



Georgia



National Political Dialogue on Integrated Management of Water Resources in Georgia in the Framework of European Water Initiative

Transboundary Water resources Management Problems in Georgia, Transboundary Water Cooperation with Neighboring Azerbaijan and Getting Prepared for accession of Georgia to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention, Helsinki, 1992)

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Introduction

Water is necessary in all fields of life. The main objective for all states is providing of adequate supply of population with good quality water, maintaining hydrological, biological, and chemical functions of ecosystems, adjusting the activities of man, considering the possibilities of nature, and struggling with diseases connected with water.

The main problems of freshwater reservoirs and sources of fresh water are: accessibility of water resources (regional imbalances of presence and need of surface and ground waters), low quality of water and hydrological changes (changes of interconnections between Rivers and their high-water Riverbeds). The main reasons for inadequate access to water resources are worsening of the quality of water and hydrological changes.

1.1. The main objectives and goals of the paper

The present paper provides the review on development of transboundary water cooperation with the objective of “Strengthening of transboundary water cooperation, including preparation of transboundary water agreement with Azerbaijan and supporting Georgia to join to Water Convention of UN EEC”.

The paper makes an attempt to analyze problems and experience of transboundary water cooperation of Georgia, as well as cooperation of Georgia with Azerbaijan in water policy management, provides the information about current transboundary projects and prepares recommendations on further development of cooperation with Azerbaijan and steps, which will be taken by the Government of Georgia to sign the UN EEC Convention on waters.

The paper was prepared in the framework of National political dialogue on complex management of water resources with support of grant from the Government of Finland.

1.2. National policy dialogue on IWRM

National policy dialogue (NPD) on integrated water resources management (IWRM) and water supply and sewage (WSaS) are main on-the-fly instrument of Water Initiative of European Union as the Component for Eastern Europe, Caucasus, and Central Asia (EECCA).

NPD / IWRP are means of rendering practical assistance in strengthening of integrated water resources management in the countries of EECCA. They are based on consultations with ministries, agencies, and institutions (including science and scientific circle), non-governmental and other national and international organizations. In Georgia, NPD / IWRP started under the guidance of UN EEC in September, 2010 with participation of UN EEC members of Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention, Helsinki, 1992) Convention Secretariat in cooperation with the Ministry of Environmental protection and Natural Resources (from March, 2011, it has the new name – the Ministry of Environment), and other interested sides.

The dialogue is organised in cooperation with the Ministry of Environment by support of Georgian National Water Partnership.

The process of NPD / IWRP starts from the meeting in Tbilisi in March, 2011. National policy dialogue on IWRM discusses three main topics: preparation of national water law on the basis of the principles of IWRP; creation of objectives on implementation of the program of UN EEC / WHO Protocol on Problems of Water and Health of Water Convention of UN EEC, as well as transboundary water cooperation with neighbor Azerbaijan and preparation of joining of Georgia to Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention, Helsinki, 1992).

The process of NPD / IWRP in Georgia is carried out by the support of European Union, as well as the government of Finland and OSCE.

II. Transboundary water cooperation

2.1. Transboundary water resources of Georgia and current situation

The territory of Georgia embraces two basins – the basins of the Caspian Sea and the Black Sea. The majority of Rivers flow into the Caspian Sea and it should be mentioned that the Rivers of Kura, Terek and Sulak flow along semi-desert, most arid sensitive ecosystems of Georgia and Azerbaijan. Transboundary water basins of the Caucasus include the basin of the Kura-Araks (Araz) River, the basin of the Chorokhi River, the basin of the Psou River, the basin of the Psou River, the basin of the Terek River, the Alazani River, the basin of the Debed (Debet) River, lakes of Kartsakhi, Djandara, and others.

The extent of two longest Rivers in the Caucasus – the Araks (Araz) and Kura constitutes more than 1000 kilometers. Average volume of the River flow of Caucasus Rivers fluctuates sharply, reaching its maximum in the regions of the Great Caucasus and Adjara (Adjara-Trialeti ridge), where these levels reach 1000 mm, whereas in the lowland of Kura-Araks (Araz) they constitute 50 mm. Water resources are distributed very unevenly, and maximal amount of the total flow fall on the territory of Georgia.

Water consumption in Georgia is uneven. Unlimited water consumption and irrational use of water resources is common in Georgia, which is caused by increased domestic water consumption, leakages in the systems of domestic water supply, and unlimited use of water in agriculture.

In some countries of the countries of Caucasus, in which transboundary water ecosystems are located, irrigation takes more than 60% of consumed water, while in the countries of more humid and modest climate irrigation is carried out mainly in order to add to the amount of water, coming in the form of natural precipitation. Curtailment of agriculture in the countries of South Caucasus in the process of transformation into market economy caused considerable decrease of consumed amount of water. On the other hand, in Turkey, the demand for irrigation water has increased by 35% in recent years in connection with realization of new projects in the field of irrigated agriculture.

Increase of industrial water use in connection with the growth of concentration of industrial operation and inefficiency of consumption is also the reason of reduction of accessibility to water. In Georgia, industrial water consumption sharply decreased after the break-up of Soviet Union. At the same time, in Northern Caucasus and Azerbaijan, the majority of enterprises continued functioning, and the level of water consumption has almost not changed.

Sectoral approach to water economy having been formed in previous century still remains one of the main frameworks for water consumption, excluding any coordination in carrying out of the policy on water resources protection and use.

The above-mentioned is in natural way reflected in the system of institutional management and legal base, as well as in the formation of financial strategy on water consumption. Concerning financial strategy it should be noted that the “polluter pays” principle of sustainable development was introduced practically in all countries at the end of previous century, but mechanisms of implementation of this principle have changed for last 6 years in Georgia. The system of taxes and duties, so-called “water payment” is of rather fiscal nature for states and/or municipalities. This payment remains low and does not contribute to preservation of water resources, since tax proceeds are not used directly for environmental protection, but go to general budget.

Ineffective and non-coordinated systems of management of hydrological resources have recently led to the deficit of drinking water in many regions of Georgia.

Problems of deficit of funds of water economy organizations should also be mentioned, which led to further worsening of the condition of water economy systems. The single water company created recently has practically centralized all systems of municipal water supply, and it is still early to judge how effective it will work.

Application of fertilizers and sulfur-containing substances in agriculture influenced the quality of surface and ground waters, which causes the leaching of nitrates and phosphorus and brings to acidification and eutrophication;

Uncontrolled discharge from industry, agriculture, and sewage, as well as other wastes into River systems in previous century has increased the level of pollution of the majority of Rivers of the region. The discharge of such elements as heavy metals, oil products, phenols, copper, nutrients, pesticides, and organic materials has brought to pollution of surface and ground waters in the country.

