, small agribusinesses and local communities.⁶ During the Subsidiary Body meeting held in June 2024, parties agreed on a road map for work, and at COP29, parties discussed and agreed on the primary functions and structure of the Sharm el-Sheikh online portal, where countries and observers will be able to submit information on climate action in support of agriculture and food security.

Adaptation is mentioned in the first GST, which encouraged the implementation of land-use management, sustainable agriculture, resilient food systems, nature-based solutions and ecosystem-based approaches.⁷ The GST also noted the importance of increasing adaptation efforts to achieve climate-resilient agrifood systems and recognized the importance of sustainable and regenerative production and equitable access to adequate food and nutrition for all.⁶

Agrifood systems in the context of climate change

Agrifood systems encompass everything from agricultural production to the industrial processes that refine and distribute food and non-food products. This intricate web involves not only the physical conversion of raw materials but also the social, economic and environmental impacts that accompany these processes.

The agricultural sector is both a major contributor to GHG emissions and highly vulnerable to the impacts of climate change. This underscores the central role of agriculture in the broader climate change agenda and highlights the need for comprehensive strategies that address its dual role as a driver and casualty of climatic shifts. Agrifood systems must enhance productivity and resilience while achieving climate goals, requiring addressing food security and nutrition needs and mobilizing climate finance for sustainable transformation.

Agrifood systems in nationally determined contributions

The agricultural sector stands distinct from other sectors outlined in the NDCs, given its direct linkages to several Sustainable

¹ For more information, please visit <https://www.cop28.com/en/food-and-agriculture>.

Development Goals (SDGs), including SDG 1 (No Poverty), SDG 2 (Zero Hunger) and SDG 3 (Good Health and Well-being). Furthermore, its significance extends to other SDGs, including SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequalities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water) and SDG 15 (Life on Land).

Hence, it is a priority to ensure that the agricultural sector is transparently and comprehensively represented in NDCs, encompassing both mitigation and adaptation aspects. This is crucial, as NDCs serve as an inclusive assessment of collective progress towards climate goals. Particularly for Europe and Central Asia, reflecting agriculture and agrifood systems in NDCs is pivotal for several reasons:

- Significant economic contribution of agriculture and importance for livelihoods and food security: Agriculture is a significant contributor to the economies and livelihoods of countries in the ECA region.
- Climate change impacts on agriculture: The ECA region is already experiencing the impacts of climate change, including shifts in temperature, precipitation patterns and extreme weather events. Agriculture is particularly vulnerable to these changes, affecting crop yields, livestock and overall food security.
- Climate finance: Clear communication on financing needs and transparent reporting enhance the ability of countries to access international climate finance opportunities. To provide targeted support, resource partners require accurate and detailed information on countries' vulnerabilities, mitigation and adaptation strategies, and priorities related to agriculture and food systems for climate action.
- Evidence-based decision-making: As current NDCs guide more ambitious goals for the next NDC cycle, a robust NDC must be informed by up-to-date and accurate data. Reliable data also are critical to the establishment of adequate

national strategies and policies and the identification and financing of the most pressing needs. However, the acquisition of high-quality data often is among the biggest bottlenecks for countries.

1.3 GREENHOUSE GAS EMISSIONS IN EUROPE AND CENTRAL ASIA

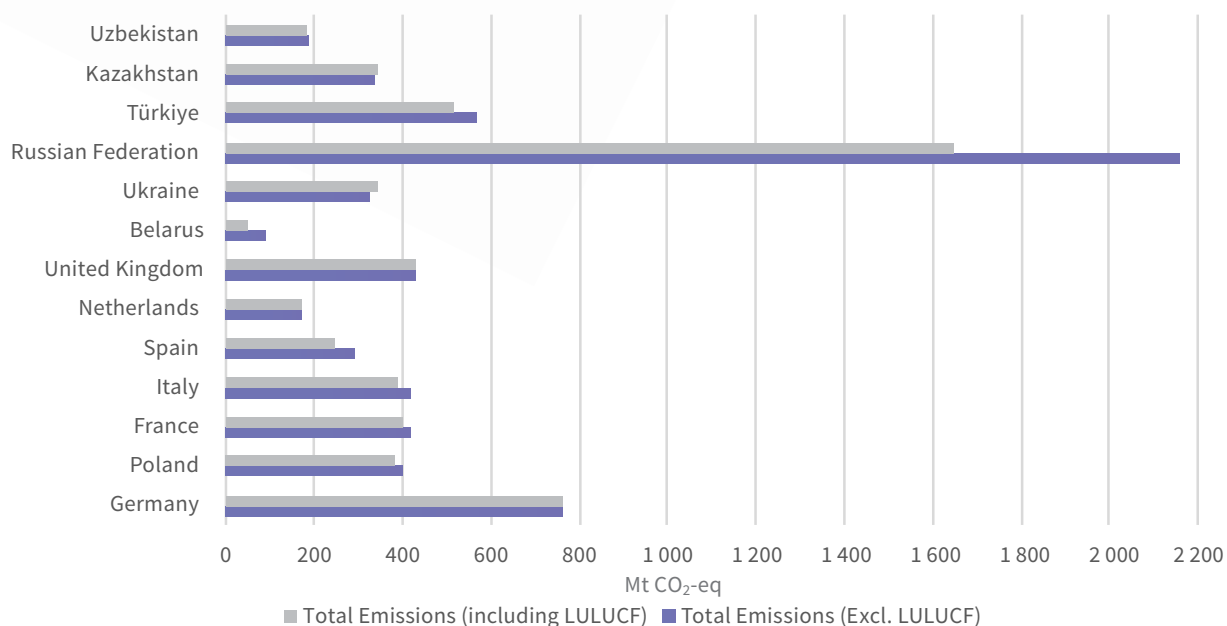
In 2022, global GHG emissions set a new record, reaching 57.4⁸ gigatonnes (Gt) of carbon dioxide equivalent (Gt CO₂e), marking a 1.2 percent increase (0.6 Gt CO₂e) from the previous year.⁹ It is imperative to substantially reduce global GHG emissions to a range between 33 and 41 Gt CO₂-eq by 2030 in order to align with the least-cost pathway necessary to achieve the temperature target outlined in the Paris Agreement. This highlights a significant emission reduction gap that must be bridged globally.

The graphs provided in this section consider national emissions, both including and excluding LULUCF. LULUCF may act as a carbon sink, thus reducing overall national GHG emissions in many countries, or it may act as a net emitter due to land use and land-use change practices.

The top seven global emitters in absolute terms are: China, the United States of America, India, the European Union, the Russian Federation, Brazil and Indonesia.¹⁰ On the other hand, G20 countries — among which are the Russian Federation and the European Union — accounted for 76 percent of global emissions.

Within the ECA region, the countries with the highest emissions in absolute terms are the Russian Federation, Germany, Türkiye, the United Kingdom, France and Italy (Figure 1).

Figure 1. Total greenhouse gas emissions among countries in Europe and Central Asia with annual emissions over 100 Mt CO₂-eq

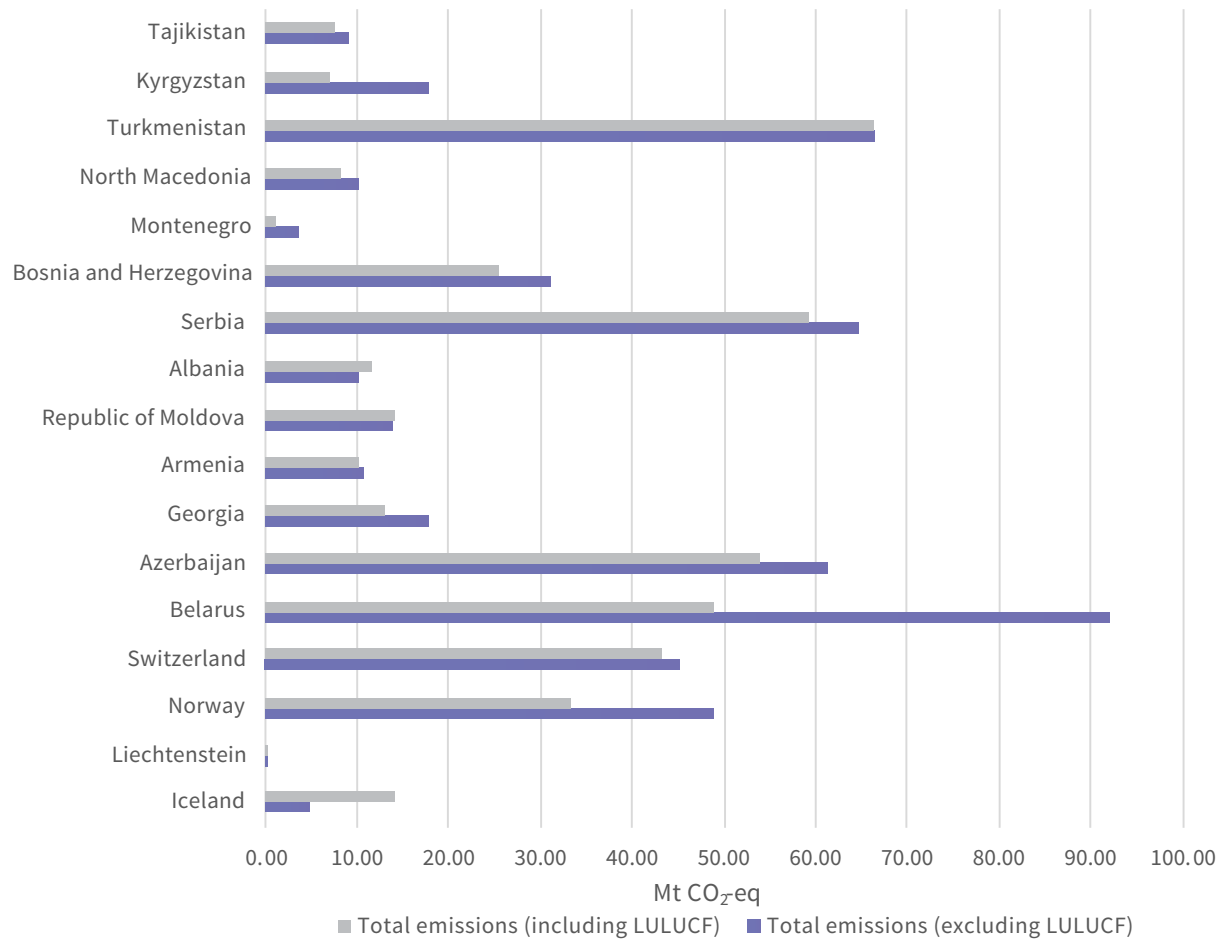


Note: Emissions reflect the latest year of inventories, which are 2017 for Uzbekistan and 2021 for the rest of the countries.
Sources: Individual country inventories. See References.

Among the countries that emit less than 100 megatonnes (Mt) CO₂-eq per year (Figure 2), Belarus, Turkmenistan, Serbia, Azerbaijan, Norway and Switzerland have the highest absolute emissions when excluding LULUCF.

When including LULUCF emissions, Belarus and Norway benefit from the LULUCF sector being a significant emissions sink, while in countries such as Iceland and Albania, the LULUCF sector is a net emitter.

Figure 2. Total greenhouse gas emissions of countries in Europe and Central Asia with emissions under 100 Mt CO₂-eq



Note: Emissions reflect the latest year of inventories, which are 2016 for Azerbaijan, 2017 for Georgia, 2017 for Armenia, 2019 for Republic of Moldova, 2019 for Albania, 2020 for Serbia, 2018 for Bosnia and Herzegovina, 2019 for Montenegro, 2016 for North Macedonia, 2010 for Turkmenistan, 2018 for Kyrgyzstan, 2014 for Tajikistan and 2021 for the rest of the countries.

Sources: Individual country inventories. See References.

GHG emissions from the agricultural sector can result from a variety of emission categories, as defined by the IPCC. The emission categories (and relevant subcategories for this analysis) are the following:

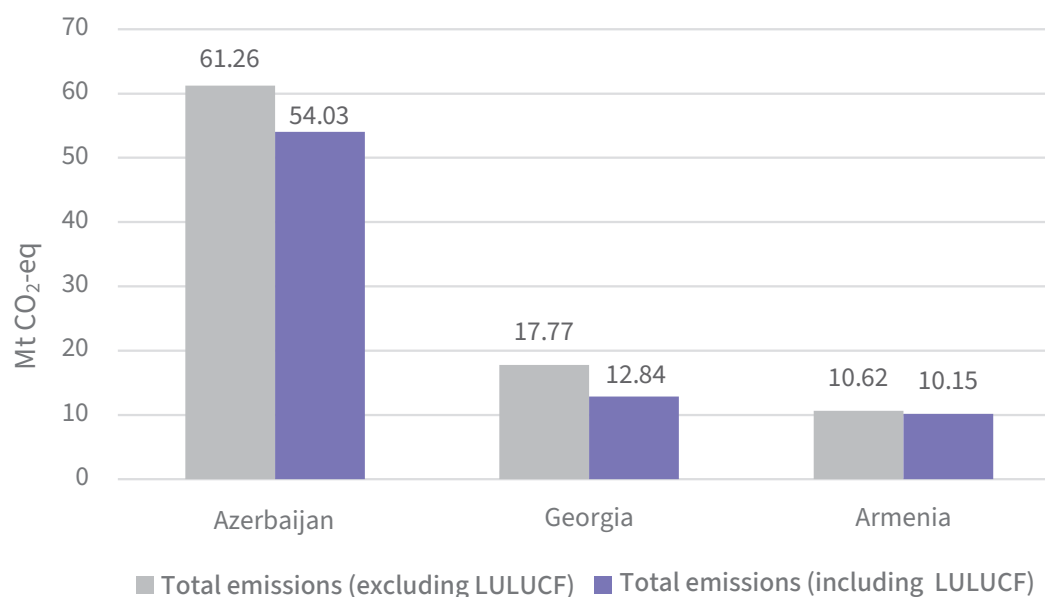
- enteric fermentation
- manure management
 - indirect N₂O from the collection, storage and use of manure
- rice cultivation
- agricultural soils
 - direct N₂O emissions from managed soils
- prescribed burning of savannas
- field burning of agricultural residues
 - biomass burning

- liming
- urea application
- other carbon-containing fertilizers
- other

CAUCASUS

All the countries of the Caucasus region have annual emissions below 100 Mt CO₂-eq. However, Azerbaijan has significantly higher emissions than Georgia and Armenia due to its economic activities based on fossil fuels (Figure 3). Emissions in Georgia have been increasing since 1995 due to economic growth, technological gaps, energy inefficiencies, and limited mitigation measures.¹

Figure 3. Total greenhouse gas emissions in the Caucasus



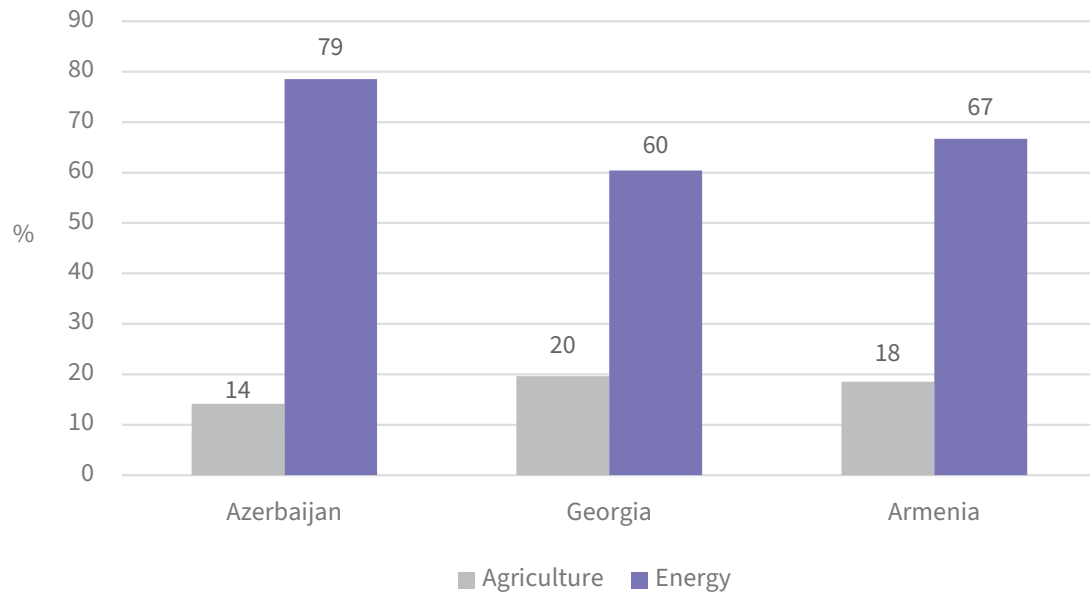
Note: Emissions reflect the latest year of inventories, which are 2017 for Uzbekistan and 2021 for the rest of the countries.
Sources: Individual country inventories. See References.

¹ For more information, please see the LT-LEDs from Georgia at <https://unfccc.int/sites/default/files/resource/Georgia%27s%20LT-LEDs%202023-eng.pdf>.

In Georgia and Armenia, agriculture represents a significant share of each country's GHG emissions (20 percent and 18 percent, respectively), while the biggest emitting sector, energy, stands at 60 percent

and 67 percent respectively (Figure 4). Emissions from agriculture represent 14 percent of the emissions of Azerbaijan, also second after the energy sector at 79 percent.

Figure 4. Share of energy and agriculture emissions compared to total greenhouse gas emissions, latest year available

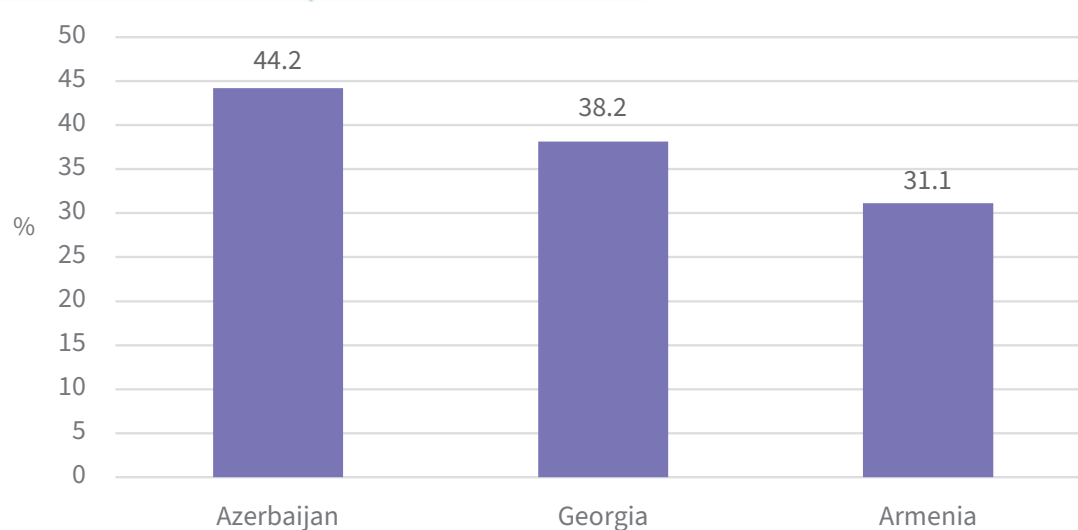


Note: Emissions reflect the latest year of inventory, which is 2016 for Azerbaijan and 2017 for Georgia and Armenia.

Sources: Individual country inventories. See References.

The agricultural sector is often linked to significant methane emissions and is sometimes the largest methane-emitting sector. In Azerbaijan, Georgia and Armenia, the share of methane emissions from

agricultural sector reaches 44.4 percent, 38.2 percent and 31.1 percent of total methane emissions, respectively, reflecting a significant methane emission source for the countries (Figure 5).

Figure 5. Share of emissions from the agricultural sector in overall methane emissions in the Caucasus, latest year available

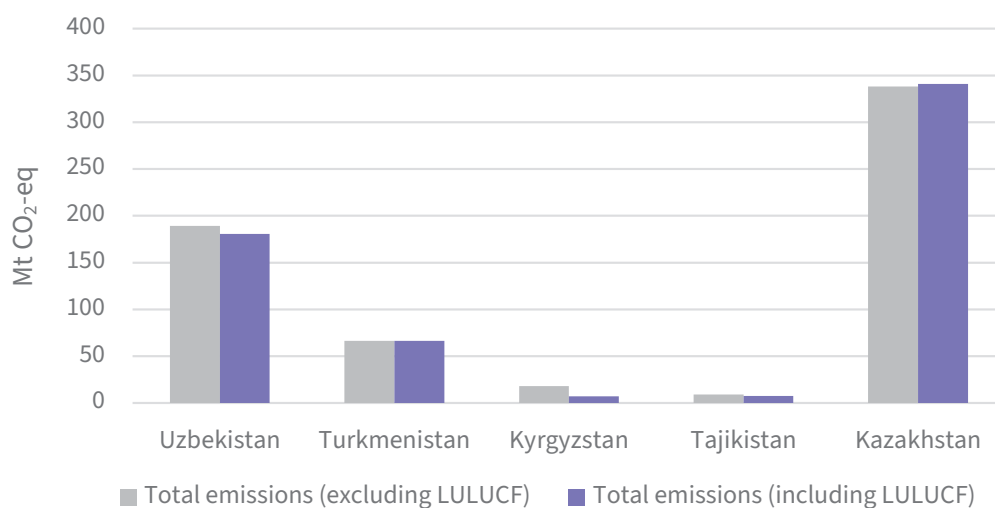
Note: Emissions reflect the latest year of inventories, which are 2017 for Uzbekistan and 2021 for the rest of the countries.

Sources: Individual country inventories. See References.

The agricultural activities that cause most of the emissions from agriculture in this subregion are enteric fermentation,

manure management and agricultural soil management-related activities such as fertilizer use.

CENTRAL ASIA

Figure 6. Share of energy and agriculture emissions in overall emissions in Central Asia

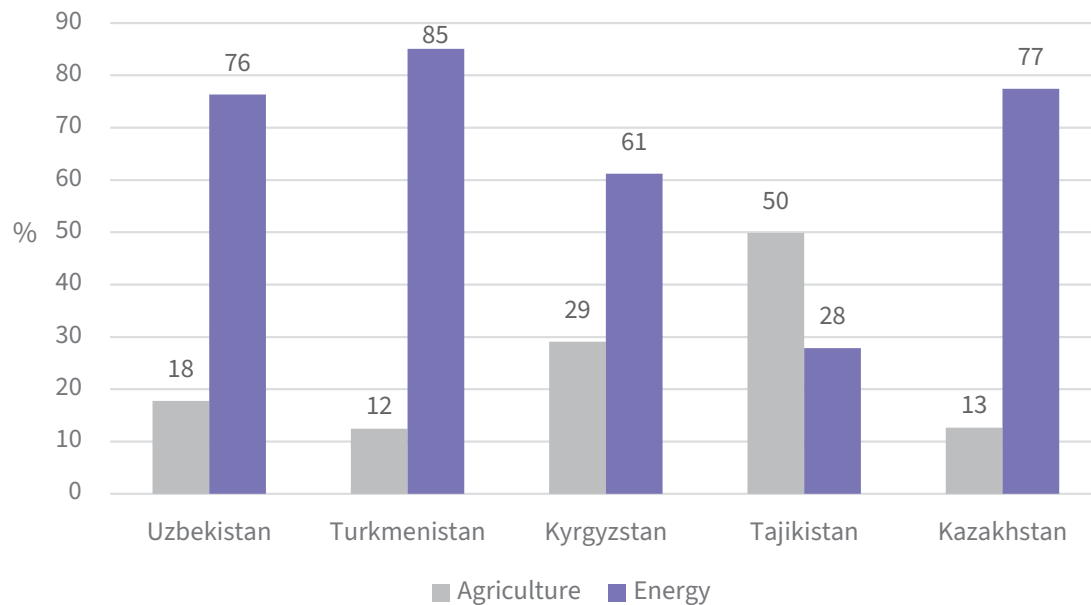
Note: Emissions reflect the latest year of inventories, which are 2017 for Uzbekistan, 2020 for Turkmenistan, 2018 for Kyrgyzstan, 2014 for Tajikistan and 2021 for the rest.

Sources: Individual country inventories. See References.

Kazakhstan and Uzbekistan have significantly higher emissions than the rest of the Central Asia subregion. Kazakhstan is the only country in which LULUCF cause net

emissions (Figure 7). Emissions from the sector are attributed to croplands rather than forest conversion and have been declining since the mid-2000s.¹¹

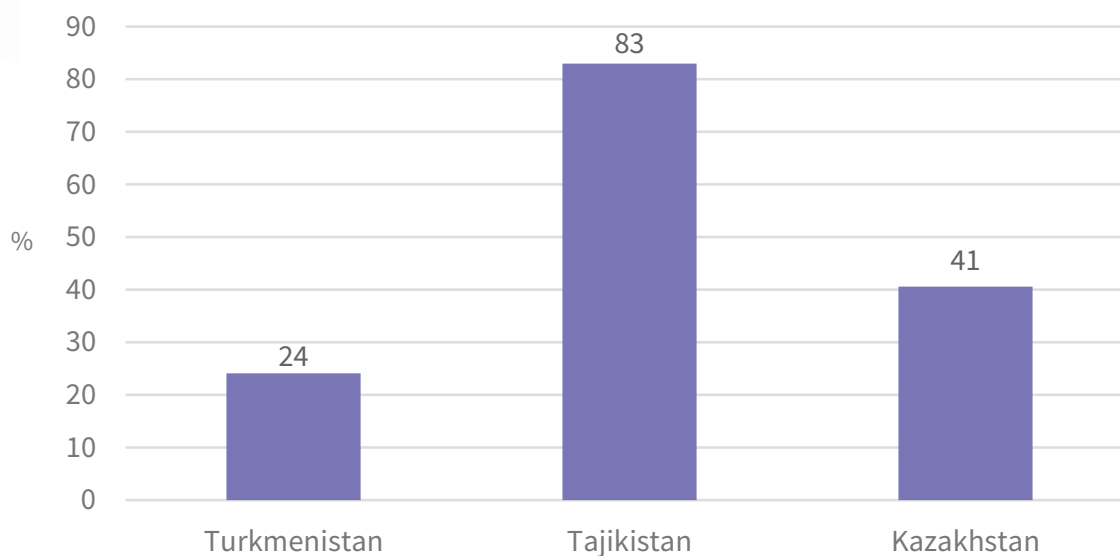
Figure 7. Total greenhouse gas emissions in Central Asia



Sources: Individual country inventories. See References.

Agriculture emissions in the subregion are significant compared to those from the energy sector. In Tajikistan, agricultural emissions (50 percent of total emissions) exceed the emissions from the energy sector (28 percent) due to the high share of hydropower generation in energy mix. In Turkmenistan, energy sector emissions are significantly higher (85 percent) than agricultural sector emissions (12 percent).

In Central Asia, the agricultural sector is responsible for 83 percent of methane emissions in Tajikistan, 41 percent in Kazakhstan and 24 percent in Turkmenistan (Figure 8). Data were not available for the other countries of the subregion.

Figure 8. Share of agricultural sector emissions in total methane emissions in the Central Asia subregion, latest year available

Note: Emissions reflect the latest year of inventories, which are 2017 for Uzbekistan and 2021 for the rest of the countries.

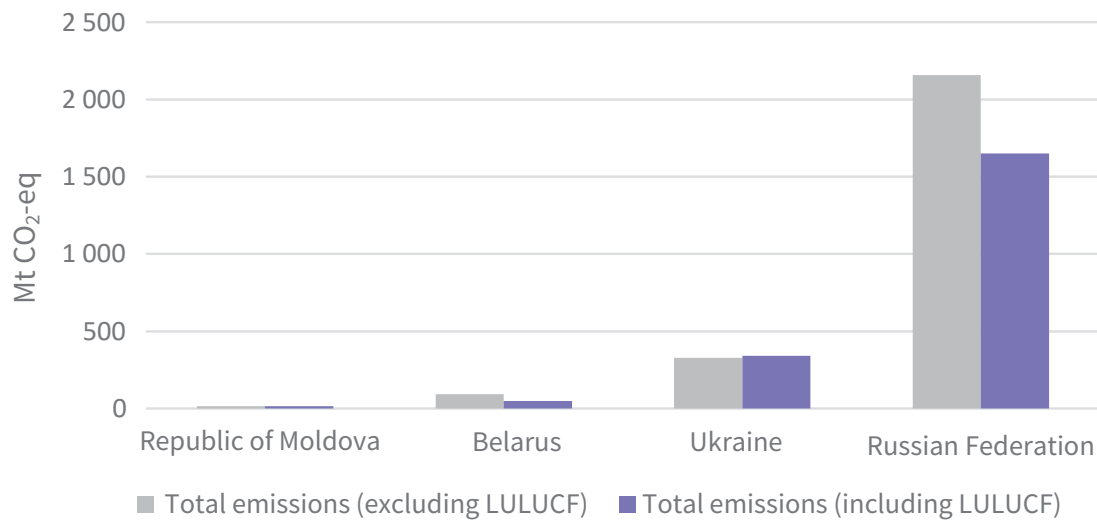
Sources: Individual country inventories. See References.

Enteric fermentation is the activity causing most of the agriculture emissions in this subregion, but biomass burning also is a significant source of emissions in Kazakhstan

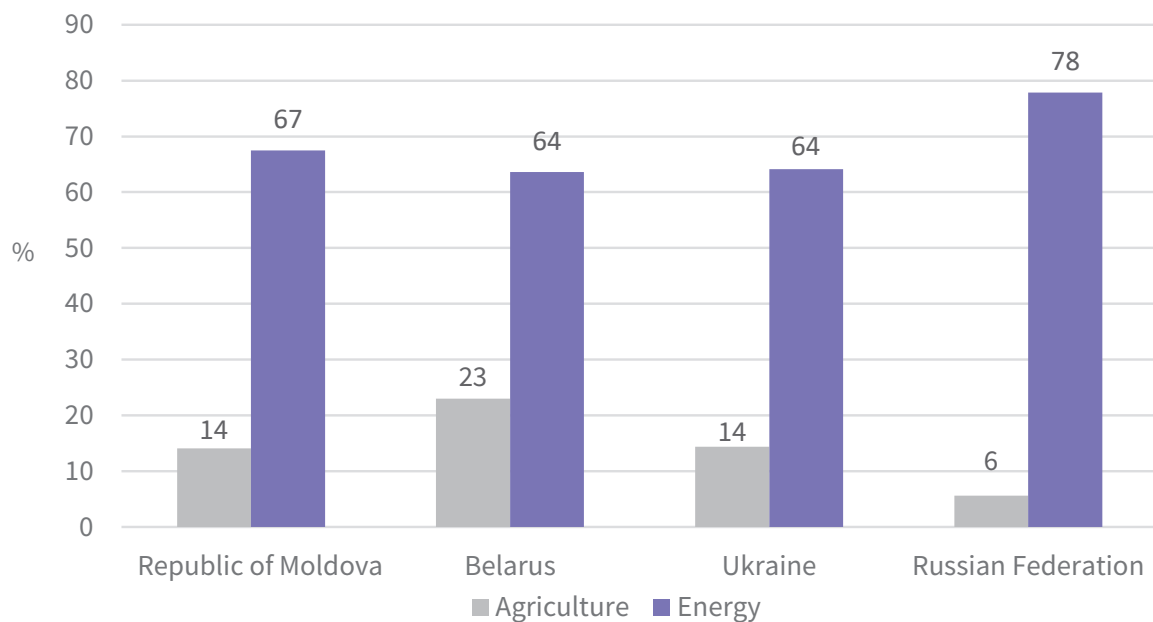
CIS EUROPE AND UKRAINE

GHG emissions from the Russian Federation exceed emissions from the rest of the CIS region

countries. The LULUCF sector in the Republic of Moldova and Ukraine is net emitting, while it is a net sink in the Russian Federation (Figure 9). In Belarus, the share of agricultural emissions is significant, as the sector causes 23 percent of total emissions. The agricultural sector represents 14 percent of emissions in both the Republic of Moldova and Ukraine (Figure 10).

Figure 9. Total greenhouse gas emissions in the CIS Europe and Ukraine subregion

Note: Emissions reflect the latest year of inventories, which are 2017 for Uzbekistan and 2021 for the rest of the countries.
Sources: Individual country inventories. See References.

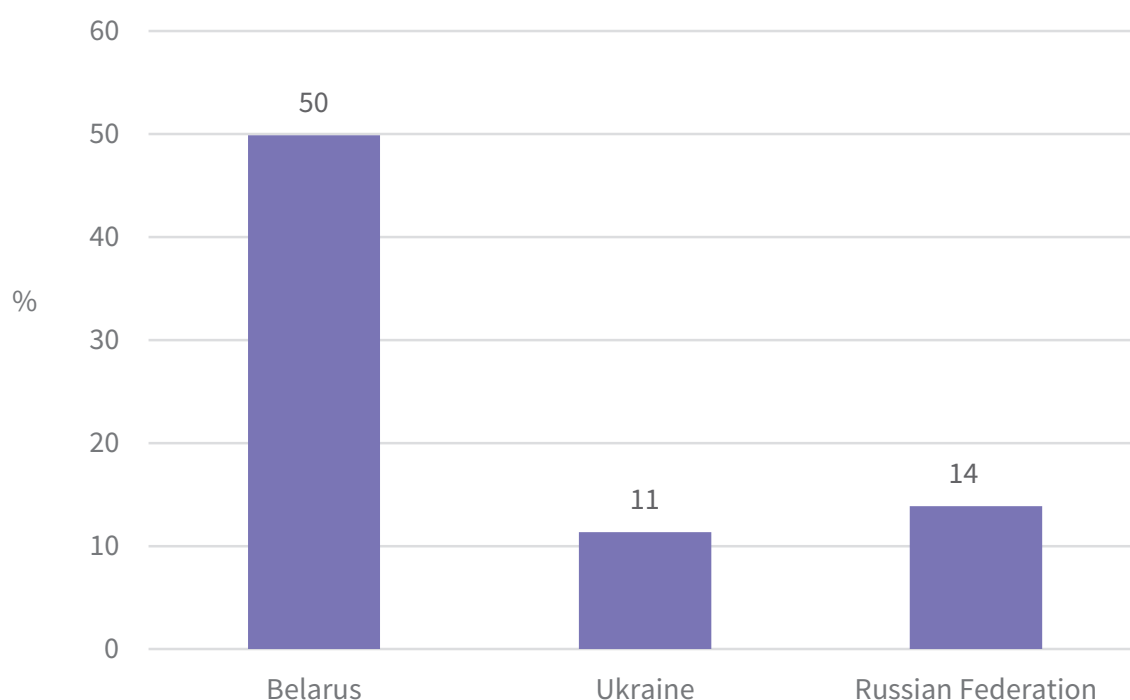
Figure 10. Share of energy and agriculture emissions compared to total greenhouse gas emissions (excluding LULUCF) in the CIS Europe and Ukraine subregion

Sources: Individual country inventories. See References.

The agricultural activities that cause most of the emissions in this subregion are mainly biomass burning, but in the Republic of Moldova, agricultural soil management is the most important contributor to overall GHG emissions. Enteric fermentation and manure management are significant emission sources in Belarus, Ukraine and the Russian Federation.

The countries that have reported the agricultural sector's share of overall methane emissions are provided in Figure 11. Due to the importance of agriculture in the economy of Belarus, the sector contributes 50 percent of the methane emissions there.

Figure 11. Share of agricultural sector emissions in total methane emissions, selected countries of the CIS Europe and Ukraine subregion



Note: The figure includes only those countries for which data were available.

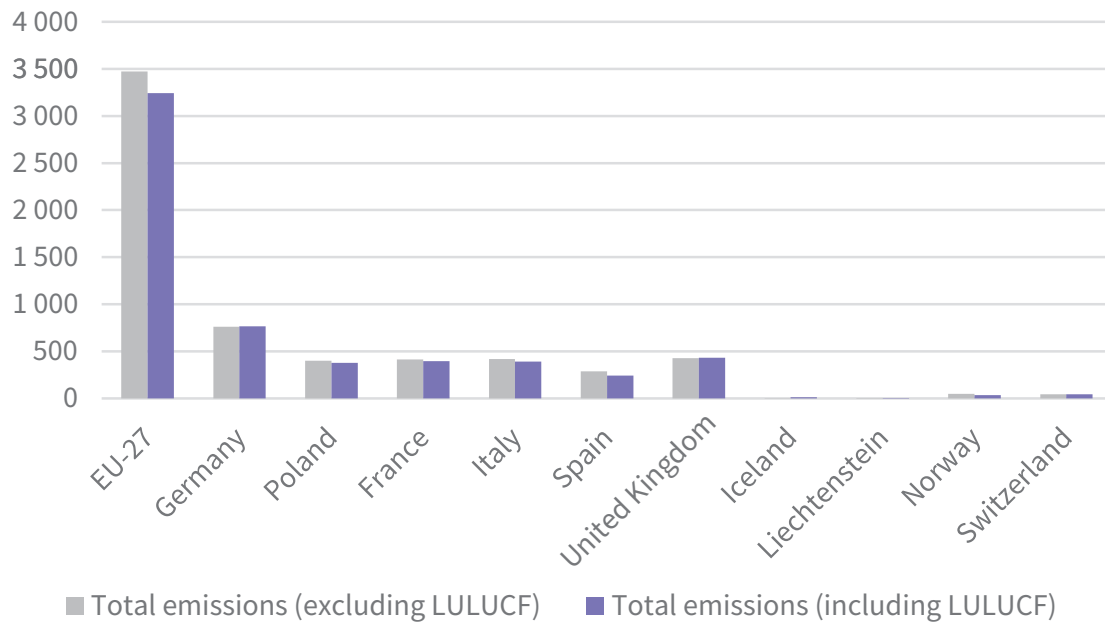
Sources: Individual country inventories. See References.

EU-27, UNITED KINGDOM, AND EFTA

The European Union and its 27 Member States represent a substantial share of global greenhouse gas emissions, with Germany,

Poland, France, Italy and Spain standing out as significant contributors. Emissions in the United Kingdom of Great Britain and Northern Ireland are comparable in scale to those of these countries. In contrast, the EFTA countries exhibit markedly lower levels of absolute emissions (Figure 12).

Figure 12. Total greenhouse gas emissions in the EU-27, United Kingdom and EFTA subregion



Sources: Individual country inventories. See References.

Compared to emissions from the energy sector, agricultural emissions do not represent a high share of total emissions in any of the countries of the EFTA or of the EU-27 and the United Kingdom, never exceeding 14 percent of total emissions (Figure 13).

At the same time, the agricultural sector causes a significant share of methane emissions,

representing 87 percent in Liechtenstein, 83 percent in Switzerland, 56 percent in the EU-27, 54 percent in Norway and 49 percent in the United Kingdom (Figure 14).

The agricultural activities that cause most of the emissions in this subregion are enteric fermentation, manure management and agricultural soil management.

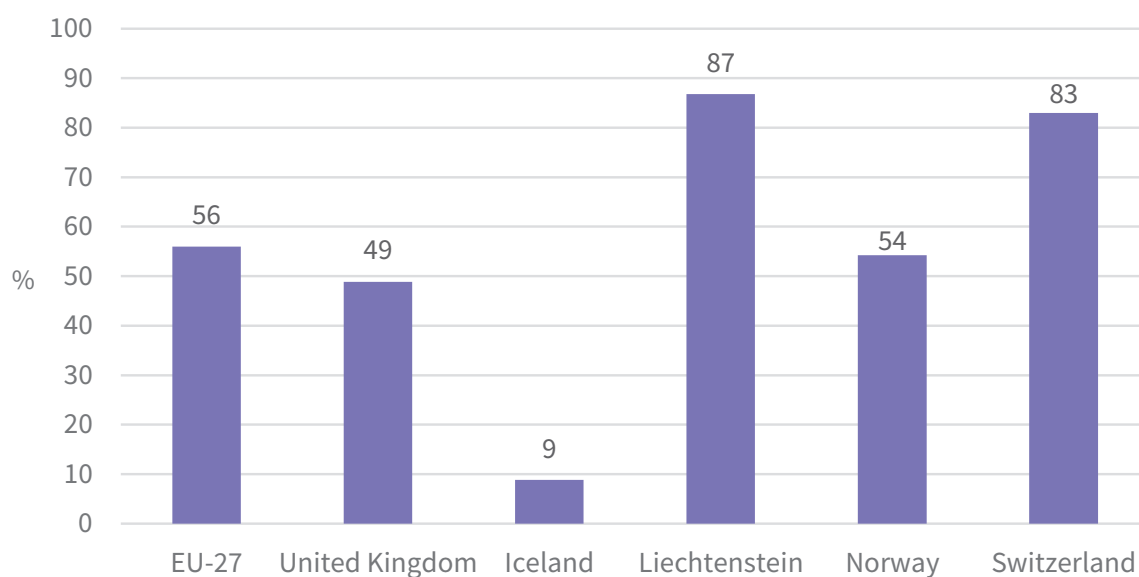
Figure 13. Share of energy and agriculture emissions in total greenhouse gas emissions (excluding LULUCF) in the EU-27, United Kingdom and EFTA subregion



Note: The figure includes only those countries for which data were available.

