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STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

OF THE WASTE MANAGEMENT ACTION PLAN
OF GEORGIA

SEA

REPORT

JANUARY | 2016

The SEA report draws upon the information contained in the National Waste Management
Action Plan as of October 2015

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The report was prepared by the national SEA Pilot Project Team experts: Ms. Elena Bakradze, Ms. Tamar Kvantaliani, Ms. Nia Giuashvili, Mr. Goergi Gaphrindashvili, Mr. Georgi Natroshvili, and Mr. Irakli Kaviladze and the SEA Pilot Project Team Leader - Ms. Irma Melikishvili – under supervision of the UNECE international experts: Dr. Maia Gachechiladze-Bozhesku and Mr. Michal Musil.

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Organization responsible for the report: United Nations Economic Commission for Europe (UNECE)

Convention on Environmental Impact Assessment in a Transboundary Context

Palais des Nations CH-1211 Geneva 10 Switzerland

Tel: +41 22 917 1723

Email: eia.conv@unece.org

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1. Background Information

1.1 Project Information

In 2013, Georgia informed the UNECE (United National Economic Commission for Europe) about its commitment to fundamentally reform the existing Environmental Impact Assessment (EIA) system and introduce Strategic Environmental Assessment (SEA) system. With this purpose, the “[Greening Economies in the Eastern Neighborhood](#)” (EaP GREEN) programme¹ implemented by the UNECE with the financial support of the European Commission assists Georgia to develop its national SEA systems and raising awareness and understanding of the benefits of SEA among various stakeholders. Particularly, among other activities, the pilot SEA project on the Georgia’s National Waste Management Action Plan (Action Plan) was designed to assist the Ministry of Environment and Natural Resources Protection of Georgia.

In July 2015, Georgia started the activity on **Pilot application of the SEA procedure to the national Waste Management Strategy and Action Plan**. Besides analyzing likely affects related to the Strategy and Action Plan and suggesting its optimization from environment and health point of view, the SEA pilot also aimed at testing the SEA procedure as stipulated by a new draft law on “Environmental Assessment Code”. A national SEA Pilot Project team was brought together to undertake the SEA under supervision of the UNECE international experts.

1.2 SEA Process

The SEA pilot project was initiated at an early stage of the Action Plan preparation, when its draft was not available yet. Therefore information about its content was limited. In order to proceed with the SEA, the Scoping phase was based on the information presented in the Waste Management Strategy (i.e. document elaborating general objectives of the waste management, and forming a framework for the Waste Management Action Plan where more specific measures would be elaborated). The first version (entitled “version 5”) of the draft Action Plan was provided to the SEA experts in September 2015. Based on the draft Action Plan (entitled “version 9”) and the draft scoping report a set of preliminary recommendations were issued by the SEA team to the Planning Team. The public consultation meeting on the scope of SEA was conducted on 22 September 2015². It aimed at presenting the preliminary findings of the SEA scoping stage and obtaining feedback from the stakeholders. The event gathered up to 40 people from relevant ministries including the Ministry of Environment and Natural Resources

¹ The “Greening Economies in the European Union’s Eastern Neighborhood” (EaP GREEN) programme aims to support the six Eastern Partnership countries: Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine to move towards green economy by decoupling economic growth from environmental degradation and resource depletion. The programme is structured around three components:

- Governance and financing tools for sustainable consumption and production and green economy;
- EIA and SEA accompanying SCP policy implementation; and
- Demonstration projects.

Governments and the private sector are the key target groups of EaP GREEN programme. The programme is financially supported by the European Union and other donors, and is jointly implemented by four international organizations: OECD, UNECE, UNEP, and UNIDO.

² For details refer to the UNECE’s website - <http://www.unece.org/index.php?id=40751#/>

Protection of Georgia, Ministry of Health, Labour and Social Affairs, the Ministry of Infrastructure and Regional Development etc. as well as environmental NGOs. The collected comments were considered in the final SEA scoping report and transferred in this SEA Report ([See Annex 1](#)).

The next updated version of the Action plan was received by the SEA team in early October, and was used as a basis for the preparation of the bridged SEA Summary Document for the final public consultation meeting. This final public consultation meeting was held on 30 October, 2015³ aiming at obtaining feedback from the key stakeholders on the draft Strategy and Action Plan, and on the preliminary recommendations of the SEA. The event gathered up to 55 people from relevant Ministries, NGOs, and International Organizations. Some comments were provided during the consultation meeting but no written comments were received during the consultation period (up to November 12th 2016). It is worth to note that the Planning Team had only two months to prepare the Action Plan and thus to work under extreme time pressure producing new versions of the Action Plan. Due to this the SEA experts had to work on different versions of the Action Plan throughout the SEA process. The latest draft of the Action Plan was presented to the SEA Team and to the stakeholders at the public consultation meeting on 30th October 2015.

During the SEA process two specific training workshops were delivered and regular coaching of the national SEA team by international experts was held within the frame of the pilot project. The training workshops included an initial scoping and baseline analysis workshop (a Skype webinar) on 5 August 2015 and a training workshop on effect assessment and mitigation measures on 21-22 September 2015⁴.

After the completion of the Scoping phase, the SEA process proceeded with the evaluation of potential environmental impacts/effects of the Action Plan and further to the preparation of the SEA Report. This document constitutes the final SEA Report.

³ For details refer to the UNECE's website - <http://www.unece.org/index.php?id=41200#/>

⁴ For details refer to the UNECE's website - <http://www.unece.org/index.php?id=40749#/>

2. Nature of this report

The purpose of this SEA Report is to document the outcomes of the SEA for the Waste Management Action Plan of Georgia (Action Plan). The SEA is defined as *a systematic & anticipatory process, undertaken to analyze environmental effects of proposed plans, programmes & other strategic actions and to integrate findings into decision-making.*

The content of the SEA Report was prepared in compliance with the draft law on Environmental Assessment Code, which requires accommodating the following items:

- a) the content and the main objectives of the strategic document and its link to other strategic documents;
- b) the relevant aspects of the current state of the environment, including health, and the likely evolution in case if strategic document will not be implemented;
- c) the characteristics of the environment, including health, in areas likely to be significantly affected;
- d) the environmental, including health, objectives established at international, national and other levels which are relevant to the strategic document and the ways in which these objectives and other environmental, including health, considerations have been taken into account during its preparation;
- e) the likely significant environmental impact of implementation of strategic document;
- f) the description of how the assessment was undertaken including difficulties encountered in providing the information to be included such as technical deficiencies or lack of knowledge;
- g) the likely significant transboundary environmental impact;
- h) the mitigation measures to prevent, reduce or mitigate any significant adverse effects on the environment, including health, which may result from the implementation of strategic document;
- i) an outline of the reasons for selecting the alternatives dealt with;
- j) the measures envisaged for monitoring environmental impact of implementation of strategic document;
- k) a non-technical summary of the information provided

This SEA Report builds on the activities and findings obtained in the SEA Scoping phase and documented in the SEA Scoping Report. This report presents the results of the evaluation of likely synergies or conflicts between the objectives of the Action Plan and relevant environmental and health objectives as well as evaluation of likely effects of the planned measures on the key relevant environmental (including health) issues. The evaluation was based on the expert judgment of the SEA team and verified through the SEA consultations. The aim of the assessment was not only to generate assessment opinions, but also suggest opportunities for enhanced integration of environmental and health considerations into the Action Plan.

Following the assessment of the likely effects, risks and opportunities related to the Action Plan, measures to prevent or mitigate potential negative effects and enhance positive effects were considered. The SEA Report thus presents recommendations such as an indication of what should be taken into consideration on the subsequent steps of the planning (specific problems, areas, technologies, economic considerations, priorities to be given to certain steps etc.), what specific environmental and health data/analysis shall be prepared prior implementation of given action, etc., as well as identification of areas/locations,

which should not be used for certain waste management developments or areas/location, which can be recommended to be utilized.

The SEA Report also includes an analysis of alternatives. However, due to the abstract nature and unfocused scope of the planning process outputs, the SEA only considered the 'business-as-usual' alternative and the Action Plan as no other feasible / reasonable alternatives were available.

Finally, the SEA Report puts forward indicators related to the key identified environmental and health issues and proposes specific actions to ensure that the Action Plan implementation progress and its key environmental and health consequences will be monitored in line with the requirements of the national legislation.

3. The content and the main objectives of the National Waste Management Action Plan and its link with other plans or programmes

The purpose of this section is to outline the key components of the Action Plan, and to provide information on its objectives, and planning process.

The Waste Management Code of Georgia (2015) requires the Ministry of Environment and Natural Resources Protection of Georgia, together with other competent authorities, to prepare the Waste Management Strategy (the Strategy) and the Waste Management Action Plan (the Action Plan) and submit the documents to the Government of Georgia. The first step in the development of the Action Plan was to develop a National Waste Management Strategy (NWMS). These two high-level documents are an integral part of the waste management planning system in Georgia.

To develop the Strategy and the Action Plan a Logical Framework Approach (LFA) has been applied by assessing the actual situation and the related challenges and problems. The overall objectives and how to overcome the challenges/problems have then been identified. For each Objective a set of Targets (including a time target) have been set in the Strategy. A number of Actions is needed to be implemented to meet each Target. The LFA approach can be outlined as:

- Vision
- Objectives (to meet the vision)
- Targets (to meet the Objective)
- Actions (to meet the Targets)

The identified nine objectives and relevant targets of the Strategy are provided below in the Table 1:

Table 1: National Waste Management Objectives and Targets (As of October, 2015)

| |
|--|
| <p>Objective 0.1. Waste Management legislation in harmony with EU requirements and International Conventions developed, implemented and enforced</p> <p>Target 1.1. All necessary Laws and by-laws for full legal transposition of AA requirements as regards waste adopted and implemented</p> <p>Target 1.2. International Conventions fully transposed, implemented and enforced</p> <p>Target 1.3. Waste legislation enforced effectively</p> |
| <p>So Objective 0.2 Waste Management Planning system established and implemented nationally and locally</p> <p>Target 2.1 First generation of five-year Municipal WM Plans for all municipalities developed and approved</p> <p>Target 2.2. First generation of three-year Company WM Plans developed and agreed with the Ministry</p> |
| <p>Objective 0.3 An effective waste collection and transportation developed and implemented</p> <p>Target 3.1. Roles and responsibilities between private and public sector waste management clarified</p> <p>Target 3.2. Waste operators competent to meet legal requirements</p> <p>Target 3.3. National targets for the following waste to be collected and managed</p> |

| | 2020 | 2025 | 2030 |
|-----------------|------|------|------|
| Municipal waste | 80% | 100% | 100% |
| Hazardous waste | 50% | 75% | 100% |

Target 3.4. Establishment of a National Hazardous Waste Management system

Target 3.5. National initiatives taken for Special waste streams

Objective 0.4 Waste disposed in a safe manner for the human health and environment

Target 4.1 New modern landfills with transfer systems established or modification of existing landfill in a transition period in accordance with EU standards with separate cells for special waste

Target 4.2 Existing landfills closed

Target 4.3 All dumpsites closed and remediated

Target 4.4 Disposal of biodegradable waste minimized at the landfills

Objective 0.5 Waste prevented, reused, recycled and/or recovered to the extent possible

Target 5.1 Source separation for paper, plastic, glass and metal established

Target 5.2 National minimum targets for separated waste to be managed:

- 70% Paper recycled
- 50% Glass recycled
- 90% Metal recycled
- 70% Plastic recycled

Target 5.3 Waste prevention promoted and implemented by companies

Target 5.4 Waste not reused or recycled to be recovered to the extent possible

Target 5.5 Waste reuse, recycling and incineration facilities established

Objective 0.6 Waste Management Costs covered in accordance with the Polluter Pays Principle

Target 6.1 A full cost recovery system for citizens developed by each municipality

Target 6.2 A full cost recovery system for companies developed

Objective 0.7 Extended Producers Responsibility promoted and implemented to the extent possible

Target 7.1 Mandatory obligations for producers introduced

Target 7.2. National minimum targets for the following waste to be managed: (in 2020)

| | 2020 | 2025 | 2030 |
|-----------------|------|------|------|
| Batteries | 30% | 60% | 80% |
| Waste Oils | 50% | 75% | 100% |
| Packaging waste | 50% | 75% | 80% |
| WEEE | 20% | 50% | 80% |
| Tyres | 50% | 70% | 100% |
| Accumulators | 80% | 100% | 100% |
| ELVs | 20% | 50% | 80% |

Target 7.3 Incentives for EPR introduced

Objective 0.8 Waste Data and Information Management system developed and implemented

| |
|---|
| Target 8.1 Waste Data Management system (data collection, reporting and database) developed and implemented |
| Target 8.2 Waste Information System with public access developed and implemented |
| Objective 0.9 Capacities strengthened for the national and local public sector, as well as private companies and general public to meet the requirements of the development of the WM system |
| Target 9.1 Capacities of the MENRP and other relevant national institutions strengthened |
| Target 9.2 Capacities of the Municipalities strengthened |
| Target 9.3 Capacities of the Private sector strengthened |
| Target 9.4 Awareness of general public on Waste Management raised |

All actions in the Action Plan are related to the Strategy’s objectives and targets. The Action Plan takes the Strategy one step further and proposes **Actions** to meet Targets in the Strategy. Correspondingly the objectives, targets and actions in the Action Plan are clustered in relevant nine sections:

1. Legislation
2. Waste Planning
3. Waste Collection and Transport
4. Landfills
5. Prevention, reuse, recycling and recovery
6. Cost recovery
7. Extended Producers Responsibility (EPR)
8. Waste Data
9. Management capacities

Table 2: Abstract from the Action Plan (As of October, 2015)

| | | | | | |
|-----------------------|---|------------------------------|-------------|-------|-------------------|
| Objective: O.1 | Waste Management legislation in harmony with EU requirements and International Conventions developed, implemented and enforced | | | | |
| Target T 1.1 | All necessary Laws and by-laws for full legal transposition of AA (Association Agreement) requirements as regards waste adopted and implemented | | | | |
| | Actions | Implem entation Period | Responsible | Costs | Source of finance |

| | | | | | |
|----------------|--|-----------|---------------|--|------------------|
| A 1.1.1 | By-laws to be prepared and adopted (Code Art 49,2) : <ul style="list-style-type: none"> • By-law on the municipal waste collection and treatment • By-law on the rules and conditions for registration of collection, transportation, pre-treatment and temporary storage of waste • By-law on special requirements for collection and treatment of hazardous waste | 2016 | MENRP | | Donor assistance |
| A 1.1.2 | By-laws to be prepared and adopted (Code Art 49,3) : <ul style="list-style-type: none"> • By-law on Incineration of Waste and Co-incineration of Waste | 2016 | MENRP | | Donor assistance |
| A 1.1.3 | By-laws to be prepared and adopted (Code Art 49,4) : <ul style="list-style-type: none"> • By-laws on different types of specific waste | 2019 | MENRP & MESD | | Donor assistance |
| A 1.1.4 | By-laws to be prepared and adopted (Code Art 49,5) : <ul style="list-style-type: none"> • Sub-laws setting requirements for transport of waste | 2016 | MENRP & MESD | | Donor assistance |
| A 1.1.5 | By-laws to be prepared and adopted (Code Art 49,6) : <ul style="list-style-type: none"> • By-law on healthcare waste management | 2017 | MENRP & MLHSP | | Donor assistance |
| A 1.1.6 | By-laws to be prepared and adopted (Code Art 49,7) : <ul style="list-style-type: none"> • By-law on animal waste management | 2017 | MENRP & MoA | | Donor assistance |
| A 1.1.7 | Law on transboundary shipment of hazardous wastes (BASEL) to be prepared and adopted | 2016 | MENRP & MoF | | Donor assistance |
| A 1.1.8 | Law on mining waste | 2016-2017 | MENRP | | Donor assistance |

Although the Action Plan is formally required to cover a 5-year span, it follows the Strategy's lay-out and extends to 2030. Every 3 years, the implementation of the Action Plan should be reviewed and reported upon to the Government. The Action Plan should be renewed every 5 years.

The draft Strategy and Action Plan are prepared with the financial assistance of the EC. The Action Plan aims at the development of the Georgian waste management to be in harmony with the EU waste management policy. The Action Plan is in line with the National Environmental Action Programme of Georgia 2012-2016 (NEAP) and has taken the recommendations in the draft Environmental Performance Reviews, Georgia, UNECE, 2015 into consideration.

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4. The relevant aspects of the current state of the environment, including health

This chapter describes environmental baseline analyzed during the scoping stage and identifies the key environmental and public health issues relevant to the Action Plan for establishing the background for the assessment of potential environmental and health effects of the Action Plan.

