WHITE PAPER ON WATER ALLOCATION PLANNING FRAMEWORK

USAID GOVERNING FOR GROWTH (G4G) IN GEORGIA

CONTRACT NUMBER: AID-114-C-14-00007

DELOITTE CONSULTING LLP

USAID | GEORGIA

USAID CONTRACTING OFFICER’S REPRESENTATIVE: REVAZ ORMOTSADZE

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WORK PLANNING: WATER RESOURCE MANAGEMENT 3600

LANGUAGE: ENGLISH

28 SEPTEMBER 2017

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DATA

Reviewed by: George Chikovani

Project Component: Water Resource Management Component: USA07529-00-01-0112

Practice Area: Water Resources Management

Key Words: Water Resources Management, Water Allocation
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EXECUTIVE SUMMARY

Water allocation and water sharing is a key aspect of water planning. It involves planning how surface and underground water resources will be managed and shared to achieve environmental, economic and social outcomes.

There is no one perfect way to undertake water planning. It is clear, however, that there are lessons being learned by individual states and territories that would benefit water planning in other jurisdictions if the experiences were shared.

Governing for Growth (G4G) in Georgia has carried out various studies and produced reports related to assessing the state of the water sector, the compliance of existing legislation with European Union (EU) legislation and produced starting points for leading Georgia’s legislation and institutional entities towards compliance with EU legislation. One of the envisaged endpoints in this regard is the development of water allocation plans that ensure environmental sustainability, social equity and economic stability through prioritized allocation of the available water resources considering resource availability and sectoral needs including environmental aspects and their future projections on a basin scale.

The analysis has shown that there is no enabling environment for applying modern basin allocation approaches in Georgia, due to a number of barriers, including absence of regulations, tools (regulatory or market-based) and knowledge for efficient, fair and environmentally sustainable basin allocations as well as low government capacities for water quantity data collection and analysis, creating water balances and cadaster’s.

The ongoing legal reform in the water resources management sector will address many challenges if the new water law is enacted and effectively implemented. Even with a new law there are some drawbacks in terms of supporting basin allocation planning.

This report describes the future problems projected in the pilot Aragvi River basin and provides a framework as well as the necessary actions for implementing water resources allocation planning in Georgia considering both institutional and technical aspects. It specifically describes the need for an enabling legal environment based on the new water law and the need for empowered institutions.
INTRODUCTION

G4G is a five-year United States Agency for International Development (USAID) funded project implemented by Deloitte Consulting LLP since 2014. G4G aims to support Government of Georgia (GoG) in sustainable management of freshwater resources across multiple competing interests. Within its mandate, G4G implements number of the activities which facilitates improving of regulatory and legal framework for the effective management of river basins in Georgia.

On June 27, 2014 Georgia and the European Union signed an Association Agreement (AA). With signing of the AA, the GoG has made a commitment to bring its laws and practices closer to those of the European Community, including the water protection/management requirements.

Following the signing of AA agreement, the Ministry of Environment and Natural Resources Protection of Georgia (MENRP) has developed a Road Map for the implementation of the EU-Georgia AA in the field of environment and climate action. The roadmap enables the MENRP to implement legal approximation, policy making and similar activities in line with the specific requirements of the AA (including water resources management).

To support the sound implementation of Water Framework Directive (WFD), G4G supports the GoG at the national and regional government levels in water resource allocation plan development and implementation. The purpose of the assignment is to provide assistance in effective water resource management and strengthening human and institutional capacity in developing and implementing water resource management and allocation plans at the local/regional level.