Sources: Individual country inventories. See References.

Figure 14. Share of agricultural sector emissions in total methane emissions in the EU-27, United Kingdom and EFTA subregion



Note: The figure includes only those countries for which data were available.

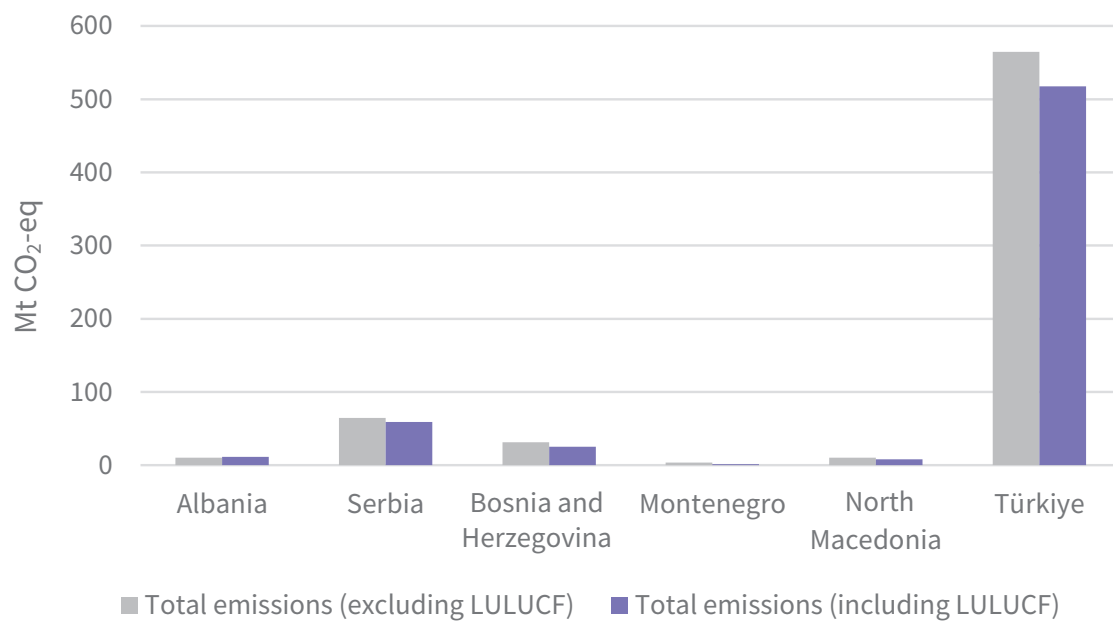
Sources: Individual country inventories. See References.

SOUTHEASTERN EUROPE

In the Southeastern Europe subregion, Türkiye is the largest emitter, and the country's GHG emissions have increased significantly over the past few decades due to economic growth (Figure 15).

In the subregion, agricultural emissions are low compared to those of the energy sector, but agriculture still ranks as the second or third sector for emissions. Albania is an exception, with a share of agricultural sector emissions of 23 percent due to its high economic dependence on the agricultural sector (Figure 16).

Figure 15. Share of energy and agriculture emissions in total greenhouse gas emissions (excluding LULUCF) in the Southeastern Europe subregion

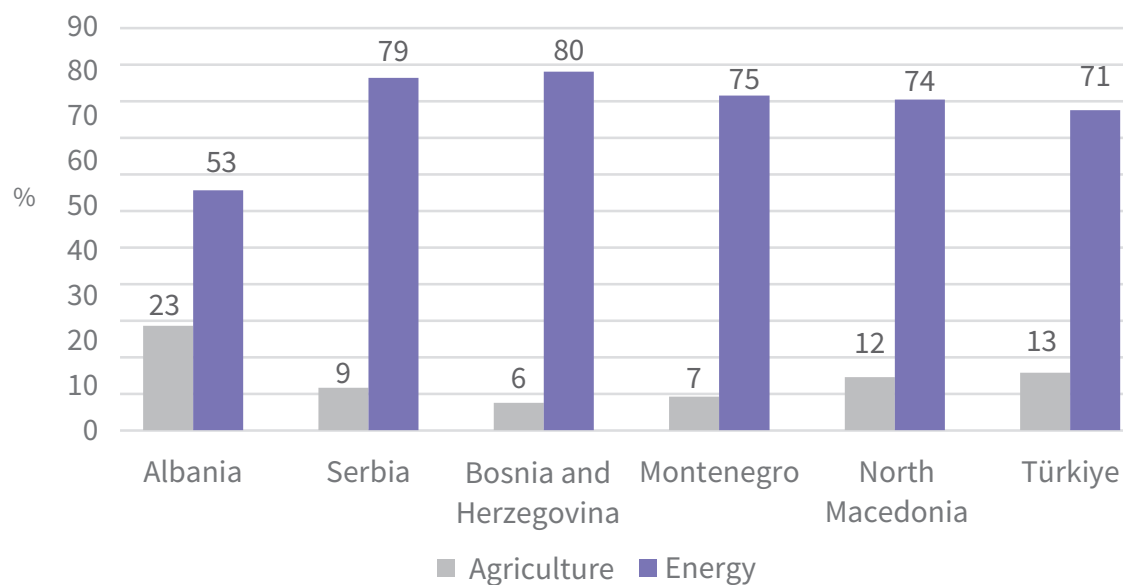


Sources: Individual country inventories. See References.

In Türkiye, 61 percent of total methane emissions come from agriculture, while that figure is 41 percent in Montenegro and 34 percent in Serbia. The countries that reported their agricultural methane emissions are reflected in Figure 17.

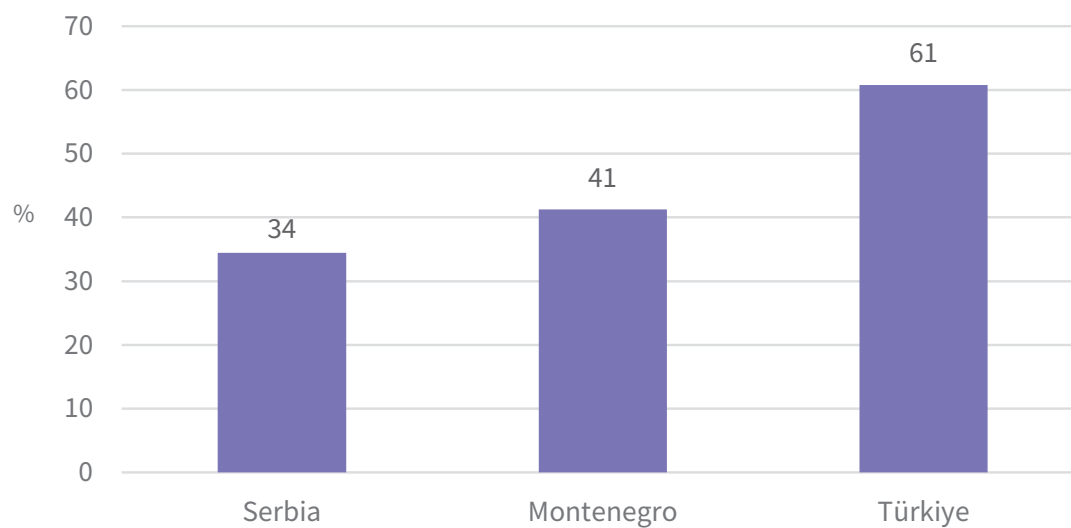
The countries of Southeastern Europe differ in terms of the contribution of agricultural activities to overall GHG emissions. Türkiye has significant GHG emissions due to enteric fermentation and biomass burning. The rest of the region has emissions mainly from enteric fermentation, manure management and agricultural soil management in a variety of levels.

Figure 16. Share of energy and agriculture emissions in total greenhouse gas emissions (excluding LULUCF) in the Southeastern Europe subregion

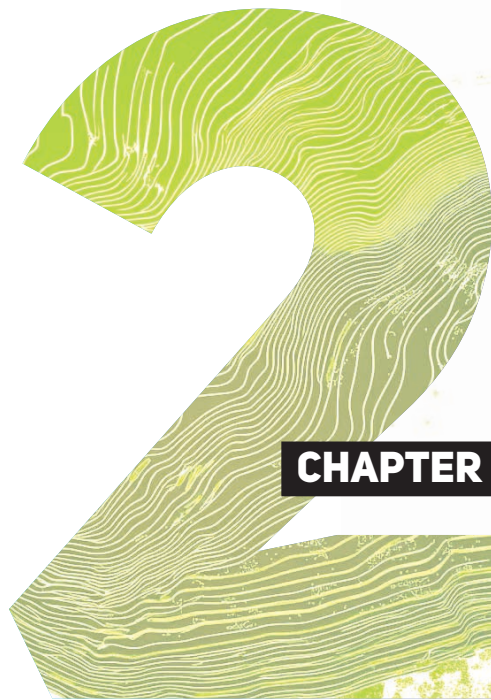


Sources: Individual country inventories. See References.

Figure 17. Share of agricultural sector emissions in total methane emissions in the Southeastern Europe subregion



Sources: Individual country inventories. See References.



CHAPTER

NATIONALLY DETERMINED CONTRIBUTION TARGETS AND PLEDGES ON MITIGATION AND ADAPTATION IN EUROPE AND CENTRAL ASIA

2.1 KEY FINDINGS

MITIGATION

NDC commitments and targets:

- In the ECA region, there is an overall tendency towards increasing mitigation ambition. Almost all countries either increased their economy-wide emission reduction targets or kept them similar to their previous submissions. However, both regionally and globally, the ambition is insufficient for global efforts of keeping warming to below 1.5 °C.

- Most of the countries of the ECA region do not have a quantified emission reduction target in the agricultural sector, although they identify it as a priority sector for emission reductions. Just three countries (Albania, Kyrgyzstan and North Macedonia) currently have such sector-specific emission reduction targets.

Policies and measures in NDCs:

- Central Asia: Countries show varying levels of reflection of agricultural GHG mitigation contributions in their NDCs. Categories such as enteric fermentation and biomass burning are not addressed by corresponding policies and measures in two of the five countries.

- Caucasus: Key emission categories within the agricultural sector are addressed comprehensively by the policies and measures mentioned in the NDCs of all the countries.
- CIS Europe and Ukraine: There currently exists a lack of policies and measures in the NDCs of all countries to address key emission categories, specifically biomass burning, agricultural soil management, enteric fermentation and manure management.
- The EFTA and EU-27 and United Kingdom subregions exhibit similar or aligned mitigation targets, with EFTA countries' policies and measures closely aligned with the EU-27, albeit partially reflected in their NDCs.
- In Southeastern Europe, some countries lack specific policies or measures targeting key emission categories, such as enteric fermentation and manure management, while other countries currently have a limited level of mitigation measures with the potential to address emissions, such as sustainable agriculture promotion.

ADAPTATION

Adaptation pledges

- Adaptation is increasingly included as a priority in the updated NDCs (17 out of 24 countries), as compared to 11 in the first NDCs. Belarus included adaptation in its first NDC but not in its updated NDC. The four EFTA countries, the EU-27 and the United Kingdom focused primarily on mitigation in their updated NDCs.
- The vulnerability of the agricultural sector to the impacts of climate change was mentioned in 15 (out of 24) updated NDCs, as compared to ten of the first NDCs. All countries in the Caucasus and Central Asia included it, as did Albania, Bosnia and Herzegovina, Montenegro, the Republic of Moldova, the Russian Federation, Serbia and Türkiye.
- The updated NDCs also contained an increase in the inclusion of the words "loss" and "damage" and terms related to agricultural loss and damage more specifically. The agriculture subsector most frequently mentioned as incurring loss and damage was the crops subsector, followed by forestry, livestock and fisheries.

Adaptation measures in NDCs:

- Agriculture-related adaptation and risk reduction measures were included in 12 of the updated NDCs, as compared to eight of the first NDCs.
- The type of interventions most included were disaster risk reduction/CCA agricultural good practices and technologies at farm level and climate risk proofing of grey infrastructure, followed by agroclimatic and disaster risk information systems and climate and disaster risk governance.
- These agricultural relevant adaptation and risk reduction measures were mostly related to crops, followed by the forestry, livestock, fisheries and aquaculture subsectors.

2.2 GREENHOUSE GAS MITIGATION TARGETS, POLICIES AND MEASURES

Since FAO's 2021 regional NDC report, 14 Europe and Central Asia region countries have submitted updated NDCs, demonstrating varying levels of increased ambition across the board. Notable is an increase in the inclusion of greenhouse gas reduction targets that encompass entire economies rather than focusing on specific sectors.

More NDCs now incorporate unconditional targets, which are not contingent on international support. This signifies a growing commitment from countries to undertake climate actions independently, without relying solely on external assistance.

Despite a global increase in overall commitment to climate action including in NDCs, the projections for global emission reduction fall short of the Paris Agreement target of limiting the temperature increase to 1.5 °C. Current NDC pledges for 2030 are not enough to close the anticipated emissions gap.

Fully implementing the unconditional and conditional NDC pledges for 2030 is projected to result in 2 percent and 9 percent reductions in emissions, respectively. It is estimated that global reductions of 28 percent and 42–50 percent, respectively, are required by 2030 to stay within the temperature limits.

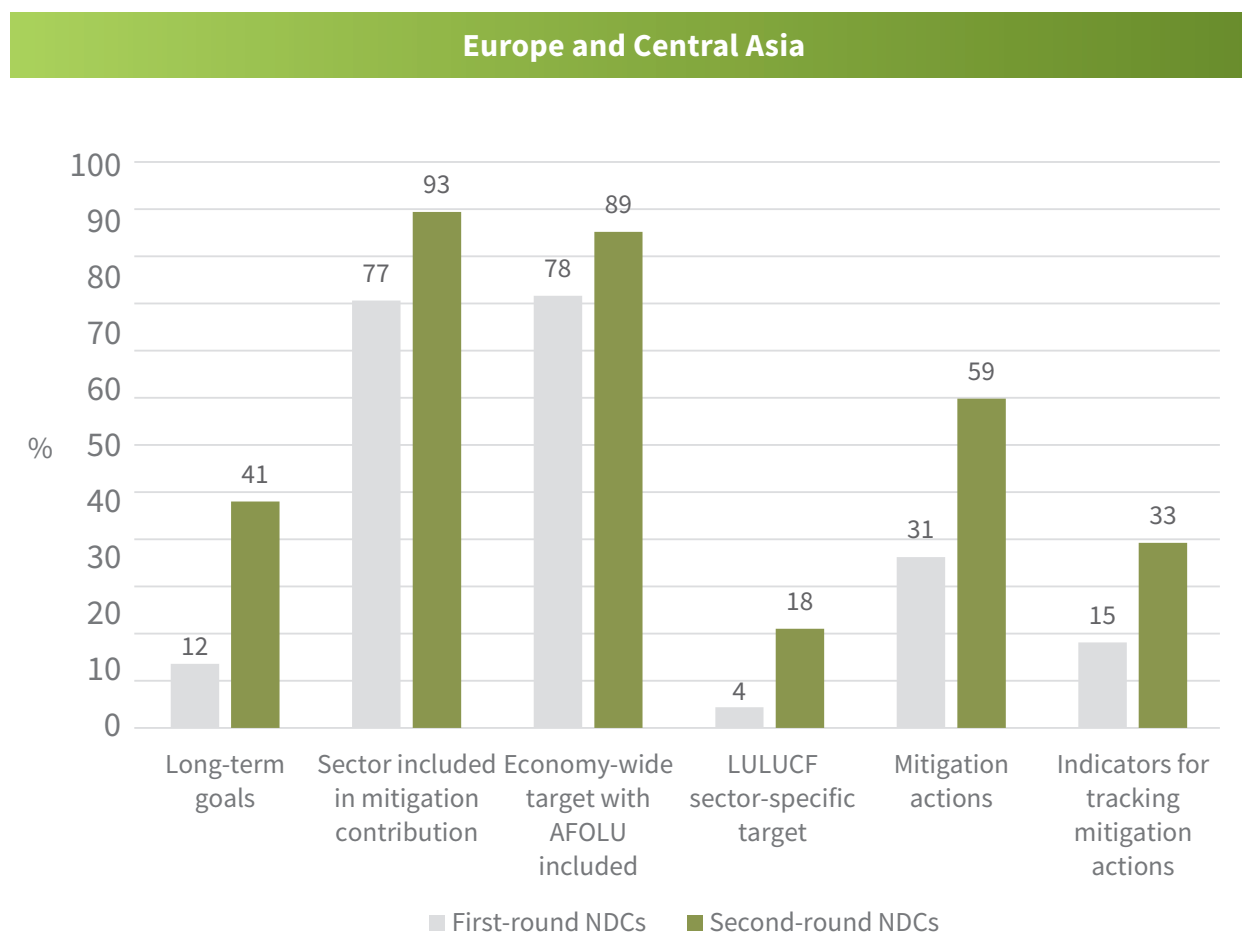
Consequently, urgent mitigation actions are vital in this decade to significantly decrease total global emissions from the levels implied by the current NDCs. It is vital that the forthcoming round of NDCs, outlining targets

for 2035, closes the evident “ambition gap” in the commitments made in the previous NDCs.

UPDATED NDC COMMITMENTS AND TARGETS

Countries of the ECA region have made significant progress in their updated NDCs in terms of including long-term goals, disclosing sector-specific targets and detailing mitigation actions (Figure 18).

Figure 18. Comparison of mitigation ambition between first and second rounds of NDCs in ECA countries



Note: The figure indicates the percentage of countries that included certain elements in their NDCs. For example, 12 percent of countries in Europe and Central Asia included long-term goals in their first NDCs, and 41 percent did so in their second submission.
Source: Crumpler, K., Wybieralska, A., Roffredi, L., Tanganelli, E., Angioni, C., Prosperi, P., Umulisa, V., Dahlet, G., Nelson, S., Rai, N., Schiettecatte, L.S., Salvatore, M., Wolf, J. & Bernoux, M. 2024. *Agri-food systems in nationally determined contributions: Global analysis*. Rome, FAO.

The figure indicates an increase (from 4 percent to 18 percent) in the number of countries that have sector-specific GHG targets in their agricultural sectors. In the ECA region, 93 percent of countries have included the agricultural sector in their mitigation contribution in their updated NDCs, and 89 percent have included economy-wide emission reduction targets, including AFOLU. The inclusion of long-term goals increased from 12 percent of the countries to 41 percent.¹²

THE CAUCASUS

Emission reduction targets among countries in the Caucasus region range from

approximately 35 percent to 40 percent by either 2030 or 2050. Azerbaijan recently adjusted its target timeline, extending it from 2030 to 2050, while also revising its ambition from a 35 percent reduction to 40 percent. Conversely, Georgia has amplified its ambitions, elevating its target from a 15 percent reduction in its earlier NDC to 35 percent reduction in its current NDC submission. In contrast, Armenia has maintained its commitment from its previous NDC, with an aim of achieving zero net emissions by 2050.

Table 3 summarizes the NDC ambitions of the countries of the Caucasus subregion.

Table 3. Status of Long-Term Low Emission Development Strategy submissions

Country	Baseline	Target year	Mitigation target in agriculture	Unconditional mitigation target	Conditional mitigation target	Targets in previous NDC
Armenia	1990	2030	-	40% emission reduction	-	Reducing GHG emissions to at most 2.07 t CO ₂ -eq/capita
Azerbaijan	1990	2050	-		40%	35% (2030)
Georgia	1990	2030	-	35%	50–57%	15% (unconditional) and 25% (conditional)

Source: NDCs. See References.

CENTRAL ASIA

Countries in Central Asia have collectively raised their aspirations across both conditional and unconditional targets, with the exception of Kazakhstan, as indicated in Table 4. Notably, Uzbekistan has elevated its ambition from a 10 percent reduction per unit of gross

domestic product (GDP) to a 35 percent reduction per unit of GDP in its unconditional target. Kyrgyzstan, uniquely within the subregion, has set specific targets for agricultural emissions, aiming for reductions of 1.05 percent and 1.11 percent compared to its business-as-usual scenario, utilizing 2017 as the base year.

Table 4. Summary of updated nationally determined contribution targets and ambitions in the Central Asia subregion

Country	Baseline	Target year	Mitigation target in agriculture	Unconditional mitigation target	Conditional mitigation target	Targets in previous NDC
Kazakhstan	1990	2030	-	15% reduction	25% reduction	Same targets
Kyrgyzstan	2017	2025 and 2030	1.05% (2025) 1.11% (2030) reduction compared to business as usual	Reduction by 16.63% (2025) and 15.97% (2030)	Reduction by 36.61% (2025) and 43.62% (2030)	Reduction by 11.49% (2025) and 13.75% (2030) (unconditional) and 29% (2025) and 30.89% (2030) (conditional)
Tajikistan	1990	2030	-	Reduction in the range of 30–40%	Reduction in the range of 40–50%	10–20% (unconditional) and 25–35% (conditional)
Turkmenistan	2010	2030	-	20% reduction	-	No emission increase by 2030
Uzbekistan	2010	2030	-	35% reduction per unit GDP	-	10% reduction per unit GDP

Source: NDCs. See References.

CIS EUROPE AND UKRAINE

The CIS subregion countries have increased their emission reduction targets compared to their earlier NDCs. Belarus, for instance, has raised its unconditional reduction target from 28 percent to 35 percent. Importantly, the earlier target excluded LULUCF emissions, whereas the new NDC target incorporates these emissions, leveraging the country's extensive forestry reserves.

Similarly, the Russian Federation has adjusted its NDC targets to include LULUCF, recognizing the significant carbon sequestration potential of its forests. The country has marginally enhanced its ambition from a 25–30 percent reduction to a 30 percent reduction by 2030 in its latest NDC submission. Studies suggest that this level

of ambition can be achieved through the country's existing policies and measures.¹³

Ukraine also has bolstered its ambition, increasing its target from 60 percent to 65 percent, while the Republic of Moldova has elevated its unconditional target from 64–67 percent to 70 percent.

None of the countries in the subregion have set quantitative targets for the agricultural sector in their NDCs. However, the Low Emissions Development Programme in the Republic of Moldova does indicate a targeted emission reduction of 44 percent by 2030 for the agricultural sector, signalling a step towards sector-specific emission reduction strategies. Table 5 summarizes the NDC ambition progress of the countries of the subregion.

Table 5. Summary of updated NDC targets and ambitions in the CIS Europe and Ukraine subregion

Country	Baseline	Target year	Mitigation target in agriculture	Unconditional mitigation target	Conditional mitigation target	Targets in previous NDC
Belarus	1990	2030	-	35% (incl. LULUCF)	40% (incl. LULUCF)	28% (excl. LULUCF) (unconditional)
Republic of Moldova	1990	2030	-	70%	88%	64–67% (unconditional) and 78% (conditional)
Russian Federation	1990	2030	-	30% emission reduction (incl. LULUCF)	-	25–30% emission reduction (incl. LULUCF)
Ukraine	1990	2030	-	65% emission reduction	-	not exceed 60% of 1990 GHG emissions level in 2030

Source: NDCs. See References.

EU-27, UNITED KINGDOM AND EFTA

The countries within this subregion have demonstrated ambitious emission reduction targets. Among them, the EU-27, Norway and Iceland have committed to unconditional pledges of at least 55 percent emission reduction by 2030, while Lichtenstein and Switzerland have set targets of 40 percent and at least 50 percent reduction, respectively, by 2030.

The United Kingdom unveiled its latest NDC in 2022, promising a 68 percent reduction in emissions by 2030 from 1990 levels. This marks a significant leap in mitigation ambition within the subregion.

Despite the comprehensive economy-wide quantitative emission reduction targets set by all countries, none of them has reflected sectoral targets for agriculture in the NDCs, despite the existence of sectoral targets in national and sectoral strategies. Table 6 summarizes the NDC progress in mitigation ambition in the EU-27, United Kingdom and EFTA subregion.

Table 6. Summary of nationally determined contribution targets and ambitions in the EU-27, United Kingdom and EFTA subregion

Country	Baseline	Target year	Mitigation target in agriculture	Unconditional mitigation target	Conditional mitigation target	Targets in previous NDC
EU-27	1990	2030	-	At least 55%	40% (incl. LULUCF)	28% (excl. LULUCF) (unconditional)
United Kingdom	1990	2030	-	At least 68%	88%	64–67% (unconditional) and 78% (conditional)
Iceland	1990	2030	-	At least 55%	-	25–30% emission reduction (incl. LULUCF)
Liechtenstein	1990	2030	-	40%	-	Not to exceed 60% of 1990 GHG emissions level in 2030
Norway	1990	2030		At least 55%		At least 50% and towards 55%
Switzerland	1990	2030, 2021–2030		- At least 50% by 2030 - Net zero by 2050	At least 50% by 2030	35% by 2025 and 50% by 2030 70–85% reduction by 2050

Source: NDCs. See References.

SOUTHEASTERN EUROPE

The countries within this subregion have demonstrated a considerable surge in their commitments to mitigation efforts compared to their previous NDCs. Albania, for instance, has substantially elevated its unconditional target from 11.5 percent to 20.9 percent. Notably, the country also has set a specific emission reduction target of 3 percent within the agricultural sector, signalling a targeted approach to sectoral emission reduction.

Türkiye, which is both an Annex I^k country and a member of the G20, has the highest

emissions among the countries in the subregion. Despite this, its NDC ambition has notably increased, from 21 percent to 41 percent. However, the country's targets are based on business-as-usual projections rather than a reduction from baseline emissions.

North Macedonia also has significantly augmented its unconditional emission reduction target, from 30 percent to 51 percent compared to 1990 emissions levels. Additionally, the country has set a sectoral emission reduction target of 29 percent within the agricultural sector, underlining a focused approach to addressing emissions in specific sectors.

Table 7. Summary of nationally determined contribution targets and ambitions in the EU-27, United Kingdom and EFTA subregion

Country	Baseline	Target year	Mitigation target in agriculture	Unconditional mitigation target	Conditional mitigation target	Targets in previous NDC
Albania	Business as usual	2030	3% reduction	20.9%	-	11.5% emission reduction
Bosnia and Herzegovina	1990	2030, 2050	-	Emission reduction of 33.2% by 2030 and 61.7% by 2050	Emission reduction of 36.8% by 2030 and 65.56% by 2050	2% (unconditional) and 23% (conditional) emission reduction by 2030
Montenegro	1990	2030	-	35% excl. LULUCF	-	30% emission reduction
North Macedonia	1990	2030	29% reduction	51% excl. LULUCF 82% incl. LULUCF	-	30% (unconditional) and 36% (conditional) emission reduction
Serbia	1990, 2010	2030	-	33.3% reduction (baseline 1990) and 13.2% (baseline 2010)	-	9.8% reduction by 2030
Türkiye	Business as usual	2030	-	41% emission reduction compared to business as usual	-	21% emission reduction compared to business as usual

Source: NDCs. See References.

^k Türkiye proposed to amend the list of parties included in Annex I to the convention in a way to exclude Türkiye. A final decision has not yet been made.

ASSESSMENT OF POLICIES AND MEASURES FOR EMISSION REDUCTION IN THE AGRICULTURAL SECTOR IN NDCS

Policies and measures outline the specific actions and interventions that will be taken to achieve mitigation objectives. These interventions may encompass a wide range of activities, including changes in land-use practices, adoption of sustainable agriculture techniques, reforestation efforts or incentives for emission reduction technologies. By specifying the actions to be taken, policies and measures provide clarity on how mitigation contributions will be realized both at the economy-wide level and within the AFOLU sector specifically.

While some countries may offer comprehensive insights into their agricultural mitigation strategies, others may provide more limited data due to constraints such as resource availability, technical capacity or the nascent stage of their climate action planning. The evaluation framework in this report adapts to the available information within the NDCs, understanding that the depth and granularity of data may vary from one country to another.

Countries' mitigation efforts are defined according to the greenhouse gas source and sink categories outlined in the 2006 IPCC Guidelines for National Greenhouse Gas Emissions Inventories. The assessment in this section is conducted with regard to the policies and measures coverage in NDCs compared to the key GHG emission categories and subcategories under agriculture in the latest available national GHG inventories.

The following section evaluates the extent to which countries address GHG emissions from the agricultural sector via policies and measures in their latest NDCs. However, it should be kept in mind that NDCs sometimes do not include policies and measures already in force in the country that can address agricultural emissions. The reason for this is that sometimes policies not particularly designed for CCM can in fact help reduce emissions. Such policies and measures are assessed in Chapter 3 of this report.

The tables in this section analyse the policies and measures highlighted in the NDCs to assess whether they address the most important GHG inventory categories for each country. The policies and measures in the EU-27 have been assessed against the most important categories at the European Union level. The evaluation regarding which measures address which key emission category and subcategory is based on the Mitigation Impact Matrix provided in Annex I, Table 54.

THE CAUCASUS

The countries of the Caucasus do not have a quantitative GHG reduction target in their agricultural sectors. However, the NDCs indicate emission reduction measures that may directly or indirectly address key emission subcategories under the agricultural sector.

Table 8 includes an assessment of whether the policies and measures may address those emission subcategories of the countries.

The NDC from Armenia mainly indicates the Agriculture Strategy 2020–2030 as the main policy framework for reducing greenhouse gas emissions in the agricultural sector, without providing the measures in the NDC. However, the measures provided within the Agriculture Strategy 2020–2030 address the country's key GHG emission categories in the agricultural sector.

Azerbaijan, in its NDC, indicates priority areas in the agricultural sector: improving the mechanisms for the sustainable use of agricultural land and water resources and adopting sustainable agriculture practice/approaches, which potentially can address the key GHG emission categories determined. However, those priorities have not been linked with a policy framework; therefore, it is not clear whether the policies and measures indicated in the NDC may address the country's key emission category areas in the agricultural sector. The country has not submitted its LT-LEDs.

Georgia has indicated “encouraging the climate smart agriculture and agritourism” as a mitigation measure in the agricultural sector that potentially can address the key emission subcategories under agriculture. The measures indicated in the NDC have

not been linked with a particular policy framework, but the country's Climate Change Strategy 2030 and the Agriculture and Rural Development Strategy of Georgia 2021–2027 (to be detailed in section 3) address the measures indicated in the NDC, which

provides solid evidence for the country to address its key emissions subcategories under the agricultural sector. Table 8 provides a summary of policies and measures in NDCs addressing key emissions categories in the agricultural sector of the Caucasus.

Table 8. Policies and measures in NDCs addressing key emissions categories in the agricultural sector of the Caucasus

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS				
			Enteric Fermentation	Direct N ₂ O Emissions from Managed Soils	Indirect N ₂ O From Collection, Storage and Use Of Manure	Rice Cultivation	Urea Application
Armenia							
	Agriculture strategy (2020–2030)		✓	✓	✓		✓
Azerbaijan							
		- improving the mechanisms for sustainable use of agricultural land and water resources - sustainable agriculture practice/ approach	✓		✓	✓	✓
Georgia							
		encouraging climate-smart agriculture and agritourism	✓	✓	✓		

Source: NDCs. See References.

Highest share under agricultural sector key subcategories

Mid-level share under agricultural sector key subcategories

Low-level share under agricultural sector key subcategories

not key category

CENTRAL ASIA

The countries of Central Asia have different ways of including agricultural GHG mitigation activities in their NDCs. Kazakhstan, Kyrgyzstan and Tajikistan indicate measures that may address key emissions categories, while Turkmenistan and Uzbekistan do not have a comprehensive set of policies and measures that address key emission sources

reflected in their NDCs. Turkmenistan, however, mentioned the use of modern land use methods that may address direct N₂O emissions from managed soils (Table 9).

In its NDC, Kazakhstan indicates its 2021–2030 Action Plan as the main mitigation contribution. The plan includes measures to reduce methane emissions from livestock, which can address two key subcategories

under agricultural emissions. There are no specific measures indicated in the NDC to address emissions from biomass burning.

Kyrgyzstan indicates reducing livestock numbers and increasing efficiency, managing manure and replacing synthetic fertilizers with natural ones, and organic farming – all of which can serve to reduce emissions in key subcategories under the agricultural sector.

Similarly, Tajikistan indicates measures that can address key emissions sources, such as enteric fermentation, manure management and biomass burning. Such measures include biomass generation from manure, sustainable disposal and use of agricultural waste, biofuel production, and improved livestock breeding.

Table 9. Policies and measures addressing key emissions categories in the agricultural sector of Central Asia

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS				
			Enteric Fermentation	Manure Management	Direct N ₂ O Emissions From Managed Soils	Indirect N ₂ O Emissions From Managed Soils	Biomass Burning
Kazakhstan							
	2021–2030 Action Plan	change in fodder for animals to reduce methane emissions from cattle and prevention of overgrazing, responsible management and protection of pastures	✓	✓			✗
Kyrgyzstan							
		- reducing the livestock headcount, increasing productivity and improving the pedigree stock - expanding the area of cultivated organic crop farming lands - increasing efficiency of the application of manure as a fertilizer and generation of biogas	✓	✓	✓		

Table 9. (Cont.)

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS				
			Enteric Fermentation	Manure Management	Direct N ₂ O Emissions From Managed Soils	Indirect N ₂ O Emissions From Managed Soils	Biomass Burning
Tajikistan							
		- introduction of technologies and equipment for collecting of anaerobic systems, manure storage and processing and adequate poultry manure management - mastering ecologically safe, highly efficient and energy-saving technologies for the disposal and use of agricultural waste - biofuel production, including biodiesel and bioethanol - improved livestock breeding	✓	✓			✓
Turkmenistan							
		use of modern land-use methods in agriculture	✗		✓		
Uzbekistan							
		focus in NDC is placed on improving productivity of agricultural land as a mitigation measure.	✗	✗	✗	✗	

Source: NDCs. See References.

Highest share under agricultural sector key subcategories

Mid-level share under agricultural sector key subcategories

Low-level share under agricultural sector key subcategories

not key category

CIS EUROPE AND UKRAINE

The NDCs of the countries within the CIS Europe and Ukraine subregion do not include GHG mitigation strategies that address the key emissions categories in the agriculture and LULUCF sectors.

Specifically, there is a lack of defined policies and measures aimed at addressing key emissions categories such as biomass burning, agricultural soil management, enteric fermentation and manure management. As a consequence, the strategies intended for achieving NDC targets remain unclear within the CIS Europe and Ukraine subregion.

While the NDCs of the subregion lack policies and measures, the LT-LEDS of the Russian Federation and Ukraine provide information on the countries' long-term GHG mitigation strategies in the agricultural sector. Neither the Republic of Moldova nor Belarus has yet submitted an LT-LEDS.

The LT-LEDS outlined by the Russian Federation prioritize a dual approach centred on decreasing energy intensity and enhancing energy efficiency to drive emission reduction. Within the agricultural sector, emission reduction strategies are delineated, focusing on optimizing soil fertilization practices and adopting precision farming techniques. The latter entails leveraging cutting-edge technologies such as remote sensing to maximize agricultural efficiency. Furthermore, the adoption of regenerative

technologies is highlighted, aimed at bolstering yields while facilitating carbon absorption.

In addition, targeted measures are proposed to mitigate emissions from livestock, including enhancing the productivity of farm animals. Complementing these efforts, initiatives such as biofuel production are underscored within the spectrum of sustainable agriculture and land use management strategies.

The LT-LEDS in Ukraine comprehensively address significant emission sources within the agricultural sector, emphasizing long-term policies and measures primarily directed towards managing manure, mitigating enteric fermentation emissions, optimizing fertilizer usage and enhancing water efficiency.

Table 10. Policies and measures addressing key emissions categories in the agricultural sector of the CIS Europe and Ukraine subregion

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS			
			Enteric Fermentation	Manure Management	Agriculture Soil Management	Biomass Burning
Belarus						
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗			✗
Republic of Moldova						
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗	✗	✗	
Russian Federation						
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗	✗		✗
Ukraine						
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗			✗

Note: In the case of the Republic of Moldova, agriculture soil management includes direct and indirect N₂O emissions from managed soils.

Source: NDCs. See References.

Highest share under agricultural sector key subcategories

Mid-level share under agricultural sector key subcategories

Low-level share under agricultural sector key subcategories

not key category

EU-27, UNITED KINGDOM AND EFTA

The countries of this subregion have similar or aligned mitigation targets. EFTA countries' CCM policies and measures are aligned with the EU-27 in many aspects, and this is partially reflected in their NDCs. The United Kingdom has followed its own path since leaving the European Union, including its mitigation ambition policies and measures.

The EU-27 has a flagship policy and legislative framework focusing on a 55 percent reduction of greenhouse gas emissions by 2030 and zero net emissions by 2050, which includes key policies and legislation, such as the European Union Climate Law, Revised Effort Sharing Decision Regulation and Fit for 55 legislative framework (Table 11). These latter two have measures for agricultural emissions

that directly and indirectly addresses the key emission categories.

The United Kingdom has focused on a net zero strategy in its NDC, which sets out sectoral policies and proposals for decarbonizing all sectors of the country's economy to meet the net zero target by 2050, including agriculture. Some of the measures in the strategy include introducing farming schemes¹ and environmental land management schemes and establishing the Farming Innovation Programme; most of the measures directly or indirectly address the country's key emissions in the agricultural sector.

Liechtenstein and Switzerland follow a similar path as the European Union in terms of their emission reduction ambition and national policies and measures, but the details are not indicated in their NDCs.

Table 11. Policies and measures addressing key emission categories in agricultural sector in the EU-27, United Kingdom and EFTA subregion

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS		
			Enteric Fermentation	Manure Management	Direct N ₂ O Emissions From Managed Soils
EU-27					
	• European Climate Law • Revised Effort Sharing Decision Regulation • Fit for 55 legislative framework • Land Use, Land-Use Change and Forestry (LULUCF) Regulation	No particular measures on agricultural sector has been indicated in the NDC			
United Kingdom					
	• Net Zero Strategy (2021) • Green Growth Strategy for Northern Ireland	• Supporting farmers to take up low-carbon practices and technologies			

¹ For example, the provision of financial support to farmers who implement sustainable agriculture practices.

Table 11. (Cont.)

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS		
			Enteric Fermentation	Manure Management	Direct N ₂ O Emissions From Managed Soils
Iceland					
	Climate Action Plan for 2018-2030	No particular measures on agricultural sector has been indicated in the NDC	✓	✓	✓
Liechtenstein					
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗	✗	
Norway					
	- Effort Sharing Regulation (ESR) - Land Use, Land-Use Change and Forestry (LULUCF) Regulation - Climate Change Act		✓	✓	✓
Switzerland					
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗	✗	✗

Note: For more information on the Green Growth Strategy for Northern Ireland, please see <https://www.daera-ni.gov.uk/consultations/consultation-draft-green-growth-strategy-northern-ireland>

Source: NDCs. See References.

Highest share under
agricultural sector key
subcategories

Mid-level share under
agricultural sector key
subcategories

Low-level share under
agricultural sector key
subcategories

not key category

SOUTHEASTERN EUROPE

In the Southeastern Europe subregion, Bosnia and Herzegovina, Montenegro and North Macedonia have not indicated specific policies or measures that can address their key emissions categories (Table 12). Serbia does not indicate which policies are planned or in force that may address GHG

mitigation in the agricultural sector. However, “increasing the quality of soil and rational use of fertilizers” has been provided among the GHG mitigation measures that potentially can address the key emissions category of direct N₂O emissions from managed soils.

Albania does not provide a policy framework for agricultural emissions, but measures such

as the promotion of sustainable agriculture, the improvement of fertilization and animal feeding practices potentially can address the key emissions categories in this sector.

Türkiye has provided an economy-wide GHG mitigation policy framework in its national climate change strategy and action plans, together with an Environmentally Based Agricultural Land Protection Programme in its updated NDC. Also, the NDC indicates direct measures such as regulating animal feed rations, improving practices in cattle breeding, using agricultural biomass for

energy generation and improving methane production from manure. The policies and measures that are indicated in the NDC have the potential to address the country's key emission categories in the agricultural sector.

The LT-LEDS in Ukraine comprehensively address significant emission sources within the agricultural sector, emphasizing long-term policies and measures primarily directed towards managing manure, mitigating enteric fermentation emissions, optimizing fertilizer usage and enhancing water efficiency.

Table 12. Policies and measures addressing key emission categories in the agricultural sector of Southeastern Europe

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS				
			Enteric Fermentation	Manure Management	Direct N ₂ O Emissions From Managed Soils	Biomass Burning	Agricultural Soils
Albania							
	No specific policies indicated for agricultural sector in NDC	• promotion of climate-smart and sustainable agriculture • improvement of agricultural soil practices • improvement of fertilization, pasture, and animal feeding practices	✓	✓	✓		
Bosnia and Herzegovina							
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗	✗			✗
Montenegro							
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗				
North Macedonia							
	No specific GHG mitigation policies and measures indicated regarding agriculture and LULUCF sectors in the NDC		✗	✗	✗		

Table 12. (Cont.)