4.1 Surface and ground waters

Due to insufficient monitoring of surface water bodies, data for surface water quality are limited. However, even the limited existing monitoring data indicate that pollution from urban wastewater discharges is a general problem of pollution in Georgia. Municipal sewage from cities and settlements pollute water with organic matters, nitrogen and phosphorus compounds. High levels of ammonia are reported for most of the observed rivers. Untreated municipal wastewater is responsible for 67% of all surface water pollution (NEAP, 2012 –2016). Thus, untreated municipal wastewater is a major cause of surface water pollution in Georgia. Municipal wastewater pollutes the rivers with organic matter, suspended solids, ammonia, detergents, heavy metals, oil products, and other hazardous substances downstream of large cities.

Most polluted rivers are the Kura, Vere, Alazani, Algeti, Suramula (the Caspian Sea basin) and Rioni (the Black Sea basin) Rivers. Sectors significantly affecting the surface water quality are mining, oil production and food industry. Other sources are sanitary landfills, illegal dumpsites and agricultural activities.

Concentrations of heavy metals exceed permissible levels at certain locations on particular rivers ([See Annex 2](#)). In Georgia, large industrial facilities producing manganese, copper and gold mining sites, processing plants, oil refineries and power plants pollute the river bodies of the Black Sea and the Caspian Sea basins with heavy metals, oil products and other toxic substances.

Most of the 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 of surface and ground water pollution.

The general state of the environment has a direct influence of the status of groundwater. The environmental quality of soils, surface waters, ambient air and rainfall all have an impact on groundwater quality. Environmental pollutants enter groundwater during the water cycle. Pollutants from soils are carried down to groundwater by percolating rainwater. Pollutants from surface waters also percolate down to the water table. Airborne pollutants such as dust are dissolved by the rain, and deposited onto the soil which then percolates into the groundwater.

The groundwater is mainly affected when pollutants from wastes, agricultural lands and polluted surface waters get into the aquifers. As a result groundwater is polluted by microelements, non-metals, oil products and pesticides. Pesticides are of most concern as they are persistent in water and the environment, they are toxic and can travel long distances.

Groundwater pollution occurs mostly in areas where groundwater is derived from infiltration of rivers or where little protection is provided by the overburden (thin soils and sub soils) and rock layers over the groundwater aquifer. These aquifers are very sensitive to the surface water quality, because they are in direct hydraulic continuity with

surface water. The pressured groundwater horizons are usually much less polluted especially in the high pressure area.

Soil monitoring were updated in 2013 year ([See Annex 3](#)), analyzes are performed only on heavy metals, pesticides and Total petroleum Hydrocarbons, which is not enough for the describing the picture regarding the soil pollution and particularly in connection with the pollution from dumpsites.

4.2 Air and climate change

Air pollution in Georgia is mainly due to the transport sector. It accounts for 62-78% of NO_x and CO emissions in the country. Emissions from the sector has increased, as number of registered vehicles doubled in the country in the past 10 years, besides most cars are more than 10 years old (National Report on the State of Environment of Georgia 2007-2009).

Other major pollutants are energy and industrial sectors. In the energy sector, the major polluter is Gardabani thermal power plants working on natural gas, main emissions are CO, NO_x and dust. In the industrial sector, the main polluters are cement, concrete and asphalt factories located in Kartli Region and Rustavi City, also the Batumi Oil Terminal and the Manganese factory in Zestaponi ([See Annex 4](#)).

In urban areas, vehicle emissions are the primary source of air pollution. As per the available data, the concentrations of the priority pollutants (SO₂, NO₂, CO) exceed the allowable limits in all Georgian cities where monitoring occurs (NEAP, 2012-2011).

Waste is one of sources of air pollution in Georgia as well. Most of the existing landfills (except Rustavi and Tbilisi) do not have system of collection and removal of combustible landfill gasses.

The air emissions arising from the waste management sector in Georgia are due to either the direct emissions (landfill, composting, anaerobic digestion) or indirect emissions (transports associated with waste collection or disposal).

Climate Change (CC) and its adverse impacts on ecosystems and the economy are a threat to sustainable development. For the last 10 years, the average air temperature has increased by 0.7 °C in some regions of Western Georgia, and by 0.6 °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%.

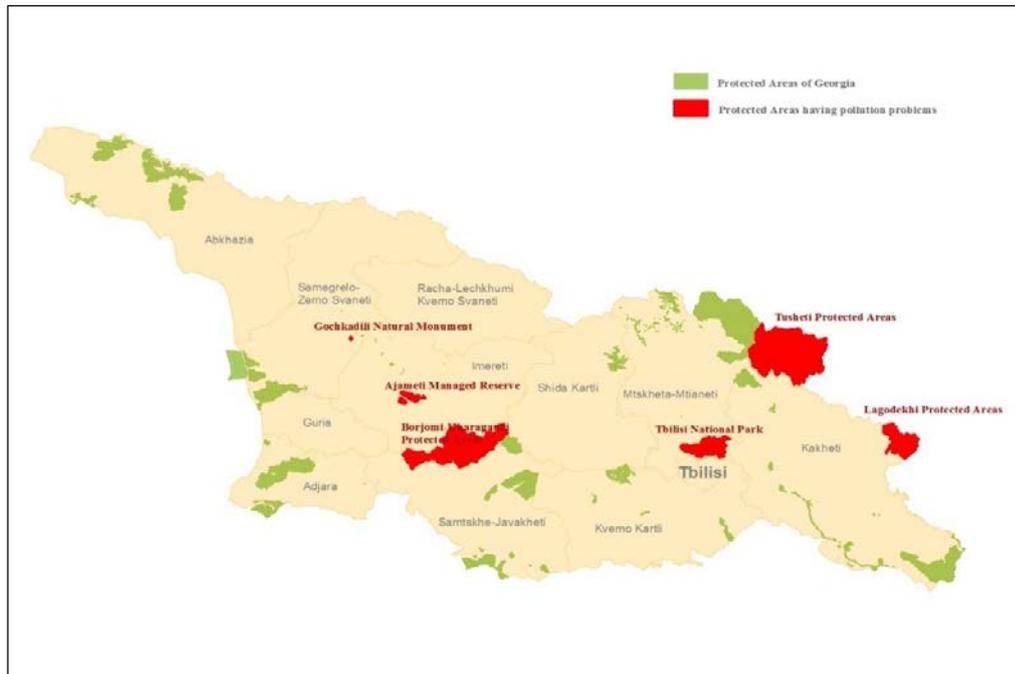
There is lack of information on existing non-hazardous landfills, however, the waste sector is also considered as one of the source of GHG emission. About 80% of emissions come from landfills and 20% from waste water. Methane makes 95.6% of total emissions, and NO_x – 4.4%, CO₂ emissions are not calculated. The landfills in the region are located in rural areas but are close to main towns (from 3km-10km). Waste traffic is done by heavy vehicles; however the contribution to air quality from waste transport is unknown as there is no data available.

4.3 Biodiversity and protected areas

Pollution is one of the most evident problems that impairs on biodiversity and human health. It has a direct effect on the protected areas and needs to be addressed rapidly as PAs due to their protection regime are the source of fresh air, clean water, etc. For instance, Borjom-Kharagauli National Park supplies potable water to town Borjomi with a population of 10 thousand people. Contribution of the Mtirala National Park

ecosystems to provision of water supply for Ajara population should also be taken into account. Ways of pollution differs, at some of the PAs main source of littering is construction materials together with other type of waste, for instance at Tbilisi National Park, where there is a road inside the territory and people throw their garbage straight from the cars or dispose their construction waste materials at night. Due to such circumstances it is very difficult for PA rangers to find such facts and issue an administrative act. Other critical Protected Areas in terms of pollution are: Ajameti, Tusheti, Borjomi-Kharagauli, Lagodekhi, Gochkadili PAs (See Figure 1).

Figure 1: Protected Areas of Georgia and PAs having most critical situation with regard to waste



4.4 Geology and mineral resources

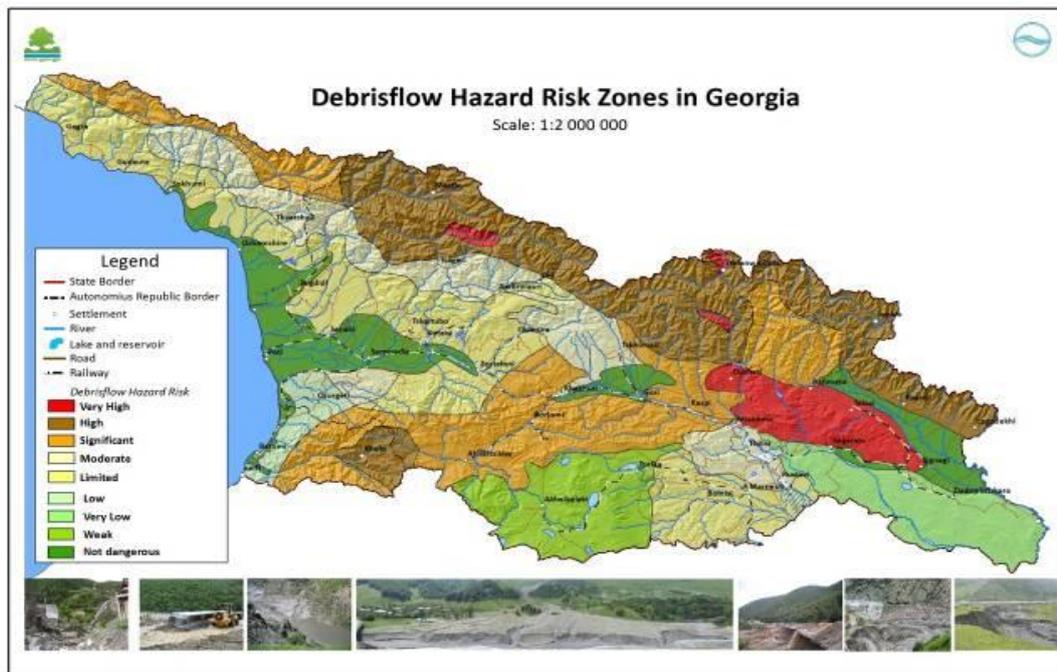
Georgia is one of the most sensitive countries to natural disasters among mountainous regions of the world. Landslide-gravitational, debrisflow and water based erosion processes are the most frequent natural disasters of geological character that occur in Georgia. At the same time, the geographic location of Georgia and its complex topography result in atmospheric conditions that give rise to extreme meteorological and hydrological events. There are frequent floods, flash floods, heavy rains, hail, snow avalanches etc. Specialized surveys confirm that landslide-gravitational processes, debrisflows and riverbank erosion increases year by year.

Figure 2: Landslide-Gravitation Hazard Risk Zones in Georgia



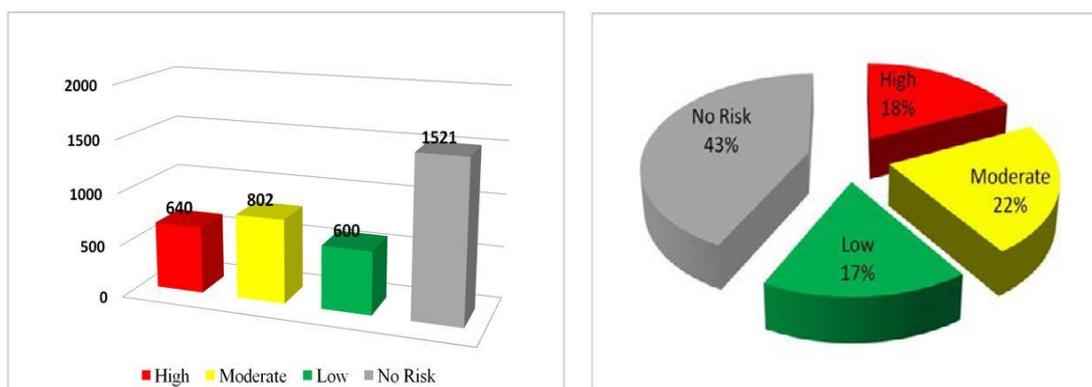
Author: Tsereteli, Gaprindashvili

Figure 3: Debrisflow Hazard Risk Zones in Georgia



(Author: Tsereteli, Gaprindashvili)

Figure 4: Number of Settlements under Geological Hazard Risk



(Author: Tsereteli, Gaprindashvili)

Georgia is rich in mineral resources, many of which are competitive on the world market. In particular gold, copper, manganese and zeolites are interesting for international trade. However, uncontrolled and unregulated extraction of mineral resources, namely in Chiatura, Kazreti, Uravi and Tsana has significant impact on the environment. As such, it is important that a proper regulatory system be in place to ensure that these activities are carried out in an environmentally sound manner.

The pollution of air, water and soil, as well as deforestation and landslide activation are major environmental concerns related to the extraction of mineral resources. The scale of these impacts varies depending on the minerals being extracted and the technologies used. The anticipated lifetime of a mining operation mainly depends on the supply of mineral reserves available at the mine site and the viability of their extraction. The rate at which such reserves may be extracted is also determined by the mining license which defines annual extraction amounts.

Georgia does not belong to any important world basins of ferrous-containing ores. However, there are number of areas where iron ores may be found. Four quite significant deposits of ferrous metals have been identified in Poladauri, Dzama, Tkibuli-Shaori, and Supsa-Natanebi. In addition, there are significant reserves of titan magnetite sands located in the estuaries of the rivers Supsa and Natanebi. The ferrous deposits are not currently being exploited, although studies are underway and it is anticipated that mining operations will begin in the near future.

Georgia has been one of the biggest producers of manganese in the world since the end of the nineteenth century. Manganese extraction continues today, and according to the license conditions issued for exploitation of the Chiatura manganese deposit, approximately 1.6 million tonnes of this metal should have been extracted between 2008 and 2011.

The extraction works for arsenic deposits have temporarily ceased even though the license for extraction works at the Lukhuni deposit was issued for 25 years and allows for the extraction of 9, 534 tonnes of arsenic. Intensive extraction of metals (including gold and silver) is on-going at Bolnisi gold-cooper-barite-polymetal deposits.

4.5 Public health

According to the WHO estimates 17% of the overall disease burden⁵ and 19% of all deaths in Georgia are attributable to environmental risk factors.

⁵Disease burden is estimated in years of life lost due to poor health or disability or premature death (DALYs - Disability Adjusted Life Years). One DALY can be thought of as one lost year of healthy life.

In Georgia 91% of all deaths are caused by non-communicable diseases ([See Annex 5⁶](#)). Leading causes are cardiovascular diseases (38%), neuropsychiatric disorders (28%), cancers (8%), and sense organ diseases (8%).

Among disease burden attributable to the environmental factors about 1/5 is caused by cardiovascular diseases, followed by injuries/trauma and cancers ([See Annex 6](#)).

Environmental factors are responsible for a certain fraction in the burden of various disease conditions. E.g. environmental risk factors are accountable for majority of diarrheal disease burden, almost half of injuries/poisonings and asthma, one third on COPD and 1/6 of cardiovascular disease burden ([See Annex 7](#)).

Despite abundant sources of surface and ground waters almost all regions of Georgia experience deficit of supply of drinking water of normative quality and sufficient quantity. Inspection conducted by the food safety, veterinary and plants protection service in 2007-2009 on the whole territory of Georgia showed that quality of drinking water supplied through the piped water supply systems does not meet the established requirements. In most cases, chemical indicators of epidemic safety (permanganate oxidability) exceeded allowable limits, and residual free chlorine was not recorded at all; microbiological contamination was detected as well (total coliformal bacteria and E.Coli exceeded established limits). Especially bad situation was found in Poti, Zugdidi, Martvili, Senaki, Akhaltsikhe, Dmanisi, Lentekhi, Ambrolauri, Ozurgeti, Baghdati, Tskaltubo, Zestafoni regions. Main reasons for such violations were poor sanitary and technical condition as well as poor exploitation of the water supply system

Sanitary reliability of small scale water supply systems in rural areas is very low. For instance, in 2006-2007, water supply of farms of Samtskhe-Javakheti and Shida Kartli was studied⁷. In both regions almost in all wells, springs or water reservoirs was found E. Coli and general coliformal bacteria, number of which exceeded established hygiene norms.

Problems of small scale water supply systems were also detected by the research of 2011⁸: 73% of Marneuli and Dusheti bore holes, water reservoirs, water pipelines to family farms were contaminated, including with St. Fecalis, which was found in 38% of samples in Marneuli and in 49% of samples in Dusheti.

Air pollution, especially inhalable particulate matter (PM10), exacerbates asthma symptoms and recent studies indicate that it can also contribute to the incidence of the disease. Urban air pollution, especially particulate matter, also causes other significant health problems, reducing the life expectancy of residents of more polluted areas by over one year.