As a result of decrease in industry, municipal enterprises have become main polluters of water resources. In Georgia, municipal sewage collects about 60% of all sewage waters. It should be noted that the system of treatment facilities is actually not modernized and requires considerable investments.

Climate change is natural reason for the reduction of the amount of water, and significantly influences the state of water resources and quality of rendered services on water supply. By the data of hydro meteorological services of Georgia, ice cap of Central Caucasus diminished almost by 1/3. It is generally known that glaciers are important reservoirs of fresh water. One of the reasons of reckoning of fresh water resources among “nonrenewable” ones proved to be reduction of the reserves of fresh water. In relation to this, it is quite important to provide for the necessity of analysis at regional level of consequences of climate change in the context of water resources, as it is obvious that climatic changes will significantly influence the condition of water ecosystems¹.

Hydrological changes of water resources in the region are connected with artificial regulation of watercourses, including flood control, as well as generation of electricity (construction of dams) and drainage of adjacent agricultural lands. One of the consequences of excessive use of surface and ground waters can become reduction of the level of ground waters, drying of water reservoirs, and,

¹ “Second Report of Georgia on Climate Change”, 2009.

as a result, changes in flora and fauna. Other consequences can be depression of landscape, disturbance of stability of buildings and constructions.

Organic pollution and eutrophication of water sites has brought to deterioration of conditions of dwelling of biological cenoses, including those of fish. Organic substances, heavy metals, and other chemical elements and compound pollute ground waters, including drinking water, and can extremely negatively influence the health of living organisms, including human being. The discharge of polluters into surface waters (mainly Rivers) often brings to transboundary pollution.

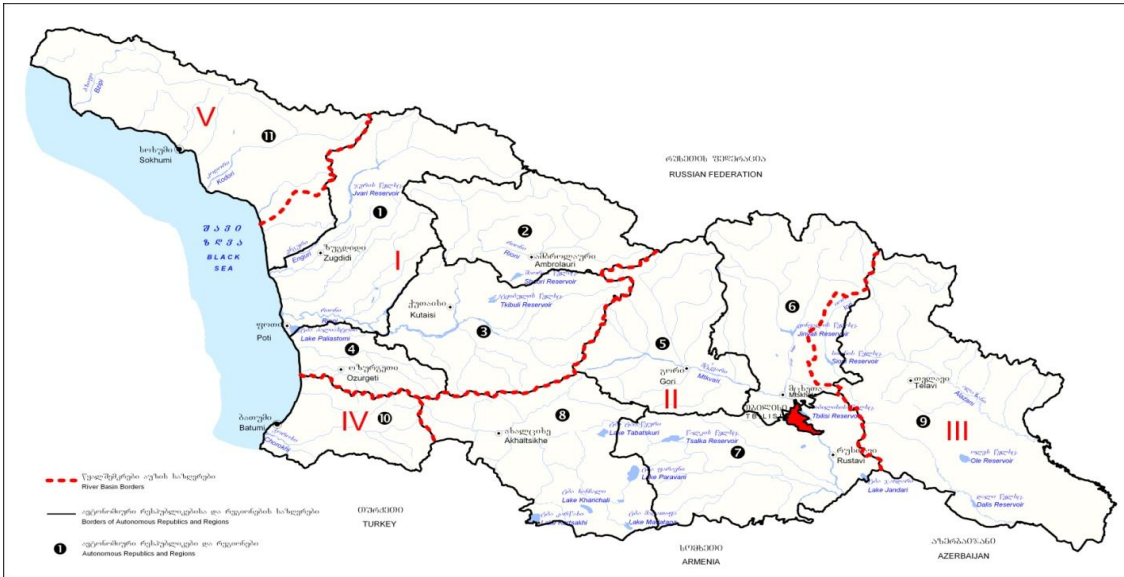
Consequences of hydrological changes in River systems can include: increase of the level of a River, instability of subsidence of sediments in the Riverbed, increase of sedimentary transportation. All this exacerbates the significance of high water cases. Construction of dams and reservoirs can bring to deterioration of lands and disturbance of habitats, as well as social problems.

Scanty water resources, industrial pollution, minerals industry, and construction of dams may cause tension and hostility in the relationships between different water consumers.

Hydrological map of Georgia



2.2. Basins of transboundary Rivers and lakes of Georgia The main basins of transboundary Rivers



I – The

Rioni River basin

II – The Kura River basin

III – The Alazani River basin

IV – The Chorokhi River basin

V – The Psou River basin

2.2.1. River basin of the Alazani River



The Alazani River is a transboundary River for Georgia and Azerbaijan. The total length of the River is 391 kilometers. In Georgia it is 104 km. The common boundary between Georgia and Azerbaijan is 282 km, in Azerbaijan there are 5 km.

The River starts at southern slopes of Chief Caucasian ridge. Considerable part of the River runs along Azerbaijani-Georgian borders and flows into the Mingachevir reservoir in Azerbaijan. In Georgia, the River system of the Alazani consists of 1.803 minor Rivers with total length of 6.815 km. Seasonal melting of snow and rains result in spring floods. There are also floods in spring, caused by Rivers, which can result in insignificant raise of water level, especially in the lower reach.

Alazani-Agrichai aquifer consists of unconfined part (more subject to pollution and other impacts), and upper part of alluvial cone at the foot of mountains, under which there is the only unconfined aquifer with artesian ground waters (better protected by confining bed). The level of ground waters reaches maximal depth at the top of the cone (up to 90 m), and in the artesian basin of the Alazani it fluctuates between 10 and 60 m.

2.2.2. River basin of the Chorokhi (Korukh) River

The Chorokhi River is a transboundary River for Turkey and Georgia.

The River starts in Turkey and flows into the Black Sea 6 kilometers to the South-West from the city of Batumi.

The basin of the River is mainly of mountainous nature with the Riverhead located at the height of about 2,700 m (Turkey).

The length of the River is 438 km (26 km within Georgia). The catchment area is 22 100 km². The width of the River between the state border and the village of Erge (within Georgia) is 60-200 m, with the high-water bed getting 1.5-2 km wide further at the mouth of the River.

To the main transboundary inflows belong: 37 km of the Machakhelistskali River, which forms itself at the confluence of spring brooks, flowing from the Southern slope of mount Mereti at the height of 2 200 m and flows into the Chorokhi River (on the territory of Georgia) from the right bank at 21 km from its mouth. The length of the flows of the River is 37 km. The catchment area is 369 km². The upper part of the basin is located within Turkey, the middle and lower streams are within Georgia. Water regime was studied in 1951-1992. Average annual expenditure of the water is 20.6, the highest expenditure is 34.0, and the lowest are 9.72 m³/sec.

The resources of surface waters amount to 276m³/year (average figure for the period from 1951 to 1992). At the Chorokhi/Korukh River it was planned to build 10 dams, including the biggest of them – the dam of Jusufel and HES.