COUNTRY	Policies in the NDC	Measures in the NDC	KEY CATEGORIES IN AGRICULTURAL EMISSIONS				
			Enteric Fermentation	Manure Management	Direct N ₂ O Emissions From Managed Soils	Biomass Burning	Agricultural Soils
Serbia							
	No specific policies indicated for agricultural sector in NDC	increasing the quality of soil and rational use of fertilizers					
Türkiye							
	- Environmentally Purpose Agricultural Land Protection Programme (2005–2020) - Türkiye National Climate Change Action Plan (2011–2023) - Türkiye National Climate Change Strategy (2010–2023)	- control methane emissions by regulating animal feed rations - improve practices in cattle breeding, rational feeding, and regulation of the number of animals - use of agricultural biomass for energy generation and the improvement of methane production from manure					

Note: The Bosnia and Herzegovina national GHG inventory provides accumulated values under agricultural soils.

Source: NDCs. See References.

Highest share under
agricultural sector key
subcategories

Mid-level share under
agricultural sector key
subcategories

Low-level share under
agricultural sector key
subcategories

not key category

2.3

UPDATES ON CLIMATE CHANGE ADAPTATION PLEDGES AND POLICIES AND MEASURES IN NATIONALLY DETERMINED CONTRIBUTIONS

UPDATE AND SUMMARY OF NATIONALLY DETERMINED CONTRIBUTION ADAPTATION PLEDGES AND AIMS

Adaptation was included in the updated NDCs of 17 countries (out of 24), as compared to 11 the first time around. The exceptions were Belarus, all four EFTA countries (Iceland, Liechtenstein, Norway and Switzerland), the EU-27 and the United Kingdom. However, the EU-27, Iceland, Switzerland and the United Kingdom have submitted specific adaptation communications to the UNFCCC that may include information on adaptation priorities, implementation and support needs, and plans and actions. Some of these adaptation communications are analysed later in this section.

Fifteen ECA countries have indicated that the agricultural sector is one of the vulnerable sectors negatively impacted by climate change (as compared to ten in the

first NDCs). Belarus, the EU-27, all EFTA countries (Iceland, Liechtenstein, Norway, Switzerland), North Macedonia, Ukraine and the United Kingdom did not make such an indication.

In addition, a study conducted by Crumpler *et al.*¹⁴ indicated that three-quarters of the NDCs that included adaptation referred to agrifood systems. Moreover, the key adaptation components of agrifood systems indicated in these NDCs were those that referred to systems at risk (92 percent), hazards (83 percent), adaptation actions (63 percent), long-term goals and indicators to track progress (25 percent) and short-to-medium-term objectives and quantifiable and time-bound targets (21 percent).¹⁵

THE CAUCASUS

In all countries of the Caucasus subregion, adaptation is included as a priority in their NDCs, as outlined in Table 13. Armenia included the need for adaptation policies and measures, particularly for its vulnerable mountainous ecosystems that already are adversely impacted by climate change and reduced water availability. Azerbaijan has indicated that it will establish mechanisms to mitigate the adverse impacts of climate change on agriculture, develop an adaptation plan and implement adequate sectoral adaptation measures. Apart from this, Georgia aims to enhance the country's preparedness and adaptive capacities of particularly vulnerable sectors to the adverse impacts of climate change and to plan and implement identified adaptation measures. This is reflected in the updated NDCs of all three Caucasus countries, all of which include an adaptation pledge/aim and mention of agriculture as one of the sectors vulnerable to the impacts of climate change.

Table 13. Analysis of adaptation and agriculture inclusion in the updated NDCs of the Caucasus subregion

Country	Adaptation indicated as a priority in NDC	Adaptation pledge/aim	Agriculture included as sector vulnerable to climate change impacts
Armenia (updated NDC)	Yes	The country mentions the importance of adaptation policies and measures and considers the ecosystem-based approach as the basis for the development of its national adaptation.	Yes
Azerbaijan (updated NDC)	Yes	The country will continue planning and implementing appropriate adaptation measures, including in the agricultural sector.	Yes
Georgia (updated NDC)	Yes	The country will improve its preparedness and adaptive capacity by developing climate-resilient practices that reduce the vulnerability of highly exposed communities.	Yes

Source: NDCs. See References.

CENTRAL ASIA

Adaptation is indicated as a priority in the updated NDCs of all Central Asian countries, as indicated in Table 14. As a result, all Central Asian countries have adaptation pledges/aims mentioned in their updated NDCs, which have a stronger focus on the importance of CCA and resilience as well as the actions that need to be undertaken. For instance, Kyrgyzstan included its focus on CCA and enhancing resilience at all levels, whereas Turkmenistan mentioned its aim to achieve the Paris Agreement's mitigation and adaptation goals aligned to its national situation and capacities. Tajikistan mentioned its aim to accelerate its adaptation actions, while Kazakhstan and

Uzbekistan are more concrete, indicating that legal and policy reforms are needed for the implementation of CCA actions. Kazakhstan, even though it had not included adaptation as a priority in its first NDC, goes one step further to indicate that it has already taken actions to lay the basis for the CCA process by including a chapter dedicated to CCA in its new environmental code, which was adopted in 2021. In all the countries' updated NDCs, agriculture is mentioned as one of the sectors vulnerable to the impacts of climate change. Uzbekistan mentioned in its updated NDC that urgent CCA measures require implementation, as its most vulnerable populations, residing in the country's most arid regions, are highly dependent on agriculture for their livelihoods.

Table 14. Analysis of adaptation and agriculture inclusion in the updated NDCs of the Central Asia subregion

Country	Adaptation indicated as a priority in NDC	Adaptation pledge/aim	Agriculture included as sector vulnerable to climate change impacts
Kazakhstan (updated NDC)	Yes	The country considers CCA important and decided in 2018 to update its 2015 NDC by adding, among others, a component on adaptation to climate change during the national NDC review process.	Yes
Kyrgyzstan (updated NDC)	Yes	The country attaches utmost importance to CCA and resilience at all levels.	Yes
Tajikistan (updated NDC)	Yes	The country has strengthened its focus on adaptation with the aim to accelerate its adaptation actions.	Yes

Table 14. (Cont.)

Country	Adaptation indicated as a priority in NDC	Adaptation pledge/aim	Agriculture included as sector vulnerable to climate change impacts
Turkmenistan (updated NDC)	Yes	The country indicated that it is firmly committed to the principles of the Paris Agreement.	Yes
Uzbekistan (updated NDC)	Yes	The country recognizes the importance of adaptation, including the need for structural reforms in ensuring policy changes in the long run and the urgent implementation of CCA measures.	Yes

Source: NDCs. See References.

CIS EUROPE AND UKRAINE

In all the updated NDCs of the CIS Europe and Ukraine subregion, adaptation is indicated as a priority in the NDCs – except for Belarus, where it was mentioned in its first NDC but not in its updated version, as shown in Table 15. As a result, Belarus is the only country in the subregion that does not have an adaptation pledge/aim included in its updated NDC. However, Belarus indicated in its first NDC the significant impacts of climate change and that it is developing and implementing national CCA strategies and sectoral programmes and plans. The other countries of the subregion indicated in their first NDCs their focus and priority

on adaptation, while their updated NDCs are more action oriented. For instance, the Republic of Moldova mentioned that it is implementing its CCA strategy and action plan, while Ukraine indicated that by 2030 it plans to create a baseline for CCA. The Russian Federation included a section on target areas for the implementation of the global goal of adaptation to climate change and the establishment of its national CCA system. Agriculture is included as a sector vulnerable to the impacts of climate change in the updated NDCs of the Republic of Moldova and the Russian Federation. In Belarus it was included in its first NDC but not in its updated NDC, and Ukraine did not include it in either of its NDCs.

Table 15. Analysis of adaptation and agriculture inclusion in the updated NDCs of the CIS subregion

Country	Adaptation indicated as a priority in NDC	Adaptation pledge/aim	Agriculture included as sector vulnerable to climate change impacts
Belarus (updated NDC)	No	No	No
Republic of Moldova (updated NDC)	Yes	The country mentions that it is implementing its CCA strategy and action plan, aimed at becoming resilient to climate change impacts.	Yes
Russian Federation (updated NDC)	Yes	The country included a section on target areas for the implementation of the global goal of adaptation to climate change. In this regard, a national CCA system is being formed.	Yes
Ukraine (updated NDC)	Yes	The country indicated that by 2030 it plans to create a baseline for adaptation to climate change in order to increase resilience and reduce vulnerability to climate change.	No

Source: NDCs. See References.

EU-27, UNITED KINGDOM AND EFTA

The first and updated NDCs of countries in the EU-27, United Kingdom and EFTA subregion do not indicate that adaptation is a priority, nor is there an adaptation pledge/aim included or an indication that agriculture is a sector vulnerable to the impacts of climate change. In its first and updated NDCs, the United Kingdom mentioned that it submitted its adaptation communication to the UNFCCC in parallel

with its NDC, setting out the country's domestic and international ambition and action on adaptation and resilience. Switzerland also indicated in its updated NDC that comprehensive information on adaptation strategies, planning, measures and implementation is available in its first adaptation communication and in its seventh national communication. It should be noted that of all the EFTA countries, Liechtenstein is the only one that has not yet submitted its updated NDC, as outlined in Table 16.

Table 16. Analysis of adaptation and agriculture inclusion in the updated NDCs of the EU-27, United Kingdom and EFTA subregion

Country	Adaptation indicated as a priority in NDC	Adaptation pledge/aim	Agriculture included as sector vulnerable to climate change impacts
EU-27 (second updated NDC)	No	No	No
United Kingdom (updated NDC)	No	No	No
Iceland (updated NDC)	No	No	No
Liechtenstein (first NDC)	No	No	No
Norway (first and second updated NDC)	No	No	No
Switzerland (updated NDC)	No	No	No

Source: NDCs. See References.

SOUTHEASTERN EUROPE

In the updated NDCs of all Southeastern Europe countries, adaptation is indicated as a priority, as shown in Table 17. This was not the case in the first NDCs of the Southeastern Europe countries, where it was mentioned as a priority only by Bosnia and Herzegovina. In the updated NDCs, both Albania and Türkiye mentioned that, given its importance, an adaptation component has been included, while Bosnia and Herzegovina included a section on CCA and indicated the importance of assessing the impacts of climate change and identifying priority adaptation measures

for the short, medium and long term. In the updated NDC of Montenegro, the country mentioned the mitigation co-benefits of adaptation actions and that its national adaptation strategy and plans are being established, while North Macedonia stated in its updated NDC that it is including an adaptation component in its subsequent submissions, once the relevant national strategic and planning documents are prepared and adopted. Agriculture is mentioned as one of the sectors vulnerable to the impacts of climate change in all NDCs except for North Macedonia, although it was not previously included in the first NDCs of Albania, Montenegro, North Macedonia and Türkiye.

Table 17. Analysis of adaptation and agriculture inclusion in the updated NDCs of the Southeastern Europe subregion

Country	Adaptation indicated as a priority in NDC	Adaptation pledge/aim	Agriculture included as sector vulnerable to climate change impacts
Albania (updated NDC)	Yes	It mentioned that adaptation has been considered in the updated NDC.	Yes
Bosnia and Herzegovina (updated NDC)	Yes	The country indicated the importance of assessing the impacts of climate change and identify priority adaptation measures (short, medium and long term).	Yes
Montenegro (updated NDC)	Yes	The country indicated the expected mitigation co-benefits of adaptation actions.	Yes
North Macedonia (updated NDC)	Yes	No, but it aims to include it in its next submission, with relevant plans under development.	No
Serbia (updated NDC)	Yes	The implementation of adaptation measures was mentioned, including a particular focus on mitigation co-benefits resulting from adaptation actions.	Yes
Türkiye (updated NDC)	Yes	It recognizes the importance of adaptation, and the adaptation component is included in its updated NDC.	Yes

Source: NDCs. See References.

IMPACT OF DISASTERS ON AGRICULTURE AND FOOD SECURITY IN THE ECA REGION

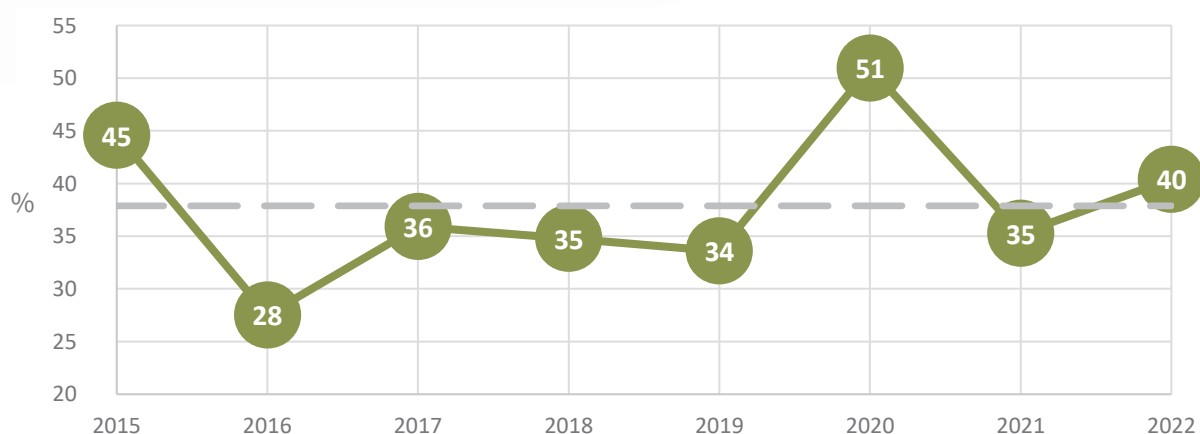
According to a FAO study,¹⁶ agriculture absorbed 23 percent of the total overall economic impact caused by medium and large-scale disasters in least developed countries (LDCs) and low- and middle-income countries between 2007 and 2022. The extent of global agricultural losses due to disasters was estimated at USD 3.8 trillion in crop and livestock production over the past 30 years. This corresponds to an average loss of USD 123 billion per year, or 5 percent of annual global agricultural GDP. Particularly vulnerable to the impacts of disasters, including those related to climate, are the smallholder farmers and their agriculture-dependent communities who rely on the sector and its activities for their food, incomes and livelihoods.

It is estimated that from 1992 to 2021, the total agricultural losses due to disasters in the ECA region were USD 200.6 billion, which is 10 percent of the total agricultural GDP (USD 2 trillion) of the ECA region.¹⁷

ANALYSIS OF AGRICULTURAL LOSS AND DAMAGE DATA IN EUROPE AND CENTRAL ASIA

In total, nine^m of the 17 ECA countries have reported on the Sendai C2 indicator “Direct agricultural loss attributed to disasters” in the Sendai Framework Monitor: Albania, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Serbia, Tajikistan, Türkiye, Ukraine and Uzbekistan. From 2015 to 2022, the total agricultural loss reported under the C2 indicator was USD 3.9 billion, which accounts for 36 percent of the total direct economic loss attributed to disasters in these reporting countries.

^m Thirteen countries inserted data in the Sendai Framework Monitor for the Sendai C indicators. However, four countries included “0” and just nine countries included actual figures.

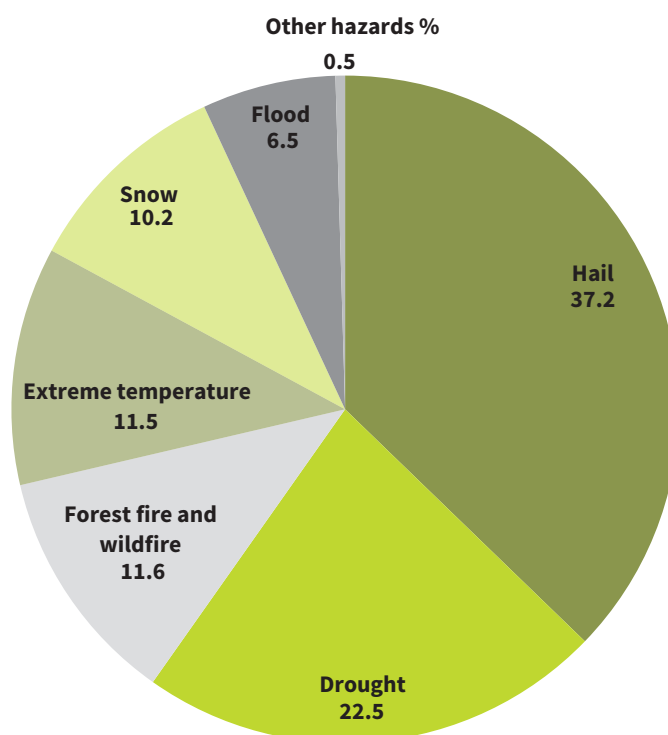
Figure 19. Annual agricultural loss as a share of total disaster loss, percent, 2015–2022

Source: UNDRR. 2023. *Sendai Framework Monitor*. Data as of March 2023.

From 2015 to 2022, the average annual agricultural loss as a share of total disaster loss was about 37.9 percent, with the highest share of agricultural loss as part of total disaster loss (51 percent) occurring in 2020 and the lowest (28 percent) occurring in 2016, as indicated in Figure 19.

When Member States report their agricultural losses in the Sendai Framework Monitor, they are provided with options to specify losses per hazard type, geographical region, agricultural crop type and asset type, among

other options for disaggregation. The most reported type of disaggregation is by hazard type, with eight out of nine countries reporting this data. From 2014 to 2022, the total hazard disaggregated agricultural loss was USD 54.9 million, with hail being the most damaging hazard type (37.2 percent), followed by drought (22.5 percent), forest fire and wildfire (11.6 percent), extreme temperature (11.5 percent), snow (10.2 percent) and flood (6.5 percent), as shown in Figure 20.

Figure 20. Agricultural loss by hazard type, percent, 2014–2022

Source: UNDRR. 2023. Sendai Framework Monitor. Data as of March 2023.

ASSESSMENT OF LOSS AND DAMAGE DATA IN THE NDCS

In terms of the observed and/or projected climate-related hazards and trends reported in the NDCs that included an adaptation component, 72 percent reported temperature trends, followed by rainfall trends (52 percent), drought and extreme heat (40 percent each), storms and floods (32 percent each) and wildfires (28 percent), as shown in Figure 21.

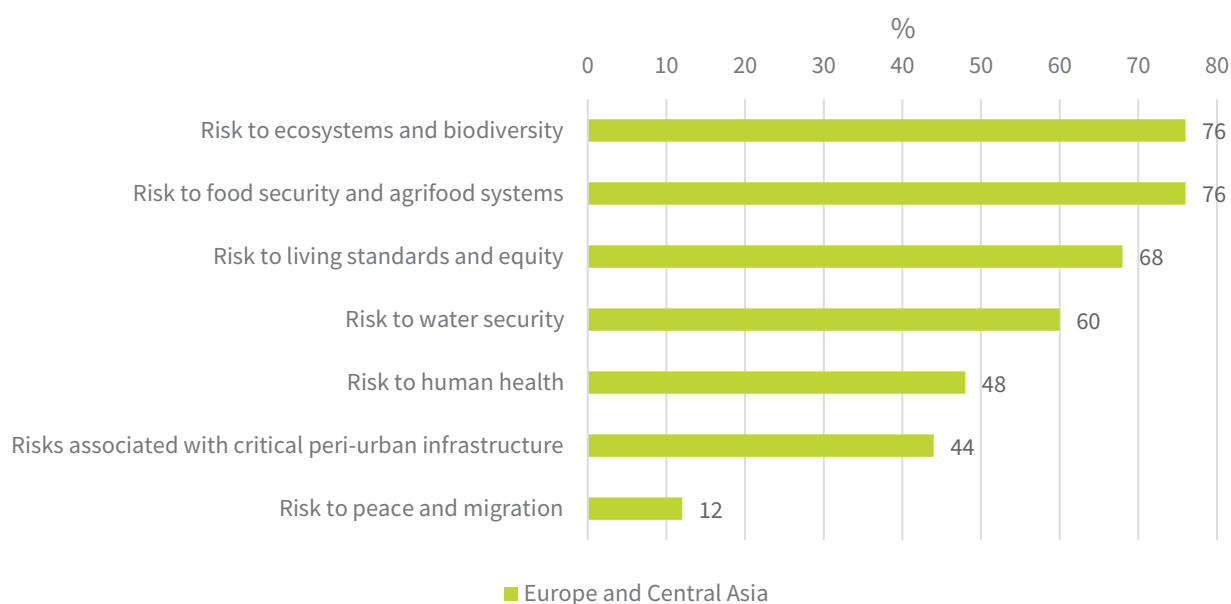
In those NDCs with an adaptation component in the ECA region, observed and/or projected key risks due to climate change were those related to risks to ecosystems and biodiversity (76 percent) and risks to food security and agrifood systems (76 percent), followed by risks to living standards and equity (68 percent) and risks to water security (60 percent), as shown in Figure 22.

Figure 21. Observed and/or projected climate-related hazards and trends reported (percentage of nationally determined contributions with an adaptation component)



Source: Crumpler, K., Wybieralska, A., Roffredi, L., Tanganelli, E., Angioni, C., Prosperi, P., Umulisa, V., Dahlet, G., Nelson, S., Rai, N., Schiettecatte, L.S., Salvatore, M., Wolf, J. & Bernoux, M. 2024. *Agrifood systems in nationally determined contributions: Global analysis*. Rome, FAO.

Figure 22. Observed and/or projected climate-related hazards and trends reported (percentage of nationally determined contributions with an adaptation component)



Source: Crumpler, K., Wybieralska, A., Roffredi, L., Tanganelli, E., Angioni, C., Prosperi, P., Umulisa, V., Dahlet, G., Nelson, S., Rai, N., Schiettecatte, L.S., Salvatore, M., Wolf, J. & Bernoux, M. 2024. *Agrifood systems in nationally determined contributions: Global analysis*. Rome, FAO.

Further analysis was conducted by assessing the inclusion of the words “loss” and “damage” in the first and updated NDCs in the ECA region as well as whether these were mentioned in relation to the agricultural sector. Significant increases were observed regarding the inclusion of “loss” and “damage”: Among the 24 countries,

six countries included “loss” in their first NDCs, and 18 included it in their updates. Meanwhile, seven included “damage” in their first NDCs, with 16 doing so in their updates. References to agricultural loss and damage also substantially increased (from one to ten countries and from three to seven countries, respectively) (Table 18).

Table 18. Analysis of the inclusion of loss and damage (including agricultural loss and damage) in the first and updated nationally determined contributions in Europe and Central Asia

	Loss included	Agricultural loss included	Damage included	Agricultural damage included
In first NDCs	6 of 24	1	7	3
In updated NDCs	18 of 24	10	16	7

Source: NDCs. See References.

CAUCASUS

Loss was included in the first and updated NDCs of Azerbaijan and Georgia, but there was no reference to agriculture-related loss. For instance, in these NDCs, it is mentioned that relevant adaptation measures are needed to decrease or minimize economic losses. In the first and updated NDCs of Georgia, reducing the losses of specific hazards such as sea level rise and extreme weather events is included. Damage was included in both the first and updated NDCs from Georgia but neither in the first NDC from Armenia nor the updated NDC from Azerbaijan. Only Georgia

referred to various hazards that caused damage – namely sea level rise and extreme weather events, such as drought, floods, flash floods, landslides and mudflows – as outlined in Table 19. Moreover, agriculture-related damage was specifically mentioned in the first Georgian NDC, with reference to the cropping and livestock subsectors. For example, the severe drought of 2000 reduced the production of cereals close to zero, and nearly 400 000 ha of agricultural land was damaged; additionally, sea level rise is expected to cause significant damage to the coastal areas of the Black Sea, with the estimated costs of around USD 600 million for the implementation of a coastline adaptation programme.¹⁸

Table 19. Analysis of the inclusion of loss and damage (including agricultural loss and damage) in the first and updated nationally determined contributions in Europe and Central Asia

Country	Loss included in the NDCs	Specific hazards/disasters included	Agriculture-related loss included	Agricultural subsectors mentioned	Damage included in the NDCs	Specific hazards/disasters included	Agriculture-related damage included	Agricultural subsectors mentioned
Armenia (updated NDC)					X			
Azerbaijan (first NDC)	X				X			
Azerbaijan (updated NDC)	X							
Georgia (first NDC)	X	sea level rise			X	drought, sea level rise, floods, flash floods, landslides, mudflows	X	crop, livestock
Georgia (first NDC)	X	extreme weather events			X	extreme weather events		

Source: NDCs. See References.

CENTRAL ASIA

Loss and damage were included in the first NDCs of Kyrgyzstan, Turkmenistan and Uzbekistan. However, only in the first NDC of Turkmenistan from 2016 did loss and damage specifically refer to the agricultural sector and in particular the crop subsector. For instance, it mentioned that assuming the failure of timely implementation of adaptation measures, the reduced volume of production could reach 20 percent by 2030, with an estimated loss of value of crop production at TMT 58 777 billion (equivalent to USD 20.5 billion in 2016) for the 2016–2030 period.¹⁹ When comparing the updated

NDCs of the Caucasus countries, all included loss and damage and related to agriculture except for the updated NDC of Uzbekistan, which included damage but not in relation to the sector. Countries did mention agriculture subsectors, such as forestry (damage) by Kazakhstan, crop (loss and damage) by Kyrgyzstan, forestry (loss and damage) and crop, livestock and forestry (damage) by Turkmenistan, and crop (loss) by Uzbekistan. Specific hazards/disasters were included in the updated NDCs of Tajikistan (floods, landslides, mudflows, avalanches and drought) and Turkmenistan (drought, floods and mudslides), as shown in Table 20.

Table 20. Analysis of loss and damage in the nationally determined contributions of the Central Asian countries

Country	Loss in cluded in the NDCs	Specific hazards/ disasters included	Agriculture-related loss included	Agricultural subsectors mentioned	Damage included in the NDCs	Specific hazards/ disasters included	Agriculture-related damage included	Agricultural subsectors mentioned
Kazakhstan (updated NDC)	X		X		X			forestry
Kyrgyzstan (first NDC)	X				X			
Kyrgyzstan (updated NDC)	X		X	crop, forestry	X			crop
Tajikistan (updated NDC)	X		X	crop, livestock	X	floods, landslides, mudflows, avalanches, drought	X	
Turkmenistan (first NDC)	X		X	crop, forestry	X	floods, mudslides drought, floods, mudslides		crop, livestock, forestry
Turkmenistan (updated NDC)	X	erosion	X		X			
Uzbekistan (first NDC)					X			
Uzbekistan (updated NDC)	X		X	crop	X	extreme weather events		

Source: NDCs. See References.

Turkmenistan and Uzbekistan indicated in their updated NDCs that drought is and will be adversely affecting their agricultural sectors, with the former mentioning that it is posing a threat to the sector's productivity, while the latter mentioned that due to water scarcity, crop yield reduction is expected. Kyrgyzstan in its updated NDC mentioned that it is expecting a reduction of 10 percent in the volume of losses and use of water resources when adaptation measures are implemented.²⁰

CIS EUROPE AND UKRAINE

Only in the first NDC of the Republic of Moldova were loss and damage included; no reference to agriculture-related loss and damage was mentioned, but damage caused by floods and drought was described. For instance, it is estimated that during the 1984–2006 period, the country's annual economic losses

caused by natural hazard-induced disasters amounted to USD 61 million. The 2008 floods cost the country around USD 120 million, and the total estimated damage and losses caused by the 2010 floods were about USD 42 million. It is estimated that if EUR 1 would be spent on flood protection, it would avoid EUR 6 of cost generated by damage. Moreover, it is further stated that the 2007 and 2012 droughts resulted in estimated losses of approximately USD 1 billion and USD 400 million, respectively.²¹

When comparing the updated NDCs, only those from the Republic of Moldova and the Russian Federation included loss and damage, and only the Republic of Moldova linked this to the agricultural sector, indicating the anticipated impact of climate change on the forestry sector (for example, through diseases, droughts and fires).

Table 21. Analysis of loss and damage in the nationally determined contributions of the countries in the CIS Europe and Ukraine subregion

Country	Loss in cluded in the NDCs	Specific hazards/ disasters included	Agriculture-related loss included	Agricultural subsectors mentioned	Damage included in the NDCs	Specific hazards/ disasters included	Agriculture-related damage included	Agricultural subsectors mentioned
Republic of Moldova (first NDC)	X	floods, drought			X	floods, drought		
Republic of Moldova (updated NDC)	X	drought, floods, hail, heavy rainfall, wind, frost, landslides			X	drought, diseases, fires		forestry
Russian Federation (updated NDC)	X				X	drought, forest fires, plant pests and diseases, degrada- tion of permafrost		

Source: NDCs. See References.

The updated NDC from the Republic of Moldova included additional estimated values related to loss and damage; it is estimated that the preliminary value of the average annual loss due to extreme weather events (e.g. drought, floods, hail, heavy rainfall, wind, frost and landslides) is USD 34 million per year. The current annual climate-related damage is estimated at USD 414 000, of which USD 219 000 is caused by drought, USD 177 000 by pests and USD 18 000 by fires. In addition, around USD 300 000 is spent each year on pest treatment remedies.²² Under its adaptation priorities and the enhancement of disaster risk management (DRM), the country included the application of the methodology

and standards on loss and damage assessment in all affected climate-related sectors, populations and geographical areas.

In its updated NDC, the Russian Federation mentioned damage to buildings and communications due to the degradation of permafrost and, as a result of climate change, an expected increase in the frequency, intensity and duration of droughts in certain regions. It also mentioned extreme rainfall, floods, waterlogging and forest fires. However, none of these changes were linked explicitly to damages and losses. The NDC does highlight the importance of undertaking comprehensive accounting of possible losses and benefits associated with climate change.

EU-27, UNITED KINGDOM AND EFTA

Loss and damage were not mentioned in the first NDCs of the EU-27, Iceland, Liechtenstein, Norway and Switzerland, and very little was included in the updated NDCs of the EU-27 and the United Kingdom, with the former mentioning only biodiversity loss and ecosystems degradation and damage

caused by the COVID-19 pandemic. The United Kingdom included in its first and updated NDCs losses related to the marine environment and its aim to implement nature-based solutions to address climate change and reverse biodiversity loss. Only in two of the four updated NDCs from the EFTA countries were loss of woodlands and fire-related damage included – by Iceland and Switzerland, respectively, as shown in Table 22.

Table 22. Analysis of loss and damage in the nationally determined contributions of the EU-27, United Kingdom and EFTA countries

Country	Loss in cluded in the NDCs	Specific hazards/ disasters included	Agriculture-related loss included	Agricultural subsectors mentioned	Damage included in the NDCs	Specific hazards/ disasters included	Agriculture-related damage included	Agricultural subsectors mentioned
EU-27 (updated NDC)	X		X		X	COVID-19 pandemic		forestry
United Kingdom (first NDC)	X		X	fisheries				
United Kingdom (updated NDC)	X		X	fisheries				
Iceland (updated NDC)	X		X	fisheries				
Switzerland (updated NDC)					X	fire		forestry

Source: NDCs. See References.

SOUTHEASTERN EUROPE

Loss and damage is included only in the first NDC of Serbia, and it is more detailed than the information in its updated NDC. In its first NDC, specific hazards/disasters were included, such as extreme weather events (loss and damage), drought, high temperatures and floods (loss) and forest fires (damage). For instance, it is estimated that the loss and damage associated with extreme weather events since 2000 exceeds EUR 5 billion, with more than 70 percent of losses linked to drought and high temperatures. Moreover, it is calculated that the droughts of 2000, 2003, 2007 and 2012 caused more than EUR 3.5 billion in damage,

with the 2012 drought resulting in a 50 percent decrease in the yields of certain crops. Further estimates indicate that the 2014 floods caused more than USD 1.5 billion in damage, and more than EUR 300 million in material damage was incurred by forest fires during the 2000–2009 period.²³

The updated NDCs of all countries in Southeastern Europe include some loss and damage information; however, in the updated NDCs of Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia and Türkiye, it is highly limited, with only Türkiye referring to damage caused by forest fires and only Serbia referring to its first NDC for losses and damages

associated with extreme weather events. Bosnia and Herzegovina included that in 2014, the country ranked third in terms of total losses and damage caused by climate change in the Global Risk Index and that the 2012 drought caused agricultural production losses of around BAM 1.65 billion and the reduction of grain and vegetable yields by approximately 70 percent.²⁴ The updated NDC of Albania is the

most detailed of all countries in the subregion; it includes such specific hazards and disasters as forest fires and floods (loss and damage), heat stress (loss), and coastal erosion and new pests and diseases (damage). It also includes agriculture-related loss and damage and mentions the crop, livestock and forestry subsectors, as outlined in Table 23.

Table 23. Analysis of loss and damage in the nationally determined contributions of the countries of Southeastern Europe

Country	Loss in the NDCs	Specific hazards/disasters included	Agriculture-related loss included	Agricultural subsectors mentioned	Damage included in the NDCs	Specific hazards/disasters included	Agriculture-related damage included	Agricultural subsectors mentioned
Albania (updated NDC)	X	heat stress, floods, forest fires	X	forestry, livestock	X	floods, coastal erosion, forest fires, new pests and diseases	X	crop, livestock, forestry
Bosnia and Herzegovina (updated NDC)	X	drought	X	crop	X	drought, diseases, fires		forestry
Montenegro (updated NDC)	X				X			
North Macedonia (updated NDC)	X				X			
Serbia (first NDC)	X	drought, high temperatures, extreme weather events, floods			X	forest fires, extreme weather events	X	forestry
Serbia (updated NDC)	X	extreme weather events			X	extreme weather events		
Türkiye (updated NDC)	X				X	forest fires	X	forestry

Source: NDCs. See References.

The updated NDC of Albania includes various examples of agricultural damage and loss incurred in the past few decades. For instance, during the 2007–2019 period, around 337 800 ha of forests were burned due to forest fires, which is about 33 percent of the national forest area. In addition, during 1985–2020, around 80 ha of the coastal forest belt of Mediterranean pines

disappeared due to coastal erosion. Moreover, during the 2010–2020 period, the western lowlands were substantially inundated several times, which resulted in significant damage to agricultural production of approximately USD 100 million, including 10 000 ha of wheat, 15 000 ha of fodder crops, 1 000 ha of fruit trees and more than 1 500 ha of vineyards.²⁵

ASSESSMENT OF AGRICULTURE-RELATED ADAPTATION AND RISK REDUCTION MEASURES IN NDCS

This subsection focuses on the extent to which relevant agricultural adaptation and risk reduction measures are included in countries' updated NDCs. The following types of interventions should be implemented by countries based on their locations and context specifications and needs, helping them enhance the adaptation and resilience of their agricultural sectors to future climate variability and change:

- **Agroclimatic and disaster risk information systems** encompass measures to better understand risks and include agroclimatic monitoring, disaster risk and vulnerability assessments, and the collection of agriculture damage and loss.
- **Early warning systems**, as one component of risk information systems, aim to provide accurate, timely, relevant and localized multihazard alerts in order to reduce the adverse impacts of climate-related hazards on lives and agricultural livelihoods.
- **Climate and disaster risk governance** includes such aspects as legal and policy frameworks, institutional structures, interinstitutional alignment and coordination, planning and decision-making processes, capacity development, and financial resources allocation and investment.
- **Risk transfer mechanisms** (risk-informed and shock-responsive social protection and risk insurance) can protect assets and livelihoods to help better manage risks, such as contingency funds, savings, loans and risk-sharing schemes (i.e. grain reserves, warehouse receipt systems and revolving funds), and agricultural risk insurance (i.e. crop insurance and weather index-based insurance).
- **DRR and CCA agricultural good practices and technologies at farm level** aim to reduce underlying risks and vulnerabilities. These good practices and technologies may enhance socioeconomic and environmental benefits (e.g. increasing yields, income and diversification; reducing labour, fertilizer or water costs; and decreasing vulnerability against production failure due to the impacts of climate variability and change).
- **Nature-based solutions at territorial/ecosystem level** include measures that aim to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively while at the same time providing benefits to human well-being and biodiversity.²⁶
- **Climate risk proofing of grey infrastructure** entails ensuring that agriculture-related infrastructure is resilient against climate hazards through enhancing the infrastructure's physical vulnerabilities, such as improving the hurricane resistance of seed storage facilities, building livestock shelters that reduce heat stress, and ensuring adequate irrigation and drainage systems (i.e. drip irrigation and drainage systems that reduce the adverse impacts of droughts and floods).
- **Preparedness, early/anticipatory action and emergency response** aim to limit and respond to disaster damage. Emergency responses focus on responding after disasters to save the lives of people and animals and provide relief (e.g. by distributing seeds, fertilizer, fishing equipment, livestock feed, veterinary medicines, farm tools and machines). Emergency response also can involve cash and voucher programmes that help people cope with crises while protecting livelihoods and strengthening resilience to future shocks and stresses. Better preparedness can help reduce the adverse impacts of disasters through such efforts as establishing preparedness and contingency plans, identifying safe spaces for animals in the event of flooding, or stockpiling supplies, vaccinations and other medications. Early and anticipatory actions, initiated by early warning triggers, can include moving animals to safe locations ahead of a coming disaster.^{27,28}

When relevant agricultural adaptation and risk reduction measures were not included in countries' updated NDCs, information was supplemented through analysis of countries' adaptation communications to the UNFCCC, when available. These reports outline the

party's information on its adaptation actions and plans, with a view to enhancing action and support and contributing to the global goal on adaptation.²⁹ Parties to the UNFCCC also must submit national communication reports on the implementation of the convention to the Conference of the Parties, and these were analysed when available. National communication reports, which are to be submitted by both Annex I and non-Annex I countries,ⁿ provide information on emissions and removals of greenhouse gases, vulnerability assessments and measures for CCM and CCA, among other topics.

Relevant agricultural adaptation and risk reduction measures were included in 12 updated NDCs out of 24 countries (up from eight countries in the initial NDCs). The types of interventions most included were DRR/CCA agricultural good practices and technologies at farm level and climate risk proofing of grey infrastructure, followed by

agroclimatic and disaster risk information systems and climate and disaster risk governance, as shown in Table 24. Crops (12 countries), forestry (nine countries), livestock (seven countries), fisheries (one country) and aquaculture (one country) were the subsectors most frequently included.

Additional analysis was undertaken of the remaining 12 countries' adaptation communication and their latest national communication reports, which showed that the most-included type of interventions were agroclimatic and disaster risk information systems and climate and disaster risk governance, followed by DRR/CCA agricultural good practices and technologies at farm level and nature-based solutions at territorial/ecosystem level, as provided in Table 24. The subsectors included were crops (11 countries), forestry (nine countries), livestock (eight countries), aquaculture (four countries) and fisheries (two countries).

Table 24. Summary of the types of relevant agricultural adaptation and risk reduction interventions included in the updated nationally determined contributions (12 total) and latest national communications (12 total) of the countries in Europe and Central Asia

Type of relevant agricultural adaptation and risk reduction interventions	In updated NDCs	In latest NCs
Agroclimatic and disaster risk information systems	10	12
Early warning systems	5	4
Climate and disaster risk governance	10	12
Risk transfer mechanisms (social protection and risk insurance)	4	6
DRR/CCA agriculture good practices and technologies at farm level	12	11
Nature-based solutions at territorial/ecosystem level	9	11
Climate risk proofing of grey infrastructure	12	7
Preparedness, early/anticipatory action, and emergency response	3	7

Source: NDCs. See References.

CAUCASUS

In the Caucasus countries, relevant agricultural adaptation and risk reduction measures were included in all three countries' NDCs. While these measures were included in both the first and updated NDCs of Georgia and Azerbaijan, this is not the case in Armenia, which included these measures

only in its updated NDC. Measures related to the cropping subsector were included in the NDCs of all countries, while measures related to the forestry subsector were mentioned in the updated NDCs of Azerbaijan and Georgia. Azerbaijan is the only Caucasus country that included livestock-related adaptation and risk reduction measures in its updated NDC, as indicated in Table 25.

ⁿ Annex I Parties include the industrialized countries that were members of the Organisation for Economic Co-operation and Development in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States. Non-Annex I Parties are mostly developing countries. <https://unfccc.int/es/topics/mitigation/workstreams/nationally-appropriate-mitigation-actions/national-reports>

Table 25. Relevant adaptation and risk reduction measures included by agriculture subsectors in the Caucasus subregion

Country	Relevant agricultural adaptation and risk reduction measures included	Cropping subsector	Livestock subsector	Forestry subsector	Fisheries subsector	Aquaculture subsector
Armenia (updated NDC)	Yes	X				
Azerbaijan (updated NDC)	Yes	X	X	X		
Georgia (updated NDC)	Yes	X		X		

Source: NDCs. See References.

The updated NDCs of the Caucasus countries include different types of agriculture-relevant adaptation and risk reduction measures, as indicated in Table 26. For example, farm-level agricultural DRR/CCA good practices and technologies and nature-based solutions at territorial/ecosystem level were included in all three countries. This included, for example, support for the ecosystem-based approach to adaptation (Armenia); the cultivation of new forest areas, water and land-protecting forest strips (windbreaks) and improvement of pasture management and agricultural lands (Azerbaijan); and the promotion and preservation of endemic, protected and indigenous species that are highly important for food and agriculture, including implementing support measures to reduce loss and damage caused by extreme weather events (Georgia).

