



UNDP/GEF Kura II project

Water supply and Demand Management

National level assessment Report on
Current and Planned Laws, Regulations and enforcement mechanisms
in the Water Sector in Georgia



April 2018



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Resilient nations.*





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Produced for:	UNDP/GEF Kura II Project
Financed by:	UNDP/GEF



National Assessment report:

Current and planned laws, regulations and enforcement mechanisms in the water sector

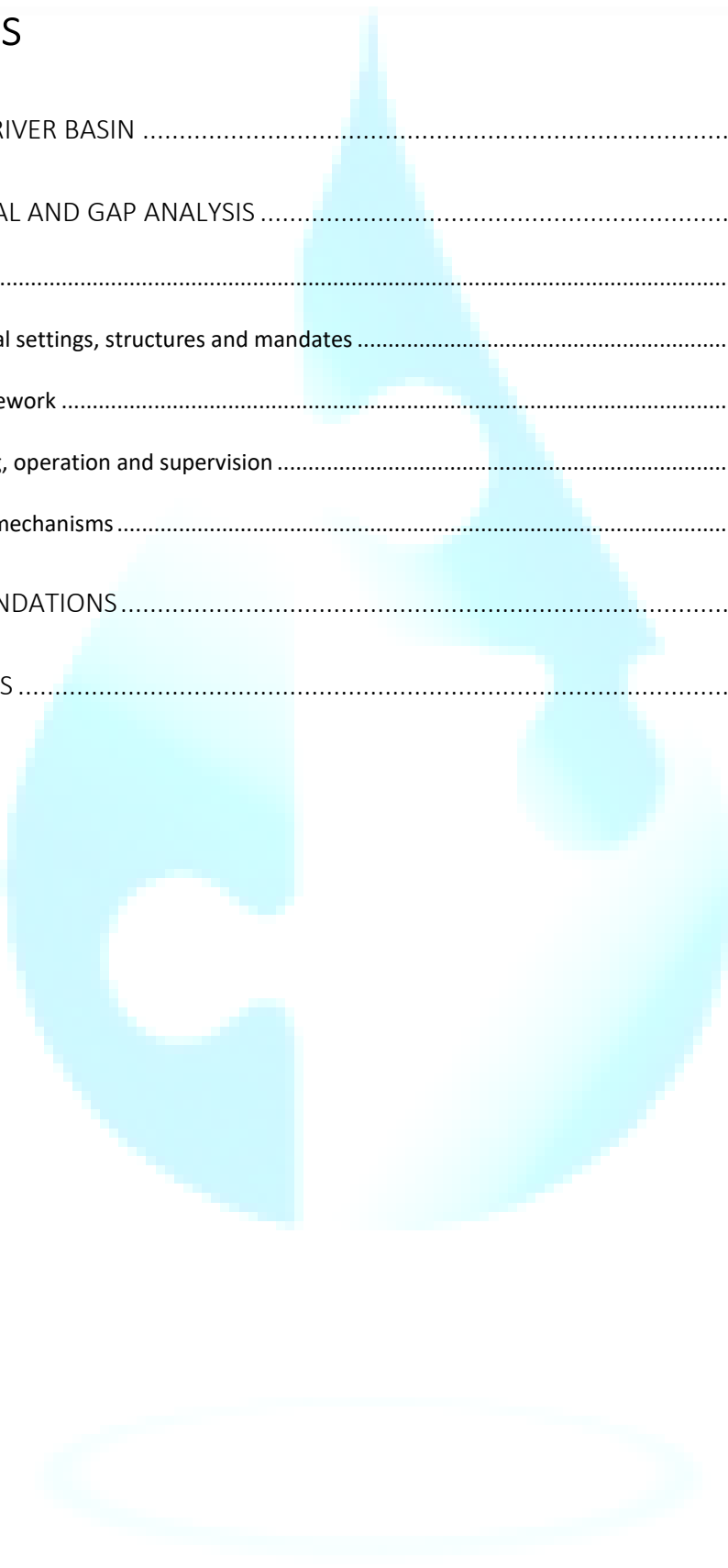
Part I: Georgia

List of Abbreviations and Acronyms

BCM	Billion Cubic Meter
DES	Department of Environmental Supervision under MEPA
EIB	European Investment Bank
FAO	Food and Agricultural Organisation
GA	Georgian Amelioration Ltd.
GNEWSRC	Georgia National Energy and Water Supply Regulatory Commission
GWP	Georgian Water and Power Company
HPP	Hydro Power Plant
JSC	Joint Stock Company
LTD	Limited Company
MCM	Million Cubic Meter
MEA	Ministry of Environment Protection and Agriculture
MEPA	Ministry of Environment Protection and Agriculture
MESD	Ministry of Economy and Sustainable Development
MRDI	Ministry of Regional Development and Infrastructure
MPD	Minimal permissible discharges
UNDP	United Nations Development Program
UWSCG	United Water Supply Company of Georgia
WUO	Water User Organisations
WWTP	Wastewater treatment plant

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The Kura River Basin



1 THE KURA RIVER BASIN

The Kura/Aras River Basin stretches over five countries, namely Armenia, Azerbaijan, Georgia, Iran and Turkey and covers an area of 190 190 km². Azerbaijan with a total area of 86 600 km² of which 60 020 km² are within the Kura basin and Georgia with a total area of 69 700 km² of which 34 560 km² are within the Kura basin cover together roughly about 50% of the Kura River Basin.

The Kura River, originating in Turkey, forms the main river basin in the South Caucasus with approximately 1500 km length. After 150 km the Kura River reaches the border of Georgia. While flowing east, the river follows the large valley between the Greater Caucasus and Lesser Caucasus mountains. It drains most of the southern Caucasus and the mountain ranges of the extreme northern Middle East.

The largest tributary is the Araz River which has its origin also in Turkey. Along its course to the Kura River, the Araz River constitutes the border between Turkey and Armenia, Armenia and Iran and Iran and Azerbaijan.

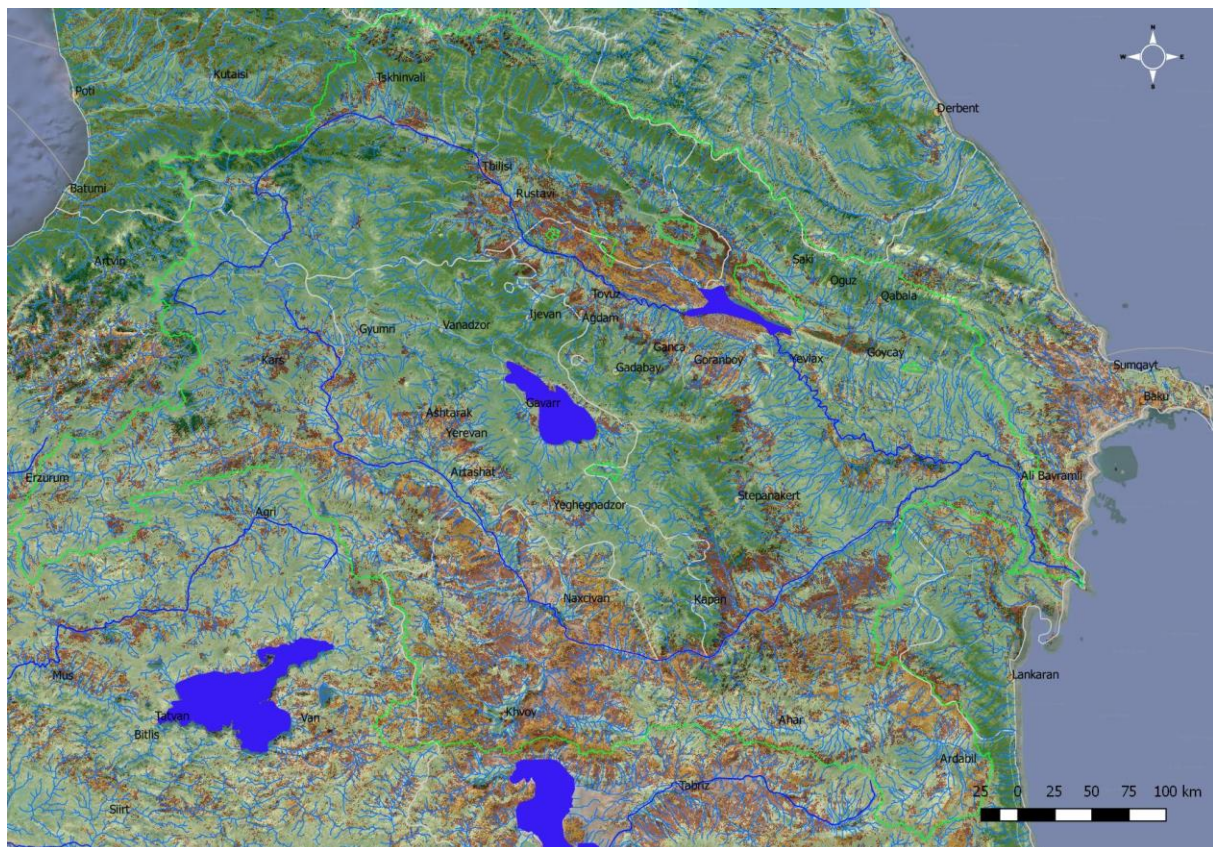


Figure 1: Overview of the Kura river basin

The Kura River Basin is the main transboundary water system in the geopolitically challenging region of the South Caucasus. The participating countries of Azerbaijan and Georgia have undergone significant political and economic transition and are now developing rapidly across a wide range of water dependent sectors (UNDP, 2017).