In urban areas gas consuming individual devices are used. A part of such heaters is a technically safe construction that allows to take burned gases out of buildings, although cheaper heaters are used, that emit burned gases inside buildings. Despite the fact that the situation is changed in urban areas the situation is still problem in rural areas of the country. In rural areas of Georgia 78% of children live in homes where solid fuel is used for cooking. This practice substantially raises risk of chronic obstructive pulmonary disease development not only for children but for housewives as well.

The general spectrum of Occupational diseases in Georgia for 2002–2006 is the following:

- Respiratory system Diseases (Workers of mines and quarries or pits);

⁶ Global status report on non-communicable diseases. WHO (2010)

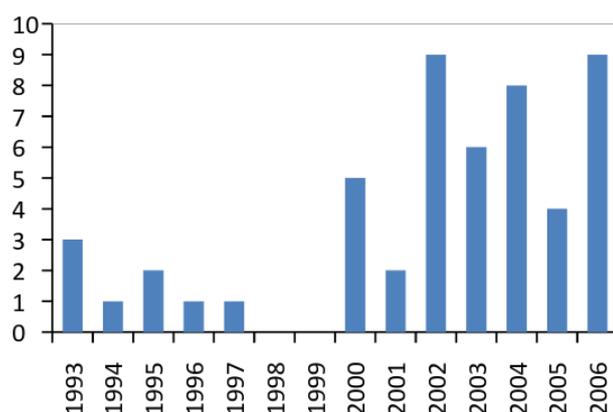
⁷Scientific research of Georgian Agriculture hygiene, S/R Sanitation and Hygiene Institute, GtZ, 2007

⁸Sakvarelidze National Centre for Disease Control and Public Health and Natadze S/R Institute for Sanitation, Hygiene and Medical Ecology – results of joint research

- Two sided cochlea neuritis with professional dull hearing (frequently in pilots, whose flying time exceeded 10 000 hours);
- Different scale of manganese occupational poisoning (mainly in workers of “ChaiturManganese” in Chiatura and “Fero” in Zestaponi);
- Different levels of vibratory diseases (mainly in drivers of crane or big volume auto transport means – “Beliz” drivers).

Besides these diseases, single cases of some rare occupational diseases were encountered. As it is seen in **Figure 5** incidence rate was quite low in 2001 because most of the enterprises were shut down in Georgia. After the privatization the existed enterprises resumed working that gradually resulted in increase of occupational diseases.

Figure 5: Occupational Poisoning by years



Starting from 2006 reported cases of occupational diseases has decreased, with reduction of incidence rates; the situation can be explained failure to detect cases at earlier stage. N. Makhviladze scientific research institute of labor medicine and ecology is mainly referred by patients who already have developed the stage of a disease, that allows to obtain any group of disability (disability group is determined only on the basis of the diagnose, made at the institute).

Currently no comprehensive information on occupational diseases and occupational trauma (or poisoning) is available in Georgia. Only those patients who anticipate assistance from the side of the state (because of disability) are registered and diagnosed with occupational diseases, thus only they refer to respective medical facilities.

4.6 Waste

There is no up-to-dated comprehensive and official statistical data on the produced waste amounts in Georgia. Until January 2015, preparing a waste inventory and maintaining relevant data base was not legally required for organizations. Therefore, the report is based on the inventory results conducted in 2007.

The exact annual amount of the waste originated in Georgia is unknown. As per the assessment and inventory conducted in 2007, 3.4 million m³ domestic wastes (i.e. approximately 800 thousand tonnes⁹) are originated in Georgia annually. 45% of the

⁹ The average density of domestic waste is taken as 250 kg/m³.

domestic waste is originated in Tbilisi. Other important waste-originating regions are the Autonomous Republic of Ajara, Samegrelo-Zemo Svaneti, Imereti, KvemoKartli and ShidaKartli.

Table 2: Distribution of Domestic Waste in Different Regions of Georgia, 2007

| Region | Number of population | Amount of the originated waste as per the inventory, m ³ /year | Amount of the originated waste per capita | | Amount of the originated waste as per the expert's opinion, m ³ /year |
|-------------------------|----------------------|---|---|------------------|--|
| | | | Inventory according to hectares | Expert's opinion | |
| Ajara A/R | 377 200 | 327 676 | 0.87 | 0.95 | 358 340 |
| Guria | 139 300 | 14 890 | 0.11 | 0.5 | 69 650 |
| Samegrelo-ZemoSvaneti | 472 900 | 203 270 | 0.43 | 0.6 | 283 740 |
| Imereti | 700 100 | 191 650 | 0.27 | 0.7 | 490 070 |
| Racha-Lechkhumi-Svaneti | 49 100 | 1 850 | 0.04 | 0.4 | 19 640 |
| Samtskhe-Javakheti | 208 500 | 122 538 | 0.59 | 0.5 | 104 250 |
| ShidaKartli | 314 000 | 161 090 | 0.52 | 0.7 | 219 800 |
| Mtskheta-Mtianeti | 124 500 | 14 052 | 0.11 | 0.5 | 62 250 |
| KvemoKartli | 507 600 | 179 187 | 0.35 | 0.7 | 355 320 |
| Kakheti | 404 800 | 60 500 | 0.15 | 0.6 | 242 880 |
| Tbilisi | 1 103 300 | 1 095 000 | 0.99 | 1.1 | 1 213 630 |
| Total | 4 401 300 | 2 371 703 | 0.54 | 0.66 | 3 419 570 |

Source: Waste inventory conducted in 2007.

The summarized results of the different categories of industrial waste inventoried in 2007 in different regions of Georgia showed that the largest part of industrial waste come on mining waste (85%).

Among these wastes, hazardous wastes, containing arsenic, existing in Lentekhi and Ambrolauri municipalities, shall be mentioned. However, recently the assessment of contamination of arsenic burials, existing in the villages of Uravi and Tsana was carried

out. Certain measures for improving the situation have been carried to reduce the risk of chemical leakage into the water bodies.

Problem remains the management of medical waste as well. Recording of medical wastes in Georgia is not maintained presently. According to 2007 inventory results significant amount of waste was revealed. However, information on medical wastes was not updated since then. The problem also remains management of animal waste.

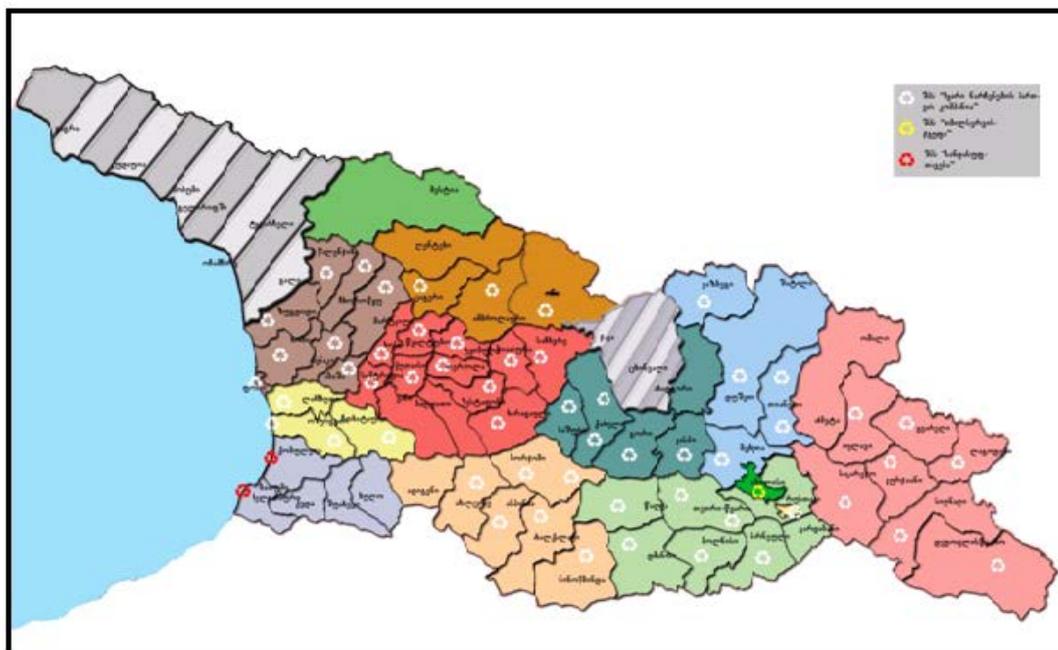
Waste treatment slowly develops in Georgia, and the entrepreneurs have the permits to treat only limited types of waste.

At present, up to 10 small incinerators of medical and biological waste operate in Georgia. The capacity of mentioned incinerators ranges from 70 to 120 kg per hour. Incinerator cannot be used for commercial purposes. Permit owners are permitted to incinerate medical waste produced by them. If used efficiently, these capacities can be sufficient for Georgia. However, well-organized accumulation and transportation procedures of the medical waste from medical establishments to the incinerators can be seen in Batumi and Kobuleti only.

According to information of the Solid Waste Management Company their capital consists of 53 existing/old landfills. Among them operation of two landfills in Rustavi and Borjomi are planned to be transferred to management of the company (See Figure 5: Landfills registered in Georgia). 22 landfills have been renovated and 8 of them were equipped with new techniques. In 2014, 16 units of heavy technique (tractors) were purchased and 2 units of heavy technique were delivered by the municipalities, and they are distributed in the regions. The company has 9 regional offices, and there are special booths near the landfills where operators take control to prevent the access of people or domestic animals to the landfills.

Total 8-10 landfills comply with the international standards capable of accommodating all the waste of the country are planned to open on the territory of Georgia.

Figure 6: Landfills registered in Georgia



4.7 Social-economic factors

The most municipal governments in Georgia face challenges in proper management of waste with most effort made to generate sufficient funds for waste management. Today in all regions of Georgia one type of municipal cleaning fee exists. Each municipality establishes the amount of cleaning fee by its decision. As per the existing law, the monthly cleaning fee should not exceed 3 GEL per person and 25 GEL per company. According to the analysis of the State Audit Office of Georgia, in most municipalities accumulated cleaning fees are much lower than cleaning accrued revenue (service fees that are due but have not been paid/collected)¹⁰ (See Annex 8).

The average annual revenue from cleaning fee has been 27 million GELs in Georgia for the last 2 years. This amount represents about 0.09% of the annual GDP in 2014. According to this data, the average annual cleaning expenditure per person in Georgia is 7.25 GELs, which accounts approximately 0.3%-0.8% of annual household expenditure. As big share (approximately 80%)¹¹ of the total amount of the waste generated in Georgia comes on the population, we can assume that population downturn trend will decrease the amount of waste from 2015 to 2025. But we cannot exclude the fact that the structure of the waste amount between population and economy will change in the future. It requires further researches and analysis in order to determine the trends of waste amount in Georgia.

4.8 Characteristics of the environment, including health, in areas likely to be significantly affected

The Table 3 below summarizes key environmental and health issues identified at the scoping stage and provides description of those areas where the main environmental and health issues are detected and identified. To the extent possible, the table determines the geographical scope of the problems. However, since the Action Plan is supposed to be applied on the whole territory of Georgia, and at the same time it does not indicate specific localities for implementation of individual activities/projects, it is difficult to identify the trend of the problems within the specific localities. Thus, the analysis provides only general information on the issues and their overall effects on the particular areas.

Table 3: Key environmental and health issues and relevant geographic areas

| Environmental and health receptors | Specific concerns and problems | Geographic areas of concern |
|------------------------------------|---|---|
| Surface and ground water | <ul style="list-style-type: none"> ● Lack of drains for rain water collection ● Agriculture runoffs ● Leakage of | Most polluted rivers with organic matters, nitrogen and phosphorus compounds are the Kura, Vere, Alazani, Algeti, |

¹⁰ State Audit Office of Georgia; Efficiency audit of solid municipal waste management; 2015, p. 36

¹¹ Clean up Georgia; Report on Municipal Solid Waste Management in Georgia; 2012, p. 3

| | | |
|------|--|--|
| | <p>contamination from landfills</p> <ul style="list-style-type: none"> ● Pollution of surface water with organic matter, nutrients, heavy metals, pesticides ● Industrial wastewater discharges ● Municipal wastewater discharges ● Storm water runoffs ● Agricultural runoffs ● Leakages from landfills | <p>Suramula (the Caspian Sea basin) and Rioni (the Black Sea basin).</p> <p>High concentration of pollutants are detected in: the Kura River section within Tbilisi and Rustavi (ammonia and bacteriological pollution); the Kazretula River and Mashavera as well as the Foladauri River at some places (heavy metals), the Kvirila (manganese ions); the Rioni and its tributary Ogaskura (ammonia ion); the Tkibuli (mechanical pollution from coal mining industry); the Kubiszkali (ammonia ion, oil products); and the Luhumi River (arsenic ion).</p> <p>Other areas responsible for the pollution of surface and ground waters included: Iagluja landfill (former storage of PoPs) Mining areas in Racha (Arsenic), Bolnisi (Kazreti)-gold mining, and Chiatura (mining of manganese), Illegal dumpsites mainly located near the rivers.</p> |
| Soil | <ul style="list-style-type: none"> ● Contamination of soil by: ● organic, inorganic, microbiological pollutants ● chemical waste from industry ● organic and inorganic fertilizers from agriculture ● PoPs ● leakages from landfills ● construction waste ● mining waste | <p>Contamination of soil mainly occurs in rural areas due to agricultural activities. Soil contamination is detected in mining sites in Chiatura (manganese mining), Racha and Svaneti (arsenic ores), Kazreti (gold mining), Zestaponi. Pollution is also detected near the Iagluja (former PoPs storage site). Some landfills are also responsible for soil contamination.</p> |
| | <ul style="list-style-type: none"> ● Land use activities for construction | <p>Illegal landfills also are the main sources of soil contamination in Georgia</p> |

| | | |
|--|--|---|
| Atmospheric Air and Climate | <ul style="list-style-type: none"> Poor data collection and processing of landfill emissions | <p>Major source of air pollution is transport, energy and industrial sectors. In the energy sector, the major pollutants are Gardabani thermal power plants working on natural gas, main emissions are CO, NOx and dust. In the industrial sector, the main pollutants are cement, concrete and asphalt factories located mainly in Kartli Region and Rustavi City, also the Batumi Oil Terminal and the Manganese factory in Zestaponi</p> <p>Most of the existing landfills (except Rustavi and Tbilisi) do not have system of collection and removal of combustible landfill gasses.</p> |
| | <ul style="list-style-type: none"> Landfill gas emissions are not collected | |
| | <ul style="list-style-type: none"> Adopt and implement necessary laws related to air quality protection | |
| | <ul style="list-style-type: none"> Self-burning of waste | |
| | <ul style="list-style-type: none"> No use of waste as energy source | |
| | <ul style="list-style-type: none"> Lack of capacity of targeted municipalities to meet obligations under Covenant of Mayors | |
| | <ul style="list-style-type: none"> Lack of proper list of pollutants to be monitored for ensuring effective air quality control | |
| Biodiversity/PA | <ul style="list-style-type: none"> Lack of capacity of Municipalities to meet waste management obligation in terms of protected areas Limited capacity of the municipalities to collect and take the waste out from PAs (depending on PA category) | <p>Protected Areas vulnerable to pollution are: Ajameti, Tusheti, Borjomi-Kharagauli, Lagodekhi, Gochkadili PAs (See Figure 1: Protected Areas of Georgia and PAs having most critical situation with regard to waste).</p> |
| | <ul style="list-style-type: none"> Absence of legal landfills or areas for waste collection near PAs Lack of trash bins at PAs Lack of segregation of toxic substances | |
| | <ul style="list-style-type: none"> Degradation of biodiversity due to pollution | |
| | <ul style="list-style-type: none"> Decreasing number of animal species | |
| | <ul style="list-style-type: none"> Decreasing number of visitors | |
| Geological Hazards | | Georgia natural hazards occur |

| | | |
|-------------------------------|---|---|
| | <ul style="list-style-type: none"> • Risk of geological hazards | <p>almost in all landscape - geomorphological zones. Natural hazards (Landslides, Debrisflow/Mudflows, river floods, flashfloods, rockfalls, snow avalanches etc) are affecting many populated areas, agricultural fields, roads, oil and gas pipes, high-voltage electric power transmission towers, hydraulic structures and reclamation constructions, and tourist complexes. Most natural hazards prone areas include Racha-Lechkhum-Kvemo Svaneti and Ajara regions.</p> |
| Mineral Resources | <ul style="list-style-type: none"> • Waste form excavation and processing of mineral resources • Waste material from construction • Lack of use inert materials for secondary use | <p>Most affected areas in terms of mining include Chiatura, Racha, Kazreti, as well as Kharagauli Municipality; River basins (Tskhenistskali, Adjaristskali, Kvirila et. al)</p> |
| Socio-economic aspects | <ul style="list-style-type: none"> • Absence of waste survey system • Insufficient budget for municipalities to manage waste • Absence of socio-economic policy for the waste management • Absence of society solvency for waste management | <p>The problem is relevant to all municipalities of Georgia</p> |
| | <ul style="list-style-type: none"> • Change in the population size/household waste (most of waste (80%) is generated in household | |
| Public Health | <ul style="list-style-type: none"> • The nature of raw waste, its composition as it decomposes (e.g., toxic, allergenic and infectious substances), and its components (e.g., gases, dusts, leakages, sharps); • The nature of waste as it decomposes (e.g., gases, dusts, leakages, particle sizes) and their change in ability to cause a | <p>The sources of health related issues identified include illegal and legal landfills, identified hot spots; Industrial and mining sites including Rustavi, Chiatura, Zestaphoni, Kvemo Qartli and Imereti</p> |

| | | |
|--------------------|---|---|
| | <p>toxic, allergenic or infectious health response;</p> <ul style="list-style-type: none"> • The handling of waste (e.g., working in traffic, shoveling, lifting, accidents); • The processing of wastes (e.g., odor, noise, accidents, air and water emissions, residuals, explosions, fires); • The disposal of wastes (e.g., odor, noise, stability of waste piles, air and water emissions, explosions, fires). | |
| Solid Waste | <ul style="list-style-type: none"> • Lack of landfills relevant to international standards • Illegal dumpsites | <p>The problem is relevant to all regions of Georgia, especially Ajara region.</p> <p>Areas of concern include riversides, rural areas, old industrial sites, Iagluja (former PoPs storage), most landfills, Industrial areas especially Rustavi, Chiatura, Kazreti, Racha); mining sites including Racha, Chiatura, Kazreti. One of the polluted areas in terms of waste also includes Tbilisi National park</p> |
| | <ul style="list-style-type: none"> • Hazardous waste • Construction waste • Mining waste • Medical waste | |
| | <ul style="list-style-type: none"> • Lack of separation of hazardous waste from household waste • Lack of waste separation | |
| | <ul style="list-style-type: none"> • Operation of landfills without permit • Landfills don't meeting standards | |
| | <ul style="list-style-type: none"> • Absence of monitoring on landfills in terms composition • Lack of evaluation of the damage of existing landfills • Absence of monitoring evidencing the failure to meet the exploitation standards of landfills • Emission of harmful pollutants (dioxides and furans) in the air during burning of waste • Absence of information on the amount of waste on landfills • Self-burning • Absence of reporting on waste | |