Climate risk proofing of grey infrastructure also was mentioned by all countries, particularly regarding the enhancement of climate-resilient infrastructure and sustainable use in irrigation and innovative irrigation management practices and technologies. Both Armenia and Georgia included agroclimatic and disaster risk information systems. Armenia indicated the assessment of climate change on agriculture, including forestry, fisheries and natural ecosystems (aquatic and terrestrial). Georgia mentioned the economic impact on its coastal zone, mountain ecosystems and ecosystem services and on the livelihoods of the local population.

Table 26. Types of relevant agricultural adaptation and risk reduction interventions included in the Caucasus subregion

Type of relevant agricultural adaptation and risk reduction interventions	Armenia (updated NDC)	Azerbaijan (updated NDC)	Georgia (updated NDC)
Agroclimatic and disaster risk information systems	X		X
Climate and disaster risk governance	X		
DRR/CCA agriculture good practices and technologies at farm level	X	X	X
Climate risk proofing of grey infrastructure	X	X	X
Nature-based solutions at territorial/ecosystem level	X		

Source: NDCs. See References.

CENTRAL ASIA

Relevant agricultural adaptation and risk reduction measures were included in the updated NDCs of all Central Asian countries but Kazakhstan. These measures were not included in the first NDC of Kyrgyzstan but were mentioned in both the first and updated NDCs of Tajikistan, Turkmenistan and Uzbekistan. Since the NDC of Kazakhstan

did not include any relevant measures, its latest national communication report was analysed. Crop-related measures were included in the reports of all Central Asian countries, and Kyrgyzstan, Tajikistan and Turkmenistan also included forestry-related measures. The updated NDCs of Kyrgyzstan and Tajikistan further mentioned measures related to the livestock subsector, as shown in Table 27.

Table 27. Relevant adaptation and risk reduction measures included in the agriculture subsectors of Central Asia

Country	Relevant agricultural adaptation and risk reduction measures included	Crop subsector	Livestock subsector	Forestry subsector	Fisheries subsector	Aquaculture subsector
Kazakhstan (second national communication report)	Not in its updated NDC	x				
Kyrgyzstan (updated NDC)	Yes	x	x	x		
Tajikistan (updated NDC)	Yes	x	x	x		
Turkmenistan (updated NDC)	Yes	x		x		
Uzbekistan (updated NDC)	Yes	x				

Source: NDCs. See References.

All Central Asian countries but Uzbekistan included measures related to agroclimatic and disaster risk information systems. For instance, Kazakhstan and Kyrgyzstan mentioned agrometeorological monitoring and forecasting systems, while Turkmenistan emphasized the need to create agricultural innovation systems that provide consulting services to agricultural producers on CCA.

All five country reports included measures related to climate and disaster risk governance, including strengthening the CCA capacities of agricultural specialists in Kazakhstan and relevant government officials in Tajikistan. Additional examples include ensuring the support of legal, policy and institutional frameworks to implement sustainable forest management practices in Tajikistan and Turkmenistan and the need for improving policies for preventing and responding to climate emergencies in Kyrgyzstan. Kyrgyzstan, Tajikistan and

Turkmenistan included the need to establish sustainable climate-smart financial services, products and systems in agriculture. Regarding risk transfer mechanisms, Kazakhstan focused on enhancing its existing crop insurance system, while Kyrgyzstan prioritized the development of mechanisms for the implementation of a climate risk insurance system.

Agricultural DRR and CCA good practices and technologies at farm level were included by all countries, including Kyrgyzstan (the development of agroforestry and conservation agriculture), Tajikistan (livestock breeding, the enhancement of pasture productivity and management, and the promotion of crop rotation, intercropping and crop diversity to reduce the impacts of droughts and pests), Turkmenistan (transition to integrated water resources management) and Uzbekistan (introduction of climate-resistant and water-saving technologies in agriculture).

Furthermore, nature-based solutions at territorial/ecosystem level were promoted by all Central Asian countries but Kazakhstan, including the expansion of the network of specially protected natural areas in Kyrgyzstan and the promotion of reforestation and afforestation (“green infrastructure”) in Tajikistan and Turkmenistan.

Moreover, all countries also included climate risk proofing of grey infrastructure, such as ensuring climate-resilient irrigation infrastructure (Kyrgyzstan) and the improvement and efficiency of irrigation and drainage systems (Tajikistan and Turkmenistan). Only Kyrgyzstan mentioned the strengthening of people’s prevention and response capacities and, in this regard, also the need to raise awareness and knowledge of climate emergencies, as shown in Table 28.

Table 28. Types of relevant agricultural adaptation and risk reduction interventions included in the Central Asia subregion

Type of relevant agricultural adaptation and risk reduction interventions	Kazakhstan (second national communication report)	Kyrgyzstan (updated NDC)	Tajikistan (updated NDC)	Turkmenistan (updated NDC)	Uzbekistan (updated NDC)
Agroclimatic and disaster risk information systems	X	X	X	X	
Early warning systems			X		X
Climate and disaster risk governance	X	X	X	X	X
Risk transfer mechanisms (social protection and risk insurance)	X	X			
DRR/CCA agriculture good practices and technologies at farm level	X	X	X	X	X
Nature-based solutions at territorial/ecosystem level		X	X	X	X
Climate risk proofing of grey infrastructure	X	X	X	X	X
Preparedness, early/anticipatory action and emergency response		X			

Source: NDCs. See References.

CIS EUROPE AND UKRAINE

Relevant agricultural adaptation and risk reduction measures are included in both the first and updated NDCs only in the Republic of Moldova. In Belarus, these measures were included only in the country’s first NDC, and the first and updated NDCs of the Russian Federation and Ukraine did not include any

relevant measures. Hence, the latest national communication reports of these countries were assessed. The agricultural adaptation and risk reduction measures identified in the documents of all countries in the CIS Europe and Ukraine subregion were related to the crop, livestock and forestry subsectors and, in addition, the aquaculture subsector in Belarus and Ukraine, as shown in Table 29.

Table 29. Relevant adaptation and risk reduction measures included by agriculture subsectors in the CIS Europe and Ukraine subregion

Country	Relevant agricultural adaptation and risk reduction measures included	Crop subsector	Livestock subsector	Forestry subsector	Fisheries subsector	Aquaculture subsector
Belarus (eighth national communication)	Not in updated NDC	X	X	X		X
Republic of Moldova (updated NDC)	Yes	X	X	X		
Russian Federation (eighth national communication)	Not in updated NDC	X	X	X		
Ukraine (sixth national communication)	Not in updated NDC	X	X	X		X

Source: NDCs. See References.

Establishing early warning systems was mentioned by Belarus (floods), the Republic of Moldova (natural hazards and seasonal weather information) and the Russian Federation (forest fires). Aspects related to climate and disaster risk governance were included by all countries of the subregion, such as revision of forest management standards based on climate change-related forecasts (Ukraine), establishment of legal and policy frameworks for forestry and aquaculture (Belarus), flood and drought risk management (Republic of Moldova) and the need for capacity building regarding legal and policy frameworks (Belarus and Republic of Moldova). Regarding risk transfer mechanisms, all CIS countries but the Russian Federation included insurance, with agricultural risk insurance included by the Republic of Moldova and Ukraine. The former is the only country that included the increase of climate resilience of rural livelihoods through social protection programmes.

All countries in the CIS Europe and Ukraine subregion included the promotion of crop-, livestock- and forestry-related DRR and CCA good practices, including promoting climate-resilient varieties and species, such as fish species, to adapt to changes in climatic conditions (Belarus and Ukraine). In addition, measures were included by Belarus to

combat desertification, land degradation and floods. The Republic of Moldova and the Russian Federation emphasized crop diversification, while the Russian Federation included measures aimed at the retention of surface runoff of melt and storm water to reduce soil erosion and landslide risks.

Nature-based solutions are included by all countries of the subregion, mostly related, inter alia, to restoring lands to reduce wind erosion, restoring natural river channels and floodplains for flood protection, and enhancing control over drained peatlands in fire-prone periods (Belarus); promoting landscape management to provide shelter to livestock and cultivating protection forest belts or buffer zones for agricultural land (Republic of Moldova); forest reproduction and afforestation to reduce forest fire and soil erosion risks (Russian Federation); and afforestation of coastal protection zones and implementation of anti-erosion measures (Ukraine).

In terms of climate risk proofing of grey infrastructure, all but the Russian Federation included related measures; for instance, Belarus focused on the construction of resilient irrigation systems and the design of animal housing and livestock facilities to prevent heat stress in animals (Table 30).

Table 30. Types of relevant agricultural adaptation and risk reduction interventions included in the CIS Europe and Ukraine subregion

Type of relevant agricultural adaptation and risk reduction interventions	Belarus (eighth national communication report)	Republic of Moldova (updated NDC)	Russian Federation (eighth national communication report)	Ukraine (sixth national communication report)
Agroclimatic and disaster risk information systems	X	X	X	X
Early warning systems	X	X	X	
Climate and disaster risk governance	X	X	X	X
Risk transfer mechanisms (social protection and risk insurance)	X	X		X
DRR/CCA agriculture good practices and technologies at farm level	X	X	X	X
Nature-based solutions at territorial/ecosystem level	X	X	X	X
Climate risk proofing of grey infrastructure	X	X		X
Preparedness, early/anticipatory action and emergency response	X		X	

Source: NDCs. See References.

EU-27, UNITED KINGDOM AND EFTA

Agriculture-relevant adaptation and risk reduction measures were not included in the first and updated NDCs of the European Union, the United Kingdom or the EFTA countries. Hence, the latest national communication reports – and the four adaptation communication reports submitted by the European Union, United Kingdom, Iceland and Switzerland – were analysed regarding the inclusion of specific agriculture-relevant adaptation and risk reduction measures. However, since their national communication reports were

generally more detailed, the findings from these two types of reports were combined. The European Union report included relevant agricultural adaptation and risk reduction measures that specifically covered the crop subsector, while the United Kingdom mentioned those covering the crop, livestock, forestry and fisheries subsectors. Of the four EFTA countries, only Norway included relevant agricultural adaptation and risk reduction measures that encompassed all five agricultural subsectors, while Liechtenstein and Switzerland referred to the crop, livestock and forestry subsectors, with the latter adding aquaculture. Iceland covered only the forestry sector (Table 31).

Table 31. Relevant adaptation and risk reduction measures included by agriculture subsectors in the EU-27, United Kingdom and EFTA subregion

Country	Relevant agricultural adaptation and risk reduction measures included	Crop subsector	Livestock subsector	Forestry subsector	Fisheries subsector	Aquaculture subsector
EU-27 (adaptation communication report/eighth national communication)	Not in updated NDC	x				
United Kingdom (adaptation communication/eighth national communication)	Not in updated NDC	x	x	x	x	
Iceland (adaptation communication/eighth national communication)	Not in updated NDC			x		
Liechtenstein (eighth national communication)	Not in updated NDC	x	x	x		
Norway (eighth national communication)	Not in updated NDC	x	x	x	x	x
Switzerland (adaptation communication/eighth national communication)	Not in updated NDC	x	x	x		x

Source: NDCs. See References.

Although not many specific agriculture-relevant adaptation and risk reduction measures were included in the adaptation communication and eighth national communication reports from the European Union, some mentioned are farm-level DRR and CCA good practices, such as those related to agroforestry, soil conservation and water management, as well as nature-based solutions. Others include conducting risk and vulnerability assessments, recording and sharing climate risk and loss data, and raising awareness and increasing the knowledge of CCA through, for example, the European Climate Adaptation Platform and the Joint Programming Initiative on Agriculture, Food Security and Climate Change. Also mentioned were the promotion of risk insurance, climate risk proofing of infrastructure and the mainstreaming of conflict-sensitive, anticipatory, preparedness and preventive approaches to climate resilience in relevant European Union policies and instruments.

The adaptation communication and eighth national communication reports from the United Kingdom referred to agroclimatic and disaster risk information systems, such as forestry risk assessments and soil carbon monitoring. In addition, specific farm-level DRR and CCA good practices and technologies included were no-till and precision farming and appropriate water management to reduce the impacts of floods and drought. The use of new varieties and genetic improvements to crops, livestock and commercial trees was also mentioned, as were the restoration of degraded peatlands and other wetlands, the need for “building back better” related to flood and coastal erosion risk management infrastructure and technology, and risk transfer mechanisms such as insurance. Contingency planning to enhance preparedness to respond to wildfire risk also was mentioned, as outlined in Table 32.

Table 32. Types of relevant agricultural adaptation and risk reduction interventions included in the EU-27 and United Kingdom

Type of relevant agricultural adaptation and risk reduction interventions	European Union (adaptation communication report/eighth national communication report)	United Kingdom (eighth national communication report)
Agroclimatic and disaster risk information systems	X	X
Early warning systems		
Climate and disaster risk governance	X	X
Risk transfer mechanisms (social protection and risk insurance)	X	X
DRR/CCA agriculture good practices and technologies at farm level	X	X
Nature-based solutions at territorial/ecosystem level	X	X
Climate risk proofing of grey infrastructure	X	X
Preparedness, early/anticipatory action and emergency response	X	X

Source: NDCs. See References.

Agroclimatic and disaster risk information systems were included in all of the analysed documents from the EFTA countries (for example, the collaborative work between Liechtenstein and Switzerland at the Swiss Federal Food Safety and Veterinary Office, which provides biweekly information on the spreading of the most important animal diseases to both countries). Norway mentioned the need for awareness raising, knowledge management and extension services support to promote more climate-resilient production systems, including climate advisory services at the farm level. Early warning systems were included by Liechtenstein (animal diseases and plant diseases under development) and Switzerland to enhance risk-informed decision-making in agriculture.

All EFTA countries referred to different aspects of climate and disaster risk governance. For instance, Norway referred to the financial support provided to increase the conservation and use of genetic resources in plants, animals and forestry. Liechtenstein and Switzerland focused on the need to adjust agricultural legal and policy frameworks to include specific incentives and requirements for the implementation of CCA practices. The latter included local-level forest management plans that are updated every ten years as well as the updated forest development plan 2030+, which is currently being developed. Only Norway included risk transfer mechanisms, particularly

regarding insurance/compensation schemes that cover damage caused by natural hazards.

Some farm-level DRR/CCA agriculture good practices and technologies included are the planting of native birch (Iceland); the conversion of spruce and fir stocks into mixed deciduous and coniferous forests (Liechtenstein); and the adaptation of seed production for grass and clover and the improvement of crop and livestock practices to address abiotic and biotic stresses (Norway). Switzerland included practices to reduce the impacts of drought, pests and diseases and to prevent plant and animal heat stress.

Nature-based solutions at territorial/ecosystems level were included by all EFTA countries but Norway, including afforestation, the promotion and implementation of sustainable land use and restoration of degraded land (Iceland) and research on biodiversity to increase the resilience of agroecosystems (Switzerland).

Regarding climate risk proofing of grey infrastructure, Switzerland included optimization of water management.

Liechtenstein mentioned that emergency planning is undertaken in the case of avalanches, flooding and forest fires, whereas Norway indicated that it is enhancing preparedness and adaptation to climate change (Table 33).

Table 33. Types of relevant agricultural adaptation and risk reduction interventions included in the EFTA subregion

Type of relevant agricultural adaptation and risk reduction interventions	Iceland (adaptation communication report/eighth national communication report)	Liechtenstein (eighth national communication report)	Norway (eighth national communication report)	Switzerland (adaptation communication report/eighth national communication report)
Agroclimatic and disaster risk information systems	X	X	X	X
Early warning systems		X		X
Climate and disaster risk governance	X	X	X	X
Risk transfer mechanisms (social protection and risk insurance)			X	
DRR/CCA agriculture good practices and technologies at farm level		X	X	X
Nature-based solutions at territorial/ecosystem level	X	X		X
Climate risk proofing of grey infrastructure		X	X	X
Preparedness, early/anticipatory action and emergency response		X	X	

Source: NDCs. See References.

SOUTHEASTERN EUROPE

Relevant agriculture adaptation and risk reduction measures were included in the updated NDCs of four of the six countries in the Southeastern Europe subregion: Albania, Montenegro, Serbia and Türkiye, with Türkiye the only one that also included these measures in its first NDC. As Bosnia and Herzegovina and North Macedonia did not include any relevant measures in

their updated NDCs, this assessment was undertaken by analysing their latest national communication reports. All countries but Bosnia and Herzegovina included measures for the crop subsector, and all but Türkiye included measures for the forestry subsector. Relevant measures were included for the livestock subsector by all countries but Bosnia and Herzegovina and Montenegro. Albania was the only country that also included measures for its fisheries and aquaculture subsectors (Table 34).

Table 34. Relevant adaptation and risk reduction measures included by agriculture subsectors in the Southeastern Europe subregion

Country	Relevant agricultural adaptation and risk reduction measures included	Crop subsector	Livestock subsector	Forestry subsector	Fisheries subsector	Aquaculture subsector
Albania (updated NDC)	Yes	x	x	x	x	x
Bosnia and Herzegovina (fourth national communication)	Not in updated NDC	x		x		
Montenegro (updated NDC)	Yes	x		x		
North Macedonia (fourth national communication)	Not in updated NDC	x	x	x		
Serbia (updated NDC)	Yes	x	x	x		
Türkiye (updated NDC)	Yes	x	x			

Source: NDCs. See References.

All countries in Southeastern Europe included various types of relevant adaptation and risk reduction-related interventions for agriculture in their updated NDCs and national communication reports (Table 35).

All countries included agroclimatic and disaster risk information systems, such as developing research and studies on risk assessment for pastures (Albania); improving the monitoring, analysis and modelling of data to adequately assess climate change and its impacts on the agricultural sector (Bosnia and Herzegovina); and purchasing drones for the monitoring of forest conditions and climate change (North Macedonia). Most countries focused on the rehabilitation of existing irrigation and drainage systems and the construction of new and improved irrigation systems as part of climate risk proofing of grey infrastructure, while North Macedonia included climate risk proofing of livestock housing. This also was emphasized by Serbia, which included the adaptation of zootechnical conditions in animal husbandry facilities.

All countries included aspects related to climate and disaster risk governance. Bosnia and Herzegovina mentioned the capacity building of its agricultural producers, the promotion and dissemination of agricultural practices, and the increase in knowledge and skills regarding adaptation measures by extension services. Several countries in the subregion mentioned the importance of finance, such as subsidy schemes for farmers to introduce new technologies in livestock husbandry, diversification and processing activities as well as financial support for the application of livestock insurance schemes, which was included by Albania.

DRR/CCA agricultural good practices and technologies at farm level and nature-based solutions at territorial/ecosystem level were included by all countries in Southeastern Europe, such as reducing exposure to risks at sea (e.g. storms and winds) and increasing the resilience of aquaculture to reduced water flow and changes in water physiochemical parameters (Albania). Specific mentions were made by all countries in the subregion, except for

Türkiye, of reforestation and afforestation, climate change-adapted tree species, and forest fire management. Measures for crops included reducing the impacts of pests, diseases, droughts, floods and wind erosion through new cultivars, crop rotation, soil conservation, crop diversification, mulching, direct planting, no-tillage, construction of hedgerows and windbreaks. Measures for the livestock subsector included the establishment of a national cryobank for the conservation of the most vulnerable local farm animal genetic resources (Albania), the breeding of genetically heat-tolerant animals and improved practices in cattle breeding (North Macedonia and Türkiye),

and the adoption of special feed and feeding techniques during periods of excessive heat (North Macedonia).

Early warning systems were included by Albania (fire detection) and Türkiye (flood and drought forecasting), and risk transfer mechanisms were included by Albania (aquaculture insurance) and Türkiye (establishing insurance). Measures related to preparedness, early/anticipatory action and emergency response were included, among others, for pastures and meadows, forestry, fisheries and aquaculture (Albania) and to reduce water-related risks and impacts (Bosnia and Herzegovina), as shown in Table 35.

Table 35. Types of relevant agricultural adaptation and risk reduction interventions included in the Southeastern Europe subregion

Type of relevant agricultural adaptation and risk reduction interventions	Albania (updated NDC)	Bosnia and Herzegovina (fourth national communication report)	Montenegro (updated NDC)	North Macedonia (fourth national communication report)	Serbia (updated NDC)	Türkiye (updated NDC)
Agroclimatic and disaster risk information systems	x	x	x	x	x	x
Early warning systems	x					x
Climate and disaster risk governance	x	x	x	x	x	x
Risk transfer mechanisms (social protection and risk insurance)	x					x
DRR/CCA agriculture good practices and technologies at farm level	x	x	x	x	x	x
Nature-based solutions at territorial/ecosystem level	x	x		x	x	
Climate risk proofing of grey infrastructure	x	x	x	x	x	x
Preparedness, early/anticipatory action and emergency response	x	x	x			

Source: NDCs. See References.



CHAPTER

UPDATE: LEGISLATION AND POLICY FRAMEWORKS FOR MITIGATION, ADAPTATION AND DISASTER RISK REDUCTION

3.1

KEY MESSAGES

- GHG policies and legislative frameworks have gained pace over the past decade, with some directly targeting GHG reduction within agrifood systems, while others have indirect yet significant effects in this regard.
- In the Central Asia and CIS Europe and Ukraine subregions, GHG mitigation in agrifood systems is linked with sustainable and rural development, and sectoral policies and legislation address GHG mitigation in agrifood systems. The EU-27 boasts the most comprehensive legislative and policy framework in the region regarding the integration of CCM policies and measures in agrifood systems. The countries of Southeastern Europe have made strides in advancing climate mitigation policies and legislative frameworks within the agriculture and LULUCF sectors.
- In many ECA countries, economy-wide GHG mitigation policies exist as a foundation that is needed for the development of sector-specific policies, strategies and legislative frameworks aimed at reducing emissions within agrifood systems. Similarly, LT-LEDS documents stand out as a comprehensive framework for GHG mitigation in the agricultural sector, offering a robust set of measures in many ECA countries.

- National policies, strategies and legislative frameworks need to align with and be integrated into sectoral policies and strategies, and mitigation concerns should be mainstreamed into strategies and practices related to agriculture and food value chains.
- The ECA region has seen a fourfold increase in the number of countries that have established and adopted NAPs and national adaptation strategies since FAO's Second NDC report, which was published in 2021.
- The countries that have NAPs and/or national adaptation strategies include Albania, Azerbaijan, Belarus, Bosnia and Herzegovina, the European Union, Georgia, Iceland, Liechtenstein, Norway, the Republic of Moldova, Russian Federation, Serbia, Switzerland, Türkiye, Ukraine and the United Kingdom.

3.2

CLIMATE CHANGE MITIGATION LEGISLATION AND POLICY FRAMEWORK UPDATES

This section provides an overview of recent advancements within each subregion concerning legislative and policy initiatives aimed at mitigating GHG emissions within agrifood systems.

Some legislative measures and policy frameworks directly target GHG reduction within agrifood systems, while others may have indirect yet significant effects in this regard. The following sections summarize the pertinent legislative and policy updates, with a focus on those anticipated to directly impact GHG mitigation within agrifood systems and excluding policies that target other sectors and may have indirect impacts.

CAUCASUS

The primary focus of Azerbaijan is on addressing emissions from the energy sector, given its significant contribution to the nation's overall emissions. Conversely, Georgia employs a multifaceted approach, encompassing both broad economy-wide strategies and sector-specific mitigation plans, which include measures tailored for agrifood systems.

Table 36 provides a comprehensive overview of the key policies, strategies and legislative frameworks implemented by these countries to reduce emissions within the agriculture and LULUCF sectors.

Armenia currently lacks comprehensive policies or legislative documents outlining economy-wide emission reduction strategies, especially for the agricultural sector. While laws such as the Law on Organic Agriculture, Governmental Decision No. 725-L validating the Regulation on Land Degradation Neutrality and the Agricultural Land Use Efficiency Concept and Program of Measures do not explicitly target GHG mitigation in agriculture, their overarching objectives may facilitate emission reduction through sustainable agricultural practices.

Armenia submitted its LT-LEDS in December 2023, with measures encompassing enhanced manure management for biogas production, improvements in irrigation conveyance efficiency, and the introduction of cattle breeds with higher feed digestibility. The Armenia Agriculture Strategy (2020–2030) was adopted in 2019. One of its seven principles is CCA, resilience and environmental sustainability, which is to be achieved through the promotion of climate-smart agricultural practices and sustainable resource management.

Azerbaijan lacks a comprehensive economy-wide policy for emission reduction. However, its emphasis on the energy sector serves to drive low-carbon development. Despite this, climate change considerations have yet to be fully integrated into the country's policies and measures within agrifood systems. While certain policies such as the Food Safety Policy or the Law on Organic Agriculture may indirectly address CCM and CCA in agrifood systems, there remains a need for more explicit measures targeting emission reduction.

Georgia has made significant strides in developing its policy and legislative framework for economy-wide emission reduction. Table 36 provides detailed insights into the key policies and strategies aimed at reducing emissions within agrifood systems, including forestry. These measures directly target the country's primary emission categories within the agricultural sector.

Additionally, Georgia submitted its LT-LEDS in 2023, outlining further measures to address emissions from the agricultural sector. The LT-LEDS focuses on addressing enteric fermentation, manure management

and direct and indirect nitrous oxide emissions but notes that the implementation of those measures will require significant technological transformation.

Beyond the policy framework, various strategies encompassing agrifood systems include measures that indirectly contribute to emission reduction. For instance, the Development Strategy of Georgia – Vision 2030 advocates for sustainable land management, integrated water resource management and improved forest management, among other initiatives.

Table 36. Key policies, strategies and legislation that address emission reduction in the agriculture and LULUCF sectors in the Caucasus

Country	Strategy, policy or legislation	Highlights of measures regarding agriculture and LULUCF
Armenia	- Agriculture Strategy (2020–2030) in 2019 - LT-LEDS (2023)	- Promote sustainable agriculture practices such as increasing the availability of cultivable farmland, improving irrigation systems, enhancing access to finance, and improving the quality of seeds and planting materials. - Promote modern livestock management techniques and facilities, consolidating farms and developing wholesale markets. - Manage manure and produce biogas, improve irrigation conveyance efficiency, and import cattle with higher feed digestibility.
Azerbaijan	National Forest Programme (2013)	Increase carbon storage through the rehabilitation and improvement of forests.
Georgia	2030 Climate Change Strategy (2021) 2021–2023 Action Plan of the 2030 Climate Strategy (2021) - Low Emission Development Strategy (LT-LEDS) (2023) - Agriculture and Rural Development Strategy of Georgia 2021–2027 (2019) - Forest Code (2020)	- Develop and support climate-smart approaches in the agricultural sector through agriculture technologies and services. Increase crop yields and intensify crop processing. Maintain agrobiodiversity. - Halt and reverse the degradation of agricultural lands and increase the efficiency of agricultural soils and pastures. Restore degraded soils. Reduce direct and indirect nitrous oxide emissions from agricultural soils. - Implement the sustainable management of soil and pastures and support the introduction of sustainable domestic animal feeding practices. - Ensure manure processing through advanced technologies. - Increase the production from dairy and meat-producing livestock. - Expand the processing of dairy and meat products and improve processing technologies. - Implement sustainable forest management principles throughout the country. Sustainably use forest resources. Maintain and improve the quantitative and qualitative indicators of the forest. - Preserve and improve the social and environmental functions of forests, including soil protection and water and climate regulation. Support the implementation of energy-efficient and renewable energy technologies and practices.

Source: authors' own elaboration based on the relevant policies, strategies and legislation.

CENTRAL ASIA

GHG mitigation in agrifood systems is very much linked with sustainable and rural development in Central Asia. Therefore, sectoral policies and legislation can directly or indirectly address GHG mitigation in agrifood systems. Table 37 provides details regarding the key policies, strategies and legislative frameworks that have emission reduction among their principal objectives in the agriculture and LULUCF sectors.

Kazakhstan committed to achieving zero net emissions by 2060 in 2023. While the country has enacted several laws and policies pertaining to the agricultural sector that potentially could contribute to emission reduction efforts indirectly, such as Law No. 423-V ZRK “On production of organic goods” or the Kazakhstan 2050 Strategy, these initiatives do not prioritize climate mitigation as their primary objective. Consequently, they have not been included in Table 37, which focuses specifically on policies and strategies directly targeting emission reduction within the agriculture and forestry sectors.

The current climate change policies and measures in Kyrgyzstan predominantly centre on CCA efforts. Meanwhile, existing mitigation policies prioritize emissions from the energy sector over those from the agriculture and LULUCF sectors. Nevertheless, there are certain elements within the policy framework that indirectly support the adoption of sustainable agriculture practices, thereby contributing to emission reduction.

For instance, the enactment of the Law on Organic Production in 2023, along with its associated legislative framework, represents a significant step. This law aims to promote organic food production, encompassing both agriculture and livestock sectors. Moreover, the prioritization of organic agriculture is reiterated in various national strategies and policies.

Despite these efforts, the current national strategy documents, such as the National Development Strategy of the Kyrgyz Republic for 2018–2040, primarily emphasize measures related to food security and increased production within the agricultural sector. Unfortunately, specific targets for GHG emission reduction in agriculture have not been outlined in these strategies.

Tajikistan has implemented nationwide programmes within the agricultural sector that can directly contribute to GHG mitigation impacts, as outlined in Table 37. Additionally, several programmes and policies indirectly support GHG mitigation efforts. These include initiatives such as the programme to create favourable conditions for the introduction of good agricultural practices in agricultural production of the International Standard GLOBALG.A.P., Law No. 1001 “On organic agriculture and organic production” and the amendment to Law No. 56 “On state regulation of agricultural land fertility”. These measures, coupled with the National Development Strategy for the period to 2030, collectively contribute to efforts in Tajikistan towards emission reduction and sustainable agricultural practices.

In contrast, the focus of Turkmenistan on GHG emissions mitigation within the agricultural sector and agrifood systems in general is relatively limited. However, laws such as the Law “On environmental protection” include measures that indirectly support emission reduction. Despite the existence of the National Climate Strategy of Turkmenistan (2012), specific measures targeting emission reduction from the agricultural sector are not explicitly outlined in the policy document.

Similarly, Uzbekistan currently lacks a dedicated policy framework specifically targeting GHG mitigation resulting from agrifood systems. However, the adoption of the Strategy on the Transition of the Republic of Uzbekistan to a ‘Green’ Economy 2019–2030 signals a commitment to comprehensive measures aimed at deepening the structural transformation, modernization and diversification of key economic sectors. While these measures may indirectly support sustainability in agrifood systems and efforts to reduce emissions, a more explicit integration of GHG mitigation targets within agricultural policies could further enhance the country’s efforts towards climate action and sustainable development.

Table 37. Key policies, strategies and legislation that address emission reduction in the agriculture and LULUCF sectors in Central Asia

Country	Strategy, policy or legislation	Highlights of measures regarding agriculture and LULUCF
Kazakhstan	Strategy of Achieving Carbon Neutrality until 2060 Kazakhstan (2023)	- Ensure sustainable agriculture management and climate-smart agriculture, in particular the development of carbon farming, the introduction of precision farming principles, the development of new climate-resistant crops, and the development of organic farming practices. Improve irrigation and replace chemical fertilizers with organic fertilizers. - Ensure sustainable livestock management through technological solutions to reduce methane emissions from livestock. Ensure sustainable pasture management. - Ensure sustainable forest management and reforestation. - Harness the potential of bioenergy production from agricultural waste.
Kyrgyzstan	There is currently no specific economy-wide or sectoral (agriculture) strategy, policy or legislation available addressing GHG mitigation in the agrifood sector.	
Tajikistan	- Programme for the Development of the Agrifood System and Sustainable Agriculture for the period until 2030 (2023) - National Action Plan for Climate Change Mitigation (2003)	- Introduce climate-smart agriculture methods to ensure the rational use of natural resources (soil and water) and environmental protection. - Aid and support rural areas in the development of effective and rational methods in agriculture. - Ensure the rational use of soils to optimize production and ensure profitability of crops. - Protect and enhance natural sinks and reservoirs of greenhouse gases. - Promote sustainable forest management practices, afforestation and reforestation.
Turkmenistan	There is currently no economy-wide or sectoral (agriculture) strategy, policy or legislation available addressing GHG mitigation in the agrifood sector. Agriculture is mentioned in the National Strategy on Climate Change, but specific measures are not mentioned.	
Uzbekistan	Strategies for Agriculture Development for 2020–2030	- Decrease GHG emissions as a target through sustainable agriculture. - Expand the forest area.

Source: authors' own elaboration based on the relevant policies, strategies and legislation.

CIS EUROPE AND UKRAINE

The countries of this subregion have a variety of approaches when it comes to the legislative and policy framework concerning the implementation of their NDCs. Often, GHG mitigation in agrifood systems are addressed through policy frameworks that support sustainable agriculture or environmentally friendly agrifood value chains.

An example to this case is Belarus, where GHG mitigation in the agricultural sector is addressed through policy and strategy documents such as the National Action Plan for the Development of Green Economy in

Belarus⁹ for 2021–2025, which aims for an inclusive, smart and digital “green” economy that contributes to the achievement of economic growth, and the Belarus National Strategy of Sustainable Social & Economic Development – 2030. The country has not submitted its LT-LEDs.

The Ukraine 2050 Low-Emission Development Strategy indicates a series of measures for emission reductions in the agricultural sector, as summarized in Table 38. Other strategic documents, such as the State Climate Change Policy Implementation until 2030 and the National Economic Strategy 2030 (2021), provide the framework for enhancing the legislative, policy and

⁹ For more information, please visit <https://www.effectivecooperation.org/belarus-national-development-vision-and-plans>.

institutional framework in order to enable a transition towards low-carbon development, without particularly focusing on sectors.

In contrast, the focus of Turkmenistan on GHG emissions mitigation within the agricultural sector and agrifood systems in general is relatively limited. However, laws such as the Law “On environmental protection” include measures that indirectly support emission reduction. Despite the existence of the National Climate Strategy of Turkmenistan (2012), specific measures targeting emission reduction from the agricultural sector are not explicitly outlined in the policy document.

Similarly, Uzbekistan currently lacks a dedicated policy framework specifically targeting GHG mitigation resulting from agrifood systems. However, the adoption of the Strategy on the Transition of the Republic of Uzbekistan to a ‘Green’ Economy 2019–2030 signals a commitment to comprehensive measures aimed at deepening the structural transformation, modernization and diversification of key economic sectors. While these measures may indirectly support sustainability in agrifood systems and efforts to reduce emissions, a more explicit integration of GHG mitigation targets within agricultural policies could further enhance the country’s efforts towards climate action and sustainable development.

Table 38. Key policies, strategies and legislation that address emission reduction in the agriculture and LULUCF sectors in CIS Europe and Ukraine

Country	Strategy, policy or legislation	Highlights of measures regarding agriculture and LULUCF
Belarus	There is no particular economy-wide or sectoral (agriculture) strategy, policy or legislation available addressing GHG mitigation in agrifood systems.	
Republic of Moldova	Low Emissions Development Programme until 2030 (LT-LEDS) (effective in 2024)	Enact sectoral mitigation measures with the vision of reducing agricultural sector emissions by 44 percent in 2030.
Russian Federation	Strategy for the Long-Term Development of Russia with a Low Level of GHG Emissions until 2050 (LT-LEDS-2022)	- Optimize soil fertilization and use best-available technologies in agriculture. - Maximize biogas production from agricultural waste. - Increase the productivity of farm animals. Develop directional breeding and biofuel production from livestock for reduced livestock emissions.
Ukraine	- Ukraine 2050 Low Emission Development Strategy (2017) - Strategy of the State Environmental policy of Ukraine for the period to 2030 (2019)	- Increase efficiency in fertilizer use. Introduce advanced manure treatment technologies and promote animal feed additives for reduced enteric fermentation. - Ensure soil conservation/soil improvement. - Ensure forest management/forest conservation and forestry protection measures.

Source: authors’ own elaboration based on the relevant policies, strategies and legislation.

EU-27, UNITED KINGDOM AND EFTA

The EU-27 has a comprehensive legislative and policy framework in the Europe and Central Asia region regarding the integration of CCM policies and measures in agrifood systems and related sectors. One notable example is the new Common Agricultural Policy (CAP) Reform, which emphasizes “sustainable management of natural resources and climate action” among its key policy objectives, representing an advancement in climate sensitivity compared to previous iterations of the CAP. Additionally, the Farm to Fork Strategy outlines plans to reform the agricultural system within the climate context, aiming to ensure that agriculture, fisheries, aquaculture and the food value chain contribute appropriately to overall emission reduction targets. Moreover, the LT-LEDS places special emphasis on the agricultural sector for reducing GHG emissions, demonstrating a holistic approach to climate action.

The United Kingdom has made significant strides in mainstreaming CCM measures across major economic sectors. Notable policy frameworks include the Agriculture Act 2020, which provides support for activities that mitigate or adapt to climate change, and the Net Zero Strategy: Build Back Greener, serving as the country’s LT-LEDS submitted to the UNFCCC. Additionally, sectoral policies such as “The path to sustainable farming: An agricultural transition plan 2021 to 2023”, the Environmental Improvement Plan 2023 and “Delivering 30by30 on land in England” indirectly promote emissions mitigation through the promotion of sustainable and environmentally friendly agriculture and land-use practices.

In Iceland, the GHG mitigation policy framework is primarily reflected in the Climate Action Plan (2018–2030), updated in 2020, with measures outlined in the plan also reflected in the country’s LT-LEDS.

The Net Zero by 2050 Vision in Liechtenstein guides the country’s GHG mitigation efforts across all sectors, including agriculture, with a focus on the specific measures outlined in Table 39. In 2020, the country adopted the Climate Vision 2050, which sets the goal of reaching net zero by 2050, assessing the current domestic situation and defining long-term goals. The implementation of the vision and strategy are further specified through the Long-term Climate Strategy 2050.

The key policy documents in Norway shaping GHG mitigation strategies in the agricultural sector include the Climate Change Action Plan for 2021–2030 and the country’s long-term low-emission strategy for 2050, with key measures detailed in Table 39.

The Climate Strategy Agriculture and Food 2050 in Switzerland targets a 40 percent reduction in GHG emissions from the agricultural sector compared to 1990 levels.³⁰ This strategy aims to ensure that the agriculture and food system contribute to the realization of the economy-wide net zero target by 2050 and minimize climate risks. Additionally, policy initiatives such as the Global Programme Food Security Programme Framework 2021–2024 indirectly support GHG mitigation in the agricultural sector by promoting the transformation towards sustainable and resilient food systems aligned with agroecological principles. Key legislation such as the Federal Act on the Reduction of CO₂ Emissions provides a general framework for emission reduction efforts without specifically targeting the agricultural sector.

Table 39. Key policies, strategies and legislation that address emission reduction in the agriculture and LULUCF sectors in the EU-27, United Kingdom and EFTA

Country	Strategy, policy or legislation	Highlights of measures regarding agriculture and LULUCF
EU-27	• The New CAP Reform (2021) • Regulation (EU) 2023/1115 on deforestation-free products • Farm to Fork strategy (2020) • European Green Deal (2019) • European Climate Law (2021) • A Clean Planet for All • Long-term Low Greenhouse Gas Emission Development Strategy of the European Union and its Member States (2020)	• Promote agri-environmental measures and projects related to environmentally friendly investment or innovation measures, and support organic farming. • Promote the protection of forests from deforestation. • Ensure the food chain has a neutral or positive environmental impact, preserving and restoring the land, freshwater and sea-based resources. Help mitigate climate change. • Innovate through digitalization, smart technologies, precision farming and precision agriculture, optimizing the application of fertilizer and plant protection products. Treat manure in anaerobic digesters, reducing non-CO₂ emissions and producing biogas.
Iceland	• Climate Action Plan for 2018–2030 (2020 update) • On the Path to Climate Neutrality, Iceland's Long-Term Low Emission Development Strategy (2021)	• Support climate-friendly agriculture and carbon-neutral beef production. • Support the improved feeding of livestock to reduce enteric fermentation. • Improve the use and handling of fertilizers. • Enhance action in forestry and land reclamation and the recovery of wetlands.
Liechtenstein	• Climate Vision 2050 (2020) • Climate Strategy 2050 (2022)	• Strengthen the sustainable production of food (meat, dairy products, agriculture) and optimized livestock production. • Slow the degradation of organic soils and monitor the storage of carbon in agricultural soils. • Ensure the consumption of low-emission foods and the reduction of food waste.
Norway	• Climate Change Action Plan for 2021–2030 (2021) • Long-Term Low Emission Strategy for 2050 (2020)	• Reduce food waste and support effective and optimized fertilizer use and the conservation of agricultural land. • Improve fertilizer application and storage, using manure for biogas production. • Develop knowledge and improve routines for feeding and feed production for reduced enteric fermentation. • Protect and conserve forests.
Switzerland	• Long-Term Climate Strategy (2021) • Climate Strategy Agriculture and Food 2050 (2023)	• Expand research on food system reform. Expand knowledge, strengthen participation and/or develop policies coherently, targeting consumption patterns, food waste, nutrients, water, soil and energy.
United Kingdom	• Agricultural Act (2020) • International Nature and Climate Policy Framework (2023) • Net Zero Strategy: Build Back Greener (2021) (LT-LEDS)	• Promote sustainable and environmentally friendly agriculture and land use practices, as well as innovation, coordinated policy action and redirecting investment in agriculture and food systems and land use to identify, develop and scale approaches that can reduce emissions.