The UNDP GEF Kura *Project Advancing Integrated Water Resource Management (IWRM) across the Kura river basin through implementation of the transboundary agreed actions and national plans* is

implementing a Strategic Action Program for the Kura River Basin in partnership with the Governments of Georgia and Azerbaijan.

The Kura-Araz River Basin lies in the transition between the Temperate Zone and the Subtropical Zone. The average temperature ranges from -1°C to 16°C or according to the Köppen-Geiger classification, zones can be subdivided into humid subtropical (Cfa), cold semi-arid (Bsk) to humid continental (Dfa) climate.

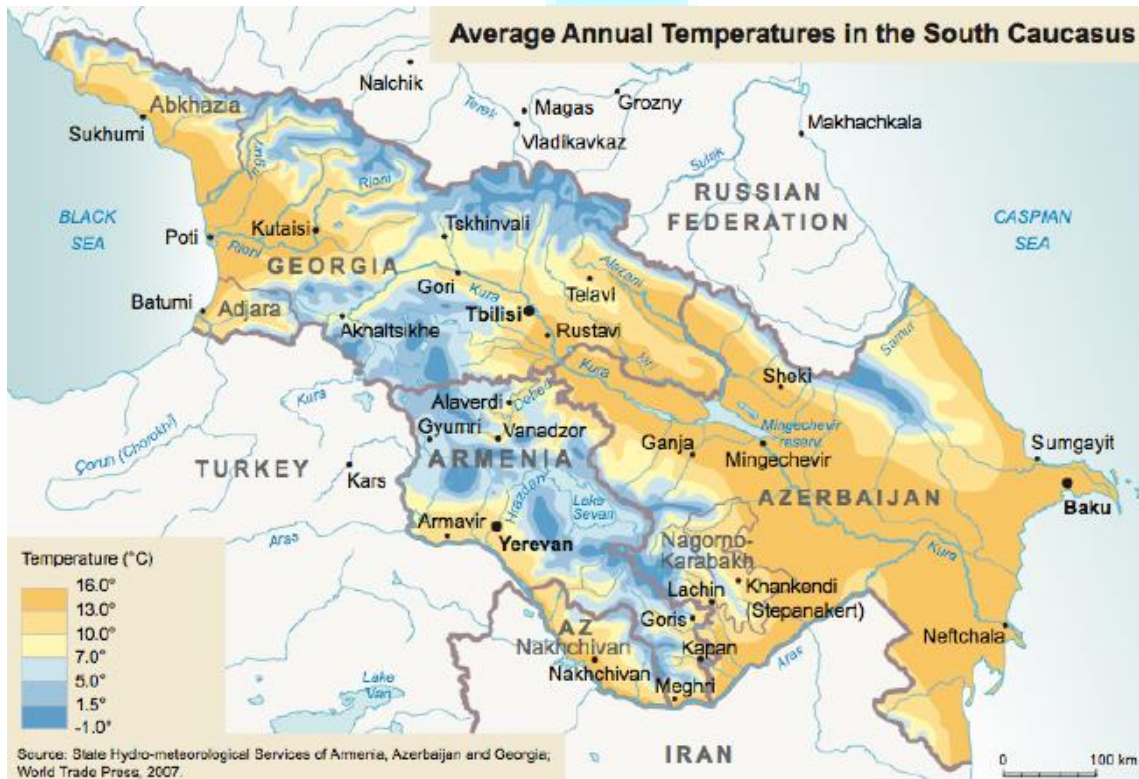


Figure 2: Temperature in the Kura River Basin, from (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013)

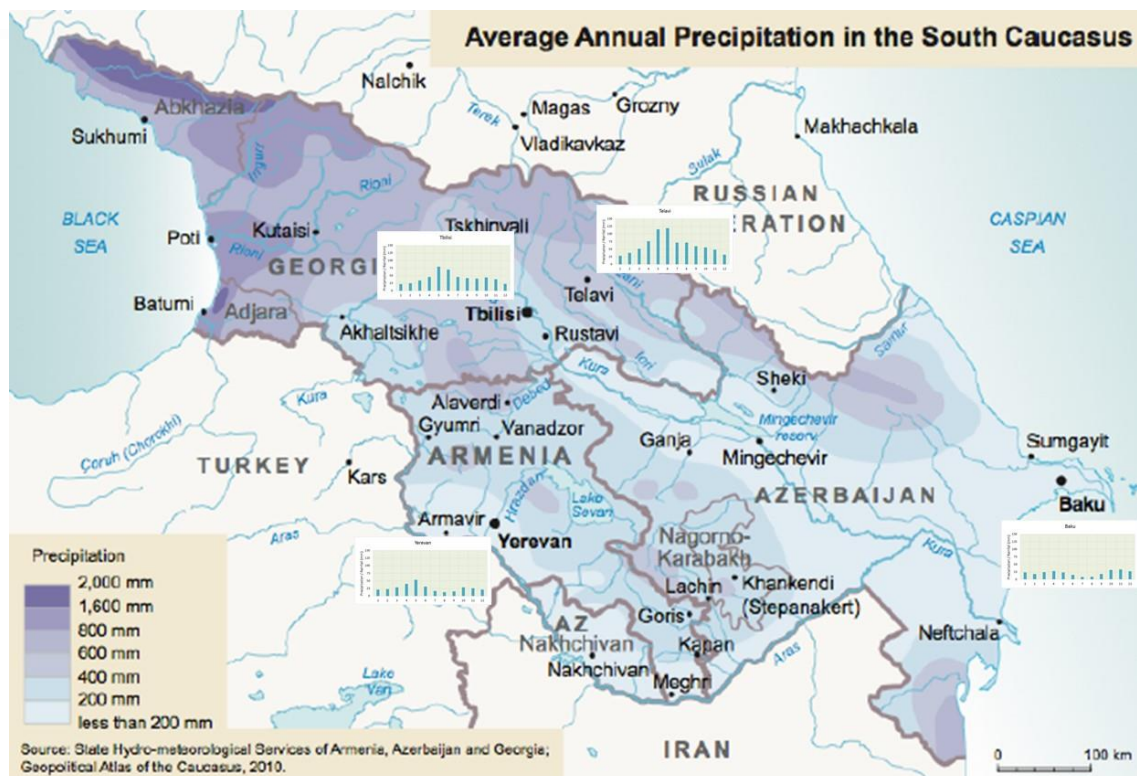


Figure 3: Precipitation in the Kura River Basin, modified from (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013), precipitation from climate-data.org

Precipitation in the basin ranges from less than 200 mm up to more than 1600 mm. The distribution is illustrated for Baku, Tbilisi, Yerevan and Telavi.

The runoff in Azerbaijan follows more or less the elevation. The highest yield of runoff occurs in the mountains, while the Kura and Araz lowlands are regions with considerable abstraction and losses.

