ევროკავშირი საქართველოსთვის
The European Union for Georgia

Project:

Elaboration of Climate Mainstreaming Recommendations for Energy, Agriculture and Health Sectors of Georgia

Deliverable 3:

Climate Mainstreaming Recommendations for Energy, Agriculture and Health Sectors of Georgia – Baseline Survey

Tbilisi

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Project implemented by organization “Environment and Development”

ABBREVIATIONS

AUG	Agricultural University Of Georgia
BAG	Business Association of Georgia
DCE	Direct consumers of Electricity
EBRD	European Bank for Reconstruction and Development
ECUAC	Emergency Situations Coordination and Urgent Assistance Center
EIEC	Environmental Information and Education Centre
EMA	Emergency Management Agency (Ministry of Internal Affairs)
EP	Electricity Producers
ESCO	Electricity Market Operator
FA	Farmer's Associations
GAAS	Georgian Academy of Agricultural Sciences
GEDF	Georgian Energy Development Fund
GGTC	Georgian Gas Transportation Company
GIZ	German Society for International Cooperation
GNERC	Georgian National Energy and Water Regulatory Commission
GoG	Government of Georgia
GREDA	Georgian Renewable Energy Development Association
GSE	Georgian State Electrosystem
GTU	Georgian Technical University
IO/D	International organizations / Donors
LCNG	Large Consumers of Natural Gas
LSG	Local Self Governments
MEPA	Ministry of Environment Protection and Agriculture
MESD	Ministry of Economy and Sustainable Development
MIA	Ministry of Internal Affairs
MoF	Ministry of Finance
MOH	Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs of Georgia
MRDI	Ministry of Regional Development and Infrastructure
NCDC(&PH)	National Center for Disease Control and Public Helath
NEA	National Environment Agency

NGOs	Non Government Organisations
NDC	Nationally determined contribution
PA	The Parliament of Georgia
PPPA	Public and Private Partnership Agency
RC	Red Cross
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WHO	World Health Organization (WHO)
WB	World Bank

TABLES

DIAGRAMS

CONTENTS

1. INTRODUCTION

The EU4Climate Project helps governments in the six EU Eastern Partner countries - Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine - to take action against climate change. It supports countries in implementing the Paris Climate Agreement and improving climate policies and legislation. Its ambition is to limit climate change impact on citizens lives and make them more resilient to it. EU4Climate is funded by the European Union (EU) and implemented by the United Nations Development Programme (UNDP).

The sub-project "Elaboration of Climate Mainstreaming Recommendations for Energy, Agriculture and Health Sectors of Georgia" of the above mentioned project is financially supported by UNDP and implemented by the NGO "Environment and Development". The project aims to assist UNDP and the Ministry of Environmental Protection and Agriculture of Georgia (MoEPA) in identifying the priority directions for climate mainstreaming in energy, agriculture and health sectors and based on identified and agreed priorities develop specific sectoral recommendations and pathways for climate mainstreaming.

The overall objective of the project: to design and conduct the review and analysis of the national policies, strategies and pogrammes, legal and regulatory framework and development plans in the energy, agriculture and health sectors in order to identify priority direction and develop recommendations for mainstreaming of climate change considerations into the respective sectors planning processes.

Specific aim of the project:

- Review established or on-going development policies, strategies, programs and plans in the energy, agriculture and health sectors from a climate change perspective and to ascertain their alignment with local, national and international priorities to facilitate the mainstreaming of climate change into respective sectors;
- Identify and analyze opportunities and challenges as well as priority directions for mainstreaming climate change into the energy, agriculture and health sector's policies, strategies, programs and plans and based on identified opportunities, challenges and priorities provide specific recommendations towards strengthening them from a climate change perspective.

This report presents the results of the activities carried out under the second report defined by the technical assignment within the project. This stage of the project involved:

- Identify and analyze stakeholders in the energy, agriculture and healthcare sectors (Activity 2.1);
- Identify established or on-going development programmes, policies & strategies and plans to be mainstreamed during consultations with relevant sector institutions and agencies (Activity 2.2);
- Review the identified development policies, strategies, programs and plans, as well as existing institutional and regulatory frameworks in the energy, agriculture and health sectors (Activity 2.3);
- Screen the energy, agriculture and health sector development policies, strategies, programs and plans to determine their alignment with local, national and international priorities for climate change mainstreaming to highlight any existing or potential conflicts, contradictions or gaps that may exist (Activity 2.4).
- Creating a climate change risk profile for Georgia's energy, agriculture and health sectors (Activity 2.1).

The results of the listed activities are reflected in the relevant chapters of the report below. In particular, the second chapter of the report describes the methods and approaches used to perform each stage of the assessment/activity; The third chapter is a general, introductory section that provides information on the general framework for a country's climate change, including a key policy framework, international treaties and a brief description of the obligations under these treaties that define the main context for combating climate change and its consequences.The fourth chapter introduces the sector stakeholders and their analysis through the power-interest matrix; The fifth chapter of the report is devoted to the analysis of the political

context (international commitments, policy and strategic level documents) of the assessment sectors (energy, agriculture, healthcare) and legislative and institutional framework to reflect aspects of climate change within it. The sixth section presents the country's climate change risk profile in the target sectors; The seventh, concluding chapter summarizes the evaluation process and identifies the recommended areas that the project implementation team will work on in the later stages of the project.

The peculiarity of the report is the fact that it contains the results of the evaluation of separate/different sectors. Accordingly, the sectors mentioned in each subsection and the results of their evaluation are presented independently, albeit in accordance with a common approach and structure.

2. METHODOLOGY

The main goal of the project, as mentioned, is to identify the directions of sectoral priorities in the energy, agriculture and health sectors and to develop relevant recommendations, the implementation of which will ensure the actualization/strengthening of climate change issues in the priority areas of the target sectors.

The achievment of this goal is thought, in terms of target sectors, through detailed analysis of international commitments of the country as well as high ranking documents (policies, strategies, programs), existing legal framework and institutional framework and the development of relevant recommendations based on the analysis. Based on this approach, the project implementation process naturally involved an independent evaluation of each sector direction by an expert in the relevant field, which was carried out within the given evaluation. The target sectors of the project - energy, agriculture and health - were evaluated independently by experts in each area, and finally the results obtained in all three areas were compiled into a single, consolidated report.

At the initial stage of the evaluation, a process implementation methodology was developed by an expert from all three target sectors, which was agreed upon and eventually developed as a unified approach.

Below Table 1 provides a detailed description of methods used to assess all three sectoral areas.

Table 1: Methods used in the evaluation process

Research / Assessment Component	Method	Context
Identify sectoral stakeholders and stakeholders analyses	• Literature review • Desk study; • Interviews; • Online research; • Develop an power-interest matrix	• Identify all the agencies / institutions / specific individuals that have / interest or influence in a particular sector in terms of climate change. • Stakeholders were identified by sectors: government, non-governmental and all others (academy, independent experts, media representatives); Primary interviews were used to clarify this list • evelopment of stakeholder influence(power)-interest matrix according to their relation to the research issue. Also their categorization - allocation of functional groups for further consultations (public sector, international / donor organizations, non-governmental organizations, academic sector, private sector, general public).
Creating a climate change risk profile for Georgia's energy, agriculture and health sectors	• Desk study; • Online research; • Content analysis	• Find reports on the existing climate change risk profile. • Find additional material - studies / reports published in Georgia on target sectors and climate change. As well as various international studies and reports. • Analyze relevant information from national level reports on identified climate chang erelatd issues and identify current threats to sectors (content analysis). Accordingly, identify the main threats that are on the agenda of a particular sector in the context of climate change.

		• Risk profiles were developed by identifying existing threats and assessing sectoral vulnerabilities.
International commitments related to climate change (by sectors). Identifying and reviewing already approved and ongoing development programs, policy documents and strategies, as well as plans. Assess the legislative and institutional framework	• Online survey (including official websites of relevant agencies) • Interviews with representatives of institutions • Qualitative content analysis • Conceptual analysis • Keyword Analysis	• Identify development programs, policy documents and strategies, as well as action plans (published and still under preparation) approved or under development in the target sectors. • Document search was carried out in several ways: Key documents on climate change were selected, reflecting the issues of the target sectors. The search for strategic and political documents was carried out by searching the websites of the legislative informer and key policy-making organizations (ministries and other relevant agencies). The search for analytical and evaluation documents was carried out by evaluating the above-mentioned resources as well as the websites of non-governmental organizations working in the field. Also, the so-called "Snow ball principle", which means the search for the relevant additional material / document, which is referenced in the sources already found. • Thematic search terms used in the document search / analysis process included keywords (e.g "climate change", "health", "heat waves", etc.). • The collected material / literature were reviewed using the qualitative content analysis method, based on the following key criteria - 1. Relevance, 2. Timeliness and 3. Impact. • The identified material / literature were processed using conceptual analysis and relevant information will be used in various aspects of the research.

It should be noted that a kind of cross cutting approach to the research process was presented by consultations with stakeholders, which were used during all components of the research.

Coordination communication with the responsible sectoral agencies/ ministries was carried out in all phases of the research and is planned in future during defining the specific recommendations.

The initial interviews that took place while working on this document were also important in terms of searching for documents. Within initial interviews, respondents were asked to share relevant documents in their possession.

3. CLIMATE CHANGE - GENERAL NATIONAL FRAMEWORK

The country's core policies and approaches to climate change challenges are defined by the country's political and legislative framework, as well as the international commitments which is conditioned international agreements signed by the country.

The main structure responsible for the development and implementation of state policy in the field of climate change is the Ministry of Environment Protection and Agriculture of Georgia.

International context

At the global level, the United Nations Framework Convention[1] on Climate Change is a key agreement that sets out the basic principles for countries to act on climate change. Georgia affiliated to the Convention in the year of its entry into force (1994). Georgia also accedes to the most important agreements adopted under the Convention - the Kyoto Protocol (ratified by Parliament in 1999) and the Paris Agreement (approved by the government in 2017). The country conducts communications regards fulfillment of its obligations towards Secretariat through following documents:

- *National Communication* - is a document that outlines local climate change trends and measures taken by the country in relation to climate change. The Ministry of Environment Protection and Agriculture of Georgia[2] is responsible for coordinating the document preparation process. Three national communications have been prepared by the country and submitted to the Convention. The process of preparing the fourth national communications is practically completed.
- *Biennial Update Report (BUR[3])* – represents an independent and comprehensive report on greenhouse gas emission trends and planned climate change mitigation measures, which is required to be submitted to the Contracting Parties every two years from 2014. The report reflects the results of the national greenhouse gas inventory, the country's emission trends, the mitigation measures implemented to limit gas emissions, etc. Coordinating the preparation of biennial reports is also a function of the Ministry of Environment Protection and Agriculture. Two such reports have been prepared for this phase, along with inventory reports, in 2016 and 2019, respectively.
- *Nationally Identified Contribution (NDC[4]) Document* – is a document that reflects the country's commitment to the international community. The NDC presents the country's climate-related goals. According to the document developed by Georgia, the country has four main goals by 2030. In particular,
    1. Georgia undertakes an unconditional commitment that by 2030 the national level of greenhouse gas emissions will be 35% lower than the rate recorded in 1990.
    2. In case of international support, Georgia takes responsibility to reduce the total national greenhouse gas emissions for 50-57% by 2030 compared to the rate recorded in 1990, if the world follows the global average temperature growth limit of 2˚C or 1.5˚C, in the appropriate sequence.
    3. On the basis of the contribution defined at the national level of Georgia, a climate action plan is prepared to identify mitigation measures, the implementation of which will contribute to the fulfilment of both unconditional and conditional commitments undertaken by Georgia and the achievement of the target indicators.

[1] See. Convention website - https://unfccc.int/

[2] Specifically - Ministry of Environment Protection and Agriculture of Georgia - Department of Environment and Climate Change, Climate Change Division

[3] Biennial Update Reports

[4] http://www.eiec.gov.ge/getattachment/2c23121a-0163-4246-9b1e-d2b83acb28db/Final-Draft-NDC_Georgia_GEO.pdf.aspx

4. Georgia takes responsibility to explore the possibility of adapting to the negative effects of climate change by mobilizing local and international resources for those sectors that are particularly vulnerable to the negative effects of climate change.

In order to achieve goals set out in the nationally defined contribution document in terms of GHG reduction, the document sets out sectoral objectives that should form the basis of the 2021-2022 Climate Change Action Plan. These sectors are transport, buildings, generation and transmission, agriculture, industry, waste and forestry. In terms of adaptation, the document defines actions that are mainly aimed at assessing the impact of climate change on specific sectors. These sectors are - groundwater and surface waters, mountain ecosystems, endemic species, forestry sector, agriculture, especially those sectors that have the largest contribution to the gross domestic product and/or are a unique product for the country (grapes, nuts, honey). As well as resorts and the health sector.

In terms of climate change mitigation, an important mechanism for achieving the goals set at the national level is the 2030 Climate Change Strategy of Georgia and the Action Plan for 2021-2023, developed by the Ministry of Environment and Natural Resources of Georgia[5]. This document, in accordance with the NDC, sets out the state policy on climate change mitigation in the following sectors of energy generation and transmission; Energy consumption in the transport sector; Energy consumption in buildings; Energy consumption in industry and industrial processes; Agriculture; Waste management and forestry.

In 2016, the ***"Georgia-EU Association Agreement[6]"*** entered into force, which is the most important document on the country's climate change agenda. Under the Agreement on Climate Change, the signatories[7] agree on the need for co-operation in the following areas - carbon trading, climate change mitigation and climate change adaptation; Integrating climate change issues into sectoral policies and research, development, introduction and dissemination of clean technologies; The agreement emphasizes the need for cooperation in the preparation of technology transfer measures based on the "Low Emission Development Strategy", "Nationally Acceptable Mitigation Actions" and technological needs assessment. Under the agreement, the country also undertakes to harmonize national legislation with EU legislation.

In terms of cooperation with the EU, we should mention the EU Initiative - ***the Covenant of Mayors***, which unites local authorities who voluntarily commit to increase energy efficiency and the use of renewable energy sources in their territories. By signing, local authorities confirm that they will reduce greenhouse gas emissions on their territory by 40 percent by 2030 compared to 1990 levels. In 2014, the European Commission launched the Covenant of Mayors Initiative on Climate Change Adaptation as part of an EU adaptation strategy aimed at involving cities in adapting to climate change. In 2015, these two initiatives were combined to develop an integrated approach in the field of climate and energy. 6 cities and 17 municipalities in Georgia are united in this initiative of the European Union. Municipalities should develop "Sustainable Energy and Climate Action Plans"[8] under the Covenant of Mayors. The Ministries of Environment Protection and Agriculture of Georgia and the Ministry of Economy and Sustainable Development of Georgia are jointly responsible for coordinating actions related to local climate change and sustainable energy for the member municipalities of the Covenant of Mayors.

On July 1, 2017, Georgia became ***a full member of the European Energy Community***[9], which creates an important commitment to take important measures in the energy sector in term of climate change. Including the harmonization of Georgian legislation with EU directives and regulations.

