National Environmental Action Programme of Georgia
2012 –2016

Tbilisi 2012

Foreword

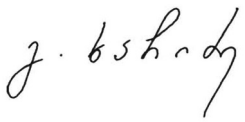
At the Ministerial Pan-European Conference, held in Lucerne, Switzerland in 1993, countries endorsed the Environmental Action Programme for Central and Eastern Europe (EAP/CEE). To achieve the goals set in the Programme the countries took obligation to develop and implement national environmental action programmes. The national Law on Environment Protection (1996) also requires developing and implementing a 5-year environmental action programme.

To ensure protection and improvement of the state of the environment as well as to meet obligations of the Constitution of Georgia, international treaties and national legislation, Georgia developed and adopted the first National Environmental Action Programme (NEAP) in 2000 (Presidential Decree #191 on "Adoption of National Environmental Action Programme dated by 20 May, 2000). Approval of this document stipulated a launch of a new stage of cooperation between Georgia and International Financial Institutions and developed countries.

Preparation of the second National Environmental Action Programme (NEAP-2) was started in 2010 under the overall coordination of the Ministry of Environment Protection of Georgia and in close cooperation with all stakeholders. The document was developed with financial support of the Government of the Netherlands. Working group was established and mandated to reveal most acute environmental challenges and define the ways of resolving them in close collaboration with all stakeholders based on transparent and rational criteria. NEAP-2 is an official document presenting planned actions of Georgia in the field of environment for 2012-2016.

The preparation process of NEAP-2 was conducted in following phases: revealing environmental challenges, identifying significant problems, defining the measures for addressing them, and setting timeframes and budgetary estimates for their implementation.

While developing the second National Environmental Action Programme, experience gained during the preparation and implementation of the first National Environmental Action Programme, results of various studies in the fields of environment and human health, energy, agriculture and other sectors of economy directly or indirectly reflecting state of the environment in Georgia, as well as existing socio-economic trends and main strategic directions of the government of Georgia since 2004, were taken into account.



Minister of Environment Protection of Georgia

George Khachidze

The Ministry of Environment Protection of Georgia expresses its gratitude to the Government of the Netherlands and to Mr. Rob Kramers, Project Coordinator for thier support and close cooperation during the development of the second National Environmental Action Programme. We also appriciate the work of international and local experts, whose role is substantial in the preparation of the document.

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Ministry of Foreign Affairs of Georgia
Ministry of Defense of Georgia
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National Environmental Action Programme of Georgia
2012 – 2016

Approved by the Resolution of the Government #127 of
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Executive Summary

Article 37 of the Constitution of Georgia states "*Everyone shall have the right to live in a healthy environment and enjoy natural and cultural surroundings".* This provides the basis for environmental policy and the protection of natural resources.

Georgia is on a fast track of economic development. Economic growth is a basis for country welfare which may bring considerable pressure on natural resources and the environment. Therefore, sustainable economic development is important for the country from the perspective of environmental protection and rational use of natural resources. Internationally, Georgia has signed several environmental agreements, resulting in international obligations and access to international scientific and technological knowledge and funds.

The State of the Environment Report of 2007-2009, shows that the environment in Georgia has already been under certain pressure. Therefore, introduction of sustainable development principles, which provide an opportunity to balance economic growth, environmental protection and social development, is needed. Sustainable development represents a crucial precondition for the long-term prosperity for Georgia and the Georgian people.

Environmental problems cannot be resolved quickly. High future remediation costs can be avoided by making the right decisions now. Long-term goals require the successful and timely implementation of short-term activities. Many environmental problems are inter-related and need an integral approach. Therefore, a comprehensive national plan is an important tool for addressing the most acute environmental problems and setting the national agenda for cost-effective improvement of the environment and meaningful protection of the natural resources of Georgia. This plan is the National Environmental Action Programme 2 for 2012-2016 (NEAP-2).

Long-term goals, short-term targets and respective activities are presented in NEAP-2 for eleven themes. Each thematic chapter in this document clarifies the environmental problems and causes, stakeholders, the actions taken to-date, national and international developments and an assessment of the regulatory framework. Each chapter concludes with a table of activities that clearly states what actions will be undertaken, who will take those actions and what the estimated costs are. Potential sources of financing and indicators of success are also listed.

The eleven themes and corresponding long-term goals are specified in Table 1.

Table 1. Environmental themes and long-term goals

Theme	Long-term goals (20 year)
Water Resources	Ensure safe water quality and adequate water quantity for human health and aquatic ecosystems
Ambient Air Protection	Have clean air throughout Georgia that is safe both for human health and the environment
Waste and Chemicals	Establish a modern system of waste management in Georgia
Black Sea	Improve ecological conditions of the Black Sea
Biodiversity and Protected Areas	Ensure the protection and rehabilitation of unique eco-systems, species diversity and genetic resources of Georgian biota
Forestry	Improve the functional state of forests through the development of sustainable forestry
Land Resources	Achieve the best possible land-use through sustainable management of land resources
Mineral Resources and Groundwater	Safeguard the environment and human health from negative environmental impacts associated with the extraction of mineral resources; Ensure provision of safe drinking water to the Georgian people and promote economic development through entering the international market
Disasters	Minimize the loss of human lives, negative impacts to human health and the environment, and economic losses
Nuclear and Radiation Safety	Ensure radiation safety of people and the environment
Climate Change	Ensure the security of the Georgian population by means of implementation of measures for adaptation to CC and reduce Green House Gases (GHG)

NEAP-2 also presents several cross-cutting issues, such as environmental impact assessment and permitting, enforcement, environmental education and public awareness, monitoring, the scientific basis for decision-making and the need for geo-informational systems. NEAP-2 concludes with an explanation of the importance of policy coordination within the national government and between the national and the municipal levels.

The implementation of NEAP-2 requires actions by the government, private sector and general public. It calls for an increased awareness of the environmental effects of existing practices in many sectors of the economy and society, followed by necessary changes in these practices. The implementation of NEAP-2 will also require additional funds, including contributions from the international donor community. Future NEAPs will provide additional guidance for achieving an environmentally healthy future and enjoyable natural and cultural surrounding, as provided for in the constitution of Georgia.

As mentioned above, NEAP-2 covers the period of 2012-2016. The Law on Environment Protection requires preparation of a National Environmental Action Programme in every five years. Thus, NEAP-3 will be developed for 2017-2021. The results of the activities described in NEAP-2, together with other relevant developments in the next five years, will be used as a basis for NEAP-3.

Table of Contents

Introduction

The right to live in a healthy environment is guaranteed by the Constitution of Georgia (1995) which states: "*Everyone shall have the right to live in a healthy environment and enjoy natural and cultural surroundings"* (Article 37).The Constitution also obligates everyone *"to care for the natural and cultural environment.*" The Constitution of Georgia, which has supreme power over other laws and international treaties, provides the general framework for various state arrangements and all legal acts (policy/strategic documents) should be in compliance with it.

Since 2004 the Government of Georgia has undertaken radical reforms in a number of key sectors. The major political priorities of the Government of Georgia are liberalization of the economy and stimulation of economic growth, attracting foreign investments, creating a robust investment environment through regulatory reform and job creation, as well as rapid infrastructural development and energy security. The initiatives implemented by a new government in Georgia have resulted in visible improvements and positive trends in many sectors. However, these initiatives may also impose a pressure on the environment and natural resources. Without due consideration of the principles of sustainable development, the country will face severe and irreversible environmental problems in the long run.

The situation is aggravated by the fact that around 20 percent of Georgia's territory is occupied and consequently, no state control or implementation of any activities for environmental protection and management of natural resources is possible in occupied regions of Georgia (Abkhazia, Georgia and Tskhinvali Region, Georgia).

The readiness of Georgia to take measures to implement the principles of sustainable development was emphasized by the President of Georgia Mr. Mikheil Saakashvili in his speeches at the United Nations Climate Change Conferences held in Copenhagen (Denmark) in December 2009 and in Cancun (Mexico)in December 2010.

What Is Sustainable Development?

Sustainable development has been defined in many ways, but the most often-quoted definition comes from the Brundtland Report[1] which states that *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* Sustainable development represents a balanced interaction of social, environmental and economic factors as a path, rather than a barrier, to economic growth and represents a crucial precondition for the long-term prosperity of any country. Georgia is no exception.

Why Do We Need an Environmental Policy Plan?

Georgia faces a number of environmental problems that cannot be resolved with existing resources. The experience of developed countries has proven that economic growth can exacerbate environment and natural resource problems. These problems will continue to increase in the future if measures are not taken today. Therefore, it is necessary to have a concrete plan identifying measures for addressing the most acute environmental problems and setting long-term goals.

1 The Report of the Brundtland Commission, formally known as the **World Commission on Environment and Development** (WCED). World Commission on Environment and Development (WCED). *Our common future.*Oxford: OxfordUniversity Press, 1987 p. 43

Box1.Physical, social and political contexts of Georgia

Location:
Georgia is situated in the South Caucasus Region bordered by the Russian Federation to the north, Turkey to the southwest, Armenia to the south and Azerbaijan to the east. The total area of Georgia is 69,875 km^2 with several climatic zones including subtropical and semi-arid regions. Alpine climate starts at about 2,100 meters.

Natural Resources:
Georgia has more than 26,000 rivers. The rivers flow either into the Black Sea to the west, or into the Caspian Sea via Azerbaijan to the southeast. Over 80% of electricity is generated by hydropower, utilizing only 18% of the estimated hydropower production capacity of the country. Georgia is rich in ground water resources. The total volume of fresh ground water is estimated to be about 24 million cubic meters. Georgia also has more than 800 fresh water lakes.

Forests cover about 27,950 km^2 (about 40% of Georgia). As of 2010, there are 50 protected areas (14 Strict Nature Reserves, 8 National Parks, 14 Natural Monuments, 12 Managed Natural Reserves and 2 Protected Landscapes) covering 7.1% of the total area of the country (493,988 ha).

Major mineral resources of Georgia are manganese (222 million tons), copper (341,000 tons), coal (1 billion tons) and gold (37.6 tons). Estimated oil and gas reserves amount to 580 million tons and 125 million m^3, respectively.

Demography:
The population of Georgia is 4.4 million, 83.8% of which are ethnical Georgians. The average population density is 71 inhabitants per km^2, however, density varies significantly by region. The most densely populated areas Tbilisi, the capital of Georgia, with 1,272,000 city dwellers.

Economic Indicators:
During the last period, significant economic growth was recorded in Georgia. Maximum growth (12.3%) was traced in 2007. From 2004-2007 the total increase of Gross Domestic Product (GDP) was 34.7%. 2003-2008 GDP per capita was increased from $919.00 to $2,921.10. GDP growth slowed in 2008 due to war between Russia and Georgia, coupled with the global economic crisis. Still, GDP of Georgia in 2008 equaled 19 074. 9 million GEL ($12 800.5 million) and GDP growth was 2.3% when other states, including developed countries, suffered from significant economic recession in terms of negative growth of GDP. After decreasing GDP by 3.8% in 2009, an increasing trend of economic development was noticed, and in 2010 GDP increase amounted to 6.4%.

According to UNDP, the Human Development Index (HDI) for Georgia was 0.778 in 2007 ranking 89th out of 182 countries.

Government:
The elected president is the Head of State. The executive branch of the government is represented by the 16 Ministries. The Prime Minister, three State Ministers and 16 Ministers compose the Cabinet of Ministers.

The legislative body of the Country – the Parliament of Georgia, is unicameral and has 150 delegates.

The court system is composed of common courts (city/regional courts, courts of appeal and Supreme Court) and Constitutional Court.

There are 69 self-governing units and 2 autonomous republics (Autonomous Republics of Abkhazia and Adjara) in Georgia.

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Existing national policy plans for environmental protection and the use of natural resources are sectoral, e.g., the National Biodiversity Strategy and Action Plan (NBSAP). Environment and natural resources related issues are to be more adequately addressed in nationally adopted policy papers setting country priorities. Therefore, it is reasonable to have a comprehensive and consistent policy document identifying the relationships between the environment and key sectors within the overall economic framework, considering national priorities as well as interests of different stakeholders in environmental protection and natural resources management.

The Function of NEAP-2

Environmental degradation and irrational use of natural resources, coupled with global environmental problems, pose devastating risks to the well-being of the people of Georgia, including their economic well-being. Land erosion, water and air pollution, illegal timber cutting and forest degradation are just some of the environmental problems Georgia faces today. A list of the major environmental problems in Georgia is provided in Table1.

The second National Environmental Action Programme of Georgia (NEAP-2) is an official document representing Georgia's agenda for environmental actions for 2012-2016. However, this period of time is not enough to solve all environmental problems. That is why the plan sets long-term goals and, therefore, serves as the foundation for long-term environmental planning. Recognizing the need for economic development, NEAP-2 is a program document emphasizing sustainable development from environment point of view rather than restrictive perspectives.

Because the environment continues beyond Georgian borders, a number of cross-border issues are included in the NEAP-2. Environmental problems related to the Black Sea, transboundary rivers, air pollution, etc. are addressed in the document, and the adequate measures are planned.

NEAP-2 strives to modify and strengthen the legal, administrative and institutional framework at all levels and therefore creates a good platform for the EU approximation process. Partnership and shared responsibility among all economic entities (public and private entrepreneurs, non-governmental organizations) will be promoted during the NEAP-2 implementation process. Thus, NEAP-2 of Georgia creates a strong foundation for ensuring a healthier environment and improved well-being of the population, creation of better conditions for economic growth and promotion of a participatory approach.

State of the Environment (SoE) and Environmental Performance Review (EPR)

According to Georgian legislation, the country is required to prepare a State of the Environment report once every three years. The last SoE was prepared in 2010 and it covers the period of 2007-2009. The document provides a detailed description of environmental problems and their extent.

Another important document, developed in 2010, is the Environmental Performance Review (EPR), an assessment of the effectiveness of environmental policy in Georgia. The document was prepared with the assistance of the UN Economic Commission for Europe (UNECE). In this document, Georgia's environmental protection performance was evaluated from the perspective of institutional, legal and management reforms, major achievements and deficiencies were documented and recommendations provided.

These two documents created a robust foundation for the development of the NEAP-2.

Preparation of NEAP-2

Development of the NEAP-2 was coordinated by the Ministry of Environment Protection of Georgia (MEP) with financial support from the Government of the Netherlands. The preparation of the NEAP-2 was based upon democratic principles, with full transparency and participation of stakeholders. All line ministries, scientific and non-governmental organizations as well as other interested parties were involved in the preparatory process.

Overall guidance of the NEAP-2 preparatory process was undertaken by the project coordinator from the MEP and Dutch experts. After a detailed analysis and consultative process, eleven priority environmental sectors were selected. For each sector, small teams were established composed of a theme leader from the MEP, a national consultant and, where necessary and useful, a Dutch expert. A general national consultant was responsible for compiling the final document. The NEAP-2 preparatory process started with the identification phase in October 2009 and ended with its official adoption by the Government of Georgia.

Content of NEAP-2

NEAP-2 includes 15 chapters. Chapter 1 describes the history of environmental policy in Georgia starting from the mid 1990's and the processes that contribute to formulation of environmental policy at the national level. Chapters 2 through 12 are sector chapters.

Each sector chapter has the same structure. It begins with a description of the environmental issue and explanation of major stakeholder involvement. Previously implemented measures and their effectiveness are explained. Sector-specific national and international developments are described, and long-term (20 year) goals and 5-year short-term targets are elucidated. A brief analysis of the adequacy of the existing legal framework for meeting those targets is then provided. Finally, each sector chapter ends with a table of actions necessary for achieving each 5-year target. The tables also include information on timeframes, responsible organizations, financial estimates and indicators.

Sectoral chapters start with Chapter 2 - Water Resources. Chapter 3 addresses Ambient Air and Chapter 4 Waste related issues. Chapters 5 and 6 and 7 cover the Black Sea, Biodiversity and Protected Areas, and Forestry sectors, respectively. Land Resources are described in Chapter 8. Mineral Resources, including groundwater are analyzed in Chapter 9. Chapter 10 is about Natural and Man-made Disasters, as well as Industrial Accidents. Chapters 11 and 12 address Radiation and Climate Change respectively.

Following the sector chapters, the NEAP-2 contains two general chapters. Chapter 13 identifies cross-cutting issues common to all environmental sectors. The final chapter considers the complex and inter-sectoral nature of environmental problems there is the need for policy integration that is described in the final chapter 14.

A list of abbreviations can be found in the Annex.

Table 1. Major Environmental Problems in Georgia

GENERAL PROBLEMS

- Improving environmental legislation;
- Increasing awareness of stakeholders;
- Improving monitoring, inspection and enforcement systems;
- Strengthening the knowledge for adequate policy-making.

MAJOR SECTOR SPECIFIC PROBLEMS

Water Resources
- Pollution of water from different sources
- Improvement of water resources management
- Creation of effective pollution prevention and water abstraction control mechanisms
- Improvement of municipal wastewater systems

Air Protection
- Pollution from transport sector
- Inadequate air monitoring system

Waste Management
- Littering the environment
- Pollution of the environment from landfills
- Pollution of the environment from accumulated hazardous wastes

Black Sea
- Decline in commercial marine living resources
- Bio-eutrophication of the Black Sea and its coastal zone
- Improvement of ecological state of the water

Biodiversity and Protected Areas
- Decrease of viable populations of endangered species and degradation of habitats
- Improvement of fishing and hunting practices
- Development of a unified protected areas network
- Ineffective management of the protected areas
- Absence of proper database for biodiversity conservation and sustainable management of biological resources

Forests and Forestry
- Absence of sustainable forestry practices
- Unsustainable logging and grazing

Land Management
- Land degradation
- Improvement of planning and management practices
- Improvement of institutional communication between the various stakeholders

Mineral Resources
- Abandoned mining sites
- Unsustainable mining practices
- Inadequate monitoring of groundwater
- Unsustainable groundwater management practices

Disasters
- Setting up well-established early warning systems for expected natural hazards
- Intensified floods and flash floods
- Implementation of activities to influence artificially certain natural hazards
- Possible threats from industrial accidents

Nuclear and Radiation Safety
- 'Orphan' radio-active sources
- Strengthening State management and regulation of the sector
- Need for the enhanced radiation safety for people and the environment

Climate Change
- Impacts on natural ecosystems and biodiversity: forest and land degradation, desertification, melting of glaciers
- Decreased water resources and soil fertility
- Intensified disasters

CHAPTER 1. HISTORY OF ENVIRONMENTAL POLICY IN GEORGIA

The endeavors for introducing an environmental protection planning system in Georgia began in the late 1990s. Recognizing the complexity of environmental issues and the need for reflecting environmental aspects in economic development, human health and social welfare sectors, the framework Law on Environment Protection (LEP) was enacted in 1996. The LEP requires preparation of the national Strategy for Sustainable Development (SSD) and mandates the Ministry of Environment Protection Georgia to lead this process. By the same law, the drafting process of NEAP is organized by the Ministry of Environment Protection based on the Strategy for Sustainable Development. The Strategy for Sustainable Development has never been developed. The LEP also says that a National Environmental Action Programme (NEAP) should be prepared every five years. A National Commission for Sustainable Development was established in 1996 by presidential resolution, but has failed to develop a Strategy, and the Commission was abolished in 2005. A similar Commission was reconstituted the same year by governmental resolution but the SSD has still not been developed.

The First NEAP and Other Policy Developments

The MEP started preparation of the first NEAP in 1996 with financial support fromthe World Bank. NEAP-1 was adopted in May 2000 by the decree of the President of Georgia. NEAP-1 covered the period of 2000-2004 and set priorities and relevant actions to address environmental problems. Due to the absence of any procedure for reporting on the state of implementation of the NEAP-1 or other official statements, it is difficult to evaluate achieved outputs. However, cursory assessment revealed that only donor and other international institution supported NEAP-1 activities have been implemented. Moreover, by the time the NEAP-1 was adopted, some activities emphasized in the document had either already been implemented or were planned to be implemented as part of specific pre-approved projects. Other activities were very ambitious and general. It is also worth mentioning that NEAP-1 did not include any cost estimates. Therefore, NEAP-1 was a policy document, in which some activities were adjusted to specific, already funded, projects rather than real needs, while other activities were less realistic under the existing economic circumstances andapoor system of budgetary planning. Lack of planning experience coupled with insufficient financing opportunities for the proposed measures undermined implementation of the NEAP-1.

Despite the above-mentioned drawbacks of the NEAP-1, the importance of this document should not be underestimated; it was the first attempt to provide an officially adopted 5-year action plan for environmental protection. Another attempt by the MEP to have the NEAP-2 for 2008-2012 years failed. A project aiming to develop this document started in 2006 and it was funded by the United Nations Development Program (UNDP). Draft NEAP-2 was elaborated by the end of 2007. However, this document was severely criticized by the NGO sector and other experts due to the applied priority selection and general document development methodologies. Therefore, this document has not been approved officially.

Mid-term Expenditure Framework

Another important planning document in the field of environment protection is the four-year Mid-term Expenditure Framework (MTEF) that is being prepared in compliance with Governmental Resolution #19, dated 26 January 2006. According to the Resolution, all ministries are required to prepare and annually update a MTEF identifying priority directions, measures and budget indications for different sectors. Priorities of the MTEF for 2012-2015 in the environment sector are: introduction of river basin management systems, biodiversity protection, establishment of protected areas system and development of eco-tourism, reforming the waste management system, monitoring ecological balance in the environment, prevention of dangerous natural processes and improvement of ambient air protection monitoring system. Measures to achieve expected outputs for each priority serve as a good foundation for the NEAP-2.

National Environmental Legislation

A number of laws and sub-laws in the field of environmental protection have been adopted in Georgia since 1991. The Constitution of Georgia, that has supreme power over all other legislation, establishes basic rules for environment protection and use of natural resources. The Law on Environment Protection (1996) establishes the general legal framework for comprehensive environmental protection and management of natural resources. Many sector-specific environmental laws are also in place. However, most of them establish general legal norms that are not developed sufficientlyin regulatory acts.

International Obligations

Environmental policy of Georgia is shaped by a number of international obligations. The intention of the Government of Georgia to synchronize its legislation with that of the European Union (EU) has been officially declared several times, and some specific achievements are already in place. To be approximated and appropriately integrated into the developed international community, Georgia strives to introduce internationally adopted environmental approaches and regulations where possible. Currently, Georgia is party to about 50 multilateral and bilateral environmental treaties, which impose specific requirements on member countries. A list of major environmental conventions and protocols to which Georgia is party, is provided in Table 2.

Article 6 of the Constitution of Georgia proclaims that “an international treaty or agreement of Georgia unless it contradicts the Constitution of Georgia or Constitutional Treaty of Georgia, shall take precedence over domestic normative acts.” This provision is elaborated on in the Law on International Treaties, which states that provisions of international treaties have direct power and do not need to be reflected in national legislation. Despite this, not all international obligations are met fully.

To further its EU integration process, the MEP continues to actively work on more than ten other international agreements. Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Convention on Environmental Impact Assessment in a Transboundary Context, Protocol on Pollutant Release and Transfer Registers, Protocol on Civil Liability for Damage and Compensation for Damage Caused by Transboundary Effects of Industrial Accidents on Transboundary Waters, and Protocol on Strategic Environmental Assessment are among those international treaties which are on the current agenda of MEP.