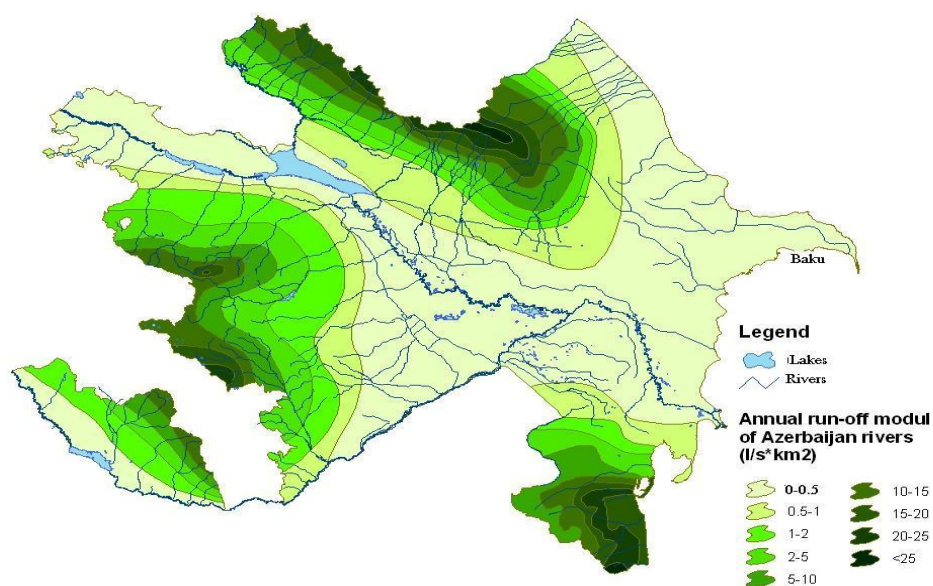


Figure 4: Runoff map of Azerbaijan taken from (Verdiyev, 2018)

The runoff distribution in Georgia was taken from (Beldring, 2017). The figure shows the big differences of the major basins. The western part of Georgia draining into the Black Sea has considerably higher precipitation and runoff compared to the eastern part draining into the Caspian Sea.

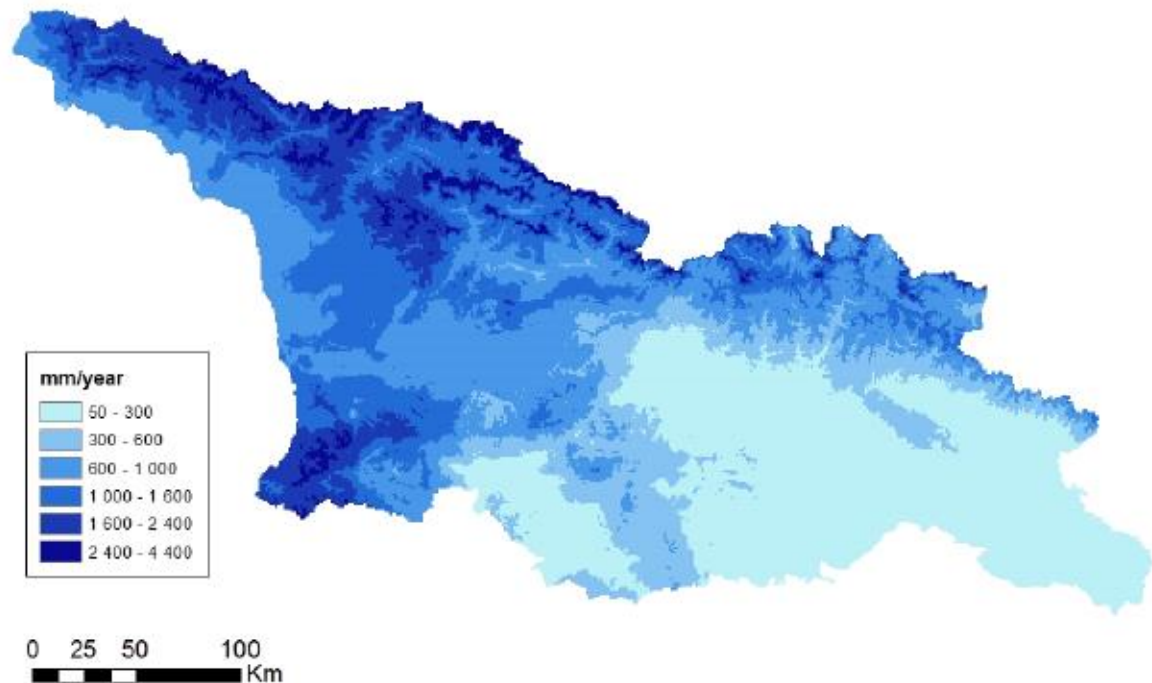


Figure 5: Runoff map of Georgia taken from (Beldring, 2017)

The assessment of available water resources is considerably hampered by substantial gaps regarding data and reliability of data. Figures concerning surface and groundwater resources in Georgia and Azerbaijan result in different water balances depending on the sources used. The sources used were FAO Aquastat, UNICEF Washdata.org, (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013), (Vogel, 2017) and internal reports of the Kura II Project provided by national consultants from Georgia and Azerbaijan. Which data source is used for preparing tables or figures is indicated.

Examples of contradicting data is demonstrated by few examples. (Verdiyev, 2017b) claims an increase of water abstraction from 11 to 11.5 BCM whereas (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013) indicates an increase from 4 to 6 BCM for the same time period. Although the increase is in the same order, absolute values differ by more than 100%. (Vogel, 2017) indicates a long-term average discharge of the Kura River of 20 BCM at Tbilisi station, 4.5 BCM for the Alazani River (in Azeri Ganikh River) and 20 BCM for the Khrami River. Only the figure for the Alazani River is in the same range of other sources while the value for the Kura River seems 100% higher and for the Khrami River 10 times higher, which is probably attributable to mistaken units. Based on all sources, a best estimate about the flow network of the Kura-Aras River Basin is shown in Figure 6.

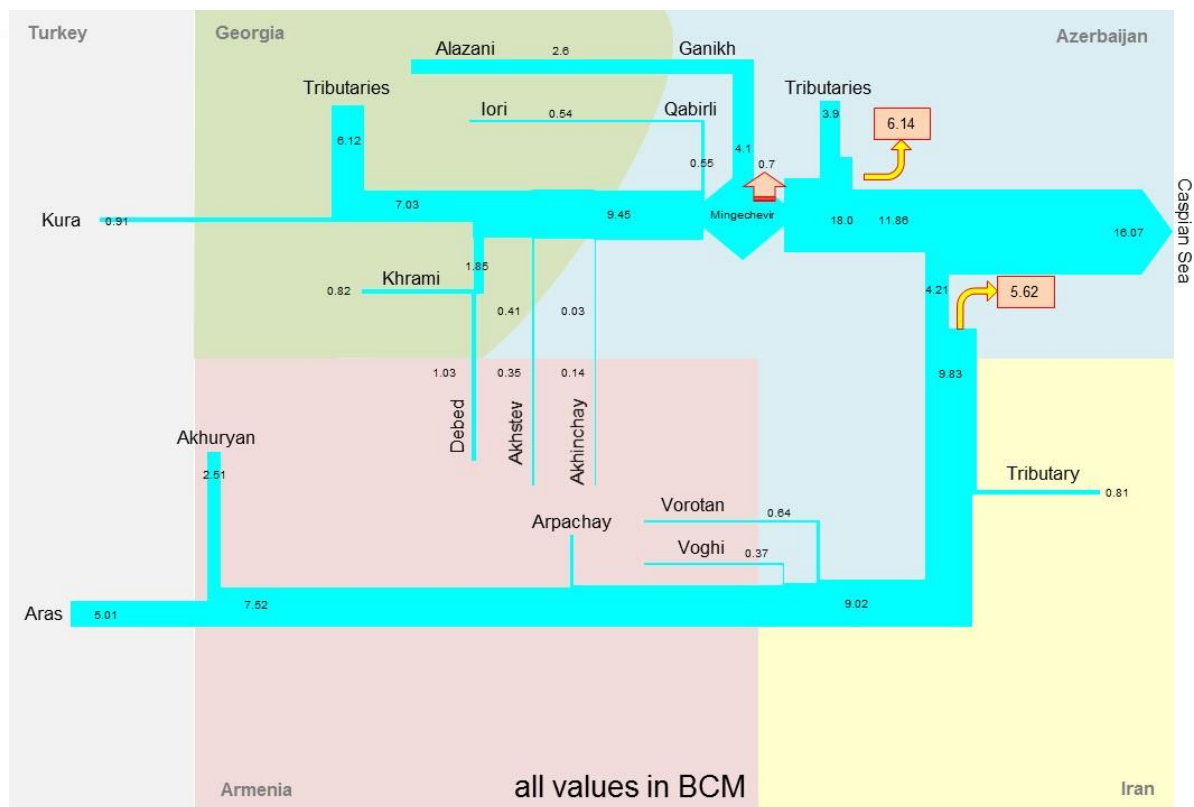


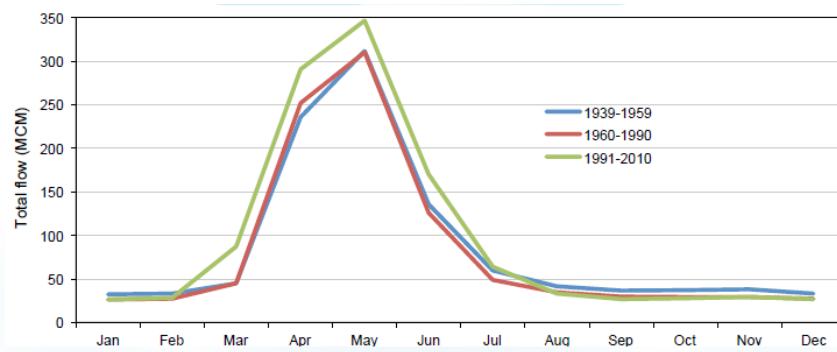
Figure 6: Surface water flow chart of Kura-Araz River Basin (source: (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013), (Verdiyev, 2018)), (FAO, 2018)