[5] http://www.eiec.gov.ge/getattachment/30bb3f45-7d2e-442d-8b47-26bd650e72db/CSAP-01-12-2020.pdf.aspx
[6] https://matsne.gov.ge/ka/document/view/2496959?publication=0
[7] On the one hand, the European Union and the European Atomic Energy Community and their member states, and on the other hand, Georgia.
[8] https://www.covenantofmayors.eu/about/covenant-community/signatories.html
[9] http://www.energy-community.org/

National context

At the national level, a significant part of sectoral and country development strategic documents and action plans developed in recent years address climate change issues in one form or another. Finally, these documents define the main framework of the country in terms of climate change. From such documents, it is especially noteworthy -

- Strategy “Georgia2020“
- Country Basic Data and Directions 2020-2023
- "Low-Emission Strategy for Georgia" (the document was developed in 2017 but still has unofficial statistics. The document covered the period up to 2030. However, it was decided to develop a new strategy for a longer period 2020-2050).
- Third National Environmental Action Program of Georgia for 2017-2021.
- National Action Plan of Environment and Health of Georgia for 2018-2022.
- Georgia National Biodiversity Strategy for 2014-2020 and Action Plan.
- National Waste Management Strategy 2016-2030 and Action Plan 2016-2020.
- Georgia's Agriculture Development Strategy (2021-2027).

In addition, climate change is reflected in various sectoral development policies and strategies (including energy, agriculture, health, waste and water management, and protection). It should be noted that in a significant part of the documents, the focus in terms of climate change is mainly on the potential impacts of climate change. There is less talk directly of climate change as a major challenge.

In this context, the present report serves to identify key documents in selected sectors (energy, agriculture, health), analyze them to discuss climate change issues and ultimately develop detailed recommendations for the later stages of project implementation that will address these issues.

4. STAKEHOLDERS

This chapter identifies key sectoral stakeholders (energy, agriculture, health). A detailed stakeholder analysis (including an power-interest matrix) is also provided.

In order to identify the stakeholders, in accordance with the pre-designed approaches, the existing strategic, policy and regulatory documents in the field of climate change were evaluated, which define the structures responsible for each direction and the parties involved at different stages/levels.

In addition, during the initial interviews with stakeholders, information was sought about individuals who are actively involved in climate change decision-making and implementation.

In order to analyze the power(impact)-interest of stakeholders, the identified stakeholders were assessed in terms of their attitudes towards target sector and climate change issues. Those stakeholders were identified as highly interesting and highly influencial who on the one hand represent agencies with hierarchically higher ranks and on the other hand, have leverage to define/develop a sectoral policy or legislative framework. Also, their role is crucial in terms of allocating present/available resources. The high interest and relatively low impact group includes stakeholders who, despite of the high interest due to their institutional functions, lack the capacity to define/approve the high-level legislative framework and policy documents. In contrast to this group, the group of high influence and relatively low interest is formed by the agencies that have high leverage due to their functions, at the same time they may lack the direct interest in actualizing climate change issues. Finally, the low-interest and low-impact groups include institutions/agencies whose interest in climate change is relatively low (not directly involved in climate change issues) and are not involved in relevant legislative and policy-making activities, but are important players of a particular sector; The priorities set in these sectors and the decisions made will have a direct impact on them.

Based on the above approach, below is a stakeholder analysis by sectors.

4.1 Energy sector

In order to identify stakeholders in the energy sector, first of all, the main groups that have an interest in this sector were identified. In particular, these sectors are:

- Public sector;
- International organizations / donors;
- Non-governmental organizations;
- Private sector;
- General Public.

Following the identification of stakeholders, the redistribution of their positions on the impact (power)/interest matrix was determined by the level of their involvement in climate change issues[10].

According to the above sectors, the main stakeholders in the energy sector are the following agencies/institutions/organizations - Table 2:

Table 2: Stakeholders – Energy sector

Sector	Stakeholder

[10] This list and matrix can be updated/corrected after consultation/public meetings with stakeholders, as planned within project.

Ministries	• Ministry of Environmental Protection and Agriculture of Georgia (MEPA); • Ministry of Economy and Sustainable Development of Georgia (MESD); • Ministry of Regional Development and Infrastructure of Georgia (MRDI); • Ministry of Finance of Georgia (MoF).
Ather state Institutions/ Organisation	• Parliament of Georgia (PA); • Georgian National Energy and Water Supply Regulatory Commision (GNERC); • Local Self-Government (LSG); • Georgian State Electrosystem (GSE); • Georgian Oil and Gas Corporation (GOGC); • Georgian Gas Transportation Company (GGTC); • Electricity Market Operator (ESCO); • Georgian Energy Development Fund (GEDF); • Public-Private Partnership Agency (PPPA).
International Organizations / Donors (IO/D)	• United Nations Development Program(UNDP); • World Bank (WB); • United States Agency for International Development (USAID); • Energy Community; • European Bank for Reconstruction and Development (EBRD); • German Society for International Cooperation (GIZ); • German Development Bank/Kreditanstalt für Wiederaufbau (KfW); • Danish International Development Agency (DANIDA).
Non-governmental Organizations (NGOs)	• Energy Efficiency Center Georgia; • World Experience for Georgia; • Greens Movement of Georgia; • Green Alternative; • Caucasus Environmental NGO Network (CENN); • Georgia's Environmental Outlook-GEO; • Sustainable Development Center REMISSIA; • Regional Environmental Centre for the Caucasus - REC Caucasus.
Privat Sector	• Direct consumers of electricity (DCE); • Large consumers of natural gas (LCNG); • Electricity producers (EP); • Business Association of Georgia (BAG); • Georgian Renewable Energy Development Association (GREDA).
General Public	• Citizens - General Public (Citizens) _ (GP).

In order to develop an impact-interest matrix, pre-identified stakeholders were assessed for their attitudes towards energy sector and climate change issues. The group of high interest and high influence includes those agencies/individuals that are at a higher level hierarchy than others (define and approve the legislative framework including policies, strategies and action plans in the sector) and have an impact on resource allocation (both human and financial resources, in terms of state budget as well). Also in the group of high interest and high influence are those agencies/individuals who can formally and informally influence the above-mentioned hierarchically superior groups (even in the form of holding a superior position over others in negotiations/consultations on these issues).

Agencies that do not directly define and approve first legislation and high-level policy documents in the sector, are included in the low-impact group. However, due to their institutional functions, which include the development of secondary legislation in the sector and the approval of local action plans, they are considered to be of the high interest.

Those stakeholders were identified in the high-impact and low-interest groups, whose immediate interest may not be to update climate change issues, but due to the nature of their activity, they are more likely to be required to take legal action measures.

Agencies/individuals, who are not directly involved in legislative activities in this field and whose activities are not concentrated on climate issues were considered to be of a low interest and low influence with the actualization of climate change issues in the energy sector. However, these stakeholders are important players in the energy sector and policies defined in the sector on climate change will also have an impact on them, so it is important to inform them in a timely manner.

The final results are presented below - Diagram 1

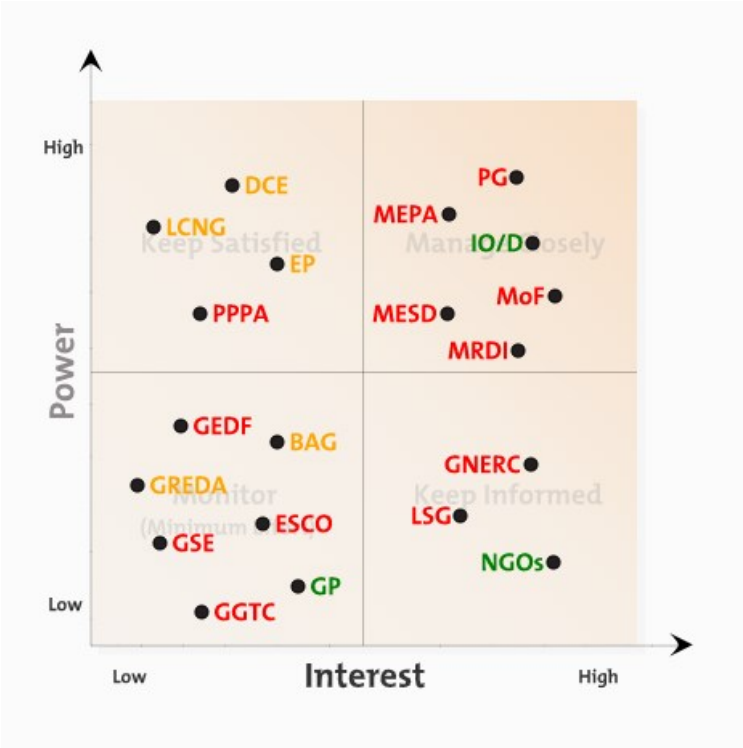

Diagram 1: Power-Interest Matrix - Energy sector [11][12]

4.2 Agriculture sector

The Ministry of Environment Protection and Agriculture of Georgia ensures the development and implementation of the unified state policy for the development of agriculture in Georgia. The Ministry's area of governance includes the assistance of management and development of environment, agriculture and rural field. The Ministry carries out activities in this direction with its subordinate organizations in accordance with their competencies.

Along with government agencies, the contribution of the non-governmental sector is important, which is actively involved in the implementation of various climate change projects, collects a lot of data and information. It is noteworthy that farmers' associations are constantly taking care of the training and awareness of member farmers and inform them of modern climate-friendly technologies.

[11] Marked in colors in the matrix: Red - Public sector; Orange - Private sector; Green - Civil sector, donors, society.
[12] See abbreviations used in the matrix in stakeholder listing table - (Table 2).

The role of scientific and education-research institutions, which create scientific knowledge and are responsible for staff training, is important in the development of the field.

The full list of stakeholders and their impact/interest matrix is given below - Table 3.

Table 3: Stakeholders – Agriculture sector

Sector	Stakeholder

State Institutions	• Parliament of Georgia (PA)
	• Ministry of Environmental Protection and Agriculture of Georgia (MEPA):
	  ○ LEPL National Environment Agency (NEA)
	  ○ LEPL National Food Agency
	  ○ LEPL National Agency for Sustainable Land Management and Land Use Monitoring
	  ○ NNLE Agricultural Projects Management Agency (APMA)
	  ○ LTD Georgian Amelioration
	  ○ LEPL Scientific-Research Center of Agriculture (SRCA)

International Organizations / Donors (IO/	• Food and Agriculture Organization (FAO) • International Fund for Agricultural Development (IFAD) • German Society for International Cooperation (GIZ); • United States Agency for International Development (USAID); • Austrian Development Agency (ADA) • Sweden's government agency for development cooperation (SIDA) • Swiss Agency for Development and Cooperation (SDC) • Japan International Cooperation Agency (JICA)
Non-governmental Organizations (NGOs)	• Biological Farming Association (Elkana) • Farmers Associations (FA) • Regional Environmental Centre for the Caucasus - REC Caucasus • Caucasus Environmental NGO Network (CENN) • Centre for Biodiversity Conservation & Research. (NACRES) • The Greens Movement of GeorgiaFriends of the Earth- Georgia
Scientific and Educational-Research Organisations	• Georgian Academy of Agricultural Sciences (GAAS) • Agricultural University of Georgia (AUG) • Georgian Technical University (GTU)
Privat Sector	Farmers / Land Users (Fa/LU)
General Public	General Public (Citizens) (GP)

At the final stage of the stakeholder analysis, an impact-interest matrix was developed, which is presented below - Diagram 2.

Stakeholders identified at the initial stage to compile the impact-interest matrix were assessed for their involvement in the agricultural sector and climate change issues. The group of people with high interest and high influence were included to the agencies/individuals who define and manage policies, strategies and action plans. They also have the right to dispose of appropriate resources, including budget funds.

High impact and low interest groups identified agencies/stakeholders whose immediate interest may not be the actualization of climate change issues (e.g. due to a wide range of activities), but can have a significant impact on the process.

Organizations/agencies/stakeholders that do not directly define sectoral policies and are authorized to approve legislation and policy documents at the national level are included in the low-impact and high-interest categories, as they directly affect the implementation of decisions made at national level and/or decisions influence their activity.

Units with low interest and low influence are those organizations/individuals that are not directly involved in policy defining and legislative activities in this direction and their activities are directly or indirectly related to the agriculture. Accordingly, it is important to inform them.

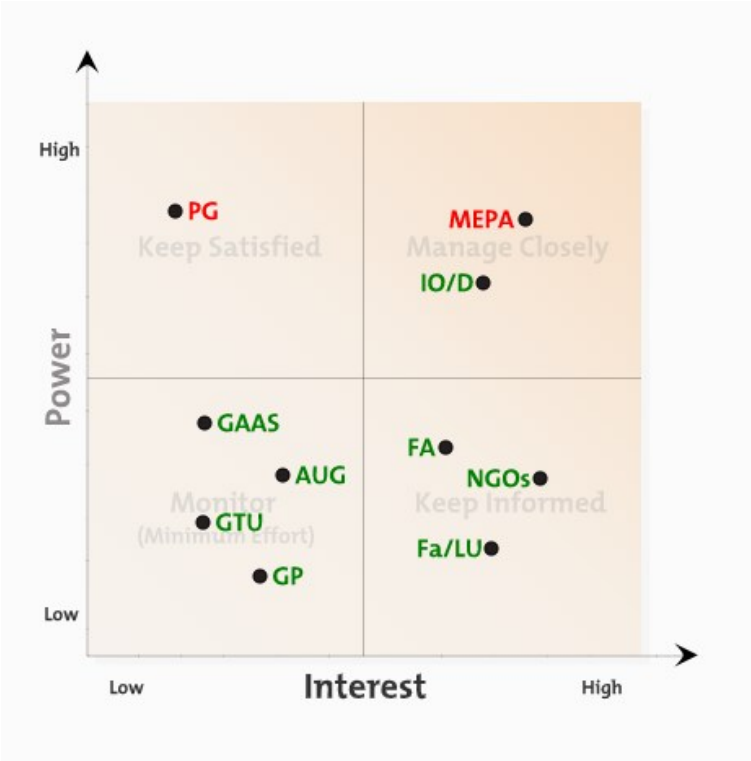

Diagram 2: Power-Interest Matrix - Agriculture sector [13][14]

4.3 Health sector

In order to identify the stakeholders, the existing strategic, policy and regulatory documents in the field of climate change were critically evaluated, which define the responsible structures in a separate direction.

In addition, during the initial interviews with stakeholders, information was sought about individuals who are actively involved in climate change decision-making and implementation.

A detailed list of stakeholders is given in Table 4 (a list of health sector stakeholders with reference to identified contact persons is given in Appendix 1).

Table 4: Stakeholders – Health sector

Sector	Stakeholder

[13] Marked in colors in the matrix: red - public sector; Orange - private sector; Green - civil sector, donors, society.
[14] See abbreviations used in the matrix. In stakeholder listing table (Table 3)

State Agencies	• Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health and Social Affairs of Georgia (MOH) • National Center for Disease Control and Public Health (NCDC) • Emergency Coordination and Urgent Assistance Center (ECUAC) • Ministry of Environmental Protection and Agriculture of Georgia (MEPA) • National Environmental Agency (NEA) • Environmental Information and Education Center (EIEC) • Emergency Management Service (Ministry of Internal Affairs) (MIA/EMA) • Governement of Georgia / Policy Planning unit (GoG/PP)
Non-governmental Organizations (NGOs)	• Georgia Red Cross Society (GRCS) • The Union for Sustainable Development (EcoVision) • Caucasus Environmental NGO Network (CENN);

In the final stage of the stakeholder analysis, an impact-interest matrix was developed, which is presented below - Diagram 3.