During 2015-2017, G4G has promoted and supported water allocation planning in Georgia. G4G have carried out various studies related to assessing the state of the water sector, the compliance of existing legislation with EU legislation and produced starting points for leading Georgia’s legislation and institutional entities towards compliance with EU legislation. One of the envisaged endpoints in this regard is the development of water allocation plans that ensure environmental sustainability, social equity and economic stability through prioritized allocation of the available water resources considering resource availability and sectoral needs including environmental aspects and their future projections on a basin scale. The Aragvi basin has been selected as a pilot model in this regard to assess water demands, establish an environmental flow methodology and assess water resources using Water Allocation and Planning (WEAP Software) modelling. Works were carried out in cooperation with relevant government institutions to build capacity and highlight the needs for water allocation planning in light of increasing demands and potentially changing runoff conditions caused by climate change. The future development scenarios that were modelled revealed that while under current conditions water resources in the basin are sufficient, future developments are likely to lead to significant shortcomings and competition between water users. This is particularly alarming as the assessed scenarios included likely near-future developments such as population growth in Tbilisi with already these leading to water deficits. The shortages may in addition be further exacerbated by the current agricultural or industrial developments as well as likely climate change effects leading to reduced water resource availability.

This white paper elaborates on the strategies and necessary prerequisites for upscaling water allocation planning activities, i.e. for developing water allocation plans and related implementation needs in other river basins in Georgia. The white paper utilizes the lessons learned during these pilot activities and describes the technical and institutional developments necessary to implement water allocation planning for whole Georgia including:

- Legal framework aspects;
- Institutional development and capacity needs;
- Technical improvement needs.

The paper has been compiled based on various interactions with stakeholders during meetings between 2015 and 2017 with the goal to facilitate the upcoming processes related to planning and agreeing the water allocation planning framework for Georgia and to facilitate a coordinated development of Georgia’s different water using sectors utilizing synergies and joint benefits.
RESULTS OF ARAGVI BASIN PILOT ASSESSMENT

Modeling the water resources situation in the pilot Aragvi River basin has shown that while under current conditions water resources are just sufficient to fulfill water user needs, future developments as projected based on current trends will lead to severe shortages and competition if such development is allowed in an uncoordinated manner.

Tbilisi’s population is growing, leading to a steadily increasing water demand that to a large extent is covered through piping water from the Aragvi basin. In addition agricultural and industrial developments in the basin indicate strongly increasing water demands. Further the basin carries additional hydropower potential that may be utilized, catering for Georgia’s growing power demand.

The analysis of these future scenarios shows significant competition for water resources leading to shortages in downstream installations considering the current uncoordinated water use, leading to likely negative impacts on investments as well as problems for Tbilisi water supply as shown below.

The graph indicates a significant reduction in reliability of Tbilisi city water supply under different development scenarios, considering population growth and increase in hydropower production. Further water stress may occur downstream considering likely irrigation and industrial developments.
WATER ALLOCATION PLANNING FRAMEWORK

BACKGROUND

Georgia is a water rich country with significant development perspective and endeavours in the different water using sectors, intending to make use of the resource as clearly stated in the Socio-Economic Development Strategy of Georgia “GEORGIA 2020”. The strategy specifically includes the development of the hydropower and irrigation sector, however, the water resources that cater both sectors are distributed unevenly, the inter-sectoral coordination of water use is challenging and a structured coordinating body or tool is missing. Further, both bulk water users have partly very differing needs with regards to quantity and timing. In order to avoid potentially upcoming problems between the two sectors and other stakeholders, water allocation plans are intended to provide the mechanisms and rules for water resource distribution, aiming at an overall benefit for the country by considering needs of the population and political directions through respective prioritization.

A new draft “Law on Water Resources Management” has been developed in 2014. The Purpose of the law is to ensure the protection of water resources and their rational use considering the interests of the wellbeing of the present and future generations according to the principles of the integrated management of water resources, to create the secure environment for human health. The drafting of this law goes in line with Georgia’s signing of an association agreement with the European Union (2014) through which Georgia undertakes to gradually approximate its environmental governance and environmental policy related legislation to EU legislation.

The suggested approach for water resources allocation is based on "Principles, Procedures and Approaches for Basin Water Allocation Planning", an Asian Development Bank (ADB) publication that deals with modern approaches to allocation planning. Activities in this regard include an assessment of the current legal and institutional setup and responsibilities, meetings and interviews with sectoral stakeholders to understand current coordination and decision-making mechanisms as well as for agreeing the endeavoured discussion and negotiation steps for water resources allocation.