Figure 6 is schematic flow network of the Kura and Araz River with the contribution of major tributaries. The numbers were taken from (Verdiyev, 2018) and (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013) and checked against (FAO, 2018). The figures differ but within tolerable margins of ± 1 BCM at the total flow into the Caspian Sea, which is in the range of 10%. FAO data tend to be smaller. All data refer to long-term average, however, the reference period of the figures is not always given and might be inconsistent.

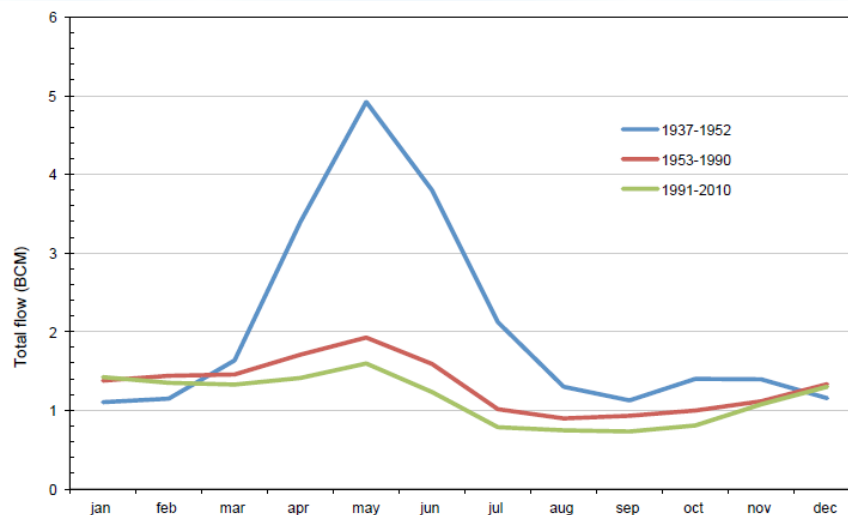
The major problem is related to missing measurements of abstractions at various locations. This is why abstraction was only assigned to two locations in the flow chart at which observations exist. The location downstream the confluence of Kura and Araz refers to the hydro post Surra, upstream the confluence to Zardab station in the Kura River and to Novruzlu station in the Araz River.

Water abstraction are mostly concluded from flow measurements at observation stations or given as total sum without spatial disaggregation.

The inner-annual flow distribution of the Kura River at two locations is shown below. The observation point Surra downstream of the confluence with the Araz River, indicates an anthropogenic impact. The hydrological regime of the Kura River has significantly changed over time. Considerable amounts are diverted into channels for irrigation and large dams leading to a homogeneous flow distribution which does not follow the natural pattern.



Average total monthly discharge for different periods at Khertvisi, Georgia
Source: (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013)



Average total monthly combined discharge for Kura + Araz for different periods at Surra, Georgia
Source: (Hannan, Leummens, & Matthews, Desk Study - Hydrology, 2013)

Figure 7: Inner-annual flow distribution of the Kura River

Given the period 1991-2010, the aggregated flow over 12 month at Khertvisi and at the combined Kura + Araz flow corresponds to the calculated flow in the schematic view above.

Georgia



(source: FAO Aquastat, accessed 2018)

2 SITUATIONAL AND GAP ANALYSIS

The National Assessment Report about current and planned laws, regulations and enforcement mechanisms in the water sector of Georgia consists of a situational analysis in combination with a gap analysis focusing on rational use of water and water efficiency. The following key topics and criteria are considered and evaluated:

- Institutional settings, structures and mandates
- Regulations and enforcement
- Capacity building and processes
- Tools
- Finance
- Facilities, monitoring and measurements
- Data, information management

The evaluation is based on reports from national consultants and documents which were made available by the UNDP Kura II Project management. In addition, documents from various other sources were used, above all, UNECE provided good and up-to-date literature.

2.1 Criteria

A situational and gap analysis requires criteria upon which the situation can be analysed and gaps identified. Criteria are sorted according to topics and listed in Table 1. Each section was evaluated according to the criteria summaries are given based on identified gaps.

Table 1: Criteria for gap analysis

Structural and mandate domain gaps
Roles and responsibilities unspecified
Roles and responsibilities are overlapping
Roles and responsibilities unclear
Legislation domain gaps
Regulations are not in place
Regulations unspecified
Regulations too limited in scope
Regulations in place but not applied
People domain gaps
Understaffed
Training gaps
Staff will be overwhelmed in the near future
Process domain gaps
Course of action is unspecified
Course of action is inhomogeneous
Course of action is overlapping
Course of action is unclear
Tools domain gaps
Tools are missing
Tools are duplicate and yield diverse results
Tools are inefficient

Tools lack functionality
Tools are likely to be insufficient in the near future
Financial domain gaps
Resources seem insufficient
Origin of resources is unclear or insufficient
Relationship between beneficiaries and source of fund seems unclear or
Lack of resources is likely to occur in the near future
Monitoring and measurement domain gaps
Measurements not sufficient
Measurements not located where it is needed
Not the measurements that is needed
Measurements not available when needed
Information domain gaps
Data not sufficient
Data not located where it is needed
Not the data that is needed
Data not available when needed
Data not created
Data not consumed
Data relationship gaps

2.2 Institutional settings, structures and mandates

This section concentrates on roles and responsibilities in view of setting up laws, normative regulations and enforcement. An overview of responsibilities related to water resources is illustrated in Figure 8.



Figure 8: Institutional setting adopted from (Makarova, 2016)

Each entity listed is involved in either the development of laws, regulations and/or enforcement. The Ministry of Environment Protection and Agriculture (MEPA) is the main environmental authority in Georgia. The entity underwent several restructuring and was downscaled in 2011 but regained its former functions almost entirely and re-established or established several new key units. However, it is unclear to what extent the latest reorganisation in 2018 has impacted on the structure and mandates.

Table 2 was adopted from (MOA, 2017) and summarises the roles and responsibilities of various entities in consideration of the new Statute of the Ministry of Environment Protection and Agriculture of 6 March 2018 (approved by Government Decree #112). The table assumes that the new Ministry of Environment Protection and Agriculture (MEPA) has adopted all mandates of the former Ministry of Environment and Natural Resources Protection (MENRP) except for the issuing of licences for natural resources use, including for groundwater, which was transferred to the Ministry of Economy and Sustainable Development.

