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Natural Resources of Georgia and Environmental Protection

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Natural Resources of Georgia and Environmental Protection

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FOREWORD

The present statistical publication, "Natural Resources of Georgia and Environmental Protection" provides data on use and protection of land, forest and water resources, protected areas, natural disasters, hydrometeorological events, etc. It also provides some methodological explanations from different scientific sources.

The data given in the publication reflect the main trends in the field of natural resources of Georgia and environmental protection activities in 1995-2014.

Notation keys:

...	-	No data
-	-	Event does not exist
0.0	-	Insignificant value

An insignificant difference between the summation result and the sum of the summands in some cases can be explained by rounding of the data values.

GEOGRAPHIC LOCATION AND NATURAL RESOURCES OF GEORGIA

(BRIEF OVERVIEW)

Georgia is located in the Central and western part of the South Caucasus. Total length of the border of Georgia is 2148 kilometres, out of these 1839 kilometres on land. To the west Georgia is bounded by the Black Sea – between the estuary of the river Psou and village Sarpi, to the north – by the Russian Federation, to the east – by Azerbaijan, to the south – by Armenia, and to the south west - by Turkey. The extreme west and east borders go through eastern latitude 40°05′ and 46°44′, and north and south borders – through north longitude 41°07′ and 43°35′.

Relief The territory of Georgia is spread up vertically to 5068.8 m from sea level (peak Shkhara). Georgia is distinguished with complexity of relief – about 2/3 of its territory is mountainous. Along the north border, more than 1/3 of the country area is occupied by the Caucasus Mountain System. The relief of Georgia is represented by high, medium and low mountains, uplands and plains. There are following principal orographic units in Georgia: the Caucasus Mountains, the intermountain plains divided by Likhi Ridge into Kolkheti and Iveria Valleys and Trialeti Ridges (part of the Small Caucasus Mountain System). Some of the peaks of the main watershed ridge of the Caucasus Mountains in Georgia are higher than 5000 m.

Climate Georgia is characterized by almost every climate zone existing on the earth, from humid sub tropical climate to eternal snow and glaciers zone. Diversity of the climate in Georgia is determined by its location on the northern border of the subtropical zone between the Black and the Caspian Seas on the one hand and by complexity of its relief on the other hand. Average temperature in January is +3°C (on Kolkheti Valley), and in August – +23°C - +26°C. The ridges of various direction and height play an important role in climate formation.

A local climate is determined by the Caucasus Mountains which protects Georgia from cold air masses incursion and by the Black Sea which makes the temperature moderate and facilitates to greater precipitation, especially in western Georgia, where annual amount of precipitation is 2800 mm, while in eastern Georgia it is only 300 mm.

Due to its location on a relatively lower longitude and temperate cloudiness, Georgia receives a significant warmth form the sun. Average annual sunshine is 1350 – 2520 hours.

Mineral Resources There are plenty of mineral resources available in Georgia; out of them the following have industrial importance: oil, coal, non ferrous and rare metals, mining and chemical raw materials, inert materials and other mines.

Ground Waters Ground waters have a great importance in the mineral treasure of Georgia. They are very important for development of national economy of the country is highly dependent on the ground water. Georgia is also rich in thermal waters that can have a wide range of use in agriculture and energy sector. There is a big amount of fresh ground water resources in Georgia. Its distribution is very unequal – it increases from the east to the west.

Rivers River network in Georgia is unequally distributed; out of 26060 rivers with total length of about 60000 km, 18109 rivers are in western Georgia, and 7951 rivers – in eastern Georgia. Length of 25923 rivers is less than 25 km, of 121 rivers – about 25-100 km, and of 16 rivers – 100-500 km. The rivers of Georgia belong to the Black and the Caspian Sea basins. Almost all rivers of eastern Georgia form the entire system of Mtkvari and flow into the Caspian Sea, while the rivers of western Georgia independently join the Black Sea. The biggest river of Georgia (as well as of the South Caucasus) is Mtkvari. Only its middle part (400 km) is on the territory of Georgia, its origin is in Turkey and flows into the Caspian Sea, on the territory of Azerbaijan. The rivers of Georgia are fed by glaciers, snow, rain and ground waters. Water resources of Georgia are not equally distributed. Run-off of the rivers of western Georgia (together with transit) compiles 49.8 cubic kilometres, and run-off of eastern Georgia – 16.5 cubic kilometres.

The most voluminous river is Rioni; Mtkvari is much less voluminous, its run-off near Georgian Azeri border is 8.3 cubic kilometres. The following rivers - Enguri, Kodori, Bzipi, Tskhenistskali, Kvirila, Liakhvi, Aragvi, Ktsia-Khrami, and Alazani - are worth mentioning as well.

Lakes There are about 860 lakes in Georgia. Most of them are very small; therefore a total area of the lakes does not exceed 170 square kilometres (0.24% of the country territory). The lakes of Georgia are remarkable with their diverse origins. The majority of lakes in Georgia are fresh water, and part of them contains very little salt. The largest lake in area in Georgia is Lake Paravani, in volume – Lake Tabatskuri, in depth – Lake Ritza, that it is the deepest lake in the South Caucasus.

Reservoirs There are 44 reservoirs on the territory of Georgia, their total area is 163 square kilometres, and the total volume of water is 3315 million cubic metres.

There are 734 **glaciers** in Georgia and they all are located in the Caucasus Mountains. Their cumulative area is 511 square kilometres that is 0.7 % of the country territory.

Wetlands in Georgia are located on the Kolkheti Valley and its total area is 627 square kilometres. Georgia is bounded to the west by the **Black Sea**. The length of the coastline is 330 km. Within the territory of Georgia the following rivers flow into the Black Sea: Rioni, Bzipi, Kodori, Enguri and Chorokhi.

Winter is mild and warm on the coast of the Black Sea. An average temperature in January is + 4-7°C. The amount of precipitation is large during all seasons; South part of Kolkheti is especially rainy, where the annual precipitation is more than 2500 mm.

An average value of surface layer **salinity** of water in an open sea fluctuates from 17.8‰ (in spring) to 18.3‰ (in winter). From the surface to the depth of 200 metres the salinity increases up to 21.3‰. Rivers of Georgia make the sea significantly fresher near the coast, especially in spring and in the first half of summer. However, the water stays salty beyond 2-4 miles from the coast.

Fauna There is a rich and diverse fauna in Georgia, mainly represented by the elements of sub district of Mediterranean Sea of Pale arctic district, but in north part of the country the representatives of European and Siberian sub districts are also frequently met, while in south east district – species of Central Asian sub district fauna or others similar to them.

There are around 100 mammal species, more than 330 bird species, about 48 reptile species, 11 amphibian species, and 160 fish species known in Georgia. Thousands of invertebrate species are met, but an exact number is not determined yet. Animals are distributed by zones, but the species with a great ecologic valence inhabit in several zones.

The idea about necessity of protecting the nature in Georgia was formed in ancient past followed by a gradual development of legal norms. Old Georgian sources provide interesting information concerning a legal protection of single objects of nature. “The forest guards” are mentioned in the Book of King Tamar, dated 1189, and “the senior guardians” are mentioned even earlier in 1078. Norms regulating the use of water and pastures are provided in the document of the XVIII century (“Dasturmali”). One of the articles of this document protects hawks’ and peregrines’ nests. King Vakhtang’s Book of Laws also takes into account protecting water, forest and pastures. In Ioane Bagrationi’s Book of Laws (the project of public reforms in Kartl-Kakheti Kingdom) the following is mentioned: “there should be a person responsible for hunting forests and fields; nobody can hunt in the royal hunting lands without their permission”. Hunting was prohibited in a reproduction period of birds and animals.

Source: Georgian Soviet Encyclopedia

Volume “Soviet Socialistic Republic of Georgia”, 1981

DEFINITION OF TERMS

Anthropogenic	Created as a result of human activity, for example: landscape, vegetation, and soils.
Arid	Vegetation spread under dry climate conditions (desert, valley), where amount of evaporated humidity exceeds the precipitation.
Atmosphere	The gaseous mass or envelope surrounding the earth or any other celestial body.
Climate	The meteorological conditions, including temperature, precipitation, and wind that characteristically prevail in a particular region.
Configuration	A form or disposition of objects against one another.
Ecology	Social science, studies interrelations of human and nature and technical economic aspects of mentioned process.
Endemic	A plant or animal peculiar to a particular geographic area.
Epiphyte	A plant that grows on another plant upon which it depend for mechanical support but not for nutrients.
Fauna	Animal life. Animals, characteristic of a region, period, or special environment.
Flora	All the plants that live in a particular area, time, period, or environment.
Genesis	The origination.
Hydrosphere	The aqueous envelope of the earth (oceans, seas, lakes, rivers).
Landscape	A general view of any place, part of the earth surface characterized by a particular combination of relief, climate, and animals.
Meteorite	A stony or metallic mass of matter that has fallen to the earth surface from cosmic space.
Mile	A unit of length, employed mainly for marine navigation. The International Nautical Mile equals to 1.85 km.
Mineral	A natural chemical substance or element that is naturally formed under the ground.

Nival	Associated with a great cold; for example: nival zone – the highest natural zone of mountains, which normally is located above the snow zone (otherwise: permanent snow belt).
Orography	The study of the physical geography which studies the relief of the earth surface.
Phitocenosis	Unity of such plants that grow together and have close relations with one another and environment. A plant community.
Photosynthesis	The process by which a green plant turns water and carbon dioxide into food when the plant is exposed to light.
Promile, ‰	A tenth of a percent or one part per thousands.
Radiation	Emission of electromagnetic energy by a particular body.
Steppe	A large, flat area of land with grass and very few trees especially in a dry climate zone.
Tectonic	1. Related to movement and deformation of the earth crust. 2. Related to with composition and development of the earth crust.

LAND RESOURCES

Land resources play an important role in human life and activities. While using the land, man uses its chemical, physical and biological features. Thus, final result of the land cultivation – harvest - depends on thickness of the fertile layer, its mechanical composition, availability of chemical substances, i.e. soil fertility. Land represents the territorial-spatial basis in industrial activities (except the mining industry), in construction and infrastructure sectors. Land is one of the main national wealth that needs special care and protection; almost half of natural wealth of Georgia counts on soil.