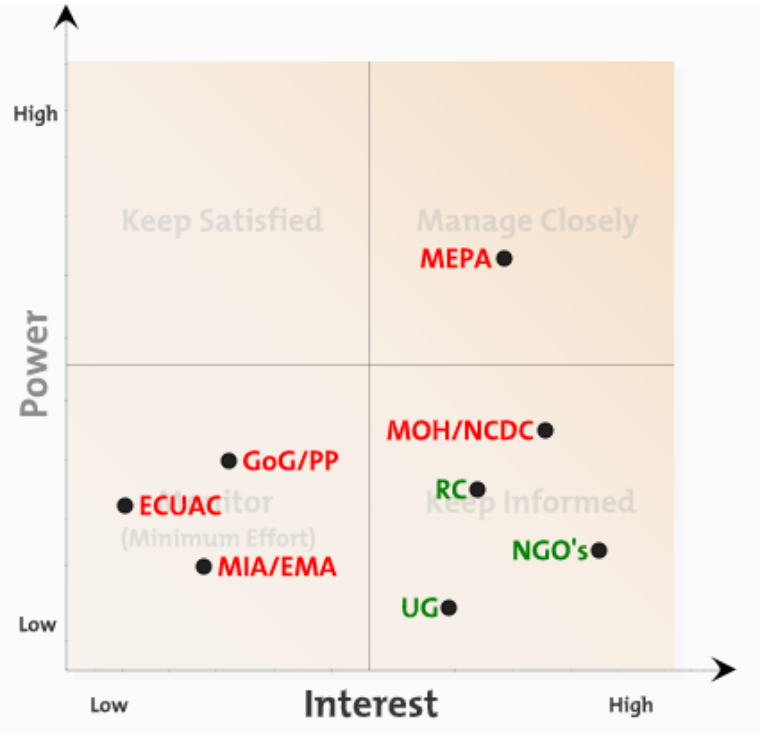

Diagram 3: Power-Interest Matrix - Health sector [15][16]

[15] Marked in colors in the matrix: red - public sector; Orange - private sector; Green - civil sector, donors, society.
[16] See abbreviations used in the matrix in stakeholder listing table (Table 4).

5. POLITICAL, INSTITUTIONAL AND LEGISLATIVE FRAMEWORK

5.1 Energy sector

Atmospheric air pollution is one of the major environmental challenges worldwide. Energy is on the list of sectors that make the largest contribution to air pollution from anthropogenic sources. Georgia's total greenhouse gas emissions in 2017 were approximately 17,766 gigagram (gg) of CO^2 equivalent, where the share of energy sector was 60% (including transport sector).[17] Taking mentioned circumstances into account, renewed national level contribution targets have been developed, where one of the main targets is the reduction of the greenhouse gas emission rate by 20% by 2030, compared to the rate recorded in 1990. For this purpose, sectoral targets in terms of greenhouse gases limitations have been identified. For the energy sector, this primarily envisages a 15% reduction in greenhouse gas emissions in the energy generation and transmission sector by 2030, relatively to the forecasts under the baseline scenarioto.[18]

To achieve the targets of climate change mitigation policies, specific measures need to be defined in the energy sector to help reduce greenhouse gas emissions while improving the country's energy independence and ensuring low operating costs in the energy sector.

In order to describe the political context, institutional and legal framework of the energy sector, initial consultations with stakeholders were conducted in accordance with the pre-developed research methodology. Within these consultations, priority was given to the communication with energy and climate change policy makers, in particular the Ministry of Economy and Sustainable Development (Department of Energy Reform and International Relations) and the Ministry of Environment Protection and Agriculture (Climate Change Division). Meetings with these agencies were conducted in the form of individual semi-structured interviews (virtual). As a result of these consultations, key policy, strategy and action plan documents were identified and further qualitative content analysis of these documents was performed.

Political framework

Speaking about the political framework of the energy sector, it is noteworthy that Georgia has taken steps to move closer to Europe in recent years, which have essentially determined the direction of the ongoing reforms in the country, including in the energy sector. In 2014, an Association Agreement was signed between Georgia, on the one hand, and the European Union and the European Atomic Energy Union, on the other, and their member states (Association Agreement[19]). In this context, the parties agreed on the need to strengthen cooperation in the field of energy. In 2017, Georgia became a member of the Energy Community. Based on these agreements, Georgia has committed itself to the gradual approximation of regulations to European legislation.

The following is a description of the legal framework in the Georgian energy sector, as well as analysis of the state of fulfillment of commitments under the Energy Union membership in the context of energy and climate change.

Among the key documents defining the policy framework of the energy sector are the following:

[17] Fourth National Communication.

[18] Georgia's Updated Nationally Determined Contribution (Final Draft) - http://www.eiec.gov.ge/getattachment/5a00f7a6-ecc0-4d4d-8411-e0ad522e2402/Final-Draft-NDC_Georgia_ENG.pdf.aspx

[19] https://matsne.gov.ge/ka/document/view/2496959

- Georgia's Energy Policy;
- Georgia's Energy Strategy 2020-2030;
- Integrated Energy and Climate Plan;
- National Energy Efficiency Action Plan 2019–2020;
- National Renewable Energy Action Plan.

The following is a brief overview of these documents in the context of climate change::

Georgia's energy policy is approved by the Georgian Parliament. It is a key document of the country that defines the country's priorities and long-term vision in the energy sector. The current document on the main directions of state policy in the field of energy of Georgia (**Georgian Energy Policy**) was approved by the Parliament of Georgia in 2015. The existing policy document does not specify its term and/or period. At the same time, the previous policy document approved in 2006 (repealed after the adoption of the new document) also did not specify the validity period, although the document contained forecasts for 2015 inclusive. The need to change the current policy document stems from the fact that the situation in the sector has changed significantly since 2015 - Georgia has taken significant international commitments and is implementing reforms in the sector, based on this. Currently, under the auspices of the Ministry of Economy and Sustainable Development, work is underway on a new energy policy document that should be in line with the new legislation. An important novelty is the fact that the energy policy document must pass a strategic environmental assessment process conducted by the Ministry of Environment Protection and Agriculture. This will improve coordination between sectors and ensure a sustainable long-term vision for the energy sector.The table below (Table 5) presents the main directions covered in the energy policy documents by years (2006 policy document, 2015 policy document and the working version of the 2020 policy document) (energy policy concept)[20]:

Table 5: Analysis of the main directions of Georgian energy sector policy documents

	2006 year	2015 year	2020 year (darft version)
Main directions	Efficient use of energy	Diversification of energy supply sources, optimal utilization of Georgia's energy resources and creation of reserves	Diversification of external sources of energy supply
	Energy security	Utilization of renewable energy resources of Georgia	Increasing the resilience of the energy sector
	Third party access to electricity transmission and distribution networks	Gradual approximation of Georgian legislation with EU legislation	Development of mineral energy resources
	Accounting	Development of the Georgian energy market and improvement of the energy trade mechanism	Energy efficiency
	Attracting local and foreign investmen tand privatizing	Increasing the role of Georgia as a transit country in the region	Utilization of renewable energy resources
	Economic sustainability of the sector	Georgia - Regional Center for Clean Energy Production and Trade with this energy	International Energy Cooperation
	Tariff policy	Develop and implement a unified approach to energy efficiency	Energy market reform

[20] Energy Policy Concept Document (working version).

	Bilateral and regional cooperation	Consideration of environmental components when implementing energy projects	Consideration of environmental requirements
	-	mproving the quality of service and protecting the interests of the customer	Mitigating and adapting to climate change
	-	-	Improving the quality of service and protecting the interests of the customer
	-	-	Energy poverty and helping vulnerable consumers
	-	-	Research, innovation and technological development

The first policy document of 2006 did not address the issues of environment and climate change at all. However, the 2015 policy document took the environmental component into account in the context of energy infrastructure. This involves the transfer of international experience in the process of developing energy projects, which should include a social and environmental impact assessment (ESIA) and related public consultations. As for the climate change issue, it is actually presented in this document: "It is important to use renewable energy resources to solve the problem of climate change and provide the country with clean energy."[21] In the area of climate change, the direction of energy efficiency is also noteworthy and this issue was considered in the energy policy documents of Georgia from the very beginning. But it should be noted that the link between energy efficiency and climate change issues in the existing versions of energy policy documents has not been identified and energy efficiency is presented only in the context of consumer optimization.

The current version of the energy policy concept discusses more issues than previous policy documents. It should be emphasized that the new energy policy document assumes that environmental requirements are taken into account and that climate change mitigation issues are identified as key directions. Relevant sectoral and sub-sectoral strategies and action plans are being developed in accordance with the energy policy document to ensure that priorities set out in this document are met.

In 2019, the Ministry of Economy and Sustainable Development approved **Georgia's Energy Strategy 2020-2030**. This document describes the existing energy sector, its challenges and development prospects in the medium term. As for the sub-sector strategy documents, work has been done in this regard before and there exist working documents of 2016 electricity and natural gas strategies that have not been approved yet. Currently, the most advanced sub-sectoral strategic documents (ten-year transmission network development plan) have been developed by the electricity and natural gas network operators - the Georgian State Electric System and the Georgian Oil and Gas Corporation.

At the same time, based on the requirements of the energy union and in accordance with the current legislation of Georgia, an integrated **National Energy and Climate Plan 220-2030 (NECP)** should be developed and approved in Georgia, which itself is a strategic document on the development of the sector. An important novelty is the fact that the strategic document, along with energy issues, will foresee climate policy issues. This document is intended for a 10-year perspective and should cover five main areas:

1. Decarbonization;
2. Energy efficiency;
3. Energy security;

[21] 2015 Resolution of the Parliament of Georgia on the Main Directions of the State Policy in the Energy Sector of Georgia https://matsne.gov.ge/ka/document/view/43804?publication=0

4. Domestic energy market;
5. Research, innovation and competitiveness.

This document is in the early stages of development and at this stage it is not advisable to conduct a content analysis of the document. It should be emphasized that the 2030 Climate Change Strategy and the 2021-2023 Action Plan, the National Energy Efficiency Action Plan 2019-2020 and the National Renewable Energy Action Plan 2019-2021 are used in the development of this document. Once approved by the NECP, the National Energy Efficiency and Renewable Energy Action Plan documents will no longer be approved separately, as the issues covered in them will be fully presented in the document. According to the Law on Energy and Water Supply, the state energy policy must include the National Integrated Energy and Climate Plan. The NECP is approved as an integral part of the State Energy Policy Document or its annex (presumably at the 2021 Spring Session of the Parliament of Georgia).

In 2019, the Ministry of Economy and Sustainable Development also approved the **National Energy Efficiency Action Plan 2019-2020**. This plan is a step forward since it was first developed and approved. This plan outlines measures to reduce and optimize energy consumption compared to the baseline scenario. Under this plan, the potential for energy savings was calculated: in 2020, in the primary energy source - 9%, in the final energy consumption - 4%; In 2025 in primary energy source - 13%, in final energy consumption - 9%; And in 2030, 14% in primary energy sources, 11% in final energy consumption.

The National Renewable Energy Action Plan 2019-2021 was approved last year. The main goal of this action plan is to present the legislative initiatives and investment measures that will help to increase Georgia's share of renewable energy by 35% in the total final energy consumption by 2030. In 2020, Resolution #75 of the Government of Georgia approved the rule for developing the minimum requirements for a harmonized sample for the National Renewable Energy Action Plan. The Ministry of Economy and Sustainable Development is working on a new version of the National Renewable Energy Action Plan within the updated legislative framework.

Legislative framework

A brief overview of the documents defining the legislative framework of the energy sector is presented based on the following laws:

- Law on Energy and Water Supply;
- Law on Energy Efficiency;
- Law on Energy Efficiency of Buildings;
- Law on Energy Labelling;
- Law on encouragement of production and use of energy from renewable sources.

Over the past two years, the legislative framework of the energy sector has undergone significant changes. Within harmonization with European legislation, the main regulatory law was approved - at the end of 2019, the **law on energy and water supply** came into force. In the energy sector, this is considered to be the most important legislative reform implemented in the last decade, as it, in accordance with the established exceptions, meets the requirements of the most important directives and regulations set out in the ''Association Agreement'' and establishing treaty of ''Energy Union''[22]. Apart from the above law, which defines new rules of the sector functionality, a number of related laws were adopted, namely: in May 2020, the **law on energy efficiency and the law on energy efficiency of buildings** were approved. These two laws set out the legal basis for the measures needed to promote and implement energy efficiency in the country.

[22] Analysis of the economic impact of the development of local energy resources and its role in energy security (2020) - http://gegroup.org/assets/project_presentation/Final_Report.pdf?fbclid=IwAR0SyAXqb7ZVwNXys4TK7XaF_aJlzvu9UQeeuNwolrFQ0SXQxUSws9Rknek

Also, from December 2019, the law on energy labelling came into force, which promotes consumer awareness about energy labelling of home appliances and considers the protection of consumer rights in this area.

In December 2019, a **law was approved to encourage the production and use of energy from renewable sources.** This law provides the creation of a legal basis for the promotion, encouragement and use of energy from renewable sources, as well as the establishment of a mandatory national overall target for the total share of energy received from the renewable energy and energy consumption by transport.[23] Under the law, the state has made a significant commitment - by 2030, to increase the share of energy from renewable sources in total final energy consumption by 35% (national overall target). As for the legislative framework of the country as a whole, it is in the process of changes and relevant agencies are involved in the development of the secondary legislation[24].

An important facet of the assessment of the legislative framework in the energy sector is the fulfillment of the obligations under the Energy Union membership. Every year, the current process is evaluated by the Secretariat of the Energy Union, which monitors a total of 10 areas:

- Electricity;
- Gas;
- Oil;
- Renewable energy;
- Energy efficiency;
- Environmental protection;
- Climate;
- Infrastructure;
- Statistics;
- Cyber security.

As of November 1, 2020, the current level of the implementation of the third energy package by Georgia is estimated by 36%.[25] The level of implementation increased by 12% compared to the previous year, which is mainly due to the laws adopted in the main sector. According to 2020 data, the average implementation rate in the Energy Union is 53%. Georgia ranks last among the members of the Energy Union in terms of the pace of implementation, although it should be taken into account that Georgia is the newest member of this union.

The secretariat of the Energy Union evaluates the ongoing processes within each direction separately. For the purposes of this study, out of the 10 areas listed, attention will be focused only on the following areas:

- **Renewable Energy** - This area includes the National Renewable Energy Action Plan and Renewable Energy in Transport;
- **Energy Efficiency** - Also envisages energy efficiency targets and measures to be taken;
- **Environment protection** - in the context of energy also addresses the issue of industrial emissions (including emissions from thermal power plants);
- **Climate** - discusses monitoring of greenhouse gas emissions and integrated energy and climate plan.

[23] Analysis of the economic impact of the development of local energy resources and its role in energy security (2020) - http://gegroup.org/assets/project_presentation/Final_Report.pdf?fbclid=IwAR0SyAXqb7ZVwNXys4TK7XaF_aJlzvu9UQeeuNwolrFQ0SXQxUSws9Rknek

[24] This figure was 29.5% in 2019 (base year) by law.