Table 2: Summary of roles and responsibilities, adopted from (MOA, 2017)

Entity	Roles and Responsibilities
Ministry of Environment Protection and Agriculture of Georgia	<p>This ministry (MEPA) is the parent ministry of the National Environmental Agency (NEA) and is responsible, through the NEA, for monitoring and protecting the quality of Georgian waters</p> <p>The former MOA plans and implements state policy in the agricultural sector, including the amelioration subsector, and, through its Department of Melioration and Land Management, oversees Georgian Amelioration Ltd on behalf of the Ministry of Economy, which holds 100% of the shares of Georgian Amelioration Ltd (GA).</p>

Entity	Roles and Responsibilities
Hydro-Melioration and Land Management Department	<p>This department is most directly related to irrigation. It is responsible for developing policies related to irrigation and agricultural land and monitors its implementation. It is also responsible for gathering and processing data related to its mandate and is involved in budget development and rehabilitation project planning.</p> <p>This department has been or is currently instrumental in a number of actions, including the following.</p> <ul style="list-style-type: none"> • Seeking funding for the sector from the state budget and from foreign donors • Serving on rehabilitation project tender commissions
Department of Food, Agriculture and Rural Development	This Department develops programmes for different fields and determines the priorities for the agricultural sector.
Agricultural Projects Management Agency	This agency provides vouchers to farmers for tractor hire, seeds, fertilizer and other inputs on a prepaid debit card. This mechanism could potentially be used for providing irrigation subsidies to farmers.
Policy and Analysis Department	This department carries out policy research, analyses investments, identifies and evaluates sector problems and develops agricultural development policies, strategies and action plans as well as environmental policy.
Department of Environmental Supervision (DES)	<p>The department verifies compliance with regulatory requirements. There are seven divisions in the department including: Integrated Environmental Control Service, Biodiversity Control Service and Environmental Patrolling and Rapid Response Service (statute of the Environmental Supervision Department approved by Order # 2-98 of the Ministry of Environment Protection and Agriculture of 22 February 2018). DES is in charge of controlling the compliance of environmentally related permits and environmental regulations. Compliance with technical safety, however, is under the umbrella of the Technical and Constructions Supervision Agency under the Ministry of Economy and Sustainable Development.</p>
Ministry of Economy and Sustainable Development	The MESD holds the stock in GA on behalf of the Government of Georgia. Oversight responsibility for GA is delegated to the MEPA.
Ministry of Finance	The Ministry of Finance (MoF) develops annual budgets in conjunction with concerned ministries and provides funds to other government ministries.
Department of Hydrometeorology	This department, a unit of the NEA, is responsible for collecting data on river discharges and meteorological conditions throughout the country. Its mandate is extremely important in view of analysing water resources availability, rational use of water and rehabilitation, but at present it seems that only little data on river discharges are actually collected.
Ministry of Regional Development and Infrastructure	<p>This ministry (MRDI) houses the Municipal Development Fund (MDF) which manages development projects for a variety of different sectors. In the past it has managed the USAID-financed rehabilitation of the Saltvisi-Tirifoni Irrigation Scheme.</p> <p>Rehabilitation of irrigation channels (funded by WB) is overseeing by the Ministry of Environment Protection and Agriculture (formerly Ministry of Agriculture). MRDI is responsible for planning and</p>

Entity	Roles and Responsibilities
	development of municipal water supply and sanitation systems. MDF now is focused on roads and water supply-sanitation projects.
National Agency for Public Registry	The Public Registry maintains a national registry of land ownership. At present only a small fraction of the land within the boundaries of irrigation systems is registered. Completion of the land registration process is important to GA to facilitate development of contracts for irrigation water and for assessing and collecting irrigation tariffs. The Registry is housed in the Ministry of Justice.
Georgia National Energy and Water Supply Regulatory Commission	This commission reviews and approves tariffs charged by electricity supply and municipal water supply companies. It is widely regarded as the authority with the mandate to cover irrigation tariffs as well. In practice, the commission approved an initial set of irrigation rates in 2011, but has not acted since with respect to the irrigation tariff.

Through its Department of Melioration and Land Management, MEPA oversees Georgian Amelioration Ltd (GA) on behalf of the Ministry of Economy, which holds 100% of the shares of GA. (MOA, 2017).

Table 3: Structural and mandate domain gaps

Structural and mandate domain gaps	
clear	General structure: Assuming the new MEPA has adopted almost all mandates, specification of roles and responsibilities seems generally clear.
clear	Control and enforcement: DES and the Technical and Constructions Supervision Agency have both the responsibility to control compliance with regulations and standards. However, they focus on different aspects and must coordinate themselves.
unknown	Monitoring: It is assumed that data collection of the Melioration and Land Management Department and Department of Hydrometeorology are clear.
clear	Land cadastre: The idea of running the land cadastre system in an own department is good if and when all other tasks related to the cadastre system make use of this system, for example the Agricultural Projects Management Agency.
deficient	Water use efficiency: It is unclear who assumes responsibilities in terms of water use efficiency. Considering the huge losses in both water supply and irrigation sector, urgent actions are required but apparently, no mandate has been given to any department to take care of the problem. Alternatively, it has been assigned to an entity but without success. This statement grounds on the fact that the unsatisfactory situation lasts for long time, is known but still no improvement is visible.
deficient	IWRM principles: IWRM principles are not reflected in the institutional settings.
weak	Normative regulations and state-of-the-art: Melioration and Land Management Department seems to be the only body who determines standards and state-of-the-art in terms of technical implementation. Representatives of operators and research organisations (Universities) are not involved. Apparently, nothing similar is in place for the water supply sector. In addition, it seems as determining normative regulations does not follow a procedure of participation of relevant entities and review mechanisms.

Summary:

Structural and mandate domain gaps	
Roles and responsibilities unspecified	no
Roles and responsibilities are overlapping	partly
Roles and responsibilities unclear	partly

2.3 Legal framework

“The last decade of environmental law-making in Georgia can be generally characterized as the story of a gradual watering down of environmental safeguards and of relaxing or totally cutting off environmental procedures. It is also a history of sterile law development whereby legal documents were drafted without being approved. The most recent example is the Environmental Code of Georgia that absorbed resources and created false expectations without any end result. It is clear now that the development of this comprehensive legal act was an error, given the difficulty of reaching consensus on a text of such complexity. Failure to enact the Environmental Code left Georgia with all the previously existing gaps in its legal framework, most importantly as concerns environmental assessments and permitting, water resources management, forestry and waste management ...”

This statement stems from (UNECE, 2016) indicated as a contribution from the Ministry of Environment and Natural Resources Protection of Georgia. On the condition that this still reflects the truth in 2018, it can be concluded that water use efficiency and cutting down losses is not considered a priority task.

A compilation of relevant legal acts can be found in (Dzneladze, 2017):

EU - Georgia Association Agreement (AA/DCFTA) / Association Agreement of June 27, 2014 between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Georgia, of the other part (Official Journal of the European Union, OJ L261, 30.8.2014). http://eeas.europa.eu/georgia/pdf/eu-ge_aa-dcfta_en.pdf

Law of Georgia on Water (1997) / Law of Georgia No.936-Is of 16 October, 1997 (Official Bulletin of the Parliament of Georgia, Part I, Vol. 44, 11/11/1997/ *Consolidated Version as of 26.12.2014/* as modified by 19 amending laws / Last amended by Law of Georgia No. 3007-rs of 26/12/2014 – GE LHG Official Website, 12/01/2015 [**Georgian Version**] <https://matsne.gov.ge/ka/document/view/33448>

Law of Georgia on Environmental Protection (1996) / Law of Georgia No.519-Is of 10 December, 1996 (Official Bulletin of the Parliament of Georgia, Part I, Vol. 1-2 (33-34/7), 22/01/1997) / *Consolidated Version as of 01.06.2017* / as modified by 23 amending laws / Last amended by Law of Georgia No.5369-IIs of 01.06.2017 [**English Version**] <https://matsne.gov.ge/en/document/view/33340>

Law of Georgia on Environmental Impact Permits (2007) / Law of Georgia No.5602-es of 14 December, 2007 (GE LHG, Part I, Vol.47, 26/12/2007) / *Consolidated Version as of 13.04.2016/* as modified by 14 amending laws / Last amended by Law of Georgia No. 4960-IIs of 13/04/2016 [**English Version**] // From January 1, 2018 is substituted by the Environmental Assessment Code of Georgia (2017). <https://matsne.gov.ge/en/document/view/20206>

Law of Georgia on Ecological Examination (2007) / Law of Georgia No.5603-es of 14 December, 2007 (GE LHG, Part I, Vol.47, 26/12/2007) / *Consolidated Version as of 25.03.2013/* as modified by 2

amending laws / Last amended by Law of Georgia No. 468-rs of 25/03/2013 [**English Version**] / *From January 1, 2018 is substituted by the Environmental Assessment Code of Georgia (2017).*
<https://matsne.gov.ge/en/document/view/20212>

Law on Fees for Use of Natural Resources (2004) / Law of Georgia No 946-rs of 29 December, 2014 (Legislative Herald of Georgia, Part I, Vol. 41, 30.12.2004) / Consolidated Version as of 20.09.2017 / as modified by 25 amending laws / Last amended by Law of Georgia No 1286-ls of 20.09.2017 [**Georgian Version**] <https://matsne.gov.ge/ka/document/view/28948>