The table above summarizes the main environmental and health problems identified at the scoping stage and describes the main areas where problems occur. In relation to water the most problematic areas include riverbanks where illegal dumping of waste occurs, besides surface waters downstream of big cities are considered to be most polluted with nutrients and heavy metals as well. Underground water is more prone to pollution in the areas of landfills not meeting the standards where pollution percolates down through the groundwater aquifers. In terms of soil the most contaminated areas include mining sites and former pesticide storage areas. Poor air quality is mostly due to transportation sector and energy related activities. Geological hazards are characteristic for the whole territory of the country; therefore, it is very important to conduct geological study of the area before any waste management infrastructure will be constructed. The most vulnerable areas to pollution are mining sites, thus cleaning up of mining sites and setting relevant management and regulatory activities for further prevention of mining waste is important. Protected areas are also prone to pollution unless the proper management plans and infrastructure is on place. Municipalities should be prepared to develop and ensure proper implementation of cost effective mechanisms for municipal waste management. It is also very important to consider environmental impact on health and occupational health related issues to set relevant actions for improving existing environmental conditions, especially in rural areas.

5. Policy Objectives -Led Analysis and the Quality of the Action Plan

This section provides information on the existing environmental, including health, objectives relevant to the Action Plan and the ways in which these objectives and other environmental, including health considerations have been taken into account during its preparation.

5.1 Identifying environmental, health and socio-economic objectives relevant to the Action Plan

Based on the understanding of the planning context described above, a number of reference environmental policy objectives were selected to provide framework for evaluation of the Action Plan compliance with the relevant environmental policies.

As a part of the SEA the policy objectives-led assessment was conducted in order to evaluate consistency between the objectives of the Action Plan and relevant **environmental and health policy objectives established at the national (and international) level**. A set of key relevant environmental as well as health policy objectives was developed during the scoping stage of the SEA based on the review of key national strategic documents and Georgia's international commitments. Subsequently, the objectives outlined in the draft Action Plan were evaluated as to whether they are in compliance or in potential conflict with the previously defined set of environmental and health policy objectives.

Table 4: Relevant Environmental and Health Policy Objectives Established at the National Level

| Issue | Objective | Source |
|--------------------|---|---|
| Water | <ul style="list-style-type: none"> Establishment of an effective water management system Establishment of effective pollution prevention and water abstraction control Mechanisms Reduction of water pollution from untreated municipal wastewater Reduction of pollution from diffuse sources in agriculture | <ul style="list-style-type: none"> National Environmental Action Program (NEAP 2012-2016) |
| Soil | <ul style="list-style-type: none"> Minimize soil contamination by establishing an effective and environmentally friendly waste collection, transportation and disposal/storage/treatment system | <ul style="list-style-type: none"> National Environmental Action Program (NEAP 2012-2016) |
| Air/Climate Change | <ul style="list-style-type: none"> Adopt and implement necessary laws related to air quality protection Envisage landfill gas collection facilities in WM plan Create supportive market and regulatory climate for | <ul style="list-style-type: none"> Sustainable Environmental Action Plan (SEAP) for four cities Country Development Cooperation |

| | | |
|--------------------------------------|---|--|
| | investment in renewable energy and clean production; assist municipalities in preparation of Action Plan to meet commitments to the Covenant of Mayors to lower GHG emissions. | Strategy, Fiscal Year 2013-2017 <ul style="list-style-type: none"> • National Communication 2010-2013 • National Environmental Action Program (NEAP 2012-2016) |
| Protected areas | <ul style="list-style-type: none"> • To develop a system of waste removal from the Tusheti region • To elaborate a waste management plan for protected area | <ul style="list-style-type: none"> • Tusheti Protected Landscape Management Plan |
| Geological hazards/mineral resources | <ul style="list-style-type: none"> • Minimize the loss of human lives, negative impacts to human health and the environment, and economic losses • 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 | <ul style="list-style-type: none"> • National Environmental Action Program (NEAP 2012-2016) |
| Socio-economy | <ul style="list-style-type: none"> • Ensure environmental protection as an integral part of the process of economic growth • Facilitate the introduction of environmentally-friendly modern technologies and development of a “green” economy | <ul style="list-style-type: none"> • Socio-economic development strategy of Georgia – “Georgia 2020” |
| Public Health | <ul style="list-style-type: none"> • Provide healthy environment to population • Limitation of the disease dissemination • Ensure Biological Safety • Elaboration rules for disposal of the hazardous infections as well as their survey and control methodologies including transportation, management and utilization | <ul style="list-style-type: none"> • Law on Public Health |
| Waste | <ul style="list-style-type: none"> • Protect the environment and human health, establish legal basics in the field of waste management to introduce the measures helping prevent waste | <ul style="list-style-type: none"> • Waste Management Code |

| | | |
|--|--|--|
| | <p>origination and promote their re-use, accomplish environmentally friendly waste treatment (including recycling and separation of the secondary raw material), generate energy from the waste and reach safe waste accommodation</p> | |
|--|--|--|

5.2 Assessment results

The assessment results are presented below in the form of assessment matrix indicating mutual linkages between the Action Plan objectives and the selected environmental policy objectives.

The analysis was elaborated in following format using the legend:

+ Likely synergy between a priority of the Strategy and given environmental/health objective (i.e. implementation of the Strategy’s priority will help to achieve the environmental/health objective)

0 No link between a priority of the Strategy and given environmental/health objective

– Likely conflict between a priority of the Strategy and given environmental/health objective (i.e. implementation of the Strategy’s priority may slow down or even make impossible achieving the environmental/health objective).

A short abstract from the full Policy Objective-led evaluation matrix is provided in **Table 5**. A full Policy Objective-led assessment matrix is found in **Annex 9**.

Table 5: Abstract from the Policy objectives-led evaluation matrix

| Environmental and Health Objectives | Waste Management Action Plan's Objectives | | | | | | | | | Recommended changes to the proposed Waste Management Action Plan |
|-------------------------------------|--|---|--|--|--|---|--|--|--|---|
| | Waste Management legislation in harmony with EU requirements and International Conventions | Waste Management Planning system established and implemented nationally and locally | An effective waste collection and transportation developed and implemented | Waste disposed in a safe manner for the human health and environment | Waste prevented, reused, recycled and/or recovered | Waste Management Costs covered in accordance with the Polluter Pays Principle | Extended Producers Responsibility promoted and implemented | Waste Data and Information Management system established | Capacities strengthened for the national and local public sector, as well as private companies and general public to meet the requirements of the WM | |
| Minimize soil contamination | 0 | 0 | +/- If the collection /disposal is not implemented properly | + | 0 | 0 | +/- | +/- | +/- | Enforce the implementation of monitoring systems with regard to landfills |
| Adopt and | + | 0 | + | 0 | +/- | + | 0 | + | 0 | |

| | | | | | | | | | | |
|---|--|---|--|---|--|---|---|---|---|--|
| implement necessary laws related to air quality protection | EU waste management legislation and international conventions covers air protection issues | | Waste collection and transportation is a source for air pollution that can be regulated by law | | Laws will assist to regulate waste recycling or recovery in the environmentally friendly way | Laws envisage sanctions for illegal/excess air emissions | | The laws will assist to regulate waste data collection and management | | |
| Envisage landfill gas collection facilities in WM plan | + WM legislation shall envisage obligation to include gas collection facilities | + Gas collection facilities shall be included in all WM plans | + Gas collection is essential part of environmentally friendly waste disposal | 0 | | + Landfills that don't have gas collection facilities shall be fined as polluters | 0 | 0 | 0 | |

Thus, the policy objectives-led assessment (conducted in a form of evaluation matrix developed by the SEA expert team) has not identified any potential significant policy conflicts and found the Action Plan's objectives to be in formal conformity with the country's environmental and public health protection policy goals. However, the level of actual contribution of the Action Plan to the fulfilment of the country's environmental and health objectives remains questionable. The low level of detail about how the Action Plan objectives are elaborated and the lack of information on how the stated objectives will be achieved are the limiting factors of this analysis. The information base concerning available opportunities in terms of technologies, techniques, investment locations, infrastructure needs, available funding etc. should be developed in order to ensure rational decision making while preparing subsequent strategic decisions envisaged by the Action Plan (e.g. decisions related to the design of a separate waste collection system). Without it the risk of negative side-effects of the Action Plan implementation on individual environmental components, localities, or population groups cannot be fully ruled out, despite the formal compliance of the Action Plan with the relevant environmental and health policy objectives.

The recommendations responding to the concerns identified in this analysis are incorporated in Chapter 7.

6. Likely environmental, including health, effects and measures to prevent, reduce or mitigate any adverse effects on the environment, including health, which may result from the implementation of the Action plan

6.1 Effect evaluation and proposed mitigation measures

Table 6 below summarizes potential risks and effects that the implementation of particular objective and targets can have on the health and environmental issues identified and described at the scoping stage. An indication of expected effects is made for each Action Plan objective and corresponding targets.

The analysis was done by analyzing the characteristics of the potential effect/impact and subsequently assigning values to each effect/impact in line with the following evaluation scale:

| | |
|-----|---|
| -- | Significant negative effect |
| - | Minor negative effect |
| 0 | No effect expected |
| + | Minor positive effect |
| ++ | Significant positive effect |
| +/- | Under different circumstances both positive and negative effect could be expected |
| ? | Uncertainty |

In this manner, each objective and target was evaluated against the identified environmental, health and socio-economic issues, as relevant. Based on this assessment, measures and recommendations were formulated to prevent or mitigate the identified potential negative effects and to enhance the identified potential positive effects.

Table 6: Evaluation of effects and proposed mitigation measures

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|---|
| <p>Objective 0.1. Waste Management legislation in harmony with EU requirements and International Conventions developed, implemented and enforced</p> <p>Target 1.1. All necessary Laws and by-laws for full legal transposition of AA (Association Agreement) requirements as regards waste adopted and implemented A¹² 1.1.1 –A 1.1.8</p> <p>Target 1.2. International Conventions fully transposed, implemented and enforced A 1.2.1 – A 1.2.4</p> <p>Target 1.3. Waste legislation enforced effectively</p> | + | +/- | + | + | + | +/- | <p>In general, adoption of the relevant waste management related by-laws in accordance to EU requirements will affect positively on air, water and soil quality in the future across Georgia. Potential damage to soil, surface and groundwater as a result of emissions or abstractions due to waste will be reduced. It will affect health of the population positively in the long term. Potentially the effect for biodiversity and protected areas will be positive as well (A 1.1.1 – 1.1.8).</p> <p>Incineration of waste will reduce landfill gas emission but at the same time the risk of emissions from incineration exists (A 1.1.2).</p> <p>Waste transportation is significant source of air emission; therefore setting certain requirements defined by proposed by-law may have a positive effect; however, can be costly (A 1.1.4).</p> <p>Healthcare waste can be hazardous, therefore, setting certain requirements for healthcare waste management will affect positively on the environment and public health (A 1.1.5).</p> <p>Animal waste can be hazardous; its management will have positive effect but must be done adequately, Enforcement of animal waste regulation is essential for effective animal waste management (A 1.1.6).</p> <p>Preparing and adopting law on hazardous waste shipment will have positive affect and minimize emissions during shipments (A 1.1.7).</p> <p>Mining waste is a big problem for the country in terms of environmental pollution. Disposal of mining waste can be costly for companies working in mining business (A 1.1.8).</p> <p>Clarification and enforcement of the roles and responsibilities in terms of illegal</p> |