[25] Georgia Annual Implementation Report 2020 (Energy Community Secretariat) - https://www.euneighbours.eu/sites/default/files/publications/2020-11/EnC_IR2020_Georgia.pdf

In terms of renewable energy, the process of fulfilling the obligations is at an early stage and work is currently underway in this direction. As mentioned above, the National Renewable Energy Action Plan was approved in 2019, although the document needs to be updated. Georgia was also not required to meet its renewable energy targets by 2020. As for the direction of renewable energy in transport, work on the legislative base has not started in this part. Overall, the level of performance in the field of renewable energy is estimated by the Energy Union at 33%.

For comparison, according to the Energy Union, implementation in the areas of energy efficiency, environment and climate is at an advanced stage. Legislative changes in the field of energy efficiency were approved in 2020 and the level of implementation in this area was 44%[26]. However, in terms of energy efficiency, the main task now is to develop a secondary legal framework, which is mandatory to comply with the requirements of the third energy package.

Climate and environmental protection works are underway, where the level of performance in the field of climate is 43%, and 53%in the field of environment protection[27]. In the field of environmental protection, work should begin on important legislative changes, including the issue of emissions of harmful substances into the atmosphere. This, in turn, is significant for the energy sector as there are currently four thermal power plants operating in the country and construction of the additional thermal power plant(s) is planned.

According to the energy and water supply law, the Integrated Energy and Climate Plan is defined as an energy policy annex, rather than a separate action plan. The Energy Union emphasizes that this diminishes the importance of the document compared to other action plans (which are required by law). This could jeopardize the actualization of climate change issues in the energy sector.

A study of the legal framework described above has revealed that the Georgian government is actively working to meet its international obligations. Despite the violation of part of the terms stipulated in the protocol on the accession of Georgia to the founding agreement of the Energy Union, the framework laws were adopted and part of the action plans were approved at the end of 2019. However, within the international obligations, a significant work needs to be completed towards the legislative framework. Consideration of climate change issues, development of detailed targets in this area and submission of implementation plans are scheduled under secondary legislation. Therefore, it is important to continue the legislative process with a high standard of transparency and public involvement, timely and to completely fulfil its international obligations[28].

Content analysis of the literature revealed that there are gaps in the legislative framework. In particular, the fact that work on a energy policy document is at an early stage, while the action plan and strategy documents have either already been approved or are in the final stages of development. This means that these documents were developed without a long-term vision for the respective sector. Following the approval of the energy policy document and the integrated energy and climate plan, the legislative framework needs to be revised to bring it in line with other documents and harmonize it with the industry policy and strategy document. It is also important to consider the baseline and alternative policy planning scenarios based on which data will be developed, as this will have a significant impact on the targeting of climate change issues in the sector.

[26] Georgia Annual Implementation Report 2020 (Energy Community Secretariat) - https://www.euneighbours.eu/sites/default/files/publications/2020-11/EnC_IR2020_Georgia.pdf
[27] Georgia Annual Implementation Report 2020 (Energy Community Secretariat) - https://www.euneighbours.eu/sites/default/files/publications/2020-11/EnC_IR2020_Georgia.pdf
[28] Georgia 2020: Energy Policy Overview (IEA) https://www.euneighbours.eu/sites/default/files/publications/2020-07/Georgia_2020_Energy_Policy_Review.pdf

Table 6: Energy sector - Screening of key documents in the context of climate change

Document	Document type	Document status	Document content	Link to climate change
Energy Policy for Georgia	National Policy Document	Approved in 2015	Defines the priorities of the sector and the strategic directions of the sector development	The document, approved in 2015, does not address climate change issues, although this document is in process of updated
Energy Strategy of Georgia 2020-2030	National Strategy Document	Approved in 2019	Describes the existing situation of sector, its visions, priorities, challenges and ways to solve them	The issue of climate change is not substantially presented, and is only mentioned in the context of energy efficiency and the use of renewable resources. Does not contain the description of ways to mainstream the climate issue in the sector. Targets and related adaptation and mitigation measures are not presented in the context of climate change.
National Energy and Climate Plans	National Action Plan	In process of development	Defines the targets according to the sector and the measures for their achievement	According to the existing working version, climate change issues will be widely presented, including adaptation and mitigation measures
Energy Efficiency Action Plan 2019–2020	National Action Plan	Approved in 2019	Describes investment and policy measures to promote development of energy efficiency	In the context of energy efficiency, climate change issues are addressed, and relevant measures are described.
National Renewable Energy Action Plan	National Action Plan	Approved in 2019	Describes targets and relevant measures for the development of renewable energy sources	The current working version presents the main target indicators. At this stage, however, the document does not outline detailed measures on climate change.
Law on Energy and Water Supply	Law of Georgia	Approved in 2019	The basic law of the field, which defines the general legal basis in the energy sector	Does not reflect on climate change issues as it focuses on defining the rules of operation of the sector.
Law on Energy Efficiency	Law of Georgia	Approved in may 2020	Defines the general legal basis of the measures needed to promote and implement energy efficiency in the country	Describes the principles of developing energy efficiency target indicators. As for targets and measures, they should be reflected in the Energy Efficiency Action Plan.

Law on Energy Efficiency of Buildings	Law of Georgia	Approved in may 2020	Defines the legal basis for promoting the rational use of energy resources and improving the energy efficiency of buildings	Secondary legislation under this law is in process of development, which sets out the basic requirements for buildings. The law does not define the main target indicators. Part of the building energy policy is described in the Law on Energy Efficiency.
Law on Energy Labeling	Law of Georgia	Approved in 2019	Promotes consumer awareness on energy labeling of domestic technical equipments and considers protection of consumer rights in this area.	Ensures compliance of the energy consumer product when used or placed on the market in Georgia with the requirements defined by this Law and relevant technical regulations.
Law on promoting the generation and consumption of energy from renewable sources	Law of Georgia	Approved in 2019	Defines the legal basis for the promotion, encouragement and use of energy from renewable sources	Defines the mandatory national common target indicators of the total share of energy received from renewable sources in the total final consumption of energy and in the consumption of energy by transport.
Country Basic Data and Directions (BDD)document	Fiscal Policy Definition Document	Approved annually	The document sets out the priorities of state spending agencies and, consequently, defines the content of budget programs	The document does not prioritize climate change

Finally, on the basis of the analysis of the given documents, within presented research it is advisable to pay special attention to the existing documents which are in process of elaboration:

- Energy Policy Document;
- Integrated Energy and Climate Plan.

Both documents define main policies of the sector and therefore it would be appropriate to focus on these two documents in order to actualize climate change issues, including in the format of consultative workshops.

Institutional arrangement

Listed below are the key representatives of the institutional framework within the energy sector and their role in this field. Due to the fact that the reform process is actively underway in the energy sector and the sector is undergoing transformation, based on the study of the above documents, the description of the institutional framework will highlight the expected changes in the functions of these agencies.

The Parliament of Georgia - is the highest representative body of the country, which carries out legislative power, determines the main directions of the country's domestic and foreign policy, controls the activities of

the government of Georgia within established framework by the constitution of Georgia and exercises other powers. Its competence includes the approval of primary legislation and sector policies in the field of energy.

The Government of Georgia - is the highest body of executive power, which implements the domestic and foreign policy of the country. The government is accountable and responsible to the Parliament of Georgia. It defines the rules/procedures for the development of action plans in the energy sector and approves them.

Ministry of Economy and Sustainable Development of Georgia - an agency responsible for the field of energy since 2017 (until 2017, there existed the Ministry of Energy and it had to coordinate the field). The Ministry is actively working on legislation, policies, strategies and action plans in the field of energy. This agency is also involved in coordination with the Ministry of Environment Portection and Agriculture on climate change.

Ministry of Environment Protection and Agriculture of Georgia - the agency responsible for the directions of environment protection and climate change. In addition to issuing environmental impact permits, it also sets targets and considering commitments for climate change for all sectors, including energy. The Ministry systematically reports on the impact of climate change on various sectors to identify vulnerabilities and develop recommendations. It should also be noted the recent role of this agency in conducting strategic environmental assessments of policy and strategy documents. Within this process, the possibility/probability of having a negative impact on the environment based on this document, is determined. Only after successful completion of this procedure is the approval of such documents allowed by the relevant agencies (Parliament of Georgia, Government of Georgia and/or Ministry of Economy and Sustainable Development).

Ministry of Finance of Georgia - This agency is an executive body established in accordance with the law of Georgia, which establishes state governance in the financial-budgetary and tax spheres. It also determines the fiscal policy of the country. Sectoral action plans provide a description of specific measures and identify the necessary financial resources related to them. This, in turn, falls within the direct competence of this agency and requires coordination with other sectoral agencies with the Ministry of Finance.

Georgian National Energy and Water Regulatory Commission - a state regulatory body, the activity area of which will change/increase significantly in accordance with the obligations under the Energy Union. It's research interests include developing a secondary legislation in the field, issuing permits for electricity generation and approving development plans for energy companies.

Public and Private Partnership Agency - This agency is actively involved in the development of power plant projects. Most of the new power plant projects fall within the legislative framework of this agency. Public and private partnership law is directly related to energy infrastructure projects and therefore, its role is important in terms of climate change mitigation measures.

Municipalities - as local self-government, is an important part of the institutional framework described. They are responsible for developing and implementing local policies within the framework set by law. Their competence includes the management of natural resources of local importance, as well as water and forest resources and land resources owned by the municipality, in accordance with the law. The role of municipalities in the presented study is also important in the context of climate change, as 24 cities/municipalities are signatories to the agreement of Mayors. This EU initiative brings together local and regional governments that are voluntarily committing to reducing greenhouse gas emissions on their territory by 20% by 2020, and by 30% by 2030. To achieve this, an Energy Sustainable Development Action Plan (SEAP) [29] is being developed at the local level. At this stage, 10 cities and 1 municipality of Georgia have submitted

[29] The Sustainable Energy and Climate Action Plan (SECAP) is being developed since 2020.

this action plan[30]. From 2020, in addition to the reduction measures under the report, adaptation measures will also be considered.

Summary

Based on the analysis of the legislative framework, it was revealed that climate change issues are less considered in some of the already approved documents. It is also difficult to define to what extent climate change issues will be foreseen in sectoral documents currently under development. This uncertainty significantly increases the level of vulnerability of the energy sector to climate change and the events caused by it.

The second important conclusion from the content-analysis of the literature is that policy, strategy and action plan documents have been actively developed over the last two years in the field of energy and environment (including climate change). These documents were not developed under the auspices of long-term sectoral policies, so it is expected that not all important documents on energy and climate change issues is properly coordinated. This could hamper the actualization of climate change issues in the energy sector and in turn jeopardize the effectiveness of nationally defined mitigation and adaptation measures.

Despite the challenges listed, the first steps that need to be taken to actualize climate issues in the energy sector are noteworthy. Newly and future commitments under the legislative framework will create explicitly positive dynamics in reducing greenhouse gas emissions in the energy sector.

At the same time, for the effectiveness of the legislative framework, it is necessary to pursue the right policies to ensure that the negative impacts of climate change is reduced. One of the measures of policy effectiveness are action plans, developed in this direction, where appropriate mitigation measures are described. In order to select correct measures for climate change issues, it is necessary to properly assess the current situation. This requires reliable, multi-year, detailed data and a unified approach in terms of processing this data. As the energy sector is multidisciplinary and intertwined with many sectors, this further increases the importance of data reliability in the process of defining political targets.

In addition to data, when developing a policy, it is also important to have human resources, which should not only prepare private sector reports (based on the analysis of various scenarios), but also get engaged in active coordination with representatives of other sectors. There is a clear challenge in this area in terms of energy and environment - numerous international reports indicated that these agencies have had staff shortages for years. The change in government structure in 2017 had the most impact on these two areas. The Ministry of Energy was merged with the Ministry of Economy and Sustainable Development, while the Ministry of Environment Protection and Natural Resources combined with the Ministry of Agriculture. In both cases, the pre-existing staffing deficit has been exacerbated and continues to be a significant obstacle to the effective functioning of these two areas.

5.2 Agriculture sector

Political framework

In general, when talking about the agricultural sector, it should be noted that the sector is one of the most vulnerable to climate change. These changes related to climate change directly affect water resources, soils and biodiversity. Consequently, agricultural production is strongly affected by climate change, which is why most of the adaptation measures worldwide come fall upon the agriculture.

Georgia is a part of various international environmental conventions, including:

[30] Georgia 2020: Energy Policy Review (IEA) - https://www.euneighbours.eu/sites/default/files/publications/2020-07/Georgia_2020_Energy_Policy_Review.pdf

- UN Framework Convention on Climate Change;
- Convention on Biological Diversity; And
- UN Convention for Combat Desertification.

These conventions oblige the country to take active actions on climate change issues.

In accordance with the Framework Convention on Climate Change, Georgia has a responsibility to reduce greenhouse gas emissions into the atmosphere and to adapt to climate change in order to create a sustainable basis for stable food production and ensure economic development. It should be noted that at the initial state, the Convention did not oblige developing countries, including Georgia, to take effective action and was only limited to reporting obligations. The Convention also requires for parties to facilitate climate change adaptation and mitigation measures, including the inventory of greenhouse gases and the preparation of national communications. The first, second and third national communications were prepared within the convention, emphasizing that Georgia's agriculture is significantly affected by temperature, change of precipitation regime and extreme events such as drought, heavy rainfall, hail, strong winds. The Fourth National Communication is practically completed.

On June 7, 2017, the UN Framework Convention on Climate Change "Paris Agreement" entered into force for Georgia, which is considered to be the beginning of a new phase in world climate change and main objectives of which, are:

1) Significant reduction of climate change risks and negative impacts on economic sectors by limiting global average temperature growth to 2°C;
2) Better adaptation of countries to climate change and development of low-emission countries in a way that does not restrict food production.

The Government of Georgia has expressed its readiness to join the global effort to combat climate change by developing a Nationally Identified Contribution (NDC) document[31] prior to the 2015 Paris Agreement Conference. Georgia's NDC document emphasizes the importance of the agricultural sector. The Nationally Identified Contribution Document[32] supports the development of low-carbon approaches in the agricultural sector by promoting climate-friendly agricultural technologies and services. In the same document, a country plan is announced to assess the effects of climate change on the access to groundwater and surface water resources and their sustainable use for irrigation in agriculture. At the same time, the goal is to reduce greenhouse gas emissions from all major sectors of the economy, including rural areas, which should reach a 35% reduction by 2030 compared to the same level in 1990 and in the case of international support - 50-57% reduction. In addition, it is planned to assess the level of vulnerability of agricultural products that have the largest share in GDP (e.g., grapes, nuts) and/or to produce a unique product of the country, for example, such as Georgian honey. This process will be carried out with the assessment of the likelihood of climate change and spread of infections to ensure food safety.