European Neighbourhood Policy of the European Union (ENP)

The EU-Georgia Action Plan, based upon the European Neighbourhood Policy of the European Union, sets strategic objectives for cooperation between Georgia and the EU. The Action Plan was endorsed by the Government of Georgia and the European Commission (EC) in November 2006. Implementation of this plan will be a huge step towards Georgia’s objective of further integration into European economic and social structures. The EU-Georgia Action Plan is an official document used to shape environmental policy in Georgia. Promotion of sustainable development, including protection of the environment, is a priority of the Action Plan. Establishing appropriate conditions for good environmental governance and taking steps to prevent the deterioration of the environment as well as protection of human health, and rational use of natural resources are among the objectives of this document.

In order to implement the EU-Georgia Action Plan, each ministry of Georgia develops annual action plans and reports to the State Minister for Euro-Atlantic Integration on the state of implementation of their Action Plans. The Office of the State Minister sends a summarized report to the EU annually. The EU then evaluates the reports and provides recommendations that are reflected in the next Action Plans of the Ministries of Georgia.

Eastern Partnership

Eastern Partnership is an initiative of EU member states and Eastern European countries. This process was launched in 2009 and aims to improve the political and economic trade relations of the six Post-Soviet states - Ukraine, Belarus, Moldova, Azerbaijan, Armenia and Georgia - with the European Union. Eastern Partnership provides four thematic platforms for cooperation. Platform 2 on “Economic Integration and Convergence with the EU Policies” sets Environment and Climate Change as a core objective to be addressed within the framework of this initiative. Prevention of, preparedness for, and response to natural and man-made disasters as well as environmental governance are also among the flagship initiatives of the Eastern Partnership process. In addition, within the framework of the Eastern Partnership (Panel – Environment and Climate Change) an active cooperation has been launched towards “Promoting a Green Economy in the Eastern Partnership Countries.” The first meeting on this topic was held in Brussels on 7 July, 2011.

Georgia is committed to the objectives of the Eastern Partnership and strives to reflect them into its Action Plans and programs.

EU-Georgia Association Agreement

Currently negotiations on the EU-Georgia Association Agreement are being conducted. One of the topics of the agreement is environment protection. Draft agreement envisages a number of activities in this field promoting not only improvement of environment for people and ecosystems, but also better environmental governance and effective decision-making on environmental issues.

Table 2. Conventions and Protocols Ratified by Georgia

Name of the Treaty	Date of entry into force for Georgia
Convention on Biological Diversity (CBD) • Cartagena Protocol on Biodiversity	31 August,1994 2 February, 2009
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	12 December, 1996
Ramsar Convention on Wetlands of International Importance • Especially as Waterfowl Habitat	7 June, 1997
The Vienna Convention for the Protection of the Ozone Layer • (Montreal) Protocol on Substances that Deplete the Ozone Layer	19 June, 1996 16 September, 1996
Convention on the Protection of the Black Sea Against Pollution • The Black Sea Biodiversity and Landscape Convention Protocol to the Convention • on the Protection of the Black Sea Against Pollution	15 January, 1994 26 September, 2009
United Nations Framework Convention on Climate Change (UNFCCC) • KYOTO Protocol	27 October, 1994 16 February, 2005
Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention)	30 October, 2001
Stockholm Convention on Persistent Organic Pollutants	2 January, 2007
Convention on Long-range Transboundary Air Pollution	12 May, 1999
United Nations Convention to Combat Desertification (UNCCD)	21 October, 1999
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	28 May, 2007
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposals	18 August, 1999
International Convention for the Prevention of Pollution from Ships (MARPOL)	19 April, 1994
Convention on the Conservation of Migratory Species of Wild Animals • Agreement on the conservation of bats in Europe • African/Eurasian Migratory Water-bird Agreement • Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)	1 June, 2000 1 June, 2001 1 August, 2001 24 August , 2002
Convention on the Conservation of European Wildlife and Natural Habitats	1 March, 2010
Agreement between Georgia and International Atomic Energy Agency for the application of safeguard in connection with the threat on the non-proliferation of nuclear weapon • Protocol Additional to the Agreement between the Republic of Georgia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the treaty on the Non-proliferation of Nuclear Weapons.	3 June, 2003 3 June, 2003
Convention on the Physical Protection of Nuclear Material	7 October, 2006
Joint Convention of the Spent Fuel Management and on the Safety of Radioactive Waste Management	29 October, 2009
The European Landscape Convention	Entered into force on 1 January, 2011[2]

2 Ratified by Parliament of Georgia on September 15, 2010

CHAPTER 2. WATER RESOURCES

This chapter addresses surface water-related issues, while groundwater is addressed in Chapter 9, Mineral Resources.

2.1 CURRENT SITUATION

Georgia is rich in water resources. The total actual renewable water resources from rivers and renewable groundwater resources are estimated at 61.5 billion m^3 per year, while total annual withdrawal in 2008, including hydropower generation, amounted to 29.7 billion m^3. Therefore, there is sufficient water in Georgia to meet the actual demands. However, water is distributed unevenly, predominantly located in the west, while the eastern regions frequently suffer from water shortages.

Due to insufficient monitoring of surface waters, data for surface water status are limited. However, even the limited existing monitoring data indicate that pollution from urban wastewater discharges is a general problem. High levels of ammonia and BOD[3] are reported for most of the observed rivers. Concentrations of heavy metals exceed permissible levels at certain locals on particular rivers.

Untreated municipal wastewater is responsible for 67% of all surface water pollution. Industrial sectors strongly affecting surface water quality are: mining, oil production and food industry. Other sources are: unsanitary landfills, illegal dumpsites and agricultural activities.

Water Resources Management

In Georgia, water is managed according to a model based on administrative boundaries. National water policies defined by numerous legislative acts and water-related responsibilities are scattered among various state institutions. Both horizontal and vertical cooperation and coordination between these institutions needs to be strengthened.

In order to effectively manage water quality, it is necessary to regularly collect monitoring data and assess water quality status in water bodies. This information is essential for planning measures to improve water quality where needed. The scarcity of basic hydrological and water pollution data in Georgia does not allow for drawing a comprehensive picture of surface water conditions. As of 2010, 29 hydrologic stations were operational. Of these, seven stations have been rehabilitated and equipped with modern devices. Monthly monitoring of physico-chemical quality elements is carried out on 22 rivers, measuring 33 different parameters.

In order to introduce the European model of water management, it is necessary to shift to a new and more sustainable model such as river basin management (RBM), which provides a strategic approach and ensures long-term sustainable water governance. This approach provides unified management of all types of water bodies, including groundwater. In addition, RBM incorporates spatial planning and land use. Simultaneously, consideration is given to the interests of all water user sectors as well as to the ecosystem.

Pollution Prevention and Water Abstraction Control Mechanisms

According to national legislation, water abstraction as well as discharge in water bodies for those activities are subject to environmental impact permit, are regulated by this permit.

Activities not subject to environmental impact permits have to comply with technical environmental regulations.

3 Biochemical Oxygen Demand - a measure of the organic pollution of water: the amount of oxygen, in mg per liter of water, absorbed by aerobic microorganisms in a water sample kept at 20°C for five days.

To avoid pollution from diffuse sources, adequate attention should be paid to sustainable application of fertilizers, pesticides and herbicides.

Conditions of Municipal Wastewater Systems

Untreated municipal wastewater is a major cause of surface water pollution in Georgia. Presently, there is only one fully operational biological waste water treatment plant (WWTP), while another one provides only primary, mechanical treatment.

2.2 MAIN STAKEHOLDERS

The **Ministry of Environment Protection of Georgia** (MEP) is a key institution at the national level dealing with surface water-related issues. MEP is responsible for the state management and protection of surface water as well as for setting up water monitoring systems. Other water-related responsibilities are scattered among different state institutions.

The **Ministry of Labour, Health and Social Affairs of Georgia**(MLHSA) is responsible for defining policy that ensures a safe environment for the public health. Specifically, the MLHSA develops environmental quality standards, including those for drinking water, surface waters, and groundwater.

The **Ministry of Regional Development and Infrastructure of Georgia** (MRDI) is responsible for implementing regional development policy including coordination and support of the development of water supply and sanitation systems in the regions of Georgia. The Ministry also manages the 100% state-owned water service company Ltd United Water Supply Company of Georgia.

The **Ministry of Agriculture of Georgia** is responsible for monitoring, supervision and state control over drinking water safety parameters and compliance with established drinking water quality standards.

The **Ministry of Energy and Natural Resources** (MENR) issues licenses for natural resources consumption.

Local Self-Governance Institutions are responsible for the management of water resources of local importance but they generally have very limited competences; water management is highly centralized.

2.3 MEASURES TAKEN TO DATE

Rehabilitation and Construction of Municipal Wastewater Systems

Gradual rehabilitation and construction of wastewater systems in Georgia have been proceeding for several years. The rehabilitation of water supply and sanitation systems in Batumi, Poti, Kutaisi, Borjomi and Bakuriani is ongoing. Construction of a biological wastewater treatment facility in Ninotsminda is almost finalized. Construction projects fora biological wastewater treatment facility for Batumi, the coastal settlements from Batumi to the Turkish border, and Poti have been developed. Similar projects for Kutaisi, Borjomi and Bakuriani need to be developed. Construction terms of these facilities will be planned once financial resources are secured. Full rehabilitation and modernization of the Gardabani WWTP is planned by 2018.

Institutional Reforms

Due to reforms in the water services sector, water service companies were consolidated and a state owned company, Ltd United Water Supply Company of Georgia. was established. The aim of these reforms was to simplify water management and to attract investments to this sector. Preparation of a policy paper on the development of the water supply and wastewater sectors is planned.

2.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

Projected Increase of Pressure on Water

Coincident with economic growth, future water use including abstraction and discharge, is projected to increase. Planned increases in the number of hydroelectric facilities, a growing tourism industry, enlarged water supply networks and expanded irrigation systems will increase the demand and impact on water. To address those challenges, effective regulatory measures need to be enacted in Georgia.

Rehabilitation and Construction of Municipal WWT Systems

Rehabilitation and construction of municipal wastewater treatment systems, when completed, will significantly improve the surface water quality.

International Obligations

Georgia, as an ENP partner country, has committed to harmonize its water-related legislation with that of EU. Full implementation of the EU-Georgia Action Plan will have considerable environmental benefits for Georgia in terms of: establishing more sustainable use and management of water; more efficient and effective management of water at the river basin level; reduced flood risks; reduced pollution due to improved treatment of wastewaters; benefits for human health due to improved quality of drinking and bathing waters; benefits for ecosystems; improved conditions for economic activities and tourism, for example, the establishment of instruments to address water scarcity, encouraging involvement of stakeholders, etc.

The UNECE-supported National Policy Dialogue on Integrated Water Resources Management (IWRM) in Georgia was launched in September 2010. The National Policy Dialogue on IWRM in Georgia will be focusing on three major topics: (1) preparation of the National Water Law based on the IWRM principles; (2) setting targets for implementation of the UNECE/WHO Protocol on Water and Health of the UNECE Water Convention and (3) transboundary water cooperation with neighboring Azerbaijan.

2.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

The long-term goal is **to ensure safe water quality and adequate water quantity for human health and aquatic ecosystems.** To achieve this goal it is necessary to reach the following four short-term targets and respective measures:

Target 1 – Establishment of an effective water management system

Target 2 – Establishment of effective pollution prevention and water abstraction control mechanisms

Target 3 – Reduction of water pollution from untreated municipal wastewater

Target 4 – Reduction of pollution from diffuse sources in agriculture

2.6 ASSESSMENT OF NECESSARY REGULATORY MEANS

The Water Law of Georgia, which was adopted in 1997 is outdated and fails to respond to modern requirements. It does not encompass all aspects of water management and protection and lacks linkages to other sectors. In order to resolve existing legislative inconsistencies and fully address all water-related issues, it is necessary to introduce the new Law on Water with the subsequent detailed regulations. Currently, a new Law on Water is under development, which will regulate all types of water bodies including groundwater.

2.7 TARGETS AND MEASURES

Overall long-term goal – ensure safe water quality and adequate quantity for human health and aquatic ecosystems

Target 1 – Establishment of an effective water management system

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[4]	Potential Source	Indicators
1	Develop a new draft Law on Water	2012-2013	Ministry of Environment Protection (MEP),	-----	-----	New Law on Water is developed and submitted to the Parliament for approval
2	Introduce sub-legal acts defined by the new Law on Water	2013-2014	MEP, Government of Georgia	-----	-----	Sub-legal acts required by the new Law on Water are developed
3	Implement river basin management (RBM) pilot projects on identified river basins	2012-2016	MEP	Medium cost	Donors, State Budget	River Basin Management Plans for the selected river basins are developed
4	Extend water pollution monitoring network	2012-2016	MEP	Medium cost	Donors, State Budget	Number of additional sampling points
5	Carry out additional regular monitoring of: polyaromatic hydrocarbons, pesticides and total petroleum hydrocarbons (TPH)	2012-2016	MEP	Medium cost	Donors, State Budget	Analyses are in place
6	Carry out regular hydrobiological monitoring	2012-2016	MEP	Low cost	Donors State Budget	Database is in place

Target 2 – Setting up of effective pollution prevention and water abstractioncontrol mechanisms

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Include specific identified industrial sectors producing nutrient rich wastewater in the list of activities requiring an environmental impact permit and mandatory EIA	2012-2014	MEP	-----	-----	The draft law on amendments to the Law on Environmental Impact Permit is prepared and submitted to the Parliament
2	Provide awareness-raising campaign for industries	2012-2016	MEP	Low cost	Donors, State Budget	Number of personnel from industries participating in the campaigns

4 In this document less than 100 000 GEL is defined as “Low cost”, 100 000 – 500 000 GEL – “Medium cost” and 500 000 –up “High cost”.

Target 3 – Reduction of water pollution from untreated municipal wastewater

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Develop a national program for rehabilitation and construction of municipal wastewater collection and treatment systems	2012-2014	Ministry of Regional Development and Infrastructure (MRDI), MEP	Medium cost	Donors, State Budget	National program for rehabilitation and construction of municipal wastewater collection and treatment systems is in place
2	Finalize rehabilitation and construction of municipal wastewater collection and treatment systems in 10 selected cities and towns (Batumi, Kobuleti, Ureki, Poti, Borjomi, Bakuriani, Kutaisi, Mestia, Anaklia, Marneuli)	2012-2016	MRDI, MEP	High cost	IFI	Wastewater collection and treatment systems are rehabilitated in selected 10 cities and towns
3	Provide training to the personnel operating newly built WWTPs	2016-2016	MRDI, MEP	Low cost	Donors State Budget, Private sector	Number of WWTP staff members trained

Target 4 –Reduction of pollution from diffuse sources in agriculture

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Initiate development of a National Action Plan on sustainable use of pesticides, herbicides and fertilizers	2015 -	Ministry of Agriculture (MA), MEP	Medium cost	Donors State Budget	The process of development of the National Action Plan on sustainable use of pesticides, herbicides and fertilizers is started
2	Support establishment of the pilot organic farms	2012-2016	MEP, MA, local self-governing units	Medium cost	Donors State Budget	Pilot organic farms are operational

Chapter 3. Ambient Air Protection

3.1 CURRENT SITUATION

Clean air is one of the most important targets of environmental protection. It is scientifically proven that concentrations of such gases as CO, NO_x, SO_2, fine dust, and organic compounds above the specific limits seriously affect human health, ecosystems and wealth.

Air pollution in Georgia mainly comes from the transport, industrial and energy sectors. In urban areas, vehicle emissions are the primary source of air pollution. Based on available data, concentrations of the priority pollutants (SO_2, NO_2, CO and in Zestafoni -MnO_2) exceed the allowable limits in all Georgia cities where monitoring occurs. It is recommended to improve the air monitoring system in Georgia.

Pollution from the Transport Sector

The transport sector is responsible for the majority of air-borne pollutants. It accounts for 87% of CO, 70 % of NOx, 50% of SO_2 and 40% of Volatile Organic Compounds (VOCs) emissions in the country. A number of factors are responsible for the transport sector's pollutant contribution, including:

- In the last 10 years, the number of registered light vehicles doubled, reaching 12 vehicles per 100 persons;
- The majority of cars in Georgia are outdated;
- Even though most cars are imported from Europe, the catalytic converters are outdated, which increases the amount of emitted harmful substances;
- Many cities in Georgia have no traffic optimization system. As a result, traffic jams are frequent, which makes car engines work the most inefficiently with highest emissions.

Pollution from the Industrial Sector

Historically, the major industrial sources of air pollution in Georgia were cement plants in Rustavi and Kaspi, ferroalloys plant in Zestafoni and metallurgical plants in Rustavi and Kutaisi. After the breakup of the Soviet Union, the metallurgical plants ceased operation. During recent years, the emissions from the cement industries were reduced to acceptable levels. Installation of stack filters is proceeding at the Zestafoni ferroalloys plant; however this plant is still the major pollution source in the region because of high levels of MnO_2emissions. Because of the costs associated with the plant rehabilitation as well as being the main employer in this region, in accordance with the existing legislation, the plant was given an extension until 2013 to meet emissions reductions. After 2013, the plant is required to decrease its emissions to the allowed level.

The energy sector in Georgia consists mainly of three large power stations located in Gardabani, which consume natural gas to produce electricity. These power stations are: JSC "Energy Invest", LTD; "Mtkvari Energy;" and JSC "Tbilsresi". Those sources do not cause significant local pollution of the air because of high stacks and natural gas consumption.

Air Quality Monitoring

By 2009, four air pollution measurement stations were operational in the cities of Tbilisi, Batumi, Kutaisi and Zestafoni (one station per city). Renovation of existing stations, measurement methodologies and systems of data processing are needed.

According to the monitoring data, all observation points show excess of the maximum allowed concentrations of some air pollutants. In order to assess the size and composition of the population

exposed to the polluted air and plan necessary measures for reduction of human health related risks, it is necessary to expand the monitoring network.

Therefore, renovation of air monitoring system through legislative, methodological and technical mechanisms is crucial.

3.2 MAIN STAKEHOLDERS

The Ministry of Environment Protection of Georgia is the primary public body responsible for ambient air quality in Georgia. The Ministry implements state policy and is responsible for emission registering and air quality monitoring. The latter is performed by a body within the Ministry's system - the National Environmental Agency.

Decisions affecting air emissions from the transport sector in Georgia are made in different state institutions. Decisions concerning vehicle types that are subject to regular technical checking are made by **the Parliament of Georgia**; after this obligatory monitoring is enacted, its enforcement is a function of the **Ministry of Internal Affairs**; The **Government of Georgia** determines the allowable concentrations of harmful substances in the automotive fuels; the **Ministry of Economy and Sustainable Development** ensures development and adoption of technical regulations for the transport sector; The same Ministry implements overall transport policy in the country; Decisions about public transport development or traffic optimization are made independently by each municipality.

3.3 MEASURES TAKEN TO DATE

Transport Emissions

In recent years, some efforts have been made to promote public transport in Georgia. For example, Tbilisi City Hall purchased more than 1000 buses for the Tbilisi Bus Company. Discount regimes creating an incentive for using the public transport have been introduced. The most successful is a joint bus-metro card for travelling in Tbilisi.

The Tbilisi municipality is also a leader in traffic optimization activities. A new system of crossroads has been introduced, which substantially decreased the number and duration of traffic jams in the city. The restructuring of central crossroads is also underway.

Stricter fuel quality standards, which substantially decrease car emissions, will be enacted from 1 January 2012.Obligatory regular technical checking for passenger cars has been postponed until 2013.

On 12 April 2010, the mayor of Tbilisi signed the "Covenant of Mayors." By signing the document, Tbilisi and Rustavi accepted the obligation of reducing CO_2 by a minimum of 20% by 2020. The Covenant also envisages implementation of an action plan promoting sustainable energy.

Industrial Emissions

In 2008-2009, highly efficient air filters were installed in the Rustavi and Kaspi cement plants, bringing emissions of those plants to an acceptable level.

Air Quality Monitoring

In late 2009, the National Environmental Agency purchased three air pollution measurement stations, which were installed in the cities of Tbilisi and Rustavi (2 in Tbilisi and 1 in Rustavi). However, the stations are not automatic. The Agency started ground-level ozone measurements in Tbilisi in 2010.

During the previous years, the National Environmental Agency was equipped with modern laboratory installations through the different international projects that increased the reliability of monitoring data. Still, measurement stations and sampling methodology need modernization and improvement.

Monthly monitoring data are uploaded on the Aarhus centre web-site.

3.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

Due to its geographical location, Georgia has an important role as a transit country. Nowadays the transit infrastructure of the country is actively developing: the railway network is being improved and extended, and highways are being constructed. Accordingly, an increase of transit activities is expected in the future. If no relevant measures are taken, this will result in a substantial increase of emissions and decrease in air quality.

Emissions from the transport sector may also increase with increased internal mobility of people, both for work and recreational purposes, which may be a result of economic growth in the country. If this process is not combined with adequate development of public transportation, the number of private light vehicles will increase substantially (growth of people's well-being will also facilitate that).

Setting economic growth of the country as a priority is expected to increase development of the industrial sector as well. Industrial development, in turn, will result in increased air emissions unless proper environmental risk assessment of enterprises as well as proper enforcement of environmental impact permit conditions is in place. Therefore, this is a very opportune time to introduce the best environmental and economically feasible clean technologies to minimize the negative environment impacts of the industrial sector.

3.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

The long-term goal with regards to air quality is **to have clean air throughout Georgia that is safe both for human health and the environment**.

Short-term (five-year) targets for achieving the long-term goal are:

Target 1. Improvement and step-by-step automation of the existing air quality monitoring network that will make it possible to assess the state of ambient air and factors affecting the air quality.

Target 2. Reduction of industrial emissions through the introduction of modern energy saving technologies and proper enforcement of the requirements of environmental impact permits; and

Target 3. Gradual reduction of vehicle emissions through introduction of relevant instruments based on international experience and national specifics.

3.6 ASSESSMENT OF NECESSARY REGULATORY MEANS

Issues related to ambient air protection are regulated by the Law on Environment Protection and Law on Ambient Air Protection, as well as by sub-legal acts being developed as required by the mentioned laws.

3.7TARGETS AND MEASURES

Long-term goal: to have clean air throughout Georgia that is safe both for human health and the environment.

Target 1: Improvement and step-by-step automation of the existing air quality monitoring network

	Measures	timeline	Responsible agency	Finance estimate (GEL)[5]	Source	Indicators
1	Purchase and install automatic air quality measurement station	2012-2013	Ministry of Environment protection (MEP)	High cost	Donors	At least 1 automatic air pollution measurement station is operational for measuring at least 5 air quality parameters
2	Purchase and install air quality modelling software	2012-2013	MEP	Medium cost	Donors	Air quality model is developed and functioning for Tbilisi
3	Purchase and install new air quality automatic monitoring stations in cities of Georgia	2012-2016	MEP	High cost	State budget, donors	Air quality monitoring data are available from additional at least 5 stations
4	Ensure timely and easy public access to air quality information through creation of an internet portal and web site	2012-2016	MEP	Low cost	Donors	Web-site is regularly updated

5 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

Target 2: Gradual reduction of industrial emissions

	Measures	timeline	Responsible agency	Finance estimate (GEL)	Source	Indicators
1	Strengthen the capacities of the relevant units of the Ministry of Environment Protection	2012-2016	MEP	Medium	State budget, donors	Inspection system is improved

Target 3: Gradual reduction of vehicle emissions

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Improve/optimize traffic management in Tbilisi	2012-2016	Tbilisi City Hall	High cost	local budget, donors	Traffic management is improved in the city
2	Develop/renew in-city and inter-city public transport (introduce less polluting transport means such as electro transport.)	2011-2015	Local municipalities, MESD, ltd. Georgian Railway, MEP	High cost	local or state budget, donors	Increase in demand for public transport, and reduction in age of public transport fleet

CHAPTER 4. WASTE AND CHEMICALS

4.1 CURRENT SITUATION

Pollution of the environment by wastes and chemicals is one of the environmental problems in Georgia. The problem is complex, comprised of littering of the environment, environmental pollution from landfills, and issues related to the management of hazardous and accumulated wastes.