Law of Georgia on Electricity and Natural Gas (1997) / Law of Georgia No. 816-ls of 27 June, 1997 (Official Bulletin of the Parliament of Georgia, Part I, Vol.33, 31/07/1997) / Consolidated Version as of 22.06.2016/ as modified by 35 amending laws / Last amended by Law of Georgia No. 5499-ls of 22/06/2016 – GE LHG Official Website, 29/06/2016 [**Georgian Version**]
<https://matsne.gov.ge/ka/document/view/31744>

Law on Licenses and Permits (2005) / Law of Georgia No 1775-rs of 24 June, 2005 (Legislative Herald of Georgia, Part I, Vol. 40, 18.07.2005) / Consolidated Version as of 30.06.2015 / as modified by 67 amending laws / Last amended by Law of Georgia No 1111-ls of 28.06.2017 [**Georgian Version**]
<https://matsne.gov.ge/ka/document/view/26824>

Tax Code of Georgia (2010) / Law of Georgia No 3591-ls of 17 September, 2010 (Legislative Herald of Georgia, Part I, Vol. 54, 12.10.2010) / Consolidated Version as of 15.11.2017 / as modified by 124 amending laws / Last amended by Law of Georgia No 1378-ls of 15.11.2017 [**English Version**]
<https://matsne.gov.ge/en/document/download/1043717/94/en/pdf>

Product Safety and Free Movement Code (2012) / Law of Georgia No 114 of 19 December 2012 – LHG Official Website, 27.12.2012 / Consolidated Version as of 28.06.2017 / as modified by 15 amending laws / Last amended by Law of Georgia No 1117-ls of 28.06.2017 - LHG Official Website, 28.06.2017 [**English Version**] <https://matsne.gov.ge/en/document/download/1659419/9/en/pdf>

Environmental Assessment Code of Georgia (2017). Law of Georgia No.890-ls of 1 June, 2017 / GE LHG Official Website, 21/06/21 [**Georgian Version**]
<https://matsne.gov.ge/ka/document/view/3691981>

According to (Dzneladze, 2017), water use related legislations of Georgia can be divided into three parts:

- legislation with a direct focus on water related issues
- legislation that covers environmental aspects affecting water protection and use
- sectoral legislation, e.g. in agriculture, health, spatial planning etc.

Table 4: Legal framework related to water use, adopted from (Dzneladze, 2017)

Topic	Current situation
Permits/licenses for surface water extraction and discharges	There are no special permits/licenses for surface water extraction and discharges into water bodies. Discharge and water extraction are regulated through the environmental impact permit process.

Topic	Current situation
Environmental impact permit system	Environmental permits were introduced in 1997. The newly established Environmental Assessment Code 2017 is supposed to be the mechanism to move step-by-step towards the EU EIA Directive and to address, for instance, industrial sectors responsible for high loads of nutrient-containing wastewater, such as food industries.
Activities not subject to environmental decisions	Activities not subject to environmental decisions (former: impact permits) have to comply with technical environmental regulations, approved by the Government. Technical environmental regulations define standard discharge limits for specific pollutants. As to the right to abstract water, it is granted for a 5-year period. There are two technical regulations: <ul style="list-style-type: none"> • 1. Technical Regulation on Discharges into Surface Waters by Industrial and Non-Industrial Facilities • 2. Technical Regulation on Extraction of Water from Surface Waters Both are approved by the Governmental Decree N17, 2014, Jan-03 (Based on Product Safety and Free Movement Code of 2012). Calculations of Maximum Permissible Levels for Discharges for Hazardous Substances into Surface Waters are approved by the Governmental Decree N414, 2013, Dec-31Jan-03 (Based on Product Safety and Free Movement Code of 2012).
Non-point sources of pollution	There is no administrative or legal framework regarding the evaluation and management of non-point sources of pollution, for example from agricultural areas (nitrate, phosphate, TDS) or stock farms (mainly nitrates and ammonia).
Reuse of treated wastewater	There is no administrative or legal framework regarding the reuse of treated wastewater exits currently in Georgia.

The Law on Water, in effect since 1997, sets general principles on rational water use and declares that as one of the main objectives. Specifically, the law obliges all Georgian citizens to ensure rational and sustainable use and protection of water and obliges water users to ensure rational use of water and maintenance and restoration of its quality (Article 41). The Law on Water assigns a highest water use priority to satisfying population demand on safe drinking water (Article 4).

The new Draft Law of Georgia on Water also obliges a water user (a permit holder) to ensure rational use of water and to take measures for maintaining and restoring its quality (Article 22). The draft Law reintroduces permits for water abstraction and discharge into water. Accordingly, a permit holder will be subject to paying fees for abstraction of water from surface as well as underground water bodies. Fee amounts defined by the former legislation are subject to review and update.

Judging from what is given in the documents about legal frameworks, there is little advocacy and enforcement in terms of the environment and water. In contrast to the objectives of the Law on Water (since 1997), there is no clear evidence that the law took effect on the ground in terms of water use efficiency or rational use of water. Water losses are still incredibly high. It is very likely that measures taken, if any, failed or never came into being. As such, the introduction of the new Draft Law of Georgia must be accompanied with a behaviour change in terms of water use to bring about a significant progress or positive change. Otherwise the new Draft Law might come to nothing.

Table 5: Legislation domain gaps

Legislation domain gaps	
deficient	Enforcement: There is little evidence that regulations with respect to water use efficiency are effective or enforced. This implies that companies dealing with water supply are not requested (or forced by legal mechanisms) to invest in reducing water losses. Moreover, the current situation seems economical viable from the viewpoint of the companies despite the losses. This means that the current business model has obviously incorporated the losses and seems to prove its inappropriateness to solve the long-lasting water efficiency problem.
weak	Environmental impact permit system: For activities subject to EIA, maximum allowable discharge limits seem to be calculated based on background conditions, sensitivity of the area, cumulative effects of discharges. It is difficult to imagine that these complex topics are assessable with the current monitoring of streams and rivers in place, lack of spatially distributed hydrological and water quality models and most likely unknown composition of wastewater effluents. All aforementioned points adversely impact also on enforcement. Still, the country faces a serious water quality problem and this implies that a) Number of relevant polluters that still operate were not subject to EIA according to the legislation in force before 2018, b) lack appropriate treatment, c) what is given in the regulations is not enforced or d) the regulations are too new to see effects. This means that older facilities, starting operation before 2018, do not have and are not subject to EIA while the new Environmental Assessment Code requires EIA for all relevant sectors. The environmental impact permit system needs further implementation under recently adopted new legislation on EIA (Environmental Assessment Code of 2017).
unclear	Non-point sources: Non-point sources of pollution from agriculture is primarily caused by improper application of fertilizers, pesticides and herbicides, which, in turn, implies that no regulations concerning the use of chemicals in the agricultural sector are in place.
Minor issue	Reuse of treated wastewater: Reuse of treated wastewater is of little importance as the treatment of wastewater is still an exception in Georgia. Before this topic obtains any importance, controlled discharge and treatment of wastewater must be settled first.

Summary:

Legislation domain gaps	
Regulations are not in place	partly
Regulations unspecified	no
Regulations too limited in scope	yes
Regulations in place but not applied or enforced	yes

2.4 Monitoring, operation and supervision

Monitoring, operation and supervision deals with the relationship between those who perform services and those who monitor and oversee actions to make sure standards and rules are met.

There are two sectors with respect to water use efficiency:

- Water supply
- Irrigation

The main stakeholders are:

Supervisors	Operators
Water supply	
Georgia National Energy and Water Supply Regulatory Commission	Georgian Water and Power Company (GWP)
	United Water Supply Company of Georgia (UWSCG) (around 300 villages)
	Municipal Water Supply Companies
Irrigation	
Georgia National Energy and Water Supply Regulatory Commission (from the viewpoint of compliance control) Ministry of Environment Protection and Agriculture with its Department of Environmental Supervision (DES)	Georgian Amelioration Ltd (main system management)
	Water Users

Regarding water supply, the Georgia National Energy and Water Supply Regulatory Commission (GNEWSRC) is the body who is in charge of regulating all water supply companies (private, state-owned, municipal) which are license holders. This implies that in case of state-owned entities, the government is both supervisor and operator.

The largest operators are GWP and UWSCG. GWP understands the services of water supply and waste water drainage as a business and profit opportunity rather than a sovereign function under the public sector. Unlike other cities in Georgia, Tbilisi's relatively well developed local economy with comparatively high wages supports the business approach of GWP. However, profit maximization seldom meets sustainability and basic services like water supply and waste water, which are not subject to competition and where clients have no choices, require a clear framework in respect of control and supervision.