¹² Relevant Action of the Action Plan

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|---|
| A 1.3.1 – A 1.3.5 | | | | | | | littering and disposal at Protected Areas and Touristic complexes will improve the situation at PAs (A 1.3.1). WMP developed for each PA will solve most of the problems related to PAs (A 1.3.4). |
| | | | | | | | <p><u>Mitigation</u></p> <ul style="list-style-type: none"> All necessary Laws and by-laws for full legal transposition of AA requirements as regards waste adopted, taking into account the environmental legislation that is being harmonized with the EU environmental requirements, and implemented (Target 1.1). By-laws shall be adopted taking into account the environmental and health consideration and the enforcement of laws should be monitored (A 1.1.1 – A 1.1.8). Adequate infrastructure for waste collection, treatment, etc shall be developed prior to enforcement of these laws (A 1.1.1). Waste treatment and pre-treatment methods need to be designed properly in order to minimize emissions from treatment facilities that have an environmental impact (particulates and dust, odors etc) (A 1.1.1). Requirements for the transport of waste shall be realistic and feasible for implementation; otherwise the effect will be minimal (A 1.1.4). Also, when identifying options for setting the landfills the transportation aspect should be considered in depth. Distribution of tasks and responsibilities between municipalities and protected area administrations with regard to transportation of collected waste (A 1.1.4). By-law on waste incineration shall consider types of waste, required temperatures, and other operational and monitoring requirements (A 1.1.3). Advocacy of effective, scaled-up promotion of non-incineration technologies and support to good practices in incinerator design, construction, |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|---|
| | | | | | | | <p>operation (e.g., pre-heating and not overloading the incinerator, incinerating only at temperatures above 800°C), maintenance and lowest emissions (A 1.1.3).</p> <ul style="list-style-type: none"> • In case of incineration of healthcare and animal waste, temperature and other operational and monitoring requirements shall be selected and considered carefully (A 1.1.3 – A 1.1.4). • The law on mining waste shall give enough time to companies to adjust to new legal requirements; disposal options for mining waste must be in place at first (A 1.1.7). • Identification and inspection of Clean-up process of abandoned mining sites (A1.1.8). • Mineralogical-petrographical assessment of material and use of secondary waste (A 1.1.8). • Law on transboundary shipment of hazardous wastes (BASEL) should consider risk to biodiversity as well (A 1.1.7). • Law on mining waste should consider biodiversity issues, as applicable (A 1.1.8). • The roles and responsibilities for illegal littering/disposal in terms of PA should be clearly distributed between municipality and PA administration (A 1.3.1). • If recreational areas existing at PAs, coordination with Pas administration will be needed in terms of identifying and mapping hot spots of littering in recreational/picnic areas and developing and implementing joint inspection plans (A 1.3.2). • PA waste management plans (chapters) should be part of municipal waste management plans (A1.3.4). • Ensure ratification of Minamanta Convention and implementation of relevant pilot projects for national capacity building and strengthening (A 1.2.3). |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mine ral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|----------------------------|------------------------|--|
| <p>Objective 0.2 Waste Management Planning system established and implemented nationally and locally</p> <p>Target 2.1 First generation of five-year Municipal WM Plans for all municipalities developed and approved A 2.1.1 – A 2.1.4</p> <p>Target 2.2. First generation of three-year Company WM Plans developed and agreed with the Ministry A 2.2.1 – A 2.2.4</p> | + | +/- | + | + | + | +/- | <p>Preparing WPs for municipalities and companies will create basis for them to change their attitudes towards WM.</p> <p>Mitigation:</p> <ul style="list-style-type: none"> Capacity strengthening of municipalities shall be implemented before preparing WMP by municipalities (A 2.1.1 – A 2.1.4). Ensure targeted awareness rising campaigns for company employees before WMP for companies are prepared (A 2.2.2). Relevant assistance in terms of infrastructure, human resources (to prepare companies' waste management plans) and finances shall be in place in order to enable companies to meet obligations related to WM plans development (A 2.2.4). Mentioned Municipal WM Plans require the preparation of strategic environmental assessments (Target 2.1). Ensuring economic or other incentives for companies for handling generated wastes. These mechanisms shall be implemented at first to enable companies adequately manage waste that might be costly for them without those incentives (A 2.2.4). |
| <p>Objective 0.3 An effective waste collection and transportation developed and implemented</p> <p>Target 3.1. Roles and responsibilities between private and public sector waste management clarified A 3.1.1 – A 3.1.2</p> <p>Target 3.2. Waste operators</p> | + | +/- | + | + / - | + | +/- | <p>Development of an effective waste collection and transportation system and clarification of the roles and responsibilities between public and private sector will definitely have positive effect on the waste management sector and improve collection of waste. This will results in reduced level of illegal waste dumping. Preparation and implementation of measures for management of hazardous waste, special waste and healthcare waste on a national level will have long term positive effect on the environment and public health.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Implement awareness rising/capacity building activities for private sector and municipalities to initiate reuse, recycling and recovery activities. Envisage economic incentives for companies who carry out reuse, recycling and recovery activities; however the first priority should be given to reuse |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|--|
| <p>competent to undertake waste management activities</p> <p>A 3.2.1 – 3.2.4</p> <p>Target 3.3. National targets for the following waste to be collected and managed:</p> <ul style="list-style-type: none"> • Municipal waste – 80% • Hazardous waste – 50% <p>A 3.3.1 – A 3.3.6</p> <p>Target 3.4. Establishment of a National Hazardous Waste Management system</p> <p>A 3.4.1 – A 3.4.3</p> <p>Target 3.5. National initiatives taken for Special waste streams</p> <p>A 3.5.1 – A 3.5.11</p> | | | | | | | <p>activities (A 3.1. – A 3.1.2).</p> <ul style="list-style-type: none"> • Ensuring maximum collection by introducing affordable system of collections (in terms of monetary affordability/transportation affordability) in the mountain and remote regions especially and minimizes risk of illegal dumping/burning and associated impacts. • Action plans for various waste streams requires Strategic Environmental Assessment (Target 3.4). • Study the alternative to the transportation to minimize negative effect of transport on the environment or use environmental friendly transport for waste collation (A 3.3.2). • Collection vehicles could be redesigned to be able to take individual fractions of different types of waste together in order to minimize the number of collection journeys and resulting emission (A 3.3.1). • Mobilize financial sources for transportation vehicle and waste bins at first. • Envisage awareness rising of population on source sorting of household waste by designing relevant pilot project (A 3.3.5). • Ensure use of construction and demolishing waste as secondary materials to minimize the negative effect caused by disposal and pre-treatment of such waste (A 3.5.10). • Ensure awareness raising campaigns for private sector to reduce use of plastic bags and packages. • Along with charges consider use of other economic incentives for private sector to reduce use of plastic bags and packages (A 3.5.11). • Considering development of a Strategy and Action Plan not only for collection of Industrial (Company) waste but also for management of Industrial (Company) waste (A 3.4.3). • Considering the development of national regulations and guidance manuals |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|--|
| | | | | | | | <p>for waste service operators, possibly promoted by certification and inspection programmes to facilitate the sound management of occupational health and safety (A 3.2.4).</p> <ul style="list-style-type: none"> • All Public Health aspects related to HZW management activities must be considered in coordination with MOH (A 3.3.6 through A 3.4.2). • Within the Action plan for healthcare waste to develop a consistent and rational approach to human biomonitoring (HBM) as a complementary tool for evidence based public and environmental health measures. • Advocacy of effective, scaled-up promotion of non-incineration technologies and support to good practices in incinerator design, construction, operation (e.g., pre-heating and not overloading the incinerator, incinerating only at temperatures above 800°C), and maintenance while considering incineration plants for healthcare waste (A 3.5.2). • Ensuring coordination with Public Health authorities for considering Biosafety (Especially Dangerous Pathogens) aspects while considering Action Plan for animal waste. • Ensure Environmental Health risk assessment and full ban of use of asbestos (A 3.5.6). • All Public Health aspects must be considered in coordination with MOH when preparing action plan for contaminated soil and for Sludge from WWTPs and septic tanks (A 3. 5.7 and A 3.5.8). • Develop other economic incentive for reduction of special waste streams for companies instead of charges, as charges are not considered as measures changing the behaviours (A 3.5.11). |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|---|
| <p>Objective 0.4 Waste disposed in a safe manner for the human health and environment</p> <p>Target 4.1 New modern landfills with transfer systems established or modification of existing landfill in a transition period in accordance with EU standards with separate cells for special waste</p> <p>A 4.1.1 – A 4.1.6</p> <p>Target 4.2 Existing high risk landfills closed</p> <p>A 4.2.1 – A 4.2.3</p> <p>Target 4.3 Remaining existing landfills not to be modified closed</p> <p>A 4.3.1 – A 4.3.3</p> <p>Target 4.4 All dumpsites closed and remediated</p> <p>A 4.4.1 – 4.4.4</p> <p>Target 4.5 Disposal of biodegradable waste to be</p> | + | +/- | + | + / - | + | ? | <p>Construction of new modern landfills and closure of the dumpsites and especially identification and closure of high risk landfills will have long term positive effect on the environment and public health. However, proper planning and feasibility study is needed before opening new landfills and closing the old/non-usable ones. The potential negative impacts would be related to land take, usual impacts of any construction projects, occupational and safety risks, community health and security risks, increased transportation on the roads and the associated noise, air emissions, mud and dust impacts, and further operational impacts.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Ensure enforcement of Environmental Health monitoring procedures and risk assessment during the operation of landfills (A 4.2.6). • Ensure consideration of Public Health aspects on closure preparation stage of High risk existing landfills (A 4.2.1). • Ensure enforcement of health impact assessment and environmental impact monitoring for closed landfills (especially for high risk landfills) (A 4.2.3 and A 4.3.3). • Ensure coordination with Public Health authorities for considering all environmental health aspects during the preparation of plans for closure of existing dumpsites and implementation of the plans (A 4.1 – A 4.4.3). • Ensure enforcement of health impact assessment and environmental impact monitoring for closed dumpsites (A 4.4.4). • Provide incentives for private sector to set reuse policy as a first priority on biodegradable waste (A 4.5.1). • Provide guidance and develop pilot projects in rural areas to ensure home composting of household biodegradable waste (A 4.5.2). • Considering geological assessment of territory in feasibility study of new landfills. • Considering vicinity of protection areas in the feasibility study of new |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|--|
| minimized at the landfills A 4.5.1 – A 4.5.4 | | | | | | | landfill (A 4.4.1 – A 4.4.4). |
| <p>Objective 0.5 Waste prevented, reused, recycled and/or recovered to the extent possible</p> <p>Target 5.1 Source separation for paper, plastic, glass and metal established A 5.1.1 - A 5.1.4</p> <p>Target 5.2 National minimum targets for separated waste to be managed: (in 2025) 70% Paper recycled 50% Glass recycled 90% Metal recycled 70% Plastic recycled A 5.2.1 - A 5.2.3</p> <p>Target 5.3 Waste prevention promoted and implemented by companies A 5.3.1 – A 5.3.3</p> <p>Target 5.4 Waste not reused or</p> | + | + | + | + | + | ? | <p>Uncollected waste can cause negative impact on the landscape, land use, cultural heritage and biodiversity. Policies to eliminate these practices will have a positive effect on the environmental media and health of population. However, cumulative impacts are associated with expansion of existing landfill facilities and new composting & waste transfer facilities. Impact depends on how many new facilities are proposed for temporary storage or treatment of waste and/or their locations.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Considering economic incentives for companies for promoting Waste Minimization and Sustainable Production (A 5.3.3). Conduct feasibility and alternative study before providing financial support to private or public companies to open new recycling facilities that are associated with new impact on the environment meaning land-use, energy use, emissions etc. Recycling shall be allowed only in case if there are no other alternatives like reuse or restoration (A 5.5.1). |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|--|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|--|
| <p>recycled to be recovered to the extent possible</p> <p>A 5.4.1</p> <p>Target 5.5 Waste reuse, recycling and incineration facilities established</p> <p>A 5.5. 1 – A 5.5.2</p> | | | | | | | |
| <p>Objective 0.6 Waste Management Costs covered in accordance with the Polluter Pays Principle</p> <p>Target 6.1 A full cost recovery system for citizens developed by each municipality</p> <p>A 6.1.1 – A 6.1.4</p> <p>Target 6.2 A full cost recovery system for companies developed</p> <p>A 6.2.1</p> | + | + | + | + | + | ? | <p>While introducing a new waste tariff and waste fee collection system which is positive approach towards changing the behaviors of population, private or public entities in waste management a proper planning and analysis is essential (including economic and social aspects).</p> <p><u>Mitigations</u></p> <ul style="list-style-type: none"> • Before setting waste tariff and waste collection fee systems affordability study should be conducted to define reasonability of any tariff and waste collection fee. Waste tariffs and collection fees shall differ for different regions based on the social, economic, geographical and other conditions of the population and the region itself (A 6.1.2). • Developing a standard methodology for calculating the service delivery fee. (A 6.1.2). • Landfill gate fees should be set very carefully, which should be affordable for waste collection and transportation companies otherwise this will create incentive for illegal dumping (A 6.1.4). • Municipalities should be given assistance (relevant infrastructure, software and training) to enable them for charging and collecting waste fees electronically |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mine ral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|----------------------------|------------------------|---|
| | | | | | | | and improving their administrative skills in fee collection. |
| <p>Objective 0.7 Extended Producers Responsibility promoted and implemented to the extent possible</p> <p>Target 7.1 Mandatory obligations for producers introduced</p> <p>A 7.1.1 – A 7.1.3</p> <p>Target 7.2. National minimum targets for the following waste to be managed: (in 2020)</p> <ul style="list-style-type: none"> • Batteries – 50% • Waste Oil – 80% • Packaging waste – 50% • WEEE – 10% • Tyres – 50% • Accumulators – 80% <p>A 7.2.1 – A 7.2.2</p> <p>Target 7.3 Incentives for EPR introduced</p> <p>A 7. 3.1 – A 7.3.7</p> | + | + | + | + | + | ?/+ | <p>Introduction of Extended Producers Responsibility is an effective tool to change the behaviour of the producer in waste management and reduce the dumping of the waste in the environment.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Ensure preparation and implementation of broad awareness raising and educational campaigns or pilot projects for Extended Producers Responsibility, develop volunteer base activities for companies to engage them in waste minimization activities (Target 7.1 - 7.2). • Develop and implement relevant economic incentives to promote EPR (Target 7.1). |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mine ral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|--|------------|--------------------|------------------------------|---------------|----------------------------|------------------------|---|
| <p>Objective 0.8 Waste Data and Information Management system developed and implemented</p> <p>Target 8.1 Waste Data Management system (data collection, reporting and database) developed and implemented</p> <p>A 8.1.1 – A 8.1.5</p> <p>Target 8.2 Waste Information System with public access developed and implemented</p> <p>A 8.2.1 – A 8.2.2</p> | + | + | + | + | + | ?/+ | <p>Development of waste data and information management system is essential for having relevant and verified information and data on produced, transported, collected, disposed, recycled etc waste. It also will make easy transfer of information between private and public entities including municipalities and the Ministry of Environment and Natural Resources Protection of Georgia, resulting in reduced operational and business costs for private companies and improved data exchange with relevant public entities.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> • Ensure development of proper infrastructure and administration mechanisms before enforcing electronic information collection and assessment system. • Ensure collection of environmental health monitoring, data for waste analysis and management (A 8.1.1). |
| <p>Objective 0.9 Capacities strengthened for the national and local public sector, as well as private companies and general public to meet the requirements of the development of the WM system</p> <p>Target 9.1 Capacities of the MENRP and other relevant national institutions strengthened</p> | + | + | + | + | + | + | <p>Awareness raising and education of any stakeholders involved in waste management is important for achieving expected results and compliance as well as for sustaining long term positive effect of the proposed activities of waste management.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> • Increase awareness in various groups of population (decision makers, healthcare personnel, industry, public, and media) to environmental issues, occupational health and safety issues, waste minimization opportunities and the values recycling and resource recovery (A 9.3.1). • Strengthen capacities at Tbilisi, Kutaisi, Batumu and Zugdidi municipalities |

| Objectives/targets and relevant actions of the Waste Management Action Plan | Water/Soil | Air/Climate change | Biodiversity/Protected Areas | Public Health | Geology/Mineral Resources | Social-Economic Issues | Assessment and Mitigation/Enhancement Recommendation |
|---|------------|--------------------|------------------------------|---------------|---------------------------|------------------------|---|
| A 9.1.1 – A 9.1.2 Target 9.2 Capacities of the Municipalities strengthened A 9.2.1 – A 9.2.2 Target 9.3 Capacities of the Private sector strengthened A 9.3.1 – A 9.3.2 Target 9.4 Awareness of general public on Waste Management raised A 9.4.1 | | | | | | | to assist them in meeting commitments for GHG reduction under the Covenant of Mayors (A 9.2.3). |

The recommendations stemming from this section are incorporated in Chapter 7.

6.2 The likely significant transboundary environmental, including health, effects

No transboundary effects were identified in the context of the Solid Waste Action Plan SEA.

7. The key SEA Recommendations and quality of the planning document

A set of recommendations was prepared by SEA experts based on the analysis and assessment described in the chapters above. The proposed recommendations focus on setting conditions for safe implementation of actions envisaged in the Action Plan. They can be considered for reflection via adjusting the text of description of related AP Actions (indicated by numbers), or they can be considered at further stage of implementation, when guidelines or terms of reference for specific actions are developed.

7.1. Policy analysis recommendations and recommendations on how to improve the quality of the Action Plan

Besides the specific recommendations below, the SEA team maintain its concern that neither the Waste Management Strategy, nor the AP (which is the subject of this Pilot SEA) present any comprehensive baseline analysis of the waste sector, which can limit the value of the AP as an actual plan for the actions (i.e. as a framework for further implementation of individual envisaged actions). As, for example, currently there is no indication in the AP on what basis the quantified targets (in %) for waste recycling were set and what they represent in terms of waste volumes. Furthermore, there is no information base concerning available opportunities in terms of technologies, techniques, investment locations, infrastructure needs, available funding etc. Such Action Plan thus gives only a limited guidance for further decisions and does not facilitate rational planning of capacities for handling and/or disposal of these waste streams. Neither it assists in communication with potential donors (which are mentioned as a key source of funding for a number of the planned activities), who might want to understand the rationale for the outlined targets and actions. The SEA team understands that given the time and procedural conditions for the AP finalization, it is impossible for the planners to effectively address this principal SEA reservation.

In this context, the Action Plan document would also benefit from introduction of a section outlining a broader policy context – i.e. indication of what key national policy documents have links with or implications for the waste management planning (e.g. energy strategy, mineral resources-related policy).

In addition, in terms of phrasing the stated waste management aspirations, the SEA team suggests rewording the Action Plan's vision from the current "Georgia to become a preventing and recycling society" to the proposed "Georgia to become a waste preventing and recycling society protecting the environment and human health". The reformulation is proposed to reinforce the awareness about and commitment towards the addressing of the environmental and health protection dimensions of the waste **management sector**.