Littering of the Environment

Littering of natural landscapes and cultural sites with household wastes dumped without control is conspicuous in Georgia. This situation is problematic not only from the esthetic and economic points of view but also for the risks of diseases and parasite proliferation; both domestic and wild animals feed on the dumped litter that may poison them or result in accumulation of harmful substances in the tissues of the animals.

The main reason for littering of the environment is the disintegration of the waste collection system. Presently, the regular collection of household waste is only carried out in big cities and district centers. In many settlements, (especially villages) the residents solve the waste problem themselves by dumping the wastes in nearby ravines, along the roads, or onto river banks. Eventually, these dumps are converted into small, uncontrolled “landfills.”

Pollution of the Environment from Landfills

The environment is significantly affected by air, groundwater and surface water pollution from improperly constructed official municipal landfills. Most of the 63 official municipal landfills operational today do not have a groundwater protection barrier and a leachate collection/ treatment system.

Some of the landfills are located on riverbanks or water-tracing gorges, creating a risk for surface and ground water pollution.

Almost all municipal landfills operating in Georgia today were constructed in Soviet times and they do not meet the current environmental requirements. Spontaneous, low-temperature combustion of wastes occurs in landfills, emitting harmful substances including dioxins and furans into the air. These persistent organic pollutants degrade slowly in the environment and are transported long distances by atmospheric flows. Presently - 7 municipal landfills (in Dedoplistskaro until 2013, Tbilisi, Rustavi, Khobi, Ureki-Natanebi, Ozurgeti and Gardabani near Rustavi) have obtained environment impact permits. Three of these landfills are owned by private companies (Ureki-Natanebi, Ozurgeti and one near Rustavi). Landfills in most municipalities do not have an environmental impact permit. The main cause for this is the limited financial resources coupled with the lack of the requisite knowledge, skills and guidance in meeting the environmental requirements. According to the amendment to the “Law on Environmental Permit” of 22 March 2011, already operational non-hazardous waste landfills must obtain a permit before 1 January 2014.

Pollution of the Environment by Hazardous Wastes

In Georgia, the reporting and control systems for production, transfer, treatment or disposal of the industrial, medical/veterinary and other hazardous wastes need improvement.

Pollution from Accumulated Hazardous Wastes

The environment is also polluted with accumulated wastes and sludge from mining and enrichment industries located in the areas surrounding former Soviet plants. Especially dangerous is arsenic-containing ash and sludge in the villages of Tsana (Lentekhi Municipality) and Uravi (Ambrolauri Municipality) (on the territory of the former arsenic extraction and enrichment facility).

Obsolete agrochemicals also pose a threat to the environment, especially pesticides, which were left in large amounts after the breakup of the Soviet Union. Approximately 2,700 tons of hazardous chemicals are located in the damaged waste-burial pit at Iagluja hill. About 230 tons of obsolete pesticides were collected from the storehouses of former *kolkhozes* and *sovkhozes* all over Georgia and have been temporarily stored at the Iagluja burial. Their subsequent environmentally sound recovery and disposal is necessary. In addition, hazardous waste is produced as a result of agricultural activities, (empty containers of pesticides, agrochemicals, and obsolete pesticides from markets) and this issue needs to be adequately.

4.2 MAIN STAKEHOLDERS

State policy in the field of the waste management is being developed and implemented by the Ministry of Environment Protection. Specifically, the Ministry is responsible for developing the requisite regulations (landfill construction and technical norms of landfill operation), as well as revision of EIA reports for waste processing, treatment or disposal and issuing the environmental impact permits.

The self-governing bodies play a major role in household waste management. They are responsible for the collection of wastes and cleaning of the municipal territory, transport and disposal of collected wastes, and construction and operation of landfills. Management of hazardous wastes (including medical, veterinary, agricultural and others) or coordination of such management is not united under the supervision of any particular agency in Georgia. The Ministry of Labour, Health and Social Affairs has established mandatory sanitary norms regulating waste management, adhering to which is mandatory for the medical institutions as well.

Accumulated hazardous wastes are the legacy of Soviet industry. Some of the plants have been privatized and the wastes are now under control of the plant operator (as it is case of manganese-containing wastes in the city of Chiatura). Respectively, the responsibility for environmentally sound management of those wastes now resides with the owner.

4.3 MEASURES TAKEN TO DATE

Collection of Household Wastes

The collection of household wastes has been improving since 2006-2007. Tbilisi City Hall has pioneered this regard, declaring city cleanness a priority. As a result, the city dedicated sufficient funds for a complete renovation of all facilities and equipment of the municipal service enterprise; reimbursement of the price of the provided service increased and became reliable. Simultaneously, service quality control became more stringent. As a result the service quality improved substantially. Since 2008, other municipalities have followed the same model.

Disposal and Treatment of Municipal Wastes

The municipalities are acutely aware that their landfills will eventually need to be closed and new, modern landfills to be constructed. Construction of a Rustavi-Gardabani landfill has begun (permit has been issued) and new landfills are planned in Batumi and Borjomi.

Some projects currently being implemented include facilitation of waste separation and processing to reduce waste flow into the landfill. A pilot project of municipal waste separation has already been implemented in Kutaisi.

Hazardous Wastes

In 2008, a medical waste management pilot project was implemented in Adjara, providing Batumi municipality with facilities (an incinerator, special truck and containers) for medical waste collection, transport and disposal. The Service of Environment Protection of Adjara organized separate collection of hazardous wastes at all medical facilities.

The MEP has developed a draft law which defines and classifies hazardous wastes, establishes reporting and control of their production, transport, storage, treatment, recovery and disposal. After the law is adopted and becomes effective, it will regulate uncontrolled movements of the hazardous wastes and their safe disposal.

Accumulated Hazardous Wastes

During the recent years, inventory of the obsolete pesticides at storehouses was conducted. Also the volumes of PCB-containing oil in equipments (condensers, transformers) were assessed.

4.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

In Georgia, the recycling business is being developed slowly. There are facilities for processing only paper, glass, several types of plastics, and for extracting lead from car batteries. The development of a secondary materials industry and market is anticipated in the near future.

In Tbilisi, the annual per capita household waste production is 50% less than that in the average European household. The economic development of the country is expected to cause increased waste generation rates necessitating the development and implementation of waste minimization (for example, facilitation of multi-use packaging), waste separation and recycling programs.

Industrial development resulted in increased use of industrial chemicals and generation of more hazardous wastes. Though development of certain sectors will support the improvement of the respective waste management. For example, modernization of healthcare facilities will create favorable conditions for improved medical waste management.

Georgia has a number of international obligations in the field of waste management. In order to meet those obligations, specific projects aimed at resolving the waste management-related problems have been implemented in Georgia. Georgia also participates in the implementation of the Strategic Approach to the International Management of Chemicals (SAICM). The National Chemical Profile and SAICM capacity assessment have been developed. Assessment of the institutional capacities for establishment of Pollution Release and Transfer Register (PRTR) in the country is underway.

On 21 April 2011,the “National Action Plan on Persistent Organic Pollutants” was approved by the Governmental decree #907. The Plan envisages implementation of the obligations of the Stockholm Convention on “Persistent Organic Pollutants.”

4.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

The long-term goal for waste management is the **establishment of a modern waste management system in the country** (including safe waste disposal, use of waste as an energy resource, waste processing, waste recovery, recycling and minimization).

In the next five years the following targets should be reached:

Target 1. Improvement of household and hazardous waste management (collection, transport, and disposal); and

Target 2: Reduction of environmental pollution from accumulated wastes.

4.6 ASSESSMENT OF EXISTING REGULATORY MEANS

The frame law regulating waste management in Georgia is under development. Currently, waste management related issues are regulated by a number of provisions of various national and international legal acts.

As mentioned above, according to existing legislation, planning and implementation of collection and disposal of household wastes is the responsibility of the municipalities.

4.7 TARGETS AND MEASURES

Long-term goal –To establish modern system of waste management

Target 1: Improvement of household and hazardous waste management (collection, transport, and disposal)

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[6]	Potential Source	Indicators
1	Develop National Waste Management Strategy and Action Plan	2012-2014	Ministry of Environment Protection (MEP), Ministry of Regional Development and Infrastructure (MRDI), Government of Georgia	High cost	Donors, State Budget	National Waste Management Strategy and Action Plan is prepared
2	Develop Waste Management Law and subordinate legal acts	2012-2013	MEP, MRDI			Waste management Law and subordinate legal acts are developed and submitted to the Parliament
3	Carry out state inventory of wastes and create a waste database	2012-2014	MEP			The state inventory system is in place and a waste database is created
4	Build waste management capacities at national level	2012-2016	MEP			Waste management capacities at national level are increased
5	Raise public awareness on waste management issues	2012-2016	MEP			Awareness raising activities on waste management issues are conducted
6	Strengthen capacities of municipalities in planning and managing the household waste collection system (including financing and administering issues)	2012-2016	MEP, Ministry of Regional Development and Infrastructure (MRDI), local self-governing bodies	Medium cost	Donors, State budget	Guidance documents are developed for municipalities on development and implementation of waste management plans; trainings are conducted for representatives of municipalities
7	Develop Municipal Plans for Household Waste Management (which will be harmonized with the National Waste Management Plan)	2012-2016	Local self-governing bodies, MEP, MRDI	Medium cost (for each municipality)	Donors, Local budget	Municipal Plan for Household Waste Management is developed for each self-governing body

6 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

8	Improve collection-transport system of household wastes in all municipalities gradually	2012-2016	Local self-governing bodies	Medium (for each municipality)	Local budget	Household wastes are regularly collected in all settlements of each municipality
9	Closing/conservation of old landfills gradually and construction of new, modern landfills	2012-2016	MRDI, local self-governing bodies, MEP	High cost	Donors, State budget	Part of old landfills are closed down; New landfills are constructed
10	Developing financial-economic basis for waste minimization and for business participation stimulation in waste management	2012-2016	MEP, Ministry of Economy and Sustainable Development (MESD), MRDI	Medium cost	Donors, State budget	Economically viable package of recommendations is developed
11	Promotion of introducing of modern technologies for collection, transport and treatment of the hazardous wastes	2012-2015	MEP, Ministry of Labour, Health and Social Affairs(MLHSA), Ministry of Agriculture (MA), MRDI, MESD	High cost	Donors	Modern technologies for collection, transport and treatment of the hazardous wastesare introduced

Target 2: Reducing environmental pollution from accumulated wastes

	Measures	**Time frame**	**Responsible agency**	**Finance estimate (GEL)**	**Potential Source**	**Indicators**
1	Undertake a detailed study of arsenic-containing ashes and sludge in villages of Tsana and Uravi, develop a project (action plan) for its conservation and implement the measures of urgency	2012-2015	MEP, Local Self-governing body	High cost	Donors State budget	Project for conservation of arsenic containing wastes is developed; First stage urgent measures are implemented
2	Undertake a study/assessment of hazardous substances disposed at the Iagluja burial, packing and temporary storage/export of waste, containing persistent organic pollutants for the safe treatment; Temporary conservation of the Iagluja burial (fencing, construction drainage pits, covering the open areas with the soil layer)	2012-2015	MEP Local Self-governing bodies	High cost	Donors	The inventory of burial is developed; Up to 200 tons of hazardous chemicals/wastes are treated; The burial is fenced and drained, open areas are covered with soil layer.

CHAPTER 5. THE BLACK SEA

5.1 CURRENT SITUATION

The Black Sea is a unique water body. It has the largest specific drainage basin in the world, which drains over two million square kilometers and covers almost one third of continental Europe. These natural characteristics make the Black Sea ecosystem outstanding in terms of biodiversity. Its huge catchment area and semi-enclosed nature have made the Black Sea highly sensitive to a variety of anthropogenic impacts.

Improvement of the ecological state of the Black Sea warrants special importance considering the fact that infrastructural development of the coastal zone for promoting the tourism sector in Georgia is a national priority for the country.

The Black Sea faces the following main problems: (I) decline in commercial marine living resources, (II) degradation of the Black Sea marine and coastal biodiversity and habitats, and (III) eutrophication[7].

Decline in Commercial Marine Living Resources

In 1960, 26 commercial fish species were registered in the Black Sea.; today there are only three or four. Due to overfishing in the early 1970s and 1980s, the structure of catches has significantly shifted.

Overfishing, invasion of alien species and degradation of the aquatic environment are the primary causes of this decline. Lack of regionally coordinated methodologies to assess the populations of commercial marine resources inhibits the Black Sea-bordering countries' abilities to determine the amount of resources that might be extracted, which complicates the planning and decision making process.

Degradation of the Black Sea Marine and Coastal Biodiversity and Habitats

The increase in invasive species has a significantly deleterious impact on the native Black Sea biological diversity, with negative consequences for human activities and economic interests. Between 1996 and 2005, a total of 48 new alien species were recorded.

Ineffective management of the coastal zone contributes to the degradation of the Black Sea marine and coastal biodiversity and habitats. Decreased amounts of sediment flushed to the coast in the Chorokhi River coupled with intensive sediment extraction from the coast for construction purposes cause erosion and degradation of the coastal zone. Although Georgia introduced and implemented significant coastal conservation measures both in coastal wetlands and in marine ecosystems (i.e.Kolkheti National Park was created), it is necessary to identify and designate areas with a different protection regime considering the importance of the coastal biodiversity and habitats.

The situation is severe in the coastal zone of the Abkhazia region. To meet the infrastructural needs for the preparation of Sochi Olympiad 2014, vast amounts of construction inert materials are being extracted from the coastal zone of this region. With further development of the existing scenario, the unique and vulnerable coastal zone of the Black Sea located south from the border between the Russian Federation and Georgia will face irreversible dramatic consequences.

Some activities for the Black Sea coast can be viewed in Chapter 12 on Climate Change.

Eutrophication

7 The gradual increase in the concentration of phosphorus, nitrogen, and other plant nutrients in an aquatic ecosystem that promote a proliferation of plant life, especially algae, which reduces the dissolved oxygen content and often causes the extinction of other organisms.

Increased concentration of nutrients[8] has caused eutrophication of the Black Sea. Eutrophication creates a significant risk for the biodiversity of the Black Sea.Municipal waste water discharge is a major source of nutrients to the Black Sea. Runoff from agricultural fields is another major source of nutrients pollution of the Black Sea.

5.2 MAIN STAKEHOLDERS

At the national level, the MEP is the main governmental agency responsible for the Black Sea protection. The Ministry of Economy and Sustainable Development (MESD), the Ministry of Labour, Health and Social Affairs (MLHSA),the Ministry of Education and Science (MES), the Ministry of Agriculture (MA) and the Ministry of Regional Development and Infrastructure (MRDI) also play important roles in addressing Black Sea related problems and implementing necessary measures. Local municipalities have direct responsibilities as well, as they are in charge of municipal waste management at the local level. Other stakeholders include representatives of civil societies, business communities and the local coastal population of approximately 250,000 households.

5.3 MEASURES TAKEN TO DATE

In 1992, six countries signed the Convention on the Protection of the Black Sea against Pollution (Bucharest Convention). This international treaty creates a basis for joint and coordinated actions of the parties aimed at improvement of the Black Sea ecosystem and sustainable development of the riparian states.

A number of national and regional projects have been implemented since the Bucharest Convention entered into force (1994). The most important national achievement is the establishment of the Kolkheti National Park, which ensures protection of coastal and marine biodiversity. Currently, construction/rehabilitation of the municipal sewage systems and waste water treatment facilities is taking place throughout the whole coastal zone of the Black Sea. These efforts will significantly reduce pollution of the Black Sea.

By signing the Black Sea Biodiversity Protocol of the Convention on the Protection of the Black Sea against Pollution in 2009, Georgia has officially declared importance of Black Sea biodiversity protection at the international level.

5.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

The Black Sea coastal zone is one of the locations for development of the tourism industry in Georgia. A number of infrastructure developments in the region, the increase of tourists, potentially large scale projects such as construction of the airport, and creation of a free trade zone in the city of Poti will significantly promote economic development of the region, but at the same time will increase the load on the Black Sea. Climate change will also influence the coastal zone. The Black Sea coastal zone has been identified as one of the most vulnerable sites to climate change in Georgia. Climate Change, its potential impacts as well as planned response measures are described in Chapter 12.

The importance of protection of the Black Sea is well-recognized by the government of Georgia. Several international treaties and agreements aimed at protecting the Black Sea and promoting regional cooperation were signed between 1992 and 2009. The Black Sea Regional Strategic Action Plan (BS SAP) on the Rehabilitation and Protection of the Black Sea (2009, Sophia) sets priorities and actions for the protection of the Black Sea. Black Sea issues are one of the priorities of EU-Georgia neighborhood program. Recently, Georgia ratified the Black Sea Biodiversity Protocol to the Black Sea Convention and the Protocol for the Protection of the Marine Environment of the Black Sea from Land-Based Sources and Activities and once more proved its readiness to partici-

8 Elements such as nitrogen and phosphorus that are needed for plant growth

pate in implementing activities to protect the Black Sea.

5.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

The long-term goal for the protection of the Black sea is **to improve the ecological state of the Black Sea.** This goal is in line with the target set by all Black Sea countries in BS SAP.

For implementing this goal the following targets should be achieved in five years:

Target 1. Preservation of commercial marine living resources

Target 2. Conservation and management of Black Sea marine and coastal biodiversity and habitats

Target 3. Reduction of Eutrophication

Target 4. Ensuring good water quality for human health, recreational use and aquatic biota

Achieving these targets is very important not only from biodiversity and environmental perspectives, but for ensuring sustainable infrastructural development of the coastal region and promoting tourism in this area.

5.6 ASSESSMENT OF NECESSARY REGULATORY MEANS

There is no specific law on the protection of the Black Sea. According to the BS SAP there should be a law harmonized at the regional level with the purpose to have a unified policy for the whole region. Existing national legislation needs to be updated in accordance with modern European practices. Introduction of Integrated Coastal Zone Management (ICZM) approaches and protection of the coastal zone from degradation also requires appropriate legislation to be in place.

5.7 TARGETS AND MEASURES

Long-term goal - to reach the ecological state of the Black Sea of the 60-ies of the last century

Target 1. Preservation of commercial marine living resources

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[9]	Potential source	Indicators
1	Promote national scientific research on the Black Sea ecology and fisheries through strengthening the Black Sea Monitoring Center.	2012-2013	MEP	Medium cost	State Budget, Donors.	Capacities of the Black Sea Monitoring Center are strengthened

Target 2. Conservation and management of Black Sea marine and coastal biodiversity and habitats

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential source	Indicators
1	Include marine biodiversity aspects in relevant strategic documents	2012-2016	MEP, Ministry of Education and Science (MES)	Low cost	State Budget, Donors	Biodiversity Strategy and Action Plan includes Marine biodiversity issues
2	Development of indicators related to marine biodiversity to be added to the National Biodiversity Monitoring System	2012-2013	MEP	Low cost	GIZ	Indicators are developed
3	Development and implementation of a pilot project for preservation of marine biodiversity	2012-2014	MEP	Medium cost	GIZ	Pilot project is implemented
4	Support existing protected areas to enhance conservation of marine and coastal habitats and biodiversity	2012-2016	MEP, International Environmental Organizations	High cost	State Budget, Donors	Management of existing marine and coastal protected areas are further improved
5	Study the reasonability of building material extraction from the rivers of the Black Sea basin.	2012-2013	MESD, MEP	Low cost	State Budget, Donors	Report and recommendations are developed
6	Awareness rising of local stakeholders in coastal regions on the requirements of the Black Sea Regional Strategic Action Plan	2012-2016	MEP	Low cost	Donors	Number of trainings and workshops for stakeholder groups

9 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

Target 3. Reduction of eutrophication

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential source	Indicators
1	Introduce the adequate monitoring and assessment system of Nitrogen and Phosphorus (concentrations and loads) in major rivers of the Black Sea basin	2015-2016	MEP, MLHSA	Medium cost	Donors	Reliable data series are in place
2	Support investment projects for construction of water supply/ sewage systems and wastewater treatment plants (WWTP) for popular Black Sea resorts[10].	2012-2016	MEP, MRDI, Local self-governing bodies	High cost	State Budget, IFIs, DABLAS TF	Water supply/sewage system in Ureki and WWTP for Ureki/ Kobuleti are operational

Target 4. Ensuring good water quality for human health, recreational use and aquatic biota

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential source	Indicators
1	Develop the "List of Black Sea-specific priority pollutants" to help target monitoring priorities	2012-2013	MEP	Low cost	State Budget, DABLAS TF	List is in place and updated regularly
2	Carry out permanent monitoring of bathing water quality during the touristic season	2012-2016	MEP	Low cost	State budget	Daily monitoring during the Summer season in Batumi, Kobuleti and Ureki is carried out
3	Support the construction of Kobuleti-Batumi bypass road	2012-2014	MRDI, MEP	High cost	IFIs, State Budget	Bypass is constructed

10 This measure can also be covered by the activities of the Target 3 of the Chapter 2.

Chapter 6. Biodiversity and Protected Areas

6.1 CURRENT SITUATION

As part of the Caucasus eco-region, Georgia represents one of the biodiversity "hotspots"(currently, by Conservation International" there are identified 34 biodiversity "hotspots" in the world, which have unique biodiversity and are simultaneously under the significant threat). At the same time according to the World Wild Fund (WWF), the Caucasus is an eco-region of global importance characterized by species diversity, a high degree of endemism, diversity of vegetation types and rare biomes at global level.

There are habitats and ecosystems of global importance in Georgia. For instance, 17 sites of special importance for biodiversity conservation purposes are already included into the Emerald Network[11] and 31 important sites for birds have been identified in Georgia. Apart from these, two wetlands in the Kolkheti lowland are included on the Ramsar Convention list of Wetlands of International Importance. Georgia is biologically very rich country: 4,130 species of vascular plants are found in Georgia; as many as 600 species (14.2% of the total number of species) are Caucasian endemic and about 300 species (9.0% of the total number of species) are Georgian endemics. 16,054 faunal species have been described in Georgia, 758 of which are vertebrates.

Nowadays, halting degradation of habitats and loss of species, improving fishing and hunting regulations, increasing effectiveness of protected areas management, developing a unified protected areas network and improving of databases for biodiversity conservation and sustainable management are the major challenges to be addressed in the field of biodiversity in Georgia.