In view of irrigation, Georgia went through a variety of organizational forms since 1990 but has consolidated since 2012, when new reform efforts were launched. The reform is still on-going and aims to develop GA into a financially viable main system service provider with local level organizations as its clients. Accomplishments to date include a regional decentralization and new enterprise management software to support data-based management decision-making, along with ongoing efforts to establish a computerized asset inventory, explore a variety of new contracting modes with local level farmer-based entities and develop a radically new tariff system (MOA, 2017).

According to (Dzneladze, 2017), one of the most important reforms in recent years was the new Environmental Assessment Code. The new code expands the list of activities subject to Environmental Impact Assessment (EIA) and introduces new mechanisms of planning in the form of Strategic Environmental Assessment (SEA). The code ensures public participation not only during decision-making but also during the planning stages. In addition, according to new provisions of the code, dissemination of information and arrangement of public discussions will be conducted by the government authorities instead of investors, while the newly established decision-making procedures will reduce the financial risks of investors. Public participation is one of the key stages during the approval of management plans for hunting and fish farms. Public consultations, as required by law, are organized in process of adoption of all management plans.

Monitoring, operation and supervision grounds on legally binding standards, compliance monitoring, a legal framework which entitles operators to take actions and supervisors to control operators and a clear and enforceable course of actions in case standards are violated. In theory, the appropriate

structure is largely in place, separating supervisors and operators, assigns roles for monitoring and control. In practice, none of aforementioned criteria are fully implemented.

Table 6: Monitoring, operation and supervision domain gaps

Monitoring, operation and supervision domain gaps	
improving	<p>Monitoring:</p> <p>The NEA has succeeded in improving environmental and hydro-meteorological monitoring networks. Advancements have been in relation to surface water monitoring, which comprises 116 monitoring points on 63 water bodies. The scope of water quality monitoring includes total nitrogen concentration in the major water bodies (since 2013) and, as of 2014, total phosphorus (UNECE, 2016).</p>
improving	<p>Process chain of monitoring:</p> <p>The rehabilitation and modernization of the environmental monitoring network has progressed but data analysis remains the weakest link in the chain of information management. In order to improve the monitoring and reporting of environmental information, LEPL Centre for Environmental Information and Education started to develop an environmental information management system. The system would include reports (air, water, waste), permits / licenses, timber and other resources. However, this long-term process would take several years before it will be fully operational. Nowadays only air and timber resources system is fully functional while water and waste management systems have been developed and are being tested. It is expected that ambient air and maybe water management components would be ready by beginning of 2016 (UNECE, 2016).</p>
deficient	<p>Compliance monitoring:</p> <p>All holders of licences must establish a system of self-monitoring and report on the use of natural resources on an annual basis. Permit holders have a similar obligation if this is adequately stipulated in permit conditions. Some permits are not sufficiently well formulated and as a result regulated enterprises avoid both self-monitoring and self-reporting. General binding rules are not sufficiently clear regarding self-monitoring and self-reporting conditions, lowering the share of enterprises which establish such systems. In practice, only one third of, or even fewer, enterprises subject to sectoral technical regulations send in annual self-monitoring reports (UNECE, 2016).</p>
insufficient	<p>Legal framework for monitoring:</p> <p>According to the Law on Licences and Permits, licence holders report annually on licence conditions to the administrative authorities. The Law authorizes the licensor to control compliance with the licence terms by means of selective inspections or/and by obtaining regular reports from the licensee. Unless otherwise stipulated by the Law, the licensor shall only be allowed to control compliance with the licence terms once during a calendar year. DES monitors the licensee's obligation to submit reports within the legal deadlines, and based on analysis of information presented, carries out statutory measures (UNECE, 2016).</p> <p>Thus, compliance monitoring by DES focuses on administrative aspects and is limited to one technical inspection per year.</p>
insufficient	<p>Capacity and staff:</p> <p>The intensity and scope of inspections are limited. In 2012 and 2013, no planned inspections were conducted at all. This is mainly due to The list of all inspections conducted from 2010 to 2014 does not show one related to water abstraction or discharge (Source: Ministry of Environment and Natural Resources Protection, 2015).</p>
clear	<p>Non-compliance response and liability:</p> <p>Environmental inspectors have the power to impose administrative sanctions. The spectrum of legally mandated non-compliance responses is large but in practice they are limited to fines. The legal framework provides for an enforcement pyramid; for</p>

	example, if the repetitive application of fines does not bring an enterprise back into compliance, its licence can be repealed.
deficient	Water use efficiency: Even though water use efficiency seems to be a big problem, it doesn't play a role and is not addressed in the process of operation – monitoring — supervision.
insufficient	Development of standards: There is no systematic involvement of the private sector or research organisations in the development of environmental policies and the legal framework. A multi-staged process of seeking comments or suggestions from all three parties (monitoring, operators and supervisors), when standards are developed, is missing. This could be one reason why awareness among all stakeholders might differ.
deficient	Linkage between water use permits and water use efficiency: There is no linkage between granting a permit and water use efficiency. In case of activities subject to EIA, applicants must prepare an EIA that examines all of the potential risks to, and impacts on the environment, and show that all appropriate measures are undertaken to minimize the identified risks and impact on the environment (including water ecosystems) (Arabidze, 2017). However, water use efficiency seems unaddressed which is truly one major point in minimising impacts.

Summary:

Monitoring, operation and supervision domain gaps	
People domain gaps	
Understaffed	yes
Training gaps	no
Staff will be overwhelmed in the near future	likely
Process domain gaps	
Course of action is unspecified	partly
Course of action is inhomogeneous	no
Course of action is overlapping	no
Course of action is unclear (with respect to water use efficiency)	yes
Monitoring and measurement domain gaps	
Measurements not sufficient	largely
Measurements not located where it is needed	yes
Not the measurements that is needed	partly
Measurements not available when needed	yes
Process domain gaps	
Course of action is unspecified	yes
Course of action is inhomogeneous	
Course of action is overlapping	
Course of action is unclear	partly
Tools domain gaps	
Tools are missing	yes
Tools are duplicate and yield diverse results	no
Tools are inefficient	yes
Tools lack functionality	yes

Information domain gaps	
Data not sufficient	yes
Data not located where it is needed	partly
Not the data that is needed	partly
Data not available when needed	partly
Data not created	yes
Data not consumed	no

2.5 Financing mechanisms

2.5.1 Irrigation

(MOA, 2017) states that amelioration is ranked as top priority since 2012 with the aim to accomplish a financially viable irrigation sector. Current operating income, excluding government subsidies, constitutes just 13% of expenditures (Ukleba B. , 2017) and the ultimate success of the reform will depend on a successful tariff system, cost control and higher operational efficiency and establishment of viable local level management entities.

The ongoing reform of GA embeds the following components:

- Regional decentralization and empowerment
- Explication of all roles and functions within the Company
- Introduction of a new financial management system, the Enterprise Resource Planning system (ERP), consolidating information on many aspects of company operations
- Contracting with Deloitte for a study to design a new tariff policy for the Company
- Launching of an comprehensive asset inventory and valuation exercise
- Limited experimentation with different modes of contracting for retail water delivery

Operating costs have risen by 71% with a yield of GEL 530 per ha, assuming a service area of 68,000 ha (43,000 ha of irrigated land and 25,000 ha of drained land). At the same time income from irrigation has risen by only 7.5%. Costs for electrical energy

(Ukleba B. , 2017) describes the current tariff system as guided by Decree #2 “On the Amelioration Service Tariff” of February 1, 2011 of the Georgian National Energy and Water Supply Regulatory Commission. This Decree defines the cost of irrigation of 1 ha agricultural land to 75 GEL. This tariff does neither account for the number water requested nor the amount of irrigation water used and neglects the fact that the financial outcome of 1 ha irrigated land depends on the crops. In addition, the methodology used to develop this tariff is not clear. This tariff structure does neither encourage nor motivate farmers to use water efficiently. The most important aspect is that farmers must achieve a minimum profit of 75 GEL for each ha irrigated land to compensate costs.

The envisaged new strategy of irrigation in Georgia, highlighted in (MOA, 2017), point out that new tariffs should consist of two components – one fixed and one variable. These components have different effects on both irrigators and on GA and must be carefully assessed.