Source: authors' own elaboration based on the relevant policies, strategies and legislation.

SOUTHEASTERN EUROPE

The countries of the Southeastern Europe region have advanced their climate mitigation policies and legislative frameworks within the agriculture and LULUCF sectors, surpassing many other nations in the Europe and Central Asia region in that manner.

In Albania, the enactment of the Law on Climate Change in 2020 signifies a commitment to reducing greenhouse gas emissions across various sectors, including agriculture and forestry, by providing a legal framework. Key policy documents such as the Strategy on Agriculture, Rural Development and Fisheries 2021–2027 outline actions to foster sustainable development in agriculture, livestock and fisheries through innovation and digitalization. Additionally, the National Strategy on Climate Change – National Action Plan on Mitigation (2019) promotes sustainable food production with low emissions.

The primary GHG mitigation strategy document in Bosnia and Herzegovina is the 2020–2030 Climate Change Adaptation and Low Emission Development Strategy for Bosnia and Herzegovina (2023), which guides the country's efforts towards climate-resilient development.

The focus on sustainable development in Montenegro aligns with efforts against climate change, as outlined in the National Strategy for Sustainable Development by 2030. However, there's a lack of specific emphasis on agriculture-related emissions in this framework. Similarly, such documents as the National Strategy in the Field of Climate

Change by 2030 and the Law on the Protection from Negative Impacts of Climate Change aim to mitigate climate change impacts but do not target agriculture specifically.

GHG mitigation measures in the agricultural sector of North Macedonia are described in the Long-Term Strategy on Climate Action and Action Plan. Additionally, the National Strategy on Agriculture and Rural Development 2021–2027 seeks to contribute to CCM and CCA through specific environmental practices in agriculture.

In Serbia, the recently adopted Law on Climate Change provides a legal basis for low-carbon development strategies and climate policy implementation. Sectoral strategies such as the Agriculture and Rural Development Strategy of the Republic of Serbia (2014–2024) indirectly support climate mitigation in agriculture and forestry. The Low-Carbon Development Strategy of the Republic of Serbia with Action Plan (2024) outlines specific measures for GHG mitigation in the agricultural sector.

Türkiye has developed various strategy documents addressing economy-wide emission reductions, including agricultural emissions. The Climate Change Mitigation Strategy and Action Plan (2024–2030) and the Twelfth Development Plan 2024–2028 include GHG mitigation measures in the agricultural sector. Furthermore, the country's climate law and LT-LEDS for 2053 are currently under development.

Table 40. Key policies, strategies and legislation that address emission reduction in agriculture and LULUCF in Southeastern Europe

Country	Strategy, policy or legislation	Highlights of measures regarding agriculture and LULUCF
Albania	• Law on Climate Change (2020) • Strategy for Agriculture, Rural Development and Fishing 2021-2027 • National Strategy on Climate Change - National Action Plan on Mitigation (2019)	• Ensure the sustainable use and management of land resources by taking measures to prevent erosion and improve the fertility of agricultural lands, improving the management and use of pastures and promoting organic farming and good practices. • Improve sustainable forest systems through investments in afforestation and the promotion of sustainable agroforestry systems. • Promote sustainable food production with low emissions by developing a competitive and innovative agrifood sector, encouraging the introduction of environmentally friendly agricultural production methods, and improving water management in agriculture to protect soil and increase crop productivity.
Bosnia and Herzegovina	• The 2020–2030 Climate Change Adaptation and Low Emission Development Strategy for Bosnia and Herzegovina (2023) (LT-LEDS)	• Ensure livestock feeding change, especially in ruminants, the largest emitters of greenhouse gases. • Improve the manure storage system. • Use fertilizers and biomass waste in anaerobic digestion and biogas production. • Use polymer-coated mineral fertilizers. • Construct hydrotechnical facilities. • Develop and encourage knowledge and new technologies in this field in the entire production chain. • Ensure agroforestry as a measure of mitigation that can be incorporated into the organic and agroecological principles of production.
North Macedonia	• Long-Term Strategy on Climate Action and Action Plan (2021) • National Strategy on Agriculture and Rural Development 2021–2027 • Law on Climate Action (under development)	• Modify the feed composition and nutrition practice in dairy cows for reducing enteric fermentation. Improve manure management to reduce N₂O emissions in dairy cow and swine farms. • Protect the forest area by preventing forest fires and engaging in afforestation. • Use biochar for a carbon sink on agricultural land.
Serbia	• Low-Carbon Development Strategy of The Republic of Serbia with Action Plan (2024) • Law on Climate Change (2021)	• Subsidize better machinery, improved manure management and the use of renewable energy sources. • Increase legume share in fodder area. • Improve the genetic potential for higher milk production per head of cattle. • Use linseed as a feed additive for cattle (after 2030). • Support precision farming and anaerobic digestion.
Türkiye	• Climate Change Mitigation Strategy and Action Plan (2024–2030) • Twelfth Development Plan 2024–2028 (2023) • Green Deal Action Plan (2021) • Climate Law (under development)	• Support the research, identification, approval and implementation of research and development studies related to feed additives that suppress methane emissions in animal feed rations. • Increase efforts towards genetic-based animal breeding, considering methane emissions. • Improve the collection system for animal manure and the methods for its utilization. • Accelerate research and development projects on the use of alternative fertilizers (e.g. organic, organomineral, compost, green manure) instead of chemical fertilizers. • Promote good agricultural practices and organic agriculture. • Improve loss, waste and residue management in agricultural production. • Increase the protection of ecosystems, sustainable management and the enhancement of sink areas. Increase GHG sequestration and reduce ecosystem-related emissions.

Source: authors' own elaboration based on the relevant policies, strategies and legislation.

3.3

CLIMATE CHANGE ADAPTATION LEGISLATION AND POLICY FRAMEWORK UPDATES

CAUCASUS

This section focuses on the extent to which agriculture is integrated into countries' national climate change and disaster risk reduction policies, plans and strategies and, vice versa, whether CCA and disaster risk reduction are mainstreamed into countries' sectoral policies, plans and strategies. This will indicate the degree to which countries are prioritizing adaptation and risk reduction in the agricultural sector.

Armenia adopted in 2021 its National Action Programme of Adaptation to Climate Change and List of Measures for 2021–2025, which aims to promote the reduction and management of climate risks and to increase the resilience of sectors and communities in Armenia. It serves as the first step in the coordinated launch and implementation of the NAP process and various adaptation planning efforts from different sectors. The programme includes seven sectors in which adaptation needs were identified, including: a) agriculture, including fish farming and forestry; b) natural ecosystems (aquatic-terrestrial, including forest ecosystems, biodiversity and land cover); and c) water resources management. Some of the relevant adaptation and risk reduction actions mentioned in the action programme include, for example, the development of the draft Government Decree on Approval of the Climate Change Adaptation Concept and Action Plan for the Agricultural sector, the development of a guideline on climate change risk considerations in crop production planning, the implementation of agricultural extensions and trainings, and the development and implementation of the action plan to improve climate projections and early warning systems.³¹ The country

established in 2017 its National Disaster Risk Management Strategy and Action Plan, which indicates the linkages between climate change and climate-related disasters. It includes agricultural insurance as one of its sectoral priority actions.³²

Armenia established in 2020 its Strategy of the Main Directions Ensuring Economic Development in the Agricultural Sector of the Republic of Armenia for 2020–2030, which focuses on sustainable, innovative and high-value-added agriculture and the sustainable management of natural resources. The Action Plan for the Implementation of the Strategy for 2020–2022 included relevant DRR and CCA measures, such as activities related to risk management, including hail protection systems, agricultural risk insurance, climate-smart agricultural practices like drought-resistant seeds, sustainable intensification of animal breeding via improved species and breeds, water and soil management practices, and agricultural monitoring and awareness raising related to climate change.^{33,34} In 2023, the Armenian government adopted an Action Plan for the Implementation of the Agricultural Sector Strategy 2023–2026 that sets out around 50 measures with various objectives including, among others, increasing the productivity and competitiveness of agriculture, improving food security, promoting the sustainable development of rural communities, enhancing the adaptability to climate change and boosting resilience.^{35,36}

The country's development strategy for 2014–2025 aims to make agriculture, forestry and fisheries more productive and sustainable through the implementation of sustainable development plans. Among others, it focuses on enhancing the resource use potential of farms, increasing crop and animal productivity through intensified production, and controlling animal disease through activities aimed at disease prevention. To increase disaster resilience, the government aims, inter alia, to enhance the environmental monitoring system, implement measures related to ecological education, develop a methodology for assessing environmental pollution and the overuse of natural resources, and raise public awareness and participation.³⁷

In Azerbaijan, the country's National Forest Programme 2015–2030, adopted in 2013, focuses on ensuring that forestry activities are sustainable in the long term. It also indicates the role of forests in CCM and CCA. The programme aims to contribute to adaptation efforts, linking forestry with other economic sectors. It includes some adaptation measures (such as reforestation and measures to promote natural regeneration) and also includes the introduction of highly productive forest species to enhance forest cover, a ban on cattle grazing in the forests, measures to reduce forest pests and diseases, and compliance of legislative acts on forest protection. Other agriculture-related adaptation measures mentioned include increased water use efficiency through microirrigation technology, water conservation measures, and increasing water storage to reduce the adverse impacts of the increased variability of water availability and scarcity during high-demand months.³⁸

In 2016, Azerbaijan adopted its Strategic Roadmap for the Production and Processing of Agricultural Products, which provides guidance for the establishment of strategic plans, state programmes, concepts and action plans for agricultural development. Among its goals are protecting the environment, building institutional capacity to ensure the sustainability of food security, and increasing the production potential of agricultural products along the value chain. It also aims to increase the resilience of the agricultural sector to the impacts of climate change, including the development of agricultural insurance systems, the sustainable use of agricultural land and water resources, and the promotion of organic production.³⁹

Azerbaijan, situated in an arid zone, is experiencing water scarcity issues, with climate change expected to further reduce its water resources. Thus, the country is prioritizing sustainable water management and addressing the issues of water insecurity and drought. In its National Drought Plan, adopted in 2020, the country indicates the link between droughts and climate change and notes the main impacts of drought on agriculture. The aim of the plan is to outline the roles and responsibilities of the government and the various ministries involved in drought risk management to help mitigate, prepare and respond to drought.

Among the relevant DRR measures are the development of agricultural drought monitoring methods through the usage of remote sensing data for appropriate early warnings of droughts before irreversible crop yield loss and/or quality degradation occurs; the establishment of a national scientific and research programme to aid in the understanding of droughts and their impacts and mitigation measures; and enhancing the availability of information for those who use irrigation systems for increased water scarcity planning and decision-making.⁴⁰ In 2017, the Government of Azerbaijan started the preparation and implementation of a NAP process with the identification of three priority sections: agriculture, water and coastal areas.⁴¹ The NAP was submitted in November 2024 but isn't part of this analysis.⁴²

The country adopted in 2019 its State Programme on the Social and Economic Development of Regions 2019–2023, aimed at implementing a strategic road map that forecasts risk and increases resilience to potential hazards through such actions as the establishment of drip irrigation, the process of locating and evaluating underground freshwater sources, the enhancement of hydrometeorological networks, reforestation, and the raising of awareness on the environment, thereby contributing to the Sendai Framework for DRR 2015–2030 and to the 2030 Agenda for Sustainable Development and the SDGs.^{43,44,45,46}

In 2014, Georgia established its Climate Change Strategy, which indicated the necessity of developing the National Adaptation Programme of Action and designing and establishing DRR strategies for arid areas with local authorities and farmers. The Climate Change National Adaptation Plan for Georgia's Agricultural Sector, adopted in 2017, focused on supporting farmers to build their resilience to climate change through the climate proofing of productive infrastructure and production systems and the establishment of CCA strategies for several regions, including the Autonomous Republic of Adjara and the Kakheti, Lentekhi and Upper Svaneti regions.⁴⁷ The country also adopted the National DRR Strategy and Action Plan 2017–2020 in 2017. The plan includes such agricultural DRR measures as the establishment of an action plan for forest and valley fire risk reduction, capacity-building trainings on fire prevention and

drought risk reduction, increasing the availability of drought risk-related information to farmers, the usage and applicability of agrometeorological information, and the improvement of irrigation systems.⁴⁸

Moreover, in 2021, Georgia adopted its National 2030 Climate Change Strategy and 2021–2023 Action Plan. It mostly focused on mitigation, but some adaptation-related actions include sustainably managing soil and pastures; building the capacity to generate scientific evidence on climate-smart approaches in the agricultural sector; restoring degraded forests; and implementing sustainable forest management.⁴⁹

Among the goals of the Agriculture and Rural Development Strategy of Georgia 2021–2027 (2019) are adaptation to climate change; enhancing the productivity and sustainability of agriculture, forestry and fisheries; the sustainable use of natural resources; effective systems of food/feed safety; veterinary and plant protection; and adaptation to climate change. The strategy aims to increase the resilience of livelihoods to disasters through enhanced risk-informed planning, the dissemination of climate-smart and environmentally adapted agricultural practices, and the maintenance of agrobiodiversity.⁵⁰ The Strategy for Development of High Mountain Settlements of Georgia 2019–2023 (2019) is an intersectoral strategy that focuses on increasing the productivity and sustainability of agriculture, forestry and fisheries; restoring areas affected by forest fires; and addressing environmental issues in protected areas. The strategy also strives to increase the resilience of livelihoods to disasters, including through the implementation of a programme that aims to prevent and mitigate natural hazard-induced disaster damage.⁵¹ The Irrigation Strategy of Georgia for 2017–2025 does not refer to climate

change, but among its objectives are the rehabilitation and modernization of irrigation systems and the organizing, managing and funding of irrigation services to farmers.⁵²

Another national intersectoral programme is the Fourth National Environmental Action Programme of Georgia 2022–2026, with its main goals of ensuring that the environment is clean and safe for human health and natural ecosystems and ensuring the sustainable use of natural resources for future generations. Related to agricultural risk reduction and adaptation are the objectives of reducing land degradation/desertification and restoring degraded land, pastures and forests; preventing habitat degradation, ensuring the sustainable management of biodiversity and the management of alien invasive species, and improving forestry management by strengthening the planning and implementation mechanisms; improving the response system to natural hazard-induced disasters; improving the functionality of monitoring and early warning systems; and collecting and systematizing quantitative and qualitative data in the sphere of climate change.⁵³

The Development Strategy of Georgia – Vision 2030 (2022) supports various sectors, including agriculture, and the development of small and medium enterprises. It aims to reduce the vulnerability of the population to climate change and includes various agriculture-related risk reduction and adaptation objectives, such as improving irrigation and drainage systems, developing an effective system of food/feed safety, ensuring access to public services, developing the sustainable management of land and forests, and implementing the integrated management system of water resources.⁵⁴ A summary of the analysis of relevant key national climate change sectoral policies for the subregion is outlined in Table 41.

Table 41. Key policies, strategies and legislation that address emission reduction in agriculture and LULUCF in Southeastern Europe

Country	Key policies	Summary analysis
Armenia	• Wildfire Action Management Plan (2013) • Armenia Development Strategy for 2014–2025 (2014) • National Forest Policy and Strategy (2015) • National Disaster Risk Management Strategy and Action Plan (2017) • Strategy of the Main Directions Ensuring Economic Development in the Agricultural Sector of the Republic Of Armenia For 2020–2030 (2020) • National Action Programme of Adaptation to Climate Change and List of Measures for 2021–2025 (2021) • Action Plan for the Implementation of the Agricultural Sector Strategy 2023–2026 (2023)	Armenia considers adaptation a key priority. It has established several national climate change and DRM strategies in which agriculture's vulnerability to the impacts of climate change is acknowledged. Measures for risk reduction and adaptation in the agricultural sector are integrated into sectoral plans, policies and strategies. The country is currently advancing its national adaptation planning process through the implementation of the national action programme of adaptation, including the coordination enhancement of adaptation planning efforts for the agricultural sector
Azerbaijan	• National Forest Programme and the Action Plan 2015–2030 (2013) • Strategic Roadmap for the Production and Processing of Agricultural Products in Azerbaijan (2016) • State Programme on the Social and Economic Development of Regions 2019–2023 (2019) • National Drought Plan in Azerbaijan (2020) • Azerbaijan 2030: National Priorities for Socioeconomic Development (2021) • Social and Economic Development Strategy 2022–2026 (2022) • National Adaptation Plan (2024)	Azerbaijan has integrated various agriculture-related risk reduction and adaptation measures into its sectoral and development policies, plans and strategies. It published its NAP in November 2024.
Georgia	• Climate Change Strategy (2014) • Climate Change National Adaptation Plan for Georgia's Agricultural sector (2017) • National Disaster Risk Reduction Strategy 2017–2020 and Action Plan (2017) • Irrigation Strategy of Georgia for 2017–2025 (2017) • Agricultural and Rural Development Strategy 2021–2027 and Draft Action Plan 2021–2023 (2019) • Strategy for the Development of High Mountain Settlements of Georgia 2019–2023 (2019) • National Climate Change Strategy 2030 and its Action Plan 2021–2023 (2021) • Fourth National Environmental Action Programme of Georgia 2022–2026 (2022) • Development Strategy of Georgia – Vision 2030 (2022)	Of the three Caucasus countries, Georgia is the farthest along in prioritizing the agricultural sector in its climate change-related policies, plans and strategies as well as in the mainstreaming of agricultural risk reduction and adaptation measures into its national sectoral planning instruments. It recently established its new national climate change strategy, with 2030 mitigation targets, and has included agriculture-related adaptation measures in its 2021–2023 action plan.

Source: authors' own elaboration based on the relevant policies.

CENTRAL ASIA

Kazakhstan adopted in 2019 its Strategic Plan of the Ministry of Agriculture for the period of 2020–2024. The plan focuses on agricultural development, sustainable land management and veterinary security, but climate change is not mentioned. Neither does climate change appear in the Concept of Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2021–2030 nor in the Plan for Ensuring Food Security of the Republic of Kazakhstan for 2022–2024 (2022), with the latter including only some adaptation and risk reduction measures, such as promoting diversification in crop production, increasing irrigated land areas, and applying water-saving irrigation technologies.^{55,56} At present, the country is initiating the development of its NAP process, which will encompass subnational engagement and collaboration among national and subnational authorities.⁵⁷

The Kazakhstan 2050 Strategy (2012) is a multisectoral policy document in which the threat to global food security, acute water shortage and depletion of natural resources are acknowledged. However, climate change is not mentioned as one of these challenges, although relevant adaptation and risk reduction measures include the implementation of modern water-saving agricultural technologies to enhance the country's water use efficiency.⁵⁸ The Strategic Development Plan of the Republic of Kazakhstan until 2025 (2018) was developed to implement the Long-Term Development Strategy of Kazakhstan until 2050 and includes technological modernization, enhancement of the institutional environment and reducing adverse impacts on nature. However, it does not include climate change or specific adaptation and risk reduction measures relevant to agriculture – only those related to mitigation.⁵⁹

In Kyrgyzstan, the Priority Directions for Adaptation to Climate Change in the Kyrgyz Republic until 2017 (2013) sets out the country's main direction for CCA and includes the promotion of drought- and salt-resistant crops, the improvement of irrigation and resilient infrastructure, and the enhancement of food security monitoring and yield forecasting systems.⁶⁰ Kyrgyzstan adopted two sectoral CCA programmes – the 2015 Climate Change Adaptation Programme and the Action plan for 2015–2017 for the Forest and Biodiversity Sector – that aim to preserve biodiversity and expand forest

areas under a changing climate through adaptation and risk reduction-related measures, such as enhancing climate risk assessments, monitoring and information tools, strengthening scientific CCA capacities, encouraging cross-border cooperation, and enhancing the legal, regulatory and institutional frameworks for CCA, including financial mechanisms.⁶¹ In addition, the 2016 Programme for the Adaptation of Agriculture and Water Management to Climate Change for 2016–2020 encompasses the development and implementation of related measures for these sectors, such as conducting sectoral vulnerability assessments.⁶² Both the country's NAP and its Strategic Programme for Adaptation to Climate Change are still under development.^{63,64}

The country's sectoral frameworks do not include climate change or related measures, such as the Concept of Development of the Forest Sector in the Kyrgyz Republic until 2040 (2019), which focuses on sustainable forest management, including forest conservation and the expansion of forest management with the aim of increasing forestry's contribution to the GDP by 1 percent.⁶⁵ In addition, the Fisheries and Aquaculture Development Programme for 2019–2023 sets out the legal and economic conditions for establishing modern and well-functioning fisheries and aquaculture production, especially pond fish farming.⁶⁶ The Food Security and Nutrition Programme for 2019–2023 (2019) provides the main directions for ensuring food security in the country, but climate change is not included as one of the future challenges to potentially undermine agricultural production.⁶⁷

The National Strategy for Comprehensive Safety of Population and Territories of the Kyrgyz Republic from Disasters and Emergencies (2011) covers the 2012–2020 period and indicates the link between natural hazards and climate change. Agriculture is not substantially covered. It is mentioned only to a minor extent related to food safety and other agriculturally relevant risk reduction measures (such as strengthening the country's disaster risk monitoring and forecasting and early warning systems; enhancing preparedness and response capacities at the national, regional, district and local self-government levels; establishing resilient infrastructure; and raising awareness on DRR).⁶⁸

CCA is mainstreamed into the National Development Strategy of the Kyrgyz Republic for 2018–2040 (2018), with the development of CCA strategies included to reduce the country's vulnerability and enhance its resilience.⁶⁹ The National Development Programme until 2026 (2021) is aimed at enhancing the well-being of the population and establishing an environment for the socioeconomic development of Kyrgyzstan. Climate change is recognized as one of the factors expected to have additional negative impacts on agriculture – with the sector already experiencing persistent land degradation and soil erosion due to unsustainable land use and lack of public investment in agriculture. Kyrgyzstan aims to address these challenges through conducting land reform, modernizing land management and strengthening related institutions.⁷⁰

In 2019, Tajikistan adopted its National Strategy for Adaptation to Climate Change until 2030, which focuses on the natural hazards that can affect agriculture, food security and land tenure (e.g. floods, droughts, avalanches and landslides) and on the adaptation and risk reduction measures needed to address them. For instance, applying more effective water management and storage practices, increasing water availability via small reservoirs, enhancing irrigation infrastructure (including the rehabilitation and maintenance of drip irrigation), conducting research and increasing the usage of drought-resistant seeds, and assisting farmers in cultivating traditional crops during droughts.⁷¹ The country's NAP is still under development, with the process started in 2022.⁷²

The country's Water Sector Reform Programme for 2016–2025 (2015) states that addressing climate variability and change will involve enhanced forecasting and reducing the risks and impacts of floods, landslides, and mudslides; researching the state of the country's glaciers and water resources; and developing and implementing water use and protection policies that consider the impacts of climate change.⁷³ The country's Integrated Programme of Livestock Sector Development for the period 2018–2022 does not refer to climate change, but the need for the protection, preservation and enhancement of genetic animal resources is acknowledged.⁷⁴ The 2019 Programme of Food Security in the Republic of Tajikistan for 2019–2023 mentions

national hazards – including droughts, prolonged rainfall and early frost – but does not include climate change as a potential challenge to affect its agricultural production in the future. However, it does acknowledge that the country's current irrigation system is not able to provide sufficient irrigation water during the cropping season and mentions the aim to provide state support for irrigation systems, including on-farm irrigation networks.⁷⁵

The country also has a National Strategy for Disaster Risk Reduction 2019–2030 (2018) in which agriculture is mentioned as a priority sector and food security as a strategic objective. However, it neither links natural hazards to climate change nor includes specific sectoral interventions.⁷⁶ The country's Medium-term Development Programme for 2021–2025 (2021) includes as one of its goals ensuring the environmental sustainability and adaptation of the country's economy to climate change. Among others, it focuses on the transition towards a “green economy” and on enhancing the country's food security and quality by promoting organic farming, implementing agricultural good practices, strengthening food safety monitoring, and enhancing social assistance and child nutrition programmes.⁷⁷

In Turkmenistan, the country's National Strategy on Climate Change, adopted in 2012, aims to build climate resilience and a low-emission economy. Agriculture is among the priority sectors for CCA efforts and includes such adaptation and risk reduction measures as the breeding of drought- and salt-resistant crops; the promotion of rotational pasture use and the establishment of pasture protection belts; combating soil salinization, pasture degradation and desertification; and enhancing climate monitoring and early warning systems.⁷⁸ A new edition of the strategy was adopted in 2019, with similar specific measures still included for ensuring the sustainable use of natural resources, combating land degradation, expanding the area of forestry plantations, improving irrigated lands and reducing soil salinization.⁷⁹ The country's NAP is still under development, with its planning process having started in 2022.⁸⁰

The country's Agricultural Complex Development Programme for 2019–2025 (2019) includes more than 100 adaptation and risk reduction measures, particularly related to the enhancement of water-

related infrastructure (i.e. water reservoirs); implementing (flash) flood risk reduction through channel modernization; implementing sustainable land use practices; monitoring, preventing and combating the spread of pests and invasive species; and applying nature-based solutions along the Karakum River.⁸¹ The National Strategy of Turkmenistan on Preservation Biodiversity 2018–2023 (2018) focuses on the conservation and preservation of its biodiversity aligned to the country's obligations to the Convention on Biological Diversity, which includes the vulnerability of its desert, steppe and mountain ecosystems due to degradation processes. Climate change is a challenge that should be considered to achieve sustainable and long-term development for future generations. Hence, reducing disaster- and climate-related risks and building resilience through the preservation and restoration of the country's ecosystems is a national priority.⁸² The National Programme for Social and Economic Development until 2030 (2019) also includes the prevention and mitigation of climate change impacts and the adoption of an integrated and multisectoral approach regarding socioeconomic development aligned to the implementation of the 2030 Agenda for Sustainable Development and its 17 SDGs.⁸³

In Uzbekistan, the Strategy for the Transition to a “Green” Economy for 2019–2030 (2019) includes such policy priorities as adaptation to climate change, more efficient use of natural resources and the preservation of natural ecosystems in agriculture through the breeding of plants and animals resistant to drought, salinity and other hazards and risks; the restoration of degraded pastures; the introduction of sustainable pasture management; organic farming; and the diversification of crops.⁸⁴ The country's NAP is still under development.^{85,86}

Despite that climate change is not mentioned in the Agriculture Development Strategy of Uzbekistan for 2020–2030 (2019) or the Concept of Environmental Protection in the Republic of Uzbekistan until 2030 (2019), these strategies focus on the sustainable development of the country's agrifood sector and aim to ensure food security, the sustainable use of natural resources and the environmental protection.^{87,88} The Concept of Environmental Protection includes some measures aimed at reducing the impacts of biological risks,

managing transboundary river basins (including monitoring transboundary surface watercourses in Central Asia) and expanding natural protection areas (including forest plantations on the Uzbek side of the dried-up part of the Aral Sea).⁸⁹ While the Agriculture Development Strategy was updated in 2022, it has not yet been formally adopted.⁹⁰

The strategic objectives of the Concept for the Development of the Forestry System of the Republic of Uzbekistan until 2030 (2020) encompass the protection and conservation of forests, the development of forestry and the guarantee of food security for future generations. Climate change is mentioned in relation to fire risk management, such as enhancing firefighting and patrolling, as well as related measures, such as monitoring the state of forests. Also mentioned are planting forests according to soil and climate conditions and conducting scientific research on the cultivation of tree species resistant to drought and salinity.⁹¹ Climate change is mentioned in the Strategy for Biodiversity Conservation in the Republic of Uzbekistan for the period of 2019–2028 (2019) as further aggravating the processes of land degradation and desertification in the desert, foothill and mountainous areas, thereby impacting the state of biodiversity. The strategy includes such risk reduction and adaptation measures as establishing environmental protection and sectoral development plans at national and local levels; setting up a system of natural protected areas; enhancing preservation efficiency and the sustainable use of biodiversity; sustainably managing pastures; and protecting water resources.⁹²

The Concept for the Development of Water Sector of the Republic of Uzbekistan for the period of 2020–2030 (2020) aims to achieve water security in the context of increasing water scarcity and climate change. Among the relevant priority areas mentioned are the strengthening of forecasting and accounting of water resources; ensuring the well-functioning of flood reservoirs and other water facilities; introducing water-saving irrigation technologies for crop production; and promoting integrated water resources management, the joint management of water resources, and effective water use.⁹³ The Water Resources Management Strategy and Development of the Irrigation Sector in the Republic of Uzbekistan for 2021–2023 (2021) mentions an increase in water demand,

given its use by priority sectors of the economy and the environment and considering future changes, including climate change. In this regard, the adaptation and risk reduction measures outlined include, for example, enhancing water use planning and water usage for agricultural needs, improving works on water basins, and increasing water use efficiency and water user responsibility.⁹⁴ The aim to increase water-use efficiency in the country's economic sectors, including the introduction of water-saving irrigation technologies on an area of up to 1 million ha, is also included in the 2022 Programme on the Transition to a "Green" Economy and Ensuring "Green" Growth in the Republic of Uzbekistan until 2030.⁹⁵

The key goals of the Development Strategy of the New Uzbekistan for the period of 2022–2026 (2022) include increasing the incomes of farmers and the growth of agricultural production as well as the need to scale up government support and the implementation of new agricultural insurance mechanisms. There is no mention of climate change, but the strategy includes the expansion of forest areas, the establishment of protection forests, and crop production in desert areas.⁹⁶ A summary of the analysis of relevant key national climate change sectoral policies for the subregion is outlined in Table 42.

Table 42. Summary of analysis of relevant key national climate change and sectoral policies in the Central Asia subregion

Country	Key policies	Summary analysis
Kazakhstan	• Kazakhstan 2050 – Strategy (2012) • Strategic Development Plan of the Republic until 2025 (2018) • Strategic Plan of the Ministry of Agriculture for the period of 2020–2024 (2019) • Concept of Development of the Agro-industrial Complex of the Republic of Kazakhstan for 2021–2030 (2021) • Plan for Ensuring Food Security of the Republic of Kazakhstan for 2022–2024 (2022) • National Adaptation Plan (under development)	Kazakhstan considers adaptation to climate change a priority. However, climate change and related measures are, to a limited extent, mainstreamed into its agricultural and food security plans. Moreover, the country's development plans and strategies have only a partial focus on environmental protection and sustainable natural resources. The country's NAP is currently under development.
Kyrgyzstan	• National Strategy for Comprehensive Safety of Population and Territories of the Kyrgyz Republic from Disasters and Emergencies – period coverage 2012–2020 (2011) • Priority Directions for Adaptation to Climate Change in the Kyrgyz Republic until 2017 (2013) • Climate Change Adaptation Programme and Action Plan for 2015–2017 for the Forest and Biodiversity Sector (2015) • Programme for the Adaptation of Agriculture and Water Management to Climate Change for 2016–2020 (2016) • National Development Strategy for 2018–2040 (2018) • Food Security and Nutrition Programme in the Kyrgyz Republic for 2019–2023 (2019) • Concept of Development of the Forest Sector in the Kyrgyz Republic until 2040 (2019) • Fisheries and Aquaculture Development Programme in the Kyrgyz Republic for 2019–2023 (2019) • National Development Programme of the Kyrgyz Republic until 2026 (2021) • National Adaptation Plan (under development) • Strategic Programme for the Adaptation to Climate Change (under development)	Kyrgyzstan focuses on adaptation, as outlined in its updated NDC. The country has a CCA policy and sectoral programmes that include agriculture and adaptation and risk reduction measures, in contrast to the country's agricultural and food security programmes. However, climate change and relevant adaptation and risk reduction measures for the agricultural sector are included in the national DRR and development strategies. The NAP and strategic programme for CCA are currently under development.

Table 42. (Cont.)

Country	Key policies	Summary analysis
Tajikistan	• National Water Sector Reform Programme of the Republic of Tajikistan for 2016–2025 (2015) • National Strategy for Disaster Risk Reduction 2019–2030 (2018) • Integrated Programme of Livestock Sector Development in the Republic of Tajikistan for the period 2018–2022 (2018) • National Strategy for Adaptation to Climate Change until 2030 (2019) • Programme of Food Security in the Republic of Tajikistan for 2019–2023 (2019) • Medium-term Development Programme of the Republic of Tajikistan for 2021–2025 (2021) • National Adaptation Plan (under development)	Tajikistan has a national strategy for CCA in which agriculture is prioritized, including the integration of sectoral adaptation and risk reduction measures. This also is true of the country's development programme. Although its sectoral programmes do not specifically refer to climate change, some measures are included to reduce the adverse impacts of natural hazards on agriculture. The country's NAP is currently under development.
Turkmenistan	• National Strategy on Climate Change (2012, new edition 2019) • National Strategy of Turkmenistan on Preservation of Biodiversity 2018–2023 (2018) • Agricultural Complex Development Programme for 2019–2025 (2019) • National Programme for Social and Economic Development until 2030 (2019) • National Adaptation Plan (under development)	Turkmenistan is focusing both on mitigation and adaptation, including in the agricultural sector, as it is mainstreamed in its climate change, agriculture and biodiversity strategies and in its development programme. The country's NAP is currently under development.
Uzbekistan	• Strategy for the Transition to the Green Economy for 2019–2030 (2019) • Strategy for Biodiversity Conservation in the Republic of Uzbekistan for the period of 2019–2028 (2019) • Agriculture Development Strategy of Uzbekistan for 2020–2030 (2019) • Concept of Environmental Protection in the Republic of Uzbekistan until 2030 (2019) • Concept for the Development of Water Sector of the Republic of Uzbekistan for the period of 2020–2030 (2020) • Concept for the Development of the Forestry System of the Republic of Uzbekistan until 2030 (2020) • Water Resources Management Strategy and Development of the Irrigation Sector in the Republic of Uzbekistan for 2021–2023 (2021) • Programme on the Transition to a 'Green' Economy and Ensuring 'Green' Growth in the Republic of Uzbekistan until 2030 (2022) • Development Strategy of the New Uzbekistan for the period of 2022–2026 (2022) • National Adaptation Plan (under development)	Uzbekistan includes adaptation to climate change among its priorities in relevant national policy instruments, but it is not integrated into certain sectoral strategies and plans – except for the forestry, biodiversity, water and development documents, where sectoral adaptation and risk reduction measures are mainstreamed. The country's NAP is currently under development.

Source: authors' own elaboration based on the relevant policies.

CIS EUROPE AND UKRAINE

In Belarus, the Strategy for Adaptation of Agriculture to Climate Change in the Republic of Belarus, adopted in 2017, included several adaptation and risk reduction priorities, such as improving existing irrigation and drainage systems, introducing water-saving technologies, improving the monitoring of extreme weather events and climate change, strengthening climate impact related research and innovation, and enhancing the regulatory and institutional adaptation framework.⁹⁷ The country established the Strategy of Adaptation of Forestry to Climate Change until 2050 (2019) and the Implementation Plan for Adaptation in the Forestry Sector, which outlines various adaptation and risk reduction measures, such as the continued use and improvement of technologies and methods for afforestation and reforestation as well as climate impact monitoring.⁹⁸ Moreover, the State Programme “Belarusian Forest” for 2021–2025 was adopted in 2021, with recent changes added in 2024. Climate change and related activities are included, such as the establishment of forest crops using selective seed and planting material to increase the productivity and adaptive capacity of forest plantations to climate change, the preservation of forest genetic reserves, the optimization of forest monitoring, and the improvement of the methodology for assessing the state of forest ecosystems.⁹⁹ The National Action Plan on Climate Change Adaptation until 2030 is under development.^{100,101}

In 2017, the country adopted the Doctrine of National Food Security until 2030, which includes as one of the factors that can reduce the sustainability of food security the instability of agricultural production as a result of natural and climatic conditions and the degradation of agricultural land caused by anthropogenic and natural factors. There is no further mention of climate change or CCA measures, except for the timely identification, assessment, forecasting and prevention of internal and external risks to food security.¹⁰² The National Strategy for Water Resources Management in the Conditions of Climate Change for the period up to 2030 (2021) aims to enhance water-use efficiency to ensure the country’s sustainable economic growth within the context of a changing climate, with the primary objective of achieving long-term water security for current and future generations. The priority water uses in agriculture are

fish farming, water supply for agricultural production and land reclamation. Regarding CCA, the focus is on the enhancement of water resources management, including assessment, planning, distribution and control for the efficient and sustainable use of water resources.¹⁰³

The National Action Plan for the Development of “Green” Economy in Belarus for 2021–2025 (2021) aims to develop an inclusive, smart and digital green economy that encourages the achievement of economic growth on the basis of such principles as sustainable development, resource conservation, inclusiveness to “leave no one behind”, innovation and international cooperation. It includes priority areas for the development of a “green” economy, such as: i) adaptation to climate change; ii) introduction of the principles of sustainable consumption and production; iii) development of organic production; iv) conservation and sustainable use of landscape diversity; and v) education, training and social inclusion.¹⁰⁴ The main goal of the Strategy in the Field of Environmental Protection for the period until 2035 (2021) is to ensure the use of natural resource potential and the conservation of landscapes and biodiversity within the context of economic growth and climate change. Moreover, it also aims to reclaim and rehabilitate contaminated areas and degraded ecosystems, thereby restoring the potential of natural resources.¹⁰⁵ Adaptation measures regarding water management include the State Programme for Environmental Protection and Sustainable Use of Natural Resources 2021–2025 (2021).¹⁰⁶

The National Strategy for Sustainable Socio-Economic Development for the period up to 2030 (2017) focuses on environmental sustainability, including preventing the deterioration of the natural environment and ensuring the rational use of natural resources and the conservation of ecosystems. No mention is made of climate change, but the aim to develop a “green economy” while conserving natural capital is included.¹⁰⁷ The Programme of Socio-Economic Development of the Republic of Belarus for the period of 2021–2025 (2021) outlines the objectives and priority areas of socioeconomic development in the country, with the primary goal of ensuring the well-being of the country’s citizens through the modernization of the economy. Climate change is mentioned once within the context of the rational use of

water resources. Among some of the state's main tasks are enhancing epidemiological safety and the biosafety of the agro-industrial complex, as well as enhancing social protection, including the quality of its social services and provision of social assistance.¹⁰⁸

The Republic of Moldova adopted in 2014 its Strategy for Adaptation to Climate Change until 2020 and the Plan of its Implementation Activities, which provides an analysis of future climate risks and impacts on the various regions and vulnerable sectors of the country, including agriculture and related risks such as drought, water scarcity, pests and diseases, soil erosion, salinization and desertification. Some of the CCA and DRR activities mentioned include establishing early warning systems for hydrometeorological hazards; conducting risk assessments for crop, livestock and forestry subsectors; and climate change-related training and awareness raising for farmers. The document serves as an umbrella strategy to establish the enabling environment for the integration of CCA and DRR into national and sectoral adaptation plans.¹⁰⁹ The Strategic Framework for Adaptation to Climate Change in the Dniester Basin (2015) focuses on CCA and DRR at basin level through such measures as flood dams along riverbanks, assessments to better understand the impacts of climate change on the basin and other impacts on water resources, integrated basin management, and transboundary cooperation.¹¹⁰

The country's National Climate Change Adaptation Programme until 2030 and its Action Plan were approved by the government in 2023. The programme aims to increase the climate resiliency of the country and ensure the integration of adaptation measures into sectoral policies, in line with national CCA policy documents and in the area of DRM. Agriculture is a key priority sector in which drought-adapted and drought-resilient species and the use of anti-hail nets and actions to protect crops from early frosts will be encouraged and in which the expansion of forested areas will be promoted.¹¹¹

The National Strategy for Agricultural and Rural Development 2023–2030 (2022) specifically aims, for example, to enhance the potential of agricultural resilience to climate change; encourage smart, efficient and sustainable agricultural practices; and support sustainable rural socioeconomic

development. Activities relevant to CCA and risk reduction include the enhancement, restoration and consolidation of agricultural land; the conversion of degraded land into productive land; and the protection, maintenance and enhancement of soil quality through the application of agro-environmental measures.¹¹² The country's National Programme for Integrated Plant Protection for the period 2018–2027 and Action Plan for its Implementation (2018) aim to enhance phytosanitary treatments through the implementation of measures to control pests, diseases and weeds within the context of the adaptation of the agricultural sector to climate change.¹¹³

The country's Food Security Strategy for the period 2023–2030 (2022) focuses on food security in the context of a crisis, among other items. Hence, one of the objectives is to enhance governance to manage potential food insecurity crises more effectively; however, there is no mention of climate change.¹¹⁴

The Concept for the Reform of the National Systems of Flood Management, Prevention and Reduction of the Consequences of Floods (2018), as a nationwide policy, outlines the basic principles and objectives regarding flood protection as well as the legal and institutional framework related to flood risk management. Climate change is not mentioned, but it encompasses environmental protection measures to protect against the impact of floods, such as the reforestation and afforestation of degraded lands and in flood formation zones, the establishment of forest shelter belts and the restoration of biodiversity.¹¹⁵ The 2020 Flood Risk Management Plan covers the Dniester and Prut River basins and the Black Sea basin but does not mention climate change other than flood risk management within the context of dam failure, among other areas. However, risk reduction measures are mentioned, including establishing risk information systems, updating flood regulations at national and transboundary levels, improving flood-resilient infrastructure, restoring protective forest belts, creating and restoring coastal protection belts, and strengthening institutional capacity regarding water resources management.¹¹⁶ Related measures included in the country's environmental strategy for 2014–2023 are aimed at improving soil quality and restoring degraded lands impacted by landslides,

including the application of farmland protection strips through the implementation of sustainable land management practices such as conservation agriculture.¹¹⁷ The new environmental strategy, which covers 2024–2030, was adopted in 2024.¹¹⁸

In the Russian Federation, the new Climate Doctrine, adopted in 2023, acknowledges the need for timely adaptation to climate change, with its main objectives being the development and implementation of operational and long-term adaptation measures. It mentions that proactive adaptation is among the priorities of climate policy, and it mentions that agriculture is impacted by climate change. However, the doctrine does not list any specific adaptation measures.¹¹⁹

The country adopted in 2023 its National Action Plan of the Second Stage of Adaptation to Climate Change for the period up to 2025, outlining the anticipated impacts of changes in agroclimatic characteristics of heat and moisture availability on agricultural crops. Among some of the adaptation and risk reduction measures included are the assessment of climate impacts, the improvement of disaster and climate risk insurance mechanisms and reinsurance, the monitoring and evaluation of the effectiveness and efficiency of CCA measures, and updating the federal sectoral adaptation plans.¹²⁰

In 2020, the Russian Federation adopted its Strategy for Development of Agriculture and Fisheries through 2030, which recognizes the vulnerability of the agricultural sector to natural and biological hazards and climate change. However, the strategy lacks the inclusion of specific measures to address these risks.¹²¹ The country's Food Security Doctrine (2020) provides the main directions of state policy to ensure food security. Among its relevant aims are: i) the sustainable development and modernization of agriculture, fisheries and domestic market infrastructure; ii) the development of stockbreeding, plant selection and mixed fodder production; iii) the restoration and increase of fertility of agricultural land; iv) the protection and preservation of agricultural land from water and wind erosion and desertification; and v) the enhancement of sanitary, epidemiological, veterinary and phytosanitary regulations to ensure food quality and food safety.¹²²

Natural hazards, including those related to climate change, such as floods and forest fires, are included in the National Security Strategy of 2021, but just a few adaptation and risk reduction measures are mentioned, such as forecasting the impacts of climate change and environmental protection, conservation, and the rational use of natural resources.¹²³ There is hardly any mention of agriculture and no mention of climate change and CCA in its national development goals for the period up to 2030 (2020).¹²⁴

In Ukraine, the Concept for the Implementation of the State Policy in the Field of Climate Change up to 2030 (2016) aims to enhance climate change policy for the achievement of sustainable development. Some adaptation-related objectives include the enhancement of local government capacity regarding the development and implementation of climate change prevention measures and increasing the level of societal engagement in decision-making related to climate change.¹²⁵ The country's Action Plan for the Implementation of this Climate Change Policy (2017) focuses mostly on mitigation, while it is mentioned that the government commits to establishing recommendations for the adaptation of agriculture to climate change up to 2030, including the establishment and validation of a medium-term action plan for forestry.¹²⁶

The Single and Comprehensive Strategy and Action Plan for Agriculture and Rural Development in Ukraine for 2015–2020 (2015) outlines various strategic priorities such as the development of sustainable agriculture, including forestry and fisheries, and the development of a NAP to adapt the agricultural sector to climate change.¹²⁷ The Concept of the State Target Programme for the Development of the Agrarian Sector until 2022 (2019) contains relevant adaptation and risk reduction measures focusing on reducing agricultural land degradation and desertification, preventing and controlling African swine fever, and conserving and sustainably using biodiversity with an ecosystems approach.¹²⁸

Among other goals, the State Forest Management Strategy until 2035 (2021) aims to adapt forest management to climatic changes via such relevant measures as the development and implementation of forest rehabilitation programmes and the restoration of forest resources.¹²⁹

The Irrigation and Drainage Strategy in Ukraine until 2030 (2019) is focused on the implementation of irrigation and drainage arrangements to increase crop yields by two or three times, irrespective of existing weather conditions, as well as limiting the effects of climate change on the socioeconomic development of specific regions of the country. Among others, the enhancement of water use planning, the preservation and restoration of soil fertility, and the maintenance of river water basins are mentioned.¹³⁰ The country also has established various flood risk management plans for certain territories within river basin districts (2022); these also aim to protect agricultural land in risk zones.¹³¹

The Strategy for Environmental Security and Adaptation to Climate Change until 2030 and the Action Plan for the Implementation in 2022–2024 (2021) have as objectives the protection of atmospheric air due to emissions and the protection of water resources, soil, subsoil and land while also preventing disasters and mitigating impacts through analysis and forecasting of environment risks.^{132,133} The country's Sustainable Development Goals until 2030 (2019) policy document lists only the SDGs, and adaptation, as such, is not mentioned.¹³⁴

A summary of the analysis of relevant key national climate change sectoral policies for the subregion is outlined in Table 43.

