PROGRESS

Promoting Green Deal Readiness in the Eastern Partnership Countries

On behalf of:

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

of the Federal Republic of Germany

IKI INTERNATIONAL CLIMATE INITIATIVE

Georgia's policy frameworks for climate change adaptation and resilience in agriculture

Draft stocktaking report for Output I

Paris, 2026

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The project 'Promoting Green Deal Readiness in the Eastern Partnership Countries' (PROGRESS) is implemented on behalf of the International Climate Initiative (IKI) of the Federal Government of Germany. Within the Federal Government, the IKI is anchored in the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN). Selected project is also the responsibility of the Federal Foreign Office (AA). PROGRESS is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, as the lead agency, in partnership with the Organisation for Economic Co-operation and Development (OECD), the Regional Environmental Centre for the Caucasus (REC), the European Business Association (EBA) Moldova and the Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine (IEF).

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Background and acknowledgements

This draft report was prepared within the framework of the programme on “Promoting Green Deal Readiness in the Eastern Partnership Countries” (PROGRESS).

The project “Promoting Green Deal Readiness in the Eastern Partnership Countries” (PROGRESS) is funded by the International Climate Initiative (IKI) of the Federal Government of Germany. Within the Federal Government, the IKI is anchored in the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN). Selected project is also the responsibility of the Federal Foreign Office (AA). PROGRESS is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, as the lead agency, in partnership with the Organisation for Economic Co-operation and Development (OECD), the Regional Environmental Centre for the Caucasus (REC), the European Business Association (EBA) Moldova and the Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine (IEF).

PROGRESS aims to support the European Union (EU) Eastern Partnership countries (Armenia, Azerbaijan, Georgia, Moldova, Ukraine) with achieving long-term mitigation, adaptation and sustainable development consistent with the EU Green Deal objectives and 1.5°C pathways of the Paris Agreement. Another project objective is to promote the competitiveness of fruits, nuts and berries from the Eastern Partnership countries on the EU market, with two specific products selected in each country based on a value chain analysis (almonds and blueberries in Georgia). PROGRESS lasts during 2023-2028 and has a total budget of EUR 20 million.

The GIZ selected almonds and blueberries as two subsectors of particular focus for the PROGRESS project in Georgia based on selection criteria and following consultations with relevant ministries, sector experts and specialists. The selection was based on six criteria: economic potential, environmental impact, social inclusion, institutional development, opportunities for the value chain development, and processing potential.

The OECD leads implementation of two out of the Project’s five Outputs:

- Output I on evidence-based national policies and frameworks for climate change adaptation and resilience in agriculture, and
- Output IV on access to and mobilisation of green finance in agriculture.

This draft report is a deliverable for Output I on national policies and frameworks. Output I aims to analyse the state of national policies and frameworks for climate change adaptation and resilience in agriculture, with a focus on horticulture (fruits and vegetables), provide recommendations for improvement and share best practices, especially those of the EU. It also aims to improve the understanding of the EU Green Deal and EU standards among farmers and farming associations and promote public-private dialogue.

Concurrently, the OECD is also carrying out a stocktaking on mobilisation of green finance in agriculture under Output IV, which will be presented in a separate report.

The purpose of this draft report is to take stock of Georgia’s policy frameworks for climate change adaptation and resilience in agriculture (as of April 2025) as well as in certain areas relevant for

EU Green Deal approximation to inform future project activities. This report analyses agricultural and horticultural policy frameworks and, when possible, also mentions policies and standards for the two subsectors.

Following an Executive Summary and the Introduction (Chapter 1), Chapter 2 provides an overview of Georgia's main policy frameworks for climate change adaptation and resilience in agriculture and a few key issues relevant for the EU Green Deal approximation, as well as the main institutions involved. Chapter 3 summarises relevant provisions of the EU Green Deal, the Farm to Fork Strategy, the EU Climate Adaptation Strategy, and key EU import standards for fruits and berries.

The draft report was prepared based on secondary research and technical meetings of the local consultant with government stakeholders. The publicly available version of Georgia's Nationally Determined Contribution (NDC) 3.0, released for public participation in April 2025, was used for the purposes of this assessment.

Olga Olson, OECD Environment Directorate, managed the report preparation under the supervision of Krzysztof Michalak, OECD Environment Directorate. The main authors are: Béatrice Marois, Environment Directorate (Introduction chapter); Ketevan Vardosanidze, independent consultant (Chapter on the local policy frameworks and institutions, and policy gaps); and Olga Olson, Environment Directorate (EU Green Deal chapter). Thomas Dworak of Fresh-Thoughts Consulting provided valuable inputs. Marleen Gelbmann of the OECD Environment Directorate helped edit and finalise the report.

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Abbreviations

AA	Association Agreement
AI	Artificial Intelligence
AWPA	Almond and Walnut Producers' Association
BMUKN	German Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety
BRCGS	British Retail Consortium Global Standards
CAP	Common Agricultural Policy
DCFTA	Deep and Comprehensive Free Trade Area
EBA	European Business Association
EIEC	Environmental Information and Education Centre
EMS	Environmental Management System
EU	European Union
EUR	Euro
EWS	Early Warning System
FAO	Food and Agriculture Organization of the United Nations
GBGA	Georgian Blueberry Growers' Association
GCF	Green Climate Fund
GDP	Gross Domestic Product
GECSA	Georgia Climate Services for Agriculture
GEF	Global Environmental Facility
GEL	Georgian Lari
GFA	Georgian Farmers' Association
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GLOBAL G.A.P.	GLOBAL Good Agricultural Practice
GMS	General Marketing Standards
HACCP	Hazard Analysis Critical Control Point
IEF	Institute of Economics and Forecasting of the National Academy of Sciences of Ukraine
IFS	International Food and Safety Standard
IKI	International Climate Initiative
IPM	Integrated Pest Management
ISO	International Organization for Standardization
LEPL	Legal Entity of Public Law
MEPA	Ministry of Environmental Protection and Agriculture of Georgia
MHEWS	Multi-Hazard Early Warning System
NAP	National Adaptation Plan
NCs	National Communications
NC5	Fifth National Communication
NDC	Nationally Determined Contribution
ND-GAIN	University of Notre Dame Global Adaptation Initiative
NEA	National Environmental Agency
NFA	National Food Agency

OECD	Organisation for Economic Co-operation and Development
PROGRESS	Promoting Green Deal Readiness in the Eastern Partnership Countries
RDA	Rural Development Agency
RECC	Regional Environmental Centre for the Caucasus
SDGs	Sustainable Development Goals
SME	Small and Medium-Sized Enterprise
SPS	Sanitary and Phytosanitary
SQF	Safe Quality Food
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
USD	American dollar

Executive summary

Climate change already has impacts in Georgia and is expected to reduce its GDP per capita by 13% by the end of the century without adequate policy measures. The agricultural sector employs the largest share of people in Georgia and consists largely of self-employed workers. However, this sector is in most need of adaptation measures.

This stocktaking report has identified progress and recent developments in several key components of Georgia's policy framework for climate change adaptation and resilience in agriculture:

- Work on the National Adaptation Plan (NAP) for Climate Change Adaptation began in 2025 and is expected to finish by the end of 2027. Agriculture is one of the priority sectors, and it foresees a climate risk and vulnerability assessment of the sector.
- Key policy documents that steer climate change adaptation in Georgia's agriculture include Georgia's Fifth National Communication (NC5), the draft Nationally Determined Contribution (NDC) 3.0 and the Updated NDC 2.0 of 2021, the 2024 Agriculture and Rural Development Law, the 2021-27 Agriculture and Rural Development Strategy and its Action Plans, and the 2025-28 Government Programme which foresees financial commitments and other measures to strengthen adaptation. Other relevant documents include the 2022–26 Fourth Environmental Protection Programme of Georgia and the forthcoming Climate Change Law.
- Early Warning System (EWS) establishment is foreseen by Georgia's 2018 Law on Public Safety and Georgia's NC5. A project by the Green Climate Fund (GCF) and the United Nations Development Programme (UNDP) will establish a nationwide Multi-Hazard Early Warning System (MHEWS), expanding hydro- and agrometeorological infrastructure, and institutionalising methodologies for disaster modelling (including floods and droughts).
- A new pilot extension service "The Georgian Climate Service for Agriculture (GECSA)", funded by the UNDP, provides forecasts and information on climate risks, early warnings about pests and diseases and advisory services in two Georgian regions.
- Extension and advisory services are promoted by the 2014 Law on Agriculture and Rural Development and the 2024-27 Action Plan. The Regional Development Agency (RDA) manages a nationwide network of one-stop-shop information centres and runs a technical assistance programme to enhance the competitiveness of agricultural producers and co-operatives. The Environmental Information and Education Centre (EIEC) of the Ministry of Environmental Protection and Agriculture (MEPA) promotes environmental and agrarian education while the Georgian Farmers' Association (GFA) delivers training and information sessions.
- The RDA runs several programmes to support the deployment of climate change adaptation technologies by farmers, including co-financing of drip and sprinkler irrigation systems, anti-hail systems, agro-meteorological stations and storage facilities.

- Various policy and legal instruments promote innovation in agriculture. Measures include an innovation grant to start-ups and promotion of the use of scientific and technological advancements to enhance soil conservation.
- Policy documents that govern the sustainable use of soil include the 1994 Law on Soil Protection and the 2003 Law on Soil Conservation and Restoration and Improvement of Soil Fertility. A Climate Technology Needs Assessment and Technology Action Plan from 2023 promotes widespread adoption of land-tillage technologies.
- The 2023 Law on Water Resources Management aims to establish a comprehensive framework for sustainable water practices, mandates the government to incentivise the adoption of water-efficient technologies in agriculture and industry, and includes a framework for flood risk management.
- The 2017 Law on Permission for Distribution of Agricultural Plant Species Subject to Mandatory Certification and on Seed Production governs the production, certification, and traceability of seeds and planting material, while the 2012 Food/Feed Safety, Veterinary and Plant Protection Code regulates seed imports and market placement. The Agricultural Scientific Research Centre maintains a crop variety catalogue.

This stocktaking report further identified several priority areas for reform:

- There is no National Adaptation Plan (NAP) at national or sector levels despite being a priority for several years. An agriculture sector climate vulnerability assessment has not been carried out.
- Monitoring of implementation of adaptation measures focuses on progress, but not on their sustainability.
- Institutional co-ordination on climate change adaptation remains underdeveloped.
- While Georgia has made progress in developing EWS and is expected to have one in place in the near future, the efforts so far are insufficient to meet the agricultural sector's needs, including slow response times for rapid events. Better technical capacity and resources are required for responsible institutions.
- There is a need for more extension and advisory services on adaptation issues, as well as on seeds, fertilisers and pesticides as opposed to the current focus on governmental agricultural programmes and state support.
- There are no systemic awareness-raising measures or targeted government programmes to inform farmers about the benefits and availability of climate-resistant seeds.
- The Climate Technology Needs Assessment and Technology Action Plan from 2023 have not yet been implemented, including the adoption of land-tillage technologies.
- Georgia does not yet have a drought management plan, a flood management plan or a strategy for wastewater reuse for agriculture. The efficiency and access to irrigation must be improved.
- The food safety and phytosanitary (SPS) policies are partially aligned with those of the EU, but the in-country laboratory testing capacity is not yet up to EU standards.

In addition, the report identified some key issues for approximating the EU Green Deal, which will also reduce the environmental impact of the agricultural sector:

Organic agriculture

- A new Technical Regulation on the Rules of Organic Production and Labelling of Organic Products, which includes climate change provisions, will come into force in 2027.

- The 2024-27 Agriculture and Rural Development Programme and the Bioproduction Promotion Programme promote organic production through financial and other support.

Sustainable use of pesticides and mineral fertilisers

- There is a well-established policy framework for the use of pesticides and fertilisers, including the 1998 Law of Georgia on Pesticides and Agrochemicals; the 2012 Food/Feed Safety, Veterinary and Plant Protection Code of Georgia; and the 1996 Law on Environmental Protection. MEPA maintains a list of authorised pesticides and agrochemicals for use in the country.
- A 2021 Decree on the Approval of Measures to Achieve the Sustainable Use of Pesticides foresees a national action plan, professional training as well as integrated pest management (IPM). A corresponding Action Plan is in place for 2025-29.
- However, implementation falls short, resulting in excessive and often unsafe application of pesticides and fertilisers. The main reasons for this are lack of training of farmers and of monitoring, inspection and enforcement.

Environmental standards and certification

- The 1996 Law on Environmental Protection establishes a comprehensive set of environmental protection standards to ensure an ecological balance and safeguard human health. There are special additional requirements for food production and processing in the 2012 Code on Food/Feed Safety, Veterinary, and Plant Protection, while a manual “From Farm to Table” of the National Food Agency (NFA) provides practical guidance.
- The Hazard Analysis Critical Control Point (HACCP) certification is mandatory for every business operator engaged in food production and processing.
- However, agricultural producers and exporters need better information on new regulations on food safety and plant protection.

1 Introduction

Impact of climate change on Georgia's agriculture

Georgia contributes minimally to climate change: in 2023, it accounted for 0.04% of the total global greenhouse gas (GHG) emissions, and its per capita emissions were below the global average (European Commission, 2024[1]).

According to the 2023 vulnerability score of the University of Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index, Georgia is the 76th (out of 187) most vulnerable country and the 30th (out of 192) "most ready" [1] country out of 187 (University of Notre Dame, 2025[2]). This suggests that while challenges remain, Georgia is well equipped to adapt to climate change impacts, especially because it currently has ample water resources (University of Notre Dame, 2025[2]). Nevertheless, climate change already affects the country's resources, ecosystems, seasonal cycles and economic sectors. It has led to the following fluctuations in weather patterns:

- Average temperatures have risen during the past 50 years (FAO, 2022[3]). The average annual temperature in the country has risen by 1 degree Celsius during the last 25 years, and it is rising both in Western and in Eastern Georgia. It is anticipated that Georgia will experience an increase in average temperature between 1.6°C and 2°C nationwide during 2041-70, with significant regional variations. The most substantial warming is expected during the winter months (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).
- Relative air humidity increased by an average of 1% [-3 to +10] in 1991-2020 compared to the baseline period 1961-1990. The most significant increases have occurred in mountainous Adjara, the lowland areas of Samegrelo, Samtskhe-Javakheti, and Shida Kartli (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).
- More intense and frequent heatwaves, temperature rises and accelerating glacier melting have contributed to a rise in sea level that damages land and infrastructure along the coast and will reduce water availability over time. Although Georgia has abundant water resources, climate change is increasingly stressing them. Rising temperatures, droughts, and heatwaves reduce water availability and increase demand, especially in agriculture, while affecting all sources, including rivers, lakes, reservoirs, groundwater, and precipitation (Ministry of Environmental Protection and Agriculture of Georgia, 2024[5]; Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).

[1] The ND-GAIN Country Index is made of two scores: a vulnerability score and a readiness score. The vulnerability score measures the exposure, sensitivity and adaptive capacity of a country's food, water, health, ecosystem services, human habitat and infrastructure sectors. The readiness score evaluates the capacity of a country to invest in climate change adaptation and assesses economic, governance and social readiness. The index score is updated annually, and data is available at: Country Index // Notre Dame Global Adaptation Initiative // University of Notre Dame.

- Precipitation changes vary regionally. Annual precipitation has increased in Western Georgia, likely due to a higher frequency of heavy rainfall. However, it has decreased in Eastern Georgia by up to 15% over the last three decades, largely due to longer dry spells. However, there is a higher frequency of intense rainfall and extended duration of dry periods across the country (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).
- Wind speeds are increasing, with significant changes seen in some regions (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).
- Extreme weather events such as floods, landslides, mudslides, droughts, heatwaves, forest fires, heavy rainfall, strong winds and maritime storms have become more frequent (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]). For example, in 2010, droughts destroyed 40-50% of annual crop yields in Khobi municipality in the Samegrelo region. The economic losses from natural disasters in Georgia amounted to more than USD 14 billion during the last 40 years, and USD 700 million since 1991 (FAO, 2022[3]). Droughts accounted for 29% of this amount, storms for 13% and floods for 8% (earthquakes accounted for 50%) (FAO, 2022[3]).
- Land has been subject to desertification in some regions of Northern Georgia and degradation due to extreme weather events (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]). Thirty-five percent of agricultural land is considered degraded (Ministry of Environmental Protection and Agriculture of Georgia, 2022[6]).