The fifth of the 7 sectoral objectives set out in the 2030 Climate Change Strategy and Action Plan 2021-2023 (CSAP) is to promote the low-carbon development of the agricultural sector through the promotion of climate-friendly and energy-efficient technologies and services. The main challenges in the agricultural sector are related to emissions from enteric (intestinal) fermentation, the share of which made 44% of the sector's greenhouse gas emissions by the data of 2015, followed by emissions (41%) from organic fertilizers (manure) and agricultural soils. (14%). The share of energy-related emissions in the sector emissions was about 1%. Most of the expected growth of emissions in 2015-2030 is assumed from agricultural soils, with an estimated

[31] Submission of Georgia's "Nationally Defined Contribution" to the UN Framework Convention on Climate Change (INDC), 2015

[32] Renewed Nationally Defined Contribution of Georgia (NDC), 2020

increase of 60%. By 2030, the main sources of agricultural soil emissions will be pastures and animal stables at 32% (29% in 2015), nitrogen leaching and flashing - 26% (31% in 2015) and synthetic fertilizer use - 19% (23% in 2015). Considering the possible increase in the industrialization and the number of livestock from 2015 to 2030, the rate of emissions due to the enteric (intestinal) fermentation may increase by 17%, while emissions from the use of organic fertilizer (manure) may increase by 47%.

The Convention on Biological Diversity aims to protect and preserve biodiversity. Promoting sustainable use of biodiversity and fair and equitable redistribution of benefits derived from genetic resources. Convention participant countries have an obligation to protect biodiversity and implement principles of sustainable use of biodiversity so that biodiversity is not depleted in the long run. The parties also agree to develop a biodiversity proteciotion and conservation strategy and action plan. Georgia regularly prepares and submits national reports. To date, five national reports have been submitted to the Convention. The reports highlight the role of biodiversity in mitigating the effects of natural disasters and regulating climate change. Also, a National Biodiversity Conservation Strategy and Action Plan has been prepared, which discusses the climate change as one of the factors reducing biodiversity. The strategy focuses on agrobiodiversity, which has a special role to play in adapting to climate change. At the same time, the document of the National Strategy and Action Plan for the Protection of Biodiversity[33] defines the national goals, for the achievement of which the relevant normative documents have not been adopted. For example, one of the goals is to reduce the negative factors affecting endangered natural habitats by 2020, including by ensuring sustainable management of 70% of pastures. However, at present, most of the pastures do not have a sustainable management plan. In this regard, the project initiated by the assistance of Global Environment Fund (GEF) "Achieving a neutral land balance through restoration and sustainable management of degraded pastures in Georgia"- is important, which aims to develop a national policy for pasture management and to create an appropriate legal framework for 2022, which will help to spread the principles of sustainable pasture management.

The UN Convention to Combat Desertification serves to mitigate the effects of desertification, to reduce land degradation and drought. The Convention also covers issues of sustainable management of land resources, including the promotion of adaptive practices to agricultural land and the achievement of a neutral balance of land degradation. Under the Convention, the parties ensure to develop a long-term strategy for the implementation of the Convention - a National Action Plan to Combat Desertification[34], in which the agricultural sector is particularly important in the light of current climate change:

- Elbaboraton of agricultural development strategy;
- Awareness of decision makers and public on desertification/land degradation and drought issues and their relationship to biodiversity and climate change;
- Assess national monitoring and vulnerability of biophysical, social and economic trends;
- Create databases based on the most reliable data available on biophysical, social and economic trends and gradually harmonize relevant scientific approaches.

Georgia has an obligation to cooperate in overcome climate change within association agreement with the European Union. The collaboration aims to mitigate climate change and adapt to it.

Agricultural Development Strategy

Environmental protection and biodiversity conservation is a priority direction of Georgia's agricultural development 2015 – 2020 strategy[35], the achievement of which was planned by encouraging the introduction

[33] Biodiversity Strategy and Action Plan of Georgia 2014 - 2020

[34] Second National Action Plan to Combat Desertification 2014-2022

[35] Agricultural Development Strategy 2015-2020

of highly productive and sustainable production methods. Due to the great importance of the conservation of agro-biodiversity for the sustainability of agriculture, the strategy paper emphasizes the need for a detailed inventory of local species and varieties, identification, establishment of a genetic bank and the establishment of an effective management system, in parallel with a program to inform farmers and other stakeholders about agro-biodiversity and endemic species. In terms of biodiversity conservation, the activity of LEPL Agricultural Research Center is noteworthy, within the framework of which hundreds of wild species and cultural plants and animals have been found, restored and preserved in collections and breeding farms. Also, the gene bank of local genetic resources of fields and vegetable crops at NNLE Georgian Agrarian University. According to the strategy, one of the most important measures to mitigate climate change is to support the spread of good agricultural practices, especially the establishment of climate-smart agricultural practices, which will simultaneously replies to three challenges: Ensure food security by increasing production and revenues, adapting to climate change, and promoting climate change mitigation. One of the important factors in the development of the agricultural sector in the strategy is the development of agro-insurance, which can play a positive role in increasing resilience to the risks posed by extreme events due to climate change.

According to the strategy for agricultural development for 2015-2020, an Action Plan for 2018-2020[36] has been developed, which describes a detailed plan-schedule for each strategic direction, performance indicators and implementing agencies.

One of the three goals of the 2021-2027 agricultural development strategy[37] is the sustainable use of natural resources, the preservation of ecosystems and adaptation to climate change, which includes the following tasks: promoting environmentally friendly, climate-smart agricultural practices and promoting bio/organic production; Promoting the introduction of energy-efficient and renewable energy technologies and practices; Preservation of agro-biodiversity. Among the threats to the achievement of the goals set by the strategy are climate change, as well as floods and disasters caused by various possible natural hazards, which pose a threat to rural and agricultural development. However, there is a low awareness level of knowledge about environmental issues among the rural population, which may have a negative impact on the environment of rural areas. The 2021-2027 agricultural development strategy is accompanied by an Action Plan for 2021-2023[38], which, like the Action Plan 2018-2020, details each activity, responsible agency and performance indicators. In addition, the connection of planned tasks with the UN Sustainable Development Goals is indicated.

Based on the analysis of the discussed documents, the documents of the agricultural development strategy, which define the vision and goals of the future development of the sector, are of essential importance for the agricultural sector. Both documents of the strategy emphasize the need to distribute climate-smart technologies, although they are of a general nature and are practically not, or very little, reflected in specific plans, the implementation of which does not expect significant change. However, relatively more attention is paid to adaptation and there are virtually no plans to reduce greenhouse gas emissions from the agricultural sector, which will help to mitigate climate change.

Legal framework

Legislative documents that directly address climate change and agriculture issues or indirectly influence the conduct of processes, were identified and reviewed during the evaluation process. According to the analysis of the identified documents, the existing legal framework mainly responds to the commitments made by the country in the framework of international conventions in the field of climate change and agriculture. The connection of selected laws, government decrees and ordinances to climate change and their relevance to

[36] Georgia Rural Development Strategy 2015-2020 and Action Plan 2018-2020
[37] Agricultural Development Strategy 2021-2027
[38] Georgia Rural Development Strategy 2021-2027 and Action Plan 2021-2023.

the agricultural sector is given in **Error! Reference source not found.**, which assesses the potential of their i mplementation in terms of climate change mitigation and adaptation to climate change.

Table 7: Agriculture sector - Screening of key documents in the context of climate change

Document	Document type	Document status	Document content	Link to climate change
Law of Georgia on soil protection	Goergian legislation	Adopted: May 12, 1994	• Ensure the integrity of the soil cover, increases and maintains fertility; • Define the duty and responsibility of land users, landowners and the state to create conditions for soil protection and production of ecologically clean products; • Provide conservation of endemic vegetation and fertile soil layer of mountainous regions by protecting subalpine and alpine meadows.	• Protecting the soil and maintaining and further increasing its carbon footprint is important for mitigating climate change; • Highly fertile and healthy soils are an important prerequisite for adapting natural and agro-ecosystems (hence the agricultural sector) to climate change.
Law of Georgia on Environmental Protection	Goergian legislation	Adopted: December 10, 1996	• protect fundamental human rights established by the Constitution of Georgia in the field of environmental protection, in particular the right to live in a healthy environment and the right to enjoy the natural and the cultural environment; • ensure the protection of the environment and the rational use of natural	• Protecting the environment and creating a precondition for sustainable development will have a direct impact on climate change mitigation and adaptation

			resources by the State, and ensure a healthy environment • support the preservation of biological diversity • preserve and protect natural landscapes and ecosystems; • provide a legal framework for resolving common global and regional issues in the field of environmental protection; • ensure appropriate conditions for the sustainable development of the country.	
Law of Georgia on Wildlife	Goergian legislation	Adopted: December 25, 1996	Protect wildlife	Protecting wildlife and conserving biodiversity is important for climate change mitigation and adaptation
Law of Georgia on Water	Goergian legislation	Adopted: October 16, 1997	Protect water bodies and ensure the rational use of water resources considering the interests of present and future generations and the principles of sustainable development;	Protecting water bodies and ensuring the rational use of water resources determine climate change mitigation and adaptation
Law of Georgia on Pesticides and Agrochemicals	Goergian legislation	Adopted: November 25, 1998	Provide legal grounds for the efficient use of pesticides and agrochemicals and for their application in such a manner which is safe both for humans and the environment.	Proper selection and rational use of pesticides and agrochemicals affect both climate mitigation and adaptation
Law of Georgia on Ambient Air Protection	Goergian legislation	Adopted: June 22, 1999	Regulates protection of ambient air from harmful anthropogenic impacts in the territory of Georgia.	It plays an important role in terms of climate change mitigation
The Forest Code of Georgia	Goergian legislation	Adopted: June 22, 1999	Conduct tending, protection and restoration of forests in order to maintain and improve climatic, water regulating, protective, cultural, recreational and other natural useful properties	Maintaining the integrity and health of forest ecosystems can have a significant impact on climate change mitigation
Law of Georgia on Soil Conservation and Restoration-	Goergian legislation	May 8, 2003	Regulate soil conservation and restoration-improvement of soil	Reducing soil degradation and facilitating the restoration of degraded

Improvement of Soil Fertility			fertility, as well as erosion, mudflow, landslides, avalanches, flooding, soil pollution/ contamination, salinization, open pit extraction of minerals, agro-mines and construction materials, and other anthropogenic activities that can prevent soil loss	soils directly contributes to climate change mitigation and adaptation.
Law of Georgia on "Red List" and "Red Book"	Goergian legislation	June 6, 2003	Conservation and restoration of endangered species, conservation of species diversity and genetic resources, sustainability and creation of conditions for their sustainable development	Conservation of biodiversity is important for mitigating and adapting to climate change.
Regulation on the Rules of Forest Use	Decree of the Government of Georgia №242	August 20, 2010	• Regulation of forest use; • Conservation and protection of biodiversity.	Rationl use of forest resources has a direct impact on climate change mitigation
Law of Georgia on new Breeds of Animals and Varieties of Plants	Goergian legislation	December 15, 2010	Regulate relations associated with the legal protection and the use of new breeds of animal and species of plant and applies to all new genus and variety of the new breed/species of agricultural animals and plants.	Protecting new species of animals and plants is an important measure for climate change mitigation and adaptation
Food Products/Animal Feed Safety, Veterinary and Plant Protection Code	Goergian legislation	May 8, 2012	• state control in the fields of food/feed safety, veterinary and plant protection • define basic requirements and conditions for animal health and welfare, and plant protection and health • Impose veterinary and plant quarantine in the territory of Georgia	It is important both in terms of mitigating and adapting to climate change.
Regulation on Organic Farming	Decree of the Government of Georgia №198	July 30, 2013	• Promote biodiversity conservation, environmental protection, efficient use of natural resources in Georgia; • Define the rules of organic farming,	Promoting the development of organic production is important for the effective implementation of climate change mitigation and adaptation measures in the agriculture sector

			production and processing of organic products.	
Decree on approving the environemtnal technical regulation	Decree of the Government of Georgia №17	January 3, 2014	• Regulation of discharge of industrial and non-industrial wastewater into surface water bodies; • Regulation of water abstraction from surface water bodies; • Regulation of air pollution with harmful substances.	The protection of water resources and atmospheric air and the rational use of water resources affect the process of climate change mitigation and adaptation.
Regulation on measures to be taken within the framework of co-financing of preferential agro-credit, agricultural products processing and storage enterprises	Decree of the Government of Georgia №139	January 27, 2014	Promoting agricultural production	Development of agricultural production and increase access to modern technologies is important in terms of adaptation to climate change.
Regulation on approval of additional conditions for the distribution of seeds and planting material in Georgia	Decree of the Government of Georgia №145	February 13, 2014	• Identification of varieties; • Determining the characteristics of varieties; • Quality control of seeds varieties and planting material; • Access to information on the agricultural benefits of specific varieties.	Identifying varieties and knowing their characteristics along with quality control over it is important for climate change adaptation.
Regulation on approval of the "Red List" of Georgia	Decree of the Government of Georgia №190	February 20, 2014	Preservation and protection of biodiversity	Conservation of biodiversity is important for mitigating and adapting to climate change as it is an important genetic resource.
Regulation on approval of the state program "Produce in Georgia"	Decree of the Government of Georgia №622	November 10, 2014	• Finding and promoting innovation and modern technologies; • Creation of new enterprises and expansion / re-equipment of existing enterprises.	Development of agricultural production and development of modern resource-saving technologies and increase of access to it for mitigation and adaptation to climate change.
Waste Management Code	Goergian legislation	December 26, 2014	Establish a legal framework in the field of waste management to implement	Proper waste management can play an important role in mitigating climate

			measures that will facilitate waste prevention and its increased re-use as well as environmentally safe treatment of waste (which includes recycling and separation of secondary raw materials, energy recovery from waste and safe disposal of waste).	change and in the direction of producing valuable fertilizers for agriculture.
Regulation on approval of the state program "Introduce the Future"	Decree of the Government of Georgia №56	February 12, 2015	• Improving the efficiency of agricultural land use through the cultivation of perennial crops; • Support the production of high quality planting materials.	Promoting the cultivation of perennial crops and its rational planning is an important measure in terms of mitigating and adapting to climate change in the agricultural sector.
Law of Georgia on environmental assessment code	Goergian legislation	June 1, 2017	Regulates The procedures for environmental impact assessment, strategic environmental assessment, transboundary environmental impact assessment, and public participation in decision-making, as well as the conduct of expert examinations, fall within the scope of this Code.	The effective functioning of the environmental impact assessment system has a direct impact on the possibility of mitigating climate change and is one of the prerequisites for sustainable agriculture.
Law of Georgia on permission for the distribution of agricultural plant species subject to mandatory certification and on seed production	Goergian legislation	June 1, 2017	Regulation of relations associated with the production, reproduction, processing, storage, certification, sale and traceability of seed and planting material of species, and with local and imported seed and planting material	Ensuring the quality of seeds and planting material of agriculture crop varieties is an important measure for adapting to climate change.
Technical Regulation on approval of Standards for Ambient Air Quality	Decree of the Government of Georgia №383	July 27, 2018	Ensure improvement of ambient air quality	Ensuring improved air quality has a direct impact on climate change mitigation.

There are gaps in the existing legislation in certain areas. Among them are:

- No law/normative document defining sustainable use of common pastures and establishing a legislative regulation mechanism has been adopted. There are only general records in the current legislation, which is insufficient to bring the process within the legislative framework;

- A law on windbreaks (field protection) has not been adopted, which is of particular importance in terms of climate change mitigation. It should be noted that the relevant draft law has already been prepared and is under consideration.
- The norms for the use of agrochemicals (fertilizers, ameliorators, plant protection products) used in the agricultural sector are not regulated, therefore there are no mechanisms to control them;
- No normative acts have been developed to protect the soil from physical, chemical and biological degradation;
- There is no document regulating the use of natural pastures;
- A code of good agricultural practice has not been developed, which covers all sectors of agriculture and will be aimed at reducing emissions and increasing the stock of organic carbon in the soil.