Decrease of Number of Species and Degradation of Habitats

Due to habitat destruction and extensive, unregulated exploitation, many plant and animal species have become endangered. 29 mammal, 35 bird, 11 reptile, 2 amphibian, 14 fish and 56 woody plant species are currently included on the national Red List. In addition, 44 vertebrates found in Georgia are globally endangered and included on the IUCN Red List as vulnerable (VU), endangered or extremely endangered species. Details are described in the Box 6.1.

Box 6.1 Information about some of the endangered species

Large mammal populations are especially endangered and only special conservation measures can improve their status. In the past century, the Goitered gazelle and the southern population of wild goat (Trialeti ridge) became extinct in Georgia. The leopard and striped hyena are still present but only as isolated individuals. Red deer numbers have declined (only three populations have been preserved in PAs) in Georgia.

From 1990 to 2005, the East Caucasian Tur population decreased by 20 percent, while the West Caucasian population by 50 percent. Since the beginning of the past century, the Black Sea sturgeon populations have decreased by at least 37 times.

Overgrazing is one of the most significant factors deleteriously affecting biodiversity. Overgrazing is most acute on sub-alpine and alpine pastures of the highlands and in arid ecosystems of southeast Georgia, where numerous domestic livestock (especially sheep) and unregulated grazing have resulted in soil erosion, and reduction of plant cover composition and productivity, which creates ideal conditions for spreading invasive plants. Land degradation problems are covered in Chapter 8 on Land Resources.

Since 1990, the forest resources of Georgia have been intensively exploited. Firewood has remained the primary source of fuel for several rural communities and small towns. A significant de-

11 The Emerald Nnetwork is an ecological network to conserve wild flora and fauna and their natural habitats of Europe

mand exists for timber as well. Therefore, the introduction of sustainable forestry practices is critical for conservation of the country's biodiversity. Forestry related problems and potential solutions are addressed in Chapter 7 on Forestry.

Degradation of the Black Sea marine and coastal biodiversity is another issue that needs to be addressed. Black Sea biodiversity problems are discussed in Chapter 5 on the Black Sea.

An Environmental Impact Permitting System, which includes an Ecological Expertise of the Environmental Impact Assessment (EIA) report, is a mechanism with potential to reduce the impact of development projects on biodiversity. However, this mechanism needs further development and improvement. The actual impacts of planned activities on biodiversity, mitigation and compensation measures are generally not adequately described in EIA reports.

Fishing and Hunting Practices

Despite measures undertaken to support sustainable fishery and hunting, high levels of illegal fishing and hunting, the incomplete monitoring system and lack of competent staff in these sectors still remain an acute problem. The existing assessment system for fish stock and hunting species and additional establishment of fishing and hunting quotas needs to be improved. Lack of data complicates defining concrete measures to support sustainable fishing and hunting.

Since 1991, difficulties in the Georgian economy, the loss of markets, and dramatic decreases in fish stocks in the Black Sea, have had a negative impact on the fishing sector. Fishing activity in the Black Sea has decreased significantly. Anchovy is the most commercially important fish in Georgian waters of the Black Sea with annual catches of 30,000 to 40,000 tones. Annual catches of other fish species (whiting, spiny dogfish, three mullet species and shad) are much smaller. A more detailed description of the problem and implemented actions are provided in Chapter 5 on the Black Sea.

Fish resources have also significantly decreased in the inland waters of Georgia where invasive species are a major problem. The current state of most fish species (except for sturgeon and the Black Sea salmon species), including endemic forms in inland waters, is still unknown.

Protected Areas Network

Establishment of protected areas (PAs) is one of the most important instruments for effective biodiversity conservation. Georgia's first nature reserve was established in 1912 in Lagodekhi. Currently there are 56 protected areas covering 7.3% of the territory of Georgia. Although the primary function of protected areas is to ensure biodiversity conservation, they also have a great scientific research and socio-economic value for the country, especially for development of national and international tourism. Development of a unified PA network is one of the main challenges of the PAs system.

Some sensitive areas in the country have still not been designated as PAs.

Management of Protected Areas

Development of management plans for protected areas is one of the important mechanisms for their effective management. Upgrading the monitoring systems, completing databases and improving shortcomings in legislation is also very important. Legal aspects are discussed in paragraph 6.6.

In addition, the lack of qualified human resources and insufficient equipment and supplies contribute to the problem. Illegal use of natural resources is also among the most significant problems in PAs. Most of the problems identified in the PA system are exacerbated by insufficient funding of the system and a low environmental awareness of the population.

Proper Databases for Biodiversity Conservation

Due to a lack of modern and effective tools for data collection, storage and analysis, the identification of actual changes in species and habitat conditions is quite difficult; this, in turn, makes assessment of the current state and trends of biodiversity more difficult. Lack of proper data is one of the factors hampering development of appropriate measures necessary for the conservation of biodiversity and effective management of biological recourses.

National Biosafety System

Systematization of data on the percentage of genetically modified organisms (GMOs) in total imported sowing/planting stock and agricultural production is important. Risks from Living Modified Organisms (LMOs) to biodiversity are less known. It should also be mentioned, that the national capacity for GMO related risk management needs to be developed in the country.

6.2 MAIN STAKEHOLDERS

The Ministry of Environment Protection of Georgia (MEP) participates in the development of state policy in the field of biodiversity and is responsible for policy implementation. The MEP is also responsible for establishment and coordination of the state Biodiversity Monitoring System.

The Agency of Protected Areas (APA), (legal entity of public law of the Ministry of Environment Protection), and its subordinated 18 territorial units are in charge of management, conservation and protection of protected areas as well as establishment of a PA network and the development of ecotourism in protected areas. The Ministry of Energy and Natural Resources (MENR) issues licenses for the use of biological resources.

The National Tourism Administration of Georgia (Legal Entity of Public Law) under the Ministry of Economy and Sustainable Development (MESD) also plays a significant role in development of the tourism sector in the country.

The Ministry of Agriculture has a significant role in the protection of agro-biodiversity and in defining rules for pasture use. The Ministry of Agriculture is also responsible for the management supervision and control of pesticides and agro-chemicals. Pasture use is regulated at the level of local authorities.

The Ministry of Culture and Monument Protection is in charge of the conservation of historical and cultural heritage sites. Some of these sites are located inside or nearby PAs of Georgia and some of those sites may be designated as Natural Monuments (one of the PAs categories based on the IUCN categorization).

The Ministry of Education and Science is involved in the improvement of environmental education and raising public awareness. The Border Police of Georgia protects trans-boundary protected areas in cooperation with the MEP.

Universities and research institutes conduct research and monitoring of biodiversity and submit information and recommendations to the MEP as requested. They also participate in *ex-situ* conservation of Georgian flora, fauna and agro-biodiversity. The Commission on Endangered Species, which is composed of experts in relevant fields, is responsible for the assessment of conservation statuses of species and elaboration of the Red List.

International and national NGOs contribute significantly to biodiversity conservation.

Finally, local human populations are the immediate stakeholders as many of them rely on biodiversity resources. Therefore, any conservancy or other related activity should be planned in close cooperation with them.

6.3 MEASURES TAKEN TO DATE

The National Biodiversity Strategy and Action Plan (NBSAP) was approved by the Government of Georgia in 2005. NBSAP defines a 10 year strategy and a five year action plan in the sphere of biodiversity protection and reasonable use of biological resources. Main achievements from implementation of the NBSAP are summarized below:

In accordance with the provisions of the Law of Georgia on the Red List and Red Book, the Commission on Endangered Species conducted an evaluation of the state of flora and fauna species within the country using IUCN criteria and categories, and developed a new Red List of Georgia that was approved by Presidential Decree. Management plans have been prepared for the conservation of many species and species groups (tur, leopard, bats, brown bear, Caucasian grouse, waterfowl, imperial eagle, Mediterranean tortoise, Caucasian salamander, sturgeon).

Significant progress was made in *ex-situ* and on-farm conservation of the endemic, endangered species and agro-biodiversity of Georgia. More details are provided in Box 6.2

Box 6.2 Conservation of endangered species, endemic species and agro-biodiversity

Since 2005, the Tbilisi Botanical Gardens has been participating in the Millennium Seed Bank Project of the Kew Botanical Garden (Great Britain). Through the project, Georgia now has a duplicated collection of 600 threatened and endemic plant seeds (covering 17 % of Georgian flora).

A gene bank was established at the institute of farming. 3,075 samples of field and vegetable crops are currently being stored in the bank. 1,519 samples of fruit and vine varieties are available at the institute of horticulture, viticulture and wine making. On-farm conservation of old Georgian endangered, traditional agricultural crops is also being conducted. The traditional cultivation of 10 wheat and legume varieties (titeli doli, dika, barley, rye and millet), (cicer, bean, lentil, cowpea and chick pea) and 1 technical (flax) variety have already been restored on local farms of Samtskhe-Javakheti. 22 local apple species have also been collected; saplings have been cultivated and handed over to the farmers in Samtskhe-Javakheti.

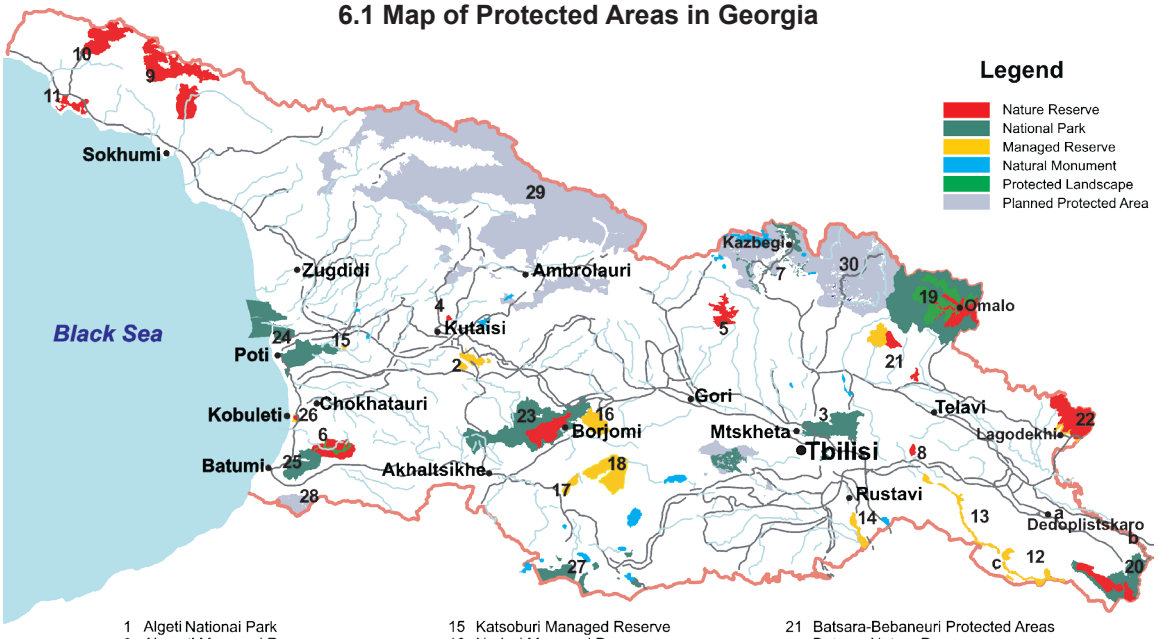
With the financial and technical support of GIZ, the National Biodiversity Monitoring System is being developed to obtain proper information on the status and trends of biodiversity, in order to develop adequate response systems and to integrate these systems into state policy. National indicators for biodiversity monitoring have been already selected. Now the data are being collected according to the selected indicators, and the analytical methods are being developed.

The achievements in the field of protected areas deserve special attention. The total area of protected areas has significantly increased during the recent years. By 2011, 7.3% of all of Georgia's territory was protected by law (511,122.5 hectares). In addition, it is planned, and some progress has already been made to further increase the total area of protected territories. Details about the planned projects are described in the Box 6.3.

Box 6.3 Planned Protected Areas

There are several ongoing activities focused on the development of new protected areas (Machakhela, Pshav-Khevsureti, Samegrelo and the Central Caucasus) as well as on the expansion of current ones (Kazbegi and Algeti). With the implementation of these projects, the percentage of protected territories in Georgia will be significantly increased.

6.1 Map of Protected Areas in Georgia



1 Algeti Nationai Park
2 Ajameti Managed Reserve
3 Tbilisi Nationai Park
4 Imereti Caves Protected Areas
5 Liakhvi Nature Reserve
6 Kintrishi Nature Reserve
7 Kazbegi Nationai Park
8 Mariamjvari Nature Reserve
& Khorugi Managed Reserve
9 Psxu-gumista Nature Reserve
10 Ritsa Nature Reserve
11 Bichvinta-miusera Nature Reserve
12 Chachuna Managed Reserve
13 Iori Managed Reserve
14 Gardabani Managed Reserve
15 Katsoburi Managed Reserve
16 Nedzvi Managed Reserve
17 Tetrobi Managed Reserve
18 Ktsia-Tabatskuri Managed Reserve
19 Tusheti Protected Areas
Tusheti Natute reesrve
Tusheti National Park
Tusheti Protected Lanscape
20 Vashlovani Protected Areas
Vashlovani Natute reesrve
Vashlovani National Park
a) Artsivis kheoba Natural monument
b) Alaznis chala Natural monument
c) Takhti-Tepha Natural monument
21 Batsara-Bebaneuri Protected Areas
Batsara Nature Reserve
Babaneuri Nature Reserve
Iito Managed Reserve
22 Lagodekhi Protected Areas
Lagodekhi Natuns Reserve
Lagodekhi Managed Reserve
23 Borjomi-Kharagauli National Park
& Borjomi Nature Reserve
24 Kolkheti National Park
25 Mtirala National Park
26 Kobuleti Protected Area
27 Javakheti Protected Areas
28 Machakhela Planned Protected Area
29 Central Caucasu Planned Protected Area
30 Khevsureti Planned Protected Areas

Measures have been taken to develop tourism infrastructure in the protected areas and as a result, several PAs already have adequate infrastructure for tourists. Different tourism services (i.e. horse-back riding, rafting, mountain climbing, hiking, bird watching, etc.) are already in place, providing income generation opportunities for the protected areas. Other capacity building and infrastructural development activities are underway. The Agency of Protected Areas supports several projects for the socio-economical development of buffer zones populations through the assistance of various donor organizations.

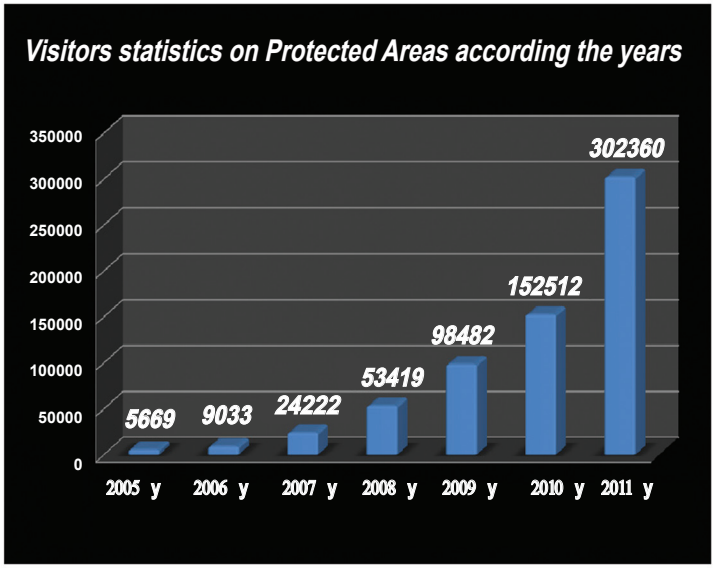
Establishment of the Caucasus Nature Fund (CNF) is also worth mentioning. The fund was established in 2006 and aims to support Protected Areas systems of Armenia, Azerbaijan and Georgia through co-financing operational costs of the PAs in these countries. Some projects have already financed by the support of this fund (for example, assistance to Borjom-Kharagauli National Park (BKNP) with fire-fighting equipment in 2009 and financing of operational costs of BKNP from (2010-2012). Additional projects are under discussion.

6.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

Taking into account that the country is focused on rapid economic development and poverty eradication, a number of infrastructural projects are expected to be implemented in Georgia. While implementing these projects, it is important to pay attention to their impact on biodiversity. Therefore, improvement of the EIA system and implementation of adequate mitigation measures are important.

One of the national priorities is the development of tourism and to return Georgia to a spot on the World tourism map. Visitation statistics for the Protected Areas of Georgia from 2005 to 2011 are provided in Figure 6.1. An increasing trend is apparent and the demand for eco-tourism is expected to increase even more in the future due to the unique and rich biodiversity of Georgia. From this perspective, the protection of rich biodiversity through establishing and strengthening the protected areas system of Georgia gains a special importance.

Figure 6.1. Visitation at the Protected Areas of Georgia (2005-2011)



In the sphere of biodiversity, Georgia has many obligations defined by various international conventions and regional agreements. At the 10th Meeting of the Parties to Biodiversity Convention (Nagoya, Japan, October 2010), the Convention Strategy for the years of 2011-2020 was adopted and biodiversity conservation goals were defined. As a party to the CBD, Georgia is obliged to define national objectives to contribute to the achievement of the 2020 goals and to update the national strategy and action plan accordingly.

6.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

Taking the interest of present and future generations into consideration, the long-term goal (20 years) of the National Biodiversity Policy is **to ensure protection and rehabilitation of unique eco-systems, diversity of species and genetic resources of Georgia**. This long-term goal can be achieved through effective management of protected areas and development of the network of the protected areas, as well as sustainable use and management of biological resources and an equitable distribution of the benefits.

To achieve this goal the following short-term targets (five year) should be reached:

Target 1. Rehabilitation, protection and conservation of viable populations of selected endangered species and habitats;

Target 2. Improvement of effectiveness of hunting and fishery management to ensure sustainable use of fauna resources;

Target 3. Development of a unified and effective protected areas network;

Target 4. Improvement of the effectiveness of PAs management through the capacity building of its administrations and introduction of financial sustainability Mechanisms; and

Target 5. Creation of proper databases for biodiversity conservation and sustainable management of biological resources through developing the relevant bio-monitoring system.

6.6 TARGETS AND MEASURES

Long-term goal - ensure protection and rehabilitation of unique eco-systems, diversity of species and genetic resources of Georgia.

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[12]	Potential Source	Indicators
1	Update the National Biodiversity Strategy and Action Plan (NBSAP) considering the 2020 targets of the Convention on Biodiversity (CBD)	2012	Ministry of Environment Protection (MEP)	Low cost	GIZ	Updated NBSAP is adopted

Target 1. Rehabilitation, protection and conservation of viable populations of selected endangered species and habitats

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Finalize state assessment of non-timber plant species (according to the IUCN criteria) and include them into the Red List of Georgia	2012-2013	MEP Botanical Garden of Ilia State University	Low cost	Donors	Minimum of 2,500 species are assessed by IUCN criteria; amendments to Red List of Georgia are made (CR, EN and VU species are included in Red List)
2	Obtain semi-wild and effectively breeding red deer population in Georgia and its re-introduction into the historically natural habitats	2012-2016	MEP	High cost	Donors	Breeding population of red deer is established minimum in 2 sites
3	Identify important sites for biodiversity conservation; Prioritize areas for their inclusion in different categories of protected areas	2013	MEP	400 000	State Budget, Donors	Maps of important areas for biodiversity conservation outside of PA are developed in GIS system; Important areas for biodiversity conservation outside of PAs are reserved through the decision of the government or parliament of Georgia
4	Carry out inventory of inland waters and wetlands, develop GIS data base; Identify priority areas for conservation.	2012-2013	MEP	Medium cost	Donors	GIS data base is developed for wetlands of Georgia, list of potential Ramsar sites is developed
5	Carry out awareness raising campaigns for target groups on the Red List species	2012-2016	MEP	Low cost	GIZ	Educational materials are distributed in 500 public schools (25 % of public schools) each year

12 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

Target 2. Improvement of effectiveness of hunting and fishery management to ensure sustainable use of fauna resources

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Improve methods for assessment of hunting wildlife resources and calculation of quotas	2012-2013	MEP	Low cost	GIZ	Methodology is approved
2	Initiate trophy hunting for supporting the development of tourist hunting	2014-2015	Ministry of Energy and Natural Resources (MENR), MEP	Low cost	GIZ	Agreed methodology, pilot area and required legal amendments for introducing of trophy hunting is in place
3	Improve methodologies for assessing fish resources and establishing quotas	2012-2013	MEP	Low cost	Donors	Methodology is approved
4	Strengthen measures to prevent poaching in inland waters; carry out capacity building of Environmental Inspectorate	2012-2016	MENR	Low cost	Donors	Training programme and associated materials are elaborated People within the Inspectorate are trained

Target 3. Development of a unified and effective protected areas network

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Prepare a draft law on establishment of planned Protected Areas and promote development of established ones	2012-2016	MEP	High cost	State budget, Donors	Draft law on establishment of new PAs is prepared; Management plans are developed and PAs are fully operational in case of their establishment
2	Support social-economical development of buffer zones through implementation of different projects	2012-2016	MEP	High cost	State budget, Donors	Number of implemented projects and beneficiaries in buffer zones
3	Expand existing Protected Areas	2012-2016	MEP	High cost	State budget, Donors	Materials are prepared for expansion of PAs boundaries; territories are officially handed to APA in its ownership, in case of expansion
4	Conduct demarcation of boundary on the PAs as needed	2012-2016	MEP	High cost	State budget, Donors	Number of PAs with demarcated borders and officially approved

Target 4. Improvement of the effectiveness of PAs management through the capacity building of its administrations and introducing mechanisms for financial sustainability

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Review the national legislation on PAs and plan further steps	2012-2016	MEP, Government of Georgia	Medium cost	State budget, Donors	Gaps in national legislation are reduced
2	Develop and approve Management Plans for existing and new protected areas as needed	2012-2016	MEP	Medium cost	State budget, Donors	Number of developed and approved Management Plans
3	Improve natural resource use management within PAs	2012-2016	MEP	Medium cost	State budget, Donors	Natural resources management mechanisms are integrated within PA system
4	Rehabilitate and improve conservation of species within PAs	2012-2016	MEP	High cost	State budget, Donors	Reintroduction processes are initiated (Gazelle, Bezoar goats etc)
5	Plan and develop infrastructure of existing and new PAs based on needs	2012-2016	MEP	High cost	State budget, Donors	Number of PAs with improved infrastructure in Georgia is increased
6	Strengthen eco-tourism potential of PAs (Develop a comprehensive plans of ecotourism; improve infrastructure, marketing; improve quality of services; offer new services, etc)	2012-2016	MEP	Medium cost	State budget, Donors	Number of Ecotourism Plans New tourist products are implemented; Income generation is increased through services provided by PAs
7	Strengthen capacity of PA personnel	2012-2016	MEP	Low cost	State budget, Donors	Number of trained personnel
8	Improve material - technical capacity of PAs	2012-2016	MEP	High cost	State budget, Donors	Administrative needs of PAs are assessed; Administrations are equipped with relevant material-technical means
9	Conduct inventory of biodiversity within PAs and establish updatable database and evaluate habitats within PAs	2012-2016	MEP	High cost	State budget, Donors	Comprehensive database on biodiversity within PAs is made; Current database of habitats within PAs is created
10	Develop and implement public awareness programme me (for educational institutions as well as for the wider public)	2012-2016	MEP	High cost	State budget, Donors	Number of developed and implemented awareness programmes