In the absence of policy measures, climate change could reduce Georgia's Gross Domestic Product (GDP) per capita by 13% and raise public debt by 18% of GDP by the end of the century (IMF, 2022[7]).

Agriculture is Georgia's sector that is in most need of adaptation measures. It is experiencing land degradation and natural resource depletion, an increase in extreme weather events and seasonal variations (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]). Agriculture is primarily rainfed, so changes in precipitation will increase the need for effective irrigation systems (World Bank, 2022[8]). It is expected that climate change will lead to more frequent occurrences of drought and more severe natural disasters such as flood and hail. Disease outbreaks, shifts in seasonal cycles and reduced water availability will be more likely to occur (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).

Climate change impacts are likely to reduce crop yields and agricultural productivity. They could also increase Georgia's reliance on imports due to its low self-sufficiency in some essential agricultural products. Nevertheless, there is also a possibility that a temperature rise and seasonal shifts might make agricultural development possible in some new regions of Georgia (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).

Brief description of the agricultural sector

In 2023, agricultural land[2] covered 34.1% (2.4 million ha) of the country's total land area, with approximately 9% (207 000 ha) of those irrigated (World Bank, 2022[9]; Georgia Amelioration, 2024[10]). The share of agriculture, forestry and fishing in Georgia's GDP has been declining since

[2] According to the World Bank, "agricultural land" refers to the share of land area that is arable, under permanent crops, and under permanent pastures (World Bank, n.d.[78]).

the 1990s, reaching 5.4% in 2024 (World Bank, 2024[11])[3]. However, it remains Georgia's largest employer (ISET Policy Institute, 2023[12]). According to the World Bank, it accounted for 40% of Georgia's total employment in 2023 (down from 55% in 2006) (World Bank, 2023[13]). According to the Georgian National Statistical Office, the rural population accounted for 38.5% of the total population at the beginning of 2025 (National Statistics Office of Georgia, 2025[14]). The main source of income of the rural population is agriculture, and there is large share of informal employment in the sector (Parliament of Georgia, 2023[15]). In 2024, 57.7% of the workforce worked in holdings focused mainly on crop production (when 50.7% of agricultural holdings were focused on crop production), compared to 23.7% in holdings focused livestock production and 18.7% focused equally on both (National Statistics Office of Georgia, 2025[14]).

Agricultural land became fragmented following the agrarian reforms and the distribution of previously collective and state farms in the 1990s, resulting in numerous small to medium-sized family farms. According to the latest 2014 census in Georgia,[4] 19.1% of agricultural holdings that own land have between 1-5 ha of land, and only 1.3% own land bigger than 5 ha. The average area of agricultural and non-agricultural land in use by agricultural holdings is 1.31 ha (National Statistics Office of Georgia, n.d.[16]). These farms are predominantly subsistence farms, characterised by limited use of input as well as low output and a high proportion of self-employed workers (FAO, 2022[3]). Family holdings accounted for 91% of the sown area of various crop groups in 2024 (National Statistics Office of Georgia, 2025[14]).

Even though Georgia has sizeable agricultural exports (contributing on average to 25-30% of the country's exports during 2010-22), it is a net importer of agri-food products (ISET Policy Institute, 2023[12]). From 2016 to 2022, Georgia's share of exports to the European Union (EU) has declined while it has risen for the Commonwealth of Independent States' market. The main importers of Georgia's agricultural products are Russia (24%), Azerbaijan (11%), Ukraine (11%), Armenia (7%) and Kazakhstan (6%). The top agricultural products exported are wine from fresh grapes, hazelnuts, spirituous beverages, mineral waters, and live bovine animals (ISET Policy Institute, 2023[12]).

Georgia produced 243.6 thousand tonnes of fruit in 2024 (excluding grapes and citrus), with 94% of those being produced by family holdings (National Statistics Office of Georgia, 2025[14]). It produced 134 000 tonnes of vegetables in 2024 and imported 148 000 tonnes (National Statistics Office of Georgia, 2025[14]).

Challenges facing the agricultural sector

The agricultural sector in Georgia faces the following challenges restricting its development:

- Lack of modern technology, underdeveloped rural infrastructure and limited access to affordable irrigation in certain parts of the territory (Ministry of Environmental Protection and Agriculture of Georgia, 2019[17]; Parliament of Georgia, 2023[15]).
- Limited storage, processing and post-harvest infrastructure, which could increase the shelf life and add value to the products (Ministry of Environmental Protection and Agriculture of Georgia, 2019[17]).
- Low level of education and expertise, including in regard to new technology and

[3] According to the Georgian National Statistics Office, the preliminary data for 2024 indicated that agriculture, forestry and fishing accounted for 6.2% of GDP (National Statistics Office of Georgia, 2025[14]).

[4] The new census was carried out in 2024, and the final, comprehensive results are expected to be published by mid-2026.

environmentally acceptable agricultural practices and methods. Additionally, many land plots have been allocated to individuals who are not farmers, contributing to a general deficiency in agricultural skills and knowledge (Parliament of Georgia, 2023[15]; Ministry of Environmental Protection and Agriculture of Georgia, 2019[17]).

- Lack of access to good inputs due to an underdeveloped market and lack of control over their quality (Ministry of Environmental Protection and Agriculture of Georgia, 2019[17]).
- Invasive species and pests and diseases are threatening crop health (Ministry of Environmental Protection and Agriculture of Georgia, 2019[17]).

Some additional considerations regarding the economic performance, challenges and specific climate change impacts for the two subsectors of focus of the Promoting Green Deal Readiness in the Eastern Partnership Countries (PROGRESS) project (blueberries and almonds) are described in Box 1.1.

Box 1.1. Blueberry and almond production in Georgia: economic trends, challenges and climate change impact

The GIZ selected blueberries and almonds as two subsectors of particular focus for the PROGRESS project in Georgia based on selection criteria and following consultations with relevant ministries, sector experts and specialists. The selection was based on six criteria: economic potential, environmental impact, social inclusion, institutional development, opportunities for value chain development, and processing potential.

Economic trends

Since 2019, Georgia has significantly increased **blueberry** production, supported by both government initiatives and donor programmes. The total area under blueberry cultivation has now exceeded 2 000 ha. Georgian blueberry orchards yield an average of 14.5 tonnes per ha, ranking the country 7th globally in terms of production volume - an achievement attributed to favourable climate and soil conditions and the introduction of new plant varieties. Blueberry exports doubled in 2023. While the main export destination is Russia, Georgia has also exported blueberries to Germany, the Netherlands and Poland. It is expected that Georgia's blueberry production will reach approximately 25 million tonnes by 2025 (Bochorishvili, Chakhvashvili and Mujirishvili, 2023[18]). In addition, Georgian blueberries can be harvested earlier than in competing European countries, such as Poland.[5]

Within nut production, Georgia is a leading producer of walnut. However, it is gaining recognition for its **almond** production, driven by rising global demand and the introduction of late-blooming varieties that lower frost damage. Almond orchards cover over 6 000 ha in the country, including new orchards, almost all of which use drip irrigation. Annual almond production currently stands at 3 000 tonnes, with projections reaching 4 000 tonnes by 2025[6]. Until 2024, most of the almond production was destined for domestic consumption, but since then small exports have begun to the EU and Uzbekistan. Georgia also imports almonds, mostly from the United States of America (USA)[7]. The average yield in Georgia is 1.01 tonnes per ha, below the world average yield of 1.51 tonnes per ha (Our World in Data - FAO, 2025[19]). Almond orchards and processing enterprises have recently become increasingly attractive investments thanks to favourable natural conditions, the opportunity to offer an alternative to the USA market, and the potential for organic almond production (EastFruit, 2021[20]; EastFruit, 2020[21]).[8]

Specific challenges

Both subsectors heavily rely on manual harvesting while suffering from limited availability of a skilled workforce. Certain almond and blueberry farmers and processors lack certification, which hinders their access to European markets[9]. Blueberry production is particularly constrained by the lack of standards and regulatory requirements. As a young sector, it does not yet have technical regulations specifying mandatory requirements for producers, processors, distributors or exporters (Bochorishvili, Chakhvashvili and Mujirishvili, 2023[18]). By contrast, almond production is more established, and a technical regulation was adopted in 2021 for business operators engaged in the entire almond value chain (Georgian Farmers Association, 2017[22]; Government of Georgia, 2021[23]).

Climate change impacts

- Rising temperatures and extreme weather threaten to reduce both the quantity and the quality of blueberry production, as the varieties grown in Georgia are not well adapted to increasing weather variability[10].
- Strong winds, frosts, droughts and temperature fluctuations particularly affect almond tree health and productivity. As a result, 46% of almond orchards are equipped with windbreaks[11].

Source: Value chains analysis report, elaborated within the PROGRESS project, based on ValueLinks 2.0. methodology designed by the GIZ; (Bochorishvili, Chakhvashvili and Mujirishvili, 2023[18]); (EastFruit, 2021[20]; EastFruit, 2020[21]); (Georgian Farmers Association, 2017[22]; Government of Georgia, 2021[23]); (Our World in Data - FAO, 2025[19]).

[5] Value chains analysis report, elaborated within the PROGRESS project, based on ValueLinks 2.0. methodology designed by the GIZ.

[6] Ibid.

[7] Ibid.

[8] Ibid.

[9] Value chains analysis report, elaborated within the PROGRESS project, based on ValueLinks 2.0. methodology designed by the GIZ.

[10] Ibid.

[11] Ibid.

2 Overview of Georgia's policy framework for climate change adaptation and resilience in agriculture

Georgia's policy frameworks for climate change adaptation and resilience in agriculture

1. Climate adaptation plans for agriculture and the main measures foreseen

Georgia has made progress in acknowledging climate risks and integrating climate considerations into several national processes.

Georgia's **fifth National Communication (NC5)** aims to enhance the adaptive capacity of the agricultural sectors that significantly contribute to the GDP (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]). Georgia's adaptation-related commitments outlined in the Updated Nationally Determined Contribution of 2021 (NDC 2.0) (see Table 2.1) largely have not been achieved to date. There is a significant progress towards establishment of a Multi-Hazard Early Warning System (MHEWS) in Georgia (more details below). However, most of the identified adaptation actions in the Updated NDC 2.0, such as assessing climate impacts on key sectors and ecosystems, and strengthening adaptive capacities in agriculture, water resources, tourism, forests, and coastal zones, were expected to be developed and operationalised through the National Adaptation Plan (NAP). The NAP has not yet been prepared, leaving the majority of these commitments outstanding and the country without a co-ordinated framework for planning and implementing adaptation measures.

The draft NDC 3.0 marks clear progress by giving adaptation a stronger, more structured place and concrete actions, and recognising agriculture as a priority highly vulnerable sector. The document treats agriculture as a cross-cutting sector and has dedicated climate adaptation-related provisions, such as supporting farmers with adopting sustainable agricultural practices and accessing appropriate technologies, diversifying their business models through value-added activities, including organic production and certification (more information in Table 2.1).

The work on the NAP, to which the NC5 refers, kicked off in spring 2025, and is planned to run until the end of 2027[12]. Agriculture is identified as one of the priority sectors, and an assessment of its climate vulnerabilities will be part of NAP development. The work is implemented by the Environmental Information and Education Centre (EIEC) under the Ministry of Environmental Protection and Agriculture (MEPA) in co-operation with the United Nations Environment Programme (UNEP). Earlier initiatives, such as the 2017 **Climate Adaptation Plan in Agriculture**[13], though never officially adopted, provided a reference for donor projects that piloted modern irrigation, soil conservation and climate-resilient farming practices.

The **2022–2026 Fourth Environmental Protection Programme of Georgia** recognises climate change as a major environmental issue and highlights climate change adaptation as a core priority of Georgia's environmental and climate policy frameworks. The programme largely mirrors and aligns with the Updated NDC 2.0 of 2021 and existing sectoral policy documents, without introducing new commitments or directions. The objective related to climate change is 13.1 which aims to create and systematise quantitative and qualitative data in the field of climate change. There are five activities in the action plan under this objective, including preparation of the NC5 and the NAP. While the programme does not explicitly cover agriculture, it does address water resources, soil management, and improvement the functioning of monitoring and early warning systems, which are highly relevant for climate adaptation.

Current adaptation policy in the agricultural sector is framed through documents such as the **2021-2027 Agriculture and Rural Development Strategy** and a forthcoming **Climate Change Law.** The **Agriculture and Rural Development Strategy** focuses on the expansion of competitive agricultural and non-agricultural sectors, sustainable natural resource use, ecosystem conservation, and development of efficient food and feed safety, veterinary and plant protection systems (ISET Policy Institute, 2023[12]). Climate change adaptation within the agricultural sector represents Strategic Goal 2. The objective under the strategic goal 2.1. is "Promoting the dissemination of environmentally adapted, climate-smart agricultural practices and supporting the development of bio/organic production". (Ministry of Environmental Protection and Agriculture of Georgia, 2024[5]). Foreseen measures include awareness-raising and knowledge improvement of farmers and entrepreneurs, expanding access to infrastructure and services, improving irrigation and drainage systems, and developing value chains through diversification, innovative technologies, co-operation and support to producers' unions and better access to financial instruments. Georgia's alignment with EU legislation on food and feed safety and veterinary and plant protection, adoption of sanitary and phytosanitary (SPS) standards and laboratory capacity enhancement are also foreseen (ISET Policy Institute, 2023[12]).

This strategy and the 2021-23 and 2024-2027 Action Plans contain activities of climate change adaptation explicitly and implicitly, including rehabilitation and transformation of windbreaks to minimise climate-related land degradation, support to existing and emerging co-operatives to implement sustainable pasture management practices, research and consultation processes to define economic and socially feasible climate smart agriculture actions, and promoting the introduction of climate-friendly agricultural practices. As a result, a law regulating windbreaks has been adopted, and extension and awareness-raising activities on climate-smart agriculture were carried out. (Ministry of Environmental Protection and Agriculture

[12] The approved project proposal under GCF Readiness "Building Capacity to Advance the National Adaptation Plan Process in Georgia" indicates that the project duration is 36 months. The finalisation period was also confirmed by the representative of MEPA.

[13] The EIEC commissioned jointly by the Ministry of Environment and the Ministry of Agriculture (these were separate ministries before the merger), as part of the "Agriculture Modernization, Market Access and Resilience" project initiated by the Ministry of Agriculture and supported by the International Fund for Agricultural Development and the Global Environment Facility (GEF).

of Georgia, 2024[5]). More specifically:

- **The 2021-2023 Action Plan**, under Objective 2.1, includes Activity 2.1.1, which aimed to identify and promote opportunities for climate change adaptation in agriculture. The Action Plan also established indicators for this activity, in 2021-2022 the assessment for the development of the NAP for the agriculture sector, and in 2023 the assessment of the vulnerability of agricultural crops to climate change. According to the 2021–2023 Action Plan implementation report, Objective 2.1 had not been achieved, as in 2023, the vulnerability of agricultural crops to climate change had not been assessed, and the NAP had not been prepared.
- **The 2024-2027 Action Plan**, also under Objective 2.1, outlines Activity 2.1.1.2, which focuses on the identification and promotion of climate change adaptation opportunities in the agriculture sector. The indicator for this activity (2.1.1.2.1) is the preparation of an analysis of existing climate change adaptation opportunities in the agriculture sector and the development of an action plan for climate change adaptation in agriculture. Activity 2.1.1.4 concerns the implementation of awareness-raising activities, including training courses, on climate-smart agricultural practices, with Indicator 2.1.1.4.1 requiring the implementation of at least four such activities.

The **Climate Change Law** is expected to introduce a statutory definition of climate change adaptation and establish integrated governance, meaning a co-ordinated system in which climate adaptation is planned, implemented and monitored across relevant sectors and institutions through clear roles, shared data and aligned national, sectoral and local actions (Ministry of Environmental Protection and Agriculture of Georgia, 2019[4]).

Looking forward, the 2025-2028 Government Programme commits up to GEL 3 billion to strengthen agriculture through improved infrastructure, modern technologies and farmer training. Adaptation-specific measures include GEL 1 billion in investments to rehabilitate irrigation and drainage systems, construction of the Ilto River reservoir in Kakheti to secure water supply for 40 000 ha and expansion of agri-insurance schemes. Complementary actions, such as pest management, sustainable pasture legislation, organic farming promotion, and capacity building, are also planned to boost the sector's resilience and competitiveness by 2028.