In Turkey, the monitoring of alluvia is carried out twice a year. In 2006, there were in total 15 series of measurements carried out, whose results were passed to Georgia through diplomatic channels.

From 1997-1999 the joint commission on the problems of the Chorokhi River is working.

2.2.3. River basin of the Debed (Debet) River

The basin of the Debet River is a transboundary one for Armenia and Georgia.

176-meter long River of Debed (Debet) starts at 2100 m over the sea level and runs through deep gorge. It flows into the River of Ktsia-khrami (on the territory of Georgia) from the right bank at the distance of 12 km from its mouth.

Its average height is monitored at hydrological post of Sadakhlo – 1680 m over the sea level.

The area of the River basin in Armenia is 3790 km² (92.4%), and in Georgia it is 310 km² (7.6%). In total it is 4 100 km². In drainage basin of the Debet River lakes occupy 0.01% of the surface.

The resource of surface waters is 29.2 m³/year (the average figure for the period from 1936 to 1990). Resources of ground waters: 82 425 600 m³/year (average figure for the period from 01.10 to 01.04). Two water reservoirs are located on the Debet River, in Armenian part of drainage basin: one at the River of Dzoraget (0.27 million km³), which is a (non-transboundary) inflow of the Debet, and another at the River of the Tashir River (5.4 million km³), which is a non-transboundary inflow of the Dzoraget River.

In Armenia, as a result of the closing of Vanadzor Chemical Complex (1989) and installation of water-supply systems with closed cycle at Alaverdi Copper-smelting Complex (2005) and Akhtala ore-dressing and processing plant (2006) water pollution reduced considerably.

At the same time, natural background pollution takes place because of leakages from tailing dumps, where the wastes from production of Akhtala plant are discharged, and water pollution occurs from

agricultural enterprises. It seems that historical pollution will further create ecological problems. Spring floods will still impose damage in lower reaches of the basin.

At present, chemical and ecological condition of River system is unsatisfactory for water flora and fauna, but corresponds to the requirements of municipal, agricultural, industrial, and other types of use.

2.2.4. River basin of Iori River

The basin of the Iori River 320 km long is a transboundary one for Georgia and Azerbaijan. The River starts at Southern slope of Main Caucasian Ridge, at the height of 2 600 meters, and flows into the Mingeaur reservoir at Southern edge of Outer-Kakhetian Plateau. According to the nature of the relief, the basin is divided into two zones:

- 1) The zone of high and medium-height mountains, encompassing North-Western part of the basin;
- 2) The zone of South-Eastern part of the basin, including the elevations of Iori plateau and loland steppe, the height of which at Lelovani hydro-post is 1640 m over the sea level.

In Georgia, the River system consists of 509 minor Rivers with overall length of 1 777 km. The density of River network constitutes 0.38 km/km². Hydrological regime of the River is characterized by spring high waters, summer/autumn floods, and constantly low level of water in winter. The area of River basin in the country is: Georgia – 4040 (86.9%); on the territory of Azerbaijan – 610 (13.1%) - in total – 4650 km². Water resources of surface waters amount to 11.6 m³/year (average figure for the period from 1963 to 1992). The resources of ground waters amount to 155 520 000 m³/year. In Georgia at the Iori River there are three large irrigation water reservoirs: Sioni reservoir (325 million m³) is used for irrigation purposes, generation of electricity and water supply; Tbilisi reservoir (308 million m³) is used for irrigation purposes and water supply, and Dalimta reservoir (180 million m³) is used for irrigation purposes.

The part of the Tbilisi receives drinking water from Tbilisi reservoir, which is one of the links of hydrotechnical channel of Sioni-Jinvali complex of reservoirs, which receive water from the Iori River. The existing amount of water is insufficient for satisfying the growing needs of the population of Tbilisi in drinking water; therefore additional amount of water is taken from the reservoir at the expense of the water planned to be used for irrigation purposes. The location of pumping stations allows using only a part of the usable storage (64 million m³).

The total withdrawal is 155 520 000 m³/year. Domestic consumption is 21.6%.

The main part of ground waters comes to the Iori valley from bottomland and over bottomland terraces of the Iori River, where there are large water intakes. Besides, with the assistance of wells confined aquifers have been disclosed, which supply population and enterprises with water.

2.2.5. River basin of the Djandari River

The area of the Djandari River amounts to 12.5 km², while the basin of its area is 102 km². Around 67% of the basin is located on the territory of Georgia, and 33% is on the territory of Azerbaijan. Water flows mainly through the Gardabani water channel from the Kura River.

Maximal channel capacity constitutes 15 m³/sec. The volume of water is 51.15 million m³, maximal depth is 7.2 m, and average depth is 4.8 m. Until 1870s there was a little reservoir on the place of Djandari Lake. After that the Marin channel was built, which ends in the basin of the lake. Later, the channel was built from South-Eastern bank, irrigating the lands on the territory of Azerbaijan. In summer, water gets very much warm (30-32%), in winter water cools down to 2-3° degrees. The lake is quite rich in fish (carp, sheatfish).

Quantity and density of population in the basin of the lake is 14000-15000 people (i.e. around 140-150 residents per km²).

Pollutants come from quite different anthropogenic sources. Industrial, domestic, and agricultural flows pollute water, coming into the reservoir from the Kura River. The lake is used for fishing.

At present, ecological and chemical condition of Djandari lake is unfavorable. Increasing pollution from the Kura River and reservoirs leads to the increase of pollution degree of the lake. Besides, expansion of the area of irrigated lands in both countries and uncoordinated use of water by different consumers lead to reduction of water level.

2.2.6. River basin of Kartsakhi lake.

The Basin of Kartsakhi Lake is a transboundary one for Turkey and Georgia.

Kartsakhi Lake is located in the southern part of Samtskhe-Djavakheti region of Georgia in the basin of the Kura River at the height of 1889 m from the sea level. State border between Georgia and Turkey divides the lake into two parts. North-eastern part of the lake (53% of the area of the water surface) is part of Georgia; south-western is part of Turkey.

The area of drainage basin of Kartsakhi Lake is 158 km².

The basin of the lake is featured by poorly developed drainage network. The only River (about 1 km long) is the Kartsakhi River. Several springs drying out in summer flow into the lake. Near south-western bank at the village of Kanarbel (on the territory of Turkey) come out a number of springs, which flow into the lake as well.

The lake has mainly sloping shores. Northern part of the lake near the mouth of the Kartsakhi River is slightly swamped. In south-western part there are a number of little islands.

Water regime of the lake was studied from 1940 to 1955. The area of water surface of Kartsakhi Lake is 26.3 km². Maximal depth is about 1 m. The lowest average monthly water level in the lake is observed in March. The highest level is in June. Maximal amplitude of average monthly levels constitutes just 31 centimeters (1944), minimal is of 11 cm (1988).