Georgia is a highland country. Lowland zone covers only 46% of the country territory. The land resources are characterized by a high level of agricultural utilization and high natural fertility of arable lands. Territorial distribution of lands in Georgia, similarly to other components, is subject to the rule on vertical zoning:

I zone (up to 250 m above sea level) – mainly characterized by sub tropical cultures of western Georgia.

II zone (250-500 m) – area of horticulture, viticulture, market-gardening and intensive field activities.

III zone (500-1000 m) – dominates cereals, arable lands, and animal husbandry.

IV zone (1000-1500 m) - grasslands; field activities are weakly developed;

V zone (1500-2000 m) – mainly grasslands.

VI zone (above 2000 m) – agriculture does not exist.

The territory of Georgia can be divided into three parts according to utilization types:

1. Agricultural land – 15.8%;
2. Natural – farming area (forest, shrubbery, hay pastures) – 70.6%;
3. Land not used in agriculture – 13.6%.

Agricultural lands are subject to permanent changes in structure and quality, determined by cultivating new areas, intensive melioration activities, and others. Moreover, erosion processes, land salinity or bogging or flooding and other unfavourable conditions cause decreasing the size of agricultural land and worsening its quality. Thus, land resources are under permanent quantitative and qualitative changes.

LAND COVER AND LAND USE BY CATEGORIES

(On April 1, 2004)

Thousand hectare

	Total area	Of which: Agricultural land	Of which: Arable land	Permanent crops	Meadow	Pasture	Residential or farming facilities and yards	Non agricultural land
Total area[1]	**7 628.4**	**3 025.8**	**801.8**	**263.8**	**143.8**	**1 796.6**	**19.8**	**4 602.6**
Of which:								
Private land	**948.9**	**767.3**	**438.5**	**180.5**	**44.0**	**84.5**	**19.8**	**181.6**
Public land	**6 679.5**	**2 258.5**	**363.3**	**83.3**	**99.8**	**1 712.1**	**-**	**4 421.0**
Of which:								
Agricultural organizations	2 822.3	2 172.1	358.8	76.1	92.7	1 644.5	-	650.2
Non agricultural	3 857.2	86.4	4.5	7.2	7.1	67.6	-	3 770.8
Settlements	88.4	1.6	0.4	0.7	-	0.5	-	8.4
Protected areas	300.7	15.6	0.1	0.1	1.1	14.3	-	285.1
Forest	2 456.2	55.9	2.8	6.1	5.1	41.9	-	2 400.3
Industry, transport, communications, radio broadcasting, TV, other media, energy, defence and other	171.9	12.8	1.2	0.3	0.9	10.4	-	159.1
Religious organizations	4.9	-	-	-	-	-	-	4.9
Water (including territorial waters)	835.1	0.5	-	-	-	0.5	-	835.5

Source: State Department for Land Management of Georgia.

[1]Including internal waters.

SOWN AREAS

Thousand hectare

	1990	1995	2000	2005	2010	2011	2012	2013	2014
Sown area, total	**701.9**	**453.1**	**610.8**	**539.6**	**256.7**	**262.4**	**259.6**	**310.7**	**316.6**
Grain and leguminous crops	269.8	259.9	386.4	354.9	191.4	191.4	186.9	236.3	246.1
Potato, vegetables and melons	70.0	54.3	93.1	94.4	48.3	45.3	52.6	48.6	46.9
Other crops	362.1	138.9	131.3	90.3	17.0	25.7	20.1	25.8	23.6

Source: National Statistics Office of Georgia.

FOREST RESOURCES AND ITS PROTECTION

Forest is one of the important components of the biosphere. Forest area is 4.1 billion hectares in the world, i.e. about half of the total land cover. World reserve of wood is around 360 billion cubic metres, and annual growth – 3200 million cubic metres. There are about 30000 species of timber and shrubs, and thousands of bird and animal species. According to modern understanding, forest is a part of geographic landscape, unity of trees, bushes, grass, animals, birds and micro organisms which are biologically interconnected in the process of their development and affect one another and environment.

A quantitative accumulation of wood species creates new qualitative features in a forest. This ecological complex has significant and versatile impact on the environment. A forest differs from parks and gardens since the trees in a forest create a specific functional interconnections.

There are several tiers in a forest that are developed according to the species composition, the biological features of the basic plants, their age and the particular physical geographic conditions. In complex forests of moderate zone the following tiers are identified: the first one consists of trees that develop first value forest (pine, spruce, fur, beech, oak, etc.); the second one is developed by second value trees (lime, maple, hornbeam, elm, etc.); the third or under wood one is composed by bushes (nut, cornel, hawthorn and so on, etc.); the fourth and fifth ones consist of grass and moss cover. One can meet climbing plants and mosses, mushrooms and algae on the branches in the different tiers of forest.

Forests become nonhomogenous on a relatively big territory. Forests differ in species composition (pure – of one species or mixed – composed with several species), form (simple – one tier and complex – multi tier), age (one aged and various aged), origin (seeds and vegetation), frequency, productivity, etc.

The species composition and ecological features of forest vegetation change sharply according to the geographic longitudes, i.e. horizontal zones.

Georgia is a highland country, thus almost all forest (97.7%) are located on the mountain slopes. In western Georgia forests begin from sea level and cover lowlands and foothill slopes up to 500 m above sea level. In lowland swampy areas we meet willow, poplar in some places Imeretian oak, ash and beech; Elevated places and foothills are covered by Colchis forests. In under wood rhododendron, bilberry, etc. are growing. There are lots of climbing plants as well.

On lowlands and foothill slopes of dry regions of eastern Georgia (Shiraki, Eldari, Mtskheta, etc.), up to 400 – 600 m above sea level light forests are spread, mostly composed of Georgian maple, pomegranate, pistacia, junipoerus, etc. In lower zone of mountains (from 500 to 900 – 1000 m) there are oak and chestnut forests. Chestnuts are met in both eastern (Kakheti) and western Georgia. On lime soils of western Georgia and dry districts of eastern Georgia (Kartli, Gare Kakheti) oaks and hornbeams are spread instead of chestnuts. Medlar, hawthorn, cornel, nuts, etc. grow in lower zone of mountains. In middle zone of mountains (900 – 1000 – 1500 – 1600 m) beech is growing in some cases purely and in some cases mixed with hornbeam, field maple, lime, spruce, etc.

In Georgia one cannot meet the beech zone only in Meskhet-Javakheti, here it is replaced by spruce, fir and pine. High zone of mountain is represented by dark coniferous forests. In western Georgia it begins from 1400 m and often reaches high margin of forest distribution. These forests are composed with the Eastern spruce and Caucasian fir, that form multiaged, highly productive, diverse pure and mixed zones. Beeches, elms, limes as well as pines are also growing here. Great number of pines is also distributed in the mountainous part of Tusheti, Meskheti and Trialeti ridge. In the districts where there are no spruces and firs (Gare and Shida Kakheti) beeches are spread. Upper zone of mountain (from 1900 – 2100 to 2400 m) is covered by subalpine forests. Crooked forests that are spread in all districts are mainly presented by birches and beeches. Subalpine light is more typical for western Georgia and is composed with highland maple, highland oak.

Forest is a global and vital factor for the entire ecological system of the earth. It is one of the live substance accumulators on our planet, as it retains a large amount of chemicals and water in the biosphere. A forest actively interrelates with the troposphere and determines the level of oxygen and carbon balance. Land vegetation and its main component – forest, provide more than 60% of the oxygen in the biosphere. One hectare mixed forest absorbs 13-17 tons of carbon dioxide and generates 10-15 tonnes of oxygen. Forest is the most productive formation of our planet and is characterised by the highest intensity of the biological circle. A biomass accumulated in the forest considerably exceeds the biomass of grass and other vegetations. Annual growth of one hectare forest phitomass is 10-30 tonnes on average, of vegetation – 9 tonnes and of tundra – 2 tonnes.

Forest has various functions: forest is a strong accumulator of the solar energy. It has a significant influence on climate formation, on water turnover in nature, and air circulation in the atmosphere; thus, forest ensures the conditions necessary for human life. The starting point of this circle is the process of photosynthesis that generates oxygen. While in 30-50s forest was generating just 30% of planet's oxygen, now forest provides 60% of biologically active oxygen, the rest is supplied by marine and oceanic plankton, and field and garden plants. Oxygen generated by a forest is qualitatively different from marine and ocean oxygen, since it is full of negative ions. This significantly increases biological features of forest, since a positive influence of negative ions on the human organism is proved by scientists. Ionization of forest oxygen is 2-3 times more than marine one and 5-10 times more than ionization of urban atmosphere.

Forest cleans the air form dust. One hectare forest filters 50-70 tonnes of dust annually, and consequently forests of Georgia filter about 135-190 million tonnes of dust.

Forest regulates intensity of snow melting, significantly reduces speed of air circulation and protects useful fauna and microorganisms. A lot of forest plants restrain disease-causing organisms and make the environment healthier. Forest is a powerful sanitary factor that ensures human life and health.

Water protecting function of forest is very important. It facilitates normal and equal supply of water to the rivers and other water resources (lakes, springs, etc.), prevents floods, improves water quality and protects it from pollution. The role of forest is also important for increasing the soil fertility and protecting it from water and wind erosion. A majority of the arable lands are located in unstable and insufficient humidity zones. A protective forest planting belongs to the activities directed against draught and erosion.

Forest is distributed on all continents, except Antarctica. In the past times forest was spread over a larger area, part of which was later occupied by agricultural lands, cities and industrial complexes.

Forest is a source of many resources: timber, bark, branches, leaves, fruit, seeds, mushrooms, etc. It is widely used in industry and other sectors. Forest is one of the biological resources that have regeneration ability. It has biochemical function, participates in formation of diverse landscapes, has a great water preserving, soil protecting, climate regulating and sanitary hygienic importance; thus, protection of forest and its rational use has a great economic and vital importance.

In Georgia forest fund is registered in every ten years. For the first time this was done in 1959 in Borjomi, Akhaltsikhe and Abastumani forests. Statistical survey of the Borjomi forests was a first attempt of organizing processing forestry information on mountain forests in the Caucasus. Organizing forest parks is one of the forms of arranging forests in Georgia.