Although surveys[14] in Georgia consistently show that residents and farmers clearly perceive the impacts of climate change, adaptation remains largely ad hoc and fragmented, with farmers navigating risks individually rather than through planned, long-term and systematically implemented support mechanisms.

Given the current lack of a NAP, as previously highlighted, agriculture-related climate risks are managed only partially and inconsistently across fragmented institutions and scattered policy documents. Laws and climate change adaptation measures and initiatives are primarily project-based. Overall, Georgia's policy framework remains more robust on climate mitigation than on adaptation.[15]

[14] (EU4Climate, 2020[75]; Westminster Foundation for Democracy, 2023[77]).

[15] Georgia adopted a Long-Term Low-Emission Development Strategy/Concept in 2023, a 2030 Climate Change Strategy and Climate Change 2021-2023 Action Plan in 2021 (focusing on mitigation), and a 2024-2025 Climate Change Action Plan in 2023 (focusing on mitigation).

Table 2.1. Policy documents relevant for climate change adaptation in Georgia[16]

Name of document	Relevant articles
National level[17]	
NDC 2.0.[18]	(4) Adaptation Target: Georgia is committed to continuing to study its adaptive capacity of different economic sectors to the negative effects of climate change, as well as to plan and implement the respective adaptation measures by mobilizing domestic and international resources for the sectors particularly vulnerable to climate change. (11) Adaptation to adverse effects of climate change covers the most vulnerable sectors of the economy, ecosystems and other natural resources, mountain ecosystems, the Black Sea coastal zone, tourism, agriculture, surface and ground water resources, forestry and biodiversity. (63) Georgia intends to assess and develop adaptive capacities for agricultural products that have the largest share in national GDP (e.g. grape, hazelnut, tangerine) and/or for domestic unique products (such as Georgian honey, non-timber forest products). This process will be implemented in accordance with assessing the changes of climatic parameters and the spread of infections in order to ensure the conservation of species and food security. (64) Georgia intends to assess the impact of climate change on the availability of groundwater and surface water resources for sustainable use in agricultural (irrigation), energy production and dwelling purposes in a long-term perspective.
Draft NDC 3.0.[19]	(4) Adaptation Target: Georgia is fully committed to continue studying the adaptation gaps and adaptation limits (targets) to the extent possible, assessing climate risks and the adaptive capacity of its population, particularly vulnerable groups, economic sectors and ecosystems, to the adverse effects of climate change by mobilizing national and international resources. (5) The adaptation matters described in 5th Chapter of NDC of Georgia will be presented in First National Adaptation Plan for determination of transformational adaptation measures and innovative approaches for enhancing climate resilience efforts. (9) Georgia recognizes the transformative potential of climate technology development and transfer, and of Artificial Intelligence (AI) to support its climate objectives. Georgia intends to create enabling environments that foster climate innovation and facilitate the adoption of cutting-edge technologies for

[16] Note: In Georgia, 33 municipalities are signatories to the Covenant of Mayors, and as of April 2025, 11 have prepared and officially adopted **Sustainable Energy and Climate Action Plans** that include climate adaptation. However, because agriculture falls largely under the competence of the central government, and resources and capacities are lacking at municipal level, agricultural adaptation measures are only minimally reflected in these plans and are typically limited to windbreak-related actions.

[17] Note: In 2017, Georgia adopted the **"National Strategy for Disaster Risk Reduction 2017-2020 and its Action Plan"**, which also covered risks and measures relevant to agriculture, including drought. However, the strategy was not updated and had been approved before the adoption of Government Decree No. 629 on the Rules for Developing, Monitoring and Evaluating Policy Documents, meaning it did not require formal monitoring or evaluation reports, and the majority of its planned activities were ultimately not achieved. The envisaged measures were later incorporated into the GCF-funded MHEWS and Climate Information project - currently the key national initiative for strengthening early warning and climate risk management in Georgia. More information about the project is provided below.

[18] The document also lists the vulnerable groups.

[19] NDC 3.0 is expected to be finalised by the end of 2025 or the beginning of 2026. The remaining steps are the decision by the Climate Change Council to recommend NDC 3.0 to the Government of Georgia for approval, the approval by the government and submission to the UNFCCC Secretariat.

both mitigation and adaptation, and to study the potential of AI technologies to enhance climate resilience, promote low-carbon development, and ensure sustainable management of natural resources by mobilizing national and international resources.

(16) Adaptation to adverse effects of climate change covers the most vulnerable areas of life, sectors of the economy, ecosystems and natural resources, including but not limited to human health and well-being, biodiversity and its hotspots, mountains, glaciers, forests, aquatic ecosystems, Black Sea coastal zone, surface- and groundwater resources, agriculture, tourism, and cultural heritage.

(46) Georgia's NDC emphasizes the critical role of hazard-responsive social protection in protecting the population from adverse climate impacts and enhancing climate resilience. Specific measures include the expansion of targeted cash transfers, public works programmes that promote sustainable livelihoods, linking social protection with early warning systems to mitigate the effects of extreme weather events, agricultural insurance schemes, drought-resistant crop distribution, and access to climate-resilient housing for low-income households.

(49) Georgia intends to continue the assessment of the impact of climate change on glaciers and on the availability of surface and groundwater resources for sustainable use in agricultural (irrigation), energy production and dwelling purposes in a long-term perspective.

(50) Georgia's NDC incorporates lessons from past adaptation efforts and intends to enhance resilience to extreme weather events through Early Warning Systems (EWS) covering the high-risk zones and other measures to protect communities in vulnerable areas.

(61) Georgia continues to facilitate the adoption of sustainable practices among farmers, agricultural service providers and input suppliers by providing support for no tillage, soil conservation, restoration, and establishment of windbreaks, and agricultural waste processing. This includes access to appropriate machinery, equipment and technologies that enhance soil health and convert agricultural waste into valuable fertilisers, contributing to both mitigation and adaptation goals in the agriculture sector.

(62) Georgia intends to assist farmers in diversifying their business models to incorporate value-added activities, including compliance with organic farming and other certification schemes, and development of agritourism services.

(65) Georgia's NDC encourages reduction of direct and indirect emissions from soils, the adoption of precision fertilization techniques to optimize nutrient application, minimizing environmental impacts such as nitrogen leaching and runoff by promoting practices like the use of cover or catch crops, vegetation buffer strips between fields and water bodies.

(66) Georgia's commitments prioritize equal access to resources, training, and financial empowerment for smallholder farmers, women, youth and other vulnerable groups to ensure inclusivity and equality in the agricultural sector.

National Adaptation Plan (NAP)	Georgia does not have a NAP. However, in spring 2025, the country has launched the development process with the support of GCF and UNEP. The NAP will serve as a strategic framework for enhancing climate resilience across sectors and ensure a systematic approach to adaptation planning at the national and subnational levels. Agriculture will be a central part of the document. The development period is 2025 – 2027.
Draft Climate Law	The development of Georgia's Climate Law was actively initiated but is currently on hold. According to the White Paper, the forthcoming law is expected to include a dedicated component on climate change adaptation (WFD; UKAID; Georgian Parliament, 2023[24]). The Draft Law on Climate Change (version as of July 2024) states that adaptation to climate change shall include measures for all priority sectors affected in the municipality, such as agriculture, healthcare, biodiversity, tourism, and others.

Sectoral level for agriculture

Agriculture and Rural Development Law	It is an agriculture sector framework law that explicitly addresses climate change adaptation. The document supports the development of the agricultural economy and entrepreneurship in Georgia. While the full text is extensive, the key provisions related to climate adaptation include: • Article 1: Sets the purpose of the law, including supporting the creation of appropriate conditions for climate change adaptation and for reducing its harmful impacts on the environment. • Article 4: Sets the objectives of agricultural and rural development policy, including promoting economic stability through agricultural production, sustainable use of natural resources, preservation of ecosystems, adaptation to climate change, and reduction of its harmful effects on the environment; supporting the establishment and development of effective systems in the areas of food/feed safety, veterinary services, and plant protection; and enhancing the underutilised potential of agricultural production in rural areas through additional financial, preferential, technical, and research support. • Articles 5-8: Mandate the development and implementation of national agriculture and rural development action programmes and set the foundation for support mechanisms for measures (economic strengthening of farmers, rural sustainable development, income growth). The government of Georgia adopts the support mechanism.
Agriculture and Rural Development Strategy of Georgia 2021-2027	The document acknowledges that adapting different sectors of the economy and reducing the impacts of climate change are critically important for reducing poverty and protecting against environmental degradation. The document also acknowledges that climate change, floods and other potential natural disasters pose a threat to rural and agricultural development. Besides, insufficient knowledge of the rural population on environmental issues may have a negative impact on the environment in rural territories. Significant steps are planned to adapt the agricultural sector to climate change, such as preparation and implementation of plans for a rapid response to droughts, floods and other extreme events in agriculture; introduction of innovative methods of irrigation management and water use, and more. The strategic goal 2 “Sustainable usage of natural resources, retaining the eco-system, adaptation to climate change” includes objectives on dissemination of climate-smart and environmentally adapted agricultural practices. The other two strategic goals are goal 3 “Effective systems of food/feed safety, veterinary, and plant protection”, and goal 1 “Competitive agricultural and non-agricultural sectors”.
Agriculture and Rural Development 2024 – 2027 Action Plan	Objective 2.1 “Promotion of environmentally adapted, climate-smart agricultural practices and the development of bio/organic production” includes activity 2.1.1.2 “Identification and promotion of adaptation opportunities for the agricultural sector to climate change”. The indicators for the activity are as follows: • Analysis prepared on the existing adaptation opportunities of the agricultural sector to climate change. • Action plan on agricultural sector adaptation to climate change developed. Among the other foreseen activities, activity 2.1.1.4 is on the implementation of awareness-raising activities on climate-smart agricultural practices, including training courses.

Environmental policies and laws

The Law of Georgia on Environmental Protection	Article 13: Sets the competences of MEPA of Georgia, including organising measures for climate change adaptation and climate change mitigation (s); organising the monitoring of environmental pollution (d); and preparing information on on-going and potential hydrometeorological and geodynamic processes and on the assessment of the geo-ecological condition and the environmental condition in the territory of Georgia, in river basins and reservoirs, in the Black Sea territorial waters and on the continental shelf and within the exclusive economic zone of Georgia (e)

	Article 27: Establishes that the environmental monitoring system represents the combination of analysis and forecasting of information obtained through monitoring of the state of the environment. The overall coordination of this system is carried out by the Ministry, and the results of environmental monitoring are accessible to the public. The legislation of Georgia defines the legal regime governing the environmental monitoring system, the types of monitoring included in it, and the procedures for conducting such monitoring. Articles 28-29, 31 and 33: Establish the legal basis for regulatory standards and environmental norms. These provisions set qualitative environmental norms, including maximum allowable concentrations of pollutants in air, water and soil, and regulate the use of chemical substances such as fertilisers and plant protection products to safeguard ecosystems, soil health and human well-being. Article 45: Sets the purpose of protecting natural ecosystems and states that natural ecosystems, landscapes, and territories must be protected from pollution, disturbance, damage, degradation, depletion, and disintegration. Article 53: Activities must not cause irreversible quantitative or qualitative changes to biodiversity or lead to its degradation. The legal regime for biodiversity protection in Georgia is established by the legislation of Georgia.
The Law of Georgia on Ambient Air Protection	Article 53(3): States that the National Environmental Agency (NEA) is responsible for climate change observation, analysis, forecasting, and scientific research activities.
The Law of Georgia on Water Resources Management	The law aims to establish a comprehensive framework for promoting sustainable water management practices in Georgia, addressing many challenges, including explicitly both current and anticipated impacts of climate change. The law also states that the special permit on water use shall include climate impacts and projections.

Source: Legislation of Georgia described in the table: (Government of Georgia, 2021[25]); draft NDC 3.0; (WFD; UKAID; Georgian Parliament, 2023[24]); (Parliament of Georgia, 2024[26]); (Ministry of Environmental Protection and Agriculture of Georgia, 2024[27]); (Ministry of Environmental Protection and Agriculture of Georgia, 2019[17]); (Parliament of Georgia, 1996[28]); (Parliament of Georgia, 1999[29]); (Parliament of Georgia, 2023[30]).

2. Monitoring and forecasting the impact of climate change on agriculture

Article 13 of Georgia's 1996 **Law on Environmental Protection** delegates environmental monitoring and prediction to MEPA. MEPA serves as the policy making authority that is responsible for the preparation of information on the state of the environment, including assessment of geo-ecological conditions and of existing and expected hydrometeorological and geodynamic processes within the territory of Georgia, in river basins and water bodies, in the territorial waters of the Black Sea, on the continental shelf and in the exclusive economic zone.

The National Environmental Agency (NEA) is responsible for environmental data collection, analysis, reporting and dissemination. The Meteorological Department is the central climate monitoring unit, and the Hydrological Department oversees the surface water observation network. The NEA's responsibilities include publishing short, medium and long-term weather and climate outlooks[20] (both overall and sector-specific), and monitoring adverse hydrometeorological and geological phenomena (e.g. avalanches, hail, fog, drought, erosion,

[20] The terms "short-, medium- and long-term weather and climate outlooks" are not defined in Georgian legislation; however, based on the NEA's operational practice, short-term outlooks generally refer to 1-5-day forecasts, medium-term outlooks cover roughly 10-14 days or monthly assessments, and long-term outlooks correspond to seasonal or multi-month climate projections, mainly 20-30 years.

landslides, floods and rockfalls) and issuing warnings about hazardous events and extreme pollution. Climate information is shared through reference books, bulletins, reviews and other materials for the government and the public. For example, agrometeorological bulletins, which are regular reports that summarise past weather conditions, soil moisture levels and crop development stages over a given period, are published on a ten-day basis and sometimes monthly. The NEA's hazard-related information is free only for governmental entities. For others stakeholders, tariffs and activities are listed in the 2014 Government Decree No. 502 on the Approval of the Types and Fees of Services provided by the Legal Entity of Public Law (LEPL) – NEA of MEPA of Georgia (Government of Georgia, 2014[31]).

For now, the key available source of climate change impacts on agriculture and predictions is the National Communications (NCs) to the United Nations Framework Convention on Climate Change (UNFCCC), with the most recent being NC5 from 2024. Currently, the NCs are prepared by the EIEC as the national co-ordinating agency responsible for managing the process and consolidating the final report and supported by the United Nations Development Programme (UNDP) and the Global Environmental Facility (GEF). Predictions and assessments for agriculture are usually based on data requested from the National Statistics Office of Georgia and the NEA.

3. Information and early warning systems for farmers and food processing companies

There is no stand-alone law establishing a separate, sector-specific statutory obligation for early warning for farmers; instead, the duty to inform is integrated into the general environmental monitoring and hazard warning mandate of MEPA. The NEA is tasked with preparing and disseminating short, medium-, and long-range forecasts and warnings for extreme natural events. Georgia's 2018 **Law on Public Safety** outlines the state's obligation to provide early warnings for natural and man-made hazards. Although not agriculture-specific, the law's scope covers all affected persons, stakeholders, environment and property, including the farming sector, and mandates co-ordination among agencies to ensure timely information flow (Parliament of Georgia, 2018[32]).

Despite the existence of various legal provisions mandating the NEA on environmental monitoring and hazard information dissemination, Georgia does not yet have a fully established, integrated early warning system that is accessible, timely, and tailored to the needs of farmers and food processing companies. However, Georgia's NC5states that there are plans to set up a national Early Warning System (EWS) (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]). The gap is expected to be addressed through the implementation of the Green Climate Fund (GCF)-funded and UNDP-implemented project **"Strengthening Multi-Hazard Early Warning System and Risk Information Platform in Georgia"** (2018-2027), which aims to establish a comprehensive nationwide MHEWS (Green Climate Fund, n.d.[33]). This system aims to provide reliable information on climate-induced hazards, vulnerabilities and risks by expanding the hydro-meteorological observation network and modelling capacities (Green Climate Fund, n.d.[33]). In the framework of the respective project, 79 new hydrometeorological stations and posts were added, which will significantly increase the accuracy of hydrometeorological monitoring (UNDP, n.d.[34]). 77 additional stations will be installed by the end of the project. To support climate-resilient agriculture, 15 agrometeorological stations were also purchased and installed. Additionally, the Rural Development Agency (RDA) has also rehabilitated 19 existing agrometeorological stations[21] and piloted a new extension package –

[21] Automatic monitoring stations record data on air temperature and humidity, precipitation levels, wind speed and direction, as well as soil temperature and moisture. This information is transmitted to the Information Processing Centre

"the Georgian Climate Service for Agriculture" (GECSA)[22] in two regions (Shida Kartli and Kakheti) covering five crops (apple, peach/nectarine, grape, maize and wheat) (Rural Development Agency, 2023[35]).