As a result of the analysis of policy-making documents, it is possible to identify the main documents that are of particular importance for climate change mitigation and adaptation measures in the rural sector:

- Rural Development Strategy 2021-2027;
- Rural Development Action Plan 2021-2023 of the Rural Development Strategy 2021-2027.

The actualization and further elaboration/detailing of climate change issues in these documents will be the main topic of discussion during the consultation with relevant stakeholders.

Institutional arrangement

The Ministry of Environment Protection and Agriculture of Georgia, together with its subordinate agencies, oversees the implementation of the discussed laws and normative documents, whose functions are discussed below in the context of climate change and agriculture.

The Ministry of Environment Protection and Agriculture of Georgia is an executive body, which has a leading role in the development and implementation of state policy in the field of climate change. The scope of activities of the Ministry is the preparation, implementation and promotion of implementation of strategic documents in the field of environment protection and agriculture. In addition, within the scope of its competence, the Ministry is responsible for planning natural and anthropogenic threats and risks, planning measures to mitigate their consequences and implementing a unified policy to ensure environmental safety.

Agencies subordinated to the Ministry of Environment Protection and Agriculture of Georgia, which directly conduct research and monitoring of climate parameters, or their activities are related to the development of adaptation and mitigation measures dictated by climate change in the agricultural sector:

LEPL National Environment Agency - studies the physical processes of climate change and participates in the development of mitigation and adaptation measures for possible adverse effects caused by these changes. The functions of the Agency include monitoring the meteorological, hydrological, geological processes and the quality of the environment (atmospheric air, surface and groundwater, sea, soil) on the territory of Georgia. Also, collect, process, evaluate and compile short, medium and long-term forecasts for environmental monitoring data and provide them to central and local authorities and media.

For the assessment and forecasting of climate change carried out by the National Environment Agency, it is crucial to continuously monitor each climate parameter and distribute the relevant data across the country. The number of observation points has dropped dramatically since the 2006 optimization. The installation of automatic stations and checkpoints started in 2010, however, despite the periodic updating of the observation network, the optimal coverage level has not been achieved at this time, which makes it difficult to present a complete climate picture in some regions and more accurately predict individual parameters.

LEPL National Food Agency - carries out food/animal feed safety, veterinary and phytosanitary control, which is especially important in the context of climate change, accompanied by the creation of conditions to

promote the spread of pests and diseases and increase the likelihood of infection. In particular, the functions of the agency include risk analysis of the epizootic situation, identification of causes and spread of common dangerous infectious diseases of animals and humans and the prevention of its spread and elimination of measures. The authority of the agency is to implement quarantine measures, to protect the territory of the country from the introduction and spread of pests. Also, phytosanitary diagnosis of agricultural lands and forecasting the spread of pests and implementation of measures to combat them.

''Georgian Amelioration" Ltd - is responsible for managing irrigation and drainage systems. In particular, ''Georgian Land Reclamation'' Ltd owns irrigation and drainage infrastructure and provides relevant services to individuals and legal entities throughout the country. Consequently, the company has an important role to play in terms of providing irrigation water to agriculture amid climate change.

LEPL Agricultural Research Center - aims to provide scientific support for the development of agriculture and food production, to preserve the agro-biodiversity of plants and animals, to breed new varieties adapted to soil-climatic conditions and to improve existing varieties, the development of energy-saving and efficient technologies and spread in farms; Providing risk assessment in the field of food safety, veterinary and plant protection; Research of degraded soils and development of rehabilitation-improvement measures; Assessing the stock of organic carbon in the soil as one of the indicators of land degradation and determining the ability of carbon sequestration, which is especially important for the inclusion of the main gas, responsible for climate change - carbon dioxide in the soil as organic matter. One of the main functions of the center is to raise the knowledge and awareness of farmers by conducting trainings and providing thematic recommendations.

LEPL National Agency for Sustainable Land Management and Land Use Monitoring - Participates in the development and implementation of the state policy on sustainable land management for agricultural purposes; Also, participate in planning of measures to combat desertification and land degradation and restore soil fertility. The main function of the agency is to compile land balance and to register agricultural land resources and create a unified database.

Rural Development Agency - In order to increase the efficiency of development and implementation of the agricultural strategy, in 2019, as a result of reorganization, LEPL Agriculture and Rural Development Agency was created in the system of Ministry on the basis of NNLE Project Management Agency, LEPL Agricultural Cooperatives Development Agency and information-consulting services. The agency was later named the Rural Development Agency. The Agency is the main implementing agency for projects and programs initiated by the Ministry of Environment Protection and Agriculture.

Summary

Based on the analysis presented in the subsection, the following main conclusions can be drawn:

- The vulnerability of the agricultural sector to climate change is high (discussed in detail in Chapter 5 of this document). The importance of climate change and the need to take effective steps in this direction are highlighted in the policy documents, action plans and legislation discussed above; At the same time, however, it should be noted that strategies and action plans poorly outline concrete ways to increase the resilience of the agricultural sector to climate change, which may increase existing risks and vulnerabilities in the sector;
- It is recommended to clearly state specific goals and objectives in the Agricultural Development Strategy 2021- 2027 documents, which will be aimed at the introduction/dissemination of mitigation measures, which include reducing greenhouse gas emissions and promoting carbon accumulation in soil and plant biomass, as well as effective adaptation measures;
- In addition, it is important to fill the existing legislative gaps that will help increase the resilience of the agricultural sector to climate change. The possibility of filling these gaps is real because:

- A draft law on windbreak (field protection) has been prepared;
- A draft law has been prepared to unify and update the two existing laws on soil protection;
- Amendment to Government Resolution # 424 is being prepared, which considers the introduction of additional control mechanisms to protect the soil from physical degradation;
- It is planned to develop a national pasture management policy and create an appropriate legal framework for 2022 (within the project Acquiring Land Degradation Neutrality Targets of Georgia through Restoration and Sustainable Management of Degraded Pasturelands, supported by the Global Environment Facility (GEF));
- A practical guide about good agricultural practices has been prepared to reduce ammonia emissions from the agricultural sector, the establishment of which is planned in the form of a Code.

5.3 Health sector

Climate change mainly has a negative impact on human health. This includes both the indirect impact of human health on social and environmental factors - fresh air, safe drinking water, food and a safe living environment - as well as the direct impact of promoting the spread of disease and radical changes in temperature (extreme cold or heat).

Political framework

Among the key documents defining policy framework of the healthcare sector are the following:

- National Environment and Health Action Plan;
- Ostrava Declaration;
- Global strategy on health, environment and climate change.

The following is a brief overview of these documents in the context of climate change:

In line with the goals of sustainable development, the World Health Organization has developed a **global strategy on health, environment and climate change**[39] and relevant measures are included in the work plan of the organization. The six strategic objectives within strategy, focus on prevention, social determinants, the integration of the environment and climate change agenda into universal health coverage policy, strengthening the health care system, finding and monitoring new evidence, and defining both health and other sectors. Adopted in 2020, this document provides a framework for member states to define strategic priorities and helps them achieve their sustainable development goals. **When speaking in the context of Georgia, it is important that this document is used as a framework document in the process of working on the country's climate change and health issues.**

There are several strategic documents in the field of healthcare in Georgia, but climate change is not mentioned in these documents. These documents include:

- Vision for the development of the health care system in Georgia by 2030 - the document has been prepared as a policy document of the Health Care Committee of the Parliament of Georgia. The issues raised in it are principally limited to the priorities of the medical field, which is only a fragment of human and population health policy. As a result, this document does not cover climate change or environmental health[40].

[39] WHO global strategy on health, environment and climate change: the transformation needed to improve lives and well-being sustainably through healthy environments. Geneva: World Health Organization; 2020. License: CC BY-NC-SA 3.0 IGO.

[40] Vision for the development of the healthcare system in Georgia by 2030. http://www.parliament.ge/ge/ajax/downloadFile/81367/Health_Strategy_geo

- National Health Strategy "Affordable Quality Health Care" - 2011-2015. The validity period of the document has expired and due to the ongoing political changes in Georgia, this document adopted in 2011 had less of a strategic function.
- Approval of the State Concept of the Georgian Health Care System for 2014-2020, "Universal Health Care and Quality Management to Protect Patients' Rights[41]", which directly addresses climate change, but mentions the role of public health as creating a safe and health-friendly environment.
- "Georgia 2020" where the issue of climate change in the health sector is not discussed.

As it was found out in the process of interviews with stakeholders, **presently the country is in an active phase of developing a new strategy for the sector**. This process is led by the Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health and Social Affairs of Georgia.The technical support of the process is provided by the EU Mission in Georgia. At this stage, the main directions document has been developed, where environmental pollution and climate change are considered as factors that may have an impact on human health. Due to the fact that there is already locally obtained evidence of such negative impact in Georgia (for example, such evidence most obviously exists in relation to heat waves), this issue will be discussed in the near future. It is important that both international experts leading the process and local experts involved in the process were informed of Georgia's commitments to existing evidences and climate change.

The priority issues voiced by the Ministry are also important in this process. It is expected that in the working process, the existing key directions document will be changed and expanded, and it will reflect the state policy, responding to various health determinants, including climate change issues. There is no specific, time-bound plan for actualization of the process. Therefore, at this stage it is important to communicate with stakeholders and to reflect the relevant priorities in the health system strategy. It is expected that the World Health Organization (WHO) Regional Office for Europe will develop an action plan for the European region on the basis of a global strategy.

The issue of integrating environmental and climate change impacts into the universal health coverage agenda plays an important role in WHO's new **global strategy**, which in turn requires cross-sectoral cooperation. Also, considers the issue in the general strategies and visions of the country. The medium term expenditure planning document, which is the country's economic vision for the medium term, should also answer and reflect the challenges of climate change for the health sector.

It is noteworthy that in 2017, Georgia joined the Ostrava Declaration as part of the 6th WHO Ministerial, emphasizing the need for evidence-based health policy to respond to environmental and climate change issues in the European region.

In 2018, the Resolution N680 of the Government of Georgia approved the **National Environment and Health Action Plan** (NEHAP-2), which is based on the principles of Parma and Ostrava Declarations adopted at the Ministerial Meetings held in 2010 and 2017 as part of the European Environment and Health Process. It is linked to the United Nations Sustainable Development Goals for 2030 and the World Health Organization Europe Regional Health Policy Platform – ''Health 2020''.

The main principle of the National Environment and Health Action Plan is close multi-sectoral cooperation to ensure public health priorities in all areas of the country policy (Health in All Policies), to realize the right to the people of Georgia, which is guaranteed by the Constitution of Georgia - to live in a safe environment. To implement the National Environment and Health Action Plan, together with the health and environment sectors, responsible bodies are economic, agricultural, education, finance, foreign affairs and local self-government sectors. The process is managed, coordinated and supervised by the Coordination Council, which is the deliberative body of the Government of Georgia and is headed by the Prime Minister of Georgia. As for

[41] https://matsne.gov.ge/ka/document/view/2657250?publication=0

the function of secretariat of the Coordination Council, it should be a prerogative of the National Center for Disease Control and Public Health.

One of the strategic objectives of the document is to integrate health issues into climate change adaptation and mitigation policies.

In relation to climate change, the plan has five medium-term goals and strategic interventions:

1. Implementation of climate change vulnerability, health impact assessment and adaptation (Health Aspects) by 2022;
2. Develop a healthcare adaptation strategy and action plan for 2021;
3. Harmonization of legislation considering the requirements of the UNFCCC Convention and the assessment of health outcomes for 2022;
4. Reduction of the share of greenhouse gas emissions in national emissions by health institutions;
5. Education/preparation and preparedness of the population for emergencies caused by natural disasters.

The presented interventions are in the process of implementation and it is important that their results are also reflected in the next period - after 2021.

It should be noted that within the framework of the Climate Forum East, the National Center for Disease Control, together with the Georgian Red Cross, developed an action plan for the adaptation of thermal waves, which eventually took the form of a road map[42]. An action plan is currently being developed within the framework of the SCORCH project "Risk Awareness and Communication for Reducing Transboundary Impacts of Heat Waves".

It should be noted separately that the financial instrument for policy implementation in Georgia is a medium-term planning document - a document of the main data and directions of the country for 2021-2024[43]. Based on this document, state resources are redistributed to priority program areas. It should be noted that the issue of climate change is not a priority in this document at this stage.

In 2015, the Government of Georgia approved the National Civil Security Plan[44], which defines the basic principles of the functioning of the unified system of emergency management in Georgia and rules of protection of the population from emergencies, emergency prevention, preparedness and response. The document also defines functions, tasks and responsible agencies of emergency assistance.

It should be noted that the document sets out general principles for the prevention, preparedness and response to the direct impact of climate change on human health, which requires specificity at the local level. For example, it should be reflected in the existing plans at the local (municipality) level. Such plans have not been developed yet.

It should be noted that in addition to the direct health sector documents, it is important that public health issues (including those related to climate change and health) are adequately reflected in other sectoral policy documents, such as the energy and agriculture sectors.

Table 8: Health sector - Screening of key documents in the context of climate change

Document	Document type	Document status	Document content	Link to climate change
National Health Strategy (In	Strategy	The documemt is in process of development;	The documemt is in process of development; It is unknown whether	Considering that the National Health Strategy is the highest-ranking

[42] https://www.ncdc.ge/Handlers/GetFile.ashx?ID=853064cf-1a4c-424c-af0e-6abe0d398f77
[43] https://www.mof.ge/5321
[44] https://matsne.gov.ge/ka/document/view/2993918?publication=0

process of development)		Based on preliminary consultations, the document is planned to for completion in 2021	the document will address climate change issues Main responsible agency: The Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health and Social Affairs of Georgia	strategic document at national level in this sector, it is important that the priority of climate change issues be voiced
National Environment and Health Action Plan	Action Plan	The documemt is in process of implementation until 2022	The document sets out the priority issues and measures to be taken in relation to climate change Main responsible agency: National Center for Disease Control and Public Health	One chapter of the document deals with climate change issues
The basic data and directions document of the country (BDD)	Fiscal policy qualifier document	Approved annually	The climate change is not prioritized in the document Main responsible agency: Ministry of Finance and spending agencies (In this particular case, The Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health and Social Affairs of Georgia).	The document sets out the priorities of state spending agencies and consequently, defines the content of budget programs.

Institutional framework

The Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health and Social Affairs of Georgia is the main body defining the strategy, policy and implementation mechanisms of the health sector in Georgia. The Ministry and its subordinate agencies have a crucial role to play in discussing the issue of climate change in the existing strategic and policy documents in the field of health, as well as in planning and directly implementing the policy implementation process in this area.

The Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs is part of the executive authority, which is responsible for forming the health policy of the country. This function is performed by the Policy Department in the Ministry in all areas within the competence of the Agency. The Department is supervised by the First Deputy Minister of Health.

It should be noted that exactly the Ministry is mentioned in the main international documents as a responsible agency. The functions of the Ministry and its subordinate agencies include both the formulation of state policy and the definition, implementation and collection of information for climate change risk and disease response (mitigation and prevention) mechanisms.