Water temperature of surface layer in winter time (December-March) is close to zero. Maximal average monthly temperature (15.6°) is observed in August. Absolute maximal temperature reaches 27°.

Freeze-up starts in the second decade of December. Average number of days with freeze-up is 100, the least number is 76, and the highest is 145. Destruction of freeze-up usually occurs in the second decade of March. Full purification of the lake from ice occurs in the first decade of April. The thickness of ice in the lake is 0.5-0.6 m.

Kartsakhi is the only lake on Djavakheti volcanic plateau, whose water is featured by excessive salinity. Solid residue constitutes 880 mg/l.

2.2.7. River basin of the Ktsia-Khrami Debet River

The basin of the Ktsia-Khrami River is a transboundary one for Armenia, Azerbaijan, and Georgia. Ktsia-Khrami River starts at the Southern slope of Trialeti ridge at the height of 2.422 m and flows into the Kura, from the left bank, 820 m higher than the mouth.

This part of water of drainage basin of the Ktsia-Khrami is in general of mountainous nature, whose average height above the sea level is 1536 m. Spring high waters are characteristic only for the Ktsia-Khrami River, the rest of the year water level in the River remains low; occasionally there are floods in spring-autumn season. To main transboundary inflows belong the Debed (Debet),

transboundary and non-transboundary horizons of ground waters in this basin, transboundary aquifer Pambak-Debet.

The area of the River basin is total of 8340 km². In Armenia it is 3790 km² (45.4%), in Georgia – 4470 km² (53.6%), in Azerbaijan 80 km² (1.0%).

Water resources of surface waters constitute 51.7 m³/y (average figure for the period from 1928 to 1990). The resources of ground waters constitute 81 492 480 m³/year.

Hydrological regime is featured by one significant spring high water. In other periods of the year water level remains mainly low and rises periodically in connection with spring/autumn high water.

2.2.8. River basin of the Kura (Mtkvari) River

The basin of the Kura (Mtkvari) River is a transboundary one for Armenia, Azerbaijan, Georgia, Islamic Republic of Iran, and Turkey.

The River of 1364 km in length starts in Turkey, at the eastern slope of Mount Kyzil-Gyadik, at the height of 2742 m and flows into the Caspian Sea. Main transboundary inflows include: Rivers Araks, Iori, Alazani, Debed, Agstev, Potskhovi, and Ktsia-Khrami. The Potskhovi River flows on the territory of Turkey and Georgia, starting in Turkey, at the southern slope of Arsiani ridge, at the height of 2720 m, and has distinct feature of mountainous River.

Alazan-Agrichay inflow is described in the basin of the Alazani River. Apart from it, other inflows are the Debet and Agstev-Akstafa – Tavush-Tovuz. The area of the River basin in Armenia is 29 743 (15.8%), in Azerbaijan – 57 831 (30.7%), in Georgia – 29 741 (15.8%).

In Eastern Georgia irrigation water is used from surface sources. Efficiency of irrigation system in the basin of the Kura River is quite low as a result of leakages (losses) of water from irrigation channels. The main industrial sectors using water are: chemical industry, building materials sector, nonferrous metallurgy, and food industry. As for municipal water supply, 620 million m³ of drinking water is supplied to population for domestic consumption. 90% of this water is consumed by urban population, and only 10% is by rural one. The main sources of drinking water are ground waters, constituting 80% of total volume of drinking water delivered by centralized network of water supply. According to the data on main figures of water consumption in Georgia, factual water consumption in the basin has reduced for last 20 years almost by 70% (from 1979 to 2003), the biggest slump being observed in industrial water consumption. Water consumption in municipal sector (Georgian part) of the basin constituted 361 million m³ in 2003.

At the section from Georgian-Azerbaijani border till Mingechevir reservoir there are no significant sources of pollution (Azerbaijan); owing to self-purifying ability of the Kura River, concentration of pollutants at this section is reduced by 30-55%.

2.2.9. River basin of the Potskhovi River

The basin of the Potskhovi River is a transboundary one for Turkey and Georgia. The River starts in Turkey at the southern slope of Arsiani ridge at the height of 2720 m and flows into the Kura River. The relief of the basin is mainly mountainous.

Total area of the River basin is 1 840 km. Above 2000 m there are Alpien meadows located, used for pastures, and grasscutting lands. Below there are mixed forests.

High water cases are mainly observed in the middle/at the end of March and reach their maximum in April, sometimes in May; average increase of water level in the River constitutes 0.8-1.2 m.

According to the information of the Ministry of Environment of Georgia, the content of ammonium ions in 2007-2009 exceeded MPC: in 2008 1.5 times, while in 2009 in 3 times. In general, ecological and chemical condition of the River is satisfactory.

2.2.10. River basin of the Psou River

The basin of the Psou River is a transboundary for Russian Federation and Georgia. The River starts at mount Aigba at the height of 2517 m and flows into the Black Sea, whose average height at the hydrological post Leselidze over the sea level is 1 140 m. Main left-bank (non-transboundary) tributaries are Besh (11 km) and Pkhista (13 km) in Georgia. Relief in the upper part of the basin is mountainous, much rugged. Lower part of the basin is represented by undulating land.

The area of the basin in Georgia is 232 (55.1%), in Russian Federation it is 189 (44.9%), in total it is 421 km². The River is fed by snow, rainwater, and ground waters. The River is characterized by spring high waters, which reach their peak in May. At present the River basin is not controlled by Georgia, being in the zone of the conflict.

2.2.11. River basin of the Sulak River



The basin of the Sulak River is a transboundary one for Georgia and Russian Federation.

The River starts at the place of the confluence of the Rivers Avarskoe Koysu (Russian Federation) and Andiyskoe Koysu (a transboundary River, flowing on the territory of Georgia and Russia and flows into the Caspian Sea. The basin is in general of meandering valley (the largest part of the basin).

Main transboundary tributaries include: Andiyskoe Koysu (a transboundary River, flowing on the territory of Georgia and Russia; 4 810 km²). The Andiyskoe Koysu River starts on the territory of Georgia on the place of the confluence of the Pirikita Alazani River and Tusheti Alazani River. Average height of the basin of the River at the hydrological post Shenako (at the distance of 1km from the source) is 2600 m above the sea level.

2.2.12. River basin of the Terek River

The basin of the Terek River is a transboundary one for Georgia and Russian Federation.

The River starts at the slopes of Mount Kazbek in Georgia and flows into the Caspian Sea. The River flows along the territories of North Ossetia/Alania, Kabardino-Balkaria, Stavropol krai, Chechnya and Dagestan (Russian Federation).