GECSA provides tailored farm-level climate services to agricultural stakeholders, including weather and seasonal forecasts (hourly and daily), information about climate risks, recommendations on irrigation decisions, early warnings about pests and diseases, and advisories to handle forecasted climate and pest and disease risks. As mentioned by the representative of the Georgian Farmers' Association (GFA), the RDA also plans to collect data from agro-stations through the GECSA to make prediction and early warning more accurate. GECSA is free of charge. The platform was developed collaboratively with national partner agencies, including the RDA, the NEA, the Scientific-Research Centre of Agriculture and the National Food Agency (NFA), with funding from the UNDP in Georgia. To support this initiative, 15 new and 19 rehabilitated weather stations were integrated into the GECSA system, enhancing the agrometeorological observation network.

Prior to targeted above-mentioned international support, the NEA had only limited experience and capacity in hazard management, especially multi-hazard modelling, relying on hard copy maps and basic approaches (UNDP; GCF; Government of Georgia, Government of Sweden and Government of Switzerland, 2022[36]). The absence of a unified, legally regulated methodology, national geospatial data and mapping standards, and an integrated platform for hazard data exchange hampers the alignment of hazard mapping with international best practices. The "Strengthening Multi-Hazard Early Warning System and Risk Information Platform in Georgia" project addressed part of this gap by institutionalising advanced methodologies for flood, drought, avalanche, landslide, mudflow, windstorm, hailstorm, and integrated multi-hazard modelling, enabling the NEA to produce more accurate and comprehensive hazard maps for disaster risk reduction and climate adaptation planning (UNDP; GCF; Government of Georgia, Government of Sweden and Government of Switzerland, 2022[36]).

Some of the farmers have their own agro-meteorological stations and smart systems. As mentioned, Georgia has made some advancements in developing information and early warning systems to support farmers and food processing companies in adapting to climate change. However, these efforts remain fragmented and insufficient to fully meet sectoral needs.

4. Extension and advisory services

Article 10 of the 2024 **Law on Agriculture and Rural Development** explicitly states that it is the RDA's competence to provide relevant information and carry out advisory activities for farmers and entrepreneurs at the local level (Parliament of Georgia, 2024[26]). The RDA's statute provides further details. Additionally, the **2024-2027 Agriculture and Rural Development Action Plan** includes Activity 2.1.1.4 on the implementation of awareness-raising activities on climate-smart agricultural practices, including training courses (Ministry of Environmental Protection and Agriculture of Georgia, 2024[27]).

The **RDA** manages a **nationwide network of information centres** (formerly known as extension units) consisting of nine regional offices and 45 municipal information centres that

of the NEA, which processes and disseminates it. As a result, local farmers are able to receive timely updates on current and forecasted meteorological conditions, enabling them to plan and adapt their agricultural activities more effectively.

[22] GECSA provides information on apples, grapes, peaches, nectarines, wheat, and maize producers; however, not all services or data are available for each of these.

deliver consulting and training services to farmers in every district (Rural Development Agency, n.d.[37]).

These information centres serve as one-stop points where farmers can get technical advice, updates on weather or pest alerts, and information on government support programmes (Rural Development Agency, n.d.[37]). Advisors (extensionists) conduct on-site farm visits, hold community meetings in villages and organise training workshops in the field. Increasingly, climate change adaptation is integrated into their messaging. For example, agents disseminate information on water-saving irrigation scheduling during droughts, guide farmers on selecting crop varieties better suited to shifting local climate patterns and promote measures like crop insurance or diversification to manage climate risks. According to their mandate, the centres are required to provide such services. However, in practice, due to limited capacity and expertise, they mainly focus on providing information about governmental agricultural programmes and assisting farmers in accessing state support.

The RDA also runs government and donor-funded programmes. **The Technical Assistance Programme** is designed to enhance the competitiveness of agricultural producers and co-operatives in both domestic and international markets. While the programme does not explicitly focus on climate change adaptation, its components indirectly support resilience by improving operational standards and market readiness and provide further advisory and educational activities.

The **EIEC** also plays a key role in climate change education and outreach. The EIEC promotes environmental and agrarian education through training programmes, seminars and public awareness initiatives. It works with diverse groups from schoolchildren to professionals. During 2019-23, the EIEC focused on key issues including disaster risk reduction related to climate change and climate-smart agriculture (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).

Finally, the **GFA** provides training and information sessions for farmers. Most farmers in Georgia obtain practical advice and information on seeds, fertilisers and pesticides as well as their use primarily from agricultural shops.

5. Promotion of the use of climate change adaptation technologies and practices

The **Governmental Programme 2025-2028** and the **Agriculture and Rural Development Strategy 2021-27** and **Action Plan 2024-27** are executed through government and donor-funded projects. The programmes usually run until the budget expires.

The RDA runs a few programmes that support the deployment of climate change adaptation technologies (Rural Development Agency, n.d.[38]):

- The Plant the Future Programme aims to promote the effective use of agricultural land through the cultivation of perennial crops. It also includes co-financing for the installation of drip irrigation systems, wells, and anti-hail systems aimed at mitigating climate-related risks (Rural Development Agency, n.d.[39]).
- The Promotion of Agricultural Production on Irrigated Land Plots Programme aims to enhance agricultural productivity and sustainability in areas equipped with irrigation systems. The support includes co-financing for the installation of irrigation systems, including drip and sprinkler systems, to optimise water usage as well as support for the installation of solar-powered energy systems and agro-meteorological stations to enhance climate resilience (Rural Development Agency, n.d.[40]).

- The State Co-financing Programme for Refrigerated Storage Facilities for Berry Crops of Agricultural Co-operatives, aims to enhance the storage infrastructure for berry crops, thereby improving post-harvest handling and market competitiveness. While the programme does not explicitly focus on climate change adaptation, the development of refrigerated storage facilities contributes to reducing post-harvest losses and maintaining the quality of perishable berry crops, which can be particularly beneficial in the face of climate variability and extreme weather events (Rural Development Agency, n.d.[41]).

6. Innovation for climate change adaptation and resilience

Article 4 of **Georgia's Law on Agriculture and Rural Development** establishes climate change adaptation as a core objective of agricultural policy alongside the promotion of innovation (Parliament of Georgia, 2024[26]). The **Agriculture and Rural Development Strategy 2021-27** and **Action Plan 2024-27** include activity 1.2.1.15 on the implementation of an innovation grants programme for the regions (up to GEL 25 000) (Ministry of Environmental Protection and Agriculture of Georgia, 2024[27]). The target for this programme is funding of 40 start-ups in 10 regions. Finally, **Georgia's 2003 Law on Soil Conservation and the Restoration and Improvement of Soil Fertility** encourages the use of scientific and technological advancements to enhance soil conservation efforts (Parliament of Georgia, 2003[42]).

The **RDA's "Innovative Technologies Grant Programme"** aims to promote the implementation of innovative and climate-smart agricultural technologies for rural residents by supporting the execution of start-up projects. The Programme was launched in 2024 and expanded in 2025 for Imereti and Adjara regions. It is funded by the Swiss Agency for Development and Co-operation and supported by the UNDP within the framework of the UNDP project on Modernisation of the Vocational Education System in Agriculture in Georgia.

7. Promotion of sustainable soil practices to preserve soil quality in view of climate change impacts.

Georgia's 1994 **Law on Soil Protection** establishes a legal framework aimed at conserving soil resources and mitigating degradation (Parliament of Georgia, 1994[43]). The Law on Soil Protection emphasises prevention of soil erosion, maintenance of soil fertility, and implementation of measures to combat desertification. It mandates land users to adopt practices that preserve soil quality and prohibits activities leading to soil degradation.

The 2019 Law on Agricultural Land Ownership is an important legal act that outlines the ownership, use, and management of agricultural land in Georgia (Parliament of Georgia, 2019[44]). It also sets out the obligations of landowners regarding the use and maintenance of agricultural land, aiming to prevent degradation and promote sustainable practices. It complements the law on Soil Protection by establishing the legal framework for land tenure, which is crucial for implementing sustainable soil practices (Parliament of Georgia, 2019[44]).

The 2003 Law on Soil Conservation and the Restoration and Improvement of Soil Fertility sets out measures and state control over the soil's fertility, including measures relevant in the context of agriculture (Parliament of Georgia, 2003[42]):

- **Article 12** establishes MEPA's responsibility for supervising soil conservation and fertility. The Ministry inspects soil conditions, ensures compliance with regulations on soil management and the use of fertility-enhancing substances, and monitors soil contamination by pollutants. It also evaluates the effectiveness of conservation measures and can require land users to stop practices that harm the environment or other land.

- **Article 13** sets out the obligations of landowners in the field of soil conservation and fertility restoration and improvement. They are required to comply with the provisions of this law and relevant normative acts. They must provide competent authorities with the necessary information regarding the implementation of soil conservation and fertility enhancement measures. Furthermore, landowners must adhere to the regulations and requirements governing soil conservation and fertility restoration and submit relevant data to state statistical authorities on the use of fertilisers and other chemical products, in line with the timeframes and procedures established by those authorities.

Georgia's **Climate Technology Needs Assessment and Technology Action Plan** 2023, prepared by Sustainable Development Centre Remissia with support from ISET-Policy Institute and ESCO-S[23], under a project funded by GCF, identifies prioritised sectors and climate technologies (largely mitigation) for Georgia, including conservation-based land-tillage technologies. The corresponding Action Plan promotes their widespread adoption by outlining measures to disseminate these technologies, support farmers' transition to soil-conservation practices, and strengthen institutional and technical capacities. Although the measure is referenced in NDC 3.0, not much has been done in practice to advance its implementation.

An initiative on **"Implementation of Sustainable Management of Landscape and Land Resources in Rural Areas to Mitigate Land Degradation and Poverty"** was implemented during 2016-19 with the aim of combating land degradation due to climate change, especially in Eastern Georgia, by promoting the use of sustainable land management practices (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).

8. Promotion of sustainable practices to preserve water in view of existing and foreseen climate change impacts

Georgia's new **Law on Water Resources Management** from 2023 aims to establish a comprehensive framework for ensuring sustainable water management practices in the country (Parliament of Georgia, 2023[30]). It addresses many challenges, including the current and anticipated impacts of climate change. The law also mandates that the government shall incentivise the adoption of water-efficient technologies in agriculture, industry, and domestic use through subsidies, tax benefits or technical assistance. The key articles include:

- **Article 13** imposes several obligations that directly promote sustainable practices to preserve water quality and quantity in agriculture and other water-intensive sectors. In the context of agricultural land, water users must irrigate and apply nutrients in line with admissible norms, prevent erosion, and avoid entry of organic substances that could lead to eutrophication of surface waters.
- **Article 29** prohibits abstractions and activities that would cause drying of water bodies or lower water levels below acceptable thresholds and requires consideration of environmental flow when designing irrigation and other hydraulic works.
- **Article 32** strengthens the monitoring, information and risk-management functions that underpin sustainable and climate-resilient practices. It establishes a national water monitoring system for surface and groundwater, including quantitative, qualitative and ecological parameters, as well as hydrological and hydromorphological observations.

[23] A private company operating on the Georgian market of energy-efficient, renewable energy and sustainable solutions for all kind of buildings and operations.

- **Article 34** stablishes a comprehensive framework for flood risk management in Georgia. The NEA must, at least every six years, carry out a preliminary flood-risk assessment for all river basin districts and identify areas with potentially significant flood risk, followed by the preparation of flood hazard maps and, together with the Emergency Management Service, detailed flood-risk maps indicating zones of low, medium and high probability, as well as exposed populations, economic activities and environmental assets. Based on this, competent state bodies, in co-ordination with the Emergency Management Service, must develop flood-risk management plans that cover prevention, protection and preparedness, including forecasting and early-warning systems; these plans are then integrated into the river basin management plans and approved according to national legislation.

The specific functions and mandates of state institutions in relation to preparedness, response, prevention and early recovery for flood-related emergencies are further determined by Georgian law, and the Government must adopt a dedicated decree on the assessment of areas under potential flood risk. The assessments are carried out in the framework of GCF-funded "Scaling-up Multi-Hazard Early Warning System and the Use of Climate Information in Georgia". The plan has not been adopted.

The Law on Water Resources Management also provides a basis for identifying nitrate-polluted and nitrate-vulnerable zones and for preparing action plans and good agricultural practice rules for these areas, which are important instruments for promoting more sustainable fertiliser management and protecting water bodies from diffuse agricultural pollution. Public awareness campaigns will be carried out to educate citizens on water-saving practices and the importance of sustainable water use (Parliament of Georgia, 2023[30]).

In Georgia, irrigation and drainage (melioration) services are provided by the **Georgian Amelioration Ltd**. under MEPA. For farmers connected to the state irrigation network, water charges are applied on a per-hectare and yearly basis rather than metered consumption. However, in cases where farmers use individual boreholes, water use is metered, and charges are calculated based on actual consumption recorded by installed water meters. There is no mandatory obligation on the consumption limits for the operators.

As a result, while the legal basis for integrated flood-risk management has significantly improved, drought management and agricultural wastewater reuse remain major policy and implementation gaps. Georgia has no standalone national drought management plan, and wastewater reuse in agriculture is not yet governed by a dedicated strategy, leaving these critical areas of climate-resilient and circular water use largely underdeveloped.

9. Climate-resistant seeds and plant varieties

The 2017 **Law of Georgia on Permission for Distribution of Agricultural Plant Species Subject to Mandatory Certification and on Seed Production** oversees the production, reproduction, processing, storage, certification, sale, and traceability of both locally produced and imported seeds and planting material subject to mandatory certification (Parliament of Georgia, 2017[45]). The 2018 Government Decree No. 411 **"On the Approval of the List of Agricultural Crops Subject to Mandatory Certification"** approves the list of agricultural crops whose seeds and planting material are subject to mandatory certification before being placed on the market in Georgia. Additional relevant legal acts are:

- The 2018 Government Decree No. 336 **"On the Rule on Labelling of Seeds and Planting Material of Agricultural Crop Varieties Subject to Mandatory Certification"** establishes mandatory labelling, including requirements to provide essential information.

The Decree legally requires that all agricultural seed and planting material subject to mandatory certification must be packaged and labelled in accordance with the approved labelling rules before being placed on the market.

- The 2018 Government Decree No. 337 **"Rule for the Certification of Seeds and Planting Material of Agricultural Crop Varieties Subject to Mandatory Certification"**, establishes a mandatory certification system for the seeds and planting materials for distribution of agricultural crops, ensuring they meet verified standards of purity, germination, health, and varietal integrity.
- The 2019 Government Decree No. 118 **"On Certification Fees"** establishes the amounts and payment rules for fees charged for seed certification services, including field inspections, sampling, laboratory testing, and the issuance of certificates, applicable to agricultural crop varieties subject to mandatory certification in Georgia.

The LEPL NFA or the LEPL **Revenue Service** are responsible for issuing permits for imports, and the LEPL **Agricultural Scientific Research Centre** is responsible for mandatory certification. The Centre also creates and manages the National Catalogue of Agricultural Crop Varieties Approved for Distribution on the Territory of Georgia (Agricultural Scientific Research Centre, n.d.[46]).

Certified seed labels may include information on the variety's characteristics, including whether it is marketed as drought-resilient. However, it is not mandatory, and there is no dedicated legal requirement to indicate climate resilience, nor are there systematic awareness-raising measures or targeted government programmes to inform farmers about the benefits and availability of climate-resistant seed varieties.