The sub-departments of the Ministry that play an important role in the impact of climate change on health, are:

LEPL L. Sakvarelidze Center for Disease Control and Public Health, which participates in the process of determining state policy on public health issues. The Center's Environmental Health Department works directly on climate change issues and the Center may also conduct research in this area.

The Department of Medical Statistics is responsible for collecting/analyzing medical and health status statistics across the country, which is crucial for both monitoring existing risks and outcomes and for identifying new challenges in a timely manner.

LEPL Emergency Coordination and Emergency Assistance Center, which is responsible for providing medical response and plays an important role in preparedness of the country towards natural disasters, heat waves and disasters caused by climate change and in terms of elimination of consequences.

The Emergency Management Agency of the Ministry of Internal Affairs also has an important role to play in responding to natural hazards and disasters. According to 2019 data, there were 14% (total response figure) of cases in the region carried out by the agency due to natural emergencies.

Civil society organizations also play an important role in raising awareness about climate change, advocating for the issue and informing the public about it.

Summary

Based on the above analysis, several important aspects are noteworthy:

- There are several strategic documents in the health sector in Georgia, although climate change is not mentioned in these documents;
- At the strategic and political level, climate change issues are not clearly and widely covered in the health sector. This is indicated by the fact that priorities in the field of health and climate change are less announced in national strategies and action plans, and no action plans have been developed to address key challenges;
- Managing the direct impacts of climate change on human health requires specific recommendations at the local level that are in line with the principles of the National Civil Safety Plan.

6. SECTORAL RISK PROFILE FOR CLIMATE CHANGE

6.1 Energy sector

According to Georgia's climate risk profile of 2017[45], three key threats have been identified in Georgia in line with the climate change forecast:

1. Increase in air temperature by 0.8° -1.4°C by 2050;
2. Increased intensity of seasonal rains and complicated forecasting;
3. Increase of disaster cases caused by natural hazards

The above-mentioned threats to climate change in the energy sector can lead to both positive and negative changes[46]. Part of the positive change means the reduction in the use of different energy sources for heating as a result of rising temperature. However, on the other hand, this can lead to the increase in energy consumption for cooling. According to estimates, climate change is expected to have more negative than positive effects on the energy sector[47].

Temperature changes make it difficult to predict[48] precipitation, including determining the melting rate of glaciers and forecasting seasonal rains. This will have a direct impact on access to water resources. The hydropower sector is the largest non-consumer (reversible) water user[49] in Georgia. About 80% of electricity generation in Georgia comes from hydropower plants. Consequently, any change in water resources is directly proportional to the amount of electricity generated. In 2017, the water use rate in this sector was 29.7 billion m^3, which corresponds[50] to an increase of about 11% in the data of 2011. Also, deteriorating access to water resources can create obstacles for thermal power plants that need water for cooling[51].

The Fourth National Communication highlights other challenges expected with rising temperatures in electricity generation. Firstly, rising temperatures can increase water evaporation from reservoirs. An increase in temperature for 1 °C on average increases water evaporation by 5-7%[52]. Also, rising air and water temperatures may reduce the efficiency of thermal power plants. In the case of wind farms, an increase in temperature causes a decrease in wind density, which negatively affects the generation volume. In the case of solar power plants, desertification caused by rising temperatures can lead to frequent dusting of the panels and reduce generation. Also reduced voltage at high temperatures in photovoltaic converters reduces electricity generation from the sun. High temperatures pose a threat to electricity transmission infrastructure and lead to increased losses in the network.

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[45] Climate risk profile of Georgia (USAID). https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID%20ATLAS_Climate%20Change%20Risk%20Profile%20-%20Georgia.pdf

[46] The Georgian Road Map on Climate Change Adaptation - TheRoadMapEngPre-design_reference191_Final.pdf (nala.ge)

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[48] Climate risk profile of Georgia (USAID). https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID%20ATLAS_Climate%20Change%20Risk%20Profile%20-%20Georgia.pdf

[49] National Report on the State of the Environment of Georgia 2014-2017 - https://mepa.gov.ge/En/Files/ViewFile/35552

[50] National report on the state of environment for years 2014-2017.

[51] Outlook on climate change adaptation in the South Caucasus mountains - CCAC.pdf (unep.org)

[52] Fourth National Communication.

Heavy rainfall can provoke disasters such as landslides, mudflow and/or floods. Due to its specificity, the energy infrastructure can be affected by such disasters, cases of which have been observed in the recent past: in 2015, mudflow caused by heavy rainfall and landslides damaged the infrastructure of the Mestiachala; landslides in Dariali Valley damaged the infrastructure of the Larsi hydropower plant and the north-south gas pipeline in 2014. The low rainfall and relatively high air temperatures caused drought, which led to the decrease in the amount of electricity generated by hydropower plants in 2012, As a result, disasters caused by natural hazards, in addition to damaging energy infrastructure, can also pose a threat to the security of energy supply, which has a direct impact on the well-being of the community.

The natural gas is not yet available on the whole territory of Georgia. Even in gasified villages, firewood is preferred for heating as a source of energy due to its relatively low cost. As a result, about 95%[53] of the rural population still actively uses firewood for heating. Although there is a resource of firewood allocated by social logging, it is known that the demand for firewood exceeds it. This can be named as one of the reasons for illegal cutting which in turn can not be controlled and causes significant damage to forest ecosystems. All this will greatly contribute to the emission of climate change-causing gases. At the same time, the illegal extraction of firewood has a negative impact on the availability of this resource for energy purposes in the long run. For rural people, where electricity and gas are available through the network, this will lead to an increased energy-related costs. And in the case of residents of highland villages, where firewood is the main energy source, a possible reduction of access to forest resources poses a critical risk.

Analysis of the legislative framework in the energy sector has revealed its vulnerability to climate change issues. This is especially noticeable in the direction that energy is the leading economic sector in terms of total greenhouse gas emissions. However, in order to determine the reduction and adaptation measures in the energy sector, it is necessary to overcome existing challenges, which are mainly manifested in the collection of statistical data and the shortage of human resources in government agencies.

6.2 Agriculture sector

Climate and any change in it directly affects agriculture. Georgia's diverse soil and climatic conditions determine the multiplicity of agricultural production. The agricultural sector has traditionally occupied an important place in the Georgian economy. Although its share made 7.4% of gross domestic product in 2019, more than 38% of the employed population drop on agriculture (Geostat, 2019). The low income of the agricultural sector is characterized by many factors in relation to the number of people employed in it, but it is also negatively affected by climate change, especially its extreme manifestations such as prolonged and severe droughts, sharp changes in temperature, strong winds and rain, hail, etc. It should be noted that in addition to the employment, developed agriculture ensures the country's food security and is the basis of the country's sovereignty and its a priority of the state to take care of it.

Impact of current and expected climate change on Georgia's agricultural sector

The First National Communication on Climate Change to the United Nations Framework Convention[54] discusses the degree of vulnerability of major crops due to rising temperatures, declining rainfall, evaporation and increased drought.

Among the most vulnerable cultures are:

- Spring and Autumn wheat;
- Potatoes (in southern Georgia);
- Vegetables;

[53] National report on the state of the environment for 2014-2017.
[54] Georgia's First National Communication to the UNFCCC, 1999

- Sunflower;
- Corn (in Eastern Georgia).

The report provides carbon dioxide (CO_2) emission data from the agricultural sector, according to which the main share of CO_2 emission, during the process of agricultural production, falls on the field incineration of agricultural waste. This is also responsible for the release of small amounts of carbon dioxide (CO). Although some measures have been taken in the country to eliminate agricultural waste incineration, the similar practice still occurs, especially in Dedoplistskaro and Sighnaghi municipalities.

Georgia's Second National Communication on Climate Change to the UN Framework Convention[55], the vulnerability of the agricultural sector is mainly discussed on the example of Dedoplistskaro and Lentekhi municipalities. The main challenges for Dedoplistskaro Municipality, are:

- Wind erosion of the soil;
- Increased duration of drought;
- Reduction of air humidity;
- Reduction of soil moisture.

As a result of these changes, further decrease of productivity of arable land and pastures is expected. According to the report, the negative impact of climate change is also estimated in Kvemo Svaneti (Lentekhi municipality).

The main challenges for Lentekhi Municipality are::

- Enhancement of soil erosion;
- Increased rainfall and floods, followed by increased drought;
- Reduction of relative humidity by 6% and hydrothermal coefficient by almost 30%;
- Reduce soil moisture;
- An increase of pest populations is expected.

In the process of preparing the communication, a strategic action plan has been developed to implement climate change adaptation measures in Dedoplistskaro and Lentekhi municipalities..

According to Georgia's Third National Communication on Climate Change for UN Framework Convention on Climate Change[56], the main challenges for the agricultural sector, are:

- Increasing the area of drought regions, increasing the moisture deficit at the expense of evaporation and loss of yield;
- Intensification of soil salinization processes with increasing evaporation intensity (in Eastern Georgia);
- Rapid mineralization of soil organic matter and reduced fertility;
- Intensive reproduction of agricultural diseases and pests;
- Intensification of erosive processes as a result of increasing rainfall intensity and frequency in some humid regions, increasing the risk of floods and hail.

The communication focuses on the impact of current climate change on the agricultural sector in Kakheti and Adjara regions.

[55] Georgia's Second National Communication to the UNFCCC, 2009

[56] Georgia's Third National Communication on Climate Change for UNFCCC, 2015

Georgia's Fourth National Communication[57] on climate change to the UN Framework Convention on Climate Change is assesses the leading agricultural sectors and main challenges they face:

- Heat stress;
- Decrease in food base/productivity (in livestock);
- Change/expansion of the area of pests and diseases;;
- Changes in areas of agro-climatic zones;
- Increase in extreme events (floods, flash floods and landslides);
- Increase in the intensity and frequency of droughts (especially in eastern Georgia);
- Enhancement of soil erosion processes.

Based on the studies conducted in accordance with the National Climate Change Adaptation Plan for the agricultural sector[58], the impact of current and projected climate change on the agricultural sector has been identified, which is manifested in the following areas:

- Relocation of agro-climatic zones;
- Decreased yields in most crops due to droughts, strong winds, unevenly distributed rainfall, hail, heat waves and increased evapotranspiration;
- Decreased fertility of agricultural lands and increased intensity of degradation, which is often facilitated by intense extreme events caused by the climate change (landslides, mudflows, floods, flashfloods, etc.);
- Increased crop loss due to extreme weather conditions (hail, frost, etc.);
- Reducing the area of irrigated lands and increasing the demand for irrigation water.

Access to irrigation water for the agricultural sector

The Second National Action Plan to Combat Desertification discusses the key challenges facing the agricultural sector, which is directly affected by climate change, which is especially reflected on the increase of irrigation water demand. Most irrigation systems do not have regulated runoff; There is no strict control of water intake, collection-drainage network and automation of the irrigation process; Most irrigation systems need to be cleaned; Most of canals have an unpaved bed, which leads to useless water losses, which has 65-70% of the total losses, while 20-30% of the losses are technical and 3-6% is due to the evaporation from the water surface[59]. The overall efficiency coefficient of most existing irrigation systems varies between 0.4-0.6, which is a very low rate and indicates a useless loss of about 50% of the irrigation water, which in turn causes soil erosion, salinization, swamping and intensifies pressure on the agricultural sector.

Numerous researches, studying the impact of climate change on Georgia, confirm that temperatures will continue to rise. However, precipitation and water flow forecast are calculated differently in these studies. The difference in forecasting is determined by the specific chosen scenario and the general circulation model used. In the case of mountain rivers, it is generally assumed that snow melt will accelerate with increasing temperature. Consequently, in the second half of the irrigation period, when the demand for irrigation water is maximum, a decrease in water flow in rivers is expected. In eastern Georgia, the average annual water flow in rivers is expected to decrease by 12-14% over the next 25 years.

Due to declining average annual water flow in rivers, there is a risk of conflicts related to the water use in several areas. One of such sphere is the construction of additional hydropower plants on Georgian rivers. In addition to 29 operating hydropower plants, construction of another 40 stations with a capacity of 175

[57] (2020) Fourth National Communication of Georgia

[58] National Climate Change Adaptation Plan for the agricultural sector, 2017

[59] Georgian Irrigation Strategy 2015-2025

megawatt is planned. Conflicts with hydropower plants occur during the irrigation season, when large-scale power generation takes place, mainly for export, the water consumption in the river is low and irrigation demand – is high. This problem is especially exacerbated when the water flow for energy generation from the river basin is transmitted and it is impossible to use it for the irrigation downstream. A similar conflict may arise between suppliers of drinking and irrigation water, especially due to the need to maintain sanitary-ecological flow in rivers and to reduce water flow in rivers due to climate change as during drought, drinking water is prioritized and farmers in the lower stream may receive less water.

Natural pastures and climate change

An important challenge for the agricultural sector is the condition of pastures, the excessive grazing of which accelerates the process of degradation in the face of high temperatures and frequent droughts, which is manifested by changes in plant species composition, multiplication of foreign invasive and weeds and intensification of soil erosion processes. Consequently, the development of livestock, which is a leading sector in the mountainous regions of the country, is significantly hindered.

Agricultural risk profile assessment

Climate change threats to Georgia's agricultural sector:

- Increasing the area of drought regions, increasing the moisture deficit at the expense of evaporation and loss of yield;
- Strengthening soil salinization processes (in Eastern Georgia);
- Decreased soil fertility;
- Intensive reproduction of diseases and pests of agricultural crops;
- Enhancement of soil erosion processes;
- Increased risk of floods and hail;
- Changes in agro-climatic zones;
- Increased demand for irrigation water in the face of the declining freshwater resources.

Taking expected threats into consideration, due to the absence of appropriate mitigation and adaptation measures to climate change and lack of legislative gaps in strategy documents and relevant action plans, the sector will not be ready to cope with the challenges posed by the future scenario and its vulnerability to climate change will increase even more.

6.3 Health sector

Climate change has a wide impact on human health and this impact is mostly negative. The WHO European Office identifies seven key priorities in this area[60], such as: extreme temperatures, droughts, floods, vector diseases, allergies, non-infectious diseases and air pollution.

In the health sector, in terms of climate change, adaptation measures are generally considered. Accordingly, this document prioritizes adaptation measures to both the direct impact of climate change on human health, as well as the indirect impact associated with changing human living environment. At the same time, it is possible to talk about some mitigation measures within the health sector, which are related to reducing the contribution of the health sector to greenhouse gas emissions. More specifically these issues are given below:

1. Direct impact on human health, such as:
    - Extreme heat/heat waves, which is directly related to increased mortality and morbidity from cardiovascular and respiratory diseases;

[60] https://www.euro.who.int/__data/assets/pdf_file/0009/397791/SDG-13-policy-brief.pdf?ua=1 It should be noted, that that the US CDC has allocated 8 + 1 priority areas https://www.cdc.gov/climateandhealth/effects/default.htm

- Air quality and incpreased level of allergens, leading to an increased burden of respiratory diseases. It should also be noted that one of the leading causes of morbidity and mortality is air pollution, especially the use of polluted energy sources for household activities (firewood, coal, open use of other fossil energy sources, etc.);
- Prevalence of infectious diseases: Climatic conditions affect diseases spread by a) water and b) insects and reptiles, altering the seasonal and geographical characteristics of the vector that transmits the infection;
- Disasters caused by naturn al hazards and changes in the amount of rainall wichi affects both general living conditions and trauma. Finally:

2. Reduce the contribution of the health sector in the climate change, in terms of reducing greenhouse gas emissions by the sector.