The water allocation concept assumes that a finite resource has to be shared between competing stakeholders based on shortcomings in the supply-demand ratio, now or under projected future conditions, taking into account potential future changes both on the supply (climate change, land use change) as well as the demand (population growth, development) side. Water is allocated based on predefined priorities based on a political consensus building process.

NEEDS AND CHALLENGES FOR WATER ALLOCATION

Georgia is the richest country in the South Caucasus in terms of available water resources. Nevertheless, the distribution of water resources in Georgia is not balanced spatially:

- 75% of water resources are located in western part of Georgia and
- 25% of water resources are located in eastern Georgia

Water resources of a desired quality are often scarce, and require allocation to different uses such as human consumption, sanitation, food production, industry, transport, energy etc. Water allocation needs to be planned in a manner that achieves economic efficiency, social equity and environmental sustainability.

Under the G4G piloted Aragvi river basin assessment, research work was conducted to identify paths to efficient water allocation. In this regard G4G undertook several studies including water supply and demand assessment, water resources and use modelling as well as assessing environmental flow requirements. The assessment of water demands in the Aragvi river basin revealed increasing demands for water and competing water needs. The assessment further revealed that increasing water demands will create severe problems and competition in future. Additionally, expected catchment degradation and climate change impacts will reduce water resource availability, further exacerbating the problem.

Conducting the assessments in the pilot basin, two main challenges for water resources allocation planning were identified. The lack of data to understand resource supply and demands as well as an insufficient legal and institutional framework dealing with a broad range of aspects from data collection and management to management policies, licensing and enforcement ability. The issues are summarized in the text box below.
The responsibilities are scattered among various institutions: Coordination between different GoG institutions is weak and requires strong leadership;

The development of the 15-year water right is used in a broader sense in some contexts, to include all water entitlements. Water permits in Georgia were abolished in 2007. Surface water abstractions are not subject to water use licensing and charges (though they should agree on abstraction volumes with the MENRP and annually report actual withdrawals and consumptions);

Some of the drawbacks in water use permitting/licensing are addressed by the laws on Environmental Impact Assessment (EIA) and Water Resource Management, by expanding the list of water use-related activities/projects subject to EIA, environmental impact permitting (e.g. new irrigation schemes, inter-basin transfers);

Draft Water Resources Management law envisages introduction of water use permits for abstractions.

Are environmental flows clearly defined? Partially

EF standards are not adequately regulated in Georgia. G4G developed Environmental Flow Methodology applicable for Georgia based on international practice. The proposed methodology was discussed, negotiated and well accepted by MENRP and other stakeholders. EF methodology is aligned with WFD, the implementation of which is Georgia’s commitment under the EU-Georgia AA.

Is water related data properly managed and assessed? Partially

The current water accounting system is weak. Water users report their monthly water abstractions on an annual basis. In fact, there is no system on site to assure the quality of data, since environmental inspectors do not check water use records. Moreover, not all the water users submit their water use data to the MENRP and there is no system in place to enforce submissions of these reports. The quality and the completeness of reports vary significantly among water users, given the poor knowledge on how to fill in the data and what parameters to report on. The reports are submitted to the MENRP as hard copies and then these data are submitted to the water accounting database by the Ministry staff.

Are water users prioritized? Partially

It is common for some of the allocable water to be granted or reserved for priority purposes, (prior to water being shared between different users). Water may be set aside to satisfy environmental requirements, for domestic purposes, or for strategic priorities (e.g. electricity generation). Such interests may be given priority both at the time of granting (long-term) water entitlements and during the annual allocation process. Current law of Georgia on water resources management (adopted by GoG in 1997) gives number one priority to drinking water supply. Other priorities are not defined by legislation.

Conflict resolution mechanisms? No

There is no mechanism for water conflict resolution in Georgia.