Policy framework for imports

The import and placing on the market of seeds in Georgia is regulated primarily through the plant health and phytosanitary control policy framework. This framework is established by the **2012 Food/Feed Safety, Veterinary and Plant Protection Code of Georgia**. Article 12 states that business operators may place products on the market only if they comply with Georgian legislation, including mandatory labelling and instructions for safe use.

The policy framework for further implementation includes, inter alia:

- 2010 Government Decree No. 426 **"On the Issuance of Permits for the Import of Products Subject to Phytosanitary Control"**,
- 2016 Government Decree No. 619 **"On Approval of Obligations and Registration of Business Operators Whose Activities Are Related to Plants, Plant Products and Other Objects Subject to Phytosanitary Control"**,
- 2016 Government Decree No. 463 **"Rule on the Implementation of Phytosanitary Border-Quarantine Control"** (Annexed with Phytosanitary Border-Quarantine Control Rule).

When importing seeds for sale, the business operator must ensure compliance with phytosanitary regulations. Under the Phytosanitary Border-Quarantine Control Rule of 2016, Government Decree No. 463 "Rule on the Implementation of Phytosanitary Border-Quarantine Control", seeds imported into Georgia for sale must be accompanied by a phytosanitary certificate issued by the competent authority of the exporting country, and imported plant-origin products must also be accompanied by an import permit issued by the competent Georgian authority NFA or Revenue Service). The customs department must carry out phytosanitary border-quarantine control, and

only consignments that comply with Georgian phytosanitary requirements may be authorised to proceed.

Additional topics of relevance to the EU Green Deal

1. Organic agriculture

The 2023 Government Decree No. 149 **"Technical Regulation - On the Rules of Organic (Biological, Ecological) Production and Labelling of Organic (Biological, Ecological) Products**" defines the principles of organic production in Georgia (Government of Georgia, 2023[47]). It sets out rules for organic production, certification, labelling and advertising, and the control and oversight of organic production and organic products. The technical regulation will be fully in force from 1 January 2027.[24] Several articles consider climate change adaptation:

- **Article 2** sets the objectives of organic production, including promoting the protection of the environment and the climate.
- **Article 6(e)** on selecting plant varieties for organic production states that it is essential to consider the specific characteristics of organic systems, particularly agronomic traits, resistance to diseases, the ability to adapt to diverse local soil and climatic conditions, and the existence of natural breeding barriers.
- **Article 14.1(d)** on the development of plant varieties suitable for organic production, establishes that selective breeding must be conducted in certified organic production conditions (not in conventional or chemically intensive settings). These breeding efforts should aim to enhance genetic diversity, utilise natural reproductive capabilities, and focus on agronomic traits, disease resistance, and adaptability to various local soil and climatic conditions (Government of Georgia, 2023[47]).

The **2024-2027 Agriculture and Rural Development Action Plan** covers the promotion of organic production under 1.2.1.14 (Ministry of Environmental Protection and Agriculture of Georgia, 2024[27]). It aims to provide co-financing to 420 beneficiaries.

The **Bioproduction Promotion Programme**, implemented by the RDA, aims to support the growth of organic agricultural production across the country and addresses the 2024-27 Agriculture and Rural Development Action Plan (Rural Development Agency, n.d.[48]). The key components are:

- *Financial support*: The programme provides financial assistance to potential beneficiaries interested in starting organic production, covering costs such as certification, consulting services, and laboratory analysis of honey and wax (Rural Development Agency, n.d.[48]).
- *Additional support for specific sectors*: For viticulture (cultivation of grapevines), the programme covers the purchase of organic fertilisers and biopreparations against pests and diseases permitted in organic farming. In apiculture (beekeeping), it supports the acquisition of medical biopreparations for bees and bio honeycombs (Rural Development Agency, n.d.[48]).

[24] The new Government Decree No. 149 is replacing the Government Decree on Bioproduction.

2. Sustainable use of pesticides and mineral fertilisers to manage pests, diseases and invasive species

The 2012 Food/Feed Safety, Veterinary and Plant Protection Code of Georgia establishes the legal framework for ensuring food and feed safety, animal health, plant health, and the regulation of pesticides, agro-chemicals, plants, and plant products, by defining responsibilities of business operators and setting rules for production, import, sale, and control across the entire supply chain. Under the Code, a business operator is any natural or legal person who carries out activities at any stage of the production, processing, storage, transport, import, distribution, or placing on the market of food, feed, plants, plant products, seeds, pesticides, or agro-chemicals. The status of a business operator arises from the activity performed, not from a specific licence or organisational form. Under Article 13, business operators must undergo business registration with the LEPL National Agency of Public Registry, appear in the economic activity registry and obtain formal recognition from the LEPL NFA for the sale of pesticides and agrochemicals. The 2018 Government Decree No. 590 **on the "Procedure for the Recognition of Business Operators Whose Activities are Related to the Field of Plant Protection"** established the rules for recognition, and only registered and recognised business operators can sell pesticides and agro-chemicals.

The 1998 **Law of Georgia on Pesticides and Agrochemicals** establishes a comprehensive legal framework for the regulation, registration, import, production, and safe use of pesticides and agrochemicals in Georgia (Parliament of Georgia, 1998[49]).

The key provisions and obligations of this law are:

- **Article 1** establishes the purpose of the law, emphasising the efficient and safe use of pesticides and agrochemicals to protect human health and the environment.
- **Article 2** "The legal grounds for the efficient use and safe application of pesticides and agrochemicals are the Constitution of Georgia, treaties and international agreements, the FAO International Code of Conduct on the Distribution and Use of Pesticides, the laws of Georgia on Food/Feed Safety, the Veterinary and Plant Protection Code, the laws on Soil Protection, on Healthcare and on Environmental Protection, this Law and other normative acts." (Parliament of Georgia, 1998[49])
- **Article 4 (b)** states that the import and circulation of pesticides and agrochemicals that are not included in the State Catalogue of Pesticides and Agrochemicals shall be prohibited.
- **Article 6** assigns responsibilities to MEPA and other relevant bodies for the regulation and oversight of pesticide and agrochemical use.
- **Article 7 "**State control and supervision over the effective use and safe consumption of pesticides and agrochemicals" (Parliament of Georgia, 1998[49]) shall be carried out, within the scope of their competence, by MEPA and the Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health and Social Affairs of Georgia. State control and supervision shall be implemented in accordance with the procedures established by the legislation of Georgia and in compliance with the international requirements of the Food and Agriculture Organization of the United Nations (FAO). MEPA is obliged to carry out control over compliance with the requirements of the FAO International Code of Conduct on the Distribution and Use of Pesticides and to submit to the FAO information on the work performed.
- **Article 8** mandates the registration and testing of pesticides and agrochemicals to assess their safety and efficacy.
- **Article 12** sets the procedure and grounds for state registration.

The **Law on Environmental Protection** establishes that the use of mineral fertilisers, pesticides, plant-growth regulators and other chemicals must follow norms that safeguard human health, biodiversity and soil quality. MEPA, together with the Ministry of Health, must develop and approve rules for the use, transport, storage and application of these substances every five years. It also mandates the creation of a unified state registry of chemical substances to support safe use, risk reduction, accounting and control. As mentioned above, pesticides and other agrochemicals that are distributed to Georgia require mandatory registration, and MEPA is responsible for catalogues such as a list of Pesticides and Agrochemicals Permitted for Use on the Territory of Georgia. Any pesticide or agrochemical intended for sale or use in Georgia must first undergo registration.

The key provisions and obligations of this law are:

- **Article 7** details the mechanisms for state control and supervision to ensure compliance with safety standards. All physical and legal persons must comply with Georgia's rules on the effective and safe use of pesticides and agrochemicals and, when requested, provide the competent authorities with any required information or documentation (Parliament of Georgia, 1996[28]).
- **Article 25** specifies the procedures for the effective and safe application of these substances, including the need for proper training and adherence to environmental standards (Parliament of Georgia, 1996[28]).

The **technical regulations** that further operationalise the pesticide, disease and invasive species management are as follows:

- On the Approval of the Provision for Registration Tests, Expertise and Registration of Pesticides and Agrochemicals in Georgia Government Decree No. 443, 31 December 2013;
- Rules for the Labelling of Pesticides and Agrochemicals Government Decree No. 427, 31 December 2013;
- On the Approval of the Maximum Residue Levels of Pesticides in Food of Plant and Animal Origin / Animal Feed Government Decree No. 623, 29 December 2016;
- On the Approval of Methods for Sampling for State Control to Determine Maximum Levels of Pesticide Residues in Products of Plant and Animal Origin, Government Decree No. 516, 31 October 2018;
- Rules for the Control and Sampling of Pesticides and Agrochemicals Placed on the Market Government Decree No. 447, 31 December 2013;
- Rules for Organising Small-Packaging of Pesticides, Government Decree No. 437, 31 December 2013;
- Products and Substances Permitted for Use in Organic (Biological, Ecological) Production Government Decree No. 125, 3 April 2024;
- Rules for Sampling of Pesticides and Agrochemicals in Food/Feed and Environmental Objects, Government Decree No. 35, 3 January 2014;
- List of Agricultural Pesticides, Agrochemicals and Seed/Planting Materials Government Decree No. 173, 12 April 2011.

The LEPL NFA is responsible for registering pesticides and agrochemicals (both local and imported), as well as for controlling and sampling pesticides and agrochemicals, according to the Government of Georgia Ordinance No. 524 on Amendments to Ordinance No. 447 of 31 December 2013 of the Government of Georgia on the Approval of the Technical Regulations – the Procedure for the Control and Sampling of Pesticides and Agrochemicals Placed on the Market. As mentioned, the use shall be in accordance with the instructions on the package and/or label. The registration process requires comprehensive data on the pesticide's efficacy, safety and environmental impact. There are no limits on pesticide use. The agricultural laboratory has

very limited capacity, preventing it from conducting extensive analyses of active ingredients. The NFA creates and manages the catalogues of registered pesticides and agro-chemicals.

Government of Georgia Decree No. 215 of 2021, on the **"Approval of Measures to Achieve the Sustainable Use of Pesticides"** sets out concrete measures to ensure the sustainable use of pesticides in Georgia, complementing the existing legal and regulatory acts in the field of plant protection and food safety. It introduces targeted measures aimed at reducing risks to human health and the environment, including the preparation of a national action plan, requirements for professional training and retraining, and the promotion of integrated pest management (IPM). The Decree establishes special restrictions on aerial spraying, measures for the protection of water bodies and drinking water sources, and requirements to reduce pesticide use or risks in sensitive areas. It also regulates key practical aspects related to sustainable use, such as pesticide application, storage, packaging, and waste management, specific measures for the protection of the aquatic environment and drinking water, and sets out indicators, reporting, and information-exchange obligations to support monitoring and informed decision-making.

A **2025–2029 Action Plan for Measures to Achieve the Sustainable Use of Pesticides** was adopted in April 2025 and has the following objectives:

- **Objective 1.1** aims at improving and modernising the pesticide registration system. The interventions are the development of new procedures for the functioning of the updated pesticide registration system (1.1.1) and revising the pesticide catalogue and the format of the registration certificate (1.1.2).
- **Objective 1.2** refers to the categorisation of pesticide users. The interventions cover different directions, including the development of a training programme for professional users (1.2.3) and certification and registry of professional users (1.2.4).
- **Objective 1.3** targets the reduction of risks of accidents and poisonings related to pesticide use. The interventions encompass theoretical and practical training for users (1.3.3.), a training programme for sales-point consultants (1.3.4.) and certification of sales-point consultants (1.3.5).
- **Objective 1.4** covers reducing the environmental impact from pesticide use. The interventions are environmental and drinking water monitoring (1.4.1) and accounting and disposal mechanism for pesticide waste (1.4.2).
- **Objective 1.5** aims at ensuring official control over the placing on the market and use of pesticides. The interventions are strengthening the laboratory capacity (1.5.1) and controlling pesticide use by professional users (1.5.2)
- **Objective 2.1** calls for the establishment of an IPM system. The interventions are the development of an IPM guideline (2.1.1), the development of incentive mechanisms for IPM adoption (2.1.2) and the dissemination of information on IPM methods (2.1.3).
- **Objective 2.2** encompasses the promotion of biological, physical and other non-chemical alternatives. The interventions focus on promoting the use of biological, physical and other non-chemical alternatives for protecting agricultural crops from harmful organisms. They include developing a guideline that outlines these alternative methods for major crops; creating and regularly updating a list of pesticides permitted for use in organic farming; designing incentive mechanisms to encourage the adoption and development of biological and non-chemical practices; and disseminating information on these alternative methods through meetings, informational videos and printed materials.
- **Objective 3.1** targets the conducting a public awareness campaign. The interventions focus on creating and dissemination of awareness-raising programmes.

Additionally, the 2023 **Law of Georgia on Water Resources Management** (Article 13) requires

farmers to comply with admissible irrigation and nutrient application norms to prevent over-application and protect groundwater and surface waters, while also prohibiting fertiliser runoff that may cause eutrophication. Furthermore, the law empowers MEPA to designate nitrate-vulnerable zones and to adopt good agricultural practice rules for fertiliser management, thereby creating a framework for targeted control and pollution prevention.

In Georgia, the use and overuse of pesticides and fertilisers faces several significant challenges: although a legal framework exists, implementation is weak, resulting in excessive and often unsafe application, partly driven by untrained users and vendor-driven incentives to overapply chemicals. Farmers frequently lack knowledge of safe handling, proper dosages and protective equipment, while monitoring, inspection and enforcement capacities remain limited (Heinrich Boell Foundation, 2024[50]).

3. Environmental standards

The **Law on Environmental Protection** is a framework law in the field and establishes a comprehensive set of environmental protection standards to ensure an ecological balance and safeguard human health. These include:

- Qualitative standards for environmental conditions (such as permissible levels of harmful substances and microorganisms in air, water, and soil)
- Limits on emissions and environmental pollution for, but not limited to, business operators subject to environmental requirements established by Georgian legislation
- Regulations for the use of chemical agents (including fertilisers and pesticides)
- Ecological requirements for products, and permissible environmental load norms.

According to the law, maximum permissible emission limits for harmful substances and microorganisms released into the environment are reviewed and updated every five years. The law also requires individual emission limits based on specific pollution sources and local environmental conditions. Additionally, it mandates the creation of a national chemical substance registry to support their monitoring, risk reduction, and proper use. Ecological requirements must also be observed during the production, transport, and storage of goods, particularly food products, ensuring that harmful impacts on both the environment and public health remain within acceptable limits established by the governmental and ministerial decrees in the field of distribution and use of pesticides, agrochemicals, food safety, air, water and soil protection, public and occupational health.

There are special additional requirements for food production and processing in the **Code on Food/Feed Safety, Veterinary, and Plant Protection** **of 2012**. There is also a manual "From farm to table" prepared by the NFA. It is a practical guide for food business operators, such as farmers, processors, distributors, retailers, and anyone involved in the food chain, to help them comply with Georgian food safety legislation. There are no specific standards for almond or blueberry production.

4. Certification

In general, there is a certification for particular seeds and for plant nurseries as mentioned in pesticides and fertilisers related sub-chapters.[25] However, blueberries and almonds are not on

[25] The 2018 Government Decree No. 337 On Approving the Rule for Certification of Seeds and Planting Material of Agricultural Crop Varieties Subject to Mandatory Certification concerns mandatory certification of seeds and planting

the list. For food products, the Hazard Analysis Critical Control Point (HACCP) certification is mandatory for every business operator engaged in food production and processing based on the Government Decree No.173 **"On the Approval of the Technical Regulations – 'General Rules of Food Hygiene' and 'Simplified Rules of Food Hygiene'"** as well as **the HACCP manual**, (LEPL National Food Agency, 2021[51]). In addition, based on the 2012 **Code on Food/Feed Safety, Veterinary, and Plant Protection,** a physical or legal entity engaged in food production and/or processing and willing to sell the product is obliged to register as a business operator in a registry (Government of Georgia, 2012[52]). Producers interested in accessing the EU market must obtain the GLOBAL Good Agricultural Practice (GLOBAL G.A.P.) certification. For instance, the company "Blueberry from Georgia" got certified in 2024 (ISO Consulting, 2024[53]).