The climate change has many effects on human health. Such effects can be identified by monitoring certain diseases. In this regard, Georgia has been selectively monitoring a number of diseases related to increased temperatures, air pollution, rising allergens, water quality and changes in the ecological environment of the disease-carrying vector. However, the impact of climate change is wider as it affects the social and environmental factors that determine health (this issue is also reflected in the third national communication).

The given risk profile is based on data and priorities presented in national communications, expert surveys and interviews with experts.

The Centers for Disease Control records statistics in details on human health, including information related to diseases caused by climate change. This primarily includes diseases that are directly related to the quality of drinking and recreational water, e.g., diarrheal diseases, cardiovascular diseases and respiratory diseases, which might be related to air pollution and temperature changes. It is not yet identified in the country increase in the spread of diseases affected by climate change, such as aquatic infections, and changes in the geographical and seasonal distribution of the vector that transmits the infection due to changes in temperature (eg, malaria, leishmaniasis, Crimean-Congo fever).

Diarrheal Diseases: Most diarrheal diseases are related to water quality. This group of diseases poses a special risk to the pediatric population (see Table 9).

Table 9: Statistics of diarrheal diseases by years

Year	Number of cases (adult population / child)		Incidence per 100,000 inhabitants (adult population / child)	
2019	15,345	10,019	412.5	1,323.9
2018	18,694	11,963	499.2	1,595.7
2017	16,759	10,337	449.5	1,399.0
2016	27,174	17,596	730.6	2,452.7

It should be noted that according to the data available in 2015-2016, the distribution of diarrhea of probable infectious origin by regions shows a picture of increased risk in the Adjara region. In particular, 50% of registered new cases (2015) and 43% (2016) are registered in Adjara region.

Additional vulnerability is due to the spread of diseases that are directly related to the rise in temperature. In Georgia, this includes increased cases of leptospirosis and Lyme disease (borreliosis).

Cardiovascular Diseases: Cardiovascular diseases are a leading cause of disease burden in Georgia (as well as globally). According to the 2019 disease burden assessment, the three leading causes of death in Georgia fall on this group of diseases (ischemic heart disease, stroke and hypertension) (Diagram 4).

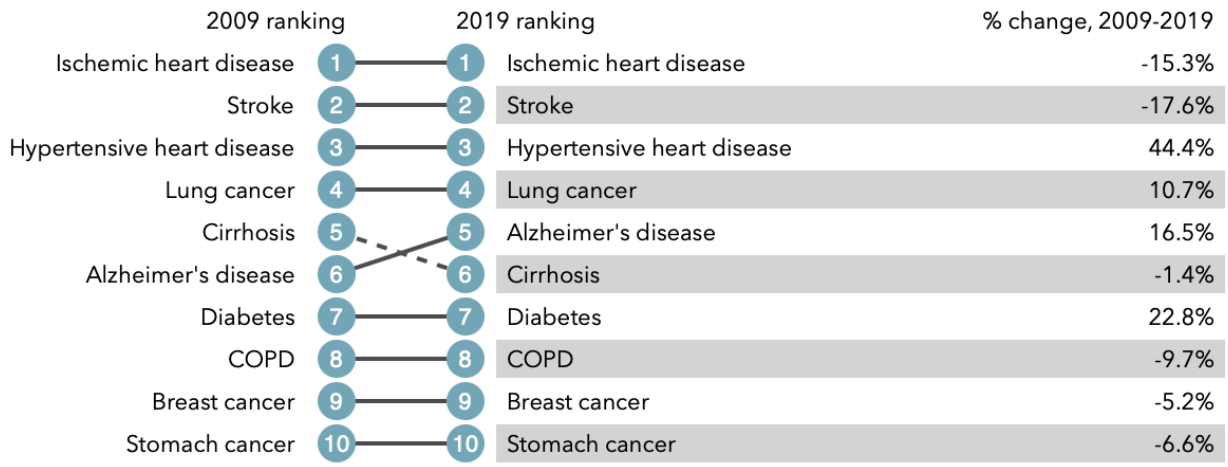

Diagram 4: Leading causes of death in Georgia (2019); The Global Burden of Disease Study[61]

It is noteworthy that the regions have the highest burden of cardiovascular disease, which, according to the Third National Report, correlates with the heat waves registered in the region[62].

Trauma and death related to natural disasters: Climate change is responsible for most cataclysms caused by natural disasters. Disaster prevention and the existence/lack of disaster preparedness and response systems are still a significant challenge for Georgia.

Air: Deaths caused by household air pollution and environmental air pollution in Georgia are estimated at 102 per 100,000 population, which is a significant challenge for public health. Unfortunately, the existing data collection and analysis system does not provide data collection and access to this indicator[63].

Health Sector vulnerability assessment surveys were conducted under both the second national communication and third national communication[64].

Respiratory diseases: Increased temperatures and level of allergens due to climate change increase the burden of respiratory diseases, and in the case of Georgia, this class of diseases is among the top 10 causes of death. (Diagram 4).

It should be noted that respiratory diseases also put a significant burden on the health care system. The incidence of respiratory diseases is particularly high in children under 15 years of age (34,819.1 case per 100,000 children, 2019)[65] and is the second leading cause of hospitalization.

The chronic diseases of the respiratory system are a particular problem in the adult population - asthma, allergic diseases of the respiratory system, chronic obstructive pulmonary disease (COPD), occupational lung

[61] წყარო: Institute of Health Matrix and Evaluation
[62] NATIONAL CLIMATE VULNERABILITY ASSESSMENT: GEORGIA (2014) http://drr-southcaucasus.org/uploads/files/CVA_Georgia_Eng_-_II.pdf
[63] NCDC Statistical reference of the year 2019, pg. 11 [https://ncdc.ge/Handlers/GetFile.ashx?ID=fad4aa1f-2eab-4792-bf4d-5792f58c1782]
[64] Third National Notice.
[65] NCDC Statistical reference of the year 2019, pg. 111 [https://ncdc.ge/Handlers/GetFile.ashx?ID=fad4aa1f-2eab-4792-bf4d-5792f58c1782]

diseases and pulmonary hypertension. Importantly, 73% of the burden comes on COPD, which in addition to tobacco consumption, is also caused by air pollution.

Healthcare System Readiness: An important aspect of vulnerability is the health sector readiness to respond to these changes. Increased infectious and non-infectious diseases pose a heavy financial risk to both households and state-funded medical services. The lack of prevention capabilities exacerbates health inequalities. Also, the increased demand for medical services is also a heavy burden for the health care providers in the regions due to the scarcity of infrastructure and human resources.

It should be noted that diseases of the respiratory and cardiovascular systems are the leading causes of hospitalization in Georgia and in 2019 made 41% of hospitalizations (22% and 19%, respectively), which is a prerequisite for system overload and increased costs.

Mental health, social well-being and gender equality: It is important to note that a person's health is not limited to his or her physical health, but also includes mental and social well-being. The impact of climate change on human mental and social well-being is enormous, although there is less research interest in this issue in Georgia.

Climate change-induced landscape and weather change, the need to change the place of residence and other related issues affect human social well-being - the need to change existing activities, social circles and other factors are directly related to people's financial status, as well as maintaining social status and social ties.

It should be separately noted that climate change-related changes also have a negative impact on gender equality, especially on the vulnerability of women and young girls. It is noteworthy that climate change adaptation measures have a positive impact on gender equality. In the case of Georgia, this may include measures such as reducing dependence on solid fuels in household production or improving access to water and sanitation.

Response measures: Climate change is an uniquely significant challenge globally. As the above analysis of the root causes of morbidity and mortality summarizes, this challenge poses a significant burden to the Georgian population, causing preventable losses and increasing system overload.

Georgia has a number of commitments to climate change, the fulfillment of which has a positive impact on human health, although at the national level, measures planned directly in the health sector are scarce.

- No national sector strategy has been developed in Georgia recently. The strategy is in the process of being developed;
- The main document outlining the strategic objectives of the sector is the National Environment and Health Action Plan (NEHAP-2) approved by the Government of Georgia on Resolution N680 of December 29, 2018. The plan envisages the integration of health issues into the policy of adaptation and mitigation of climate change, which is reflected in the tasks planned under the plan.

It should be noted that at this stage, the issue of systemic readiness of the health sector for climate change is a priority. This includes taking actions to reduce risks, as well as improving accounting and ultimately, responding to consequences and eliminating them.

Finally, with regard to the reduction of climate impact by the health sector, it should be noted that this is a priority issue for the Ministry of Health. At this stage, the Ministry is mobilizing resources to implement infrastructural changes that will reduce emissions by medical institutions/enterprises and make them more energy efficient.

7. KEY FINDINGS AND RECOMMENDATIONS

7.1 Energy sector

In accordance with the international obligations undertaken by Georgia, the legal framework of the country has been in a phase of active transformation in recent years. As a result, five laws have been passed in the energy sector in recent years.

Energy and environment (including climate change directions) policy, strategy and action plan documents have been actively developed over the last two years.

These documents were not developed under the auspices of long-term sectoral policies, so it is expected that not all important documents on energy and climate change issues will be properly coordinated.

This, in turn, could hamper the actualization of climate change issues in the energy sector and in turn, jeopardize the effectiveness of nationally defined mitigation and adaptation measures.

The energy sector has been experiencing staff shortage for years, exacerbated by a change in government structure in 2017. At the moment, this is a particularly significant obstacle, as policy documents are currently being developed that set out a long-term vision for the energy sector as well as climate change targets and measures in this area.

As a result of the staff shortages, it is expected that coordination between agencies will be of lower quality, which will have a negative impact on the actualization of climate change issues in the energy sector.

Recommendations

To avoid the above-mentioned threats, it is advisable to prioritize work on energy policy and energy and climate action plan documents at this stage.

The development and approval of sectoral policies will help to establish a long-term vision for the development of the sector. This in turn will encourage the identification of concrete, measurable, achievable, adequate and timely measures in the context of climate change in the energy sector.

In order to successfully implement and carry out climate change mitigation and adaptation measures in the energy sector, it is recommended that all sectoral and sub-sectoral strategies and action plans are revised and harmonized after the approval of the energy policy document and integrated energy and climate action plan. In order to implement this successfully and timely, it is necessary to strengthen the sector in terms of human resources.

7.2 Agriculture sector

Based on the analysis of the reviewed documents, the main faults and gaps in the policy documents related to the agricultural sector and the legislative framework were identified. In particular:

- Climate change mitigation and adaptation measures in the agricultural development strategy documents[66][67] are of general nature and less reflected in specific plans.;
- The agricultural development strategy documents practically do not reflect plans to reduce greenhouse gas emission from the agricultural sector, which will help to mitigate climate change.

[66] Agricultural Development Strategy2015-2020
[67] Agricultural Development Strategy 2021-2027

- No law/normative document, defining sustainable use of common pastures and establishing a legislative regulation mechanism has been adopted. The existing legislation contains only general records, which is insufficient to bring the process within the legislative framework;
- A law on windbreaks (field protection) has not been adopted, which is of particular importance in terms of climate change mitigation. It should be noted that the relevant draft law has already been prepared and is under the discussion stage;
- The norms for the use of agrochemicals (fertilizers, ameliorators, plant protection products) used in the agricultural sector are not regulated, therefore there are no mechanisms to control them;
- No normative acts have been developed to protect the soil from physical, chemical and biological degradation. In this regard, the updated draft law on soil protection and the planned change in the technical „regulations on the removal, storage, use and recultivation of the fertile soil layer“ are noteworthy;
- No Code of Good Agricultural Practice has been developed, covering all areas of agriculture and aimed at reducing emissions and increasing the stock of organic carbon in the soil.

Recommendations

1) The document of the Agricultural Development Strategy - the strategy of agricultural development 2021-2027 and the action plan to reflect the measures to promote climate change mitigation:

- Reduce greenhouse gas emission by introducing good agricultural practices
    - Proper management of organic waste, including changing the practice of open-field waste incineration
    - Providing minimal cover for the soil
    - Minimal soil tillage
    - Improvement of livestock care
    - Animal farm organic waste management improvements
- Promoting atmospheric carbon sequestration by converting it to the organic carbon in the soil
    - Implementing soil protection and soil improvement measures
    - Arrangement of field protection strips
    - Proper management of pastures
    - Restoration of degraded lands
- Creating incentive mechanisms within various support programs/projects.

Outline measures to support climate adaptation in the Agricultural Development Strategy document and the relevant action plan:

- Diversify agricultural production by including different crops and/or varieties;
- Facilitate and expand selection work to obtain high resistance to pests and diseases and/or to obtain a new drought-resistant varieties/hybrids;
- Establish incentive mechanisms to facilitate production diversification under various support programs/projects;
- Improvement of centralized irrigation water supply systems and minimization of losses;
- Promoting water-saving irrigation methods;
- The early notification system development/improvement and provision of access to it.

2) Strengthen the capacity of advisory services in the agricultural sector in terms of climate mitigation and climate adaptation measures;

3) Study the impacts of climate change in all areas of the agricultural sector, which will provide a full picture of the exsiting risks involved;

4) Facilitate the renewal of the meteorological observation network and increase the coverage area to create a complete climate picture and improve forecasting;

5) Replacement of fixed tariff for irrigation water with volumetric or mixed tariff;

6) Fill in the existing legislative gaps and develop mechanisms to facilitate the implementation of the regulations imposed within them.

7.3 Health sector

The study identified several key strategic documents and processes where it would be important to reflect health and climate change issues. These are:

- Health sector strategy (in development);
- Medium term planning document - Country Basic Data and Directions; and also,
- The National Environment and Health Action Plan of Georgia for 2018-2022, which is currently being implemented and it is important to actualize the strategic objectives related to the climate change.

Today, Georgia's healthcare system and population health face a number of challenges related to the effects of climate change in Georgia:

- The health deteriorating of the population/increased risk factors: including morbidity and mortality rates for cardiovascular and respiratory and a number of infectious diseases;
- Natural disasters and response to climate change and low preparedness;
- Health system preparedness and response, which includes both political (strategic) leadership and implementation and response.

It should be noted that the Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs is responsible for defining the policy on health and climate change. The LEPL National Center for Disease Control under its subordination ensures the implementation of programs in this direction as well as data collection and supervision.

LEPL Emergency Coordination and Emergency Assistance Center and LEPL Emergency Management Agency (Ministry of Internal Affairs) are responsible for responding to climate change-related disasters, extreme temperature changes and their consequences.

Recommendations

- Improve the existing accounting and reporting system to ensure the coherence of the information with both international and local requirements and to ensure timely access to the information;
- An important component of this process is the collection of scientific evidence (which is a actual issue for Georgia), in order to better understand the impact of climate change on health and assess the vulnerability of the sector; It is advisable to use the WHO tool recommended for sector assessment;
- Reduction of greenhouse gases produced directly by the medical sector;
- It is important that the global strategy on health, environment and climate change be used as a framework document in the process of working on climate change and health issues in Georgia;
- The medium term expenditure planning document, which is the country's economic vision for the medium term, should also answer and reflect the challenges of climate change for the health sector.

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