Inside Georgia the basin of the River is distinguished by mountainous-glacial form of relief. Ridge peaks of the mountains are of nibbed, often rocky nature, while slopes are generally very steep. Its average height at the hydrological post of Stepantsminda (Kazbegi) over the sea level constitutes 2840 meters. The area of River basin in Georgia is 869 km (18%), in Russian Federation it is 3941 km (82%). Water resources of surface waters of the Terek River constitute 11.0 km³/year for an average year, 10.1 km³/year for an average dry year and 9.0 km³/year for a dry year.

Spring high waters impose damage, especially in Russian part of the basin. The use of water for irrigation is the load factor both in Georgia and Russia. In the Russian part of the basin more than 700 000 hectares are irrigated. The use of water for industrial purposes is the load factor from Russian part.

III. Prospects of water cooperation

One of the mechanisms of prevention and preservation of water ecosystems is IMWR. The concept of Integrated Management of Water Resources (further – IMWR) was discussed at main international conferences in the 1990s of last century and the first years of this millennium. The conclusion was the directive of the World Summit on Sustainable Development (WSSD) in 2002, which states that all countries are obliged to develop further the plans of IMWR and water conservation while rendering support for developing countries.

Accomplishment of this directive proved to be difficult owing to low awareness of many countries about the process of preparation of such plans. One of the principles of IMWR is the principle of management of water resources at the level of River basin.

Another main principle of IMWR is active involvement of interested parties into the process of management. Key aspect of participation of interested parties is establishment of basin councils (BC) by means of introduction of legally approved regulations.

Attraction of non-governmental and social organizations to participation in the process of decision-making is an approved practice.

3.1. International agreements in the field of transboundary water resources management

In spite of the fact that in Georgia there is legislation regulating protection and use of water resources, and practically ready new draft law, which fully reflect the principles of IMWR, as well as main principles of United Nations Economic Commission of Europe (UNECE) Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

The main objective of the Convention on Transboundary Watercourses is strengthening of local, national, and regional means to provide for quantity, quality, and sustainable use of transboundary water resources.

The Convention has an integrated approach, based on the understanding that water resources are integral part of both ecosystems and human community and economy. Adherence of the Convention to integrated water resources management substitutes previous focusing on localization of the sources of pollution and management of different components of ecosystem.

The Convention calls the countries to fulfill certain obligations, from general to practical ones. Those include:

- Prevention, control and reduction of adverse transboundary impact on environment, human health, and social-economic conditions;
- Management of common water resources sensibly and reasonably, using ecosystem approach and following precaution and “polluter pays” principles;
- Conservation and restoration of ecosystems;
- Carrying out of environmental impact assessment, development of plans for emergencies, establishment of criteria of water quality, and minimization of the risk of occasional pollution of water resources.

The Convention demands from the parties to conclude special bilateral and multilateral agreements and create organizations – joint bodies, such as River and lake commissions, in order to fulfill these obligations.

Georgia lacks full-scale strategic document, regulating and determining protection and use of transboundary Rivers and lakes and ratified by all countries of the Caucasus. Only Azerbaijan and Russia joined and ratified the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

At present there exist and function bilateral treaties and agreements, signed by Georgia with riparian states:

“Treaty on Water Consumption in Boundary Rivers, Rivulets, and springs of the Union of Soviet Socialist Republic and Turkish Republic concerns the issues of irrigation, water supply, regulating of the Rivers of Araks, Vorokh (Chorokhi), Kura”.

The Treaty signed on 08.01.1927 in the city of Kars, entered into force on 26.06.1928 and a Joint Commission between USSR and Turkey was established. The Treaty was acknowledged by already independent Georgia in 1992-1993.

“Agreement between the Government of Georgia and Turkish Republic in the field of environmental protection” (1997).

The Agreement between the Government of Georgia and Turkish Republic was signed with the purpose of cooperation in the field of environmental protection. The Agreement also assumes cooperation in the field of protection of surface and marine waters; it especially specifies the necessity of exchange of information regarding the condition of the Chorokhi/Korukh River. This Agreement stipulated creation of joint commission on the problems of the Chorokhi/Korukh River.

“Protocol on mutual understanding between the Ministry of Environmental Protection and Natural Resources of Georgia and the Ministry of Energy and Natural Resources of Republic of Turkey with the purpose of surveillance of transportation of River pumps of the Chorokhi River” was signed on 19.01.1998 in the city of Ankara. On the basis of this protocol the decision of carrying out of joint monitoring over alluvia of the Chorokhi River and study of the impact of coordinated hydroelectric systems over lower reaches of the River was taken.

“Memorandum on mutual understanding between the Ministry of Environment of Georgia and State Committee on Ecology and Control over Nature Management of Azerbaijani Republic concerning cooperation in development and realization of pilot projects on monitoring and evaluation in the basin of the Kura River” (16.09.1997);

Present Protocol became the basis of practically all further joint projects on the basin of the Kura-Araks River.

“Agreement between the Government of Georgia and Azerbaijani Republic in the field of environmental protection” (18.02.1997).

Intergovernmental agreement on cooperation in the field of environment within the framework of conservation and regulation of transboundary ecosystems assumes that the parties “join their efforts for the protection of their basins from pollution, as well as management of water resources”. The Agreement also stipulates creation of separate treaty on the use of transboundary water resources.

“Protocol on the results of negotiations between Governmental delegations of Georgia and Azerbaijan Republic on the use of water resources” (27.12.1997);

“Agreement between State Committee on Irrigation and Water Economy of the Republic of Azerbaijan and Department of Management of Melioration Systems of Georgia on the use of the reservoir of Djandara (lake of Djandara)”

According to the Agreement between State Committee on Irrigation and Water Economy of the Republic of Azerbaijan and Department of Management of Melioration Systems of Georgia, Djandara reservoir receives from Georgia annually 70 million cub. m of water, including 50 million cub.m. for irrigation of 8500 hectares of lands in the Azerbaijani region of Akstapkhi and 20 million cub.m to maintain ecologic balance of reservoirs.

“Protocol of the agreement between Georgian SSR and Armenian SSR on water intake from the Debed River of November 5, 1971”

“Agreement between the Governments of Georgia and Armenian Republic in the field of environmental protection (1997)”

Agreement between the Governments of Georgia and Armenian Republic in the field of environmental protection assumes that the Parties “will make efforts for establishment of connections between national systems on environmental monitoring and corresponding databases”.

3.2. International projects carried out in Georgia in the field of water resources management – main directions and objectives.

They are actively implemented mainly on sustainable development of the basins of the Rivers of Kura-Araks (Araz).