Table 43. Summary of analysis of relevant key national climate change and sectoral policies in the CIS subregion

Country	Key policies	Summary analysis
Belarus	• National Strategy for Sustainable Socio-Economic Development of the Republic of Belarus for the period up to 2030 (2017) • Strategy for Adaptation of Agriculture to Climate Change in the Republic of Belarus (2017) • Doctrine of National Food Security of the Republic of Belarus until 2030 (2017) • National Strategy for Sustainable Socio-Economic Development for the period up to 2030 (2017) • Strategy for the Adaptation of Forestry to Climate Change until 2050 (2019) • Strategy in the Field of Environmental Protection of the Republic of Belarus for the period until 2035 (2021) • State Programme 'Belarusian Forest' for 2021–2025 (2021 with changes added in 2024) • State Programme for Environmental Protection and Sustainable Use of Natural Resources 2021–2025 (2021) • National Action Plan for the Development of 'Green' Economy in Belarus for 2021–2025 (2021) • Programme of Socio-Economic Development of the Republic of Belarus for the period 2021–2025 (2021) • National Strategy for Water Resources Management in the Conditions of Climate Change for the period up to 2030 (2021) • National Action Plan on Climate Change Adaptation until 2030 (under development)	Despite that adaptation is not included in the updated NDC for Belarus, the country has established several CCA strategies specifically for agriculture, including forestry, in which adaptation and risk reduction measures are included. The National Action Plan on Climate Change Adaptation until 2030 is currently under development.

Table 43. (Cont.)

Country	Key policies	Summary analysis
Republic of Moldova	• Strategy for Adaptation to Climate Change in the Republic of Moldova until 2020 and the Plan of its Implementation Activities (2014) • Strategic Framework for Adaptation to Climate Change in the Dniester Basin (2015) • National Development Strategy Moldova – 2030 (2018) • National Programme for Integrated Plant Protection for the period 2018–2027 and Action Plan for its Implementation (2018) • Concept for the Reform of the National System of Flood Management, Prevention and Reduction of the Consequences of Floods (2018) • Flood Risk Management Plan (2020) • Food Security Strategy of the Republic of Moldova for the period 2023–2030 (2022) • National Strategy for Agricultural and Rural Development 2023–2030 (2022) • National Climate Change Adaptation Programme until 2030 and its Action Plan (2023) • Environmental Protection Strategy until 2033 (not yet adopted)	The Republic of Moldova was among the first countries in the subregion to establish CCA-related policy instruments. The country recently established new national CCA and sectoral strategies and action plans in which agriculture is considered a priority sector and in which relevant adaptation and risk reduction measures are outlined.
Russian Federation	• National Development Goals of the Russian Federation for the period up to 2030 (2020) • Strategy for Development of Agriculture and Fisheries through 2030 (2020) • Food Security Doctrine of the Russian Federation (2020) • National Security Strategy of the Russian Federation (2021) • New Climate Doctrine (2023) • National Action Plan of the Second Stage of Adaptation to Climate Change for the period up to 2025 (2023)	The Russian Federation recently established new climate change and adaptation strategies and action plans that include agriculture as a priority sector and that outline sector-specific adaptation and risk reduction measures. However, climate change is not mainstreamed in the country's sectoral strategies, nor is it in its development document.
Ukraine	• Single and Comprehensive Strategy and Action Plan for Agriculture and Rural Development In Ukraine For 2015–2020 (2015) • Concept for the Implementation of the State Policy in the Field of Climate Change for the period up to 2030 (2016) • Action Plan on the Implementation of the Concept for the Implementation of the State Policy on Climate Change for the period up to 2030 (2017) • Concept of the State Target Programme for the Development of the Agrarian Sector of the Economy for the period until 2022 (2019) • SDGs of Ukraine until 2030 (2019) • Irrigation and Drainage Strategy in Ukraine until 2030 (2019) • State Forest Management Strategy until 2035 (2021) • Strategy for Environmental Security and Adaptation to Climate Change for the period until 2030 and Action Plan for the Implementation in 2022–2024 (2021)	Ukraine has indicated that adaptation is a priority, and this is reflected in the establishment of various CCA policies, strategies and plans. However, agriculture and related measures are mainstreamed to a limited extent, which is also the case for the integration of climate change and relevant measures into the country's sectoral strategies, plans and programmes. The country has established a national adaptation strategy and action plan.

Source: authors' own elaboration based on the relevant policies.

EU-27, UNITED KINGDOM AND EFTA

Although adaptation is not included in the European Union's updated NDC, it has adopted the new European Union Strategy on Adaptation to Climate Change in 2021 as part of the European Green Deal, which builds upon its 2013 Adaptation Strategy. The strategy provides direction on how the European Union can adapt to the unavoidable impacts of climate change, with the aim of becoming climate resilient by 2050. It aims to ensure that adaptation is smarter, swifter and more systemic and to increase international adaptation action. It acknowledges the importance of adaptation and the vulnerability and adverse impacts that the agricultural sector has experienced due to extreme weather events and climate change. It specifically focuses on the need to support farmers and land managers to reduce climate-related risks. Among the adaptation and risk reduction measures included are ensuring the optimal use of genetic diversity and non-harmful plant genetic resources for adaptation; increasing the accessibility of technical advice and climate services to enhance farmers' risk-informed planning and decision-making; climate proofing; leveraging

nature-based solutions; improving risk knowledge, data and assessments; and raising adaptation awareness. This requires supportive legal and policy frameworks to facilitate the implementation of these interventions.

As such, the European Commission aims to further mainstream adaptation into relevant European Union legal and policy frameworks, such as in the update of Natura 2000, in forestry guidelines on afforestation and reforestation, and in the new European Union Forestry Strategy for 2030 (2021).¹³⁵ The European Union Climate Law, adopted in 2021, provides guidance regarding the progress towards the global adaptation goal, as established in Article 7 of the Paris Agreement. It provides practical and financial assistance to help developing countries adapt to climate change.¹³⁶

In March 2023, European Union Member States were obliged to report for the second time their national adaptation actions under the Regulation on the Governance of the Energy Union and Climate Action¹³⁷ and aligned to the obligations of the first Implementing Regulation.¹³⁸ In total, 22 of the 27 European Union countries reported national adaptation policies in 2023, which include national adaptation strategies and NAPs (Table 44).¹³⁹

Table 44. Status of national adaptation policies in the EU-27 countries in 2023

	National adaptation policy reported in 2023
Austria	X
Belgium	X
Bulgaria	Not reported
Croatia	X
Cyprus	Not reported
Czechia	X
Denmark	X
Estonia	X
Finland	X
France	X
Germany	Not reported
Greece	X
Hungary	Not reported
Ireland	X
Italy	X
Latvia	X
Lithuania	X

Table 44. (Cont.)

	National adaptation policy reported in 2023
Luxembourg	X
Malta	X
Netherlands (Kingdom of the)	X
Poland	X
Portugal	X
Romania	X
Slovakia	X
Slovenia	Not reported
Spain	X
Sweden	X

Source: Climate Adapt. 2024. Country Profiles. [Cited 31 March 2024]
<https://climate-adapt.eea.europa.eu/en/countries-regions/countries>

The European Union also has developed its Farm to Fork Strategy (2020) and Biodiversity Strategy for 2030 (2020), which are at the centre of the European Green Deal, the European Union's growth strategy for a sustainable future. The Farm to Fork Strategy aims to ensure that agrifood systems are fair, healthy and environmentally friendly, and the Biodiversity Strategy aims to restore degraded ecosystems to establish healthy and diverse ecosystems that are more resilient to future climate-related hazards through the implementation of nature-based solutions.¹⁴⁰ The new European Union Forest Strategy (2021) aims to ensure that all ecosystems – including forest ecosystems – are restored, resilient and adequately protected, also within the context of climate change and its adverse impacts. Among the relevant adaptation and risk reduction measures included are mapping and monitoring existing forest species, the conservation and restoration of forest biodiversity, the application of biodiversity-friendly and resilient forest management practices, integrated fire management systems, and the enhancement of climate change awareness.¹⁴¹

The National Adaptation Programme and Fourth Strategy for Climate Adaptation Reporting (2023) of the United Kingdom outline interventions that the government will implement to adapt to climate change during the 2023–2028 period.

The programme, last updated in 2024, aims to establish environmental land management schemes and government compensation as motivation for producers to apply sustainable farming practices, including restoring soil health through soil coverage, implementing agroforestry, utilizing new technologies (such as precision breeding to establish more resilient crop and animal varieties), and increasing water storage through on-farm reservoirs.¹⁴²

The first food security report in the United Kingdom, published in 2021, largely focused on climate variability and change as factors that threaten global and country food production. It emphasized the importance of irrigation regarding rainfed farming and increased pressure on water withdrawals – hence the need for more water-efficient crops and improved water management practices.¹⁴³ The country's "A Green Future: Our 25 Year Plan to Improve the Environment" (2018) includes climate change as a threat to ecosystems and the environment. The need for increased adaptation actions alongside mitigation is recognized, and ensuring that agricultural systems will be productive, sustainable and resilient to climate change via specific investments is emphasized.¹⁴⁴

Northern Ireland, Scotland and Wales all have their own CCA programmes, adopted in 2019. Those are listed in Table 45.

EFTA COUNTRIES

The National Climate Strategy in Liechtenstein, adopted in 2007, included both mitigation and adaptation as well as integrated sectoral policies such as agriculture, environment and energy. This strategy was revised in 2015 with a focus on enhancing the coordination of climate-related interventions within its sectoral policies.¹⁴⁵ The country's National Climate Change Adaptation Strategy (2018) provides an overview of the climate change impacts on various sectors, including agriculture, biodiversity and water management. For instance, the risks of dry spells, droughts, heat stress and water shortages during the summer months and the need to irrigate crops are expected to increase. The strategy also includes an action plan with key identified priorities for implementation regarding the irrigation of agricultural crops, the increased need of fodder and vegetable production, sustainable land and water resources management, flood protection and biodiversity conservation.¹⁴⁶ Liechtenstein is currently developing its 2030+ Forest Strategy, which has as a main objective ensuring that its forests are highly robust and biodiverse.¹⁴⁷

In 2018, Liechtenstein adopted a climate adaptation strategy, and the importance of adaptation for Alpine regions such as Liechtenstein was included in the country's Climate Vision 2050 (2020).¹⁴⁸

Iceland adopted its Climate Change Strategy in 2007, with one of its objectives being that the government would prepare for adaptation to climate change, including for agriculture.¹⁴⁹ The country's Climate Action Plan was adopted in 2010 and updated in 2018 and 2020.¹⁵⁰ The 2020 plan includes some actions related to emission reduction that also have adaptation co-benefits, such as afforestation, revegetation and wetland reclamation.¹⁵¹ In 2021, the country adopted its first national adaptation strategy, which includes goals regarding agriculture, including fisheries and marine fish farming, such as conducting regular monitoring and assessments on the impacts of climate change for adaptation planning and implementing preparedness measures.¹⁵²

The Strategic Regional Plan for 2018–2024 (2018) includes as one of its strategic aims the sustainable development of rural communities and as one of its main concerns

the need to identify adaptation and risk reduction measures to address the impacts of climate change. Among these measures are the establishment of resilient livestock facilities through the provision of long-term loans, the preservation of nature, and the development of rural regions.¹⁵³

Norway issued Parliamentary White Paper 26 (2022–2023) – “Changing Climate: Together for a Climate-Resilient Society in 2022”, outlining preparedness and adaptation to climate change measures aimed at establishing a climate-resilient society. The government's objectives are to establish an enhanced governance system for national CCA efforts and undertake a national climate vulnerability analysis every four years, among others. It has identified CCA actions regarding food security and agriculture, particularly implementing CCA and climate-resilient farming practices; assessing agricultural tools and mechanisms to help address the impacts of climate change through these practices; and setting up a working group that includes relevant stakeholders from research, industry and administration to evaluate CCA in agriculture. Furthermore, the paper also covers areas such as floods, landslides and emergency preparedness.¹⁵⁴

The country adopted in 2021 its Climate, Hunger and Vulnerability: Strategy for Climate Adaptation, Prevention of Climate-Related Disasters and Fight Against Hunger, providing an overview of development assistance efforts to build climate-resilient societies – particularly among partner countries and Sub-Saharan Africa. The measures included in this strategy aim to contribute to, for example, the development and implementation of national NAPs, the enhancement of efficient weather and climate services to risk-inform adaptation and risk reduction, including for agriculture; the establishment of national and regional contingency plans and capacities to respond to weather and climate alerts; sustainable land management; and forest and landscape restoration, with climate-smart agriculture and nature-based solutions.¹⁵⁵

The Parliamentary White Paper 35 (2016–2017) Update of the integrated management plan for the Norwegian Sea (2017) includes measures related to climate change, namely the plan to increase knowledge on and to monitor the impacts

of climate change and ocean acidification on marine ecosystems.¹⁵⁶ Aligned to this white paper is Blue Opportunities: The Norwegian Government's Updated Ocean Strategy (2019); although it does not include climate change, it includes the conservation and sustainable use of marine ecosystems.¹⁵⁷ In addition, the Norwegian Government's Arctic Policy – People, Opportunities and Norwegian Interests in the Arctic (2020) – aims, for example, to enhance Arctic cooperation on ocean and climate change-related issues; promote integrated ecosystem-based management; increase conservation and sustainable usage; and continuously monitor ocean acidification and climate change in the Arctic seas.¹⁵⁸

In Switzerland, the Climate Strategy for Agriculture and Food 2050 (2023) focuses on both agricultural mitigation and adaptation to climate change, with specific policies related to, for example, sustainable land and water resources management aimed at maintaining soil fertility, increasing resilience to climate-related hazards, and increasing carbon storage.¹⁵⁹ These priorities also were reflected in the country's 2030 Sustainable Development Strategy (2021), which identified managing climate-related impacts and enhancing the resilience of the food system – including sustainably using soils, limiting soil degradation and loss, and conserving and restoring soil functions.¹⁶⁰ This is in line with the Swiss Soil Strategy for

Sustainable Soil Management, which was adopted in 2020.¹⁶¹

The objective of the country's Global Programme Food Security Programme Framework 2021–2024 (2020) is to increase the sustainability and resilience of food systems through the implementation of agroecological principles to adapt to climate change and enhance the resilience of women and young smallholder producers through such efforts as safety nets and risk transfer mechanisms, the sustainable use of natural resources, the maintenance and sustainable use of agrobiodiversity, and enhancements to resource efficiency, diversity and resilience.¹⁶²

The Management of Risks from Natural Hazards Strategy 2018 mentions the expected increase in the frequency and intensity of extreme weather events – particularly droughts and heat waves – linked to climate change. This strategy outlines agriculture-relevant risk reduction measures, such as land-use planning, climate-resilient building and facilities, enhanced preparedness for response to natural hazard-induced disasters, regular hazard and risk monitoring and assessments, and increasing experts' awareness, knowledge and training.¹⁶³ A summary of the analysis of relevant key national climate change sectoral policies for the subregion is outlined in Table 45.

Table 45. Summary of analysis of relevant key national climate change and sectoral policies in the EU-27, United Kingdom and EFTA subregion

Country	Key policies	Summary analysis
EU-27	• Farm to Fork Strategy (2020) • Biodiversity Strategy for 2030 (2020) • New EU Strategy on Adaptation to Climate Change (2021) • New EU Forestry Strategy for 2030 (2021) • EU Climate Law (2021)	Despite that adaptation is not included in the updated NDC of the European Union, there are various relevant policy instruments that guide adaptation to climate change in the European Union. In this regard, the European Union has established its new CCA strategy – along with its new Forest Strategy, Farm to Fork Strategy and Biodiversity Strategy – in which climate change is mainstreamed and relevant agriculture adaptation and risk reduction measures are included.
United Kingdom	• United Kingdom National Adaptation Programme (NAP3) and the Fourth Strategy for Climate Adaptation Reporting for the period 2023–2028 (2023) • A Green Future: Our 25-year Plan to Improve the Environment (2018) • Northern Ireland Climate Change Adaptation Programme for 2019–2024 (NICCAP2) (2019) • Climate Ready Scotland: Climate Change Adaptation Programme 2019–2024 (2019) • Climate Change Adaptation Plan Prosperity for All: A Climate Conscious Wales (2019)	The Russian Federation recently established new climate change and adaptation strategies and action plans that include agriculture as a priority sector and that outline sector-specific adaptation and risk reduction measures. However, climate change is not mainstreamed in the country's sectoral strategies, nor is it in its development document.

Table 45. (Cont.)

Country	Key policies	Summary analysis
Iceland	- Climate Change Strategy (2007) - Strategic Regional Plan for 2018–2024 (2018) 2020 Climate Action Plan (2020) - Strategy on Adaptation to Climate Change (2021)	Although Iceland did not include adaptation in its updated NDC, the country included its intention to prepare for adaptation to climate change. The country's 2007 climate change strategy includes adaptation, and the country adopted its national adaptation strategy in 2021, which includes sector-specific adaptation goals and related agriculture adaptation and risk reduction measures.
Liechtenstein	- National Climate Strategy (2007 and revised in 2015) - National Climate Change Adaptation Strategy (2018) - Climate Vision 2050 (2020) - Liechtenstein Climate Strategy 2050 (2022) 2030+ Forest Strategy (under development)	Liechtenstein has established various climate change and adaptation-related strategies over the years, including the mainstreaming of agriculture and measures to address the adverse impacts of extreme weather events. The mitigation of greenhouse gas emissions is included in the country's development strategies and plans. The 2030+ Forest Strategy is currently under development.
Norway	- Blue Opportunities: The Norwegian Government's Updated Ocean Strategy (2019) - Norwegian Government's Arctic Policy – People, Opportunities and Norwegian Interests in the Arctic (2020) - Climate, Hunger and Vulnerability: Strategy for Climate Adaptation, Prevention of Climate-related Disasters and Fight against Hunger (2021) - Parliamentary white paper 26 (2022–2023): Changing Climate: Together for a Climate-Resilient Society (2022)	Norway has established various white papers regarding climate change and building a climate-resilient society that include relevant adaptation and risk reduction measures to reduce the adverse impacts of climate variability and change on agriculture as well as in sectoral policies and strategies, particularly regarding the Norwegian and Arctic seas.
Switzerland	- Management of Risks from Natural Hazards Strategy 2018 (2018) - Global Programme Food Security. Programme Framework 2021–2024 (2020) - Swiss Soil Strategy for Sustainable Soil Management (2020) 2030 Sustainable development strategy 2021–2030 (2021) - Climate Strategy for Agriculture and Food 2050 (2023)	Although adaptation is not included in the Switzerland climate change strategy, it is mainstreamed in the country's sectoral strategy and programme as well as its DRM strategy, including with prioritized measures for the agricultural sector.

Source: authors' own elaboration based on the relevant policies.

SOUTHEASTERN EUROPE

Albania adopted the National Adaptation Planning to Climate Change – Framework for the Country Process in 2016.¹⁶⁴ Agriculture is considered a key sector vulnerable to the impacts of climate change, with the second goal of national adaptation planning focusing on the enhancement of agricultural resilience against floods. Some of the adaptation and risk reduction actions mentioned are climate-resilient irrigation, drainage and flood protection, integrated water resources management, ecosystem-

based adaptation, upgrading civil defence preparedness, and disaster risk reduction.

The country's National Strategy on Climate Change and Action Plans (2019) includes both mitigation and adaptation, with the inclusion of its NAP in one of its annexes. The strategy aims to enhance adaptation in view of present and future generations. Among its six prioritized actions are raising awareness on climate change and enhancing institutional capacities and interinstitutional cooperation on climate-related issues. In addition, the strategy mainstreams climate change into sectoral strategic planning,

including for sustainable and resilient agriculture, through reducing land degradation, rehabilitating degraded lands, preventing erosion in arable land and pastures, conserving forests and forest management via afforestation, expanding forest area, protecting forests, and preventing erosion and forest fires. Moreover, there is a focus on the enhancement of flood risk management through early warning systems, preparedness and spatial planning.¹⁶⁵

The Strategy on Agriculture, Rural Development and Fisheries 2021–2027 (2022) aims to ensure the sustainable development of the agrifood sector within the context of medium- and long-term challenges related to food security, livelihoods, climate change and biodiversity loss. The strategy mentioned that CCA will be integrated into all relevant sectors in order to increase the resilience of agriculture, land, water, food and energy, including through sustainable natural resources management, such as the protection of land and forest resources, afforestation and the sustainable development of marine and inland fisheries.¹⁶⁶ Two of the five strategic objectives in the National Strategy for Integrated Water Resources Management 2018–2027 (2018) are related to adaptation: i) the enhancement of scientific knowledge on water and climate issues and ii) disaster risk reduction and the management of drought and floods. Regarding agriculture, the focus is on water protection and quality via water management plans, the rehabilitation and modernization of irrigation systems, and the expansion of irrigation zones.¹⁶⁷

The Forest Policy 2030 (2018) of Albania does not cover climate change, but it does include objectives related to mitigation, adaptation and risk reduction – including sustainable forestry management, ecosystem preservation and biodiversity conservation, with disaster risk reduction and management to be integrated into forestry management to prevent forest losses and deforestation as a result of erosion, floods, fires, pests and diseases. Moreover, afforestation is encouraged to enhance forests' carbon sequestration potential, and forest areas are being increased to prevent erosion and floods due to heavy rainfall.¹⁶⁸

In Bosnia and Herzegovina, the country's Climate Change Adaptation and Low Emissions Development Strategy for 2020–2030 (2020) includes various adaptation and risk reduction

measures, such as the enhancement of forest fire protection systems, reforestation, the maintenance and restoration of the diversity of indigenous tree species, climate change-related research on plant pests and diseases, the improvement of drainage and irrigation systems, the setting up of communication-connected hail protection systems, and the increase of awareness, knowledge and capacities among farmers on CCA measures to reduce the adverse impacts of floods and drought.¹⁶⁹ The country's 2022 NAP outlines the country's risk and vulnerability assessment to climate change, with the same agricultural adaptation and risk-reduction activities as in the above-mentioned strategy.^{170,171}

The Strategic Plan for Rural Development of Bosnia and Herzegovina 2023–2027 (2024) recognizes the high vulnerability of the agricultural sector to climate change. The fourth strategic goal focuses on “sustainable management of natural resources and strengthening resilience of agricultural production to climate change”. Among the adaptation and risk reduction measures included are improvements to irrigation, drainage and flood defence systems; sustainable land and water management; and strengthening producers' knowledge, information and skills on how best to adapt to climate change and financial incentives for farmers to invest in irrigation, hail protection and indoor production.¹⁷²

The Strategy of Agriculture for Federation of Bosnia and Herzegovina for 2015–2020 (2014) has expired, and a new strategy for 2022–2025 has been finalized (but not yet adopted) by the Ministry for Agriculture, Forestry and Water Management of the Federation of Bosnia and Herzegovina. In the 2015 strategy, links between natural hazards and climate change and between DRR and CCA were established. Similar adaptation and risk reduction measures relevant for the agricultural sector are included as in the above-mentioned strategy, but it also includes the development of drought-resistant varieties, the improvement of agroclimatic monitoring and early warning systems to enhance preparedness for response, and the importance of an insurance scheme.¹⁷³ The Water Management Plan for the Water Area of the Sava River in the Federation of Bosnia and Herzegovina 2022–2027 (2022) aims to achieve the good state and ecological potential of water bodies through the implementation of water management, sustainable water use and the

protection against threats.¹⁷⁴ The Environmental Protection Strategy of the Federation of Bosnia and Herzegovina 2008–2018 (2008) similarly includes sustainably using natural resources, managing the environment, protecting soil and ensuring biological diversity.¹⁷⁵ In addition, the Development Strategy of the Federation of Bosnia and Herzegovina 2021–2027, adopted in 2020, does not mention climate change, but its third strategic goal focuses on “resource efficient and sustainable development” and encompasses the efficient and sustainable use of natural and other resources and the conservation of the environment.¹⁷⁶

The Forestry Development Strategy of Republika Srpska for the period 2011–2021 (2012) includes sustainable forest management and forest conservation – including in the context of forest degradation and the importance of protecting forests, nature and the environment – while the expected effects of climate change are not included.¹⁷⁷ The Environmental Protection Strategy of Republika Srpska 2022–2032 (2022) includes among its priorities the sustainable management of natural resources, climate change, biodiversity and nature conservation.¹⁷⁸

In Montenegro, the National Strategy for Climate Change until 2030, adopted in 2015, mentions natural hazards, such as floods and landslides. However, no connection is made between these hazards and climate change. Various CCA and risk reduction measures relevant for the agricultural sector are included (e.g. undertaking scientific research on the impacts of climate change on agriculture; applying different types of maturing varieties and adjusting the date of sowing and planting; applying reduced and deep tillage, erosion control and soil protection by planting trees; and establishing protective walls and barriers to reduce the impacts from storms and wetlands to reduce the effects of rising sea levels and flooding).¹⁷⁹ The country’s NAP is currently under development.¹⁸⁰

The Strategy for the Development of Agriculture and Rural Areas 2015–2020 (2015) mentions climate change and its expected adverse impacts on agriculture and food production as well as the availability of natural resources. Water availability and usage is considered the largest anticipated impact of climate change on the country’s agriculture; therefore, efficient water resources management and the introduction of agricultural production methods aimed at environmental protection (including sustainable forest management) are

among the objectives for reducing the effects of climate change.¹⁸¹ The National Forestry Strategy 2014–2023 (2014) mentions that some of the funds from the European Union Instrument for Pre-accession Assistance for Agriculture and Rural Development will be used towards the development of the forestry sector, such as for afforestation and fire protection. Climate change, however, is not mentioned.¹⁸²

Nor is there a link made in the Disaster Risk Reduction Strategy with a Dynamic Plan of Activities for the Implementation of the Strategy for the period 2018–2023 (2017) between climate change and the various types of natural, biological and technological hazards that affect the country. The strategy includes such planned interventions as developing flood risk management plans and conducting local disaster risk assessments. This strategy is aligned to the Sendai Framework for Disaster Risk Reduction and the 2009 European Strategy for Disaster Risk Reduction Support in Development Countries.¹⁸³

While there is quite some focus on CCM in the National Strategy for Sustainable Development to 2030 (2016), there is only some mention of CCA through, for example, the preservation of vulnerable ecosystems, the efficient use of natural resources, and the introduction and implementation of a green economy.¹⁸⁴

North Macedonia adopted in 2021 its Long-Term Strategy on Climate Action and Action Plan. The strategy focuses mostly on mitigation, but its sixth specific objective aims to increase the resilience of key socioeconomic sectors and ecosystems to the impacts of climate change. The development and adoption of its NAP falls under this objective, which will help identify the country’s adaptation needs and establish relevant CCA policies and measures.¹⁸⁵

The National Strategy for Agriculture and Rural Development 2021–2027 (2021) includes implementing sustainable environmental practices to reduce and adapt to climate change among its key strategic goals. Specific goals include promoting the sustainable development and efficient natural resources management of water, soil and air; encouraging biodiversity production; and enhancing ecosystem services and irrigation.¹⁸⁶

The National Biodiversity Strategy and Action Plan for the period 2018–2023 (2018) is aligned

to the Convention on Biological Diversity and includes as Target 15: “By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to CCM and CCA and to combating desertification.”¹⁸⁷ Among the targets included in the National Strategy for Nature Protection 2017–2027 (2018) are the protection, conservation and monitoring of geodiversity, geoheritage and other components of nature (biological and landscape diversity) through the application of traditional knowledge, innovation, good practices and incentives.¹⁸⁸

Serbia adopted in 2023 its First Programme for Adaptation to Changed Climatic Conditions for the period 2023–2030 with an action plan for 2024–2026. Among the four goals are enhancing capacities for the systematic implementation of adaptation and increasing the climate change resilience of critical infrastructure and natural resources. It includes 25 adaptation and risk reduction measures to be implemented by the ministries of agriculture, environmental protection, health, internal affairs, finance and reconstruction as well as by the Republic Hydrometeorological Service of Serbia. For the 2024–2026 period, a total of EUR 7.3 million has been allocated from the budget.¹⁸⁹

Sustainable resources management and environmental protection are among the main objectives of the National Agriculture and Rural Development Strategy 2014–2020 (NARDS) (2014). Adapting to climate change is mentioned through the promotion of resource efficiency and the implementation of agricultural production methods aimed at the conservation and enhancement of the environment, such as the application of organic farming.¹⁹⁰ The country’s Water Management Strategy until 2034 (2016) outlines the present status of water resources and management in Serbia as well as protection against natural hazards, such as flash floods, river floods and erosion. It is emphasized that the country’s water resources need to be managed in an integrated manner, based on the principle of sustainable development.¹⁹¹

The National Disaster Risk Management Programme, adopted in 2014, aims to establish a comprehensive programme for disaster resilience. The programme includes natural

hazards (e.g. floods, landslides and fire), but no connection is included between these hazards and climate change. Risk reduction measures relevant for the agricultural sector include early warning systems, insurance mechanisms that would cover catastrophe and weather risks, post-disaster needs assessments, land use planning, fire-control training and the establishment of flood overflow areas, wet and dry reservoirs, and flood protection structures such as dykes and river works.¹⁹² The Action Plan for the Implementation of the National Disaster Risk Management Programme (2016–2020) was adopted in 2017; this plan outlines specific agricultural risk reduction activities, including risk assessments, vulnerability and flood and forest fire risk maps, an early warning system for forest fires, and institutional strengthening of the country’s forest fire prevention, control and management capacities at all levels, including preparedness and response.¹⁹³

Türkiye adopted its National Climate Change Adaptation Strategy and Action Plan 2024–2030 (2024), which outlines 40 strategic targets and 132 actions for 11 priority sectors, including agriculture and food security, water resources management, and biodiversity and ecosystem services. It includes such agriculture-relevant adaptation and risk reduction measures as expanding early warning systems at province level; the monitoring of pasture capacities and yields; sustainable land and water management practices (e.g. no-till agriculture and rain harvesting); the development of land use plans; enhancing irrigation systems; establishing, ventilation, cooling and retrofitting animal shelters to reduce heat stress; and agricultural risk insurance against hail and frost.¹⁹⁴

CCA in agriculture is mainstreamed in the Strategic Plan of the Ministry of Agriculture and Forestry 2019–2023 (2019). Adaptation and risk reduction measures included in this strategy are aligned to the above-mentioned climate change strategy, such as management plans for land and water resources to reduce the impacts of floods, droughts, erosion and desertification; the establishment of animal welfare strategies to prevent, control and manage animal pests and diseases; the increase of awareness on the conservation of biodiversity, ecosystems and natural resources; and the diversification of plant and animal species.¹⁹⁵ Among the objectives of the country’s Sectoral Policy on Fisheries 2019–2023 (2019) is increasing the resilience of the fisheries and aquaculture

subsectors to the negative effects of climate change through, for example, the undertaking of studies to assess these impacts on fish stocks and production to risk-inform its long-term planning.¹⁹⁶ Ensuring water security in spite of the adverse impacts of climate change is one of the objectives of the National Water Plan 2019–2023 (2019), with such encompassing sector-specific interventions as early warning systems, the conservation of water resources, the enhancement of rainwater harvesting and groundwater storage, and the development and implementation of adaptation and risk management plans, such as for droughts.¹⁹⁷

The country's National Biodiversity Action Plan 2018–2028 (2019) aims to ensure the conservation and sustainable use of the country's biological diversity, which is being undermined by climate change and the overconsumption of natural resources and pollution, among other causes. This action plan includes, for example, risk assessment and monitoring, the rehabilitation and restoration of degraded ecosystems, and research to establish species-specific or ecosystem-based conservation approaches.¹⁹⁸ The National Steppe Conservation Strategy and Action Plan 2021–2030 (2021) aims to increase the adaptive capacity of ecosystems against climate change by, for example, documenting genetic resource quality and traditional knowledge, implementing and sharing biodiversity-enhancing agricultural practices, and ensuring sustainable and ecosystem-based rangeland management.¹⁹⁹ Linked to this is the Ecosystem-based Adaptation Strategy for

Anatolian Steppe Ecosystems 2022–2036 (2022), which aims to enhance ecosystem resilience against the impacts of climate change, build climate-resilient rural communities and increase the potential of carbon sinks.²⁰⁰

There is no link made between natural hazards and climate change in the Disaster Risk Reduction Plan of Türkiye 2022–2030 (2022), which is aligned to the Sendai Framework for Disaster Risk Reduction 2015–2030. However, relevant agricultural risk reduction measures are outlined, such as: conducting disaster risk assessments; establishing integrated disaster maps; establishing a disaster database; establishing national early warning systems; establishing disaster risk transfer mechanisms; integrating DRR into post-disaster recovery, reconstruction and rehabilitation; undertaking DRR research; and increasing public awareness on DRR.²⁰¹ Moreover, the country adopted in 2023 the Strategy and Action Plan for Combating Agricultural Drought 2023–2027, which recognizes that water is a critical issue for agriculture, food, water and energy, with measures needed to minimize the impacts of drought. In this regard, it is stated that risk-informed agriculture and water-based planning are highly needed, including forecasting agricultural droughts, monitoring drought risk at the provincial level, enhancing existing irrigation systems to reduce water loss, and increasing water-use efficiency.^{202,203}

A summary of the analysis of relevant key national climate change sectoral policies for the subregion is outlined in Table 46.

Table 46. Summary of analysis of relevant key national climate change and sectoral policies in the Southeastern Europe subregion

Country	Key policies	Summary analysis
Albania	- National Adaptation Planning to Climate Change – Framework for the Country Process (2016) - National Strategy for Water Resources Integrated Management 2018–2027 (2018) - Forest Policy Document in Albania – 2030 (2018) - National Strategy on Climate Change and Action Plan (2019) - Strategy on Agriculture, Rural Development and Fisheries 2021–2027 (2022)	Albania was among the first countries of Southeastern Europe to establish a NAP. Also, in its national sectoral strategies, adaptation and risk reduction measures are included, especially those to reduce the adverse impacts of droughts and floods, but also addressing deforestation and soil erosion processes aimed at ensuring healthy and diverse ecosystems that are more resilient to climate variability and change.
Bosnia and Herzegovina	- Environmental Protection Strategy of the Federation of Bosnia and Herzegovina 2008–2018 (2008) - Water Management Strategy of the Federation of Bosnia and Herzegovina for 2010–2022 (2012) - Forestry Development Strategy of Republika Srpska for the period 2011–2021 (2012) - Strategy of Agriculture for the Federation of Bosnia and Herzegovina 2015–2020 (2015) - Development Strategy of the Federation of Bosnia and Herzegovina 2021–2027 (2020) - Climate Change Adaptation and Low Emissions Development Strategy for 2020–2030 (2020) - Adaptation of the Water Management Plan for the Water Area of the Sava River in the Federation of Bosnia and Herzegovina 2022–2027 (2022) - Environmental Protection Strategy of Republika Srpska 2022–2032 (2022) - National Adaptation Plan (2022) - Strategic Plan for Rural Development of Bosnia and Herzegovina 2023–2027 (2024)	Adaptation is considered a priority, alongside mitigation, by Bosnia and Herzegovina. The high vulnerability of agriculture and the adverse impacts on the sector are well recognized, with various adaptation and risk reduction measures included in the national/subnational CCA and sectoral strategies. The country already has established and adopted a NAP with agriculture-prioritized CCA and DRR activities included.
Montenegro	- National Forestry Strategy 2014–2023 (2013) - National Strategy for Climate Change until 2030 (2015) - Strategy for the Development of Agriculture and Rural Areas 2015–2020 (2015) - National Strategy for Sustainable Development to 2030 (2016) - Disaster Risk Reduction Strategy with a Dynamic Plan of Activities for the Implementation of the Strategy for the period 2018–2023 (2017) - National Adaptation Plan (under development)	The link between climate change and natural hazards is not included in the climate change strategy of Montenegro, nor is the link included in the country's national disaster risk reduction strategy. Agriculture-relevant adaptation and risk reduction measures are included. Adaptation to climate change is to a limited extent integrated into the country's sectoral and development strategies. The NAP is currently under development.
North Macedonia	- National Strategy for Nature Protection 2017–2027 (2018) - National Biodiversity Strategy and Action Plan for the period 2018–2023 (2018) - National Strategy for Agriculture and Rural Development 2021–2027 (2021) - Long-Term Strategy on Climate Action and Action Plan (2021) - National Adaptation Plan (under development)	Adaptation is to a limited extent mainstreamed in the climate change policy and action plan in North Macedonia. Adaptation to climate change is included in the country's agricultural, biodiversity and nature protection strategies, with sector-specific measures outlined. The NAP is currently under development.