FACTS ABOUT CURRENT WATER MANAGEMENT, OVERVIEW AND HIGHLIGHTS

What is the current status of water resource? Neither over-used nor over-allocated

➢ The quantity of renewable water resources is enough to meet current demand of water in Georgia. However, due to inadequate planning and poor water management, shortages and conflicts over water usage between different water users still exist;

➢ Water related responsibilities are scattered among various institutions: Coordination between different GoG institutions is weak and requires strong leadership;

➢ The water monitoring network has decreased significantly since the collapse of the Soviet Union (number of hydrological monitoring stations has reduced from 170 to 40). Due to insufficient monitoring of surface and ground waters, data on quality and quantity of the country’s surface and ground waters are limited;

➢ GoG plans significant expansion of hydropower generation in Georgia. In 2014 Georgian hydropower installed capacity has increased almost by 116 megawatt (MW). It is expected that this number will reach 1,630 MW by 2020 (meaning that by 2020 hydropower generation will increase by 58% as compared to 2014);

➢ Irrigated land area is expanding rapidly (by 2014 irrigated land area covered around 88,400 ha).

Is there state policy on water management? No

➢ There is no state water management policy document in Georgia. Current water management system lacks clear vision, consistency and result orientation;

➢ Georgia’s water-related legislation is inconsistent, contradictory and fragmented throughout the wide range of legal acts;

➢ The draft Water Resource Management Law is undergoing internal revision within the GoG and is expected to be submitted to the Parliament of Georgia for approval by spring 2018. The water sector is managed according to a model based on administrative boundaries in Georgia. The draft Water Resource Management Law intends to replace the existing administration principles in water resource management and introduce the approach of integrated river basin management;

➢ River basin plans exists only at the pilot level (e.g. Chorokhi-Adjaristskali river basin). With enactment of the new law on Water Resource Management, the development of the 15-year Water Resources Management Strategy as well as river basin plans for 6 basin management districts will be mandatory;

➢ The Country does not have Water Allocation Plans.

Are water allocation instruments (abstraction permits, water rights or water licenses) in place? : Partially

➢ Those are the rights of an entity or individual (such as a factory, farmer, irrigation, water supply company, etc.) to abstract water from a watercourse. These are often in the form of a license. The term water right is used in a broader sense in some contexts, to include all water entitlements. Water permits in Georgia were abolished in 2007. Surface water abstractions are not subject to water use licensing and charges (though they should agree on abstraction volumes with the MENRP and annually report actual withdrawals and consumptions);

➢ The current water accounting system is weak. Water users report their monthly water abstractions on an annual basis. In fact, there is no system on site to assure the quality of data, since environmental inspectors do not check water use records. Moreover, not all the water users submit their water use data to the MENRP and there is no system in place to enforce submissions of these reports. The quality and the completeness of reports vary significantly among water users, given the poor knowledge on how to fill in the data and what parameters to report on. The reports are submitted to the MENRP as hard copies and then these data are submitted to the water accounting database by the Ministry staff.

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Conflict resolution mechanisms? No

➢ There is no mechanism for water conflict resolution in Georgia.
CHALLENGES:
Current legal-regulatory setting in water resources management does not support basin water allocation planning. Although the current Law on Water sets requirements on the development of water balances for individual river basins, these are only general provisions. Steps, rules, procedures and methodologies for the development of such plans are not further elaborated in the form of sub-laws or guidance documents. An institutional mechanism for water use planning contained in the current law is vague and does not take into consideration participation in the river basin planning process by stakeholders. The Law also mandates scientific institutions to develop water allocation schemes/master plans but does not specify which organizations should undertake these mandates. The requirements for water use schemes/plans are not implemented in practice.

FRAMEWORK FOR WATER ALLOCATION

Establishing a water allocation plan is complex process and usually involves a detailed situation assessment to identify water availability, existing water use and expected future demand as well as water requirements for environmental purposes. This information is used to develop different allocation scenarios, which can be assessed based on their social, economic and environmental consequences.

An illustration of this water allocation planning process is shown in the diagram below.