The main goal of the forestry is meeting the demand for forest products of national economy and population, without exhausting the forest resources. This problem should be solved without reducing the forest area, preserving forest productivity, and protecting its environmental, sanitary-hygienic and other useful characteristics. Forestry, as a production sector, has a peculiarity – a significantly long period of forest growth. One turnover of forestry takes as much time as necessary for 80 – 150 turnovers of agriculture. Changes in the forestry are basically unnoticeable for one generation.

Forest is a renewable natural resource – in case of a rational use, it retains and improves its natural features and ensures a proper change of generations. A miscellaneous importance, the length of growth, and the need for a rational use of forest determine specificity of relations between human and forest. Timber logging should be done carefully in order to encourage development of highly productive forests.

Lack of adequate road infrastructure hinders proper logging in Georgia. Road construction in mountainous regions is very expensive, thus agencies interested in a complex utilization of highland areas should cooperate.

Protecting forests from fire has a great ecological importance – fire destroys young trees and burns vegetation; this of course worsens physical – chemical, water preserving, and soil protecting features of soil. Danger of wind and water erosion also increases. In the past wildfire was quite frequent in Georgia and was spread on large areas. For example, there was a strong forest fire in 1884, named “Gujareti”. It covered 30 thousand hectares of forest from Tsagvery-Bakuriani to ravine of the River Tana. The wildfire was active for several months, population of Kartli and the military divisions were mobilized for its localization.

Implementation of forestry activities is very important for fighting against forest fires. Fire brigades should be organized and properly equipped, public awareness should be improved concerning these issues.

DEFINITION OF TERMS USED IN TABLES

Forest	Part of geographic landscape with a high density of trees, bushes, grass, animals and others that are biologically connected and have an impact on one another.
Area covered by forest	Part of the forest fund that in fact is covered by forest-forming species.
Area not covered by forest	Part of the forest fund that is covered by felled areas, valleys, sparse places, dead plants, etc.
Forest restoration	Conducting activities for forest restoration: cleaning the felled, burnt and unplanted areas. Forest restoration activities include forest planting and seeding, as well as facilitating natural recovery.
Facilitating natural recovery of forest	The activities facilitating to reproduction and preservation of growing and young valuable species. These activities include partial loosening of soil after felling the trees, facilitating tree seeding, protecting the valuable growing species.
Forest seeding	The process of sowing tree seeds in the forest area. It can be done both manually and mechanically.
Forest planting	The process of planting tree seedlings on the forest area.
Forest area	Part of the country territory covered by forest, as well as the part that is not covered by forest but is intended for the forestry needs; Forest fund includes state forests (managed by public agencies and protected forests) and forests owned by public and other forestry. Forest fund is registered according to the covered areas and timber volume.
Logging	Cutting down the trees according to their age categories (young, middle aged, matured, and aged) and cutting types, for processing and wood purposes.
Illegal logging	Cutting down the trees without permission.
Operational expenses of the National Forestry Agency	Expenditures on operation of the National Forestry Agency, such as: forest arrangements, forest restoration, development of forest protection lines, protecting forest form fire, pests, diseases, etc. as well as expenses on the office of the agency.

FOREST AREA OF GEORGIA
2014

Thousand hectare

	Forest area
Forest area, total	**2 757.6**
Of which:	
Under the National Forestry Agency	2 005.8
Under the Adjarian Forestry Agency	153.4
Under the Agency of Protected Areas	598.4
Abkhazia A/R	…

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.
Agency of Protected Areas.

FOREST COVER OF GEORGIA BY REGIONS

Thousand hectare

Territory	Forest area	Of which covered by forest
Forest cover, total	**2 159.2**	**2 015.9**
Abkhazia A/R	…	…
Adjara A/R	153.4	139.6
Samegrelo-Zemo Svaneti	272.8	256.4
Guria	86.1	82.7
Imereti	312.7	301.2
Racha-Lechkhumi and Kvemo Svaneti	282.1	268.0
Shida Kartli	237.3	213.6
Mtskheta-Mtianeti	250.6	238.0
Kakheti	288.4	268.2
Kvemo Kartli	144.1	131.0
Samtskhe-Javakheti	131.8	117.2

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Note: table does not include forest cover under protected areas.

FOREST COVER OF GEORGIA

Year	Forest area	
	Million hectare	Percentage share in the country territory
2000	2.77	39.9
2005	2.77	39.9
2010	2.77	39.9
2011	2.77	39.9
2012	2.82	40.5
2013	2.66	38.2
2014	2.17	31.4

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.
Agency of Protected Areas.

NUMBER OF EMPLOYEES AT THE NATIONAL FORESTRY AGENCY

Thousand person

	1995	2000	2005	2010	2011	2012	2013	2014
Number of employees	3.5	7.4	2.0	0.7	0.7	0.8	0.9	1.0

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.

OPERATING COSTS OF THE NATIONAL FORESTRY AGENCY

Thousand GEL

	1995	2000	2005	2010	2011	2012	2013	2014
Total amount	2 081	940	3 237	6 574	8 512	10 524	8 007	14 114

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.

FOREST FIRE

	1995	2000	2005	2010	2011	2012	2013	2014
Number of fire cases, unit	**1**	**34**	**16**	**6**	**4**	**11**	**35**	**69**
Forest area covered by fire, hectare	7	85	26	370	7	199	88	705
Monetary loss of forestry caused by forest fires, thousand GEL	0.3	11.3	0.6	...	...	...	...	...

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.
Note: table includes forest only cover under the National Forestry Agency.

FOREST RESTORATION

Hectare

Year	Forest restoration, total	Of which:	
		Forest seeding and planting	Facilitating natural recovery of forest
1995	13 912	1 002	12 910
2000	1 158	258	900
2005	74	10	64
2010	165	111	54
2011	-	-	-
2012	4	4	-
2013	50	15	34
2014	180	80	100

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.

FOREST RESTORATION BY REGIONS

Hectare

	1995	2000	2005	2010	2011	2012	2013	2014
Georgia, total	**13 912**	**1 158**	**74**	**165**	**-**	**4**	**50**	**180**
Tbilisi	125	18	1	-	-	-	-	-
Abkhazia A/R	...	...	...	...	...	...	...	...
Adjara A/R	3 070	11	1	-	-	-	34	118
Samegrelo-Zemo Svaneti	2 121	173	4	-	-	-	-	-
Guria	1 125	163	-	-	-	-	-	0.0
Imereti	1 180	81	-	-	-	-	-	0.0
Racha-Lechkhumi and Kvemo Svaneti	2 533	247	-	-	-	-	-	-
Shida Kartli	854	133	64	-	-	4	-	-
Mtskheta-Mtianeti	700	68	4	0.0	-	-	-	0.0
Kakheti	1 090	47	0.0	163	-	-	-	1
Kvemo Kartli	400	75	-	-	-	-	-	-
Samtskhe-Javakheti	714	142	-	2	-	-	16	60

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.

FOREST SEEDING AND PLANTING

Hectare

	1995	2000	2005	2010	2011	2012	2013	2014
Georgia, total	**1 002**	**258**	**10**	**111**	**-**	**4**	**15**	**80**
Tbilisi	35	18	1	-	-	-	-	-
Abkhazia A/R	...	...	...	...	...	...	...	...
Adjara A/R	70	11	1	-	-	-	-	18
Samegrelo-Zemo Svaneti	211	43	-	-	-	-	-	-
Guria	25	5	-	-	-	-	-	0.0
Imereti	130	59	-	-	-	-	-	0.0
Racha-Lechkhumi and Kvemo Svaneti	33	17	-	-	-	-	-	-
Shida Kartli	44	23	4	-	-	4	-	-
Mtskheta-Mtianeti	90	18	4	0.0	-	-	-	0.0
Kakheti	220	27	0	109	-	-	-	1
Kvemo Kartli	110	25	-	-	-	-	-	-
Samtskhe-Javakheti	34	12	-	2	-	-	15	60

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.

FACILITATING NATURAL RECOVERY OF FOREST

Hectare

	1995	2000	2005	2010	2011	2012	2013	2014
Georgia, total	**12 910**	**900**	**64**	**54**	**-**	**-**	**34**	**100**
Tbilisi	90	-	-	-	-	-	-	-
Abkhazia A/R	...	...	...	...	...	...	...	...
Adjara A/R	3 000	-	-	...	...	...	33	100
Samegrelo-Zemo Svaneti	1 910	130	4	-	-	-	-	-
Guria	1 100	158	-	-	-	-	-	-
Imereti	1 050	22	-	-	-	-	-	-
Racha-Lechkhumi and Kvemo Svaneti	2 500	230	-	-	-	-	-	-
Shida Kartli	810	110	60	-	-	-	-	-
Mtskheta-Mtianeti	610	50	-	-	-	-	-	-
Kakheti	870	20	-	54	-	-	-	-
Kvemo Kartli	290	50	-	-	-	-	-	-
Samtskhe-Javakheti	680	130	-	-	-	-	1	-

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.

VOLUME OF TIMBER HARVESTED IN FORESTS

Cubic metre

	1995	2000	2005	2010	2011	2012	2013	2014
Georgia, total	**289 712**	**442 140**	**810 615**	**876 749**	**681 669**	**518 792**	**702 137**	**667 081**
Tbilisi	19 192	4 741	6 278	-	-	-	-	-
Abkhazia A/R	...	...	...	...	...	...	...	...
Adjara A/R	24 464	44 648	73 007	77 868	86 236	71 313	75 894	77 981
Samegrelo-Zemo Svaneti	22 175	55 923	110 376	91 524	42 671	44 229	57 709	49 124
Guria	4 952	24 463	56 384	16 193	10 546	26 836	10 150	12 425
Imereti	19 098	45 270	103 718	97 440	43 643	34 580	90 449	77 744
Racha-Lechkhumi and Kvemo Svaneti	16 509	52 706	52 713	37 148	42 992	51 067	54 165	58 545
Shida Kartli	13 623	23 227	52 369	103 848	70 730	43 911	85 883	66 871
Mtskheta-Mtianeti	20 341	36 029	68 938	86 944	61 884	45 517	52 772	63 897
Kakheti	44 890	61 893	119 479	181 706	150 756	91 025	136 938	124 109
Kvemo Kartli	32 552	20 757	44 100	89 704	75 668	46 622	46 980	56 817
Samtskhe-Javakheti	71 916	72 483	123 253	94 374	96 543	63 692	91 197	82 728

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.
Note: table does not include forest cover under protected areas.