7.2. Recommendations derived from the effect assessment

In addition to the above some key recommendations from the effect assessment and mitigation/enhancement matrix are outlined as follows:

- By-laws shall be adopted taking into account the environmental and health consideration;
- Expected environmental and health effects should be reflected by including suitable indicators in the system of monitoring for the Action Plan implementation and/or monitoring system for the national waste management system;
- Develop institutional arrangement facilitating involvement of MOH (Ministry of Health) in the implementation of activities. All public health aspects must be considered in coordination with MOH;
- Ensure effective management measures in order to prevent and mitigate the possible negative consequences of Geological disasters;
- Considering economic incentives for companies for promoting Waste Minimization and Sustainable Production and conduct feasibility and alternatives study before providing financial support to private or public companies to open new recycling facilities that are associated with new impacts on the environment (e.g. land-use, energy use, emissions etc.). Recycling shall be supported in line with the principles of waste management hierarchy (as per EU Framework Directive) and priority shall be given to actions supporting waste prevention/minimization and re-use;
- Before setting waste tariff and waste collection fee systems a study should be conducted to define rational height of any tariff and waste collection fee. Waste tariffs and collection fees shall reflect the social, economic, geographical and other conditions of the population in a region;
- Increase awareness in various groups of population (decision makers, healthcare personnel, industry, public, and media) to environmental issues, occupational health and safety issues, waste minimization opportunities and the values recycling and resource recovery;
- Develop and implement relevant economic incentives to promote EPR (Extended Producers Responsibility).

7.3. Recommendations taken on board by the Planning Team

Some of the SEA findings and recommendations were taken into account in the Action Plan (entitled version 9) as of 30th of September, as compared to the version (version 5) from 15th of September. In particular, these that related to biodiversity and Protected Areas and to the socio-economic sphere. After September 2015, the Waste Management Action Plan was further developed and some additional SEA recommendations were taken into consideration. Thus, the full draft version of the Action Plan, as it was presented on the public consultation meeting in October, included the SEA recommendations regarding, for instance, the Guidelines for Waste Management Plans (WMPs) for Protected Areas (PAs), the WMPs for PAs per se, public health, and the end-of-life vehicles (ELV) .

In general, the activities provided in the Action Plan coincide to a large extent with the actions proposed by the SEA team. It is worth noting that due to the fact that the proposed Action Plan is an environmentally oriented document, and many relevant environmental and health objectives and aspects have been acknowledged in it by the waste management planners.

8. Difficulties, limitations and assumptions

8.1 Key problems in conducting the pilot SEA

One of the main objectives of the SEA pilot was to test the procedural steps of SEA of the draft Environmental Code of Georgia. It was found to be not possible to follow the procedural scheme in full due to the limited time available for the SEA pilot project and a long state review procedure envisioned by the Draft law. The actual time for conducting the pilot SEA project was three month, whereas the period for the scoping phase state review alone (to be undertaken by the Ministry of Environment) was about 41-50 working days according to the draft law. So, no tasks that were related to the review of the SEA documents (screening application, scoping report and SEA report) with involvement of the state authorities could be tested.

The planning timeline was rather pressing as well. New versions of the Action Plan were issued ad-hoc without advance notice /pre-agreed schedule. The SEA team had to work on different versions of the Action Plan, addressing frequent changes in relevant SEA documents.

In general, the Pilot SEA was initiated at an early stage of the Action Plan preparation, when its draft was not available yet. In order to proceed with the Pilot SEA, the scoping phase was based on the information presented in the draft Waste Management Strategy. The Effect Assessment stage was supposed to be based on the first draft of the Action Plan; however, when the Action Plan was provided, it was found to be imposing some limitations to the SEA analysis as it had the low level of detail about how the Action Plan objectives were elaborated, lacked the information on how the stated objectives would be achieved (no information base concerning available opportunities in terms of technologies, techniques, investment locations, infrastructure needs, available funding, etc.) (refer to Section 5.3 Summary of assessment results). In addition, it did not contain any comprehensive baseline analysis of the waste sector, which can be problematic from the point of view of effectiveness of the SEA, but also can limit the value of the Action Plan as an actual plan for the actions. Overall, these factors further complicated the possibility of the pilot SEA to fully test the procedure- and content-related provisions of the draft EA Code.

8.2 Lack of data

One of the issues identified at the scoping stage that prevented experts from conducting proper analysis was the lack of data and information on the environmental and health conditions. This includes but is not limited to:

- Absence of the Waste Management Database and statistical information to evaluate the amount of waste produced in the country
- Lack of data on groundwater and soil monitoring to have relevant picture on groundwater and soil pollution;
- Absence of the closed (abandoned) mining waste facilities inventory results;
- Lack of data with regard to waste generated or dumped on Protected Areas;

- Lack of reliable, clear, timely and systematic environmental monitoring data in order to identify potential risks to Public Health;
- Lack of national survey reports, analysis, scientific researches detecting potential environment and health correlation for the formulation environmental and healthcare actions and policy;
- Absence of consistent and rational approach to human biomonitoring (HBM) as a complementary tool for evidence based public and environmental health measures;
- Lack of national regulations and guidance manuals, promoted by certification and inspection programmes for the sound management of occupational health and safety;
- Lack of reliable air emission data;
- Poor monitoring of air emission on landfills in order to get adequate and systematic data on air quality;
- Lack of information on municipal budgets for waste management;
- Lack of information on the cost of waste management by municipalities;
- Lack of information on the quantity and structure of waste produced by municipalities.

Due to the insufficient information and data it was difficult to identify the baseline trends in relation to some issues on a given territory and to judge about their nature. Thus, the baseline analysis provides only general information on the problems and overall trends and effects on the particular area.

9. An outline of the reasons for selecting the alternatives dealt with

The SEA only considered the 'business-as-usual' alternative for the Action Plan in absence of other reasonable and feasible alternatives to be analyzed. One reason for this was a rather abstract nature of the Action Plan that did not contain any information about available opportunities in terms of technologies, techniques, investment locations, infrastructure needs, available funding, etc. Thus, there was no sufficient background / input data to make assumptions about potentially feasible and environmentally/health friendly alternatives. Therefore, the SEA experts formulated the 'business-as-usual' scenario describing what would happen if the Action Plan was not implemented. Following this, they conducted the comparison of the 'business-as-usual' alternative and the Action Plan using the matrix and expert judgment methods. The matrix uses the following symbols for describing if the Action Plan is expected to bring about better or worse effects in relation to the "business-as-usual scenario":

| | |
|---|---|
| + | Change towards better outcomes |
| 0 | The same; no measurable change expected |
| - | Change towards worse outcomes |
| ? | Uncertain |

The summary of this comparative assessment is presented in Table 7.

Table 7: The 'Business-as-usual' alternative vs. the Action Plan

| Environmental and health receptors | Specific concerns and problems | Action Plan versus the 'Business-as-usual' |
|------------------------------------|--|--|
| Surface and ground water | <ul style="list-style-type: none"> • Lack of drains for rain water collection • Pollution from diffuse sources, including agriculture • Leakage from landfills • Pollution of surface water with organic matter, nutrients, heavy metals, pesticides • Industrial wastewater discharges • Municipal wastewater discharges • Leakages from landfills | <p style="text-align: center;">+</p> <p>If actions defined by the WMAC will not be implemented this will result in further runoff of pollution from diffuse sources, including old pesticide storage sites and leakages from landfills</p> |
| Soil | <ul style="list-style-type: none"> • Contamination of soil by: • Organic, inorganic, microbiological pollutants • Chemical waste from industry | <p style="text-align: center;">+</p> <p>If the Action Plan is not implemented it can be expected that the leakages from landfills will continue;</p> |

| | | |
|------------------------------------|---|--|
| | <ul style="list-style-type: none"> • Organic and inorganic fertilizers form Agriculture, including PoPs • Leakages from landfills • Construction waste • Mining waste | amount of construction and mining waste expected to grow resulting in soil contamination and increased deposits to the landfills |
| Atmospheric Air and Climate | <ul style="list-style-type: none"> • Poor data collection and processing of landfill emissions | + If the Action Plan is not implemented and proper waste legal framework (including approximation of waste related legislation to EU legislation), construction, operational and management activities are not implemented and enforced, especially for landfills poor air quality will continue to have affect on the population and the environment due to emissions from landfills, including GHGs |
| | <ul style="list-style-type: none"> • Landfill gas emissions are not collected | |
| | <ul style="list-style-type: none"> • Smell produced from landfills disturbing nearby population | |
| | <ul style="list-style-type: none"> • Self- burning of waste | |
| | <ul style="list-style-type: none"> • No use of waste as energy source | |
| | <ul style="list-style-type: none"> • Lack of capacity of targeted municipalities to meet obligations under Covenant of Mayors | |
| | <ul style="list-style-type: none"> • Air protection legislation not relevant with EU standards | |
| Biodiversity/PA | <ul style="list-style-type: none"> • Lack of capacity of Municipalities to meet waste management obligation in terms of protected areas • Limited capacity of the municipalities to collect and take the waste out from Pas • (depending on PA category) | + If the Action Plan will not be implemented municipalities will be lacking the capacities to implement proper waste management activities in general and in case of PAs resulting in poor collection, separation and transpiration of waste |
| | <ul style="list-style-type: none"> • Absence of legal landfills or areas for waste collection near PAs • Lack of trash bins at PAs • Lack of segregation of toxic substances | |
| | <ul style="list-style-type: none"> • Degradation of biodiversity due to pollution | |
| | <ul style="list-style-type: none"> • Decreasing number of animal species | |
| | <ul style="list-style-type: none"> • Decreasing number of visitors | |
| | | |
| Geological Hazards | <ul style="list-style-type: none"> • Risk of geological hazards | + If the Action Plan will not be implemented geological and hydro-geological assessment of territory for |
| Mineral | <ul style="list-style-type: none"> • Waste form excavation and | |

| | | |
|-------------------------------|--|---|
| Resources | <ul style="list-style-type: none"> processing of mineral resources Waste from construction Lack of use inert materials for secondary use Identification and Clean-up of abandoned mining sites | residual waste will be poorly envisaged; mining waste will continue to be the source of pollution for the environment |
| Socio-economic aspects | <ul style="list-style-type: none"> Insufficient budget for municipalities to manage waste Absence of socio-economic policy for the waste management Absence of society solvency for waste management | + If the Action Plan will not be implemented a cost effective mechanism for municipal waste management and budget allocation will not be considered resulting in poor social-economic policy for waste management at the central and municipal level |
| | <ul style="list-style-type: none"> Change in the population size/household waste (most of waste (80%) is generated in household | |
| Public Health | <ul style="list-style-type: none"> The nature of raw waste, its composition as it decomposes (e.g., toxic, allergenic and infectious substances), and its components (e.g., gases, dusts, leakages, sharps); The nature of waste as it decomposes (e.g., gases, dusts, leakages, particle sizes) and their change in ability to cause a toxic, allergenic or infectious health response; The handling of waste (e.g., working in traffic, shoveling, lifting, accidents); The processing of wastes (e.g., odor, noise, accidents, air and water emissions, residuals, explosions, fires); The disposal of wastes (e.g., odor, noise, stability of waste piles, air and water emissions, explosions, fires). | + If the Action Plan will not be implemented the waste management sector will be lacking from the provision of proper environmental, public health and occupational health and safety measures |
| Waste | <ul style="list-style-type: none"> Lack of landfills relevant to international standards Illegal dumpsites | + If the Action Plan will not be on place the drastic changes in waste management on a legal, policy and institutional level will not take place resulting in poor management of waste that will continue to affect negatively on the environment and human health |
| | <ul style="list-style-type: none"> Hazardous waste Construction waste Mining waste Medical waste | |
| | <ul style="list-style-type: none"> Lack of separation of hazardous waste from household waste Lack of waste separation | |

| | | |
|--|---|--|
| | <ul style="list-style-type: none"> • Operation of landfills without permit • Landfills don't meeting standards | |
| | <ul style="list-style-type: none"> • Absence of monitoring on landfills in terms composition • Lack of evaluation of the damage of existing landfills • Absence of monitoring evidencing the failure to meet the exploitation standards of landfills • Emission of harmful pollutants (dioxides and furans) in the air during burning of waste • Absence of information on the amount of waste on landfills • Self-burning • Absence of reporting on waste | |

In general, the implementation of the Action Plan is seen as being able to have positive effects on air, water and soil quality in the future, across Georgia. Potential damage to soil, surface and groundwater due to poor waste management will be reduced. Implementation of health related activities envisaged in the Action Plan will effect on the health of population positively in the long term. Potentially, the effect on biodiversity and protected areas will be positive as well given that the Action Plan considers introducing proper waste management actions for PAs.

10. Measures envisaged for monitoring environmental, including health, effects of the implementation of the Action Plan

The SEA Report should contain measures envisaged for monitoring environmental impact of implementation of strategic document. Although proposing measures for monitoring the health effects is not part of the Draft Law, the SEA report outlines its monitoring proposal in this regard as well.

The monitoring proposals are made given the above considerations and focusing on the environmental, social and human health aspects that are likely to be affected by the implementation of the Action Plan. It is proposed to carry out monitoring by reporting on a set of indicators, which enable positive and negative effects on the environment to be measured. They have been developed to show changes that would be attributable to the implementation of the Action Plan. The indicators take account of existing monitoring networks where possible.

Furthermore, it is acknowledged that the planning authority responsible for the implementation of the Action Plan should be responsible for the delivery of the defined monitoring measures while implementing the Action Plan and make the results of its monitoring available to the Environment Ministry, the Health Ministry and the public.

Table 8: SEA Monitoring Proposal

| Environmental, social and health receptor | Proposed indicator | Source |
|---|---|---|
| Air | Amount of energy captured from waste facilities / energy recovered | Municipalities, SWMCG, Annual Environmental Report |
| Climate | Estimate of landfill gases (CO ₂ and methane) emitted/year from facilities | Landfill operators (Government of Adjara, Tbilisi Municipality and SWMCG) |
| Water | Decreased level of water pollution (surface water, ground water) according to Maximum Permissible Concentrations <ul style="list-style-type: none"> • Nutrients • Pesticides • BOD₅ • Oil products • Heavy metals | At the governmental level NEA- National Environmental Agency of the Ministry of Environment and Natural Resources Protection of Georgia- annual reports as well as could be made Self-monitoring by the owner of the landfill |
| | Decrease of total level of untreated wastewater flow (m ³ /year) from landfills | City Municipality , owner of the landfill |
| | Improved quality of drinking water <ul style="list-style-type: none"> • Preventing pollution of water | LEPL National Food Agency United water supply |

| Environmental, social and health receptor | Proposed indicator | Source |
|--|---|---|
| | <ul style="list-style-type: none"> by leachate Assuring quality of design, construction and Operation | company GWP |
| Soil | Landscape degradation and land pollution from mining activities and landfills | City municipality owner of the landfill annual reports |
| | Landfill space used | City municipality owner of the landfill annual reports |
| | Remediated landfill after closure | City municipality |
| Waste | Number of landfills without leachate collection | Stakeholders are invited to comment |
| Biodiversity and PAs | Condition of Landscapes | Municipalities, MOENRP |
| | Annual amount of waste found at Pas | MOENRP (APA), Municipalities |
| | Annual Biodiversity Monitoring data in relation to waste | MOENRP, Municipalities |
| Geology | <ul style="list-style-type: none"> Decreased level of Geological Hazards Geological Hazard monitoring statistics Minimization of hazard risk from mineral resource extraction Mineral Resources extraction statistics Remediate mining and landfill site after closure | <p>City municipality owner of the landfill annual reports, NEA</p> <p>City municipality owner of the mining and landfill site, NEA</p> <p>City municipality owner of the mining site</p> <p>Mining site owner, NEA</p> <p>City municipality owner of the mining and landfill site</p> |
| Public Health | Annual mean levels of PM10 ($\mu\text{g}/\text{m}^3$) | NEA |
| | Annual mean levels of PM2.5($\mu\text{g}/\text{m}^3$) | NEA |
| | Annual ambient concentrations of lead in the atmosphere ($\mu\text{g}/\text{m}^3$) | NEA |
| | Lead level in blood, particularly children ($\mu\text{g}/\text{dl}$) | NCDC |
| | Percentage of population with regular solid waste collection | City Municipalities, SWMC, Annual report |
| | Percentage of the solid waste that is disposed of in an incinerator | Ministry of Environment |
| | Percentage of solid waste that is recycled | Ministry of Environment |
| | Percentage of the solid waste that is burned openly | Ministry of Environment |

| Environmental, social and health receptor | Proposed indicator | Source |
|---|--|--|
| | <ul style="list-style-type: none"> • Percentage of the solid waste that is disposed of in an open dump • Percentage of the city's solid waste that is disposed of in a sanitary landfill • Percentage of the city's solid waste that is disposed of by other means • Number of outbreaks of water-related illness and total number of cases per year reported separately for drinking-water and recreational waters • Workers employed in waste management industry • Work-related hospitalizations among waste management workers • Work-related injuries among waste management workers | <p>Ministry of Environment</p> <p>Ministry of Environment</p> <p>Ministry of Environment</p> <p>NCDC, Ministry of Labour, Health and Social Affairs</p> <p>Ministry of Labour, Health and Social Affairs</p> <p>Ministry of Labour, Health and Social Affairs</p> <p>Ministry of Labour, Health and Social Affairs</p> |

11. A non-technical summary of the information provided.

In July 2015, Georgia started the activities on **Pilot application of the SEA procedure to the national Waste Management Action Plan**. The aim of the pilot project was to optimize the Action Plan (and possibly, the national Waste Management Strategy) from environment and public health point of view and test the SEA procedure as stipulated by the draft law on “Environmental Assessment Code”. The Pilot SEA was initiated at an early stage of the Action Plan preparation, when its draft was not available yet. The pilot project was accompanied by several workshops including two specific trainings delivered by international experts to coach the national SEA team. Particularly, the training workshops included an initial scoping and baseline analysis webinar (5 August 2015) and a training workshop on effect assessment and mitigation measures (21-22 September 2015). Further, to present preliminary results to stakeholders and get the feedback of draft scoping report and preliminary SEA results and recommendations two public consultation meetings were held on 22 September and 30 October 2015, correspondingly.