Project “Joint programs of management of the basin of Kura River” (2001-2003, Armenia, Azerbaijan, Georgia) TACIS

- Application of Guiding principles of UNECE on monitoring and assessment of conditions of transboundary Rivers;
- Review of existing transboundary measures and practice of water resources management;
- Coordination of the activities on monitoring, field selections, and analysis
- Ensuring of the quality and control of the quality

Project “Management of Water Resources in the Region of South Caucasus” (2002-2004, Armenia, Azerbaijan, Georgia) USAID

- Demonstration of the process of integrated planning of River basins at local level and capacity building in the field;
- Projects of IWRM plans for the basins of transboundary Rivers of Alazani (Georgia-Azerbaijan) and Khrami-Debeda (Georgia-Armenia) were prepared by the Basin Development Councils (Alazani, Khrami, Debeda);
- Regional data exchange;
- Program of small grants for local NGOs connected with the water for short-term actions (56500 USD in Georgia).

USAID project “South Caucasus for water program” (2005-2008, Armenia, Azerbaijan, Georgia)

- Joint monitoring of quality and quantity of water in transboundary Rivers;
- Introduction of GIS in the process of monitoring of water quality, creation of the model basin MIKE;
- Assistance by the data of information exchange between three countries;
- Integrated regulating of River basins, workshops of planning of water objects;
- System of coding;

Project of reduction of transboundary degradation of the Kura-Araks River basin (2004-2007, Armenia, Azerbaijan, Georgia), UNDP/GEF/SIDA

- Defining needs for transboundary management of the basin;
- Gender factor role in the field of water resources management;
- Identification of optimal institutional model of River basin management;
- National and regional GIS maps;
- National action plans regarding the currents of three countries of Southern Caucasus.

Project of reduction of transboundary degradation of the Kura-Araks River basin (2004-2007, Armenia, Azerbaijan, Georgia), UNDP/GEF/SIDA

- Creation of regional forum of NGOs on Kura-Araks;
- Analysis on identification of interesting parties.

Project on reduction of transboundary degradation of the Kura-Araks River basin (2004-2007, Armenia, Azerbaijan, Georgia), UNDP/GEF/SIDA

The main objective of the project is:

- Transboundary diagnostic analysis:
 - Cause and effect analysis
 - Cause and effect diagrams
 - Identification of short-, medium- and long-term perspective impact
- Strategic program of actions of the

Project of development of transboundary cooperation for prevention of danger in the basin of the Kura River (2003-2006, Armenia, Azerbaijan, Georgia), BMU

- Prevention of accidents in the basin of the Kura River in transboundary context;
- Transferring of know-how in the field of dangerous activities

Project “Program Science for Peace: South Caucasus Rivers Monitoring” (2002-2008, Armenia, Azerbaijan, Georgia). NATO and OSCE

- Creation of social and technical infrastructure for international transboundary Rivers water quality and quantity monitoring;

- Joint use of watershed management system and data;
- Increase of technical possibilities;
- Joint establishment of management methods for all partners.

EU Project “Water resources management in western countries of EECCA” (2008-2010, Ukraine, Belorussia, Moldova, Armenia, Azerbaijan, Georgia)

- Preparation of recommendations on development of water quality standards and water bodies classification system on the basis of these standards;
- Project of the new “Law on Water of Georgia” based on the principles of River basin management

Project on “Creation of favorable conditions for integrated management of the transboundary basin of the Kura-Araks River” (2007-2009, Azerbaijan, Armenia, Georgia)

- Development of the “road map” for sustainable management of the Kura-Araks River basin in the light of introduction of UN Directive on Water.

UN Project “Phase II of management of transboundary Rivers for the basin of the Kura River” (2008-2011, Armenia, Azerbaijan, Georgia)

- Development of common systems of information monitoring and management;
- Joint monitoring of water quality of transboundary Rivers of Kura, Alazani, Khrami, Debed (once in 3 months);
- Project on River Basin Management Plans (RBMP), including preliminary program of measures prepared for selected pilot River basins in each country project with the use of UN Framework Directive on Water Methodology (in Georgia – the Rivers of Alazani-Khrami-Debeda and Aragvi).

“Integrated natural resources management in watersheds (INRMW) of Georgia Program (USAID)” (2010-2015)

- Sustainable management of natural resources;
- Application of INRMW in target watersheds up to scaling of applied models by means of support of the policy and institutional reforms and building of capacity of corresponding institutions;
- INRMW models and management plans for 4 watersheds in the Alazani/Iori and Rioni basins.

Project “Reduction of transboundary degradation in the basin of the Kura-Araks” (UNDP/GEF)

The purpose of the project is improvement of management of the Kura-Araks transboundary basin by means of implementation of the program of sustainable political, legal, and institutional reforms and investment opportunities for the use of Transboundary Diagnostic Analysis and Strategic Action Plan.

3.2. International processes, tendencies, and perspectives of development of cooperation between Georgia and Azerbaijan along the basin of the Kura-Araks River.

In spite of the fact that there is a number of bilateral treaties and agreements between Georgia and Azerbaijan, the degree of realization of these agreements, especially the items concerning water resources management, remains low, and actions undertaken are singular.

In spite of the fact that many international programs on the Kura-Araks have been developed and implemented, and there is some progress, no official working group or intergovernmental agency has been created yet with the purpose of systematic surveillance or support of realization of the agreements and signing of a new one, stipulated in the Agreement in the field of environmental protection between Georgia and Azerbaijan, as it was mentioned above. Negotiations between Georgia and Azerbaijan aim at creation of the agreement and permanent body for cooperation in IMWR on Transboundary Rivers and Lakes. These negotiations are an advancement showing great promise, and can serve as the model for further development of cooperation on transboundary basins.

At present, the main priority for Georgia is economic development of the country, and, correspondingly, the efforts on improvement of economic indicators influenced legislation, including environmental and water resources law, and not for the better.

At present, the issuing of licenses in Georgia for withdrawal of ground waters is passed to the Ministry of Energy and Natural Resources, and the requirement of getting permission for environmental impact is now confined by large enterprises, while physical persons are not required the license for domestic use of water. It should also be noted that, according to acting legislation, at present the permissions for withdrawal and discharge are regulated only by technical regulations, which apply only to the enterprises subject to obtaining of permission for environmental impact.

Current situation on water resources management in Georgia may become serious obstacle for the signing of agreement with the Republic of Azerbaijan, so far as the undertaken obligations will require institutional, legal changes.

3.3. Agreement with EU and main directions of Georgia preparing for joining UNECE Water Convention

At present, integrated management of water resources (IMWR) is not used on the whole in Georgia. However, there are a number of positive accomplishments: although water industry sector is in the stage of reform, and now the new water law is being developed in the country, which on the whole is based on the principles of European directives (the EU Water Framework Directive (WFD)).

At present, important driving force in the cause of formation of national water policy is European policy of neighborliness, according to which Georgia has signed an agreement, obliging to harmonize new environmental laws with EU legislation and cooperate with neighbor countries in transboundary water management.