ILLEGAL LOGGING

Cubic metre

	2001	2005	2010	2011	2012	2013	2014
Georgia, total	**43 287**	**62 764**	**32 948**	**7 060**	**6 104**	**5 283**	**45 443**
Tbilisi	1 430	1 722	3 156	27	-	-	-
Abkhazia A/R	...	...	...	...	...	...	...
Adjara A/R	2 577	2 676	2 052	300	339	1 671	1 895
Samegrelo-Zemo Svaneti	3 931	3 052	916	294	396	236	2 291
Guria	633	1 436	-	-	220	225	474
Imereti	6 230	8 673	2 752	951	571	1 182	9 105
Racha-Lechkhumi and Kvemo Svaneti	1 615	1 672	-	-	649	268	802
Shida Kartli	3 311	3 665	...	...	550	188	1 596
Mtskheta-Mtianeti	3 953	8 480	...	...	168	102	20 498
Kakheti	9 459	13 299	16 456	1 646	946	432	565
Kvemo Kartli	601	1 747	525	123	1 608	229	6 636
Samtskhe-Javakheti	9 547	16 342	4 006	3 518	657	752	1 583

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Forestry Agency.
Adjarian Forestry Agency.
Note: table does not include forest cover under protected areas.

EXPORT OF NON-PROCESSED TIMBER

Thousand USD

	2000	2005	2010	2011	2012	2013	2014
Total	**3 065.3**	**49.5**	**-**	**3.1**	**15.3**	**-**	**0.0**
USA	-	0.2	-	-	-	-	-
China	94.6	-	-	-	-	-	-
Spain	77.8	-	-	-	-	-	-
UK	1.2	-	-	-	-	-	-
Germany	26.8	-	-	-	-	-	0.0
Iran	-	5.6	-	-	-	-	-
Israel	8.9	-	-	-	-	-	-
Italy	87.5	-	-	-	8.1	-	-
Latvia	1.6	-	-	-	-	-	-
Russia	9.6	-	-	-	-	-	-
Greece	60.3	-	-	-	-	-	-
Armenia	-	43.7	-	3.1	7.2	-	-
Switzerland	1.0	-	-	-	-	-	-
Turkey	2 694.3	-	-	-	-	-	-
Ukraine	1.7	-	-	-	-	-	-

Source: National Statistics Office of Georgia.

EXPORT OF NON-PROCESSED TIMBER

(Volume)

Cubic metre

	2000	2005	2010	2011	2012	2013	2014
Total	**39 033**	**559**	**-**	**31**	**75**	**-**	**0.3**
USA	-	1	-	-	-	-	-
China	787	-	-	-	-	-	-
Spain	588	-	-	-	-	-	-
UK	17	-	-	-	-	-	-
Germany	251	-	-	-	-	-	0.3
Iran	-	71	-	-	-	-	-
Israel	64	-	-	-	-	-	-
Italy	755	-	-	-	15	-	-
Latvia	24	-	-	-	-	-	-
Russia	78	-	-	-	-	-	-
Greece	721	-	-	-	-	-	-
Armenia	-	487	-	31	60	-	-
Switzerland	13	-	-	-	-	-	-
Turkey	35 693	-	-	-	-	-	-
Ukraine	42	-	-	-	-	-	-

Source: National Statistics Office of Georgia.

IMPORT OF NON-PROCESSED TIMBER

Thousand USD

	2000	2005	2010	2011	2012	2013	2014
Total	**7.7**	**632.3**	**2 222.8**	**4 558.1**	**5 364.1**	**2 207.3**	**5 788.5**
Czech Republic	-	-	567.0	1 937.2	1 023.9	847.7	1 089.4
Russia	7.7	43.9	-	32.1	-	-	-
Ukraine	-	588.4	1 655.8	2 587.6	4 330.2	1 158.2	4 461.6
Netherlands	-	-	-	1.2	-	-	-
Germany	-	-	-	-	-	-	0.1
Turkey	-	-	-	-	10.0	201.4	237.4

Source: National Statistics Office of Georgia.

IMPORT OF NON-PROCESSED TIMBER
(Volume)

Cubic metre

	2000	2005	2010	2011	2012	2013	2014
Total	**212**	**8 430**	**18 803**	**23 202**	**33 771**	**10 784**	**35 505**
Czech Republic	-	-	888	2 185	1 206	1 161	1 352
Russia	212	429	-	59	-	-	-
Ukraine	-	8 001	17 915	20 957	32 530	8 487	32 805
Netherlands	-	-	-	1	-	-	-
Germany	-	-	-	-	-	-	0.0
Turkey	-	-	-	-	35	1 136	1 348

Source: National Statistics Office of Georgia

PROTECTED AREAS

"Nature reserve is a plot of land separated from the area of general use and is declared as untouched territory. In the strict nature reserve each live (plant, field, and animal) and dead nature (cave, karst cave, stalactites, spring, rock, etc.) should be protected. Logging, hay cutting, grazing, collecting fruits and mushrooms, and hunting are prohibited there" – explained Niko Ketskhoveli and added: "but this does not mean that human will not interfere in the life of nature reserve – human is responsible for monitoring the nature reserve and should intervene when needed".

"Exotic plants should not be planted in the nature reserve. Restoration should be done using local species. Animals of other regions should not be allowed in the nature reserve, since it can cause a natural misbalance. It was definitely a great mistake when Alute squirrel was brought to Borjomi Ravine, and its enormous propagation implied elimination of a local squirrel," – said Ketskhoveli.

Today the affective and flexible way for protecting the nature and using its resources is provided by the theory of sustainable development. It first of all means implementing development principles that makes possible the following:

- Guaranteed and consistent economic growth and not short term "jump" that is inevitably followed by ecological crisis and social-economic depression.
- Use of resources when the vital environment does not lose natural functioning skills and does not need compensating human activities.
- Mainly use of renewable natural recourses and extremely rational use of nonrenewable resources.
- The main principle of a sustainable development is recognizing the universal value of natural phenomenon and consequently, protecting the existing ecosystem from further modification. This implies preserving a natural condition of the landscape (geological and geomorphological composition, hydrographic network, vegetation, animal world, etc.). Protected areas, such as strict nature reserves and national parks, facilitate protection of ecosystem.

DEFINITION OF TERMS USED IN TABLES

Biocenosis	Unity of plants and animals which exist in more or less similar conditions (animals and plants of particular field or coast).
Managed nature reserve	Protected area developed for the purpose of protecting natural conditions for preservation of wild species, bio cenosis and non organic formations of national importance, which from humans' side requires special restoration and care activities. In reserve it is allowed to use particular renewable recourses in conditions of strict control.
National park	Protected area developed for protection of relatively big and wonderful ecosystems, of national and international importance, as well as for recreational activities, where not or less damaged ecosystems, bio cenosis and plants and animals included in "Red Book" of Georgia are presented.
Natural monument	Protected area developed for preservation of relatively small unique natural territories and rare natural cultural formations.
Protected area	Land territory or area of water having a special importance for preservation of cultural phenomena involved in biological diversity, natural resources and natural environment, which is protected and managed under long-term and solid legal grounds. Categories of protected areas are the following: restricted area, natural monument, national park, public reserve, and protected landscape.
Protected landscape	Protected area developed for protecting natural cultural landscape developed as a result of harmonic interaction of human and nature, preservation of vital environment, recreational tourism and traditional activities.
Strict nature reserve	A protected area created for sustaining natural and dynamic state of nature and genetic resources. It is also intended for educational activities, environment monitoring, and scientific research, having an insignificant impact on the nature.
Travertine	Dense, banded rock composed of calcium carbonate, formed by the evaporation of river and spring waters.

STRUCTURE OF PROTECTED AREAS OF GEORGIA BY ADMINISTRATIVE UNITS, 2014

	Name
1	**Administration of Borjomi-Kharagauli National Park**
	Protected areas under the supervision of the administration:
	Borjomi Strict Nature Reserve
	Borjomi-Kharagauli National Park
	Nedzvi Managed Nature Reserve
2	**Administration of Tusheti Protected Areas**
	Protected areas under the supervision of the administration:
	Tusheti Strict Nature Reserve
	Tusheti National Park
3	**Administration of Vashlovani Protected Areas**
	Protected areas under the supervision of the administration:
	Vashlovani Strict Nature Reserve
	Vashlovani National Park
	Takhti-Tepa Natural Monument
	Eagle Gorge Natural Monument
	Alazani Floodplains National Monument
4	**Administration of Kintrishi Protected Areas**
	Protected areas under the supervision of the administration:
	Kintrishi Strict Nature Reserve
	Kintrishi Protected Landscape
5	**Administration of Lagodekhi Protected Areas**
	Protected areas under the supervision of the administration:
	Lagodekhi Strict Nature Reserve
	Lagodekhi Managed Nature Reserve
6	**Administration of Mariamjvari Strict Nature Reserve**
	Protected areas under the supervision of the administration:
	Mariamjvari Strict Nature Reserve
	Korughi Managed Nature Reserve
	Iori Managed Nature Reserve
7	**Administration of Batsara-Babaneuri Protected Areas**
	Protected areas under the supervision of the administration:
	Batsara Strict Nature Reserve
	Babaneuri Strict Nature Reserve
	Ilto Managed Nature Reserve
8	**Administration of Kobuleti Protected Areas**
	Protected areas under the supervision of the administration:
	Kobuleti Strict Nature Reserve
	Kobuleti Managed Nature Reserve

continued

9	**Administration of Imereti Caves Protected Areas**
	Protected areas under the supervision of the administration:
	Sataplia Strict Nature Reserve
	Sataplia Managed Nature Reserve
	Prometheus Natural Monument
	White Cave Natural Monument
	Khomuli Cave Natural Monument
	Tsutskhvati Cave Natural Monument
	Navenakhevi Cave Natural Monument
	Nagarevi Cave Natural Monument
	Jason's Cave Natural Monument
	Sakazhia Cave Natural Monument
	Tskaltsitela Gorge Natural Monument
	Okatse Canyon Natural Monument
	Okatse Waterfall Natural Monument
	Gabzaruli Lake Natural Monument
	Satsurblia Cave Natural Monument
	Solkota Cave Natural Monument
	Didghele Cave Natural Monument
	Melouri Cave Natural Monument
	Bgheri Cave Natural Monument
	Ghliana Cave Natural Monument
10	**Administration of Mtirala National Park**
11	**Administration of Algeti National Park**
12	**Administration of Kazbegi National Park**
	Protected areas under the supervision of the administration:
	Kazbegi National Park
	Sakhiznari Natural Monument
	Abano Mineral Water Lake Natural Monument
	Truso Travertine National Monument
13	**Administration of Tbilisi National Park**
14	**Administration of Kolkheti National Park**
	Protected areas under the supervision of the administration:
	Kolkheti National Park
	Kolkheti Multi-use Teritorry
	Katsoburi Managed Nature Reserve
15	**Administration of Ajameti Managed Nature Reserve**
16	**Administration of Gardabani Managed Nature Reserve**
17	**Administration of Chachuna Managed Nature Reserve**
18	**Administration of Liakhvi Strict Nature Reserve**
19	**Administration of Pskhu-Gumista Strict Nature Reserve**
	Protected areas under the supervision of the administration:
	Pskhu Strict Nature Reserve
	Gumista Strict Nature Reserve
	Skurchi Strict Nature Reserve