The Action Plan aims at developing the Georgian waste management in harmony with the EU waste management policy. The document contains nine objectives and numerous targets and actions that are clustered in nine sections including Legislation, Waste Planning, Waste Collection and Transport, Landfills, Prevention, reuse, recycling and recovery, Cost recovery, Extended Producers Responsibility (EPR), Waste Data and Waste Management capacities.

As the first stage in the SEA pilot, the national SEA team conducted baseline analysis aiming at identifying the environmental and health issues related to waste management issues and describing the main areas where problems occur. The experts identified several issues to be considered in further analysis. In relation to water the most problematic areas identified includes riverbanks where illegal dumping of waste occurs, surface waters are mostly polluted downstream of big cities with nutrients and heavy metals. Underground water is more prone to pollution in the areas of landfills not meeting the construction and operational standards. Soil contamination occurs in the areas where mining takes place and former pesticide storages. Poor air quality is mostly due to transportation sector and energy related activities. As the country is prone to geological hazards it is very important to conduct geological study of the areas before any waste management infrastructure will be constructed and operated. The mining waste is identified to be one of the problematic issues unless it is properly regulated. Most of the protected areas are also identified to be polluted by waste. Environmental effects on public health and occupational health related issues are also identified requiring setting relevant actions for improving existing environmental conditions, especially in rural areas. Cost-effective management of municipal waste is also one of the problems recognized at the scoping stage.

A set of the key relevant environmental, as well as health, policy objectives were identified during the next scoping stage of the SEA based on the review of the relevant

adopted national strategic documents and Georgia's international commitments. Subsequently, the objectives of the Action Plan were assessed in terms of their potential compliance or conflict with the set of environmental and health policy objectives identified at the scoping stage (policy objective-led assessment).

The policy objectives-led assessment (conducted in a form of evaluation matrix developed by the SEA expert team) has not identified any potential significant policy conflicts and found the Action Plan's objectives to be in formal conformity with the country's environmental and public health protection policy goals. However, it should be noted that the level of actual contribution of the Action Plan to the fulfilment of the country's environmental and health objectives remains questionable. Despite the formal compliance of the Action Plan with the relevant environmental and health policy objectives some of the limited factors include how the Action Plan objectives are elaborated and how the stated objectives will be achieved further.

The following step in the SEA process was the assessment of the likely effects, risks and opportunities related to the Action Plan in order to propose relevant mitigate measures to potential negative effects and enhance positive effects of proposed actions in the Action Plan. Based on the assessment the SEA team proposed recommendations such as an indication of what should be taken into consideration on the subsequent steps of the planning (specific problems, areas, technologies, economic considerations, priorities to be given to certain steps etc.), what specific environmental and health data/analysis shall be prepared prior to implementation of given action, etc., as well as identification of areas/locations, which should not be used for certain waste management developments or areas/location, which can be recommended to be utilized.

The key recommendations from the effect assessment and mitigation/enhancement can be summarized briefly as follows:

- Expected environmental and health effects should be reflected by including suitable indicators in the system of monitoring for the Action Plan implementation and/or monitoring system for the national waste management system;
- Develop institutional arrangement facilitating involvement of MOH (Ministry of Health, Labour and Social Affairs) in the implementation of activities. All public health aspects must be considered in coordination with MOH;
- Ensure effective management measures in order to prevent and mitigate the possible negative consequences of Geological disasters;
- Considering economic incentives for companies for promoting Waste Minimization and Sustainable Production and conduct feasibility and alternatives study before providing financial support to private or public companies to open new recycling facilities that are associated with new impacts on the environment (e.g. land-use, energy use, emissions etc.). Recycling shall be supported in line with the principles of waste management hierarchy (as per EU Framework Directive) and priority shall be given to actions supporting waste prevention/minimization and re-use;
- Before setting waste tariff and waste collection fee systems a study should be conducted to define rational height of any tariff and waste collection fee.

- Waste tariffs and collection fees shall reflect the social, economic, geographical and other conditions of the population in a region;
- Increase awareness in various groups of population (decision makers, healthcare personnel, industry, public, and media) to environmental issues, occupational health and safety issues, waste minimization opportunities and the values recycling and resource recovery;
 - Develop and implement relevant economic incentives to promote EPR (Extended Producers Responsibility).

The SEA also includes an analysis of alternatives, however, to limited extent, due to the abstract nature and unfocused scope of the planning process outputs. The SEA only considered the 'business-as-usual' alternative and the Action Plan as no other feasible/reasonable alternatives were available. Based on the analysis, in general, the implementation of the Action Plan seems to have positive effects on air, water and soil quality in the future, across Georgia. Potential damage to soil, surface and groundwater due to poor waste management will be reduced. Implementation of health related activities envisaged in the Action Plan will effect on the health of population positively in the long term. Potentially, the effect on biodiversity and protected areas will be positive as well given that the Action Plan considers introducing proper waste management actions for PAs.

One of the tasks of the SEA was also to propose measures envisaged for monitoring environmental effects of the implementation of the Action Plan. Although proposing measures for monitoring the health effects is not part of the Draft Law, the SEA outlines its monitoring proposal in this regard as well.

The monitoring proposals are linked to the effect assessment and mitigation and focus on the environmental, social and human health aspects that are likely to be affected by the implementation of the Action Plan. It is proposed to carry out monitoring by reporting on a set of indicators, which enable positive and negative effects on the environment and health to be measured. They have been developed to show changes that would be attributable to the implementation of the Action Plan. The indicators take account of existing monitoring networks where possible.

Furthermore, it is acknowledged that the planning authority responsible for the implementation of the Action Plan should be responsible for the delivery of the defined monitoring measures while implementing the Action Plan and make the results of its monitoring available to the Environment Ministry, the Health Ministry and the public.

12. Annexes

Annex 1. Table of Comments and their reflection in the final SEA scoping report and the draft SEA report

Comments from the SWMC (Solid Waste Management Company) of Georgia were provided in a written form

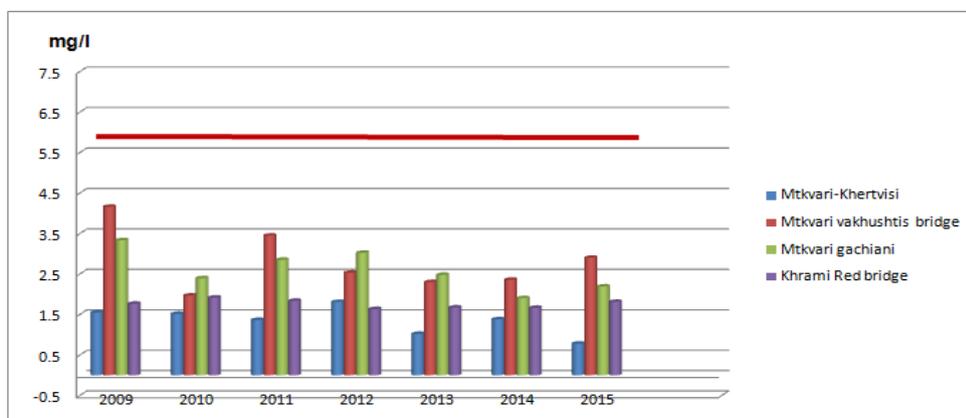
| Author of comment | Comment | Response |
|-------------------|--|---|
| SWMC | Page 11. Iron pollution in the Luhumi River – requesting source of information | The source is provided in the report’s Chapter 3.1.1 Surface Water - The Luhumi (arsenic ion). |
| SWMC | Page 14. Sanitation services change to sanitation administrative centers | Sanitation services are mentioned on page 15 chapter 3.1.3 Water supply and use - source of information is http://water.gov.ge/eng/about-us/company LLC “United Water Supply Company of Georgia” was founded on January 14, 2010. The company provides water and wastewater services throughout whole Georgia. See also regulation of the company, in all documents is mentioned Service centers. |
| SWMC | Page 19. Please review revised information and respond whether you agree with them | Considered and accepted. |
| SWMC | Page 19. Request to update information on existing non-hazardous landfills managed by solid waste management company | Considered and revised. |
| SWMC | Page 21. Request to indicate source of data on Table 1 and Table 2 | Updated. Source is: Third National Communication of Georgia on Climate Change |
| SWMC | Page 21. Request to update information | Considered and not accepted due to the argumentation available in the corresponding section of the report. |
| SWMC | Page 22. Request to correct information on Norio landfill | Considered and not amended as the report relies on the information from the Third National Communication of Georgia on Climate Change. |
| SWMC | Page 26. Reflect comment if you consider relevant | Considered and revised. |
| SWMC | Page 32. Reflect comment if you consider relevant | Excavation of mineral resources in Chiatura, Kazreti, Uravi, Tsana affects |

| | | |
|------|---|---|
| | | the Environment. |
| SWMC | Page 53. Table 4 – correct title of the table | Considered. |
| SWMC | Page 53. Table 4 – information considered outdated | Please, see footnote 25. |
| SWMC | Page 54. Information provided considered outdated | Please, see footnote 25. |
| SWMC | Page 56. Information 10000 tons of Arsenic ore to be revised | Please, see footnote 28 |
| SWMC | Page 56. Add information about Tsana | The report provided just few examples. Wording is revised to reflect this. |
| SWMC | Page 56. Order of the Minister of Labor, Health Care and Social Protection # 300/N of August 16, 2001 – document is abolished | Considered, yet should be noted that the information is from 2007. |
| SWMC | Page 58. Information on biological waste should be updated | Please, see footnote 30. |
| SWMC | Page 58. Table 6 – information should be updated or the indicated year of the information | Considered, however it should stressed that the SEA scoping report is based on the information that was available at this stage. |
| SWMC | Page 59. Number of incinerators should be adjusted | Same response as above. |
| SWMC | Page 59. Table 7 should be updated | Same response as above. |
| SWMC | Page 60. Who is in charge of management of non-hazardous landfill in Tbilisi and Ajara AR | Considered and changed accordingly. |
| SWMC | Page 60. Information on the page is revised, please, review if you agree | Considered, yet pending. |
| SWMC | Page 61. Information on the page is corrected, please, confirm if you agree | Considered, yet pending |
| SWMC | Page 65. Norio landfill or Lilo landfill? | Considered, but cannot be accepted as this is the official information from the Sustainable Energy Action Plan – City of Tbilisi, 2011 (it mentions Norio). |
| SWMC | Page 65. National Communication 2010-2013 – is there any new one? | The National Communication covers three year periods, the next one will be done is 2017, covering years 2014-2016 |
| SWMC | Page 65. Better to mention other state strategic documents | The comment is too general, no proposal was provided as to which documents shall be mentioned here |
| SWMC | Page 66. Exist other state | Considered, but cannot be accepted as |

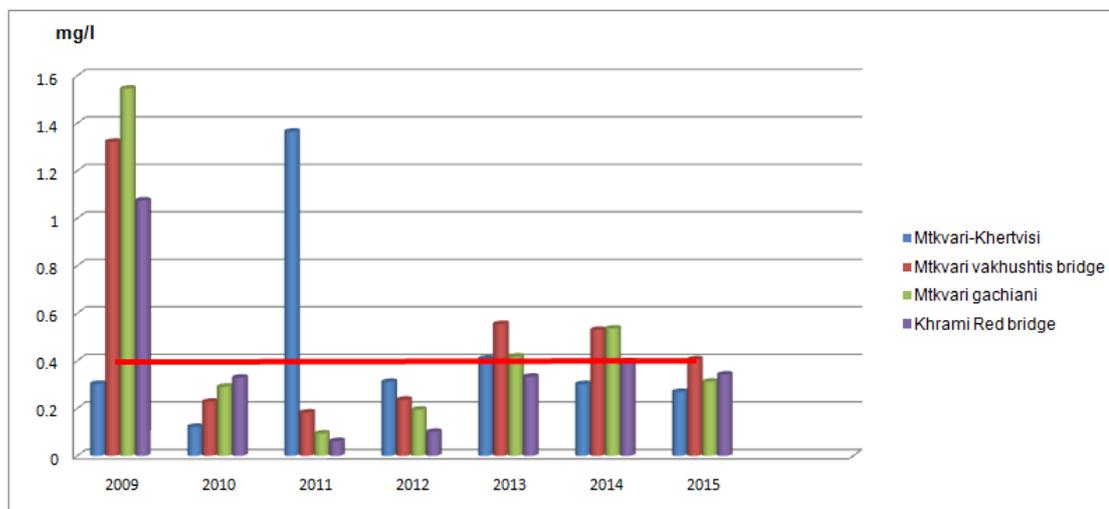
| | | |
|------|--|--|
| | strategic documents with regards to waste management | the comment mentions 'waste management documents', whereas the text is about policy documents in the field of biodiversity (and targets related to waste). |
| SWMC | Page 73. Technical Regulation – “Rules and Standards to construct and exploit the Solid domestic waste landfills – abolished | Changed to new. |
| SWMC | Page 73. Regional development strategy of Georgia | Added strategy document: State Strategy for the Regional Development of Georgia for 2010-2017 |
| SWMC | Page 76. Appropriate planning of landfills to reduce GHG emissions – deleted | Considered and deleted, as it was a repetition. |
| SWMC | Page 80. Key issues – management of protected areas out of responsibilities of protected areas | Considered and could be agreed on partially. This issue depends on the category of protected areas. For example, if it is protected landscape or multiple use area than Agency of Protected Areas is not a management authority. In case of protected landscape municipality is the responsible for its management, accordingly they have to care about waste issues as well. |
| SWMC | Page 80. Changed to lab capacity instead of list of pollutants to be monitored | Considered and found unacceptable, as the way it is presented now is more accurate. |
| SWMC | Page 80. Lack of landfills near PA – to be check with SWMC about the correctness of this information | Considered and cannot be agree upon, as it is not correct at least for the Tusheti PAs where there are no landfills or waste collection places near the PA. |
| SWMC | Page 81. Check correctness of the information | Considered and wording is improved: <ul style="list-style-type: none"> • Racha-Lechkhum-Kvemo Svaneti is example when the riverbank erosion affects the Arsenic Repository in Tsana (riv. Tskhenistskali). Nowadays, riverbank protection measures are implemented. • Geological Assessment of new Landfill polygons and adjacent territory for the preparation of project documentation |
| SWMC | Page 82. Landfill regulation already exist | Considered, yet pending |
| SWMC | Page 82. Consider updating information if applicable, if not, please, provide | Considered, yet pending |

| | explanation | |
|----------|--|---|
| SWMC | Pages 83-86. Update stakeholders list | Updated |
| SWMC | Page 87. Needs adjustment <ul style="list-style-type: none"> • Considering development of waste disposal and handling guidance for safe waste • Transportation, recycling, disposal and management. • Considering the preparation of Closure Plans for those illegal dumps and operational • dumpsites that will be subject to closure | Considered, yet pending |
| WMS, MOE | Revision of the short summary of the draft scoping report (Georgian version) | Revised both versions |
| WMS, MOE | Revision of the key environmental and health issues in Georgia (Georgian version) | Revised |
| WMS, MOE | Considering Resolution of the Government of Georgia № 421 TECHNICAL REGULATION ON THE CONSTRUCTION, OPERATION, CLOSURE AND AFTER-CARE OF LANDFILLS, August 11, 2015 | Considered and updated throughout the report. |