At present, the negotiations with EU concerning development of the Treaty on Associated Agreement are going on.

3.4. SWOT (strengths, weaknesses, opportunities, threats) analysis on the readiness of Georgia to carry out the main regulations of the Convention of the European Commission of UN on the Protection and Use of Transboundary Watercourses and International Lakes

As already noted there is no existing, ratified by the all countries of Caucasus a full scale mechanism regulating the protection and use of transboundary Rivers and lakes. This is creating certain difficulties when using the transboundary water bodies.

The objective of the given chapter was to analyze positive and negative sides and identify the chances (possibilities and threats (barriers) in case of becoming or not becoming a Party to the Convention of the European Commission of UN on the Protection and Use of Transboundary Watercourses and International Lakes.

SWOT analysis has been carried out on each of the main principles of the Convention.

1. “The Contracting Parties shall take all appropriate measures for the prevention, limitation and reduction of any transboundary impact”. (Article 2, point 1) that causes harmful consequences for the environment. These may be consequences for health and safety of human beings, flora, fauna, soil, air, water, climate, landscape, historical monuments and other material objects or interaction of these factors. In this is also included damage to the cultural heritage or national and economic conditions brought upon them as a result of changes caused by the influence of these factors.

Strengths	Weaknesses
<p>There is a network of protected territories created in Georgia covering about 10% of the whole territory of Georgia</p> <p>The major basins of the transboundary Rivers are not characterized with heavy pollution</p> <p>There is established and partly exists a system of monitoring of the pollution and regime of the water of transboundary water bodies</p> <p>The procedure of EIA in some fields of activities</p> <p>Established norms that are in force on the discharge of pollution are envisaged only for those activities which demand EIA</p>	<p>Weak system of monitoring of the water pollution</p> <p>Weak system of the State control (inspection) (After the reform of the Ministry of Environment Protection which took place in February 2011 the Environmental Inspection of the Ministry was abolished)</p> <p>There is no clear system of statistical reporting</p> <p>Weakness of the EIA system (reform is underway)</p>
Opportunities	Threats
<p>Creation of new protected territories</p>	<p>Political decision (Environmental protection inspection has been abolished, sanitary</p>

Creation of the system of regulation of water drawoff.	inspection of the water systems is not carried out, the system of the permit for the drawoff and the discharge of water and others is abolished) because of the priority of economic development
Strengthening the monitoring of the sources of pollution	Deficiency of financial resources.

Summary and recommendations for actions:

- Establishment of the monitoring system of the pollution and water regime in transboundary water bodies;
- Restoring the pollution inspecting system ;
- Development of a new legislative base for the regulation of water and restoration of economic mechanisms in the management of water ecosystems;
- Introduction of the principles of Integrated Management of Water Resources in the management of water ecosystems
- Ensuring program financing for the preservation of water ecosystems

2. “The Parties shall, in particular, take all appropriate measures:

- a) To prevent, control and reduce pollution of water causing or likely to cause transboundary impact;
- b) To ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection;
- c) To ensure that transboundary waters are used in a reasonable and equitable way, taking into particular account their transboundary character, in the case of activities which cause or are likely to cause transboundary impact;
- d) To ensure conservation and, where necessary, restoration of ecosystems. Measures for the prevention, control and reduction of water pollution shall be taken, where possible, at source”. (Article 2, point 3)

Strengths	Weaknesses
Declared in different statements. Formulated in the current legislation	There is not system of regulation of the extraction of water There is no financial mechanism for the management of water (water fee)
Opportunities	Threats
Introduction of “water fee” Creation of concessionary terms for resource-	Political decision declared by the State that the introduction of new regulatory norms will entail the deterioration of attracting new

Conclusion:

- Development of a new law and its approval (enforcement)
 - Creation of a new system of water management both for water extraction and its discharge
 - Preparation of appropriate regulations (new by-law normative acts)
 - It is necessary to develop additional reviews (reports) on the principles of water management in accordance with the IMWR
 - Holding additional seminars on the issues of IMWR
3. “In taking the measures , the Parties shall be guided by the following principles:
- a) The precautionary principle, by virtue of which action to avoid the potential transboundary impact of the release of hazardous substances shall not be postponed on the ground that scientific research has not fully proved a causal link between those substances, on the one hand, and the potential transboundary impact, on the other hand;
 - b) “The polluter-pays principle” by virtue of which costs of pollution prevention, control and reduction measures shall be borne by the polluter;
 - c) Water resources shall be managed so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs”. (Article 2, item point

Strengths	Weaknesses
There are certain mechanisms, in particular fining sanctions, assessment of the damage	There was a tax for pollution which was abolished in 2006
There are only regulations during the period EIA	The legislation on issuing a permit for the extraction and discharge was abolished in 2006
	Monitoring of the pollution in water bodies is weak
Opportunities	Threats
Restoration of the system of regulation	Political decision
Improvement of the monitoring system	Additional financial resources are necessary
Creation of a new system of permits	

Conclusion:

- Restoration of the system of regulation (permit on the discharge and extraction of water)
- Establishment of an effective system of monitoring of the pollution of water ecosystem
- Lobbying of a new legislative base on water based on the principles of IMWR

4. “The Riparian Parties shall cooperate on the basis of equality and reciprocity, in particular through bilateral and multilateral agreements, in order to develop harmonized policies, programs and strategies covering the relevant catchment areas, or parts thereof, aimed at the prevention, control and reduction of the environment of transboundary waters or the environment influenced by such waters, including the marine environment”. (Article 2, item 6)

Strengths	Weaknesses
There are a number of agreements on the management of water ecosystems with adjacent countries (see 3.1)	There are no joint institutions (there is a joint Commission only on the River Chorokhi, but there is no Commission on the rest of the transboundary Rivers)
Opportunities	Threats
Development of “roadmap” for concerted actions with the purpose of coordinating the activities	Political situation in the region (there are conflicts between the countries of the region)

Conclusion:

- Development and approval of new agreements regulating joint activities in transboundary water basins
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5. “The application of this Convention shall not lead to the deterioration of environmental conditions nor lead to increased transboundary impact”. (Article 2, item 7) – maximum norms of discharge of wastewater from point sources shall be defined on the basis of the best available technologies, at the same time it is necessary that at least methods of biological treatment of municipal wastewater is applied.