Source: Ministry of Environment and Natural Resources Protectionof Georgia.
Agency of Protected Areas.

continued

20	**Administration of Ritsa Strict Nature Reserve**
21	**Administration of Bichvinta-Miusera Strict Nature Reserve**
	Protected areas under the supervision of the administration:
	Bichvinta Strict Nature Reserve
	Lidzava Strict Nature Reserve
	Miusera Strict Nature Reserve
22	**Administration of Javakheti Protected Areas**
	Protected areas under the supervision of the administration:
	Javakheti National Park
	Kartsakhi Lake Managed Nature Reserves
	Sulda Lake Managed Nature Reserves
	Khanchali Lake Managed Nature Reserves
	Bughdasheni Lake Managed Nature Reserves
	Madatafa Lake Managed Nature Reserves
23	**Machakhela National Park**
	Not yet transferred for management:
	Ktsia-Tabatskuri Managed Nature Reserve
	Tetrobi Managed Nature Reserve
	Managed by local Municipality:
	Tusheti Protected Landscape

Source: Ministry of Environment and Natural Resources Protection of Georgia.
Agency of Protected Areas.

PROTECTED AREAS OF GEORGIA BY CATEGORIES, 2014

№	Name	Total area, hectare
	Protected Areas, total	**600 717**
	Strict Nature Reserves, total	**140 672**
1	Babaneuri	862
2	Batsara	2 986
3	Bichvinta-Miusera	3 645
4	Borjomi	14 820
5	Vashlovani	10 143
6	Tusheti	12 627
7	Kintrishi	10 703
8	Lagodekhi	19 749
9	Liakhvi	6 388
10	Mariamjvari	1 040
11	Ritsa	16 229
12	Sataplia	330
13	Pskhu-Gumista	40 819
14	Kobuleti	331
	National Parks, total	**352 566**
1	Algeti	6 822
2	Borjomi-Kharagauli	61 235
3	Vashlovani	24 610
4	Tbilisi	23 218
5	Tusheti	69 515
6	Kolkheti	44 600
7	Machakhela	8 733
8	Mtirala	15 806
9	Pshav-Khevsureti	75 843
10	Kazbegi	8 687
11	Javakheti	13 498
	Managed Nature Reserves, total	**70 393**
1	Ajameti	5 117
2	Asa	3 943
3	Gardabani	3 484
4	Tetrobi	3 100
5	Ilto	6 971
6	Iori	1 336
7	Kacoburi	295
8	Lagodekhi	4 702
9	Nedzvi	8 992
10	Kobuleti	439
11	Ktsia-Tabatskuri	22 000
12	Korughi	2 068
13	Chachuna	5 200
14	Kartsakhi	158
15	Sulda	309
16	Khanchali	727
17	Bughdasheni	119
18	Madatapa	1 398
19	Sataplia	34

continued

	Natural Monuments, total	2 378*
1	Abano Mineral Lake	0.0
2	Alazani Floodplain Forests	204
3	Artsivi Gorge	100
4	Balda Canyon	6
5	Bodorna Rock Columns	18
6	Bgheri Cave	...
7	Gabzaruli Lake	...
8	Goderdzi Pertified Forest	36
9	Gochkadili Canyon	13
10	Dashbashi Canyon	669
11	Didghele Cave	...
12	Tetri Cave	2
13	Truso Travertines	4
14	Iazoni Cave	...
15	The River Abasha Waterfall	99
16	Melouri Cave	...
17	Motena Cave	2
18	Mukhura Waterfall	14
19	Nagarevi Cave	...
20	Navenakhevi Cave	...
21	Nazodealo Cave	12
22	Okatse Canion	70
23	Okatse Waterfall	...
24	Oniore Waterfall and the First Toba Cave	33
25	Ochkhomuri Waterfall	9
26	Prometheus Cave	47
27	Roshki	118
28	Sakazhia Cave	...
29	Samshvilde Canyon	475
30	Satsurblia Cave	...
31	Sakhiznari Cliff	336
32	Solkota Cave	...
33	Takhti-Tepa	10
34	Toba Waterfall and Arsen Okrojanashvili Cave	73
35	Keterisi Mineral Travertine	1
36	Ghliana Cave	...
37	Tsutskhvati Cave	...
38	Tskaltsitela Gorge	22
39	Khomuli Cave	...
40	Jvari Overpass Travertine	3
41	Jortsku Cave	2
	Protected Landscapes, total	**34 708**
1	Tusheti	31 518
2	Kintrishi	3 190

Source: Ministry of Environment and Natural Resources Protection of Georgia. Agency of Protected Areas.

*Includes only areas of the natural monuments with registered borderds and areas.

NUMBER OF ANIMALS PRESERVED IN PROTECTED AREAS OF GEORIGA

Unit

Name	1995	2000	2005	2009	2010	2011	2012	2013	2014
Chamois	672	807	594	366	552	577	1 154	589	529
Hyena	-	2	-	-	1	-	-	1	8
Brown bear	213	265	325	359	543	710	382	533	522
Deer	776	194	299	510	554	573	613	657	779
Wildcat	98	83	2 507	369	511	253	359	446	403
Marten	475	476	1 816	1 292	1 598	1 088	1 113	728	1 157
Hare	1 046	948	551	2 103	3 599	1 321	1 908	1396	1 097
Badger	290	298	7 018	703	828	585	594	725	545
Grey wolf	210	310	224	383	626	563	260	586	630
Fox	340	694	275	543	667	474	739	646	748
Wild goat	130	150	170	83	150	61	150	150	215
Nutria	30	40	-	927	1 293	240	950	1600	425
Jackal	282	187	4 173	6 209	9 151	8 899	9 088	10246	8 606
Lynx	39	37	63	75	85	77	74	1018	874
Boar	126	230	320	643	892	1 563	541	97	155
Roe	759	735	1 372	1 932	2 613	2 440	2 592	801	1 148
Squirrel	780	130	50	1 796	1 667	877	1 329	3644	2 878
Otter	10	20	168	174	411	204	374	513	270
Auroch	750	641	695	743	1 455	1 395	1 470	2160	1 277
Ounce	-	-	1	1	1	-	-	-	-
Gazelle	-	-	-	9	7	7	-	-	20

Source: Ministry of Environment and Natural Resources Protection of Georgia.
Agency of Protected Areas.

NUMBER OF BIRDS PRESERVED IN PROTECTED AREAS OF GEORGIA

Unit

Name	1995	2000	2005	2009	2010	2011	2012	2013	2014
Mountain eagle	79	55	38	50	51	29	16	79	60
Gorge eagle	...	2	10	26	46	44	17	42	60
Field eagle	...	10	10	…	...	...	...	...	…
Owl	176	419	531	630	30	347	441	714	562
Nightingale	60	90	40	60	...	40	...	...	40
Grey partridge	...	...	100	82	...	82	85	...	…
Partridge	890	365	2 120	3 168	4 670	3 455	695	2 514	3 898
Woodpecker	2 894	449	504	1 999	2 311	1 097	1 220	321	1 992
Sparrowhawk	46	97	75	535	403	139	226	276	342
Gyps	15	28	80	94	116	114	26	191	233
Caucasian grouse	412	780	982	570	845	791	439	1 146	894
Cinereous vulture	...	12	42	157	184	140	41	267	211
Eurasian woodcock	252	692	528	435	950	570	280	447	670
Black ring dove	670	...	375	251	362	16 140	5 140	3 396	2 477
Hawk	60	75	35	393	608	767	770	772	511
Black stork	...	...	10	...	20	20	20	137	125
Blackbird	2 970	1 930	1 842	5 688	3 652	12 149	3 280	1 951	3 724
Falcon	12	...	16	43	18	1 037	212	59	63
Caucasian snowcock	641	702	766	453	645	400	280	575	625
Crow	90	310	150	125	35	200	4 782	1 550	…
Mistle thrush	2 340	1 380	1 100	200	210	220	...	...	…
Eurasian jay	1 440	1 100	779	3 034	2 158	2 163	300	3 435	3 322
Pheasant	20	45	166	200	647	670	...	2 658	1 772
Black kite	...	...	50	50	17	6 613	219	56	39

Source: Ministry of Environment and Natural Resources Protection of Georgia.
Agency of Protected Areas.