Target 5. Creation of proper databases for biodiversity conservation and sustainable management of biological resources through developing the relevant bio-monitoring system

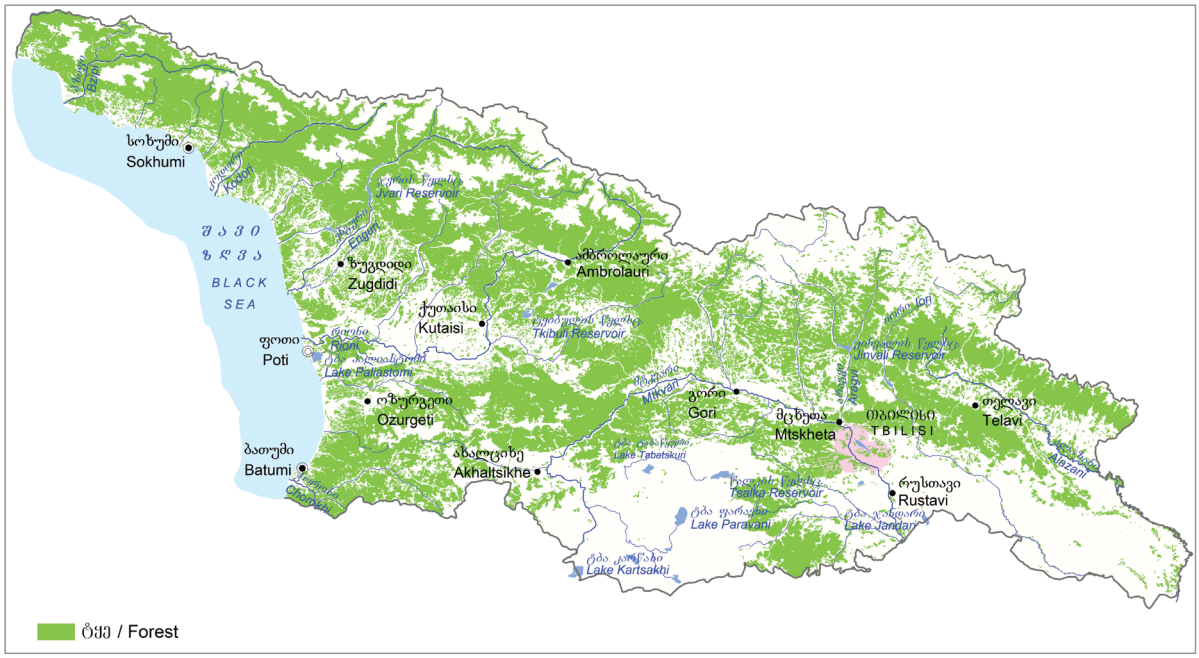
	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Designate methodology for data collection and analysis according to national biodiversity indicators	2012	MEP	Low cost	GIZ	Methodologies are developed, adopted for all (26) indicators and published
2	Conduct trainings for organizations participating in biodiversity monitoring and for the ministerial staff	2012-2013	MEP	Low cost	GIZ	Number of trained personnel
3	Prepare biodiversity monitoring manual	2012	MEP	Low cost	GIZ	Biodiversity monitoring manual is published on the bio-monitoring web-site
4.	Establish Geographic Information System (GIS) Centre for biodiversity monitoring	2012-2013	MEP	Low cost	GIZ	GIS center is in place and functioning
5	Carry out data collection and analysis according to the selected indicators	2012-2016	MEP	Low cost	GIZ	Results of data analysis is published on the bio-monitoring web-site at least on 15 indicators

CHAPTER 7. FORESTRY

7.1. CURRENT SITUATION

All forests of Georgia are currently owned by the state. In Georgia, around 2.77 million ha are covered with forests, i.e. 39.9% of the country's territory – including an estimated 0.5 million ha of primary forests, 2.2 million ha of natural modified forests and 60,000 ha of protective artificial plantations. Total standing volume amounts to 430 million m^3, and average annual forest growth measures approximately 4.0 million m^3. At the same time forests in Georgia are distributed unevenly and with some regions rich in forests there are numerous scarcely forested regions where the covering of the territory by forest does not exceed 10 percents. Distribution of forest cover is shown on the Map 7.1. Additional information on forest types is provided in Box 7.1.

Map 7.1 - Forest Distribution in Georgia



Box 7.1

The forests of Georgia are highly diverse. Considerable difference between the climates of Western and Eastern Georgia determine the variation in vegetation. Semi-arid and arid forests vegetation layer simply does not exist in Western Georgia.

There are four main vertical layers of forests in Western Georgia: forests (up to 1,900m above sea level), sub-alpine (1,900-2,500m); alpine (2,500-3,100m) and nival (>3,100m). Whereas there are six zones in Eastern Georgia: semi-deserts; dry grasslands (valleys) and arid, thin, lucid forests (150-600m above sea level); forests (600-1,900m); sub-alpine (1,900-2,500m); alpine (2,500-3,000m); sub-nival (3,000-3,500m); and nival (>3500m).

In mountain forests and alpine zones, forestless formations of semi-arid ecosystems are also found. Georgia's forests consist of the following species: eastern beech - 1,164,000 ha (42%); hornbeam-298,000 ha (11.8%); oak - 281,000 ha (11.2%); alder - 200,000 ha (7.2%); chestnut - 105,000 ha (3.8 %); and coniferous species - (Caucasian Silver fir, Eastern fir, pine etc.) - 455,000 ha (17.4%). 22.3% of Georgia's forests are altitudes from 0-500m above sea level, 23.5% from 501-1,000m above sea level, 16.6% from 1,001-1,500 meters, 17.4% from 1,501-2,000 meters and 19.8% above 2,001 meters. Most of forests of the country are located on the slopes of the Major and Minor Caucasus. 3.8% of the forest area are located on slopes from $0\text{-}10^0$, 16.4% on slopes from $11\text{-}20^0$, 17.0% on slopes from $21\text{-}25^0$, 18.6% on slopes from $26\text{-}30^0$, 20.1% on slopes from $31\text{-}35^0$ and 24.1% on slopes steeper than 35^0.

Forests are the most important biome for biodiversity conservation in Georgia, harboring many endemic and relic species of woody plants and herbs, and providing habitats for globally rare and endangered animals.

Forests provide a variety of goods and services and are a source of livelihood for thousands of rural people. In many rural areas and towns, fuel wood is the primary source of energy for heating and cooking. For these purposes, the average rural household consumes 5-15 cubic metres of fuel wood annually. In Georgia, annual consumption of fuel wood has been estimated at 1million cubic metres. The country's forests are an important source of timber for domestic markets, in particular construction and furniture. Georgia supplies substantial quantities to international markets as well.

Non-timber forest products including nuts, berries, mushrooms and medicinal plants are important direct sources of sustenance and well-being for rural people. Tree seeds, in particular of *Abies nordmaniana*, are important sources of income for rural economies. Forests are used by rural people for grazing purposes for cattle, goats, sheep and pigs. Hunting and game management provide some income to state budget, and tourism and recreation indirectly provide indirect income to local economies. Considering the environmental and economic value of forests, protected areas have been developed which mainly consist mainly of forest lands. The total area of protected areas in Georgia is about 7.1% of the country's territory. Protected areas related issues are addressed in Chapter 5.

Although Georgia belongs to the number of countries rich in forests, average forest stand density for considerable part of the forests has reached a critical threshold. Such forests have significantly decreased the protective functions and lost the ability to regenerate, which affects the biological sustainability of forests and overall ecological situation in Georgia. Currently, the country's forests are threatened by unsustainable forest use (logging), overgrazing and not environmentally sound forest practices.

Absence of a sustainable forestry system

Georgia's existing forestry system is not based on sustainable development principles. Absence of a sustainable forestry setup eventually plays a role of system-based problem that causes environmental problems associated with forests. Existing methods and rules for forest inventory and planning do not correspond with sustainable development principles; In fact, no standards, indicators or adequate statutory instruments for sustainable forestry are applied.

Unsustainable forest use (unsustainable logging) and overgrazing on forest lands

Two main types of unsustainable forest use can be distinguished based on their underlying causes and the actors involved: unsustainable logging of industrial timber for processing and sale in domestic and international markets; and unsustainable cutting of trees for fuel-wood by or for rural people who have no affordable alternative. Unsustainable logging is often illegal. The potential environmental impacts of logging operations are not always identified, and/or steps taken to avoid or mitigate negative impacts are not systematic either. As a result, regeneration of forests where logging took place is not always ensured.

Grazing levels in the forests around settlements are often far above carrying capacity. Overgrazing damages and prevents regeneration of herb, shrub and tree layers. Lack of regeneration and the gradual disappearance of protective vegetation lead to soil erosion, landslides and loss of forest habitat.

Rural poverty, lack of awareness among graziers and the lack of alternative livelihood opportunities contribute to the problem a lot.

Above mentioned problems are caused by a large number factors acting together in a complex system. International and domestic markets driven by profit pay little or no regard to the environmental and social impacts of their activities, and are not able to discriminate between sustainable and non-sustainable sources. Due to low purchasing capacity, rural households are not in a position to reduce the fire wood consumption level and/or purchase fire-wood from a third person source. Use of forests for grazing livestock is largely illegal. State forest management institutions and forest law enforcement bodies lack the financial and material (technical) resources necessary to ensure proper full-scale planning and control of forest resource protection and exploitation.

7.2. MAIN STAKEHOLDERS

The Ministry of Energy and Natural Recourses of Georgia and its subordinated Legal Entity of Public Law the Agency of Natural Resources, play a central role in making decisions regarding forest use and forest use activities. Acting on behalf of the government, authorized state organization represents the enforcement body as well. In general, with respect to forest management, the central government supports the introduction of sustainable and at the same time, self-sustained oriented model of forest governance.

Rural households and the private sector are also significant stakeholders in the forestry sphere. Following independence and the collapse of the energy supply system, rural households became dependent on forest resources. These pressures are very significant, and at the same time there is a general lack of concern for the environment due to more immediate problems and a lack of awareness. Because of urgent social and economic needs, households see no reason to take their impacts on forests seriously and are anyway not able to act in more environmentally responsible ways. As for the private sector, there are a large number of small businesses engaged in the harvesting and processing of timber for industrial timber and fuel wood markets and a small number of medium to large enterprises, which have the largest share of production for export. The private sector is characterized by substantial over-capacity. Like rural households, the private sector has a low level of sensitivity to environmental issues, even companies that would like to purchase sustainably produced timber have no means of differentiating between sustainable sources and non-sustainable sources, as this mechanism does not yet exist in the country.

Some NGOs are also involved in forestry activities through implementation of specific pilot projects.

7.3. MEASURES TAKEN TO DATE

Forestry related objectives and actions were reflected in the following programmatic documents: National Environmental Action Programme (2000); National Programme on Desertification (2003); and National Biodiversity Strategy and Action Plan (2005). However, practically none of the forestry related actions were supported by the relevant financial resources for implementation.

Internationally supported (WB, FAO) forestry projects have been implemented since 2000, aimed at reorganization and establishment of new policies for the sector. However, for a number of reasons, none of them have been successfully completed.

In 2007-2008, the Georgian government launched and performed a forest reform that drastically changed the system of forest licensing and forest institutional structure. The reform aimed at shifting most forest management responsibilities from the government to the private sector (e.g., long-term forest use license holders). However, this process did not complement sustainable forest management principles, as it was not accompanied with relevant legal frameworks, institutional capacity and forest planning/inventory instruments and information.

The above mentioned forest reform led the Government of Georgia to initiate a new institutional and structural forest reform that took place in mid-2010. As a result, institutional and structural

reorganization of the main forest management unit - Forestry Department occurred. Currently, the Legal Entity of Public Law - the Forestry Agency, which was a subordinated part of the Ministry of Environment Protection, is reorganized and merged with the Legal Entity of Public Law - Agency of Natural Resources. This reform became a basis for the introduction of a new model of forest management, which in final terms will ensure improvement, financial sustainability and increased organizational set-up of the forestry system.

7.4. NATIONAL AND INTERNATIONAL DEVELOPMENTS

Ongoing national and international developments do not basically contradict with opportunities to develop sustainable forestry system in Georgia. However, some infrastructural projects (e.g. construction of roads, hydropower plants and electricity lines) may become challenging in some cases. Economic growth and increased welfare of the rural population may decrease their dependence and exploitation of forest resources.

7.5. LONG-TERM GOALS AND SHORT-TERM TARGETS

The long-term goal (20 years) includes **improvement of the overall condition and ecological functions of forests through development and implementation of a full-scale sustainable forest management system in Georgia**.

This involves achievement of the following short-term (five year) tangible targets:

Target 1. Establishment of prerequisites for a sustainable forest management system
This target can be achieved through making government policies, programmes and legislation supporting sustainable forest management and demonstrating that forests can be managed in a way that is socially beneficial and economically viable as well as is and environmentally appropriate. For the above purpose a new systematically organized Forest Code has to be adopted. In parallel, work should be carried out to develop relevant regulations in line with sustainable forestry principles as well as economic instruments for proper functioning of the existing forest management set-up. Long term (10-15 years) National Programmes should be developed for implementation of necessary measures in integrated forest pest control, fire prevention and control, forest restoration and fast-growing forest plantations for fuel-wood production. Preparation of 10-year forest management plans based on forest inventory works should be started and urgent forest restoration, pest control and forest fire prevention related activities in priority hot-spot areas should be carried out.

Target 2. reduction of unsustainable and illegal forest use

This target will be achieved through actions aimed at promoting reduction of unsustainable forest use and overgrazing of forested areas. Namely, implementation of various information processing, methodological, institutional and othercapacity building measures will be needed.

7.6. TARGETS AND MEASURES

Long-term goal: Improvement of the overall condition and ecological functions of forests through development and implementation of a full-scale sustainable forest management system in Georgia.

Target 1. Establishment of prerequisites for sustainable forest management system

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[13]	Potential Source	Indicators
1	Develop a new Georgian forest legislation (new Forest Code and relevant legal acts)	2012-2013	Ministry of Energy and Natural Resources (MENR)	High cost	State Budget, Donors	New Georgian forest legislation (Forest Code and relevant legal acts) is drafted and approved
2	Develop a technical and methodological basis in line with sustainable forest management principles (development of technical and methodological guidelines for sustainable forestry)	2012-2013	MENR	Medium cost	Donors (e.g., FAO, GIZ, UNDP)	Technical and methodological basis in line with the sustainable forest management principles is in place
3	Develop economic instruments for proper functioning of the existing forest management set-up[14]	2012-2014	MENR	Low cost	State Budget	Economic instruments (economic model) for forestry sector are developed
4	Establish forestry units as Legal Entity(ies) of Private Law	2012-2015	MENR	High cost	Donors (e.g, KfW, GEF)	Forestry Units as Legal Entity(ies) of Private Law are established
5	Develop long term (10-15 years) National Programmes for implementation of necessary measures in a) integrated forest pest control; b) fire prevention and control; c) forest restoration (including climate change mitigation and adaptation measures); and d) fast-growing forest plantations for fuel-wood production	2012-2016	MENR	Medium cost	Donors (e.g, FAO, GIZ)	National Programmes (10-15 years) for implementation of urgent measures in the fields of a) integrated forest pest control; b) fire prevention and control; c) forest restoration - including climate change mitigation and adaptation measures; d) fast-growing forest plantations for fuel-wood production are developed

13 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

14. Establishing of such economic and organizational/structural model of forest management which in the conditions of stabilized logging volumes will be oriented towards increasing revenues and consequently, to getting full funding and functioning of this sector – based on best international practices.

6	Develop forest management plans based on forest inventory works	2012-2016	MENR	High cost	Donors, State budget	Forest management plans are developed for 50% of forests governed by the Agency
7	Perform urgent forest restoration, pest control and forest fire prevention related activities in priority hot-spot areas	2012-2016	MENR	High cost	Donors (UNDP, WWF, GIZ), State budget	Forest restoration, pest control and forest fire prevention related activities in priority hot-spot areas are performed

Target 2. Reduction of unsustainable and illegal forest use

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Develop and test Forest Information System	(Started in 2011) 2012-2016	MENR	Highcost	State Budget	Development and testing of Forest Information System is performed
2	Develop and test forest monitoring system	(Started in 2011) 2012-2016	MENR	Medium cost	Donors (UNDP/GEF, GIZ), State Budget	Development and testing of forest monitoring system is performed
3	Develop and implement training module in forest enforcement	(Started in 2011) 2012	MENR	Medium cost	Donors (e.g, GIZ), State Budget	Training module in forest enforcement is developed and implemented
4	Equip forestry staff with sets of uniforms and standard forestry equipment	2012-2015	MENR	High cost	Donors, State budget	Sets of uniforms and standard forestry equipment are arranged
5	Arrange systematic public awareness raising campaigns and events on forest issues	2012-2016	MENR	Medium cost	State Budget	Number of public awareness raising campaigns and events on forest issues

CHAPTER 8. LAND RESOURCES

8.1 CURRENT SITUATION

Land degradation, lack of efficient land resource management practices, limited access to appropriate information and technology, and weak institutional communication between various stakeholders (which makes a decision-making process ineffective) are the major land resource management challenges.

Land Degradation

Land degradation is an important issue in Georgia. Overgrazing, loss of forest cover and unplanned urban sprawl are major causes of land degradation. Soil erosion processes are natural phenomena, but they are exacerbated by all kinds of unsustainable human uses. Soil fertility is dependent on the degree of salination and acidification processes also. Acidification is a result of the application of acid-forming nitrogenous fertilizers. In addition, frequent agricultural soil contamination is caused by the inappropriate use of fertilizers (organic and mineral), chemicals, heavy metals and disposal of industrial and municipal waste.

Planning and Management Practices

Land degradation can be minimized through well conceived and developed policies addressing land degradation issues at national, regional and local levels. Despite the existence of a legal basis in the field of land planning, planning practices are still weak in Georgia. These weak planning practices cause misallocation of land parcels for necessary developments and construction activities. This means that land can be allocated for development projects without consideration of agricultural productivity or natural ecosystems. Well-designed spatial-territorial plans developed with the participation of all stakeholders can minimize many conflicts of interest among different parties and create a basis for sustainable use of land resources.

Institutional Communication Among Stakeholders

Strengthening cooperation among institutions on data exchange, as well as defining their rights and responsibilities is important. Application of modern scientific knowledge during the decision making process is also critical.

8.2 MAIN STAKEHOLDERS

Currently, land resource management responsibilities are divided among the following state entities: the Ministry of Environment Protection (MEP), the Ministry of Agriculture (MA), the Ministry of Economy and Sustainable Development (MESD) and the Ministry of Justice (MJ).

The MEP is responsible for the coordination of planning and implementing mitigation measures against land degradation and desertification processes caused by climate and anthropogenic factors.

MA is in charge of the development of a unified data bank for land consolidation, quality assessment of soil, organization of activities for rational land use, recovery and maintenance of land productivity and development of a state agrochemistry policy.

MESD is in charge of managing the privatization process of state-owned lands and confirmation of private ownership of the land parcels formerly owned by the State. MESD is also responsible for the

development of the cities, towns and other residential areas, approving land-use plans elaborated by the municipalities and constructing zoning maps by ownership types, together with provision of methodological guidance of the above work.

The role of the National Agency of Public Registry (NAPR) under the MJ is to set up and maintain a transparent, secure, comprehensive, modern and customer-oriented land registration system, while responding to the needs of the real estate market development.

Local self-governing bodies also have an important role. They are responsible for initiating and preparing, as well as approving and submitting, the plans for spatial-territorial development and land-use master plans to the appropriate body of executive government for final approval. However, only a limited number of municipalities have prepared these types of plans. Farms and farm amalgamations, local communities and households and scientific research institutions also participate in the management of land resources and soil protection and, therefore, represent the stakeholders in the field of land management.

8.3 MEASURES TAKEN TO DATE

Georgia has developed and adopted a legal framework for regulating land use and protection of land resources. This framework addresses not only management but also land-ownership and land-use matters. Georgia is a party to the UN Convention to Combat Desertification (UNCCD). The National Action Plan to Combat Desertification of Georgia (NAPCD) was developed and approved in 2003. NAPCD identifies the priority regions facing the risk of desertification, defines the main factors contributing to desertification in these areas, determines short- and medium-term (2003-2007) actions for combating it, expected outcomes and an implementation timeframe.

The MA has conducted studies focused on soil fertility improvement in some municipalities. Several finalized and ongoing projects have been implemented in Georgia, focused on reducing soil erosion and mitigating land degradation in selected regions of Georgia (i.e. Autonomic Republic of Adjara and Dedophlistskaro Municipality).

8.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

Interest in investing in various infrastructural and industrial projects in Georgia is increasing. There are plans to implement infrastructure development and rehabilitation projects which may increase demand for land resources. These demand trends may increase risks of soil erosion and contamination. Given the present management and decision making practices, some of these activities may cause even more degradation of land resources.

Climate change, in conjunction with the man-induced factors, may accelerate the degradation of land resources. In particular, the landscapes in eastern Georgia are sensitive to modern climate changes. Therefore, primary attention should be given to desertification processes in eastern Georgia.

8.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

The long-term goal for this sector is **to achieve the best possible land-use through optimal sustainable management of land resources.**

To achieve this long-term goal, it is necessary to promote transition from current approaches to a sustainable and integrated management of land resources to support the country's spatial-territorial planning and zoning that provides the best use of land resources and will ensure allocation of land resources of Georgia in a way that enables the country to reach the greatest sustainable benefits through balancing environmental, social and economic objectives. Conservation of territories, private property rights, the rights of local communities should also be taken into account.

The short-term goals for the next five years for land resource management and protection can be formulated as follows:

Target 1 – Reduce degraded land areas, improve the soil quality and minimize soil contamination.

Reaching this target will ensure attaining and maintaining a level of land use (including protected landscapes) that provides for environmental sustainability and implementation of commitments outlined in the UN Convention to Combat Desertification.

Target 2– Enhance the existing capacity of the spatial-land information system to ensure improved management of land resources through application of modern tools and technologies (such as remote sensing, Geographical Information Systems, etc).

8.6 TARGETS AND MEASURES

Long-termgoal: Achieve the best possible land-use through optimal sustainable management of land resources.

Target 1 – Reduce the degraded land areas and improve the soil quality and minimize its contamination

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[15]	Potential Source	Indicators
1	Develop risk assessment methodsand criteria; identify territories with potential risks	2012-14	Ministry of Agriculture (MA), MEP	Medium cost	Donors	Potential risk territories are identified
2	Draw up procedures and criteria for identification of soil contamination, inventory of areas with contaminated soil and elaborate further steps	2012-14	MEP	Low cost	Donors	Criteria are in place
3	Elaborate the guiding document for topsoil preservation and storage, protection from contamination and erosion based on internationally accepted and well-tested practices	2012-14	MEP, MA	Low cost	Donors	National system of topsoil protection is in place and is compatible with internationally accepted standards
4	Implement pilot projects for restoration of degraded lands	2013-15	MA, MEP	Medium cost	Donors	Measures for selected degraded lands are taken
5	Organize trainings in the field of land resources protection, land use, and soil contamination and protection	2012-16	MA, MEP	Low cost	Donors	Number of staff members trained

15 In this document less than 100 000 GEL is defined as “Low cost”, 100 000 – 500 000 GEL – “Medium cost” and 500 000 –up “High cost”.