**Source:** Basin Water Allocation Planning: Principles, Procedures and Approaches for Basin Allocation Planning (Asian development Bank, GWP, UNESCO and WWF-UK; 2013)
The diagram indicates an outline of the water allocation planning process. It is intended as a base for stakeholder discussion and country / situation specific adjustment to ensure that particularities and requirements in specific settings are met. It is suggested to adopt a uniform approach that may be altered based on the conditions in particular river basins but that in its main configuration remains unchanged to allow for transparency and replication. The approach further is intended to enable an evidence-based decision making process towards a national water resources management planning capacity, conducted in a participatory manner, i.e. involving various iterations of stakeholder discussions and consensus building.
IMPLEMENTED ACTIVITIES

Since 2014, G4G supports the GoG in improving and fostering integrated water resource management at the pilot and national levels with aim to lay ground to water allocation planning process. G4G has carried out various studies focusing at improving current regulatory and legal framework related to water management, and improved capacity of different governmental institutions to demonstrate modern water management approaches.

Activities conducted by G4G at the pilot and national levels supporting development of water allocation framework in Georgia are described below:

**Pilot Level Activities:**

- Developed an assessment of water balance in Aragvi river basin;
- Defined water demand and made water demand forecast for 2050 within Aragvi River basin. Water demand forecast findings were used in the WEAP software application. G4G used WEAP as a tool for developing water allocation scenarios and water allocation plan to regulate competing needs of different sectors for the selected pilot area. Different WEAP scenarios of water use in the Aragvi River basin, including scenarios such as hydropower development, irrigation expansion, industrial growth and tourism and recreation development were developed. Relevant staff members of MENRP and other stakeholders were trained in application of WEAP software.

**Improving regulatory and legal framework:**

- G4G helps GoG in harmonization of its legal framework to EU directives and facilitates implementation of obligations born under the EU-Georgia AA. The AA Roadmap recommends development of WFD guidance documents to support sound implementation of the WFD. Guidance documents developed by G4G are intended to provide an overall methodological approach and are tailored to circumstances in Georgia. Moreover, the above guidelines will guide experts to implementing the WFD and preparing River Basin Management plans.
- G4G carried out Regulatory Impact Assessment of the draft Water Resource Management Law. G4G conducted a detailed review of the current and proposed regulatory frameworks of water resource management in Georgia and proposed comparisons between the two following policy options: (1) the do nothing option; and (2) full implementation of proposed regulations. A quantitative cost and benefit analysis were developed and accompanied by a qualitative evaluation of the impacts for each scenario. The outcome of a RIA will be presented to GoG stakeholders and Parliament to enable MENRP to facilitate the approval process by Parliament.
- G4G has revised and tested the Environmental Flow methodology. EF standards are among those aspects which are not adequately regulated in Georgia. This non-regulated approach may result in violation of water users’ rights as well as degradation of habitats. The proposed methodology was discussed, negotiated and well accepted by MENRP and other stakeholders. MENRP agreed that the methodology is aligned with WFD, the implementation of which is Georgia’s commitment under the EU-Georgia AA.

**Institutional capacity building:**

- To improve monitoring of water resources and upgrading early warning system, G4G hands over five hydrological gauging stations to the National Environmental Agency (NEA) and installs them in Aragvi River basin;
- Provided trainings to the governmental institutions in water resource management.

All above listed activities are designed for supporting Georgia’s endeavor towards joining the EU and meeting requirements set by the EU–Georgia AA related to water management. Further support is particularly significant considering that Georgia switches to the River Basin Management approach and lacks proper human, technical and/or financial resources to ensure further progress for sustainable water resource management both at the pilot and national levels.

Moreover, the foundation for water allocation planning along with G4G implemented activities will be the Law for Water Resources Management that is currently under review in the GoG. The proposed Law on Water Resources Management sets framework requirements for sound water management. Hence, the Law itself does not contain detail provisions (e.g. setting of quotas on total surface and ground water abstractions within the framework of river basin plans). Therefore, further elaboration of such requirements is needed in the sub-laws.
NEXT STEPS

While the current approach with regards to water resources allocation in Georgia is fractured between different institutions, clear institutional mandate and responsibilities will be essential to ensure a coordinated approach that leads to sustainable planning and resource allocation. Of particular importance are:

- Resource understanding, i.e. monitoring and analyzing water resources availability including the responsibility if riparian agencies to deliver data to a centralized organization for storage, analysis and result dissemination;
- Prioritization of water use considering environmental flows, domestic uses, industry, irrigation and hydropower as the main water users including clear methodology for establishing environmental flow requirements;
- Licensing/permitting based on clear rules and regulations;
- Monitoring, control and record keeping of water users license entitlements, particularly as compared to resources availability;
- Enforcement of entitlements and penalties.