EXPENSES ON MAINTANENCE OF PROTECTED AREAS AND NUMBER OF EMPLOYEES
2014

	Total number of employees	Of which				Total expenses on maintenance of restricted areas and national parks (thousand GEL)	Of which	
		Head of administration	Specialist of natural resources	Security staff	Other		From state budget (thousand GEL)	From other sources (thousand GEL)
Total in Georgia	**451**	**19**	**20**	**300**	**112**	**5,789.1**	**3,794.5**	**1,994.6**
Administration of Borjomi-Kharagauli National Park	75	1	2	59	13	826.3	527.6	298.7
Administration of Tusheti Protected Areas	32	1	1	25	5	503.0	209.7	293.4
Administration of Vashlovani Protected Areas	33	1	1	26	5	499.7	296.0	203.7
Administration of Kintrishi Protected Areas	11	1	1	7	2	75.0	67.5	7.5
Administration of Lagodekhi Protected Areas	23	1	0	18	4	317.3	173.6	143.7
Administration of Mariamjvari Strict Nature Reserve	10	1	1	8	0	100.2	88.4	11.8
Administration of Batsara-Babaneuri Protected Areas	13	1	0	12	0	118.6	107.0	11.5
Administration of Kobuleti Protected Areas	9	1	1	3	4	68.6	57.6	11.2
Administration of Imereti Caves Protected Areas	41	1	1	11	28	574.1	233.9	340.2
Administration of Mtirala National Park	18	1	1	12	4	297.5	122.3	175.2
Administration of Algeti National Park	13	1	1	9	2	92.4	81.5	10.9
Adminsitraiton of Kazbegi National Park	11	1	1	9	0	86.2	73.3	12.9
Administration of Tbilisi National Park	42	1	2	34	5	321.3	275.3	46.0
Administration of Kolkheti National Park	34	1	2	25	6	260.1	232.3	27.8
Administration of Ajameti Managed Nature Reserve	18	1	1	16	0	230.3	140.9	89.4
Administration of Gardabani Managed Nature Reserve	0	0	0	0	0	0	0	0
Administration of Chachuna Managed Nature Reserve	6	1	1	4	0	91.5	78.6	13.0
Administration of Liakhvi Strict Nature Reserve	0	0	0	0	0	0	0	0
Javakheti Rrotected Areas	10	1	0	7	2	74.0	65.1	8.9
Machakhela National Park	19	1	1	15	2	76.7	64.2	12.5
Agency of Protected Areas	33	1	2	0	30	1,176.3	899.7	276.6

Source: Ministry of Environment and Natural Resources Protection of Georgia.
Agency of Protected Areas.

WATER RESOURCES

Area of the earth surface is 510.0 million square kilometres, its 71%, that is 362.1 million square kilometres, is occupied by the ocean that creates illusion of abundance of water resources. In fact 97.5% of the total hydrosphere reserve (1353.3 million cubic kilometres) is almost useless for economic activities, due to its salinity (the World Ocean, the salty lakes and the wetlands). Share of the fresh water that exists in form of rivers, glaciers, ground waters, lakes, reservoirs and wetlands, is just 2.5% or 34.7 million cubic metres. Today only 12% of total fresh water stock, or 4.16 cubic metres is being used, that clearly demonstrates problem of fresh water deficit.

According to internal waters (rivers, lakes, ground waters, glaciers, and wetlands) Georgia was one of the leading countries in the Soviet Union. However, rivers are unequally distributed between eastern and western Georgia. In western Georgia run-off of rivers (together with transit run-off) is 49.8 km^3, and in eastern Georgia – 16.5 cubic kilometres.

The problem of water consumption has a great importance among the factors having an impact on the river ecosystem, since using of water for economic activities, especially for irrigation causes lowering the water level, i.e. reduction of water resources.

Increasing level of hydrosphere pollution is even more important and problematic. The main reasons for worsening of water quality are the following: irrigation, melioration of salty soils, wastewater, and improperly arraigned reservoir caves. Importance of this problem can be justified by the following general examples: even those wastewaters which, after treatment return to the primary sources, require 15 fold dilutions with clean water in order to restore natural quality of water.

Annual volume of wastewater of any types pollutes 12-15 times more natural water in general, that is a significant part of river run-off. Quality of river and reservoir water of Georgia is alarming. Even in 1986 pollution level per unit of river run-off was 17 times more than an average world index.

Sharp decrease in industrial production in recent years implied only one positive result: amount of hazardous substances emitted into the atmosphere and pollution level in wastewaters decreased.

Inland water resources located on the country territory are the state property and can be used only on the basis of the licenses issued by authorized agencies. Ownership of the land does

not imply permission for water use. Throwing or burring industrial, household, toxic, radiatial and other hazardous waste into the water bodies or nearby areas is prohibited as well as discharge of wastewater without having an appropriate license.

Despite of great importance of administrative-legislative policies, economically grounded scientific-technical activities play decisive role in environmental protection. For example, rational allocation of industrial objects according to availability of water resources and its quality and implementing the technologies, that ensures getting the production with minimal consumption of natural resources and minimizing potential industrial waste.

DEFINITION OF TERMS USED IN TABLES

Water extraction from natural water bodies	Volume of water taken from surface water bodies (rivers, lakes and seas) and groundwater bodies for further use. This indicator does not include volume of transit water supplied to big channels and volume of water taken by population from wells, natural reservoirs, etc.
Wastewater	Industrial and household water (including mine, fossil and draining waters) discharged to surface water bodies with no or insufficient treatment. It contains much more polluting substances than admissible amount. Wastewater flowing down to the surface water bodies is divided into three categories: polluted (not treated or insufficiently treated), normatively clean (without treatment) and normatively treated.
Water use	Use of water resources abstracted from different sources (surface, main, ground, sea, etc.) for various needs; volume of used water does not include cycling water supply, wastewater of secondary use as well as wastewater controlling draining waters.
Water use for household needs	Volume of water used by population and employees of enterprises and organizations (excluding agricultural ones) for economic, household and communal needs.
Water use for irrigation	Volume of water sypplied for all types of irrigation.
Water use for agricultural needs	Volume of water used by rural population and in agriculture for drinking, economic and industrial purposes.
Water use for industrial needs	Total volume of water used for industrial needs (excluding agriculture) and for filling the cycling water supply systems.

BIG AND MEDIUM RIVERS OF GEORGIA

Name	Length of the river*, km	River basin, sq km	Corresponding sea basin
Alazani	362	11 800	The Caspian Sea
Rioni	327	13 400	The Black Sea
Iori	320	4 650	The Caspian Sea
Mtkvari	326	118 000	The Caspian Sea
Enguri	213	4 060	The Black Sea
Ktsia-Khrami	200	8 340	The Caspian Sea
Tskhenistskali	176	2 120	The Black Sea
Khobi	150	1 340	The Black Sea
Kvirila	140	3 630	The Black Sea
Algeti	118	763	The Caspian Sea
Bzipi	110	1 510	The Black Sea
Kodori	110	2 030	The Black Sea
Supsa	108	1 130	The Black Sea
Tekhura	101	1 040	The Black Sea
Didi Liakhvi	98	2 440	The Caspian Sea
Acharistskali	90	1 540	The Black Sea
Psou	89	885	The Black Sea
Ksani	84	885	The Caspian Sea
Dzirula	83	1 270	The Black Sea
Paravani	74	2 350	The Caspian Sea
Aragvi	66	2 740	The Caspian Sea
Abasha	66	350	The Black Sea
Mashavera	66	1 390	The Caspian Sea
Patara Liakhvi	63	513	The Caspian Sea
Natanebi	60	657	The Black Sea
Khanistskali	57	914	The Black Sea
Okumi	56	559	The Black Sea
Ghalidzga	53	483	The Black Sea
Tedzami	51	404	The Caspian Sea
Mokvi	50	356	The Black Sea
Chorokhi	26	22 100	The Black Sea

*Length of the river on the territory of Georgia.

Source: Ministry of Environment and Natural Resources Protection of Georgia.

MAIN LAKES AND RESERVOIRS OF GEORGIA

Name	Surface area, square kilometre	Water volume, million cubic metre	Depth, metre	
			Average	Maximum
Lake Bazaleti	1.2	5.6	4.5	7.0
Gali Reservoir	8.0	145.0	17.0	52.0
Enguri Reservoir	13.5	1 092.0	115.0	230.0
Lisi Lake	0.5	1.2	2.6	4.0
Lake Paliastomi	18.2	52.0	2.1	3.2
Jinvali Reservoir	11.5	52.0	50.0	98.0
Lake Ritza	1.5	94.0	63.1	101.0
Samgori Reservoir	11.8	308.0	26.2	45.0
Lake Sagamo	4.8	7.7	1.6	2.3
Sioni Reservoir	12.0	325.0	25.4	67.5
Lake Tabatskuri	14.2	221.0	15.6	40.0
Tkibuli Reservoir	11.5	84.0	16.0	32.0
Lake Paravani	37.5	90.8	2.4	3.3
Shaori Reservoir	13.2	90.0	6.8	11.5
Tsalka Reservoir	33.7	312.0	9.3	25.0
Khozapini Lake	26.3	19.3	0.7	1.0
Lake Jandara	12.5	52.0	4.6	7.2

Source: Ministry of Environment and Natural Resources Protection of Georgia.

MAIN INDICATORS FOR PROTECTION AND USE OF WATER RESOURCES

Million cubic metre

	2011	2012	2013	2014
Water extraction from natural water bodies , total[1]	**31 363.4**	**29 209.5**	**28 632.1**	**32,080.8**
Of which from ground water bodies	381.2	367.8	403.2	399.0
Water use, total[1]	**29 649.1**	**28 570.9**	**27 436.8**	**30,407.8**
Of which for the following needs:				
Household	439.2	330.2	448.2	434.4
Industrial	357.9	362.5	324.6	1924.0
Irrigation, agricultural and other[1]	28 852.0	27 678.2	26,664.0	28,049.5
Waste water discharge into surface water bodies, total[1]	**28 198.6**	**27 235.1**	**27 144.0**	**30 090.6**
Of which polluted[1]	626.3	475.3	438.2	477.7
Losses on water transportation	570.7	445.1	395.5	486.9
Cycling and secondary water supply	238.1	224.0	309.0	316.0

Note: [1]Including the water used by hydroelectric power plants.

Source: Ministry of Environment and Natural Resources Protection of Georgia.
Water Resources Management Service.