EU-Georgia Co-operation Framework

On 27 June 2014, Georgia and the European Union (EU) signed the Association Agreement (AA), which includes the Deep and Comprehensive Free Trade Area (DCFTA). The AA fully entered into force on 1 July 2016 (European Union and the Government of Georgia, 2014[54]).[26] This agreement has integrated Georgia into the EU Single Market in key sectors by requiring gradual alignment of its legislation with EU standards, particularly as regards SPS measures, enhancing agricultural competitiveness and resilience, as well as in climate change and environmental protection. The AA marked a significant milestone in Georgia's European integration process, strengthening the political association and economic integration with the EU (European Union and the Government of Georgia, 2014[54]).

In December 2023, Georgia was granted EU candidate country status. However, accession talks remain on hold due to the decision of the ruling party (European Parliament, 2024[55]). The Government of Georgia stated that it plans to implement over 90 % of its legal obligations under both the EU-Georgia AA and the DCFTA by 2028. The Prime Minister has voiced this commitment several times. Accordingly, the AA and DCFTA remain the only framework of the relationship. It is noteworthy that there is no free movement of goods between the EU and Georgia, but trade between the two is deeply liberalised under the DCFTA. The EU market is considered stable and highly attractive for Georgian farmers and entrepreneurs, yet it remains largely underutilised.

The EU-Georgia AA includes a dedicated climate change chapter (Title VI Chapter 4). Article 308 formally commits both parties to co-operate on mitigation and adaptation, deployment and diffusion of low-carbon and adaptation technologies and mainstreaming of climate considerations into sector policies. Article 310 underlines that cooperation shall cover the development and implementation of the National Adaptation Plan of Action (European Union and the Government of Georgia, 2014[54]). The AA includes a dedicated agriculture and rural development chapter (Title Vi, Chapter 10). While it does not explicitly mention climate change adaptation, Article 333 (b) emphasises the need to evaluate, implement and enforce policies in accordance with EU regulations and best practices. The EU legal acts subject to approximation are listed in the Annexes (Environment - ANNEX XXVI, Climate Action - ANNEX XXVII). These include **Directive 91/676/EEC (Nitrates Directive)**, **Directive 2000/60/EC (Water Framework Directive)** and

material for those plant species listed in the annex, including wheat, barley and rye crops. The list is gradually increasing. Certification is not required when a farmer produces seeds for own use only (not for sale) and when the crop variety is not included in the mandatory certification list. For other crops, there is no mandatory certification. However, they shall still comply with food SPS standards, such as not to be invasive.

[26] The 2021 – 2027 Association Agenda can be found here.

Directive 2007/60/EC (Floods Directive). Georgia's 2023 Law on Water Resources Management serves as the primary legal instrument for implementing these directives. However, full transposition and effective compliance depend on secondary legislation, detailed technical standards, and practical implementation of river basin management plans, monitoring systems, flood risk assessments. Directive 91/676/EEC (Nitrates Directive) has not been transposed yet.

According to the 2024 AA Implementation Report, "There have been no significant developments on climate change, and alignment with the EU Acquis still remains limited, including on obligations under the Energy Community Treaty" (European Commission, 2024[56]).[27] Despite the progress in agriculture, as well as food SPS policies, they are still only partially aligned with the EU Acquis. There was notable progress in organic farming, where the list of authorised substances for use in organic production was approved in April 2024, further aligning with the EU Acquis. Also, the EU has reduced the frequency of its regulated import controls on certain Georgian products susceptible to aflatoxin contamination (e.g., hazelnuts) from 30% to 20%. This follows Georgia's implementation of recommendations from the European Commission's October 2023 audit of its aflatoxin control system, which strengthened monitoring, prevention, and traceability measures (European Commission, 2024[56]). Notably, according to the AA Implementation Report, the in-country laboratory testing capacity does not yet correspond to the EU Acquis on either SPS or food safety.

Institutional set-up for designing and implementing the climate change adaptation policy for agriculture in Georgia

Georgia's capacity to adapt its agricultural sector to climate change depends on a robust and co-ordinated institutional set-up. However, co-ordination across responsible institutions remains underdeveloped, including the distribution of clear roles, responsibilities and mechanisms for collaboration. Table 2.2. lists the main institutions relevant for climate change adaptation in agriculture in Georgia.

[27] The report states that Georgia adopted a Long-Term Low-Emission Development Strategy (2023) with a 2050 climate-neutrality goal, is preparing a new NDC, adopted the 2030 Climate Change Strategy and 2024-2025 Action Plan, and endorsed its National Energy and Climate Plan in June 2024. A new NDC and the climate law are still under preparation, and urgent action is needed to establish a robust Monitoring, Reporting, Verification and Accreditation framework as well as a Monitoring, Reporting and Verification system supporting the national GHG inventory. Administrative capacities also remain weak, and climate mainstreaming across sectors is insufficient. The report emphasises the need for Georgia to align with major EU climate policy updates, including the Fit for 55 package. All these are mitigation-relevant except for the NDC.

Table 2.2. Georgia's institutional set-up for climate change adaptation in agriculture

Name of the institution	Description
Legislative branch	
Parliament of Georgia, Agrarian Issues Committee	In the Rules of Procedure of the Parliament of Georgia of 2025, Article 31, lists the Agrarian Issues Committee as one of the committees. The committee's charter, Article 2, states its key directions: a) defining the main directions of the state's agrarian policy; b) developing legislation related to agrarian reforms, food security, land resources, agricultural education and science, agro-services, and farmers' issues; c) approximation/harmonisation of Georgia's legislation with the European Union legislation, effective oversight of the implementation of rural and agricultural development strategies, and control over the enforcement of legislation (Parliament of Georgia, 2024[57]).
Parliament of Georgia, Environmental Protection and Natural Resources Committee	The Rules of Procedure of the Parliament of Georgia of 2025, Article 31, lists the Environmental Protection and Natural Resources Committee as one of the committees. The committee's charter, Article 2, states its competences, which include defining the main directions of state policy in the field of environmental protection and overseeing its implementation to ensure the country's sustainable development. This will be done through: a) promoting the transition to a green economy and supporting adaptation to climate change and the mitigation of its negative impacts; b) fulfilling obligations undertaken under the AA between the European Union and Georgia, the United Nations Sustainable Development (SDGs) Goals, and other international and regional agreements; c) effective and close co-operation with relevant state agencies, other parliamentary committees, and civil society. Climate resilience and climate change adaptation are mentioned as a strategic direction of the committee (Parliament of Georgia, n.d.[58]).
Executive branch	
Ministry of Environmental Protection and Agriculture of Georgia (MEPA)	Article 13 of the Law on Environmental Protection states that it is MEPA's competence to organise climate change mitigation and adaptation measures (Parliament of Georgia, 1996[28]).
Legal Entity of Public Law (LEPL) [28] National Environmental Agency (NEA) under MEPA	The NEA is responsible for climate monitoring, analysis, forecasting, and scientific research. It provides information on agro-climatic zones as well as on early warning.
LEPL Environmental Information and Education Centre (EIEC) under MEPA	The EIEC plays a crucial role in raising awareness and increasing knowledge about environmental and agricultural issues. In the context of agrarian education, EIEC supports the development and dissemination of educational materials, preparation of NCs to the UNFCCC, organises ad-hoc training and awareness-raising campaigns for farmers, students and agricultural professionals, and promotes sustainable agricultural practices.
Non-commercial non-entrepreneurial Legal Entity Rural Development Agency (RDA) under MEPA	The RDA plays a key role in implementing state policy on rural and agricultural development. Its core competencies include administering state support programmes for farmers and agribusinesses, promoting access to finance and modern technologies, and supporting value chain development across agricultural sectors. Additionally, the RDA contributes to enhancing food security, fostering sustainable rural livelihoods, and aligning with EU standards by facilitating the implementation of rural development projects co-financed by international partners.
LEPL National Food Agency (NFA) under MEPA	The NFA is responsible for ensuring food safety, and veterinary and phytosanitary control across the country. Its core mandate includes the regulation and supervision of food production and distribution, animal and plant health, and compliance with hygiene and safety standards. In the context of agriculture, the NFA plays a crucial role in aligning Georgia's food safety system with EU standards, supporting export readiness, and promoting sustainable and safe agrifood value chains. Through risk-based inspections, public awareness, and capacity-building efforts, the Agency contributes to protecting consumer health and strengthening the country's agrarian sector. The Agency also leads the control of mandatory certification of seed and plant nurseries and oversees HACCP certification.

[28] LEPL are established and abolished only by an act of the authorised Legislative Body. They enjoy administrative and sometimes financial autonomy and are usually run by multi-member boards.

LEPL State Agriculture Laboratory under MEPA	The laboratory's scope of work covers the full diagnostic cycle, including laboratory testing of animals and plants, as well as food safety expertise, including on food safety parameters (including veterinary drug residues, pesticides, and toxic elements) detection and identification of organisms that cause plant diseases or damage, using classical and modern molecular testing methods; and detection and identification of harmful organisms present in the soil. (LEPL State Agriculture Laboratory, 2025[59]).
LEPL Scientific Research Centre on Agriculture under MEPA	The centre organises the standardisation and certification systems for planting and seedling materials (LEPL Scientific Research Centre on Agriculture, 2025[60]).
LEPL National Agency for Sustainable Land Management and Land Use Monitoring	The agency supports adaptation through sustainable land-use planning, erosion control, and geographic information system-based monitoring.
Private/non-governmental	
Georgian Farmers' Association (GFA)	The GFA is a non-profit organisation established in 2012 to strengthen the agricultural sector in Georgia and improve the quality of life for Georgian farmers. With a membership exceeding 5 000 farmers, the GFA serves as a link between farmers and the government, advocating for farmers' interests and facilitating access to resources and services.
Almond and Walnut Producers' Association (AWPA)	The AWPA is a non-profit organisation established in 2018. It supports and unites stakeholders involved in the cultivation, processing, and export of walnuts and almonds in Georgia. The association organises training sessions, masterclasses, and experience-sharing events with international experts to disseminate knowledge on modern agricultural practices (although currently climate change adaptation is not covered). The AWPA provides agro-services to its members, including access to agricultural technologies and consultancy services to improve crop yields and quality. The association also assists members with exploring and accessing export markets, facilitating connections with international buyers and distributors. According to the website, the AWPA comprises over 30 members.
Blueberry Growers' Association (GBGA)	The GBGA is the representative association of blueberry growers formed in 2023 to consolidate and advance the Georgian blueberry industry.

Source: Developed by Ketevan Vardosanidze, local consultant, based on the websites and charters of the listed institutions.

3 EU Green Deal provisions and environmental standards

Relevant European Green Deal provisions

The **European Green Deal** is a package of policy initiatives that support the EU on the path to a green transition, with the ultimate goal of reaching climate neutrality by 2050. The Green Deal underlines the need for all policy areas to contribute to fighting climate change. It supports measures across economic sectors covering energy, transport, industry, agriculture, sustainable finance and more (European Council, 2025[61]; European Commission, n.d.[62]). The European Green Deal is an integral part of the European Commission's strategy to implement the United Nation's 2030 Agenda and the Sustainable Development Goals (SDGs) (European Commission, 2019[63]).

The European Green Deal notes that food production still results in air, water and soil pollution, contributes to the loss of biodiversity and climate change, and consumes excessive amounts of natural resources, while an important part of food is wasted (European Council, 2025[61]).

The Farm to Fork Strategy is a pillar of the European Green Deal which aims to make food systems more fair, healthy and environmentally friendly (European Commission, n.d.[64]; European Commission, 2020[65]). This strategy aims to reward farmers, fishers and other operators in the food chain who have already undergone the transition to sustainable practices, enable the transition for the others and create additional opportunities for their businesses (European Commission, 2020[65]). It states that farmers, fishers and aquaculture producers need to transform their production methods more quickly and make the best use of nature-based, technological, digital, and space-based solutions to deliver better climate and environmental results, increase climate resilience and reduce and optimise the use of inputs (e.g. pesticides, fertilisers) (European Commission, 2020[65]).

Relevant provisions of the EU Green Deal and the Farm to Fork Strategy

The key provisions of the **EU Green Deal and the Farm to Fork Strategy** with relevance for the horticultural sector include (European Commission, 2019[63]; European Commission, 2020[65])[29]:

[29] The PROGRESS project prioritises adaptation and resilience policy rather than mitigation policy. It does not focus on influence on consumer behaviour, carbon sequestration, bio-energy, and energy efficiency. The list includes some items that are not within the project scope but of importance to the horticultural sector overall. The list also covers matters on green finance, which are covered by Output IV of the PROGRESS project.

- **Sustainable practices in national strategic plans under the Common Agricultural Policy (CAP):** National strategic plans[30] should lead to the use of sustainable practices such as precision agriculture, organic farming, agro-ecology, and agro-forestry. They will need to reflect an increased level of ambition to reduce significantly the use and risk of chemical pesticides, as well as the use of fertilisers and antibiotics.
- **Tackle climate change** in the agricultural sector (mitigate climate change and adapt to its impacts).
- **Reduced use of pesticides, fertilisers and antibiotics**: Strategic plans will reflect an increased level of ambition to reduce significantly the use and risk of chemical pesticides, as well as the use of fertilisers and antibiotics.
    - Measures to **reduce chemical pesticide risks** which contribute to soil, water and air pollution, and biodiversity loss include:
        - IPM and safe alternative ways to protect the harvest from pests and diseases other than chemical pesticides (e.g. crop rotation, mechanical weeding)
        - biological pesticides
        - better environmental risk assessment of pesticides
        - improved data on pesticides
        - a faster pesticide authorisation process.
    - **Reduction in the use of fertilisers** by:
        - implementing and enforcing relevant environmental and climate legislation
        - applying balanced fertilisation and sustainable nutrient management
        - managing nitrogen and phosphorus better throughout the lifecycle
        - precise fertilisation techniques and sustainable agricultural practices.
- **Organic farming**: The area under organic farming will need to increase. It will be promoted through actions such as stimulation of supply and demand, promotion campaigns and green public procurement.
- **Protection against pests and diseases**: The EU needs to develop innovative ways to protect harvests from pests and diseases.
- **Seed security and diversity**: Farmers need to have access to a range of quality seeds for plant varieties adapted to the pressures of climate change. There is a need for registration of seed varieties, including for organic farming and easier market access for traditional and locally-adapted varieties.
- **Research and innovation**: Research and innovation is a key driver for accelerating the transition to sustainable, healthy and inclusive food systems from primary production to consumption. There is a need to consider the potential role of new innovative techniques to improve the sustainability of the food system while ensuring that it is safe. Innovative techniques, including biotechnology and the development of bio-based products, may play a role in increasing sustainability.

[30] It remains unclear if there will be new strategic plans. The proposed CAP regulation will be part of the National and Regional Partnership Fund 2028-2034 (European Commission, n.d.[76]).

- **Reduction of food loss and waste**: Measures to reduce food loss and waste include legally binding targets, quantification of food waste levels, investigation and prevention of food losses at the production stage, and appropriate date marking (use by and best before dates) etc.
- **Carbon sequestration** by farmers, which should be rewarded.
- **Circular bio-based economy** e.g. bio-refineries that produce bio-fertilisers, protein feed, bioenergy and bio-chemicals.
- **Renewable energy**: Biogas production from the food and beverage industry, solar panels etc.
- **Stimulating sustainable food processing, wholesale, retail, hospitality and food services practices:**
    - **Energy efficiency**, to reduce the environmental footprint and energy consumption.
    - **Reducing packaging** according to the Circular Economy Action Plan. As part of the initiative to harmonise separate collection systems, the Commission will assess the feasibility of EU-wide labelling that facilitates the correct separation of packaging waste at source. Further, the Commission will also establish rules for the safe recycling into food contact materials of plastic materials other than polyethylene terephthalate (European Commission, 2020[66]).
    - **Improvement of the corporate governance framework**, including a requirement for the food industry to integrate sustainability into corporate strategies.
    - **Circular business models in food processing and retail**, including specifically for small and medium-sized enterprises (SMEs); e.g. making use of food waste.
    - **Food packaging**: Revision of food contact materials legislation to improve food safety and public health (in particular, in reducing the use of hazardous chemicals), use of innovative and sustainable packaging solutions using environmentally friendly, re-usable and recyclable materials, food waste reduction such as reusable packaging etc.
    - **Revision of marketing standards** to provide for the uptake and supply of sustainable agricultural products.
    - **Creation of shorter supply chains through** a reduction of dependence on long-haul transportation.
- Protecting land, soil, water, air, plant and animal health and welfare and reversal of **biodiversity** loss.
- **Enforcement of legislation**, including on pesticide use and environmental protection.
- **Certification and labelling** of sustainability performance of food products and **targeted incentives.**
- **Access to fast broadband internet**: This will enable precision farming and the use of AI, leading to better soil management and water quality as well as a reduction in the use of fertilisers, pesticides and GHG emissions.
- **Advisory services**: there is a need for objective, tailored advisory services for all actors in the food system.