Required actions can be grouped in two lines of activities, institutional/legal aspects and technical aspects. They need to be implemented on a country-wide scale.

The foundation for implementing water resources allocation in Georgia will be a political decision for implementation based on an agreed need for water allocation planning based on a reducing resource-demand ratio, caused by ongoing developments and respectively increased water needs and at the same time reducing resource availability and changes in timing based on climate change. Based on this baseline decision, a variety of institutional and legal actions are required in line with the reform requirements described in the previous section, leading to how-to’s to achieve goals and outcomes, e.g. a memorandum of understanding (MoU’s) for agreements of who does what and when, etc. These how-to’s will cover a broad range of activities ranging from policy development to implementation and enforcement.

- Decision on host institution with responsibility for water allocation planning, implementation and monitoring;
- Formation of high level stakeholder council covering the involved sectors for prioritization and high level decision making;
- Creation of enabling environment (i.e. approving draft water law; clear legal and policy structures);
- Development of clear mandate structure reaching from data collection and planning to decision making and enforcement.

For functioning water allocation planning and implementation, it is essential that the institutions can execute their respective mandates and that they are empowered to obtain the required information from other institutions as well as water users and to enforce decisions and particularly obligations of water users under license agreements, in particular related to their reporting obligations. In addition, institutions need to have the mandate and ability to conduct the necessary checks on license holders as well as the ability to punish violations and enforce license regulations. Aspects of importance include:

- Clear application procedures;
- License register;
- Data sharing agreements, reporting obligations;
- Penalties and enforcement rules.

On the technical side it has to be clearly understood that educated water resources allocation planning can only work if sufficient knowledge about the resource base is available. Monitoring, data management, analysis and dissemination are respectively important building blocks and essential for understanding the resource base. Where necessary monitoring networks need to be designed and implemented. The activity should be based on a thorough assessment of available stations and datasets to be able to decide on how to improve the monitoring network. In addition to the network itself the respective infrastructure and resources for data collection, management, analysis, storage and dissemination need to be implemented. Further, improving forecasting ability would be an important point for dynamic water allocation planning though this could be introduced at a later stage. Knowledge aspects include:

- Water availability and runoff (quantity, timing), i.e. the resource side, including future projections of changes that may happen with catchment development and climate change;
• Water demands considering both quantities and timing in a monthly time step, as well as future projections related to development and demographic expectations;
• An assessment of EF requirements to define the remaining resource base (monthly time step);
• A thorough understanding of water balances in a basin using a monthly time step;
• A thorough understanding of current principles for water resource utilization and sharing, i.e. potential permit-, licensing- or fee systems as well as restrictions, also including wastewater discharges.

Further to the data acquisition itself, capacities for data handling including analysis and modelling are becoming the more important the more stressed a water resource becomes. Especially, water resources modelling is an excellent tool to look into different scenarios and different allocation options considering potential synergies.

• Data collection structures, sensors and telemetry;
• Data handling ability including computing- and human resource capacity;
• Analytical capacity including modeling;
• Decision support tools, scenario evaluation and facilitation of decision making.

The main point to consider is that the institution taking on responsibility and leading the water resources allocation planning approach has to have the mandate and power to deal with stakeholder institutions in a leading manner, specifically as under competing conditions not all stakeholder demands may be satisfied. Selecting the right institution for this is therefore a key point in decision making. In addition, experience in other countries has shown that water allocation planning is best placed in a "neutral" institution, i.e. typically in the ministry of environment that has no stake in the energy, irrigation, housing, tourism or transport sector. The institution has to be fitted with the strength to overcome potential resistance from stakeholder institutions through respective mandates as well as the obligation to display decision in a transparent and replicable manner according to agreed rules and priorities.

The tools, techniques and methodologies used in the piloting of Aragvi River basin will serve as example to guide the process of water resource allocation throughout Georgia.