Target 2 – Enhance the existing capacity of the spatial-land information system to ensure improved management of land resources through application of modern tools and technologies

1	Create the spatial information system for land resources, which will include development of land cover and land use information systems, through application of modern GIS and remote sensing tools.	2012-2016	MEP	Medium cost	Donors	Land Information System (LIS) with different spatial extended layers such as land use, land cover, soil type, hydrological network and other special data is established
2	Organize trainings to improve skills for application of advance technologies, such as GIS and remote sensing (RS) tools to develop and further operate Land Information System (LIS)	2012-2016	MEP, Ministry of Justice (MJ)	Low cost	Donors	Number of staff trained in GIS and RS tools and is involved in the development of LIS

CHAPTER 9. MINERAL RESOURCES

This chapter covers mineral and ground water resources related issues.

9.1 CURRENT SITUATION

Georgia is rich in mineral resources, many of which are competitive on the world market. In particular, gold, copper, manganese and zeolites have potential of international trade. The extraction of these minerals will contribute to the economic growth of the country. However, the extraction of mineral resources also contributes to environmental degradation, notably, existing abandoned mining sites and unsustainable mining practices.

Rational use and protection of ground water resources is very important not only for supplying clean water to local communities, but also because of its economic value to the country. Therefore, strengthening the monitoring and sustainable management practices of groundwater are necessary.

Abandoned Mining Sites

Former mining sites cause environmental problems as chemicals (for example, arsenic and mercury) contaminate soil and (ground) water. These problems may pose a direct threat to human health in nearby communities or to downstream water users. The responsible owners of these mining sites are often untraceable, leaving the state with an environmental liability that requires costly clean-up. In most cases, the site also poses a threat to the biodiversity and natural resources of the region.

Unsustainable Mining Practices

Ongoing extraction practices jeopardize the environment, due to the lack of proper mining practices and adequate policy. The use of old technology, old equipment, open use of chemicals and unprotected mineral waste dumps are some examples of these unsustainable practices, which lead to land degradation, water pollution (freshwater and groundwater) and soil contamination. These practices may also lead to a change of geological conditions, anthropogenic disasters and damaged landscapes long after extraction. The absence of legal requirements for conducting an Environmental Impact Assessment for mining activities contributes to unsustainable mining practices. The Technical Report responsible for describing the process for mineral extraction is developed just after the license is issued, which limits the possibility of the inclusion of environmental concerns at an early stage of designing the mining process.

The issue of accumulated sediments in gorges of some flash-flood river channels is also worth mentioning. Removing the sediments from these channels will promote the restoration of natural conditions in the streams and sustainable extraction of sediments for constructing activities.

Inadequate Monitoring of Groundwater

Monitoring of groundwater in Georgia has not been conducted during the last several years. As a result, complete groundwater quality and quantity data are not available. Nor have measures necessary for maintaining and improving the qualitative and quantitative state of the resources been determined.

Unsustainable Groundwater Management Practices

As mentioned above, existing practices for the use and protection of fresh groundwater are inadequate, which limits the opportunities for complete systemic and regular monitoring. Therefore, no robust assessment of the quality and quantity parameters of groundwater resources or maintenance measures are in place. The existing management system is not in favor of enforcing strong state supervision to ensure protection and improvement of ecological conditions for the groundwater resources. This issue is very important given the quantitative and qualitative specificities of groundwater which differentiate it from other mineral resources. Specifically, groundwater is characterized by dynamicity in terms of both quantity and quality parameters and consequently, is sensitive to natural-ecological and technogenic changes. Therefore, the introduction of a modern monitoring system in this field is crucial.

9.2 MAIN STAKEHOLDERS

The Ministry of Energy and Natural Resources of Georgia (MENR) is responsible for the development and implementation of policy in this sector. Specifically, the MENR is responsible for the licensing of mineral resources and supervising the license conditions.

Other important stakeholdersare the license holders themselves, who are responsible for assessing mineral resource reserves (including groundwater), their extraction and submitting reports to the state geological funds.

9.3. MEASURES TAKEN TO DATE

Mineral Resources

Geologic surveys have been conducted throughout Georgia. As a result, various scale geological maps have been created, which provide a good basis for identifying and further investigating mineral resource reserves. More than 1,500 deposits with high potential for industrial purposes have been identified, mapped and studied. 675 of the deposits have already been exploited. Gold, gold-copper, manganese, construction-paving materials and zeolites as well as ground, fresh and mineral waters have strategic importance for Georgia.

Groundwater

Presently, only 29% of the estimated groundwater reserves have been explored and approved. Artesian wells in Alazani, Tskaltubo, Kartli, Marneuli-Gardabani, and Kodori are well-explored, while the big and less Caucasus slopes represent the least studied areas. In the future, more efforts should be focused on exploring fresh, high pressure groundwater resources to assure that they are well-protected against pollution.

9.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

The economic development of Georgia is on a fast track. The general growth in income will lead to an increased demand for construction materials such as sand, stone, clay, marble, macadam and chalk. The national interest in, and demand for, mineral resources will result in a continued and increased extraction of mineral and groundwater resources. As the extraction rate increases, investment decisions by private companies will provide an opportunity to develop modern practices and implement new technologies. The increasing demand for mineral resources may exacerbate illegal mining, which should be paid particular attention.

Climate Change may also affect the ecological state of Georgia. Due attention should be paid to the Iori River and the Alazani River downstream basins, which are characterized by explicit arid and semi-arid features.

9.5. LONG-TERM GOALS AND SHORT-TERM TARGETS

The overall long-term goal for the mineral resources sector is **to reduce the negative impact of mineral resource extraction and safeguard the environment.** The long-term goal for groundwater resources is **to ensure provision of safe drinking water to the Georgian people and promote economic development of the country through engaging with the international market**. In order to achieve these goals, it is necessary to reach the following short-term targets and implement the subsequent measures:

Target 1.Clean-up of abandoned mining sites

Priority should be given to mining sites that represent a direct threat to human health, either nearby or downstream of polluted streams. Where urgent measures are required, containment of pollution within the premises of the site is of primary concern.

Target 2.Introduction of sustainable practices for existing and new sites

Georgia should develop a framework for the sustainable extraction of mineral resources as a basis for the approval of requests for an extraction license.

Target 3. Improvement of the groundwater monitoring system

Without a proper monitoring system, it is impossible to have a robust picture on the quantity and quality of specific groundwater bodies. Therefore, the ability to plan the rational use of groundwater resources, while considering national needs and opportunities for the international market, is complicated.

Target 4. Introduction of sustainable practices for groundwater extraction

Inadequate groundwater management may lead to deterioration of the reserves and eventual groundwater depletion. Because of the importance of this resource to Georgia, introduction of sustainable practices for groundwater extraction is crucial.

9.6 ASSESSMENT OF NECESSARY REGULATORY MEANS

The existing Law on Mineral Resources (1996), which regulates the management of mineral resources and groundwater, needs to be revised and amended in order to provide the proper environmental, health and governance interests, for sustainable extraction of mineral and groundwater resources. The revised law can also provide the legal basis for the inclusion of these interests in the license conditions.

9.7. TARGETS AND MEASURES

Long-term goal 1. – To reduce the negative impact of mineral resource extraction and safeguard the environment

Long-term goal 2. To **ensure provision of safe drinking water to the Georgian people and promote economic development of the country through entering the international market**

Target 1 – **Clean-up of abandoned mining sites**

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[16]	Potential Source	Indicators
1	Update an inventory of abandoned mining sites and assess their risk to human health and the environment	2012-2016	Ministry of Energy and Natural Resources (MENR)	Medium cost	State budget, Donors	Inventory and assessment reports are in place
2	Prioritize risky sites for containment measures	2012-2013	MENR	Low cost	State budget, Donors	Priority list is developed

Target 2 – **Introduction of sustainable practices for existing and new sites**

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Develop a Mining Legislation	2012-2014	MENR	Low cost	State budget,	New law is approved (This is a number one priority today)
2	Develop a methodology (or norms)for sustainable extraction of mineral resources	2012-2014	MENR	Low cost	State budget	Document is approved
3	Increase enforcement of license compliance	2014	MENR	Low cost	State budget	Number of inspections/ year

16 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

Target 3. Improvement of groundwater monitoring system

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Prepare a normative or legislative base for the groundwater hydro-monitoring explore	2012-2014	MENR	Low cost	State budget	normative basis of groundwater hydromonitoring exploration is developed
2	Create an electronic information base of hydro geological reports and materials preserved in Geological Funds	2012-2014	MENR	Low cost	State budget	Created base is accessible for the stakeholders

Target 4. Introduction of sustainable practices for groundwater extraction

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Train the population and enterprises on utilization of groundwater	2012-2015	MENR	Low cost	State budget, Donors	The number of people and enterprises who attended the trainings

CHAPTER 10. DISASTERS

The chapter covers problems related to natural disasters and industrial accidents, which can result inhuman fatalities, negative environmental impacts and significant economic losses for the country.

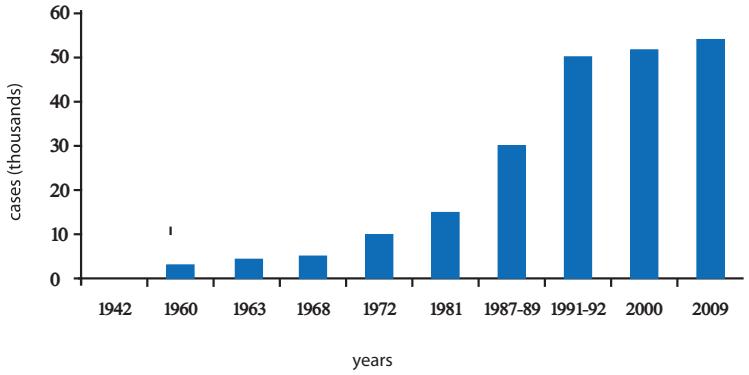
10.1 CURRENT SITUATION

Natural Disasters

Due to the complicated landscape and specific geographical location of Georgia, natural disasters are characterized by high extensiveness, frequency and risk level. With the magnitude of potential negative impacts associated with these natural disasters, Georgia is one of the most sensitive countries to natural disasters among mountainous regions of the world.

During recent decades, a significant increase in the frequency and intensity of hydrological, meteorological and geological natural disasters has been recorded in Georgia due to anthropogenic environmental impacts (especially mining, construction of hydropower facilities, illegal logging, overgrazing, unsystematic urbanization, illegal industrial activities in river beds, negligence of climate and hydrological standards during construction, and industrial land use without relevant preliminary studies) coupled with phenomena attributed to global climate change. The increase in landslide-gravitational processes occurring in Georgia is illustrated in Figure 10.1.

Figure 10.1 Landslide-gravitation processes recorded in Georgia



Major natural hazards (floods, flash floods, landslides, mudflows, snow avalanches, hail, heavy rains, storm winds, droughts, etc.), severely affect the national economy, with significant damage to agricultural lands, buildings, roads, other infrastructure, human health and the environment. Brief information on social and economic losses caused by certain disasters in Georgia is given in Box 10.1.

Box 10.1. Information on human and material losses caused by disasters

During the period of 1967-2009, approximately 70% of the territory of Georgia experienced natural hazards of hydro-meteorological and geological origin. The disaster risk zones encompassed more than 3,000 settlements. More than 400,000 houses and facilities, 1.5 million ha of agricultural lands and 550 kilometers of roads were damaged and/or destroyed. Approximately 60,000 households were resettled to other areas.

Economic losses from the above mentioned calamities exceeded 14 billion USD, with more than 1,000 human causalities, including 600 people since 1987.

The negative impacts of natural disasters are caused by numerous factors, including lack of a modern early warning system, insufficiency in mitigation and hydro-engineered bank fortification works in flood and flash flood prone areas, shortage of mitigation works in the geological hazard areas, the suspense of artificial influence over certain hydro-meteorological events and low awareness of the population regarding preparedness for anticipated disasters.

Early Warning Systems for Expected Natural Hazards

Currently, Georgia has no operational, well-developed early warning systems for expected natural hazards. An early warning system includes the baseline assessment of disaster level, regular monitoring, dissemination of forecasts and timely warnings for expected natural hazards to decision-makers and mass media. The effective operation of an early warning system facilitates implementation of prevention and risk mitigation measures. Observation networks for standard hydro-meteorological parameters have been reduced, remote observations of special hydro-meteorological parameters are not conducted, the frequency and amount of field observations of hydro-meteorological processes have decreased, weather and hydrological forecast models, as well as modern technologies for statistic processing of multi-year hydro-meteorological data are not fully adopted. Geological monitoring activities are not adequate either.

Suspense of Artificial Influence Practice on Certain Natural Hazards

Georgia has extensive experience with activities affecting natural hazards, such as artificial stratification of hail clouds and snow-avalanche and precipitation stimulations. Currently these activities are stopped. These preventive activities are extremely effective for the reduction of and, in some cases even prevention of, disaster-induced economic losses.

Industrial Accidents

Today, thousands of large, medium and small enterprises operate in Georgia. Industrial accidents can impose significant damage to human populations and the environment. In addition, a number of enterprises have been abandoned, often without any safety measures. Many of these enterprises used oil products and various chemicals, which were accumulated as waste products and kept on the plant site without any control or supervision. As a result, natural events and anthropogenic activities may increase the risk of pollution at and from these sites.

Especially high risk industries are those which produce/process oil products, chemicals, plastic, mineral and construction materials, metallurgical and mining products. Because of their location and size, industrial projects such as the Baku-Tbilisi-Jeyhan oil pipeline, Western exporting pipeline Suphsa and the Enguri dam pose potentially high risks to the population and ecosystems of Georgia.

To avoid industrial accidents, due attention should be paid to the identification of production process-related risks and risk management, improvement of the monitoring system, equipment, training of personnel and improvement of a legal basis. Existence of plans developed according to modern methodologies is crucial for timely elimination of industrial accidents.

10.2 MAIN STAKEHOLDERS

The Ministry of Environment Protection, namely its LEPL (legal entity of public law) National Environmental Agency (NEA), conducts the state hydro-meteorological and environmental monitoring and provides the population, state institutions, sectors of the economy, military forces of Georgia and other interested parties with the actual and forecasted information on hydro-meteorological and environmental state. Specifically, NEA carries out various disaster related geo-monitoring study-assessments throughout Georgia, provides timely evaluation of the situation in case of force-majeure caused by the extreme reactivation of geological and hydro-meteorological hazards and delivers respective recommendations.The National Environmental Agency is also responsible for the regular hydro-meteorological monitoring, forecasting and timely warning of relevant decision-makers

and mass media and implementation of preventive measures against certain hazardous hydro-meteorological processes (hail, snow avalanche, deficit of precipitations). The National Environmental Agency also implements soil, surface water and atmospheric air monitoring of chemical pollutants. The Department of Ecological Expertise and Inspection of the Ministry of Environment Protection along with the other tasks, is in charge of law enforcement and control over implementation of the Environmental Impact Permit conditions by enterprises.

NEA, following from its principal functions (forecasting of hydro-meteorological and geodynamic events, constant monitoring and planning /implementation of relevant measures), is considered as one of the most important national institutions in developing disaster risk reduction measures.

The Temporary Interagency Coordinating Commission in the sphere of Crises Management under chairmanship of the Secretary of the National Security Council of Georgia was established by the Presidential decree on 10 September 2010. The Commission is tasked to elaborate recommendations and proposals in order to enhance crises management system and coordinate intergovernmental activities in this direction.

The Emergency Situations Governmental Commission is the coordinator of the unified system for prevention and response to emergency situations. This commission implements assigned tasks through the Emergency Management Department of the Ministry of Internal Affairs of Georgia.

Management of the unified warning system of Georgia is provided by the Emergency Management Department of the Ministry of Internal Affairs. The Emergency Management Department represents the structure, responsible on the national level for emergency situation prevention, protection of population and territory from emergency situations, furthermore implementation of the national response plan and liquidation of consequences caused by emergency situations. (Specialized state body tasked with the liquidation of emergency situations).

Prevention and mitigation works for expected natural and anthropogenic disasters, as well as activities for eliminating the disaster consequences, are coordinated by the Emergency Management Department within its competences, under the Ministry of Internal Affairs of Georgia.

In case of receiving warnings on expected or occurring natural and anthropogenic disasters, Ministries of Regional Development and Infrastructure, Agriculture, and Energy and Natural Resources, as well as local municipalities also participate within its competencies in prevention and mitigation works in order to avoid human and economic losses. The Ministry of Regional Development and Infrastructure of Georgia coordinates works to ensures the safety of roads that are of state importance, whereas rehabilitation of local infrastructure is within the competence of local self-governing bodies.

Construction and Technical Inspection of the Ministry of Economy and Sustainable Development of Georgia is the state institution responsible for implementation of industrial safety policy and control at the national level. In order to protect human lives and welfare, property and the environment from technological threats, this agency ensures compliance of high risk facilities with established rules and regulations through state supervision and control.

Mass media plays a crucial role in timely dissemination of forecasts and warnings of expected disasters. International (humanitarian) organizations are also important stakeholders.

In addition to the National Environmental Agency, research and assessments of natural disasters are carried out by relevant scientific-research institutes of the Ministry of Education and Science of Georgia and non-governmental organizations.

The Ministry of Internally Displaced Persons from the Occupied Territories, Accommodation and Refugees of Georgia is in charge of maintaining a database on populations affected by disasters. This state organization is responsible for identifying damage and making a decision on resettlement.

In order to increase awareness, the Ministry of Education and Science of Georgia coordinates integration of disaster risk related issues in the curricula of the secondary schools as well as in the vocational and high schools.

10.3 MEASURES TAKEN TO DATE

Natural Disasters

A number of activities have been conducted in the field of disaster management caused by natural and anthropogenic factors. Specifically, all types of geological risks have been studied and mapped; detailed engineering and geological research and appropriate protective activities have been completed for more than100 high risk areas; and long-term forecasts for landslides, mudflows and coastal erosion have been processed.

Some progress for achieving the incremental rehabilitation and development of an early warning system for hydro-meteorological hazards has been achieved. Specifically, the expansion and automation of the hydro-meteorological observation network and introduction of modern techniques for collecting and sharing observational data at national and international levels, receiving synoptic products from world forecast centers and visualizations have been completed with the funds allocated from the state budget, support of international organizations and donor countries. Weather and hydrological models have been introduced for selected territories in an effort to increase staff qualifications. As a result, the weather forecasts and hydrological prognoses have been improved.

In 2008-2010, river bank fortification measures aimed at protecting the population, engineered structures and agricultural resources from flash floods were completed on 66 sites. Additionally, around 700 high risk areas were studied and included in a database identifying riverbank zones that require emergency rehabilitation; more than 80 sites have been investigated and preventive measures developed.

Industrial Accidents

A national response plan for natural and technological emergency situations was approved on 26 August 2008 by the Decree #415 of the President of Georgia “On the Adoption of a National Response Plan on Natural and Technological Emergency Situations.” The plan defines roles and responsibilities of different state authorities when responding to emergency situations. This plan represents the main working document for management of emergency situations, comprising industrial accidents.

To prevent transboundary accidents, international early warning centers have been established for the Mtkvari River basin in Armenia, Azerbaijan and Georgia. In Georgia, this centre is located in the National Environmental Agency of the Ministry of Environment Protection. Agreements have been signed among the governments of Armenia, Azerbaijan and Georgia on “Cooperation in the Field of Prevention and Mitigation of Natural and Technical Emergency Situations” which covers transboundary accident prevention and response issues. A document on the assessment of threats in Georgia for 2010-2013 was developed and approved by the Presidential Decree #707 “On Adoption of the Georgian Threat Assessment Document 2010-2013.” In addition, a certain legal basis has been developed in this sphere.

10.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

In light of ongoing climate change processes and the increase in frequency and intensity of natural disasters, the fast economic development of Georgia may place additional pressures on the environment (Climate change issues are discussed in Chapter 12). Unless appropriate preventive measures are taken, these processes may result in economic losses and human casualties.

The development of economic sectors sensitive to the impacts of natural disasters (especially, hydropower, agriculture, air, marine and land transport, construction industry and tourism), has

increased the demand for hydro-meteorological and geological information. Rapid development of these economic activities exacerbates the necessity for more timely and spatially detailed forecasts of hazardous events and processing of long-term data. Moreover, considering growth in the tourism industry, the demand for a safe environment will increase. Therefore, development and implementation measures to prevent, mitigate and rapidly respond to natural and anthropogenic disasters are of particular importance.

Georgia is actively involved in international processes directed towards disaster risk reduction and negative impact mitigation. Of these processes, it is important to highlight the Johannesburg (South Africa) World Assembly under the auspices of UN in 2002 and Hyogo (Japan) International Conference in 2005. Decisions adopted at these conferences create the basis for development of an effective early warning system, disaster forecasting and disaster risk reduction.

Disaster risk reduction is one of the three priorities of the United Nations Development Assistance Framework (UNDAF) in Georgia for 2011-2015. Measures to be implemented for disaster risk reduction with stakeholder participation are formulated in the aforementioned document, which is respectively based on the Hyogo Framework for Action.

Georgia is a member of the World Meteorological Organization (WMO), which promotes implementation of hydro-meteorological activities according to international standards. WMO assists Georgia directly in the field of hydro-meteorology as well as mediates with international organizations and donor countries for assistance.

It is also important to highlight that ratification of the UNECE Convention “On the Transboundary Effects of Industrial Accidents” has been carried out in the country. Ratification of this convention will give Georgia the opportunity to introduce modern approaches for the prevention of industrial accidents at the national level.

10.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

For disaster management, the long-term goal is **to minimize the human losses and the negative impacts to human health and ecosystems as well as minimize economic losses.** This goal, first of all, implies disaster prevention and when disasters still occur, rapid response, minimization and mitigation.

For achieving this long-term goal the following short-term targets have to be realized:

Target 1. Improvement/modernization of early warning system;

Target 2. Prevention/reduction of negative impacts of floods and flash floods in river basins of Georgia;

Target 3. Resumption of artificial influence activities on some hazardous events (hail, drought, snow avalanches);

Target 4. Risk reduction for industrial accidents.

10.6 ASSESSMENT OF NECESSARY REGULATORY MEANS

Disaster-related issues are regulated by the Constitution of Georgia, various laws and by-laws adopted in 1993-2011. These normative documents regulate particular aspects associated with causes of natural-anthropogenic disasters and mitigation activities. Regulation of issues such as reduction of negative anthropogenic impacts on the environment, creation of the framework for disaster risk reduction and liquidation of negative consequences of disasters in a timely manner are of particular importance.