- **Investments** are key to encourage innovation and create sustainable food systems[31].
- **Targeted support for SMEs:** Specific tailored solutions are required for SME food processors and small retail and food service operators, to help them develop new skills and business models while avoiding administrative and cost burdens.

Importantly, the EU aims to support the global transition to sustainable agri-food systems, including through **international co-operation** and **trade** policy. The EU will seek to ensure that all EU bilateral trade agreements have a robust sustainability chapter. The EU's trade policy will seek to obtain ambitious commitments from third countries in areas such as the use of pesticides and antimicrobial resistance (European Commission, n.d.[64]).

Relevant provisions of the EU Adaptation Strategy

The new **EU Adaptation Strategy** is part of the European Green Deal. It states that its adaptation action will be implemented in an integrated manner with the other European Green Deal initiatives, including the Farm to Fork Strategy, the Soil Strategy, the Circular Economy and Zero Pollution Action Plans and the Biodiversity Strategy (European Commission, 2021[67]). The key relevant provisions include:

- The importance of the **private and the public sector to work more closely together**, especially on financing adaptation.
- Adaptation **awareness and planning** would be spread to every single local authority, company and household.
- There is a need to **expand adaptation knowledge**, and acquire more and better climate-related data, especially on economic losses. Dialogue between policy makers and scientists needs to be promoted, and improvements in modelling are needed.
- The **digital transformation** is critical to achieving Green Deal objectives: The use of latest technologies and climate services to underpin decision-making must be promoted (for example, remote sensing, smart weather stations, AI and high-performance computing).
- **Climate resilience considerations must be mainstreamed in all relevant policy fields** applicable to public and private sectors, to support the development and adaptation strategies and plans at all levels of government. **Adaptation strategies at all levels must be effective and based on the latest science**.
- **Monitoring, reporting and evaluation are essential** to setting a robust baseline against which to measure progress on adaptation.
- **Achieving resilience in a just and fair way is essential** so that the benefits of climate adaptation are widely and equitably shared. Adaptation measures need to consider the needs of men and women, older people, persons with disabilities, displaced persons, or socially marginalised groups. Support is needed for education, training and reskilling initiatives that lead to green jobs.
- **Budgetary planning, governance and institutional arrangements need to reflect disaster risk management** (including processes and tools to address ex-ante climate related risks and reducing ex-post disaster consequences).

[31] This topic falls under PROGRESS Output IV.

- **Implementing nature-based solutions on a larger scale** would increase climate resilience and contribute to multiple Green Deal objectives. For example, **promoting and sustainably managing forests and farmland** will help adapt to climate change in a cost-effective way. It is vital to better quantify their benefits and to better communicate them to decision-makers and practitioners at all levels to improve take-up.
- To accelerate adaptation action, **implementation requires resources** that are commensurate with the challenge.
- **Solutions are urgently needed to help farmers and land managers** tackle climate risks. **Supply of suitable high-quality plant reproductive material** to support adaptation in agriculture, forestry and land ecosystem management should be facilitated and broadened. More work is needed to encourage **collaborative, transnational production and transfer of seeds and planting material**.
- **Climate resilience decision support systems and technical advice** must become more accessible and rapid to foster their take-up. Such solutions would have to work on a timescale and with resources available for the financial sector, SMEs or small farmers.
- Climate adaptation action must better leverage synergies with broader work on **disaster risk prevention and reduction**.
- Ensuring that **freshwater is available** in a sustainable manner is fundamental for climate resilience. A wider use of **drought management plans**, measures to **increase the water retention capacity of soil and safe water reuse** should be promoted. In agriculture, **a knowledge-based approach**, as well as both **high tech and nature-based solutions** are necessary to ensure a sustainable use of water. Member States can support **precision farming** via national CAP Strategic Plans. Member States must also ensure that **water is priced correctly**, in line with the Water Framework Directive, so that consumers are not mislead about the real cost of food.
- A **stable and secure supply of drinking water is of highest importance** and it must be guaranteed. It is **important to include climate impacts** in the risk analyses of (drinking) water management plans, develop water-monitoring technologies and ensure minimum river flow. Similarly, **it is important to maximise the capacity of soils to purify water** and reduce pollution.

EU environmental standards for fruit and vegetable imports

Imported food that does not comply with relevant EU environmental standards is not allowed on EU markets (European Commission, n.d.[64]). EU market requirements include mandatory requirements set in European regulations and non-mandatory private regulations set by buyers (certifications) (CBI, 2023[68]).

Mandatory requirements

Mandatory requirements apply to food safety and quality, including:

- **Limited use of pesticides** according to a regularly updated list of Maximum Residue Levels (MRLs) of pesticides. Some EU Member States apply stricter rules to pesticide levels than is required by European legislation, including supermarket chains in the Netherlands, Austria and Germany (CBI, 2023[68]). The EU pesticide database provides information on relevant MRLs for specific products.

- **Limits on contaminants** (substances that are not added to food on purpose but appear from various sources such as agricultural practices, pollution, packaging, transport and holding or occur naturally as "inherent plant toxins") such as chemicals (e.g. heavy metals, nitrate and perchlorate). Rules for raw and processed fruits and vegetables may vary (CBI, 2023[68]).
- **An HACCP Plan** to supply pre-cut fresh fruits and vegetables, to **control microbiological hazards** (viruses, parasites and bacteria) through the processing and packaging process. The buyer must be informed if there is a power cut during storage (CBI, 2023[68]).
- **A phytosanitary certificate** for most fruits and vegetables, guaranteeing that the products are free from quarantine pests and other pests. This certificate is usually issued by the exporting country's plant protection authorities (CBI, 2023[68]). The EU phytosanitary requirements are in line with the World Trade Organisation and other international rules (European Commission, n.d.[69]).

General marketing standards (GMS) for quality and maturity (CBI, 2023[68]). The OECD Fruit and Vegetables Scheme has developed 31 explanatory brochures on the marketing standards (e.g. the one on apricots is available here). The United Nations Economic Commission for Europe (UNECE) also has explanatory brochures (UNECE, n.d.[70]). It is better to aim even higher than the GMS to overcome the competition. The FAO publishes additional marketing standards for fruits and vegetables (Codex Alimentarius) (FAO and WHO, n.d.[71]).

- **Traceability** of products according to the General Food Law Regulation, with the **proof of origin** document required for all fruits and vegetables (CBI, 2023[68]).
- **Labelling and packaging:**
    - **Labelling** must adhere to EU legislation on food labelling. There are rules on labelling cartons of fresh fruits and vegetables as well as those that are processed or directly packed for consumption (CBI, 2023[68]). Stricter regulations on the **use of plastic in packaging** are expected.
    - **Packaging requirements** aim to protect the environment and prevent risk to the health of consumers. Packaging must protect the product against contamination, leakage or dehydration (CBI, 2023[68]).

It is important to keep abreast of EU regulations which are regularly updated. Products are submitted to compulsory tests at an entry point, which can include a check of phytosanitary certificates/documents; physical checks to ensure that they are free from harmful organisms; identity checks to ensure that they correspond to certification; and inspections to check for harmful organisms (CBI, 2023[68]).

Non-mandatory certifications

The main **non-mandatory certifications** include:

- Global Agricultural Practices (Global G.A.P.) is a private, voluntary certification used by most buyers of fresh fruits and vegetables in the EU, especially in northern Europe and in supermarkets. Global G.A.P. includes standards on sustainable production practices and environmental protection, including crop management, as well as worker health and safety (CBI, 2023[68]).

- International Food and Safety Standard is a food safety management system dedicated to food safety and quality. Developed by Germany and France, it is widely recognised by food manufacturers and retailers in Europe (CBI, 2023[68]).
- British Retail Consortium Global Standards (BRCGS) include a Retail and Safety Certification for companies in the food retail supply chain. The standards help companies and their customers meet legislative requirements for food and product safety. BRCGS are used in the United Kingdom but are also common in mainland Europe (CBI, 2023[68]).
- The Rainforest Alliance Certification applies to some fruits, including apricots and raspberries. The standard has detailed criteria for environmental, social and economic sustainability. It is used in large retail chains in northwestern Europe (CBI, 2023[68]).
- Fairtrade Standards incorporate social, economic and environmental criteria. They cover fresh fruits including apricots and raspberries. These standards apply to the realities of farmer co-operatives, workers at large farms or factories, artisanal miners, as well as traders and companies who buy and sell Fairtrade products. These standards are not at the top of the list for buyers because of complex requirements and high costs (CBI, 2023[68]).
- **Organic certification** is applied throughout the EU, with all European countries having their own national organic labels (CBI, 2023[68]).
- International Organization for Standardization (ISO) 14001 for Environmental Management is an internationally recognised standard that provides a framework for organisations to design and implement an Environmental Management System (EMS). An EMS would help organisations ensure that they take steps to minimise their environmental impact, comply with legal requirements and achieve environmental objectives. It comprises many aspects, including the use of resources, waste management, monitoring of environmental performance, and involvement of stakeholders in environmental commitments (ISO, 2023[72]).
- Safe Quality Food (SQF) provides an independent and external verification that a product, process and service complies with international, regulatory and other standards that enable a food producer to show that food has been produced, prepared and handled according to the highest possible standards. SQF certified sites span more than 40 countries (SQF, n.d.[73]).
- FSSC 22000 provides a certification for the food manufacturing industry and the related supply chain to ensure food safety standards and processes.

Some multinational buyers in Western Europe have their **own compliance programmes**, such as Unilever's Sustainable Agriculture Code that applies to all Unilever suppliers of agricultural goods, farmers that produce these goods and contractors working on the form.

4 Conclusions and initial policy gaps

Georgia and its agricultural sector are increasingly vulnerable to the adverse effects of climate change. Agriculture is a key pillar of Georgia's economy and the country's largest employer, accounting for 40% of total employment in 2023, while also being the sector most in need of adaptation measures. Georgia is already experiencing the impacts of climate change, including rising average temperatures, more frequent and severe heatwaves, altered precipitation patterns, higher wind speeds, increased frequency of extreme weather events and land degradation.

Georgia has advanced legislation and programmes in several key areas of climate change adaptation in agriculture. It already had several policy documents to steer climate change adaptation and is currently preparing a NAP, expected to be finished in 2027. It also plans to set up a MHEWS and has already enhanced the network of agrometeorological stations. Several channels provide extension and advisory services, including the RDA's one-stop-shop information centers and technical assistance, the EIEC's agrarian education, the UNDP-funded GECSA pilot advisory services, and the GFA's training and information sessions. The RDA moreover supports the deployment of climate adaptation and innovative agricultural technologies by farmers, including drip and sprinkler irrigation systems. Some legislation in Georgia promotes agricultural innovation, including the Law on Agriculture and Rural Development, the Law on Soil and the 2023 Law on Water Resources Management which aims to enhance soil conservation through scientific and technological progress. In addition, the 2023 Law on Water Resources Management includes a comprehensive national framework for sustainable water practices and for flood risk management. There is also legislation in place for seed and planting material production, certification, traceability, import and sales, as well as a national crop variety catalogue.

Georgia has also made notable progress in approximating some key aspects of the EU Green Deal. It is actively advancing its legislation on organic agriculture through a forthcoming technical regulation on organic production and labelling of organic products, and targeted support programmes. It approved a list of authorised substances for use in organic production in 2024, further aligning Georgia with the EU Acquis. Additionally, a well-established policy framework for the sustainable use of pesticides and fertilisers is already in place. It is complemented by a 2021 decree on sustainable pesticides and the 2025-29 national action plan, envisaged training and IPM. Environmental standards and certification are reinforced through existing legislation on environmental protection and requirements for food production and processing as well as mandatory HACCP certification.

The report identified several policy gaps in the policy frameworks for climate change adaptation in agriculture and EU Green Deal approximation:

National Adaptation Plans

- Georgia should develop a cohesive national climate change adaptation policy (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]), including a NAP (which is currently under development) and a sector adaptation plan for agriculture, underpinned by a climate risk and vulnerability assessment for the sector.
- It should improve monitoring of the sustainability of implementation of adaptation strategies, as such monitoring is currently limited to assessing the progress of these strategies, with insufficient monitoring of their sustainability (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).
- Co-ordination across responsible institutions remains underdeveloped and should be promoted, including through the distribution of clear roles, responsibilities and mechanisms for collaboration.

Monitoring of climate change, disasters and EWS

- Georgia should establish an integrated EWS that is accessible, timely, and tailored to the needs of farmers and food processing companies.
- As the EWS is expected to be implemented across the country in the near future, it is recommended to improve the response time to address rapid events (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).
- The NEA and the Emergency Management Service of the Ministry of Internal Affairs require better technical capacity and resources for monitoring and EWS operation (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).

Extension and advisory services

- Extension and advisory services mainly focus on providing information about governmental agricultural programmes and assisting farmers with accessing state support. They should strengthen their capacity and expertise to be able to also address climate impacts and adaptation topics.
- Farmers' access to information on environmentally sustainable practices and technologies as well as on seeds, fertilisers and pesticides should be expanded. Most of the farmers in Georgia obtain practical advice and information on seeds, fertilisers and pesticides as well as their use from agricultural shops.

Climate resistant seeds and plant varieties

- Use of climate resistant seeds and plant varieties should be promoted through a dedicated legal requirement to indicate climate resilience on such varieties, systematic awareness-raising measures and targeted government programmes to inform farmers about the benefits and availability of climate-resistant varieties.

Water and land

- Georgia currently lacks drought and flood management plans, which need to be developed. Better access to and efficiency of irrigation systems must be ensured.
- A strategy for wastewater reuse for agriculture should be developed.
- The EU Floods Directive and the EU Nitrates Directive could provide useful guidance.

Pest and disease management, pesticide and fertiliser use

- The in-country laboratory testing capacity does not yet correspond to the EU Acquis on SPS and food safety. Its capacity should be strengthened to enable it to conduct extensive analyses of active ingredients.
- Implementation of pesticide and fertiliser legislation is poor, resulting in excessive and often unsafe application. The main areas for improvement are training of farmers and monitoring, inspection and enforcement.
- EC Regulation No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market should be fully transposed and implemented.

Climate change innovation

- There is a need for better adoption of new technologies and innovations for climate change adaptation in agriculture, notably to address land degradation, restoration and efficiency as well as to improve crop yields (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).
- Georgia should address key barriers to effective implementation of new technologies and innovations in the agricultural sector, including the limited knowledge, awareness and qualifications among farmers (Ministry of Environmental Protection and Agriculture of Georgia, 2024[4]).

Standards

- Better information on new regulations on food safety and plant protection should be provided to agricultural producers and exporters (ISET Policy Institute, 2023[12]).

Agricultural co-operatives

- Agricultural co-operatives will benefit from better access to information and skilled labor; appropriate government regulations; access to inputs, capital and technology; insurance from natural disasters as well as support to market access such as better infrastructure and credit/finance (Rural Communities Developmetn Agency, 2017[74]).