Strengths	Weaknesses
The existing system of EIA	The system of BAT has not been introduced
In 60 municipalities there are imperfect systems of water supply and sewage	There is no system of monitoring (inspection)
Opportunities	Threats
Introduction of the BAT system	Hindering the approval of the draft law
Improvement of the control and monitoring	Absence of political will
Existence of draft law	Qualified staff for BAT

Conclusion:

- Development of a new legislative base for the introduction of BAT
- Development of a new monitoring system

6. “To prevent, control and reduce transboundary impact, the Parties shall develop, adopt, implement and, as far as possible, render compatible relevant legal, administrative, economic, financial and technical measures, in order to ensure, inter alia, that:

- a) The emission of pollutants is prevented, controlled and reduced at source through the application of, inter alia, low-and non-waste technology;
- b) Transboundary waters are protected against pollution from point sources through the prior licensing of waste-water discharges by the competent national authorities, and that the authorized discharges are mentioned and controlled;
- c) Limits for waste-water discharges stated in permits are based on the best available technology for discharges of hazardous substances;
- d) Stricter requirements, even leading to prohibition in individual cases, are imposed when the quality of the receiving water of the ecosystem so requires;
- e) At least biological treatment or equivalent processes are applied to municipal waste water, where necessary in a step-by-step approach;
- f) Appropriate measures are taken, such as the application of the best available technology, in order to reduce nutrient inputs from industrial and municipal sources;
- g) Appropriate measures and best environmental practices are developed and implemented for the reduction of inputs of nutrients and hazardous substances from diffuse sources, especially where the main sources are from agriculture (guidelines for developing best environmental practices are given in annex II to this Convention);
- h) Environmental impact assessment and other means of assessment are applied;
- i) Sustainable water-resources management, including the application of the ecosystems approach, is promoted;
- j) Contingency planning is developed;
- k) Additional specific measures are taken to prevent the pollution of ground waters;
- l) The risk of accidental pollution is minimized.

Strengths	Weaknesses
<p>In Georgia recently pesticides have not been applied intensively in agriculture</p> <p>There exists a specific system of EIA</p> <p>There are contingency plans for big facilities</p> <p>The issue is regulated by the Committee on the Contingency situation and there are definite Action Plans</p>	<p>There is no control of diffused pollution</p> <p>Sustainable agriculture</p> <p>Weak practice of the application of fertilisers and pesticides</p> <p>EIA is weak and does not reflect ecosystem approach</p> <p>There are no action plans for transboundary water bodies either for natural calamity or for man-made catastrophes</p>
Opportunities	Threats
<p>Farmers' awareness raising</p> <p>Creation and maintenance of biological farms</p> <p>Creation of an effective system of control</p> <p>Approval of a new law on the procedure of</p>	<p>Deficiency of finances</p> <p>Development of intensive agriculture</p> <p>Non-approval of the Law on EIA</p> <p>Non-ensuring sufficient financial resources</p>

<p>EIA</p> <p>Development and implementation of joint action plans for transboundary water bodies for bordering states on early warning system and joint elimination of the consequences</p>	<p>and unreadiness of relevant structures of neighbouring countries for joint activities</p>
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Conclusions:

- Maintenance of sustainable agriculture
- Introduction of biological methods of fight
- Creation of an effective control system of the pollution
- Creation and maintenance of biological farms, development of State programs
- Reduce to the minimum negative influence of threats
- Attraction of relevant sources for the implementation of transboundary programs
- Due to the imperfect system of EIA procedure in the reports presented the impact on the ecosystems are not taken into account and practically are not considered
- It is necessary to adopt a new law on the EIA procedures
- It is necessary to develop new indicators and introduce the monitoring system for ecosystems
- Development and perfection of National Activity Plans
- Development of joint activity plans
- Preparation of relevant joint agreements on the River basins
- Creation of a common data base
- Development of joint Response Plans and Liquidation for the River basins

IV. Findings recommendations

4. Proposed measures for the improvement and increase the affectivity of transboundary water resources management

Management of transboundary water resources in the Caucasus, as mentioned above, is a topic for endless projects of international and non-governmental organizations. Analysing the international and regional (Caucasus) experience of solving problems related to the transboundary water resources the reason for the not existence of actual results in common Caucasus water projects may be named: 1) absence of coordination of the management between different fields of economy using water resources;

2) Lack of finances in the sector of water supply; 3) absence of necessary coordination and cooperation at the governmental level in connection with the recently carried out reforms at the Ministry of Environment Protection. 4) Political situation between Armenia and Azerbaijan.

Taking into account all above said, it is obvious that the necessary step is to take decision about the coordination and cooperation between the states of the region at governmental levels, on the basins of trasboundary bodies, creation of joint Commission on the Transboundary Rivers basins.

At the same time, in order to take decisions at regional level and for the implementation of obligations if Georgia becomes a Party to the Convention of the European Commission of UN on the Protection and Use of Transboundary Watercourses and International Lakes, in the first place, it is necessary that Georgia carries out below listed measures for the improvement the management of water resources, for prevention, control and reduction of water pollution:

- Reduction of pollution and improvement of the treatment systems of industrial and municipal waste waters;
- Development of new indicators and introduction of the systems of norms and standards harmonized with the European system;
- Improvement of the effectiveness of water resources use through the introduction of water-saving technologies in all sectors with particular attention to the improvement of the irrigation technology for the selection of effective methods of irrigated farming and education of farmers;
- Improvement of water supply quality through the prevention of pollution at source, restoration balance between the quantity of the fertilisers applied to the soil and capacity of the crops for their assimilation;
- Creation of basis for shift to the IWRM, strengthening of the potential of the responsible bodies and partner establishments in the field of use and protection of water stock.
- Development and introduction of inter-agency mechanisms of coordination;
- Support of the programs on integrated development of basins during the construction of dams and irrigation canals for the aim of ensuring sustainable use and management of water resources, and effective management at the River basins level;
- Introduction of the tax system for ecosystem services;
- Creation of legal conditions for formation of system of earmarked financing of water-related and water protection activities;
- Establishment of institutional and legal conditions for forming unions of water users, hydro melioration condominiums and consultative services on water-saving;
- Introduction of economic incentives and technological novelties;
- Development and introduction of a mechanism of indemnification resulting from pollution and uncoordinated activities on water bodies;

In the field of monitoring –

- Improvement of monitoring of water quantity and quality at source, as well as water use (currently there are not sufficient data related to water use monitoring);
- Development and introduction of a new system of water resources and water bodies, as well as land resources monitoring

In exchange of information –

- Creation of basic network for the introduction of unified information-analytical system and improvement the access to the information in the field of the use and protection of water resources;
- Professional development and training of staff for the water sector of the countries, establishment of teaching centres.

With the lower reaches countries which in the first place along with Russia is Azerbaijan the very first measures that shall be taken are the following:

1. Signing an agreement with Azerbaijan on Cooperation for Joint Management and water use of transboundary water resources
2. Development together with Azerbaijan a common plan of activities on monitoring the transboundary water ecosystems and ensuring its implementation
3. Development of a joint Plan of Activities on the Prevention and liquidation and the early warning system related to natural catastrophes (calamities)
4. Develop a format of joint interstate Commission related to transboundary water basins and its establishment.