10.7 TARGETS AND MEASURES

Long-term goal - avoid the human losses and minimize the negative impacts to human health and ecosystems as well as minimize economic losses

Target 1. Improvement/modernization of early warning system

№	Measures	Time frame	Responsible agency	Finance estimate (GEL)[17]	Potential Source	Indicators
1	Analyze and improve the legal basis according to EU requirement for creation of an effective disaster management system	2012-2016	Ministry of Internal Affairs (MIA), Ministry of Environment Protection (MEP)	Low cost	Donors	Legal basis for proper disaster management is in place
2	Process statistical geological disaster data, create an electronic database and develop a long-term (20-25 years) prognosis	2012-2015	MEP	High cost	State budget, Donors	Maps of erosion and landslide/ flash flood risks in GIS system are created
3	Rehabilitate/expand observation network for annual geo-monitoring studies throughout Georgia	2012-2016	MEP	Medium cost (annually)	State budget, Donors	Network is rehabilitated and annual bulletin is developed
4	Assess emergency situations in force-majeure circumstances during the extreme activation of geological elements, determine the risk of hazard, provide geological recommendations to the population and offices of emergency department in the high risk area	2012-2016	MEP	Low cost (annually)	State budget	Number of population and settlements for whom the safety was ensured
5	Carry out a detailed engineer geological study for particularly hot-spot areas and develop recommendations for measures to be undertaken	2012-2013	MEP	Medium cost	State budget, Donors	Study reports and recommendations are developed
6	Procurement and adoption of ground meteorological and hydrological measuring devices	2012-2016	MEP	High cost	State budget, International organizations, Donors	Number of new meteorological and hydrological stations and observation points

17 In this document less than 100 000 GEL is defined as “Low cost”, 100 000 – 500 000 GEL – “Medium cost” and 500 000 –up “High cost”.

7	Introduce modern weather, hydrological, marine-hydro-meteorological and climate forecast models	2012-2016	MEP	Medium cost	State budget, International organizations, Donors	Modern weather, hydrological, marine-hydro-meteorological and climate forecast models are introduced and reliability of forecasts are increased
8	Process long-term hydro-meteorological statistical data	2012-2016	MEP	Medium cost	State budget, International organizations, Donors	Comprehensive hydrological electronic data bases, cadastres of hydro-meteorological disasters (recorded on the territory of Georgia) and maps illustrating distribution of these disasters in GIS system are created
9	Implement a pilot project on testing the complete natural-anthropogenic disaster management cycle in the vulnerable regions of Georgia	2012 -2015	MEP, MIA, Local self-governing bodies	High cost	Donors, State budget	The model of complete natural-anthropogenic disaster management cycle is in place
10	Develop early warning methodology and carry out awareness raising campaigns about hazardous processes for populations in high risk zones	2012-2013	MEP	High cost	Donors	Methodology is developed; Number of awareness raising campaigns

Target 2. Prevention/reduction of negative impacts of floods and flash floods in river basins of Georgia

№	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Specify flash flood risks in the river basins of Georgia	2012-2016	MEP	Medium cost	State budget, International organizations, Donors	Settlements, agricultural lands, infrastructural constructions and other objects under potential inundation risk are identified
2	Monitor the coastal zone of Ajara and Kolkheti lowland, and make a detailed mapping of underwater slope and beach	2012-2015	MEP, Ministry of Regional Development and Infrastructure (MRDI)	Medium cost	State budget, Donors	Detailed materials of mapping works are in place
3	Develop master plans for river bank protection activities for the main river basins	2012-2015	MRDI	Medium cost	State budget,	Master plans are in place
4	Map risky areas of the river banks, execute fortification works	2012-2015	MRDI	High cost (annually)	State budget	River bank fortification works are executed on risky areas of rivers adjacent to 50-60 settlements

Target 3. Rehabilitation of artificial influence activities on some hazardous events (hail, drought, snow avalanches)

№	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Identify and map avalanche risk sensitive zones in Georgia	2012-2015	MEP	Low cost	State budget, International organizations, Donors	The maps of avalanche risk zones are created including settlements, agricultural lands, infrastructural constructions and other objects in this zone
2	Procure technical and technological facilities for artificial triggering of avalanches on the Gudauri-Kobi section (Mtskheta-Kazbegi-Larsi international highway); Carry out avalanche triggering activities	2012-2015	MEP,Ministry of Defense (MD), MRDI	High cost	State budget, other interested countries	Artificial triggering works of avalanches on Gudauri-Kobi motorway are applied
3	Organize and implement works against hail in the Kakheti region (region of hail high risk)	2014-2015	MEP, Ministry of Agriculture (MA)	High cost	Insurance companies, private sector, State budget	Economic losses from hail is reduced in the Khakheti region
4	Stimulate artificial precipitation in Dedoplistskaro and Sighnaghi regions (regions of precipitation deficit)	2014-2015	MEP, MA	High cost	Insurance companies, private sector, State budget	Increased precipitation is observed in Dedoplistskaro and Sighnaghi regions

Target 4. Risk reduction from industrial accidents

№	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Develop a methodology for preparation of localization/ liquidation plans of the accidents	2012-2014	MEP, MIA, Ministry of Economy and Sustainable Development (MESD)	Medium cost	Donors, State budget	Methodology is developed
2	Strengthen capacity of the Department of Ecological Expertise and Inspection	2012-2016	MEP	Medium cost	Donors, State budget	Necessary methodology for inspecting the enterprises are developed and applied; Guiding manual for inspectors are developed

CHAPTER 11. NUCLEAR AND RADIATION SAFETY

11.1 CURRENT SITUATION

Nuclear and Radiation Safety aims to protect people and the environment from the harmful effects of ionizing radiation. Georgian legislation uses the term "**ionizing radiation**" defined in the Law of Georgia on Nuclear and Radiation Safety (1999) as an *emission generated as a result of nuclear transformation, or slowing down of charged particles in a substance, the interaction of which with a physical, or biological body gives rise to ions of opposite charge*. **Ionizing radiation** should be differentiated from non-ionizing radiation which is emitted for example by a cellular network, high voltage power transmission and other generators of non-ionizing radiation.

Ionizing radiation possesses high energy. It can eject electrons from an atom, or break a chemical bond and generate electrically charged ions. Examples of ionizing radiation are x-rays and gamma-rays. Ionizing radiation can damage living tissues and result in organ failure, genetic changes and even death. Radiation safety standards have been developed to protect against these harmful effects.

Radioactive isotopes - remnants since the earth's formation (238U, 232Th, 40K, etc.) - represent natural sources of ionizing radiation. These isotopes slowly decompose into isotopes of other substances that also can be radioactive (e.g. 222Rn). Natural sources of ionizing radiation can also be created by solar rays(e.g.14C).

There are naturally occurring sources of radiation in the environment, which give rise to "background" levels of radiation, which we are exposed in the general environment. Living organisms are adapted to such background radiation and usually it is not considered harmful.

Man-made radioactive isotopes are produced as a result of human activities either for immediate needs, or as by-products of certain technological processes (3H, 129I, 131I, 137Cs, 90Sr, 99Tc, 239Pu etc.). Some do not occur naturally. Some generators of ionizing radiation (e.g., x-ray devices) do not contain radioactive sources. Ionizing radiation coming from man-made sources and generators can be very dangerous to human health and the environment if uncontrolled.

Ionizing radiation is in use inmany sectors of the economy such as energy, medicine, industry, science and defense. These are called man-made or technogenic sources. Man-made sources of ionizing radiation are regulated by legislation.

Some isotopes, such as Caesium-137 (^{137}Cs) and Strontium-90 (^{90}Sr), do not occur naturally; therefore any concentrations indicate contamination. Much of it comes from atmospheric deposition after the atmospheric nuclear bomb tests performed in the 20th century. Some areas, especially in West Georgia, were contaminated after the Chernobyl accident. A survey conducted in 2000 predictably found traces of man-made isotopes (including those of Chernobyl origin) in several areas. It should be noted that these concentrations in absolute terms are insignificant - in all cases, the radiation dose rate stays well within permissible limits.

Georgia is located in a region where vast amount of radiological material was used during the Cold War period for military, communication, agricultural and scientific purposes. A considerable quantity of such materials (especially those owned by the Soviet, later Russian, military) have not been properly withdrawn from use or transferred to the authorities of Georgia. As a result, some of these materials cannot be recorded, including even some enriched uranium that reportedly disappeared in the early 1990s from a facility located in Abkhazia, Georgia.

There also is clear evidence of criminal groups exploring opportunities to use Georgian territory for illicit trafficking of nuclear and radioactive materials. The Georgian Ministry of Interior has foiled eight attempts of illicit trafficking of enriched uranium during the last 10 years, including several cases of weapons-grade enrichment. Criminals associated with these attempts have been detained. The most recent case of illicit trafficking was the attempted sale of highly enriched uranium in March 2010.

Abkhazia, Georgia and Tskhinvali region, Georgia, occupied by Russian military forces, are closed for national and international control, which deters efforts of the government of Georgia and international community to achieve the nuclear safety in these regions.

Referring to abovementioned, strengthening the state management and regulation of the sector as well as enhancing radiation safety for people and the environment arevery important.

Need for Strong State Management and Regulation of the Sector

After the restoration of independence, the troublesome situation in Georgia has delayed the initiation of a new framework of management, therefore leading to a string of accidents. Legal and organizational restructuring aimed at the establishment of a state control over the situation was started at the late 1990s.

Need for Enhanced Radiation Safety for People and the Environment

With the support of partner countries and organizations, Georgia has developed an appropriate infrastructure for the control of nuclear and radioactive materials and has enhanced its institutional and technical capacity to combat illicit trafficking. However, the following challenges still exist: radioactive waste management needs further improvement; the regulator's institutional capacity is limited; and, some laws and regulations need amendments.

11.2 MAIN STAKEHOLDERS

The Ministry of Energy and Natural Resources is the National Regulatory Authority in the field of nuclear and radiation safety. The ministry issues licenses and permits for nuclear and radiation activities, which are the principal tools for State regulation of this issue. The Nuclear and Radiation Safety Service (NRSS)[18] of the Ministry of Energy and Natural Resources conducts pre-licensing as well as post-licensing inspections of the regulated organizations. The NRSS specialists advise users on the measures to be taken to comply with the norms of the nuclear and radiation safety and check their implementation. The NRSS also receives information on the effective doses received by professional employees.

The Ministry of Interior conducts necessary measures to prevent and restrict illegal use and illicit trafficking of nuclear and radioactive materials. In addition, the Ministry of Interior participates in administrative proceedings as an interested administrative unit in accordance with the Law of Georgia on Permits and Licenses.

The Ministry of Environment Protection of Georgia conducts monitoring on natural radiation background levels.

In addition, other government institutions, such as the Ministry of Economy and Sustainable Development, the Ministry of Defense, the Ministry of Labour, Health and Social Affairs and the Ministry of Education and Science, have competency in the sector. It worth mentioning that nuclear and radiation safety and (especially) security issues are subject to permanent international interest. Therefore, international organizations and in the first place the International Atomic Energy Agency (IAEA) are also involved in these processes through the international agreements that Georgia is party to, as well as through its extensive Technical Cooperation (TC) program conducting several national and regional projects.

The community engaged in radiation related activities in Georgia is comprised of a few hundred institutions using generators of ionizing radiation; a few dozen organizations possess radioactive sources and/or technologies involving these as well.

18 Since 18 March 2011. before that this service was part of the Ministry of Environment and Natural Resources of Georgia

11.3 MEASURES TAKEN TO DATE

As of January 2010, 640 organizations engaged in radiation related activities were registered in Georgia. 1,145 generators of ionizing emission, 1,537 so called "sealed"[19] and 762 "unsealed" sources were also registered. These sources' activities vary from 1 milliCurrie up to 35,000 Currie. 826 sources are disused and stored in a special centralized temporary repository under state supervision. Unsealed sources are usually of low activity and are used for scientific purposes.

The handling and storage of sources which are in use are regulated by national legislation. Depleted sources are given the status of "radioactive waste" and stored in the temporary repository. Nuclear fissionable material is stored under strict control, and the Nuclear and Radiation Safety Service of the Ministry of Energy and Natural Resources conducts regular monitoring.

The only scientific research nuclear reactor was operated in Georgia from the 1960's until the 1990's. It is now closed and is undergoing decommissioning with the support of the International Atomic Energy Agency. The former repository of radioactive waste located to the east of Tbilisi (operated during the Soviet period) is also closed. According to measurements, the radiation background levels are within permissible levels at both of these facilities.

Detection, neutralization and safe storage of uncontrolled and unexploited radioactive sources remaining since the Soviet period is ongoing. Management of these sources during the period of disintegration of the former Soviet Union appears to have been very poor, with many being lost or discarded in an inappropriate manner, especially from the former Soviet (later Russian) Army military bases. Up to 300 of these sources have been located, 50 of which were located and neutralized between 2007 and 2010. This work will be continued in future.

To prevent and restrict illegal use and illicit trafficking of nuclear and radioactive substances, portable detectors were installed at check points on the Georgian border in 2008-2009.The Ministry of Internal Affairs carries out all necessary measures to prevent and restrict illegal use and illicit transit of nuclear and radioactive substances. As of today, adequate control of all legal shipments from the nuclear and radiation safety and security perspective is ensured.

The temporary repository of radioactive substances began operation in 2007 (with the assistance of the USA) and provides for the safe storage of radioactive wastes.

11.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

Since 1996, Georgia has been a member of the International Atomic Energy Agency (IAEA). This imposes certain obligations on Georgia to accede to the nuclear and radiation safety and security policy and relevant standards recommended by the IAEA.

Full compliance with the International Treaty on Non-Proliferation of Nuclear Weapons, its Safeguard Agreement and Protocol Additional (2003) is an especially important issue. According to international obligations, the NRSS periodically reports to the IAEA (through the Ministry of Foreign Affairs of Georgia) on the implementation of nuclear materials' safeguard provisions in the country. As of 2011, the country is in compliance with international obligations.

Georgia participated in the first Nuclear Security Summit (Washington DC, March 2010) and committed to cooperation towards achieving global nuclear security.

In October 2009, the Georgia-USA agreement of 1997 on cooperation in the sphere of non-proliferation of weapons of mass destruction has been extended (First time it was extended in 2002). Based on this agreement, the US Department of Energy and the Ministry of Energy and Natural Resources of Georgia are preparing a so-called "Implementing Agreement" on cooperation to enhance the security of radioactive sources of Georgia. The Implementing Agreement will facilitate implementation of concrete projects employing financial support from the USA and human resources from Georgia.

Other partners – the European Commission, United Kingdom and Sweden – are also working on

19 Sealed source – radioactive source disposed in capsule for unlimited time, or mixed with non-radioactive material in a way to avoid accidental leakage or separation

collaborative projects within Georgia. Joint working meetings will be held to enhance the coordination of the partnerships.

Through this international cooperation, Georgia is participating in the process of achieving global nuclear security, thus improving the national capacity to respond to challenges posed by the potential illicit traffickers as well as to increase the safety culture in the regulated community.

11.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

Nuclear and radiation safety, and security sector in particular, have become the subject of permanent international interest. **Therefore, the long-term (20-year) goal for this sector is to ensure radiation safety of people and the environment.** The scope encompasses the peaceful use of nuclear materials, devices and technologies with respect to the non-proliferation regime, prevention of any illegal activities involving nuclear materials and other sources of ionizing radiation in accordance with the Georgian legislation and international obligations, and ensuring the safety of all types of activities involving radioactive materials and other sources of ionizing radiation.

To meet this long-term goal the following short-term targets should be achieved in the next five years:

Target 1. Enhancement of State management and regulation of the sector

Target 2. Improvement of radiation safety for people and the environment

11.6 ASSESSMENT OF NECESSARY REGULATORY MEANS

Protection of the population and the environment from the harmful effects of the ionizing radiation is the strategic objective in the sector. To achieve this objective, basic principles of safety must be implemented by the means of the State System of Accounting and Control (SSAC).

State regulation of the nuclear and radiation safety sector in Georgia is based on Article 37 of the Constitution of Georgia, international obligations of Georgia (the International Treaty on the Non-proliferation of the Nuclear Weapons – NPT - first of all), the relevant legislation of Georgia – Law of Georgia on the Protection of the Environment (1996) and the Law of Georgia on Nuclear and Radiation Safety (1999), Statutes of the Ministry of Energy and Natural Resources and its Nuclear and Radiation Safety Service, and relevant international practices.

Basic policy in the sector is defined by the Law of Georgia on Nuclear and Radiation Safety. The Law assigns state regulatory functions for nuclear and radiation activities to the Ministry of Energy and Natural Resources of Georgia. To exercise this function, the Ministry has established the Nuclear and Radiation Safety Service within its structure.

11.7 TARGETS AND MEASURES

Long-term goal - ensure radiation safety of peopleand the environment

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[20]	Potential Source	Indicators
1	Develop the necessary legislation	2012 -2015	Ministry of Energy and Natural Resources (MENR)	Low cost	Donors	Updated version of the framework law is in place
2	Establish a regional unit of Nuclear and Radiation Safety Service in Western Georgia	2012-2013	MENR	Low cost	Donors (2011-2013), after 2013 – State Budget	A functioning operational structure in the Western Georgia is established

Target 1. Enhancement of the State management and regulation of the sector

Target 2. Improving radiation safety of humans and the environment

	Measures	Time frame	Responsible agency	Finance estimate (GEL)	Potential Source	Indicators
1	Continue the systematic search for orphan sources of ionizing radiation	2012 – 2016 (permanently)	MENR	Medium cost	State budget, Donors	
2	Enhance the management of radioactive wastes (institutional issues) and develop a long-term strategy for the management of radioactive wastes	2012-2013	MENR; Ministry of Education and Sciences (MES); Tbilisi City Hall	Medium cost	State budget, Donors	The system of management of radioactive wastes is restructured; A long-term strategy is developed
3	Improve the management of radioactive wastes in the Saakadze storage	2012-2013	MENR; Tbilisi City Hall	Low cost	State budget, Donors	Radiation safety of the site is assessed and its physical protection is ensured
4	Improve the management of radioactive wastes, including the final phase of decommissioning the Mtskheta research reactor	2012-2016	MENR; MES	450 000	Donors, State budget	Reactor is decommissioned and site is cleaned
5	Continue technical cooperation with the IAEA (IAEA TC)	2012-2016	MENR; other relevant ministries	2 Million (2012-2013, only national projects)	IAEA TC; State budget (5% state co-financing)	At least 5 national projects are agreed with the IAEA TC and implemented during 2011-2013 and 2013-2015
6	Conduct public information campaigns	2012-2016	MENR	Low cost	State budget; Donors.	Annual plans for public information and awareness raising are elaborated

20 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

Chapter 12. Climate Change

12.1 CURRENT SITUATION

Climate Change (CC) and its adverse impacts on ecosystems and the economy are a threat to sustainable development. CC process in Georgia first became apparent in the 1960`s and has accelerated since the end of the last century. For the last 10 years, the average air temperature has increased by $0.7^0$C in some regions of Western Georgia, and by $0.6^0$C in Eastern Georgia. Precipitation has slightly decreased in most regions of Western Georgia since the 1960`s; however some areas have seen increased precipitation. Precipitation in Eastern Georgia has increased by no more than 6%.

As a result of these changes, the intensity and frequency of extreme events caused by global warming have risen. In semi-arid regions, the frequency of droughts and strong winds in the spring has increased. In the Black Sea coastal zone, coastal erosion and abrasion processes have intensified. In addition, satellite observations of the Greater Caucasus mountain range has shown that the average speed of glacial withdrawal is 8 m/year, and their surface area has decreased by 6-9%. When withdrawing, glaciers of the Caucasus leave behind immense quantities of stones, pieces of rock, mud, and resulting mud-flows after intense rains. Such events pose a risk not only to the safety of the population but also to the economy of the country.

CC related problems in Georgia are of greatest concern in those areas being most vulnerable to CC. It remains unclear what the potential CC impacts are on other regions and specific sectors of Georgia.

Regions of Particular Vulnerability to Climate Change

In assessments made under Georgia's Second National Communication (SNC) to the United Nations Convention on Climate Change (UNFCCC), the regions of particular vulnerability to CC have been identified. These regions are the Black Sea coastal zone, semi-arid regions (especially, agricultural lands/croplands and grasslands in these regions) and highlands/mountainous areas.

The Black Sea coastal zone is affected by several geophysical processes (tectonic movements, sea level rise, storms, floods, underwater flows, sedimentation at the inflows of rivers, etc.). Some of them have intensified due to CC-related processes.

In semi-arid regions of Georgia, adverse impacts of CC are revealed in increased frequency and strength of droughts, changes in temperature regimes and precipitation totals. These events have negative impacts on agricultural productivity that may seriously threaten food security. To assess vulnerability to CC and elaborate adaptation measures, Dedoplistskaro has been chosen as a "pilot region," as this area faces the threat of desertification. This region has been historically characterized by a dry climate and is prone to land degradation. During recent years, land degradation has noticeably intensified in this region due to increased temperature and strong winds.

In the highlands, increase in frequency and intensity of flashfloods, landslides and mud-streams/mudflows has caused serious damage to agriculture, forestry, roads and other infrastructure. Lower Svaneti (Lentekhi region) has been studied as a mountainous "pilot region", vulnerable to extreme events caused by global warming. Under the circumstances of forecasted temperature increase in this region, significant reduction of the glaciers in this area is expected by 2050.

The lack of awareness regarding CC issues and their insufficient integration into development plans of various sectors impedes finding and implementing effective ways of addressing the problem.

CC Related Issues to be Studied

In addition to above-mentioned, other changes (not yet studied) are also observed in Georgia. Therefore, it is appropriate to assess and specify the ecological vulnerability of other regions in Georgia, current and future CC impacts and develop and undertake relevant adaptation measures as well as find investments for particular programs and projects.

CC-induced processes can have significant adverse impacts on human health. In Georgia, a tendency towards increased intensity and frequency of heat waves has already been observed, and elderly people area high-risk group for heat exposure. These issues need to be studied and addressed adequately.

The potential of forests for carbon dioxide sequestration in Georgia also needs to be studied.

12.2 MAIN STAKEHOLDERS

The Ministry of Environment Protection (MEP) of Georgia is responsible for the implementation of the UNFCCC and, consequently, the elaboration of national policy in this sector. Along with the MEP, Ministries of Energy and Natural Resources, Agriculture, Economy and Sustainable Development, Labour, Health and Social Affairs are major stakeholders in the assessment of vulnerability of ecosystems and sectors of economy to CC and elaboration of adaptation/prevention measures. The role of the Ministry of Education and Science is also important, as CC issues are to be included in educational programs.

The role of the local authorities and population is important especially in the vulnerable regions to CC.

The private sector has a special role for low emission economic development. Therefore, raising their awareness on CC related challenges is very important.

The general population is also considered a stakeholder because of its high-risk vulnerability to CC and because of its contributions to CC processes.

12.3 MEASURES TAKEN TO DATE

In 1994, Georgia ratified the UNFCCC, and in October 1999 accessed the Kyoto Protocol (KP), to the UNFCCC. In 1997-1999, Georgia prepared and submitted the Initial National Communication (INC).

From 1999 to 2001, projects were implemented to study the possibilities for rehabilitation of heat-supply systems and small Hydro Power Plants (HPPs). Based on the results of these researches, a project “Renewable energy resources for local energy supply” was started. Within the framework of the project, the Municipal Development Fund (MDF) was assigned a function to promote use of renewable energy. Since 2010, the project has been assisting the private sector in developing business plans and assessing project viability. In addition, solar energy and biogas use measures have been implemented in some villages of the Racha region in the framework of the project.

Several projects have been implemented in the country since 2003, which considerably increased the local potential for implementation of the Convention and Kyoto Protocol. Namely, a procedure for considering Clean Development Mechanisms (CDM) projects and the CDM national board have been established, the Green House Gases (GHG) inventory process has been improved, local experts have been trained and awareness-raising campaigns have been held for various target groups (i.e. local self-governing bodies, farmers).