Bibliography

Agricultural Scientific Research Centre (n.d.), *National Catalogue of Varieties of Agricultural Crops Allowed for Distribution on the Territory of Georgia*, https://gpvc.srca.gov.ge/catalogue/ (accessed on 22 December 2025). [46]

Bochorishvili, E., M. Chakhvashvili and D. Mujirishvili (2023), *Blueberry Business in Georgia*, Galt and Taggart, https://ramad.bog.ge/galt/blueberry-business-in-georgia_eng_0.pdf (accessed on 16 January 2026). [18]

CBI (2023), *What Requirements Must Fresh Fruit and Vegetables Comply with to be Allowed on the European Market?*, https://www.cbi.eu/market-information/fresh-fruit-vegetables/buyer-requirements (accessed on 16 January 2026). [68]

EastFruit (2021), *Horticulture of Georgia 2020: Surging exports of nuts, apples, blueberries, peaches, and mandarins*, https://east-fruit.com/en/news/horticulture-of-georgia-2020-surging-exports-of-nuts-apples-blueberries-peaches-and-mandarins/? (accessed on 11 August 2025). [20]

EastFruit (2020), *Georgia will be a new California of global almond production – Ashish Kapur*, https://east-fruit.com/en/trending/georgia-will-be-a-new-california-of-global-almond-production-ashish-kapur/ (accessed on 19 August 2025). [21]

EU4Climate (2020), *What Does the Georgian Population Think about Climate Change: Quantitative Survey*, https://www.undp.org/georgia/publications/what-georgians-know-about-climate-change-2020#:~:text=Key%20findings%3A,the%20consequences%20of%20climate%20change (accessed on 16 January 2026). [75]

European Commission (2024), *Georgia 2024 Report*, https://enlargement.ec.europa.eu/document/download/7b6ed47c-ecde-41a2-99ea-41683dc2d1bd_en?filename=Georgia%20Report%202024.pdf. [56]

European Commission (2024), *GHG Emissions of All World Countries (2025 report)*, https://edgar.jrc.ec.europa.eu/report_2025#emissions_table. [1]

European Commission (2021), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Forging a Climate-Resilient Europe - the New EU Strategy on Adaptation to Climate Change*, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082 (accessed on 16 January 2026). [67]

European Commission (2020), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Farm to Fork Strategy for a Fair, Healthy and Environmentally-Friendly Food System*, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381 (accessed on 16 January 2026). [65]

European Commission (2020), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A New Circular Economy Action Plan for a Cleaner and More Competitive Europe*, https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF (accessed on 16 January 2026). [66]

European Commission (2019), *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee on the Regions: The European Green Deal*, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52019DC0640. [63]

European Commission (n.d.), *European Green Deal*, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en (accessed on 16 January 2026). [62]

European Commission (n.d.), *Farm to Fork Strategy*, https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en (accessed on 16 January 2026). [64]

European Commission (n.d.), *The CAP post-2027 in the next EU budget*, https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-post-2027-next-eu-budget_en (accessed on 16 January 2026). [76]

European Commission (n.d.), *The EU: A Common Market for Plants and Plant Products*, https://food.ec.europa.eu/system/files/2016-10/ph_biosec_non-eu-trade_factsheet_open-market_plants-products.pdf (accessed on 16 January 2026). [69]

European Council (2025), *European Green Deal*, https://www.consilium.europa.eu/en/policies/european-green-deal/#:~:text=The%20European%20Green%20Deal%20is,reaching%20climate%20neutrality%20by%202050. (accessed on 16 January 2026). [61]

European Parliament (2024), *Joint statement on the Georgian government's decision to pause its accession to the European Union*, https://www.europarl.europa.eu/delegations/en/joint-statement-on-the-georgian-governme/product-details/20241129DPU39689 (accessed on 11 August 2025). [55]

European Union and the Government of Georgia (2014), *Association Agreement*, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:22014A0830(02) (accessed on 16 January 2026). [54]

FAO (2022), *Comprehensive analysis of the disaster risk reduction system for the agricultural sector in Georgia*, https://doi.org/10.4060/cb8450en. [3]

FAO and WHO (n.d.), *Codex Alimentarius - International Food Standards*, https://www.fao.org/fao-who-codexalimentarius/en/?committee=CCEXEC. [71]

Georgia Amelioration (2024), *Tamaz Mgebrishvili presented a report to the Committee on Agrarian Issues*, https://www.ag.ge/En/News/25128? (accessed on 11 August 2025). [10]

Georgian Farmers Association (2017), *Almond Market Research*, https://gfa.org.ge/docs/nushis-bazris-kvleva/ (accessed on 11 August 2025). [22]

Government of Georgia (2023), *Technical regulations – on the labeling of organic (biological, environmental) production rules and organic (biological, environmental) products*, https://matsne.gov.ge/ka/document/view/5781518?publication=0 (accessed on 16 January 2026). [47]

Government of Georgia (2021), *Georgia's Updated Nationnally Determined Contribution (NDC)*, https://unfccc.int/sites/default/files/NDC/2022-06/NDC%20Georgia_ENG%20WEB-approved.pdf (accessed on 16 January 2026). [25]

Government of Georgia (2021), *Resolution No. 618 on On Approval of the Technical Regulation on Almonds*, https://faolex.fao.org/docs/pdf/geo209899.pdf (accessed on 16 January 2026). [23]

Government of Georgia (2014), *Decree on the Approval of the Types and Fees of Services Provided by the Legal Entity under Public Law called the National Environmental Agency of the Ministry of Environmental Protection and Agriculture of Georgia*, https://www.matsne.gov.ge/ka/document/view/2465275?publication=0 (accessed on 16 January 2026). [31]

Government of Georgia (2012), *Code on Food/Feed Safety, Veterinary, and Plant Protection*, https://nfa.gov.ge/Ge/Files/ViewFile/5800 (accessed on 16 January 2026). [52]

Green Climate Fund (n.d.), *Scaling-up Multi-Hazard Early Warning System and the Use of Climate Information in Georgia*, https://www.greenclimate.fund/project/fp068 (accessed on 11 August 2025). [33]

Heinrich Boell Foundation (2024), *Pesticide Use in Georgia: What Do We Need to Know for Safer and Environmentally Friendly Agricultural Production and Consuption?*, https://ge.boell.org/en/2024/02/16/pestitsidebi-sakartveloshi (accessed on 16 January 2026). [50]

IMF (2022), *Georgia Technical Assistance Report - Updating the Balance Sheet and Quantifying Fiscal Risks from Climate Change*, https://www.imf.org/en/Publications/CR/Issues/2022/05/27/Georgia-Technical-Assistance-Report-Updating-the-Balance-Sheet-and-Quantifying-Fiscal-Risks-518383. [7]

ISET Policy Institute (2023), *Agricultural Exports to the EU: Does Public Sector Support Have a Say?*, https://iset-pi.ge/storage/media/other/2023-05-31/bd4d1440-ff82-11ed-820b-738e30c7551a.pdf (accessed on 16 January 2026). [12]

ISO (2023), *ISO 14001:2015, Environmental Management Systems – Requirements with Guidance for Use*, https://www.iso.org/standard/60857.html. [72]

ISO Consulting (2024), *The company has certified Blueberry from Georgia as GLOBALG. A.P and GRASP requirements*, https://www.isoconsulting.ge/single-post/%E1%83%99%E1%83%9D%E1%83%9B%E1%83%9E%E1%83%90%E1%83%9C%E1%83%98%E1%83%90%E1%83%9B-%E1%83%9A%E1%83%A3%E1%83%A0%E1%83%AF%E1%83%98-%E1%83%9B%E1%83%9D%E1%83%AA%E1%83%95%E1%83%98-%E1%83%A1%E1%83%90%E1%83%A5%E1%83%90%E1% (accessed on 11 August 2025). [53]

LEPL National Food Agency (2021), *From 1 June 2020, the introduction of HACCP principles will become mandatory in retail outlets*, https://nfa.gov.ge/En/News/Details/319/ (accessed on [51]

11 August 2025).

LEPL Scientific Research Centre on Agriculture (2025), , https://srca.gov.ge/en (accessed on 11 August 2025). [60]

LEPL State Agriculture Laboratory (2025), , https://sla.gov.ge/ (accessed on 11 August 2025). [59]

Ministry of Environmental Protection and Agriculture of Georgia (2024), *2024-2027 Agriculture and Rural Development Action Plan*, https://mepa.gov.ge/Ge/PublicInformation/34108 (accessed on 16 January 2026). [27]

Ministry of Environmental Protection and Agriculture of Georgia (2024), *Georgia's Fifth National Communication*, https://unfccc.int/sites/default/files/resource/5NC_Eng.pdf (accessed on 16 January 2026). [4]

Ministry of Environmental Protection and Agriculture of Georgia (2024), *Georgia's First Biennial Transparency Report to the UNFCCC*, https://unfccc.int/sites/default/files/resource/BTR_Eng_Printable.pdf. [5]

Ministry of Environmental Protection and Agriculture of Georgia (2022), *Fourth National Environmental Action Programme of Georgia for 2022-2026*, https://mepa.gov.ge/Ge/Files/ViewFile/53629 (accessed on 16 January 2026). [6]

Ministry of Environmental Protection and Agriculture of Georgia (2019), *Agriculture and Rural Development Strategy of Georgia 2021-2027*. [17]

National Statistics Office of Georgia (2025), *Statistical Publication Agriculture of Georgia 2024*, https://www.geostat.ge/en/single-archive/3428 (accessed on 16 January 2026). [14]

National Statistics Office of Georgia (n.d.), *2014 Agricultural Census Results: General Information on Agriculture Holdings*, https://www.geostat.ge/en/modules/categories/751/section-1-general-information-on-agricultural-holdings (accessed on 23 October 2025). [16]

Our World in Data - FAO (2025), *Almond yields, 1961 to 2023*, https://ourworldindata.org/grapher/almond-yields?tab=table#sources-and-processing (accessed on 11 August 2025). [19]

Parliament of Georgia (2024), *Agrarian Issues Committee Charter*, https://web-api.parliament.ge/storage/files/shares/Komitetebi/agraruli/agraruli-komiteti-debuleba-new.pdf (accessed on 16 January 2026). [57]

Parliament of Georgia (2024), *Agriculture and Rural Development Law*, https://www.matsne.gov.ge/ka/document/view/6192001?publication=0 (accessed on 16 January 2026). [26]

Parliament of Georgia (2023), *Georgian Agricultural Sector: Transformation and Developments over the Past Decade*, https://web-api.parliament.ge/storage/files/shares/Komitetebi/agraruli/publikacia/transformacia.pdf (accessed on 16 January 2026). [15]

Parliament of Georgia (2023), *Law of Georgia on Water Resource Management*, https://www.matsne.gov.ge/document/view/5846594?publication=0 (accessed on 16 January 2026). [30]

Parliament of Georgia (2019), *Law on Agricultural Land Ownership*, https://www.matsne.gov.ge/en/document/view/4596123?publication=0 (accessed on 16 January 2026). [44]

Parliament of Georgia (2018), *Law on Public Safety*, https://www.matsne.gov.ge/en/document/view/4243170?publication=2 (accessed on 16 January 2026). [32]

Parliament of Georgia (2017), *Law of georgia on permission for the distribution of agricultural plant species subject to mandatory certification and on seed production*, https://www.matsne.gov.ge/en/document/view/3695226?publication=1 (accessed on 16 January 2026). [45]

Parliament of Georgia (2003), *The Law on Soil Conservation and the Restoration and Improvement of Soil Fertility*, https://matsne.gov.ge/en/document/view/14938?publication=10 (accessed on 16 January 2026). [42]

Parliament of Georgia (1999), *Law on Ambient Air Protection*, https://matsne.gov.ge/ka/document/view/16210?publication=25 (accessed on 16 January 2026). [29]

Parliament of Georgia (1998), *Law on Pesticides and Agrochemicals*, https://www.matsne.gov.ge/en/document/view/18106?publication=9 (accessed on 16 January 2026). [49]

Parliament of Georgia (1996), *Environmental Protection Law*, https://www.matsne.gov.ge/document/view/33340?publication=33. [28]

Parliament of Georgia (1994), *Law on Soil Protection*, https://www.matsne.gov.ge/document/view/93874?publication=9 (accessed on August 2025). [43]

Parliament of Georgia (n.d.), *Environmental Protection and Natural Resources Committee Charter*, https://web-api.parliament.ge/storage/files/shares/Komitetebi/garemo/garemo-komiteti-debuleba-new.pdf. [58]

Rural Communities Developmetn Agency (2017), *Agricultural Cooperatives in Georgia*, https://www.yenkoop.org/wp-content/uploads/2018/08/en_coops_in_georgia.pdf (accessed on 23 December 2025). [74]

Rural Development Agency (2023), *The Rural Development Agency will offer a new extension package to farmers in pilot, Kakheti and Shida Kartli*, https://www.rda.gov.ge/en/articles/news/881251-sophlis-ganvitarebis-saagento-sapiloted-kakhetsa-da-shida-qartlshi-akhal-saeqstentsio-pakets-shestavazebs-phermerebs (accessed on 11 August 2025). [35]

Rural Development Agency (n.d.), *Bioproduction Promotion Program*, https://www.rda.gov.ge/en/programs/bioprodution/e53f6a04-d9d4-4ad6-8ae6-c4da707c38b2 (accessed on 11 August 2025). [48]

Rural Development Agency (n.d.), *Co-financing Programme for Storing Berry Crops for Agricultural Cooperatives*, https://www.rda.gov.ge/programs/cooperatives-berries/9671e5f6-cb57-4c74-8648-1c954dad07a1 (accessed on 11 August 2025). [41]

Rural Development Agency (n.d.), *Consulting Service*, [37]

https://www.rda.gov.ge/en/contact/consulting (accessed on 11 August 2025).

Rural Development Agency (n.d.), *Introduce the Future*, https://www.rda.gov.ge/programs/305853-danerge-momavali/ca9c173d-887a-4ce8-a891-7988e9311c88 (accessed on 11 August 2025). [39]

Rural Development Agency (n.d.), *Programme for facilitating the production of agricultural products on the plots provided by irrigation*, https://www.rda.gov.ge/programs/629860-irigatsiit-uzrunvelkophil-mitsis-nakvetebze-sophlis-meurneobis-produqtsiis-tsarmoebis-khelshetskobis-programa/3695cdcc-f017-4d66-a366-fa597f575822 (accessed on 11 August 2025). [40]

Rural Development Agency (n.d.), *Programmes*, https://www.rda.gov.ge/en/programs (accessed on 11 August 2025). [38]

SQF (n.d.), *What Is SQF?*, https://www.sqfi.com/our-program/what-is-sqf (accessed on 16 January 2026). [73]

UNDP (n.d.), *Reducing the risk of climate-driven disasters in Georgia*, https://www.undp.org/georgia/projects/climate-change-disasters. [34]

UNDP; GCF; Government of Georgia, Government of Sweden and Government of Switzerland (2022), *Analysis of Legal and Regulatory Framework for Disaster Risk Knowledge Component of Multi-Hazard Early Warning System in Georgia*, https://www.undp.org/sites/g/files/zskgke326/files/2022-06/undp-georgia-hazards-legal%20review-2022_eng.pdf (accessed on 16 January 2026). [36]

UNECE (n.d.), *Brochures and Posters*, https://unece.org/trade/wp7/brochures-and-posters (accessed on 16 January 2026). [70]

University of Notre Dame (2025), *ND-GAIN Country Index (ND-GAIN)*, https://gain-new.crc.nd.edu/country/georgia (accessed on 7 August 2025). [2]

Westminster Foundation for Democracy (2023), *Climate Change and Environmentally Focused Nationwide Opinion Poll on Knowledge, Perception, Attitudes, Behavior and Desired Policies*, https://www.wfd.org/what-we-do/resources/public-opinion-environmental-and-climate-change-issues-georgia (accessed on 16 January 2026). [77]

WFD; UKAID; Georgian Parliament (2023), *A Climate Law for Georgia: A White Paper Proposing the New Law*, https://web-api.parliament.ge/storage/files/shares/Komitetebi/garemo/White-Paper-WDF-ENG.pdf (accessed on 16 January 2026). [24]

World Bank (2024), *Agriculture, forestry, and fishing, value added (% of GDP)*, https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS (accessed on 3 June 2025). [11]

World Bank (2023), *Employment in Agriculture (% of total employment) (modelled ILO estimate)*, https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS (accessed on 3 June 2025). [13]

World Bank (2022), *Agricultural land (% of land area)*, https://data.worldbank.org/indicator/AG.LND.AGRI.ZS. [9]

World Bank (2022), *Agriculture, Water, and Land Policies to Scale Up Sustainable Agri-Food Systems in Georgia: Synthesis Report and Way Forward.*, World Bank, https://openknowledge.worldbank.org/server/api/core/bitstreams/b8f63c85-23d5-55c6-bc80-98a3419e7194/content (accessed on 16 January 2026). [8]

World Bank (n.d.), *Metadata Glossary*, https://databank.worldbank.org/metadataglossary/world-development-indicators/series/AG.LND.AGRI.ZS? (accessed on 16 January 2026). [78]