Fixed proportion:

Farmers connected to the irrigation system have to pay a fixed fee whether or not they make use of irrigation. Introducing this accounts for the infrastructure which is required to service the farmers. From the viewpoint of farmers, this is the amount of money that must be invested to be connected to and profit from a service provider. (MOA, 2017) points out that charging all agricultural land owners within the boundaries of an irrigation system with a fixed fee will encourage them to contract for

water and practice irrigated agriculture rather than continuing to grow rainfed crops or devoting their land to pasture or other low value uses.

Variable proportion:

The variable portion of the tariff, the portion tied to the volume of water actually delivered, encourages clients, e.g. WUOs, to restrict the amount of water which they order from GA and to make efficient use of that water within their own service areas. This, in turn, allows GA to maximize the total service area through its WUO clients with a limited supply of water. Measured deliveries, coupled with a volumetric fee, also provides clients with a way of holding GA accountable for making the bulk water deliveries specified in their contract and withholding payment in the event that deliveries are not made (MOA, 2017). The latter requires a closer look. WUO clients can be supplied with a likelihood of occurrence of annual volumes of water due to the variable nature of hydrology. In case of drought conditions, the service is subject to limited quotas. Consequently, GA must assess the amount of deliverable water for each river basin and irrigation system carefully in advance and to link that with a supply safety in order to avoid legal cases due to false promises and overestimated supply safety. This requires a good estimate of water losses.

(MOA, 2017) suggests that subsidies might be necessary for a certain group of farmers where the ability-to-pay is very limited. If subsidies are unavoidable they should not be targeted to prices of water consumed as this would counter the incentive of saving water.

Table 7: Financial domain gaps - Irrigation

Financial domain gaps	
deficient	Current tariff: The current tariff lacks any incentive to use water efficiently.
	Future tariff strategy: The envisaged new tariff structure embeds the component needed to generate incentives to save water. Its effectiveness will depend on the details and the ability of GA and WUOs to cope with the requirements.
critical	Measurements: Measurements are the foundation on which a successful transition from the old to a new, viable irrigation sector is grounded. Unfortunately, at present there is hardly any equipment which is suitable to meet the standards which are needed with the new tariff system.
critical	Data management: Data management is obligatory. The process chain from measurement, data collection, transmission, processing and decision support must be developed from the scratch as nothing is currently at hand. A financially healthy system without data management is impossible.
critical	Asset management: There is neither an asset management system in place nor exists an inventory of the assets.
problematic	Maintenance costs: Outsourcing is considered as one possible way to save costs. GA may experiment with contracting out management of main canal and secondary canals providing service to WUOs to private firms. This would be done in the event that it lowered total costs of service provision and would be subject to regulatory approval. In this case, clear quality indicators are needed to guarantee standards. These standards are not yet set.

Summary:

Financial domain gaps	
Resources seem insufficient	yes
Origin of resources is unclear or insufficient	yes
Relationship between beneficiaries and source of fund seems unclear or	no
Lack of resources is likely to occur in the near future	yes

2.5.2 Water supply

Water and sewer tariffs are set by the Georgia National Energy and Water Supply Regulatory Commission. The approved methodologies and rules for tariff calculations in Georgia is established by the ordinance #21, of August 10, 2017 of the National Energy and Water Regulation Commission of Georgia.

UWSCG uses two types of service fees:

1. per cubic meters in the area where meters are installed
2. per member of household in areas where meters are not available.

Fees for cubic meter of water delivered are fixed rates. The rate for private households is 0,499 GEL per capita, for commercial enterprises 4.307 GEL.

GWP owns a different tariff structure. Fixed tariff for unmetered consumption is 3.14706 GEL per capita, from which are for water supply – GEL 2.537 and wastewater treatment GEL 0.61006.

For metered consumption 1 m³ runs up to GEL 0.2655 from GEL 0.21476 is for water supply and GEL 0.05074 for wastewater service.

Tariffs for Organizations and Commercial Sector are quite different. Tariff for supply of drinking water and passing – treatment of waste water for state organizations and commercial sector is GEL 4.41674 per 1m³, from which 3.5 GEL are for water supply and 0.895 for wastewater.

Table 8: Financial domain gaps – Water supply

Financial domain gaps	
No gap	Depreciation of assets: Depreciation of assets is applied at GWP and points at having an asset management plan at hand. Depreciation is calculated on a straight-line basis over the following estimated useful lives: <ul style="list-style-type: none"> • Real estate 50 years • Infrastructure assets 10-40 years • Fixtures and fittings 3 years • Vehicles 10 years source: (GWP, 2015)
critical	Lack of incentives due to low tariffs: Until September 2010 the water metering was voluntarily for population. Currently still large proportion of water users are not equipped with meters. The current low water tariffs do not provide incentives for investments into the meters.
critical	Illegal water abstraction: The low fines for water stealing do not discourage the potential misusers and contributes to the high level of commercial losses.
deficient	Tariff structure metered versus unmetered:

	One person in an unmetered household can use 11.81 m ³ of water in order to reach the same price a metered household has to pay for 1 m ³ . As a result, metering of households can be understood as a unequal treatment and households without meters will certainly do anything to avoid metering as long and as best they as possible.
uncertain	Fees for water abstraction: The financial audit of GWP does not mention fees for water abstraction (GWP, 2015), Section 7, page 20. While groundwater abstraction is subject to licensing and fees, surface water abstraction fees are not enforced since the abolishment of surface water permits in 2007. This counters any efforts of water use efficiency.
deficient	Operation & Maintenance (O&M): The revenue from water supply of GWP amounts to 94663 Tsd GEL in 2015 from which 4023 Tsd. GEL (4.2%) were spent for maintenance (GWP, 2015). The share for O&M of approximately 4% is low compared to other water supply companies. GELSENWASSER (www.gelsenwasser.de), a German company offering services in water supply and wastewater sector, has a revenue of 207 Mio.EUR from water supply and spends 76 Mio. EUR for O&M which is a share of 36.9%. Both companies are stock companies.

Summary:

Financial domain gaps	
Resources seem insufficient	yes
Origin of resources is unclear or insufficient	no
Relationship between beneficiaries and source of fund seems unclear or	no
Lack of resources is likely to occur in the near future	partly

3 RECOMMENDATIONS

Table 9: Recommendations

Topic	Remarks	Prerequisite	Plan
Institutional settings, structures and mandates			
Water use efficiency	Combating water losses should be clearly anchored in the mandate of a department of MEPA. They should be given the authority to inspect and supervise water suppliers and GA.	Staff	Short-term
IWRM principles	IWRM principles should be reflected in the institutional settings by establishing river basin committees.	Restructuring of responsibilities	Long-term
Donor funded projects	Consolidation is recommended towards different types of project origins, so that information sharing and uniform standards are guaranteed.	Restructuring	Mid-term
Legal framework			
Enforcement	Legal binding standards for objectives of water use efficiency with timelines are required. They should be targeted with a legal framework that authorizes department to enforce them.	Development of objectives and timelines	Mid-term
Impact permit system	The permit system should be extended to incorporate water use efficiency as an indicator for permission with regular inspections.	Definition of indicators	Mid-term
Monitoring, operation and supervision			
Monitoring	Strengthening of NEA.	Allocation of fund	Short-term
Process chain of monitoring	Measurements need post-processing. Extension of the existing environmental information management system	Technical feasibility	Mid-term
Compliance Monitoring	Supervision of license holders must be enhanced with strict rules for non-compliance. Self-reporting system needs frequent checks. Strengthening of the capacity of DEA.	Staff, training, equipment	Short-term
Technical standards	Establishment of technical committees with the involvement of the private sector, research organisations to determine the technical standards regarding water use efficiency. These standards become state-of-the-art and legally binding. Standards are required for: <ul style="list-style-type: none"> • New infrastructure • Rehabilitation of existing infrastructure • Operation & Maintenance If possible, inclusion of international experts at the beginning to include international best practice.	Extension of GNEWSRC	Mid-term
Financial affairs			
Tariff	Abolishment of the old tariff systems and development of new tariffs. Existing ideas and work (MOA, 2017), (pwc, 2015) and others should		Mid-term

Topic	Remarks	Prerequisite	Plan
	be taken up and evaluated against their effects to enhance water use efficiency.		
Tariff	Increase the prices for unmetered households per person		Short-term
Fees for offences	Fine illegal water abstraction		Short-term
O & M	Increase Operation & Maintenance. The low portion of O&M must be changed.	See legal framework	Short-term
Data and asset management	Data and asset management are needed for a financial consolidation.	Inventory	Short-term
Fees for water abstraction	GWP must be subject to payments for abstracting water.	Adaption of regulations	Mid-term

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