INDICATORS FOR WATER EXCTRACTION, USE, AND DISCHARGED WASTEWATERS BY ADMINISTRATIVE-TERRITORIAL UNITS, 2014

Million cubic metre

	Water extraction from natural water bodies	Water use	Wastewater discharged into surface water bodies
Georgia, total	**28 632.1**	**27 436.8**	**27 144.0**
Tbilisi	4 513.0	4 307.0	4 218.5
Abkhazia A/R	...	...	...
Adjara A/R	900.6	895.6	896.8
Samegrelo-Zemo Svaneti	4 200.0	4 198.2	4 195.5
Guria	121.0	110.7	110.7
Imereti	10 807.6	10 217.0	10 248.3
Racha-Lechkhumi and Kvemo Svaneti	1 521.0	1 491.8	1 491.8
Shida Kartli	107.5	106.9	69.1
Mtskheta-Mtianeti	3 700.4	3 666.8	3 661.8
Kakheti	520.0	469.3	458.4
Kvemo Kartli	900.3	745.8	564.2
Samtskhe-Javakheti	1 340.7	1 227.6	1 222.0

Source: Ministry of Environment and Natural Resources Protection of Georgia.
Water Resources Management Service.

AMBIENT AIR PROTECTION

Atmospheric air that surrounds the earth is one of the main components of environment and represents source of life on our planet. Atmosphere protects the earth from destructive impact of meteorites: most of them burn while flying through the dense layers of atmosphere; it also detains a large share of ultraviolet radiation and ensures life existence on the earth. Atmosphere basically consists of nitrogen (78.084%) and oxygen (20.976%). Carbon dioxide has a very small share in the atmosphere (0.0314%), but plays a special role since it absorbs and releases long wave radiation. Moreover, carbon dioxide is essential for plants.

Atmosphere always contains water steam in different quantities and its role is significant in atmospheric events: water steam condensation causes creation of clouds and precipitation, and its transformation is followed by absorption or emission of big amount of warmth. It is well known that a person daily consumes about 1 kg food, 1.5 litre water and 12 kg air in relaxed condition. It is possible to check the quality of water or food and treat them when needed, but the air is consumed as it is in the environment. This is a good example for realizing importance of protecting of atmospheric air form hazardous substances.

Air pollution is spread in several kilometres vertically. During the last decades the amount of polluting substances into atmospheric air increased twenty times. Atmosphere is highly polluted by the enterprises of black and coloured metallurgy, and chemical industry that emit sulphur gases, carbon dioxide, dust and other substances.

Transport emissions have a significant share in total air pollution. One of the alternatives for reducing transport emission can be improvement of internal combustion engine and petrol quality, use of electro mobiles, etc. In the near future the substance substituting mentioned types of fuel will be hydrogen, which is cheaper and more flexible than electricity. In combustion process it mixes with oxygen and without smoke develops steam in insignificant amount.

Greening industrial sites and development of forestry economy has a great importance for implementation of measures aiming protection of atmospheric air. One hectare forest filters about 50 – 70 tonnes of dust per year. The forest is directly connected to improvement of the health of atmospheric air and protection of water resources, since oxygen is basically filled by photosynthesis. 1 hectare forest emits 10-15 times more oxygen than any phitocenosis.

DEFINITION OF TERMS USED IN TABLES

Decontaminated hazardous substances	Amount of hazardous substances collected as a result of decontamination of gas and air emitted from stationary sources. It does not include hazardous substances used in technological processes of production in form of raw materials or intermediate products.
Hazardous substances emitted into the atmosphere from stationary sources	Total amount of all hazardous substances emitted into the atmosphere as a result of incomplete filtration and cleaning by abatement equipment. This does not include hazardous materials generated as a result of erosion, forest fire, etc.
Stationary sources emitting hazardous substances into the atmosphere	These sources can be organized and nonorganized; organized sources are immobile sources out of which hazardous substances are emitted from gas and air discharging systems (chimneys, ventilation devices, etc.). The system gives possibility to use gas cleaning and dust collection equipment, for decontamination of hazardous substances. The source is considered non-organized when hazardous substances directly go into the atmosphere due to non-hermetic protection of technological aggregates, loading systems (for example: places for loading cement, etc.).

NUMBER OF STATIONARY SOURCES EMITTING POLLUTANT SUBSTANCES

Unit

	1990	1995	2000	2005	2010	2011	2012	2013	2014
Number of enterprises emitting hazardous substances	405	132	117	153	1 099	1 365	1 398	1 835	2 486
Total sources emitting hazardous substances	9 263	3 007	1 401	693	...	...	...	...	...
Among them organized	8 460	2 752	1 238	563	...	...	...	...	...

Source: Ministry of Environment and Natural Resources Protection of Georgia.

MAIN INDICATORS OF GENERATION OF HAZARDOUS SUBSTANCES IN STATIONARY SOURCES AND PROTECTION OF ATMOSPHERIC AIR

Thousand ton

	1990	1995	2000	2005	2010	2011	2012	2013	2014
Hazardous substances developed in stationary sources, total	**766.7**	**30.4**	**28.7**	**57.3**	**661.0**	**724.0**	**799.8**	**852.0**	**938.7**
Of which:									
Decontaminated hazardous substances	412.6	15.0	10.0	33.2	630.7	688.7	761.3	808.3	893.9
Share of decontaminated hazardous substances in total amount of hazardous substances emitted by stationary sources (%)	53.8	37.2	35.0	57.9	95.4	95.1	95.2	94.9	95.2

Source: Ministry of Environment and Natural Resources Protection of Georgia.

DECONTAMINATION OF HAZARDOUS SUBSTANCES GENERATED IN STATIONARY SOURCES AND EMISSION INTO THE ATMOSPHERE, BY STATIONARY SOURCES

Thousand ton

	Hazardous substances generated in stationary sources, total	Of which:		Share of decontaminated hazardous substances in total
		Decontaminated hazardous substances	Hazardous substances emitted into the atmosphere	
		2000		
Hazardous substances, total	**28.7**	**10.0**	**18.7**	**35.0**
Of which:				
Solid	9.2	5.9	3.3	64.6
Gaseous or liquid	19.5	4.1	15.4	21.1
Of which:				
Sulphur dioxide	0.4	-	0.4	-
Carbon oxides	3.7	1.9	1.8	51.0
Nitrogen oxides	4.1	1.0	3.1	23.5
Hydrocarbon	8.1	-	8.1	-
Other	3.2	1.2	2.0	0.8
		2005		
Hazardous substances, total	**57.3**	**33.2**	**24.1**	**57.9**
Of which:				
Solid	34.5	29.6	4.9	85.8
Gaseous or liquid	22.8	3.6	19.2	15.8
Of which:				
Sulphur dioxide	0.9	-	0.9	0
Carbon oxides	12.1	2.6	9.5	21.5
Nitrogen oxides	2.8	0.7	2.1	25.0
Hydrocarbon	6.6	-	6.6	0
Other	0.4	0.3	0.1	0
		2010		
Hazardous substances, total	**661.0**	**630.7**	**30.1**	**95.4**
Of which:				
Solid	631.6	628.0	3.7	99.4
Gaseous or liquid	29.3	2.8	26.5	9.6
Of which:				
Sulphur dioxide	1.8	-	1.8	-
Carbon oxides	15.1	1.5	13.7	10.0
Nitrogen oxides	4.0	1.0	3.0	25.0
Hydrocarbon	7.5	-	7.5	-
Other	1.0	0.4	0.5	40.0
		2011		
Hazardous substances, total	**724.0**	**688.7**	**35.2**	**95.1**
Of which:				
Solid	690.4	685.4	4.9	99.3
Gaseous or liquid	33.6	3.3	30.3	9.8
Of which:				
Sulphur dioxide	2.2	-	2.2	-
Carbon oxides	16.0	2.1	13.8	13.1
Nitrogen oxides	5.0	0.6	4.4	12
Hydrocarbon	9.7	-	9.7	-
Other	0.9	0.6	0.2	66.7

continued

	Hazardous substances generated in stationary sources, total	Of which:		Share of decontaminated hazardous substances in total
		Decontaminated hazardous substances	Hazardous substances emitted into the atmosphere	
		2012		
Hazardous substances, total	**799.9**	**761.3**	**38.6**	**95.2**
Of which:				
Solid	762.9	757.7	5.2	99.3
Gaseous or liquid	37.0	3.6	33.4	9.7
Of which:				
Sulphur dioxide	2.0	-	2.0	-
Carbon oxides	17.7	2.0	15.7	11.2
Nitrogen oxides	5.2	0.6	4.6	11.5
Hydrocarbon	11.3	0.2	11.1	1.8
Other	0.9	0.7	0.2	77.8
		2013		
Hazardous substances, total	**852.0**	**808.3**	**43.7**	**94.8**
Of which:				
Solid	808.5	804.0	4.5	99.4
Gaseous or liquid	43.5	4.3	39.2	9.9
Of which:				
Sulphur dioxide	2.1	0.0	2.1	0.0
Carbon oxides	22.8	2.6	20.3	11.4
Nitrogen oxides	7.0	0.8	6.2	11.4
Hydrocarbon	5.8	0.1	5.7	1.7
Other	5.7	0.8	4.9	14.0
		2014		
Hazardous substances, total	**938.7**	**893.9**	**44.7**	**95.2**
Of which:				
Solid	895.7	890.0	5.7	99.3
Gaseous or liquid	43.0	3.9	39.0	9.1
Of which:				
Sulphur dioxide	2.6	0.1	2.5	3.8
Carbon oxides	21.8	2.3	19.6	10.6
Nitrogen oxides	7.8	1.1	6.7	14.1
Hydrocarbon	7.8	0.0	7.8	0.1
Other	3.0	0.4	2.5	13.3

Source: Ministry of Environment and Natural Resources Protection of Georgia.