Table 46. (Cont.)

Country	Key policies	Summary analysis
Serbia	• Strategy of Agriculture and Rural Development 2014–2024 (2014) • National Disaster Risk Management Programme (2014) and Action Plan for the Implementation of the National Disaster Risk Management Programme (2016–2020) • Water Management Strategy of the Territory of the Republic of Serbia until 2034 (2016) • National Programme for Agriculture for the period 2018–2020 (2017) • First Programme for Adaptation to Changed Climatic Conditions for the period 2023–2030 with Action Plan for the period 2024–2026 (2023)	Agricultural adaptation and risk reduction measures are mainstreamed in the country's 2023 CCA programme and action plan, while climate change is included neither in its sectoral strategies nor in its DRM programme and action plan, although it does include agriculture-relevant adaptation risk reduction measures.
Türkiye	• National Strategy and Action Plan on Combating Desertification 2015–2023 (2015) • Strategic Plan of the Ministry of Agriculture and Forestry 2019–2023 (2019) • Sectoral Policy on Fisheries 2019–2023 (2019) • National Water Plan 2019–2023 (2019) • National Biodiversity Action Plan 2018–2028 (2019) • National Rural Development Strategy 2021–2023 (2021) • National Steppe Conservation Strategy and Action Plan 2021–2030 (2021) • Ecosystem-based Adaptation Strategy for Anatolian Steppe Ecosystems 2022–2036 (2022) • Disaster Risk Reduction Plan of Türkiye (TARAP) 2022–2030 (2022) • Strategy and Action Plan for Combating Agricultural Drought 2023–2027 (2023) • National Climate Change Adaptation Strategy and Action Plan 2024–2030 (2024)	Türkiye is one of the Southeastern Europe countries with several established climate change and adaptation strategies and action plans in which agriculture, adaptation and risk reduction measures are mainstreamed. Similarly, relevant interventions are integrated into the country's sectoral strategies and plans, its national DRR plan and its agricultural drought strategy and action plan.

Source: authors' own elaboration based on the relevant policies.



CHAPTER

CHALLENGES AND SOLUTIONS FOR NATIONALLY DETERMINED CONTRIBUTION IMPLEMENTATION AND MONITORING

4.1

KEY MESSAGES

- The region encompasses a diverse range of countries with varying levels of economic development. Some nations rely heavily on oil and gas as primary energy sources, and emission reduction efforts often are directed to the energy sector, despite the agricultural sector's significant contribution to emissions.
- When policies and strategies in the agricultural sector are compared, countries tend to prioritize adaptation practices over mitigation due to the high importance of food security and the significant current and expected impacts of climate change on the agricultural sector.
- The challenges linked to implementing NDCs, especially when looking at emissions mitigation in the agricultural sector, include weak policy frameworks and inadequate enforcement mechanisms, limited institutional capacities, possible trade-offs with food security and livelihoods, and limited access to finance and technologies.
- The extent to which climate finance requirements are reflected in the NDCs is crucial for gauging the genuine needs for implementing policies and measures. However, numerous countries have yet to adequately incorporate this information relative to their actual needs.

- Globally available climate finance falls short of the real need. Even under the most conservative estimates, current financial allocations constitute less than half of the required funding.
- Countries have identified a range of challenges linked to the implementation, monitoring and financing of their adaptation goals.

4.2

CHALLENGES AND SUPPORT MECHANISMS FOR NATIONALLY DETERMINED CONTRIBUTION IMPLEMENTATION AND MONITORING

CHALLENGES

CLIMATE CHANGE MITIGATION

Bottlenecks linked to the implementation of GHG mitigation measures in the agricultural sector include:

- **Policy challenges:** Weak policy frameworks, inadequate enforcement mechanisms and a lack of alignment between climate and agriculture policies and strategies can hinder the development and implementation of effective GHG mitigation policies in the agricultural sector. In many countries, CCM policies are not reflected in legal and strategic agricultural frameworks. An example is Uzbekistan, where the Strategy on the Transition of the Republic of Uzbekistan to a “Green” Economy 2019–2030 has been developed but reflections in agricultural policies and strategies are yet to be made.
- **Limited institutional and human capacities:** GHG mitigation in the agricultural sector requires specific expertise that often is limited – both within national institutions and at the farm level. For example, many countries lack human capacities to develop national emissions calculations and projections (e.g. verification of the data used, uncertainty analysis, quality control and assurance). With the emerging Enhanced Transparency Framework, countries will face additional reporting requirements. The new reporting framework – especially the biennial transparency reports – may be challenging, especially for non-Annex I parties with less experience; Armenia, Kyrgyzstan, Tajikistan and Uzbekistan reportedly have requested support for capacity-building programmes on these topics.
- **Lack of clearly defined institutional roles and responsibilities:** In many countries, roles and responsibilities regarding data gathering, GHG inventory preparation, GHG emission mitigation strategy development, the development of policies and measures, and policy implementation and monitoring do not abide by a robust set of rules and regulations. Also, in some countries, frequent turnover among relevant experts within institutions can cause a loss of institutional knowledge on certain topics.
- **Lack of proven solutions for addressing key emission sources:** Some emission sources in agricultural activities have limited low-emission alternatives. Methane emissions from enteric fermentation, for example, is a major emission source in most ECA countries, and the potential solutions (e.g. methane inhibitors and modifiers or livestock breeding and genetics) have potential downsides and varied effectiveness.
- **Geographical and cultural specificity of agricultural mitigation measures:** Unlike in the energy sector, GHG mitigation measures in the agricultural sector may not have the same impact in one place that they do in other places due to geographical conditions or cultural differences, such as how measures are implemented and their level of acceptance among farmers.
- **Food security and livelihood trade-offs:** There may be trade-offs between GHG emission reduction measures and food security or rural livelihoods, particularly in countries where agriculture plays a critical role in providing employment and income.

- **Limited data and monitoring:** Agriculture emissions are difficult to measure accurately due to the complexity of agricultural systems and limited monitoring infrastructure. A lack of comprehensive data on emissions from various agricultural activities hinders the development and implementation of effective mitigation strategies.
- **Lack of awareness among farmers on emissions and climate change:** Farmers often lack awareness of the GHG emissions caused by some traditional farming practices and of the potential benefits of adopting more sustainable methods. Limited access to capacity-building activities further compounds this issue.
- **Limited access to finance and technology:** Smallholder farmers often face barriers to accessing finance and adopting climate-friendly technologies and practices. Small-scale farmers often lack the collateral required by financial institutions for the provision of loans, and thus they may find it difficult to access affordable financing for climate adaptation or mitigation projects. They also might not know of the availability of climate finance or how to access it, including eligibility criteria and how to apply. Moreover, there is a lack of clarity regarding the specific financial support needed, hindering effective planning and resource allocation.
- **Fragmented land ownership:** Fragmented land ownership and small farm sizes make it challenging to implement landscape-level

approaches to emission reduction, such as agroforestry or land-use planning. In some cases, fragmented land ownership may be associated with unclear or insecure land tenure arrangements, and farmers who lack formal land titles or who face the risk of land disputes may find it difficult to access climate finance, as financial institutions may perceive them as higher-risk borrowers.

- **Water scarcity and irrigation practices:** Water scarcity can lead to unsustainable irrigation practices that can contribute to GHG emissions, particularly from methane released from waterlogged soils.

The challenges to NDC implementation for GHG mitigation in the agricultural sector are not limited to the above-mentioned issues; however, in many developing states and emerging economies, similar issues are at the core of the problems.

CLIMATE CHANGE ADAPTATION

As shown in the other chapters of this report, ECA countries increasingly have included adaptation in their updated NDCs, although the degree of mainstreaming varies among the countries. To identify the main challenges, constraints and capacity-building needs of countries regarding adaptation – and in particular in the agricultural sector – an analysis was conducted of the 16 countries that included adaptation in their updated NDCs, with an overview provided in Table 47.

Table 47. Overview of challenges, constraints and capacity needs related to implementation, monitoring and financing of adaptation in the updated nationally determined contributions in Europe and Central Asia

In updated NDCs	Implementation	Monitoring	Financing
Challenges, constraints and capacity needs included	13 (out of 16 countries)	13	8
Agriculture related	7	3	
Environment related			1

Sources: NDCs. See References.

Some of the challenges, constraints and capacity needs related to the implementation, monitoring and financing of adaptation were

related specifically to agriculture and the environment, as shown in Table 48.

Table 48. Overview of challenges, constraints and capacity-building needs related to adaptation included in the updated nationally determined contributions in Europe and Central Asia

In updated NDCs	Implementation	Monitoring	Financing
<i>Caucasus</i>			
Armenia		X	
Azerbaijan	X (AG related)	X (AG related)	
Georgia	X (AG related)	X (AG related)	
<i>Central Asia</i>			
Kazakhstan	X		
Kyrgyzstan	X	X	X
Tajikistan	X (AG related)	X	X
Turkmenistan	X (AG related)	X (AG related)	X (AG related)
Uzbekistan	X (AG related)		
<i>CIS Europe and Ukraine</i>			
Republic of Moldova	X (AG related)		X
Russian Federation	X	X	
Ukraine		X	
<i>Southeastern Europe</i>			
Albania	X	X	
Bosnia and Herzegovina		X	
Montenegro	X (AG related)	X	X
North Macedonia	X	X	X
Türkiye	X	X	X

AG=Agriculture

Sources: NDCs. See References.

Regarding financing, Turkmenistan included the need to enhance the financing systems related to the environment, particularly for protected natural areas, by introducing innovative financial sources. Tajikistan indicated in its updated NDC that there is no clear mechanism for identifying financial resources for adaptation and mitigation measures from different sources, including from development partners, the private sector and the government. Hence, it aims to establish indicators and tracking procedures for national and subnational funding sources.

In terms of agriculture-related monitoring, Azerbaijan mentioned the establishment of assessment indicators for the

implementation of agricultural production on the basis of environmental standards as well as enhancing environmental protection mechanisms in the agricultural sector. Georgia included assessing the impacts of climate change on coastal and mountain ecosystems as well as on the availability of ground- and surface-water resources for sustainable use in agriculture. Moreover, it will focus on conducting research on the most vulnerable forest areas. Turkmenistan plans to increase agrometeorological observations so that specific interventions can be implemented to protect agroecosystems from climate-related elements, and it plans to set up a comprehensive inventory of soil and land

resources. Furthermore, it will establish an agency for monitoring, assessing and forecasting climate variability and change.

Of the 13 countries that included implementation-related challenges, constraints and capacity needs, seven countries mentioned those linked to the agricultural sector. For instance, the updated NDC from Azerbaijan mentioned the establishment of protective forest belts, the enhancement of livestock and pasture management, the prevention of re-salinization, reforestation and afforestation, and the sustainable use of agricultural land and water resources. Georgia aims to evaluate and establish adaptive capacities for the agriculture production of important crops and for the country's honey and non-timber forest products. In addition, it will promote the conservation of species that are endemic and endangered as well as indigenous species of high importance for food and agriculture. The updated NDC from Montenegro includes the implementation of specific agricultural adaptation and risk-reduction measures that also have mitigation

co-benefits, such as the expansion of resilient forest species in areas that are at risk of forest fires and the establishment of micro-reservoirs, harvest storage and greenbelt barriers to reduce land degradation. This also is the case for Tajikistan, with such good practices mentioned as agroforestry, conservation agriculture, crop rotation, intercropping, crop diversity and integrated pest management, among others. The Republic of Moldova, the Russian Federation, Türkiye, Turkmenistan and Uzbekistan outline some agricultural measures as part of their national climate change/adaptation policies in their NDCs (see section 3.3).

To complement the analysis of NDCs, additional analysis by subregion was conducted of the latest national communication reports from all 16 countries, as these are usually more detailed regarding adaptation. Table 49 shows the number of countries that included implementation, monitoring and financing constraints, challenges and capacity needs for adaptation in their latest national communications, including the extent to which these were related to agriculture.

Table 49. Overview of implementation, monitoring and financing challenges, constraints and capacity needs for adaptation in the latest national communications.

In latest NCs (16 total)	Implementation	Monitoring	Financing
Challenges, constraints and capacity needs included	16	16	13
Agriculture related	9	9	3
Environment related		1	1

Sources: National communications. See References.

Caucasus

In the latest national communication reports of all three Caucasus countries, challenges, constraints, and capacity needs are mentioned for implementation, monitoring and financing of adaptation, as shown in Table 50.

Table 50. Overview of agricultural adaptation-related challenges, constraints and capacity-building needs included in the latest national communication reports in the Caucasus subregion

Countries	Implementation	Monitoring	Financing
<i>Caucasus</i>			
Armenia (fourth national communication report, 2020)	X (AG related)	X	X (AG related)
Azerbaijan (fourth national communication report, 2020)	X (AG related)	X	X
Georgia (fourth national communication report, 2021)	X (AG related)	X (AG related)	X

Sources: National communications. See References.

All three countries indicated agriculture-related challenges, constraints and capacity needs. For instance, Armenia included the needs to ensure state support for the introduction of an agricultural insurance system, conduct research for crop yield projections, implement best agricultural practices and disaster risk reduction, conduct vulnerability assessments, implement agroclimatic and microclimate zoning, and integrate climate change into agricultural policies and programmes. Azerbaijan included in its latest national communication report the need to transition to climate-smart agriculture, whereas Georgia included the lack of climate management knowledge in all agricultural subsectors as well as the need for the consistent application and dissemination of knowledge.

Regarding monitoring and financing, Armenia and Azerbaijan included the needs to develop a methodology and standards for the development of comprehensive policies, establish early warning and forecasting systems for climate risks, and enhance technical capacities and mechanisms for the dissemination of information and alerts. Armenia further acknowledged the difficulty of allocating resources for the implementation of climate

policies, which undermines the monitoring and evaluation of policy implementation. Georgia mentioned the need to enhance its hydrometeorological and agrometeorological network to enhance monitoring capacities.

In terms of financing, Armenia recognized that financial support for adaptation projects is relatively smaller than for mitigation ones and is primarily focused on natural hazard-induced disasters and issues related to agriculture. Azerbaijan indicated that there are still financial and economic (besides technological and institutional) challenges to achieve low-carbon and sustainable development in various sectors of the country, while Georgia mentioned that funding sources need to be identified.

Central Asia

Implementation, monitoring and financing challenges, constraints and capacity needs related to adaptation were included in the latest national communication reports from Kyrgyzstan, Tajikistan and Uzbekistan. Kazakhstan and Turkmenistan did not include financing, as shown in Table 51.

Table 51. Overview of agricultural adaptation-related challenges, constraints and capacity-building needs included in the latest national communication reports in the Central Asia subregion

Countries	Implementation	Monitoring	Financing
<i>Central Asia</i>			
Kazakhstan (second national communication report, 2009)	X	X (AG related)	
Kyrgyzstan (third national communication report, 2017)	X (AG related)	X (AG related)	X
Tajikistan (fourth national communication report, 2022)	X (AG related)	X (AG related)	X (AG related)
Turkmenistan (third national communication report, 2016)	X	X (AG related)	
Uzbekistan (third national communication report, 2017)	X (AG related)	X (AG related)	X (AG related)

Sources: National communications. See References.

Kyrgyzstan, Tajikistan and Uzbekistan included financing-related needs. Kyrgyzstan emphasized the need to enhance financial and economic mechanisms in order to implement adaptation actions. Tajikistan mentioned the necessity of various financial sources – including national, international, public and private funds – with an extensive share from the state budget being channelled to the Pilot Programme for Climate Resilience of the Strategic Climate Fund. Awareness of this could be raised among donors, including the GCF, to persuade them to fund projects. Tajikistan also mentioned the need to set up a reserve fund for agricultural insurance within the context of climate change, and Uzbekistan emphasized the need for financial resources from government and donors to provide direct subsidies for agro-insurance in order to cover the damages caused by large-scale natural hazard-induced disasters.

Kyrgyzstan emphasized that monitoring and evaluation is required throughout the adaptation process. It also indicated the importance of capacity building for the monitoring of its forest resources under the Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+) programme as well as the maintenance and strengthening of its climatic monitoring system for water resources management. Similarly, Turkmenistan mentioned the need for the timely monitoring and forecasting of

hydrometeorological parameters for its forestry adaptation. Kazakhstan indicated a need for the monitoring of present and future land resources-related issues for adaptation of agriculture to climate change, and Tajikistan included the establishment of its drought monitoring and early warning systems together with a database that includes drought scenarios and forecasts for the country's agricultural areas.

For implementation, Kazakhstan and Turkmenistan similarly included the need to promote technology transfer, encourage climate change education, and ensure capacity development and awareness raising among experts, policymakers and decision-makers. The latter also outlined five additional capacity-building requirements, including: updating its national legal system; encouraging innovation; integrating science into production; improving disaster response capacity at local, regional and national levels; and applying assessment methods and documenting information. Kyrgyzstan and Tajikistan mentioned specific agriculture-related capacity-building activities for implementation, such as for the application of adaptation actions in the areas of forest, pasture and livestock management. Tajikistan specifically included the need to establish crop insurance systems against risks related to climate change, a need reiterated by Uzbekistan.

CIS Europe and Ukraine

The three countries analysed from this subregion included challenges, constraints and capacity-building needs related to

implementation, monitoring and financing in their latest national communication reports, with the exception that Ukraine that did not include financing-related issues, as shown in Table 52.

Table 52. Overview of agricultural adaptation-related challenges, constraints and capacity-building needs included in the latest national communication reports in the CIS countries

Countries	Implementation	Monitoring	Financing
<i>CIS</i>			
Republic of Moldova (fifth national communication report, 2023)	X	X	X
Russian Federation (eighth national communication report, 2022)	X	X	X
Ukraine (sixth national communication report and addendum, 2013)	X (AG related)	X	

Sources: National communications. See References.

Both the Republic of Moldova and the Russian Federation are undertaking adaptation monitoring. The former indicated that it has a monitoring and evaluation system for adaptation, but there is still a need to strengthen its institutional capacities to enhance its CCA planning and implementation. There is still a need for capacity building on climate vulnerability assessment methodologies and socioeconomic valuation tools as well as for the implementation of national CCA interventions, such as for the uptake of technologies and technology transfer, including the promotion of knowledge-sharing and collaboration among relevant actors.

The Russian Federation outlined that the implementation of its NAP started in 2020 with the establishment of legal frameworks and sectoral adaptation plans. The country mentions that the effectiveness of the adaptation actions will be evaluated in the coming years, with the plan to conduct the analysis regularly, which will in turn again help to make policy and implementation adjustments.

In its latest national communication report (from 2013), Ukraine outlined various national policies related to climate change and adaptation and listed various agriculture-related adaptation measures to be implemented (e.g. the assessment of forest ecosystems and the impacts of climate change; the introduction and enhancement of breeding in crop, livestock and fisheries; and the promotion of risk insurance in agriculture).

Southeastern Europe

The analysis from the latest national communication reports of the Southeastern Europe countries indicate that challenges, constraints and capacity needs regarding the implementation, monitoring and financing of adaptation-related issues were included, as shown in Table 53.

Table 53. Overview of agricultural adaptation-related challenges, constraints and capacity-building needs included in the latest national communication reports in the countries of Southeastern Europe

Countries	Implementation	Monitoring	Financing
<i>Southeastern Europe</i>			
Albania (fourth national communication report, 2022)	X	X (AG related)	X (AG related)
Bosnia and Herzegovina (fourth national communication report, 2023)	X (AG related)	X (AG related)	X
Montenegro (third national communication report, 2020)	X	X	X
North Macedonia (fourth national communication report, 2023)	X (AG related)	X (AG related)	X
Türkiye (eighth national communication report, 2023)	X	X (AG related)	X

Sources: National communications. See References.

Regarding financing, all countries indicate that additional funds are needed for capacity building and technology transfer. Albania also outlines disaster risk financing instruments, including risk transfer mechanisms (insurance and reinsurance) and other non-market risk transfer instruments (e.g. collective loss sharing and market-based instruments such as payment for ecosystem services). Montenegro and Türkiye specifically mention the importance of international funds, grants and loans, with the latter emphasizing its challenges of not being able to benefit from the GCF, instead financing various climate projects from its public budget.

In terms of monitoring, Albania, Bosnia and Herzegovina and Montenegro mentioned the need to mainstream CCA into their legal and policy frameworks for implementation as well as the monitoring of the regulations, policies and CCA and DRR measures. Albania also mentioned the need for new policies and regulations for setting up early warning systems, conducting disaster and climate risk monitoring, assessing climate change impacts, monitoring environmental issues (such as the degradation and desertification of forest and pastureland), and establishing municipal risk management plans. Montenegro emphasized that climate change also is, to a limited extent, mainstreamed in its sectoral policies and plans, with a primary focus on mitigation. North Macedonia

mentioned a need to enhance capacities for forest monitoring. Bosnia and Herzegovina mentioned the need to adequately assess the impacts of climate change on the agricultural sector and noted that the lack of both vertical and horizontal cooperation and coordination among relevant institutions is inhibiting monitoring. Bosnia and Herzegovina also mentioned, related to the implementation of its adaptation framework, the need to develop a system of indicators compatible with European Union standards, which will also be adjusted to the needs of the country. Türkiye mentioned the integration of basic monitoring data into integrated coastal zone plans in order to preserve the ecological structure of these coastal areas.

For the implementation of adaptation, all five countries noted the necessity of capacity building, including to assess climate change impacts, conduct vulnerability and adaptation assessments, upgrade early warning systems, and integrate adaptation and risk reduction measures in national CCA and DRR/DRM policies, strategies, plans and projects. Montenegro indicated insufficient information about sector-specific climate impacts and their economic implications and noted that limited climate-related economic analysis has been conducted, including damage and loss analysis, especially at the local level. North Macedonia mentioned the need to build capacities to protect its

forests against forest fires, insects, fungi and so on to ensure forest health. Bosnia and Herzegovina specifically outlined agriculture-related capacity-building needs, including continuous training, knowledge sharing and awareness raising among farmers, extension services, agricultural enterprises and non-governmental organizations regarding climate change/adaptation, sustainable land management, safe food production and environmental protection. The country also specifically mentioned the insurance of crops, plantations, livestock and agricultural infrastructure and the need to enhance the awareness of agricultural producers about the various options and benefits of agricultural insurance.

4.3

AVAILABLE FINANCING FOR NDC IMPLEMENTATION

According to a report launched at the start of UNFCCC COP28 from the High-Level Expert Group on Climate Finance, the world is off track with regards to the goals of the Paris Agreement, owing to, among other things, insufficient investment in key areas, particularly in emerging markets and developing countries. The report emphasizes that these nations will require around USD 2.4 trillion of investment a year by 2030 to meet their climate goals.

In 2009, under the Copenhagen Accord, developed countries agreed to mobilize USD 100 billion annually by 2020 to support climate action in developing countries. The Paris Agreement acknowledges the need for continued financial support and sets the stage for a new, higher finance goal to be agreed upon, starting from a minimum of USD 100 billion per year, from 2025 onward.

Box. Climate finance needs in Kyrgyzstan

In its updated NDC submitted in 2021, Kyrgyzstan offered comprehensive insights into its climate finance requirements for implementing the mitigation and adaptation policies outlined in the NDC. The document outlines a total financial need of approximately USD 7.2 billion for executing GHG mitigation policies and measures, with USD 200 million and USD 600 million estimated for the agriculture and LULUCF sectors, respectively. Notably, 40 percent of the overall climate finance requirement for GHG mitigation is expected to be covered by domestic resources, while the remaining 60 percent necessitates international support.

Similarly, in the realm of climate change adaptation, Kyrgyzstan identifies a need for financial resources of around USD 2.8 billion to implement the policies and measures outlined in its NDC. Specifically, the agricultural sector requires approximately USD 276 million to enact planned policies and measures, with additional estimated needs of USD 46 million for forestry and biodiversity initiatives and USD 12.65 million for climate-resilient areas and green cities. Kyrgyzstan anticipates that approximately 29 percent of the funds for climate change adaptation will originate from national sources, while the remaining 71 percent will be sourced from international assistance.

Institutionally, Kyrgyzstan has designated the Climate Finance Centre under the State Committee on Ecology and Climate of the Kyrgyz Republic as the secretariat responsible for managing climate finance matters.

Sources: Government of Kyrgyzstan. 2021. Updated Nationally Determined Contribution 2021.

<https://policy.asiapacificenergy.org/sites/default/files/Updated%20Nationally%20Determined%20Contribution%202021%20%28EN%29.pdf>

The process of establishing the new finance goal was initiated at COP26, where parties established an ad hoc work programme, including a series of technical discussions to run until the end of 2024. The New Collective Quantified Goal was adopted at COP29 in November 2024 (see additional details below).

Indicating climate finance needs as part of delivering on priorities in NDCs is crucial for several reasons. By specifying country climate finance requirements in their NDCs, countries in the ECA region can attract financial support from international sources such as the GCF, bilateral aid agencies and other multilateral institutions. Also, identifying climate finance needs for mitigation and adaptation allows countries to plan and prioritize their climate action strategies effectively.

The extent to which climate finance requirements are reflected in the NDCs is crucial for gauging the genuine needs for implementing policies and measures. However, numerous countries have yet to adequately incorporate this information relative to their actual needs. According to the 2023 NDC Synthesis Report,⁹ just 46 percent of parties provided specific quantitative estimates of financial assistance requirements, often presented as total amounts over the NDC time frame. Among these, 27 percent offered updated quantitative estimates for the first time in their revised or newly submitted NDCs. Moreover, among the parties indicating their financial needs, some, such as Kyrgyzstan, indicate quantitative estimates for actions dependent on international support and for those that can be financed domestically. Additionally, a significant number of countries lack sectoral breakdowns when outlining their climate finance needs.

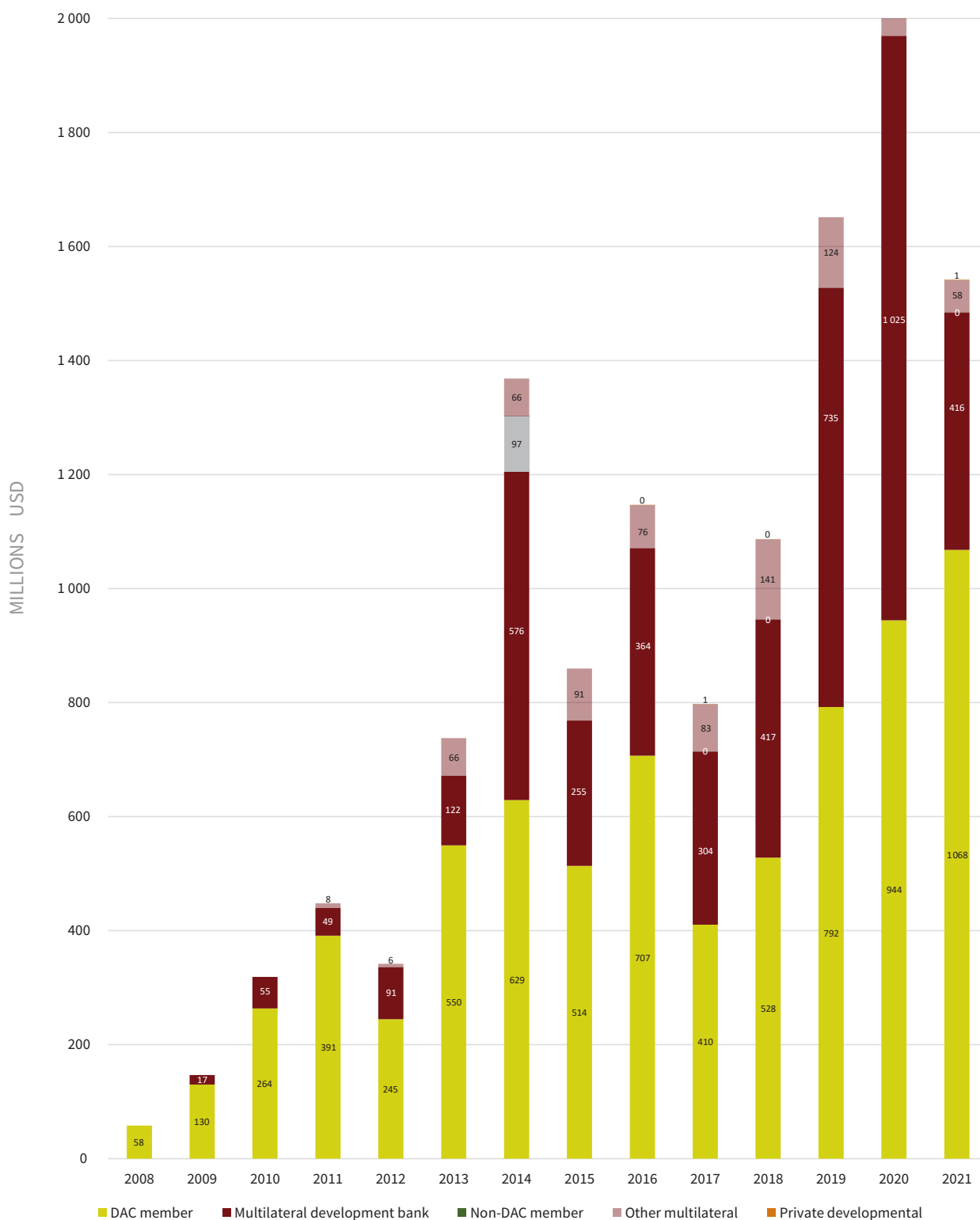
The national transparency reports submitted to the UNFCCC reveal that needs related to reforestation are the largest needs in the LULUCF sector, while needs in the agricultural sector cover a wide variety of land issues that overlap with other key sectors. Needs related to the agricultural sector are mainly in climate adaptation regarding crop diversification, the development of resistant crops, land and soil management, livestock management and fisheries.

AVAILABILITY OF CLIMATE FINANCE IN AGRIFOOD SYSTEMS

Recent studies indicate that despite the growing urgency, financial support for agricultural activities remains significantly below the required levels. In 2019/20, project-level finance directed towards agriculture activities averaged USD 11.9 billion annually, a figure dwarfed by the estimated global needs, which range from USD 30 billion to USD 218 billion per year.²⁰⁶

OECD Development Assistance Committee member countries historically have been providing the biggest contribution to climate finance in the ECA region. However, since 2014, multilateral development banks have significantly increased their climate finance contribution, providing approximately USD 1.54 billion in the ECA region in 2021. Figure 23 shows the level of increase in multilateral development bank financial support compared to OECD Development Assistance Committee member country contributions.

⁹ For more information, please visit <https://unfccc.int/ndc-synthesis-report-2023>.

Figure 23. Climate-related development finance to agrifood systems by provider type

DAC = OECD Development Assistance Committee

Sources: Galbiati, G.M., Yoshida, M., Benni, N. & Bernoux, M. 2023. *Climate-related development finance to agrifood systems – Global and regional trends between 2000 and 2021*. Rome, FAO. <https://doi.org/10.4060/cc9010en>
Chiriack, D., Vishnumolakala, H. & Rosane, P. 2023. *Landscape of Climate Finance for Agrifood Systems*. Climate Policy Initiative.

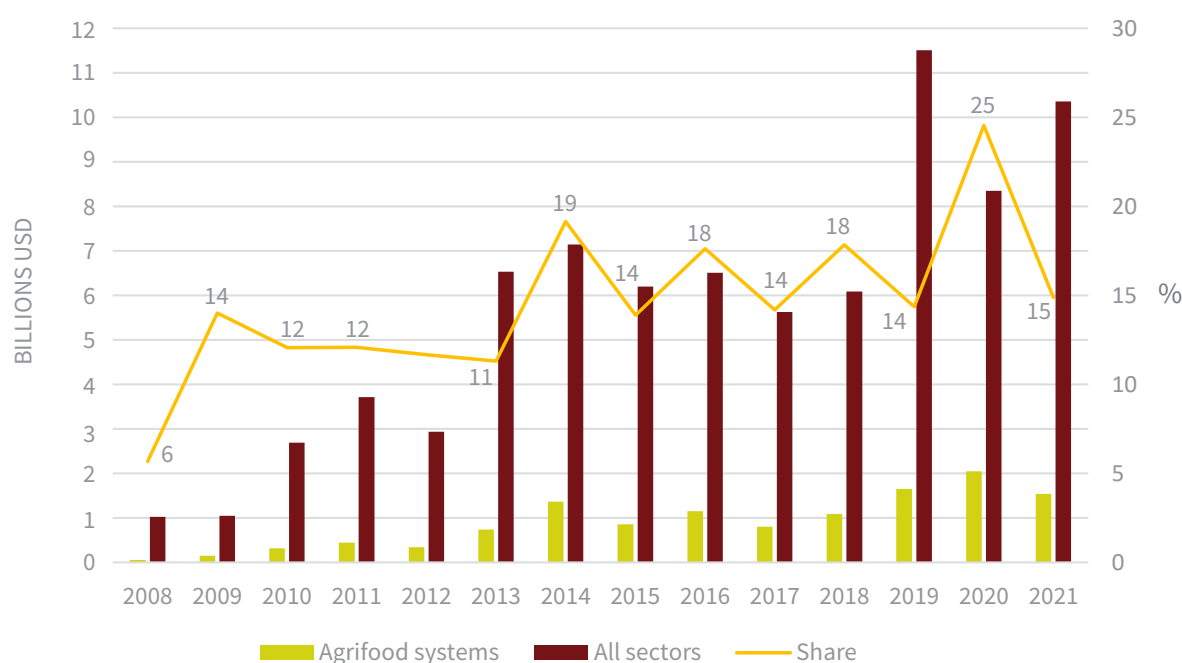
According to comprehensive scenarios, in order to bridge this gap, annual financing would need to increase substantially, ranging from 11 to 17 times the current levels. The scenarios indicate that for measures in areas of sustainable farming practices, financial services, supply chains and market access, and public research and development, an estimated USD 218 billion is needed annually, while other resources indicate that USD 146 billion is needed for agroforestry, cover crops, and grazing optimal intensity.²⁰⁹

The discrepancy between the allocation of mitigation finance and the proportional contributions to global GHG emissions remains pronounced across all facets of agrifood systems, even when factoring in finance aimed at dual benefits. This imbalance is particularly evident in agricultural production, where mitigation opportunities are significantly overlooked. Despite being responsible for 13.9 percent of global GHG emissions, crop and livestock

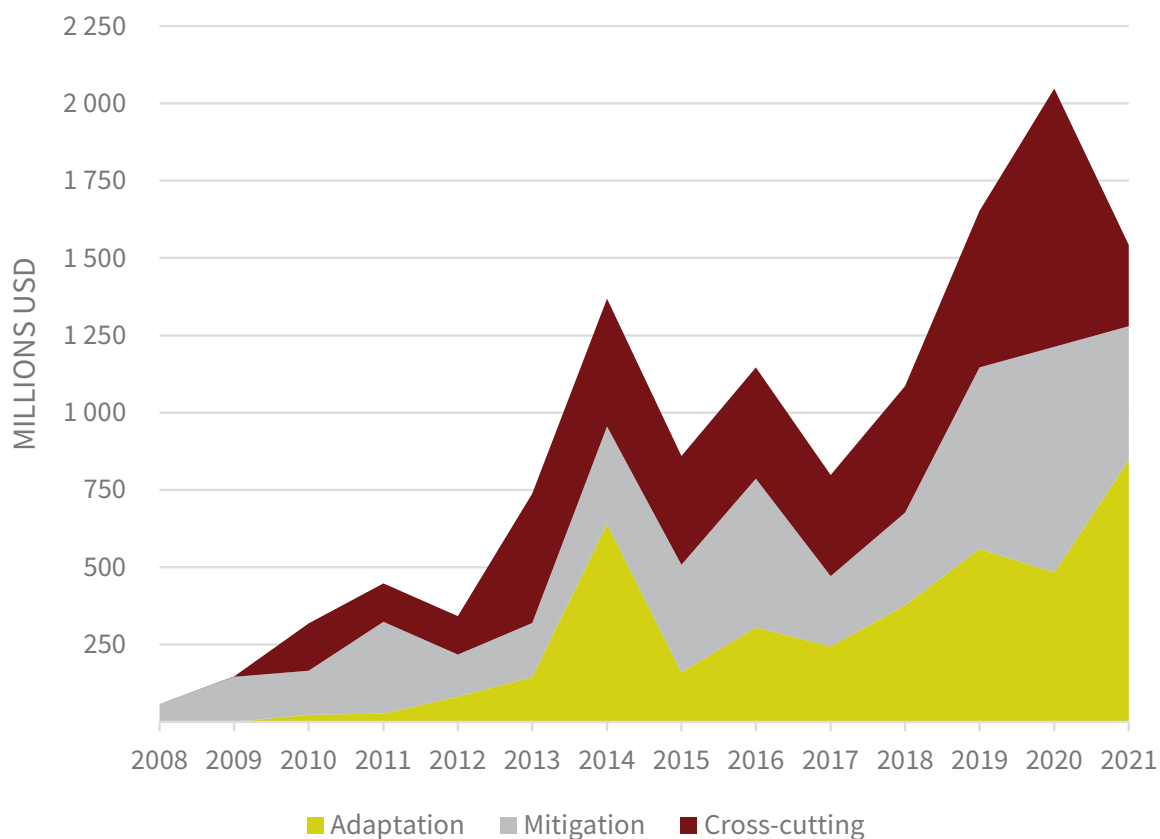
production activities received a mere 0.35 percent (equivalent to USD 2 billion) of total climate finance in 2019/20. Notably, 36 percent of this funding supported projects within the European Union. These initiatives, predominantly funded through grants from the European Agricultural Fund for Rural Development, focused on enhancing carbon sequestration, primarily through such practices as crop diversification and the adoption of organic fertilization techniques on agricultural lands.²¹⁰

Climate finance flows to Europe and Central Asia have been increasing since the early 2010s. Since then, the allocated financial resources for agrifood systems have moved from approximately 10 percent to a range of 15–20 percent of the total allocation to all sectors. According to estimates, in 2021, agrifood systems in the ECA region benefited from approximately USD 1.54 billion, while the total amount for all sectors was around USD 10.4 billion (Figure 24).

Figure 24. Climate-related development finance to agrifood systems in Europe and Central Asia



Source: Galbiati, G.M., Yoshida, M., Benni, N. & Bernoux, M. 2023. *Climate-related development finance to agrifood systems – Global and regional trends between 2000 and 2021*. Rome, FAO. <https://doi.org/10.4060/cc9010en>

Figure 25. Climate-related development finance to agrifood systems by climate objective in Europe and Central Asia

Source: Galbiati, G.M., Yoshida, M., Benni, N. & Bernoux, M. 2023. *Climate-related development finance to agrifood systems – Global and regional trends between 2000 and 2021*. Rome, FAO. <https://doi.org/10.4060/cc9010en>

The share of financing in the agricultural sector seems in line with agricultural sector emissions' share in the ECA region, considering IPCC categories. However, when considering all agrifood systems emissions included in other IPCC categories – such as energy, waste and transport – this level of financing is considered insufficient.

The allocation of climate financing for adaptation in the ECA region has undergone significant shifts since the early 2010s. Prior to 2011, there was limited financial support directed towards climate adaptation efforts. However, since that time, there has been a notable increase in funding for adaptation initiatives, and by 2021, adaptation financing had surged to 55 percent of the total climate finance allocation, signalling a growing recognition of the need to address the immediate impacts of climate change.

In comparison, mitigation financing accounted for 28 percent, focusing on long-term strategies to reduce GHG emissions. Additionally, cross-cutting initiatives received 17 percent of the total financing, indicating efforts that encompass both adaptation and mitigation objectives (Figure 25).

DECISIONS AND PROGRESS ON CLIMATE FINANCE AT THE UNFCCC COP28 AND COP29

In 2023, COP28 witnessed some additional discussions on the New Collective Quantified Goal (NCQG), which was an essential element of the Paris Agreement. The NCQG aims to set a new climate finance goal to help developing countries with their sustainable transition. At UNFCCC COP29 in November

2024, parties agreed to an NCQG that calls on actors to scale up financing to developing countries for climate action from all public and private sources to at least USD 1.3 trillion per year by 2035 while setting a goal of at least USD 300 billion per year by 2035 for developing countries' climate action.

The GCF has seen new commitments for its second replenishment, with pledges reaching a record USD 12.8 billion,⁹ including significant contributions from countries such as France, Japan, Germany, the United Kingdom and the United States of America.