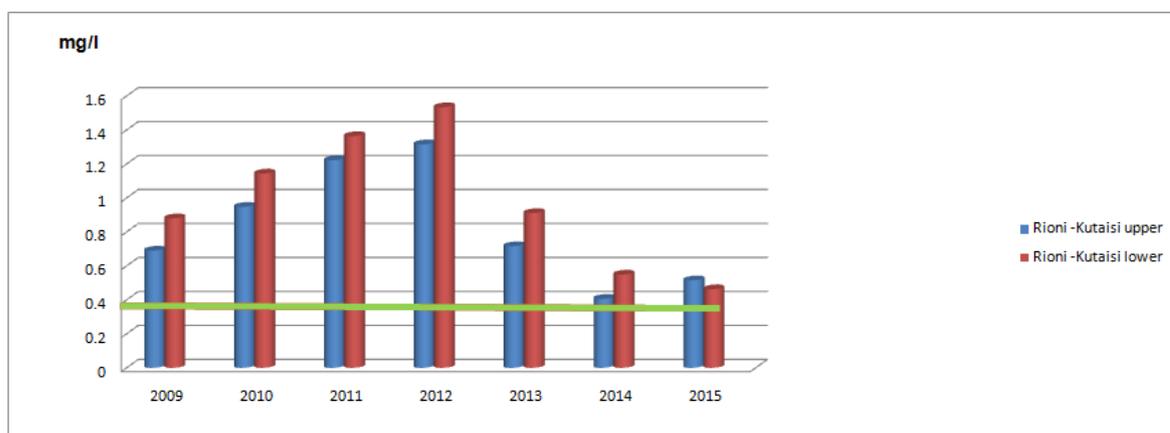
Annex 2: Trends of Pollution of the Rivers of the Caspian Sea and the Black Sea



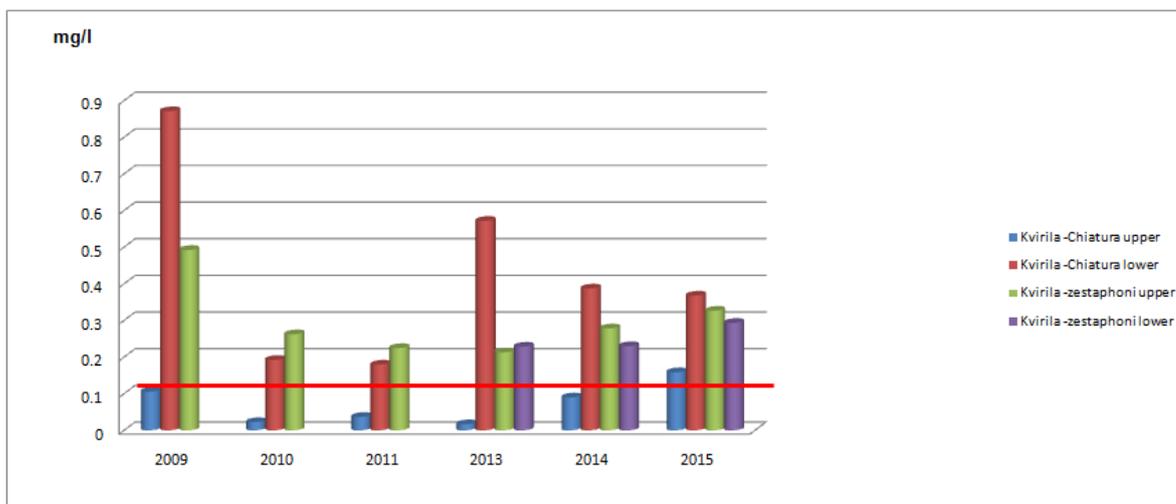
BOD5 - average annual concentration for 2009-2015years in Mtkvari river data from National Environmental Agency (the red line reflects the maximum permissible concentration, which is issued by the government Resolution №425 2013 December 31. Tbilisi)



Ammonia- average annual concentration for 2009-2015years in Mtkvari river data from National Environmental Agency (the red line reflects the maximum permissible concentration, which is issued by the government Resolution №425 2013 December 31. Tbilisi).



Ammonia- average annual concentration for 2009-2015years in Rioni river data from National Environmental Agency (the red line reflects the maximum permissible concentration, which is issued by the government Resolution №425 2013 December 31. Tbilisi).



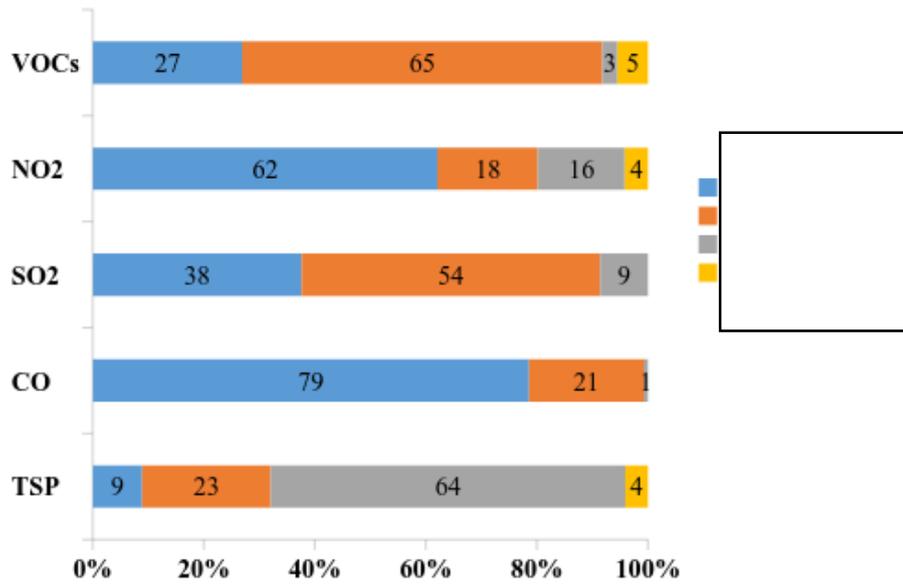
Manganese- average annual concentration for 2009-2015years in Kvirila river (The **Chiatura mine**) data from National Environmental Agency (the red line reflects the maximum permissible concentration, which is issued by the government Resolution №425 2013 December 31. Tbilisi).

Annex 3: Number of Soil Monitoring Sites for 2013-2015

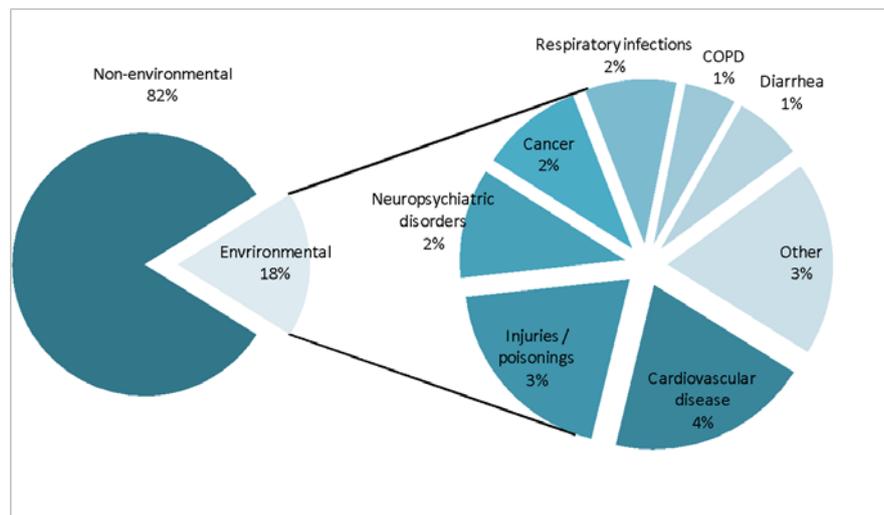
Number of soil monitoring sites for 2013-2015years provided by the National Environmental Agency of the Ministry of Environment and Natural Resources Protection of Georgia

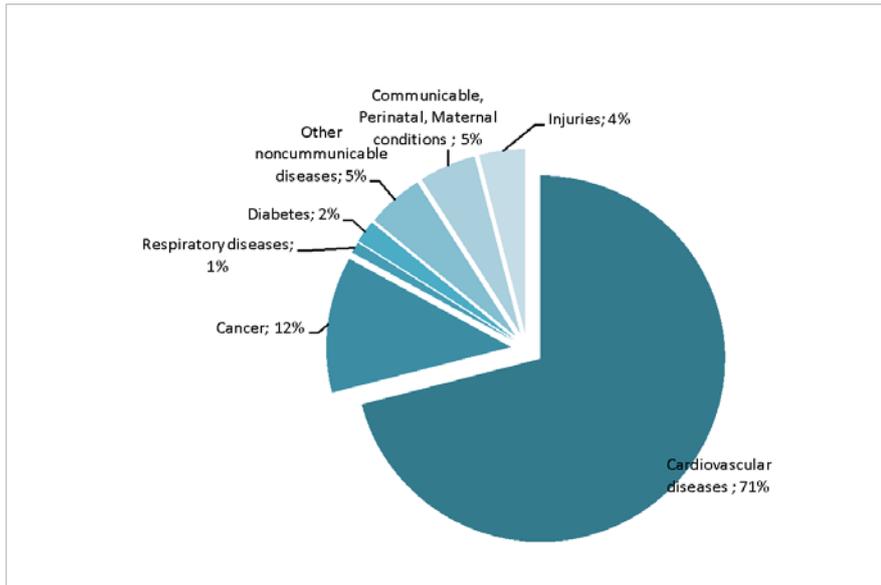
| Years | Number of monitoring sites |
|-------------|--|
| 2013 | 7 including outdated pesticides in close proximity to the former storage (one storage in the Kakheti region) |
| 2014 | 17 |
| 2015 | 30 |

Annex 4. Emission (percent per sector, 2013)

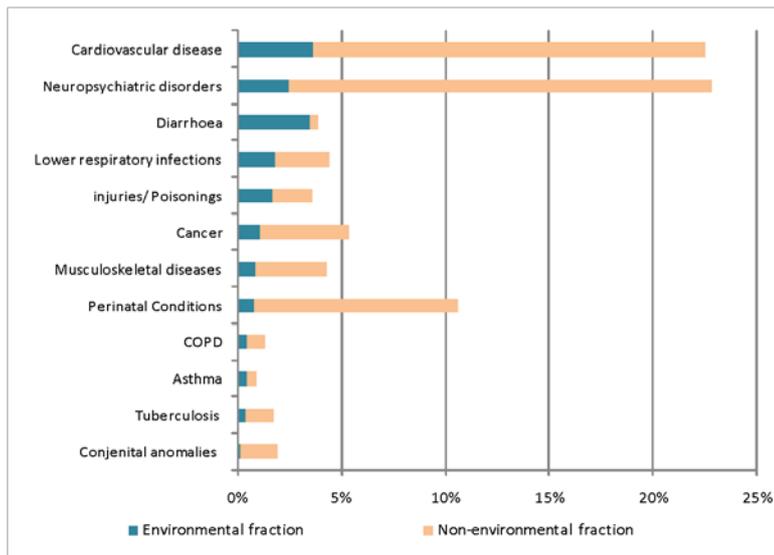


Annex 5. Mortality Structure (Georgia, all ages) (Source: Global status report on non-communicable diseases. WHO (2010))

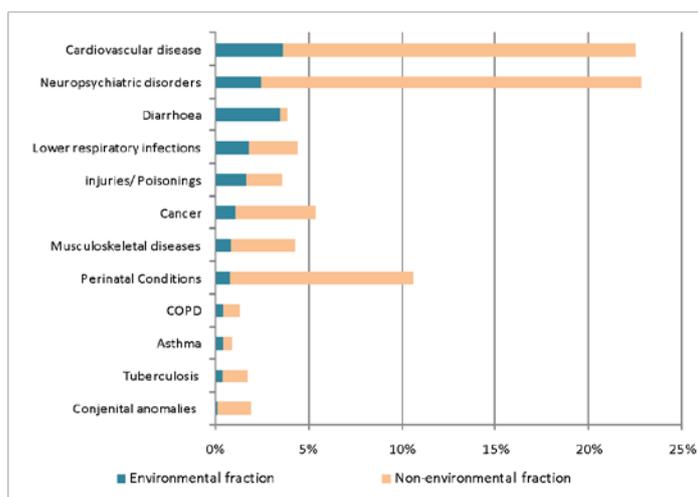




Annex 6. Disease Burden Structure by Environmental Fractions (Georgia, DALYs, all ages, 2004)



Annex 7. Diseases with Largest Environmental Contribution¹³ (Georgia, DALYs, all ages, 2004)



Annex 8. Accrued and Accumulated Revenues for 2013 (Source: State Audit Office of Georgia; Efficiency audit of solid municipal waste management; 2015, p. 45)

| 2013 | Average Customers Quantity | Fee | Accrued Revenue | Accumulated Revenue | Accumulated Rev. in % |
|-------------------|----------------------------|-----------|-----------------|---------------------|-----------------------|
| Tbilisi (6 month) | 898,422 | 2.50 | 13,476,330 | 12,426,040 | 92% |
| Batumi | 93,324 | 1.30 | 1,455,854 | 968,686 | 67% |
| 38 Municipalities | 486,251 | 0.20-1.00 | 2,657,729 | 1,231,815 | 46% |

¹³ For each disease fraction attributable to environmental risks plus non-environmental fraction comprise total disease burden

Annex 12. Policy objective-led assessment matrix

| Environmental and Health Objectives | Waste Management Action Plan's Objectives | | | | | | | | | Recommended changes to the proposed Waste Management Action Plan |
|---|--|---|--|--|--|---|--|--|--|---|
| | Waste Management legislation in harmony with EU requirements and International Conventions | Waste Management Planning system established and implemented nationally and locally | An effective waste collection and transportation developed and implemented | Waste disposed in a safe manner for the human health and environment | Waste prevented, reused, recycled and/or recovered | Waste Management Costs covered in accordance with the Polluter Pays Principle | Extended Producers Responsibility promoted and implemented | Waste Data and Information Management system established | Capacities strengthened for the national and local public sector, as well as private companies and general public to meet the requirements of the WM | |
| Minimize soil contamination | 0 | 0 | +/- If the collection /disposal is not implemented properly | + | 0 | 0 | +/- | +/- | +/- | Enforce the implementation of monitoring systems with regard to landfills |
| Adopt and implement necessary laws related to air quality | + EU waste management legislation and | 0 | + Waste collection and transportati | 0 | +/- Laws will assist to regulate waste | + Laws envisage sanctions for illegal/ | 0 | + The laws will assist to regulate waste data | 0 | |

| | | | | | | | | | | |
|---|--|--|--|---|---|--|-----|---------------------------|-----|--|
| protection | international conventions covers air protection issues | | on is a source for air pollution that can be regulated by law | | recycling or recovery in the environmentally friendly way | excess air emissions | | collection and management | | |
| Envisage landfill gas collection facilities in WM plan | + WM legislation shall envisage obligation to include gas collection facilities | + Gas collection facilities shall be included in all WM plans | + Gas collection is essential part of environmentally friendly waste disposal | 0 | | + Landfills that don't have gas collection facilities shall be fined as polluters | 0 | 0 | 0 | |
| Establishment of an effective water pollution prevention mechanism | + New legislation on water also in harmony with EU | 0 | +/- If the collection /disposal is not implemented properly | + | 0 | 0 | +/- | +/- | +/- | Started implementation of waste management action plan objectives step by step |
| Reduction of pollution from diffuse sources in agriculture | + New legislation on water also in harmony with | 0 | +/- If the collection /disposal is not | | 0 | 0 | +/- | +/- | +/- | |

| | | | | | | | | | | |
|---|--|---|----------------------|---|---|-----|-----|-----|---|---|
| | EU | | implemented properly | + | | | | | | |
| Elaboration of Municipal waste management plans including the chapter on Protected Areas | + | | | + | + | | | | | |
| | Municipal Waste Management Plans should follow EU requirements with regard to waste management | + | + | Safe waste disposal should be reflected in the Municipal Waste Management Plans | Waste disposal and recycling aspects should be unconditionally included in the waste management plans | +/0 | +/0 | +/0 | + | In general most of noted aspects are very crucial both for local municipalities and PA administrations and have to be taken into account during elaboration of waste management plans |
| Educate locals and develop effective system of waste management | 0 | + | 0 | + | + | 0 | 0 | 0 | + | This aspect of the strategy is directly related to capacity building of locals |
| Reduction of Geological Hazards by | + | + | + | | | | | + | + | Preliminary Geological assessment of the |

| | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|--|
| establishment of a modern Geological hazard monitoring system and early-warning systems | | | | + | | | | | | territory for waste material is important |
| Improvement of the groundwater monitoring system | + | + | + | + | | | | + | + | Assessment of Quantity and Quality of Groundwater is important |
| Identification and Clean-up of abandoned mining sites | + | + | + | + | | | | + | + | |
| Ensuring public health by improving environmental health monitoring and risk assessment | + | + | + | | 0 | 0 | - | + | + | |
| Preventing diseases arising from chemical, biological and physical environmental risks | + | + | + | | 0 | + | 0 | + | + | |

| | | | | | | | | | | |
|---|---|---|---|--|---|---|---|---|---|--|
| Preventing occupational or accidental exposure in solid waste management | + | + | + | | 0 | 0 | + | + | + | |
|---|---|---|---|--|---|---|---|---|---|--|