From 2006-2009, Georgia prepared its Second National Communication to the UNFCCC (SNC). In the SNC, the focus was on the vulnerability assessment of various systems and economic sectors and the elaboration of adaptation projects and strategies. Based on the document, a new project was implemented with the support of the German Government. The project focused on the reha-

bilitation of degraded lands and windbreaks through reforestation activities in the Dedoplistskaro region. Bank fortifying works have also been started in the Adlia-Batumi area. Additionally, a GHG reduction plan from the business as usual (BAU) scenario in the Energy sector has been prepared.

From 2008-2010, the Caucasian office of WWF, along with financial support from the German Government, implemented a project titled "Rehabilitation of forest landscapes to reduce CC-caused impacts in Southern Georgia." As a result, floodplain and mountain forests in Lagodekhi (Chiauri forest) and Kharagauli (former *"kolkhoz"* forests) regions have been rehabilitated. Some other projects have also been implemented with the support of various international organizations.

12.4 NATIONAL AND INTERNATIONAL DEVELOPMENTS

The Government of Georgia pays a great deal of importance to strengthening the function of the country in the transportation sector, especially that of energy carriers. Georgia is involved in energy projects of strategic importance, aimed at transporting crude oil and natural gas from Asia to Europe. These projects are expected to emit additional GHG unless the relevant mitigation measures are implemented. The biggest increase in GHG emission is expected to come from motor transportation.

Economic growth of the country will inevitably cause increases of GHG emissions. Significant growth is expected in the energy sector, from heat and hot water supply systems. Emissions from transport, industry and agriculture are likely to increase as well. Consequently, it is very important to use the GHG emission reduction mechanisms and implement relevant measures in Georgia. Reducing GHG emissions at the national level and in neighboring countries by supplying them with internally generated "clean energy," Georgia can make an important contribution to the CC mitigation process.

Positive tendencies that may significantly reduce GHG emissions are also present in Georgia. Intensive rehabilitation of hydroelectric power plants (HPPs) is currently in progress. To attract investors, the Ministry of Energy and Natural Resources of Georgia has announced (under the state program "Renewable energy – 2008") an "expression of interest" in building, operating and purchasing new HPPs (about 80 micro and medium-size HPPs). An increase of the wind energy share is an important part of the energy sector development plan for the next 15 years. The gasification program of the country (which would replace fossil fuel and wood), highway and road infrastructure development projects, extension of protected areas and activities aimed at improving forest management are also expected to reduce GHG emissions.

12.5 LONG-TERM GOALS AND SHORT-TERM TARGETS

In the long-term (20 years and more), the country's overall goals are:

1. **Ensuring the security of the Georgian population by implementation of measures for adaptation to CC**
2. **Reduction of GHG emissions**

To achieve these long-term goals, the following short-term (five year) targets should be reached:

Target 1. Implementation of adaptation measures in regions vulnerable to CC

Target 2. Identification of climate change impacts on other regions and sectors

Target 3. Creation of favorable conditions for the reduction of GHG emissions

12.6 ASSESSMENT OF NECESSARY REGULATORY MEANS

Georgian Laws on "Environment Protection" and on "Ambient Air Protection" represent the main legal acts in the field of climate change. These laws state that in order to protect the Earth's climate from global changes, the developer has to meet GHG emission norms. Currently, efforts are being made to establish relevant norms.

12.7 TARGETS AND MEASURES

Long-term goals: 1. Ensuring the security of the Georgian population by implementation of measures for adaptation to CC; and 2. Reduction of GHG emissions

Target 1. Implementation of adaptation measures in the vulnerable regions to CC

	Measures	Time frame	Responsible Agency	Finance estimate (GEL)[21]	Potential Source	Indicators
1	Elaborate National Adaptation Programmes of Activities (NAPAs)	2013-2016	Ministry of Environment Protection (MEP)	Medium cost	Donors	National Adaptation Programmes of Activities are in place
Measures in the Black Sea coastal zone						
2	Install a flood-monitoring system in the Rioni-river basin	2012-2015	MEP, Ministry of Internal Affairs (MIA), selected municipalities of the Rioni-river basin	High cost	Donors	Flood-monitoring system is installed on relevant segments of the Rioni River basin; Annual plan for costal risk management is prepared
3	Carry out coastal fortifying works at the delta of the Rioni River, taking into consideration CC-impacts	2012-2015	Ministry of Regional Development and Infrastructure (MRDI), local self-governing bodies	High cost	State budget, UNFCCC funds, international assistance, private sector entering the free economical zone	Primary fortifying works along the coast of the city of Poti are carried-out,
4	Continue on-going fortifying works on Batumi-Adlia zone taking into consideration CC impacts	2013-2016	Government of Georgia, local self-governing bodies	High cost	State budget, UNFCCC funds, international assistance	Primary fortifying works are done along Batumi-Adlia zone, and coast risk management annual plan elaborated

21 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cost".

Measures inDedoplistskaro region						
5	Rehabilitate windbreaks	2012-2015	MEP, Municipality of Dedoplistskaro, local farmers	High cost	German Agency for International Cooperation (GIZ), state budget, UNFCCC funds, international assistance, local budget	Windbreaks (28 ha) are in place, rehabilitation of windbreaks (1,700 ha) has started
6	Rehabilitate irrigation systems in Dedoplistskaro municipality	2012-2016	Dedoplistskaro municipality, local farmers, Ministry of Agriculture (MA), MEP	Medium cost	State budget, UNFCCC funds, international assistance,(local budget if possible), private sector	Pilot-projects of irrigation systems are implemented
Measures in the region of Lower Svaneti (Lentekhi municipality)						
7	Plant landslide stabilizing forests (hazelnut)	2012-2016	Local self-governing bodies, MEP,MA	Medium cost	State budget, UNFCCC funds, international assistance, private sector	Area of landslide stabilizing forests
Target 2. Identification of climate change impacts on other regions and sectors						
	Measures	**Time frame**	**Responsible Agency**	**Finance Estimate (GEL)**	**Potential Source**	**Indicators**
1	Research potential risks of CC impacts in Eastern Georgian semi-arid regions and prepare packages of appropriate adaptation measures	2012-2016	MA, MEP, Local self-governing bodies, local farmers	High cost	State budget, UNFCCC funds, international assistance, (local budget if possible)	Packages of adaptation measures for each of researched regions are prepared
2	Study possible impacts of CC on high mountainous regions and elaborate packages of relevant adaptation measures	2012-2016	MEP, Government of the Autonomous Republic of Adjara, Local self-governing bodies	Medium cost	State budget, UNFCCC funds, international assistance, local budgets	Package of adaptation measures are prepared for each researched region

Target 3. Creation of a favorable conditions for the reduction of GHG emissions

1	Elaborate Low Carbon Development Strategy – LCDS	2012-2013	Government of Georgia	High cost	UNDP, UNFCCC funds, international assistance	Low Carbon Development Strategy is in place
2	Create an inventory of GHG	2012-2014	MEP	Low cost	Global Environment Facility (GEF), State budget	National Inventory Report (NIR) is prepared
3	Increase energy efficiency in Tbilisi house	2012-2015	MEP, Tbilisi City Hall	High cost	GEF	Pilot project is impelemented
4	Promote biomass pellet production and utilization in Georgia	2012-2015	MEP, Tbilisi City Hall	High cost	GEF	Production and utilization of pallets is started, and strategy for development of renewable biomass is elaborated
Other Activities						
1	Prepare Georgia's Third National Communication to the UNFCCC	2012-2014	MEP	Medium cost	GEF	National Communication is submitted in 2014
2	Carry out technology needs assessment (TNA) for Georgia	2012-2013	MEP	Medium cost	GEF	Report on TNA and ways of its transfer is prepared
3	Conduct awareness raising campaigns on potential CC risks	2012-2016	MEP, Ministry of Education and Science, MIA	High cost	State budget, UNFCCC funds, international assistance	Awareness of population is raised

CHAPTER 13. CROSS-CUTTING ISSUES

This chapter addresses five issues that apply to all thematic sectors in the NEAP-2. These cross-cutting issues are: environmental permitting and enforcement, monitoring, scientific basis, environmental education and awareness raising, and Geographic Information System (GIS). The latter is important for data updating and analysis. All sectors will benefit adequately from addressing these issues.

13.1 ENVIRONMENTAL PERMITTING AND ENFORCEMENT

Effective enforcement is crucial to ensure that the objectives of environmental regulations are achieved. Without compliance, there is no guarantee that environmental requirements will achieve the desired results. Enforcement of environmental requirements in Georgia is implemented through environmental permitting and technical environmental regulations. Namely, certain types of activities defined by the law having significant impact on the environment are subject to an Environmental Impact Permit. Activities not subject to an environmental impact permit have to comply with technical environmental regulations which establish emission and discharge standards.

An essential part of the permitting process is the Environmental Impact Assessment (EIA). The purpose of the EIA is to investigate and present all possible impacts of the development proposals on the environment to decision-makers prior to decision-making. Thus, the EIA is an important tool for informed decision-making. At the same time, the EIA is an instrument for researching the long-term sustainability of a project. This is achieved through enforcement of environmental impact permit requirements.

Enforcement of both environmental impact permit requirements and technical regulations are implemented by the Department of Ecological Expertise and Inspection under the Ministry of Environment Protection. Recent legislative changes granted more flexibility to the Inspection Unit of this department for more effective performance of assigned functions. Still, environmental enforcement needs strengthening. Best modern European Union (EU) practices should be introduced into the existing environmental impact permitting system.

13.2 MONITORING

Environmental monitoring provides essential data for assessing environmental conditions and planning adequate measures for improvement. Additionally, environmental monitoring information is used for evaluating the effectiveness of environmental policies and implemented measures. As mentioned in various chapters of the NEAP-2, there is a need for improvement of the environmental monitoring system in Georgia. The limited number of observation stations and sampling points does not provide sufficient data necessary for a comprehensive picture of ambient environmental conditions. In addition, most measurement techniques and methodologies need updating.

There have been efforts to improve the existing monitoring network. Namely, three air monitoring stations were installed in Tbilisi and Rustavi and all three national water analysis laboratories were equipped with modern devices. Still, the number of observation/sampling stations should be increased. It is also necessary to add pollutants imposing risks to human health to the list of measured substances. In addition, adequate data interpretation systems are needed in order to make use of environmental monitoring data in environmental planning. Modern methodologies of sampling and measurement should also be introduced.

13.3 SCIENTIFIC KNOWLEDGE

Scientific research creates a strong basis for planning and addressing environmental challenges. The field of environmental protection is very complex and interconnected with a number of other sectors. Only scientifically proven data and conclusions will allow us to analyze and interpret the relationships among various processes and identify economically, socially and environmentally reasonable solutions. Therefore, the role of the science in the decision-making process needs to be strengthened in Georgia.

13.4 ENVIRONMENTAL EDUCATION AND AWARENESS

The application of science and technology alone cannot deliver sustainable development and environmental sustainability. Progress will depend on a fundamental change in society's relationship with the environment. Environmental education, which encourages people to understand and care more about their environment as well as make choices to protect their environment, is a critical tool in moving toward sustainability.

Environmental education is a long process that starts at the pre-school age and continues into adulthood. It encompasses both formal and nonformal education at general education system as well as adult education such as vocational training and capacity building. It also incorporates awareness raising campaigns that target broader audiences.

The need for environmental education is well-understood by the government of Georgia as evidenced by active cooperation in this field at both national and international levels. Environment protection and natural resource related topics are integrated in the general school curricula.The interest of the government in environmental education has also been demonstrated by the current progress in developing a national environmental education policy document. The environmental education policy document, being in compliance with the goals and targets of NEAP-2, will target a broad audience and aim at increasing general public understanding of environmental problems and changing individual behaviour. A well-informed public is a strong pillar for civil society and an important foundation for building a democratic country.

The Ministry of Environment Protection of Georgia plans to implement large-scale activities in the field of environmental education at an international level that will promote sustainable development both at national and international levels. Georgia has a long tradition in this regard. The first intergovernmental conference on environmental education was held in Tbilisi in 1977 under the auspices of the UN. About 500 participants from 68 countries were present at the conference. The "Tbilisi Declaration" and recommendations adopted at the conference have created the basis for documents and actions implemented in the field of environmental education throughout the world since. One of the actions planned by the Ministry of Environment Protection for the fall of 2012 is organizing an international conference dedicated to the 35th anniversary of "Tbilisi Declaration."

Considering the importance of environmental education outlined above as well as the need for formal and nonformal education identified in various chapters of the NEAP-2, it is evident that substantial resources should be devoted to environmental education. Enhanced formal and informal environmental education will not only contribute to sustainable development of the country, but also reduce anthropogenic impacts on the environment as well as costs for rehabilitating and restoring injured environment.

13.5 GIS SYSTEMS

Geographic Information Systems (GIS) provide new capabilities for analyzing the spatial and temporal distribution of ecological phenomena. GIS has become a highly valued and widely used tool in resource management. GIS is also used to study the environment, report on environmental phenomena, and model how the environment is responding to natural and anthropogenic factors. The need for GIS as a tool for collecting, updating, processing and analyzing data is mentioned in several sectoral chapters of NEAP-2.

Application of GIS systems in any field including environmental management and use of natural resources is hindered by the absence of digital cartographic products of different scale for the whole territory of Georgia.

Therefore, the creation of cartographic base products, having necessary GIS software and hardware and adequately training GIS specialists in sector departments of the Ministries, who will maintain the GIS systems, are very important developments for monitoring, analysis, decision-making and generally effective environmental management.

13.6 TABLE OF ACTIVITIES RELATING TO CROSS-CUTTING ISSUES (ADDITIONAL ACTIVITIES)

	Measures	Time frame	Responsible agency	Finance estimate (GEL)[22]	Potential Source	Indicators
1	Improve the environmental permitting and EIA system	2012-2015	MEP	Medium cost	Donors	Environmental permitting and EIA system is improved through appropriate legal amendments and strengthening the capacities of the involved stakeholders
2	Develop a national environmental education policy document	2012	MEP, MES	Low cost	Donors	Policy document is in place
3	Broaden application of GIS system	2012 -2016	MEP	High cost	Donors	GIS system is widely applied
4	Organize an international conference on environmental education	2012	MEP, Ministry of Foreign Affairs (MFA)	High cost	Donors, State budget	Conference is organized
5	Facilitate international forum	2012-2016	MEP, MFA	Medium cost	Donors, State budget	Establishment of international instrument is initiated
6	Promote environmental education activities at all stages of education	2012-2016	MNP, MES	High cost	Donors	Activities are implemented
7	Implement extra-curricula activities	2012-2016	MNP, MES	High cost	Donors	The relevant documentary and visual interactive materials are in place

22 In this document less than 100 000 GEL is defined as "Low cost", 100 000 – 500 000 GEL – "Medium cost" and 500 000 –up "High cos

CHAPTER 14. POLICY INTEGRATION

Definitions and General Instruments

Policy integration refers to achieving coordination, coherence and integration of public policy. Incoherent policy is less effective and less cost efficient, while integration reduces risk of unintended consequences and offers the potential to identify mutually beneficial solutions.

The government can choose from a variety of methods to ensure that environmental protection requirements are integrated into the non-environmental sector policies. Among those are: regulatory impact assessments; strategic environmental assessment and project-level assessments; sustainable development strategies; NEAPs and National Environment and Health Action Plans (NEHAPs); cross-governmental structures or committees, bringing together political and/or administrative stakeholders, such as inter-ministerial bodies composed of high-level representatives from all relevant ministries involved in preparing national sustainable development strategies, to address sustainable development issues.

Necessity

The necessity of considering integrated environmental and development policies have been widely recognized since the emergence of “sustainable development” as a guiding principle of societal development. This is not easy, however, as giving equal consideration to ecological principles alongside economic and social principles has been a major institutional challenge in many countries.

Policy integration is a continuous process that allows consideration of cross-cutting issues and avoidance of possible inconsistencies among sectors. Environmental policy integration ensures that environmental issues are considered in all relevant policy making. This is a proactive approach, versus a reactive approach, when environmental policy has to react to negative impacts caused by socioeconomic policies and practices. The outcome of environmental policy integration should be an overall improvement in policy development and implementation. Taking into account all environmental issues in policy-making will be challenging, but the goal should be sustainable development, which means a healthy environment and social welfare along with economic development.

There is a growing understanding of the interrelation and the interdependence of development and environmental and health issues in the world. Increasing economic activity is presently linked to increased energy and resource consumption and generation of larger amounts of waste products. Increased extraction of natural resources, waste accumulation and emission of pollutants degrade the environment. This degradation results in the decline in human welfare. Urban growth affects patterns of land use, air quality, and demand for water and energy and waste accumulation. Unsustainable extraction of mineral resources is linked to deforestation, loss of biodiversity, release of metals and industrial byproducts, including hazardous substances and heavy metals into the environment. On the other hand, economic growth increases the demand for goods and services which are less resource intensive, and consequently less costly. In addition, economic growth results in higher incomes and increased welfare, which in turn increases the demand for improved environmental quality.

Due to declines in industrial sector since the breakup of the Soviet Union, the overall impact of industrial activity has declined in Georgia. However, unmanaged urban growth and increased pressure on natural resources caused by the economic crisis in 1990s increased pressure on the environment. In line with economic development, increased demand on energy and natural resources and a growing tourism industry, pressure on the environment will continue to increase, unless there are effective, coordinated policy measures in place. Environmental policy integration with corresponding sector policies becomes essential. This is also important for attracting foreign investments, tourism and approximation to the European Union.

NEAP and Policy Integration

As outlined in NEAP-2, environmental issues are tightly interlaced with other sector issues. All environmental issues covered by the NEAP are crosscutting; they cannot be resolved by a single department, agency or level of government. The Ministry of Environment Protection, the Ministry of Energy and Natural Resources, the Ministry of Economy and Sustainable Development, the Ministry of Regional Development and Infrastructure, the Ministry of Agriculture, the Ministry of Labour, Health and Social Affairs, other ministries and local self-governing bodies, are public institutions referred to in each chapter of NEAP, as responsible for the implementation of measures needed to achieve short- and long-term goals recommended in the NEAP. Examples illustrating the need for policy integration are provided in the Box14.1

Box 14.1

Decisions which can affect transportation-induced air pollution, a major environmental problem in big cities in Georgia, are made by different state institutions at different levels: Georgian Parliament, Georgian Government, Ministry of Economy and Sustainable Development, Ministry of Regional Development and Infrastructure and local self-governing bodies. It is impossible to reduce air pollution caused by the transport sector without coordinated action of all these institutions.

Decisions related to the use of natural resources (for example in forest management) are connected to economic development, on the one hand, and environment protection, sustainable consumption and tourism development on the other. Accordingly, these decisions are being addressed by a number of state institutions: the Ministry of Energy and Natural Resources, the Ministry of Environment Protection, the Ministry of Economy and Sustainable Development, the Ministry of Agriculture, the Ministry of Regional Development and Infrastructure, the Ministry of Culture and Monument Protection, the Ministry of Education and Science, research and educational institutions and local self-governing bodies.

Water management, especially integrated water resources management (IWRM) is inconceivable without adequate coordination among state institutions at various levels. Water-related issues are presently addressed by the Ministry of Environment Protection, the Ministry of Labour, Health and Social Affairs, the Ministry of Economy and Sustainable Development, the Ministry of Agriculture, the Ministry of Regional Development and Infrastructure, the Ministry of Energy and Natural Resources and local self-governing bodies.

There are issues exceeding the responsibilities of only one self-governing body, such as the planning water supply and sanitation systems or municipal solid waste landfills. Therefore, coordination of national developments and local needs is also essential.

Conclusions

Environmental policy integration is an essential tool for balancing economic, social and environmental interests in a way to maximize total benefits and minimize conflicts and inconsistencies. There is a growing understanding that environmental, development and social issues are strongly interdependent, and that a healthy environment is a necessary precondition for social welfare and economic development. Conventional environmental policies are not capable of addressing all societal pressures on the environment. At the same time, environmental policy integration has been a key governance challenge in many countries.

Policy integration is an essential condition for the successful implementation of NEAP-2. As it evident, all issues covered by the NEAP are cross-cutting. Without coordinated action of all involved ministries and local governments, implementation of particular measures and correspondingly, achievement of goals set by NEAP-2 will be impossible. Major efforts should be made by the competent state institutions to find a platform for cooperation and coordination of actions. It is also very important to coordinate these actions with donors to provide them with a clear picture of Georgia's needs and to avoid potential overlaps in different projects. Environmental policy integration is important not only in terms of preserving the environment but also for securing long-term sustainable economic growth and human welfare.

Annex 1 Abbreviations

ACCOBAMS	Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area
APA	Agency for Protected Areas
BOD	Biological Oxygen Demand
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CC	Climate Change
CITES	Convention on International Trade in Endangered Species
CNF	Caucasus Nature Fund
EIA	Environmental Impact Assessment
ENP	European Neighbourhood Policy (EU)
EPR	Environmental Performance Review
EU	European Union
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEL	Georgian Lari (currency)
GHG	Green House Gas
GIS	Geological Information System
GMO	Genetically Modified Organism
GIZ	German Agency for International Cooperation
HDI	Human Development Index
HPP	Hydro Power Plant
IAEA	International Atomic Energy Agency
ICZM	Integrated Coastal Zone Management
IFI	International Financial Institutions
IUCN	International Union for the Conservation of Nature
KP	Kyoto Protocol
LEP	Law on Environment Protection
LIS	Land Information System
LMO	Living Modified Organism
MA	Ministry of Agriculture
MARPOL	International Convention for the Prevention of Pollution from Ships
MDF	Municipal Development Fund
MEP	Ministry of Environment Protection
MENR	Ministry of Energy and Natural Resources
MES	Ministry of Education and Science
MESD	Ministry of Economy and Sustainable Development
MFA	Ministry of Foreign Affairs
MJ	Ministry of Justice
MLHSA	Ministry of Labour, Health and Social Affairs
MRDI	Ministry of Regional Development and Infrastructure
MTEF	Mid-Term Expenditure Framework
NAPCD	National Action Plan to Combat Desertification
NAPR	National Agency of Public Registry (within Ministry of Justice)
NBSAP	National Biodiversity Strategy and Action Plan
NEA	National Environmental Agency (within MEP)
NEAP	National Environmental Action Programme
NEHAP	National Environment and Health Action Plan
NGO	Non-Governmental Organization

NIR	National Inventory Report (to UNFCCC)
NPT	International Treaty on the Non-proliferation of the Nuclear Weapons
NRSS	Nuclear and Radiation Safety Service (within MENR)
PA	Protected Areas
PCB	Poly-Carbonated Biphenyl
PM	Particulate Matter (as in $PM^{2,5}$ and PM^{10})
PRTR	Pollution Release and Transfer Register
RBM	River Basin Management
SAICM	Strategic Approach to the International Management of Chemicals
SEA	Strategic Environmental Assessment
SNC	Second National Communication (to UNFCCC)
SSAC	State System of Accounting and Control
SSD	Strategy for Sustainable Development
TC	Technical Cooperation Programme (of IAEA)
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Program
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
USD	Dollar (USA currency)
VOC	Volatile Organic Compound
WB	World Bank
WHO	World Health Organization
WMO	World Meteorological Organization
WWF	World Wide Fund for Nature
WWT	Waste Water Treatment
WWTP	Waste Water Treatment Plant