Moreover, 13 countries – including Barbados, France, Kenya, India, the United States of America and the United Kingdom – have endorsed the Declaration on a Global Climate Finance Framework, which is aimed at enhancing the availability, accessibility and affordability of climate and development financing. This declaration emphasizes the importance of collective action and the mobilization of both public and private financing to address global challenges while ensuring that no country is left behind.

After several years of negotiations, at COP28, delegates reached a historic agreement to establish a Loss and Damage Fund to help developing countries cope with climate change. Various entities have pledged money to the fund, including the European Union, France, Germany, Italy and the United Arab Emirates. To date, pledges from industrialized countries to the fund have amounted to USD 661 million, with an additional USD 115 million earmarked for mobilizing supplementary funds for loss and damage initiatives.^{212,213,214} The World Bank was invited to host the fund for a period of four years.²¹⁵

At COP29, negotiations on Article 6 of the Paris Agreement, which defines key mechanisms for international cooperation on carbon markets, were widely considered successful. The framework of Article 6.2, which allows the bilateral trade of mitigation units that can be used towards NDCs, was clarified with new guidance on authorization, registries and reporting requirements. Most progress was achieved on Article 6.4, which sets up the Paris Agreement Carbon Crediting Mechanism (PACM), through which countries or entities can trade credits under a United Nations supervisory body. New standards on the establishment of

methodologies and on carbon removals have opened the door to the approval of crediting methodologies by mid-2025 – and, ultimately, the operationalization of the PACM. Article 6.8 regulates non-market approaches, allowing countries to provide or receive technical and financial support for the implementation of carbon projects.

Meanwhile, there have been significant developments in the reform of the international development financial architecture. Major financial institutions – including the World Bank, the African Development Bank, the European Bank for Reconstruction and Development and the Inter-American Development Bank – have, along with France and the United Kingdom, announced the extension of debt suspension clauses in their loan contracts to cover climate-related disasters.

Additionally, these multilateral development banks have pledged to develop a unified approach to reporting climate performance and launch programmes aimed at assisting stakeholders in developing long-term climate and development strategies, as well as attracting increased private capital for climate investments through regulatory reforms and the development of new financial instruments.²¹⁶

Furthermore, several multilateral development banks and international organizations, including the Asian Development Bank, the GCF and the GEF, have joined forces to establish a working group aimed at facilitating sovereign financing for nature and climate initiatives. These mechanisms seek to provide long-term budgetary solutions for countries in the Global South to address their nature and climate-related challenges.²¹⁷

Mobilizing private finance is essential to enhancing financial support for climate action in the agrifood sector. Public funds can be used to mitigate the risks associated with climate-related projects, making them more attractive to private investors. Blended finance structures leverage public funds to mobilize larger volumes of private investment by improving the risk–return profile of projects. Public funds also can be used to develop and promote innovative financial instruments, such as green bonds, climate bonds and sustainability-

linked loans. At COP28, the United Arab Emirates launched Altéra, a fund designed to mobilize USD 250 billion in private investment in global climate solutions by 2030, underscoring the growing momentum towards mobilizing private-sector resources for climate action on a global scale.

4.4

CASE STUDIES AND BEST PRACTICES ON NDC IMPLEMENTATION

MITIGATION

POLICY FRAMEWORK FOR GREENHOUSE GAS MITIGATION: NATIONAL GHG MITIGATION POLICY FRAMEWORK IN GEORGIA

Emissions in Georgia have been increasing since 1995 due to economic growth, technological gaps, energy inefficiencies, and limited mitigation measures. Emissions related to the agricultural sector account for approximately 20 percent of total emissions and 38 percent of methane emissions in Georgia. The agricultural activities that cause most of the emissions in this subregion are enteric fermentation, manure management and agricultural activities related to soil management, such as fertilizer use.

However, Georgia has made significant strides in developing its policy and legislative framework for economy-wide emission reduction through emission reduction policies and measures in agrifood systems and in agriculture in particular.

The country's 2030 Climate Strategy, adopted in 2021, targets the sustainable management of soil and pastures and sustainable domestic animal feeding practices. On top of that, Georgia has developed its Agriculture and Rural Development Strategy (2019), which includes measures that can lead to GHG mitigation in the sector, such as adopting climate-smart and environmentally friendly agricultural practices, maintaining agrobiodiversity and implementing energy-efficient and renewable energy technologies in the sector.

The country submitted its LT-LEDS, which includes GHG mitigation targets in the agricultural sector, along with corresponding measures, in 2023. The LT-LEDS estimates that agriculture emissions will shrink to 2 211 Gg CO₂-eq in the "With Measures Scenario" and to 2 042 Gg CO₂-eq in the "With Additional Measures Scenario" by 2050,^r from 3 488 Gg CO₂-eq reported in 2017.

The 2050 priorities indicated in the LT-LEDS also address the key emission categories in the agricultural sector, such as methane emission from enteric fermentation and manure management, together with nitrous oxide emissions from fertilizer use. The proposed GHG mitigation measures in the LT-LEDS include:

- developing and supporting climate-smart approaches in crop production;
- increasing crop yields and intensifying crop processing and maintaining agrobiodiversity;
- reversing the degradation of agricultural lands, restoring degraded soils and reducing direct and indirect nitrous oxide emissions from agricultural soils;
- implementing sustainable pasture management and sustainable animal feeding practices;
- ensuring manure processing through advanced technologies; and
- implementing sustainable forest management principles throughout the country.

However, the implementation of these measures is noted to require significant technological transformation.

^r For more information, please see the 2023 Long-Term Low Emission Development Strategy from the Government of Georgia at <https://unfccc.int/sites/default/files/resource/Georgia%27s%20LT-LEDS%202023-eng.pdf>.

EMISSION REDUCTION TARGETS: AMBITIOUS GHG MITIGATION TARGETS IN AGRICULTURE AND LULUCF IN NORTH MACEDONIA

In its latest NDC, North Macedonia set a significant emission reduction target of 29 percent within the agricultural sector and a 95 percent increase of removals in the LULUCF sector. The agricultural sector is responsible for 12 percent of the country's overall GHG emissions.

North Macedonia has submitted its LT-LEDs to the UNFCCC, with a 2050 GHG emission reduction target in the agricultural sector of 34 percent compared to 1990. The LT-LEDs suggests that GHG emission reduction in the agricultural sector will be achieved through sustainable agriculture, increased carbon sequestration in soil, increased efficiency in milk production, reduced fertilizer input and the implementation of new technologies.

Beyond mitigation, afforestation and sustainable forest management are expected to transform the forest sector in the country, providing opportunities for job creation and enhanced resilience.

INNOVATIVE MONITORING METHOD FOR GHG EMISSIONS: NATIONAL EMISSION MODEL FOR AGRICULTURE FOR GHG CALCULATIONS IN THE KINGDOM OF THE NETHERLANDS

The Netherlands (Kingdom of the) has a highly developed agricultural sector, but it also faces significant challenges related to GHG emissions, particularly from livestock farming and fertilizer use. To address these challenges, the country has developed advanced methodologies and tools for estimating GHG emissions from agriculture.

One notable initiative is the Dutch National Emission Model for Agriculture, a comprehensive tool for calculating GHG emissions from various agricultural activities. The National Emission Model for Agriculture incorporates detailed data on livestock populations, feed compositions, manure management practices and agricultural land use to provide accurate estimates of emissions.

Emissions of ammonia (NH_3) and other nitrogen compounds (NO_x and N_2O) originating from various sources such as animal housing, manure storage, manure application and grazing are evaluated utilizing a Total Ammoniacal Nitrogen flow model. Additionally, emissions resulting from the application of inorganic nitrogen fertilizers, compost, sewage sludge, cultivation of organic soils, crop residues and crop maturation are computed.

The National Emission Model for Agriculture also is utilized to estimate emissions of methane (CH_4) from enteric fermentation and manure management, particulate matter from manure management and agricultural soils, and CO_2 from liming activities. These emissions assessments adhere to international guidance criteria and are documented in the annual informative inventory report for air pollutants and the national inventory report for greenhouse gases.

Additionally, the Netherlands (Kingdom of the) has invested in research and development related to innovative farming practices aimed at reducing GHG emissions. These practices include precision farming techniques, such as using sensors and drones to optimize fertilizer application, and implementing manure management strategies to minimize methane and nitrous oxide emissions.

Overall, the country serves as an example in the Europe and Central Asia region of proactivity in developing innovative methods for GHG inventory calculation in the agricultural sector and implementing measures to reduce emissions.

INNOVATIVE EMISSION REDUCTION MEASURES: PRECISION FARMING IN THE RUSSIAN FEDERATION

The Russian Federation has vast agricultural lands, and precision farming has gained attraction in recent years for its ability to optimize production while minimizing inputs and environmental impact. Particularly in regions like the Black Earth Belt, which is known for its fertile soils, precision agriculture technologies are being increasingly adopted.

For instance, in the Krasnodar Krai region of the Russian Federation, precision agriculture methods such as GPS-guided machinery, remote sensing and variable rate technology for fertilizer and pesticide application are being employed. These technologies enable farmers to precisely manage inputs based on the specific needs of areas within their fields, leading to improved efficiency and reduced environmental impact.

The Russian Federation provides various forms of support for precision farming to promote the adoption of advanced technologies and modernize the agricultural sector. Some of these supports include subsidies, grants, research and development funding, capacity-building programmes, advisory services and infrastructure development.

These efforts not only help increase productivity and profitability for farmers but also contribute to sustainability goals by reducing inputs and minimizing environmental degradation.

ADAPTATION

CLIMATE-RELATED HAZARDS, VULNERABILITIES AND RISKS

Understanding the climate-related risks and climate change-related impacts on the various sectors is crucial in order to risk-inform policies and decision-making. At present, most European Union countries have conducted multisectoral assessments covering a broad range of climate change impacts, either on all vulnerable sectors or on prioritized national key sectors, including the agricultural sector. Undertaking these risk assessments also

requires regular updating to help risk-inform the development of national and sectoral adaptation policies, plans and strategies.^{218,219}

RISK ASSESSMENTS CONDUCTED FOR THE AGRICULTURAL SECTOR IN NORTH MACEDONIA

The Crisis Management Centre in North Macedonia is mandated to undertake national disaster risk assessments to identify potential hazards, vulnerabilities, exposure and coping capacities, including for the agricultural sector, and ensure that these assessments are comprehensive and regularly updated. In this regard, the Crisis Management Centre collaborates closely with other relevant agencies, such as the Ministry of Agriculture, Forestry and Water Economy, which coordinates the risk assessments for agriculture. The ministry is responsible for the development of hazard and vulnerability profiles and disaster risk maps for the sector, which are used to identify high-risk areas and disaster risk measures, which are then integrated into the national risk management plans that are regularly updated.

However, certain types of hazards are assigned to different agencies. For example, the Ministry of Environment and Physical Planning is responsible for the establishment of the river basin management plans, including for flood risks, while the Crisis Management Centre, besides coordinating national risk assessments, also manages the potential fire systems (e.g. for forest fires), including keeping track of fire hazards and hotspots. The Ministry of Agriculture, Forestry and Water Economy involves farmers' and agricultural cooperatives and other relevant stakeholders to identify the main hazards and risks and the actions needed to reduce risks and increase resilience. It also is mandated to provide alerts and share risk information, including risk profiles and maps, to relevant stakeholders and to share the resources required for enhanced risk reduction and response to disasters.²²⁰

ADAPTATION POLICIES AND PRIORITIES

The Republic of Moldova was among the first ECA countries to establish a CCA strategy. The Strategy for Adaptation to Climate Change in the Republic of Moldova until 2020 and the Plan of its Implementation Activities (2014) facilitates the mainstreaming of CCA and DRR into national and sectoral adaptation plans.²²¹

FAO provided technical support in the country through the implementation of a GCF-funded project to mainstream adaptation into the planning process to reduce vulnerability to climate change at local and central levels. This project helped analyse the impact of the Climate Change Adaptation Strategy (2014–2020) on the agricultural sector, which led to the development of national- and community-level vulnerability profiles and emphasized the need for CCA and specific measures to be mainstreamed into relevant strategies, policies, plans and programmes.

Agricultural adaptation measures were identified to reduce the impacts of climate change on the sector; these were incorporated into the National Strategy for Agricultural and Rural Development 2023–2030 (2022) and the National Climate Change Adaptation Programme until 2030 and its Action Plan (2023) – e.g. agro-environmental measures and the use of drought-resilient varieties, anti-hail nets and early frost protection, among others.^{222,223} The project also contributed to the establishment of a climate investment framework for agriculture, which outlined financing mechanisms and tools to support investment plans, including capacity-building support to local public authorities to submit project proposals to country-level funds, such as the Ecological Fund and the Rural Development Fund.²²⁴

ADAPTATION GOVERNANCE

For the design, planning, implementation, monitoring and evaluation of national adaptation-related legislation, policies, plans and strategies, it is important that a well-functioning legal and institutional structure be in place. This encompasses that national coordination and/or advisory bodies exist as well as institutional coordination mechanisms or networks to guide, direct and monitor adaptation policies and activities within and across sectors and across different levels – national, subnational and local.^{225,226}

Legal and institutional frameworks and set-up for adaptation in Kazakhstan

Since 2019, the Ministry of Ecology and Natural Resources has been mandated to develop the country's climate change policy, with assistance from other relevant sectoral ministries, including the Ministry of Agriculture. For the planning and implementation of adaptation activities, the government ensures the involvement of the relevant stakeholders, including authorities at subnational and local levels and representatives of the private sector, youth, women's organizations, non-governmental organizations and the general public. Moreover, the undertaking of systematic studies on the impacts of climate change, including the use of climate modelling, will help to risk-inform adaptation planning.

The implementation of these regulatory and policy instruments requires close cooperation among the relevant ministries and agencies within and across sectors and at all levels. In addition, sectoral and local centres based on existing organizations will be established, as outlined in the country's adaptation plans, to assist national and local authorities in the planning and implementation of adaptation actions.

The country also has a mechanism to monitor the implementation of public policies. Among others, the implementation of sectoral policies and adaptation actions will be monitored, including through yearly reports to the ministry, as stated in paragraph 33 of the Rules for the Organization and Implementation of the Process of Adaptation to Climate Change.²²⁷

Furthermore, CCA is mainstreamed into the country's DRR legal and institutional frameworks at national and subnational levels. Transboundary coordination on DRR and CCA was strengthened through the establishment of the Centre for Emergency Situations and Disaster Risk Reduction in 2016 in Almaty, which supports neighbouring countries, such as Afghanistan and Kyrgyzstan. Moreover, regional cooperation on this is guided by the country's 2021–2030 action plan, which includes the implementation of a regional programme on CCA, water quality protection frameworks and the shared protection and use of transboundary rivers.²²⁸

MONITORING, REPORTING AND EVALUATION

Efforts to monitor, report and evaluate adaptation activities are increasing among European Union Member States. Countries are primarily using monitoring, reporting and evaluation to better understand the implementation of adaptation policies, to identify climate-related risks and vulnerabilities, and to assess the effectiveness of policies regarding climate change-related risks, vulnerabilities and impacts. According to a 2023 report from the EEA,²²⁹ the role and use of monitoring, reporting and evaluation remain unclear; for instance, the application of indicators and/or criteria still differs substantially among the European Union countries. Some of the challenges mentioned regarding monitoring, reporting and evaluation systems relate to immaturity, which constrains the adequate tracking of progress regarding implementation, monitoring and financing. In addition, the use of monitoring, reporting and evaluation results to risk-inform policy decision-making and development remains a constraint, and limited progress has been achieved so far among European Union Member States.

Monitoring and evaluation framework for adaptation in Finland

Finland has adopted a highly participatory approach towards its annual monitoring of its NAP, which was established in 2014. Both a mid-term evaluation (between 2018 and 2019) and a final evaluation (between 2021 and 2022) were undertaken. The former consisted of a facilitated self-evaluation process that encompassed group interviews with national government representatives and staff from national research institutions in eight sectors, followed by consultations with regional and local stakeholders through an online survey and five regional stakeholder workshops.

The final evaluation was even more extensive and included a desk study of the existing policy and legislation frameworks to assess the extent of CCA in various policy areas and the extent of policy coherence of adaptation across these areas. This was followed by three workshops, with regional policymakers asked to provide their feedback on the existing extent, challenges and knowledge gaps of CCA implementation in their regions. Furthermore, two national workshops were conducted to assess and outline ways to further operationalize and achieve adaptation activities in the next ten years. Moreover, a questionnaire was disseminated to all the municipalities to identify the existing degree of CCA implementation at the local level. This was further followed by interviews with national and regional stakeholders on the degree of existing human and financial resources to implement and monitor adaptation actions. Additionally, a desk study was undertaken to evaluate the different adaptation policy development paths in various European Union countries.

Besides these mid-term and final evaluations, the regular monitoring of NAP implementation is conducted by the National Monitoring Group for Climate Change Adaptation, which consists of a wide range of relevant national and regional actors. During the 2015–2017 period, this group established key indicators to monitor climate impacts, risks and adaptation actions, while the further expansion, enhancement, use and dissemination of these indicators is ongoing.²³⁰



CONCLUSIONS

The Europe and Central Asia region is diverse – not only in terms of economic development, geographical and climatic conditions, climate impacts and vulnerabilities, but also when it comes to climate ambition and action.

Fifteen countries of the region have submitted updated NDCs, with a notable rise in economy-wide GHG reduction targets. However, the inclusion of specific targets for the agricultural sector remains limited. Most of the countries of the region (all but Albania, Kyrgyzstan and North Macedonia) do not reflect quantified emission reduction targets for the agricultural sector.

While some countries have set agricultural sector targets in national documents like LT-LEDS, these targets are often not reflected in their NDCs.

Many NDCs encompass non-GHG goals, such as promoting sustainable agriculture practices or undertaking forest restoration efforts.

Developing GHG mitigation targets specific to the agricultural sector is challenging for many countries due to the nature of the sector. Countries face difficulties in gathering and providing accurate information on emissions to then serve as the foundation for reduction targets and long-term objectives.

Similarly, while some countries offer detailed information on their agricultural mitigation strategies, others provide limited data due to constraints related to resource availability, technical capacities or being in the early stages of climate action planning.

The development of economy-wide policies and strategies supported by a solid legal foundation – and, subsequently, the formulation of sectoral strategies and action plans – are essential for establishing a comprehensive CCM framework that encompasses agrifood systems.

Similarly, LT-LEDS documents stand out as a comprehensive framework for GHG mitigation priorities and goals including the agricultural sector, offering a robust set of measures in many countries. For these measures to be truly impactful, however, it is crucial that they are considered in NDCs and integrated into national-level policies and legislative frameworks.

In order to achieve GHG mitigation objectives – not only for agriculture but for all sectors – national policies, strategies and legislative frameworks must be aligned with sectoral policies and strategies, and CCM concerns should be mainstreamed in other related strategies and practices.

Adaptation is a growing priority in countries' updated NDCs, with 17 of 24 countries⁵ now including it, as compared to 11 in the first NDCs from the region. Moreover, 15 ECA countries indicated in their latest NDCs that agriculture is among the vulnerable sectors negatively affected by climate change, up from 10 in the previous NDCs.

Given the impacts of climate-related disasters on agriculture, the inclusion of "loss" and "damage" in the updated NDCs in the ECA region also was analysed, including whether these terms were used in the context of the agricultural sector. Ten updated NDCs referred to agriculture-related loss, and seven specifically referred to agriculture-related damage.

Half of the countries⁶ included agriculture-related adaptation and risk reduction measures in their latest NDCs – especially DRR/CCA good practices and technologies at farm level, climate risk proofing of grey infrastructure, and agroclimatic and disaster risk information systems. In terms of legislative and policy frameworks for climate mitigation, many countries have national climate change strategies and/or action plans that have not yet been integrated into sectoral strategies and policies, including the agricultural sector. The EU-27 has a flagship sectoral policy for integrating climate change ambition into sectoral goals.

Thirty-one countries⁷ in the ECA region have submitted an LT-LEDS to the UNFCCC. Sixteen of 24 countries have established and adopted NAPs and national adaptation strategies, and as of 2023, 22 European Union countries have reported national adaptation policies that include national adaptation strategies and plans.

The varying levels of climate action among countries reinforce the need for more international coordination and cooperation. Achieving the Paris Agreement's long-term temperature goal will require improved institutional, technical and human capacity and the scaling up of finance for climate action. Moreover, in an interconnected world, diverging climate action across countries may affect competitiveness and trigger carbon leakage.

The Paris Agreement acknowledges the need for continued financial support, reiterating the importance of the NCQG

agreed on at UNFCCC COP29. The extent to which climate finance requirements are reflected in NDCs is crucial for gauging genuine needs for implementing policies and measures. However, most countries have yet to adequately incorporate this information relative to their actual needs.

At the same time, even if financing needs are accurately reflected in the NDCs, globally available climate finance for agrifood systems falls short of the actual requirement, with current financial allocations accounting for less than half of the estimated required funding.

While the increased ambition demonstrated by ECA countries in their latest NDC submissions marks a positive development, it is imperative that both mitigation and adaptation actions – specifically focused on agriculture – are substantially scaled up. This is essential not only for establishing more sustainable, inclusive and resilient agrifood systems but also for accelerating progress towards the ambitious goals and targets outlined by the Paris Agreement, the Sendai Framework for Disaster Risk Reduction and the 2030 Agenda for Sustainable Development.

Along these lines, the following recommendations can be deduced:

- **Increase ambition in agriculture and wider agrifood system emission reductions.** ECA countries should set clear and quantifiable emission reduction targets specifically for the agricultural sector, reflecting the sector's significant contribution to GHG emissions, and ensure that these targets are incorporated in NDCs and relevant national policies, strategies and budgets.
- **Strengthen synergies between mitigation and adaptation.** Countries should promote the integration of CCA and CCM actions within agrifood systems, ensuring that strategies to reduce emissions are balanced with those addressing climate adaptation and resilience.
- **Support enhanced monitoring and reporting.** Countries should strive to improve data collection, reporting and verification mechanisms for mitigation

⁵ These include the updated NDCs of 23 countries and a regional one from the European Union, which is referred to as a country in this report.

⁶ Agricultural-relevant adaptation and risk reduction measures are included in 12 countries' updated NDCs, namely Albania, Armenia, Azerbaijan, Georgia, Kyrgyzstan, Montenegro, Republic of Moldova, Serbia, Tajikistan, Turkmenistan, Türkiye and Uzbekistan.

⁷ Including the European Union as a separate party.



and adaptation action as well as climate finance, including covering agriculture. International organizations can provide support to countries through capacity building and the development of methodologies and systems.

- **Increase climate finance for agrifood systems transformation.** Countries should develop sector-specific budgets and investment plans for agrifood systems transformation, based on identified needs and opportunities, and increase the allocation of domestic climate finance, making use of a range of instruments and ensuring private-sector participation. At the international level, multilateral development banks, donors and private-sector actors should also step up the amount of finance that is dedicated to sustainable agrifood systems, in line with country requirements.
- **Strengthen regional collaboration and knowledge sharing.** International and regional organizations, including United Nations entities and other institutions, should strengthen cooperation across the ECA region by sharing best practices on policy frameworks and adaptation and mitigation strategies, practices and technologies through regional platforms and networks.

As countries prepare for the next round of NDC submissions in 2025, an opportunity exists to deliver on the binding goals agreed in the Paris Agreement in 2015. Through targeted technical assistance, policy guidance and capacity building, FAO will continue to support countries in integrating agriculture-specific mitigation and adaptation targets and action in their NDCs. Furthermore, FAO will assist countries in developing and implementing strategies and policies at the national level to facilitate sustainable agrifood system transformation and climate action in agriculture.

Drawing on the findings of this paper and the Regional Application of the FAO Climate Change Action Plan in Europe and Central Asia, FAO is dedicated to collaborating with national stakeholders to implement this coordinated response.



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CHAPTER

ANNEX I: MITIGATION IMPACT MATRIX FOR THE AGRICULTURE AND LAND USE SECTORS

Table 54. Mitigation impact matrix for the agriculture and land use sectors

		GHG source/sink category												
		Agriculture						Forest land			Other land uses			
Land use/agriculture subsector	Mitigation policy and measure	Enteric fermentation	Manure management	Rice cultivation	Managed soils	Biomass burning on cropland	Biomass burning on grassland	Forest land remaining forest land	Land converted to Forest Land	Biomass burning on forest land	Forest land converted to other land uses	Cropland	Grassland	Wetlands
Agricultural land	Sustainable agriculture practice/approach	CH ₄	CH ₄ N ₂ O	CH ₄ N ₂ O	CH ₄ N ₂ O	CH ₄ N ₂ O	CH ₄ N ₂ O					CO ₂	CO ₂	
Cropland	General crop management			CH ₄ N ₂ O	N ₂ O							CO ₂		
	Land restoration and rehabilitation				CH ₄ N ₂ O	CH ₄ N ₂ O						CO ₂		
	Rice management			CH ₄ N ₂ O								CO ₂		
	Plant management				N ₂ O							CO ₂		

Table 54. (Cont.)

		GHG source/sink category														
		Agriculture						Forest land			Other land uses					
Land use/agricul- ture subsector	Mitigation policy and measure	Enteric fermentation	Manure management	Rice cultivation	Managed soils	Biomass burning on cropland	Biomass burning on grassland	Forest land remain- ing forest land	Land converted to Forest Land	Biomass burning on forest land	Forest land convert- ed to other land uses	Cropland	Grassland	Wetlands		
Cropland	Nutrient management	N ₂ O														
	Tillage/residue management	N ₂ O									CO ₂					
	Sustainable water use and management	N ₂ O									CO ₂					
	Set aside	N ₂ O									CO ₂					
	Fire management	CH ₄ N ₂ O									CO ₂					
Grassland	Land restoration and rehabilitation	N ₂ O					CH ₄ N ₂ O				CO ₂					
	Plant management	N ₂ O									CO ₂					
	Nutrient management	N ₂ O									CO ₂					
	Herd management	N ₂ O									CO ₂					
	Fire management							CH ₄ N ₂ O				CO ₂				
	Sustainable water use and management	N ₂ O									CO ₂					
	Set aside	N ₂ O									CO ₂					
Livestock	General livestock management	CH ₄	CH ₄ N ₂ O	N ₂ O												
	Animal feeding	CH ₄	N ₂ O													
	Animal breeding and husbandry	CH ₄														
	Manure management	CH ₄		N ₂ O												
Integrated systems	Agroforestry (including agropastoral and agrosilvopastoral systems)	N ₂ O						CO ₂	CO ₂	CO ₂ CO ₂						
	Other mixed production systems	N ₂ O						CO ₂	CO ₂	CO ₂ CO ₂						
Forest land	General forest land management							CO ₂	CO ₂	CH ₄ N ₂ O						
	Reducing deforestation and forest conservation							CO ₂				CO ₂ N ₂ O CH ₄				
	Reducing degradation and sustainable forest management							CO ₂	CH ₄ N ₂ O							
	Afforestation/reforestation							CO ₂	CO ₂							
	Fire management							CO ₂	CO ₂	CH ₄ N ₂ O						

Table 54. (Cont.)

		GHG source/sink category												
		Agriculture						Forest land			Other land uses			
Land use/agriculture subsector	Mitigation policy and measure	Enteric fermentation	Manure management	Rice cultivation	Managed soils	Biomass burning on cropland	Biomass burning on grassland	Forest land remaining forest land	Land converted to Forest Land	Biomass burning on forest land	Forest land converted to other land uses	Cropland	Grassland	Wetlands
Wetlands and organic soils	Wetlands conservation													CO ₂ N ₂ O CH ₄
	Aquaculture management													N ₂ O CH ₄
	Rewetting of organic soils drained for agriculture					N ₂ O						CO ₂ N ₂ O CH ₄	CO ₂ N ₂ O CH ₄	CO ₂ N ₂ O CH ₄
All land	Sustainable land use and management				N ₂ O	CH ₄ N ₂ O	CH ₄ N ₂ O	CO ₂	CO ₂	CH ₄ N ₂ O	CO ₂ N ₂ O CH ₄	CO ₂ N ₂ O CH ₄	CO ₂ N ₂ O CH ₄	CO ₂ N ₂ O CH ₄

Source: Crumpler, K., Federici, S., Meybeck, A., Salvatore, M., Damen, B., Gagliardi, G., Bloise, M., Wolf, J. and Bernoux, M. 2021. *Assessing policy gaps and opportunities in the nationally determined contributions – A sectoral methodology for agriculture and land use. Environment and Natural Resources Management Working Papers No. 86. Rome, FAO.*
<https://doi.org/10.4060/cb1579en>. Annex 2: http://www.fao.org/3/cb1579en/cb1579en_annexes.xlsx

A stylized map of Europe and Central Asia is shown in the background, rendered in shades of purple and green with a wavy, topographic-like texture. A large, semi-transparent number '8' is overlaid on the left side of the map. The word 'CHAPTER' is written in white capital letters inside a black rectangular box, positioned over the lower part of the number '8'.

CHAPTER

**ANNEX II: OVERVIEW
OF AGRICULTURE AND
RELEVANT CCA AND
DRR PROJECTS AND
PROGRAMMES FUNDED BY
THE ADAPTATION FUND IN
EUROPE AND CENTRAL ASIA**

Table 55. Overview of agriculture and relevant CCA and DRR projects and programmes funded by the Adaptation Fund in Europe and Central Asia

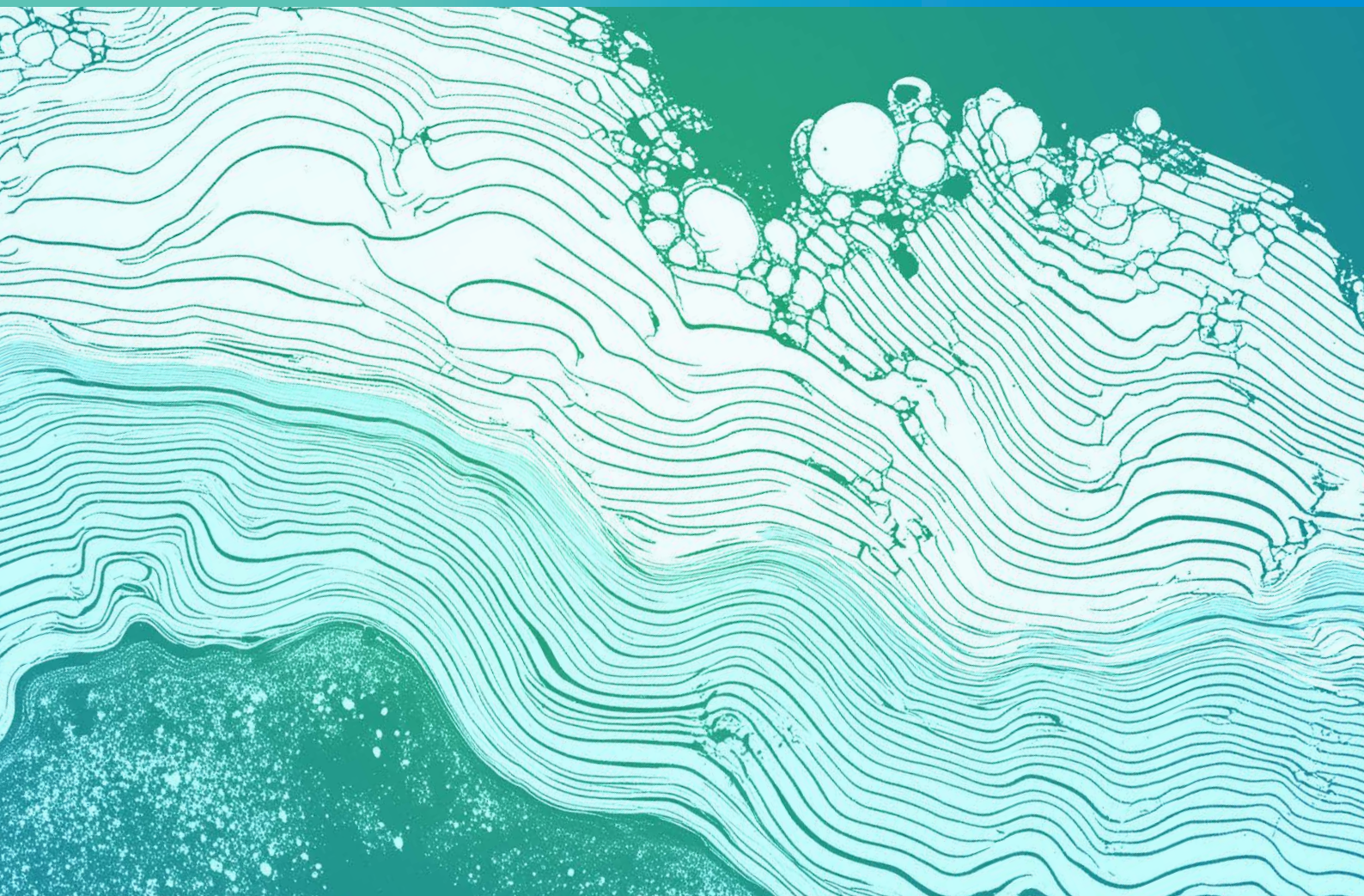
Country	Title	Sector(s)	Implementing entity	Executive entity	Approved amount	Start date	Status	Forest land remaining forest land
Armenia	Strengthening land-based adaptation capacity in communities adjacent to protected areas in Armenia	Forests	Environmental Project Implementation Unit	Ministry of Nature Protection	USD 2.5 million	Sept 2019	Project under implementation	The project aims to reduce the climate risk vulnerability of local communities living adjacent to the Khosrov Forest and Dilijan National Park by strengthening the adaptive capacity of the agricultural sector and reinforcing institutional and planning capacity for CCA. The specific objectives of the project are: 1) Community-based, climate-smart agricultural practices implemented in degraded areas to reduce the climate risk vulnerability of production systems and sustain protected areas. 2) Value chains for climate-smart agriculture strengthened and climate-smart technologies made accessible for vulnerable rural communities, including equally for women and men. 3) Awareness, planning, monitoring and decision-making capacity on climate-smart agriculture production methods and land degradation neutrality in target communities.
Armenia	Artik city closed stonepit wastes and flood management pilot project	Urban development	Environmental Project Implementation Unit	Ministry of Nature Protection	USD 1.4 million	July 2019	Project under implementation	The project seeks to improve the resilience of Artik city in Armenia, which is highly exposed to hydrometeorological threats that are increasing in frequency and intensity because of climate change. The project will reduce the quantity of debris flowing to the reservoir and the pollution of agricultural lands (300 ha of arable land, 190 ha of pastures, 15 ha of hay meadows, 640 ha of artificial forests, 80 ha of water reservoir and other natural landscapes) in the project impact area by increasing their resilience and adaptation to climate change.
Georgia	Dairy modernization and market access: adaptation component (DiMMAdapt)	Agriculture	IFAD	Ministry of Environmental Protection and Agriculture	USD 4.6 million	April 2021	Project under implementation	The overall goal of the project is to reduce the vulnerability of the dairy value chain to the deleterious impacts of climate change by enhancing the resilience of vulnerable dairy producers.
Georgia	Developing climate-resilient flood and flash flood management practices to protect vulnerable communities of Georgia	Water management	UNDP	Ministry of Environment through the National Environment	USD 5.2 million	April 2012 to Feb 20217	Project completed	The project aims to assist government officials by introducing a floodplain development policy. It also provides training to national and local authorities in advanced methods of forward-looking climate risk management planning, flood prevention and management measures (e.g. bank terracing, vegetative buffers, tree revetments), seasonal land use appropriate for floodplains (e.g. short-season annual cropping or seasonal cattle pastures), the design and implementation of a community-based flood insurance scheme, and the establishment of a flood early warning system.
Kyrgyzstan	Regional Resilient Pastoral Communities Project	Agriculture	IFAD	Ministry of Agriculture, Ministry of Natural Resources, Ecology and Technical Supervision	USD 9.9 million	Not yet started	Proposal Approved	The project goal is to contribute to rural poverty alleviation in the country through increased climate resilience, incomes and gender-sensitive growth in rural farming communities. The proposed Regional Resilient Pastoral Communities Project promotes climate-adaptive resilience through a targeted approach to reduce rangeland and forest degradation and to actively improve the condition of these interlinked ecosystems. The project will mainstream participatory, sustainable, forest and rangeland management for stakeholders in the forests and rangelands of Kyrgyzstan.

Table 55. (Cont.)

Country	Title	Sector(s)	Implementing entity	Executive entity	Approved amount	Start date	Status	Forest land remaining forest land
Montenegro	Adaptation to climate change and resilience in the Montenegrin mountain areas-Gora	Multi-sector	IFAD	Ministry of Agriculture, Forestry and Water Management	USD 10 million	Not yet started	Proposal Approved	The project aims to enhance ecosystem and smallholder livelihood resilience to climate change in northern Montenegro through the adoption of environmentally sustainable and climate-resilient technologies and practices.
Republic of Moldova	Talent retention for rural transformation (TART-Adapt)	Food security	IFAD	Ministry of Agriculture, Rural Development and Environment	USD 6 million	March 2021	Project under implementation	The project objective is to strengthen agroecological and social resilience to climate change in the climate-vulnerable areas of the Republic of Moldova by enhancing water availability and water-use efficiency and promoting adaptive agriculture production systems and technologies for improved livelihoods and food security among rural households. It will promote climate-resilient agricultural techniques, water-efficient climate-smart irrigation technologies, mainstreaming conservation agriculture into the higher educational system and promoting conservation agriculture research.
Tajikistan	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan	Rural development	UNDP	Committee for Environmental Protection	USD 9.9 million	Aug 2021	Project under implementation	The project aims to introduce an integrated approach to landscape management to develop the climate resilience of rural communities in Tajikistan. The project's activities will focus in particular within one of the most climate-vulnerable river basins, the Kofirnighan River Basin.
Turkmenistan	Addressing climate change risks to farming systems in Turkmenistan at national and community level	Water management	UNDP	Ministry of Nature Protection	USD 2.9 million	May 2012 to Sept 2019	Project completed	The main objective of the project is to strengthen water management practices and legislation at national and local levels to support the adoption of high-efficiency irrigation techniques. This is important for local communities in that, currently, water is diverted away from private-sector agriculture and horticulture towards strategic state crops. Economic evidence will be used to support water and agriculture modelling activities undertaken separately by the ministries of water management and agriculture. On the basis of economic outputs, it is expected that the project will support the reframing of water legislation to include climate change considerations and help introduce regulations that support progressive water pricing and the communal management of water delivery services by the end of 2014.
Uzbekistan	Developing climate resilience of farming communities in the drought-prone parts of Uzbekistan	Agriculture	UNDP	Uzhydromet	USD 5.4 million	May 2014 to Nov 2021	Project completed	This project aims to develop climate resilience in farming and pastoral communities in the drought-prone Karakalpakstan region of Uzbekistan. The project will develop institutional and technical capacity for drought management and early warning, establish climate-resilient farming practices on subsistence dekhkan farms, effect landscape-level adaptation measures for soil conservation and moisture retention, and widely foster knowledge of climate-resilient agricultural and pastoral production systems in arid lands. The project will improve the climate resilience of more than an estimated 1 million ha of land.

Table 55. (Cont.)

Country	Title	Sector(s)	Implementing entity	Executive entity	Approved amount	Start date	Status	Forest land remaining forest land
Regional (Central Asia)	Reducing vulnerabilities of populations in the Central Asia region from glacier lake outburst floods in a changing climate (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan)	Disaster risk reduction and early warning system	UNESCO	UNESCO Cluster office in Almaty	USD 6.5 million	Oct 2020	Project under implementation	The objective of the proposed project is to strengthen adaptation to climate change in Central Asia by reducing societal risks and vulnerabilities associated with glacier lake outburst floods. The project objective will be achieved by assessing societal risks and vulnerabilities associated with glacier lake outburst floods and then addressing these risks and vulnerabilities. The approach will strengthen the monitoring, analytical and response capacities of institutions and government officials responsible for DRR, emergencies and CCA through community and gender-sensitive ground-level training and awareness campaigns and through the establishment of early warning systems, supported with the necessary state-of-the-art monitoring strategies.
Regional (Southeastern Europe)	Integrated climate-resilient transboundary flood risk management in the Drin River basin in the Western Balkans (Albania, North Macedonia, Montenegro)	Disaster risk reduction and early warning system	UNDP	Global Water Partnership, UNDP	USD 9.9 million	Oct 2019	Project under implementation	The objective of the project is to assist riparian countries in the implementation of an integrated climate-resilient river basin flood risk management approach to improve their existing capacity to manage flood risk at regional, national and local levels and to enhance the resilience of vulnerable communities in the Drin River basin to climate-induced floods. The countries will benefit from a basin-wide transboundary flood risk management framework based on improved climate risk knowledge and information, improved transboundary cooperation arrangements and policy framework for flood risk management and concrete flood risk management interventions.



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ISBN 978-92-5-139994-1



9 789251 399941

CD6404EN/1/10.25