DECONTAMINATION AND EMISSION INTO THE ATMOSPHERE OF HAZARDOUS SUBSTANCES GENERATED IN STATIONARY SOURCES, BY ADMINISTRATIVE UNITS

Thousand ton

	Hazardous substances generated in stationary sources, total	Of which:	
		Decontaminated	Emitted into the atmosphere
2000			
Georgia, total	**28.7**	**10.0**	**18.7**
Tbilisi	0.8	0.2	0.6
Abkhazia A/R	...	...	...
Adjara A/R	9.8	0.0	9.8
Samegrelo-Zemo Svaneti	0.5	0.0	0.4
Guria	0.0	0.0	0.0
Imereti	3.6	3.1	0.5
Racha-Lechkhumi and Kvemo Svaneti	-	-	-
Shida Kartli	0.2	0.1	0.1
Mtskheta-Mtianeti	0.2	-	0.2
Kakheti	0.0	0.0	0.0
Kvemo Kartli	13.5	6.7	6.8
Samtskhe-Javakheti	0.0	-	0.0
2005			
Georgia, total	**57.3**	**33.2**	**24.1**
Tbilisi	3.0	0.1	2.9
Abkhazia A/R	...	...	...
Adjara A/R	4.1	0.0	4.0
Samegrelo-Zemo Svaneti	0.3	-	0.3
Guria	-	-	-
Imereti	27.8	19.2	8.6
Racha-Lechkhumi and Kvemo Svaneti	-	-	-
Shida Kartli	11.0	8.2	2.8
Mtskheta-Mtianeti	0.8	0.4	0.4
Kakheti	0.0	0.0	0.0
Kvemo Kartli	10.2	5.4	4.8
Samtskhe-Javakheti	0.0	0.0	0.0
2010			
Georgia, total	**661.0**	**630.7**	**30.1**
Tbilisi	26.0	24.8	1.2
Abkhazia A/R	...	...	...
Adjara A/R	4.2	2.1	2.1
Samegrelo-Zemo Svaneti	5.4	4.3	1.1
Guria	0.0	-	0.0
Imereti	20.5	5.7	14.8
Racha-Lechkhumi and Kvemo Svaneti	0.0	-	0.0
Shida Kartli	237.0	232.8	4.2
Mtskheta-Mtianeti	8.7	8.3	0.4
Kakheti	3.8	3.3	0.5
Kvemo Kartli	355.0	349.0	6.0
Samtskhe-Javakheti	0.5	0.4	0.1

continued

	Hazardous substances generated in stationary sources, total	Of which:	
		Decontaminated	Emitted into the atmosphere
	2012		
Georgia, total	**799.8**	**761.2**	**38.6**
Tbilisi	37.6	36.7	0.9
Abkhazia A/R	...	...	...
Adjara A/R	3.8	1.5	2.3
Samegrelo-Zemo Svaneti	6.8	5.5	1.3
Guria	0.4	0.3	0.1
Imereti	74.9	57.1	17.8
Racha-Lechkhumi and Kvemo Svaneti	0.0	-	0.0
Shida Kartli	267.3	263.1	4.2
Mtskheta-Mtianeti	11.1	10.6	0.5
Kakheti	2.7	2.1	0.6
Kvemo Kartli	393.8	383.0	10.8
Samtskhe-Javakheti	1.1	1.0	0.1
	2013		
Georgia, total	**852.0**	**808.3**	**43.7**
Tbilisi	20.3	16.8	3.5
Abkhazia A/R	...	...	...
Adjara A/R	3.3	1.2	2.1
Samegrelo-Zemo Svaneti	5.7	5.1	0.6
Guria	1.3	0.4	0.8
Imereti	80.6	65.7	14.9
Racha-Lechkhumi and Kvemo Svaneti	0.8	0.8	0.1
Shida Kartli	311.3	304.2	7.1
Mtskheta-Mtianeti	37.1	36.5	0.6
Kakheti	2.2	1.7	0.5
Kvemo Kartli	388.8	375.4	13.4
Samtskhe-Javakheti	0.6	0.5	0.1
	2014		
Georgia, total	**938.7**	**893.9**	**44.7**
Tbilisi	21.4	17.4	4.0
Abkhazia A/R	...	...	...
Adjara A/R	2.6	1.1	1.5
Samegrelo-Zemo Svaneti	6.1	5.4	0.7
Guria	1.3	0.4	0.8
Imereti	62.1	47.9	14.2
Racha-Lechkhumi and Kvemo Svaneti	0.8	0.7	0.1
Shida Kartli	366.3	358.8	7.5
Mtskheta-Mtianeti	2.5	1.7	0.8
Kakheti	2.8	2.0	0.8
Kvemo Kartli	471.8	457.6	14.2
Samtskhe-Javakheti	1.0	0.9	0.1

Source: Ministry of Environment and Natural Resources Protection of Georgia.

DECONTAMINATED AND EMITTED HAZARDOUS SUBSTANCES GENERATED IN STATIONARY SOURCES IN CITIES, AND THEIR SHARE IN POLLUTION OF ATMOSPHERIC AIR OF REGION AND COUNTRY, 2014

Thousand ton

City	Hazardous substances			City share, percentage	
	Generated	Of which			
		Decontaminated	Emitted	In pollution of atmospheric air of region	In pollution of atmospheric air of country
Tbilisi	21.4	17.4	4.0	100.0	8.9
Kutaisi	6.1	5.8	0.3	5.2	11.6
Rustavi	455.5	447.4	8.1	57.0	18.1
Batumi	1.9	0.6	1.3	86.7	2.9
Zestaponi	50.4	41.2	9.2	64.8	20.6
Kaspi	358.5	352.0	6.5	86.7	14.5
Gardabani	1.7	0.0	1.7	12.0	3.8
Poti	4.4	4.1	0.3	14.2	0.7

Source: Ministry of Environment and Natural Resources Protection of Georgia.

EXHAUST EMISSIONS FROM ROAD TRANSPORT BY TYPE, 2014

Thousand ton

Hazardous substances	Amount
Carbon oxides	87.9
Nitrogen oxides	22.8
Hydrocarbons	13.6
Sulphur dioxide	2.8
Soot	0.9
Ammonia	0.3
PM10	0.3
PM2.5	0.2
Other hazardous substances	0.0

Source: Ministry of Environment and Natural Resources Protection of Georgia.

HAZARDOUS EVENTS

DEFINITION OF TERMS USED IN TABLES

Avalanche	A rapid flow of snow or land down a sloping surface.
Flash Flood	A sudden raise f water level caused by heavy rains and intensive snow melting.
Flood	An overflow of river water that submerges land (during heavy rains or melting of snow).
Hail	A form of solid precipitation that consists of ball or irregular lumps of ice.
Hurricane	Very strong wind, velocity of which exceeds 20 mpc and which causes strong storm on the sea and damage of buildings on the ground.
Landslide	A geological phenomenon which includes a wide range of ground movements, such as rockfalls and deep failure of slopes. Its primary driving force is the action of gravity.
Mudflow	A downhill movement of soft wet and debris, made fluid by rain or melted snow and often building up great speed.
Squall	Short hurricane.

FREQUENCY OF GEOLOGICAL PHENOMENA (LANDSLIDE, MUDFLOW), APPROXIMATE MONETARY LOSS, NUMBER OF HUMAN FATALITIES, AND VULNERABLE OBJECTS 1995-2014 YEARS

Year	Landslide			Mudflow			Total monetary loss (million GEL)	Vulnerable objects		
	Number of landslides (activated or newly occurred)	Approximate direct monetary loss (million GEL)	Number of human fatalities	Number of mudflows	Approximate direct monetary loss (million GEL)	Number of human fatalities		Affected agricultural land	Number of human settlements	Number of buildings
1995	670	132	6	250	96	12	228	179	274	195
1996	610	80	3	165	27	5	107	232	403	626
1997	871	102	2	335	44	7	146	337	458	227
1998	543	67	5	173	20	6	87	230	370	159
1999	56	12	1	27	5	-	17	138	157	314
2000	65	13	1	23	3	-	16	162	240	207
2001	75	15	-	26	4	-	19	128	191	127
2002	69	14	1	23	2.5	2	16	148	203	193
2003	71	15	3	28	4	-	19	107	90	207
2004	949	147	4	258	28	2	175	16 289	755	6 042
2005	603	96	-	155	9	4	105	7 590	473	3 682
2006	356	71	1	63	9	-	80	3 173	531	2 066
2007	136	21	-	104	12	-	32	1 389	269	707
2008	311	48	10	126	15	8	63	1 388	392	1 198
2009	323	64	1	193	17	3	80	8 232	521	2 696
2010	250	20	3	81	5	2	25	1 155	366	822
2011	94	...	3	37	9	8	20	652	181	463
2012	325	...	1	88	50	5	50	1 255	239	845
2013	336	...	-	93	...	-	...	1 413	739	1 269
2014	727	...	-	141	...	10	...	...	1 041	962

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Environmental Agency.

NUMBER OF HYDROMETEOROLOGICAL EVENTS BY MONTHS
2011-2014 YEARS

Hydrometeorological event	January	February	March	April	May	June	July	August	September	October	November	December	**Total**
2011													
Flood and flash flood	-	-	-	-	1	5	4	3	-	-	-	-	**13**
Hurricane and squall	-	3	-	1	-	1	1	-	1	2	1		**10**
Hail	-	-	-	-	7	2	2	3	-	-	-	-	**14**
Heavy snow	-	2	-	1	-	-	-	-	-	1	-	-	**4**
Avalanche	1	-	3	3	-	-	-	-	-	-	-	-	**7**
2012													
Flood and flash flood	-	-	-	-	5	3	3	4	-	-	-	-	**15**
Hurricane and squall	-	-	-	-	-	1	1	1	-	2	-	-	**5**
Hail	-	-	-	-	7	2	2	3	-	-	-	-	**15**
Heavy snow	1	-	-	-	-	-	-	-	-	-	-	-	**1**
Avalanche	5	4	5	-	-	-	-	-	-	-	-	1	**15**
2013													
Flood and flash flood	-	-	-	-	1	2	1	2	1	-	-	1	**8**
Hurricane and squall	-	-	3	1	1	3	2	1	2	1	3	3	**20**
Hail	-	-	2	3	6	5	3	4	-	-	-	-	**23**
Heavy snow	-	-	-	-	-	-	-	-	-	-	-	-	**0**
Avalanche	1	2	2	1	-	-	-	-	-	-	-	2	**8**
2014													
Flood and flash flood	-	-	-	2	1	2	3	4	7	1	1	-	**21**
Hurricane and squall	-	3	2	1	3	8	2	2	6	5	2	-	**34**
Hail	-	-	-	3	8	10	1	3	3	-	-	-	**28**
Heavy snow	-	-	-	-	-	-	-	-	-	-	-	-	**0**
Avalanche	3	-	1	-	-	-	-	-	-	-	-	-	**4**

Source: Ministry of Environment and Natural Resources Protection of Georgia.
National Environmental Agency, Department of Hydrometeorology.