

OECD Studies on Water



Facilitating the Reform of Economic Instruments for Water Management in Georgia



OECD Studies on Water

Facilitating the Reform of Economic Instruments for Water Management in Georgia

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document, as well as any data and any map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Please cite this publication as:

OECD (2018), *Facilitating the Reform of Economic Instruments for Water Management in Georgia*, OECD Studies on Water, OECD Publishing, Paris.
<http://dx.doi.org/10.1787/9789264281776-en>

ISBN 978-92-64-28172-1 (print)
ISBN 978-92-64-28177-6 (PDF)

Series: OECD Studies on Water
ISSN 2224-5073 (print)
ISSN 2224-5081 (online)

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Photo credits: Cover © iStockphoto.com/Saiko3p.

Corrigenda to OECD publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.

© OECD 2018

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgement of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.

Foreword

The objective of this study is to support the reform of economic instruments for water resources management in Georgia. The study was implemented as part of the National Policy Dialogue (NPD) on water policy in Georgia conducted in co-operation by the OECD and supported by the EU-funded project “Environmental Protection of International River Basins (EPIRB)” under the pilot projects measures for Georgia. The work was financially supported by the European Union.

The study was designed to identify options for reform of economic instruments for water management in Georgia. It includes a specific focus on restoration of a licensing regime covering both surface and groundwater abstraction.

The OECD and the EPIRB project commissioned a group of Georgian and international experts, which included Jim Winpenny and Malkhaz Adeishvili, for the analytical work. They are authors of this report. Tatiana Efimova at the OECD provided essential oversight and inputs into the project and this report. The authors gratefully acknowledge the contribution of participants of the EUWI National Policy Dialogue to the project and to this report, and would like to thank the Ministry of Environment and Natural Resources Protection of Georgia for their very productive co-operation.

This publication has been produced with the financial assistance of the European Union. This support is gratefully acknowledged.

The views expressed herein are those of the authors and can in no way be taken to reflect the official opinion of the European Union, the government of Georgia, or the Organisation for Economic Co-operation and Development and its member countries.

Table of contents

Acronyms and abbreviations	7
Executive summary	9
Chapter 1. Recommendations for economic instruments for water management in Georgia	13
1.1. Overall conclusions	14
1.2. Implementation	16
Notes	18
References	19
Chapter 2. Water problems and management framework in Georgia	21
2.1. Context of the EU Water Framework Directive in Georgia	22
2.2. Overall availability and use of water	24
2.3. Variability of water flow	24
2.4. Water services	25
2.5. Water quality and pollution	25
2.6. Policy framework	26
2.7. Legal framework	28
2.8. Institutional framework	29
Notes	33
References	33
Chapter 3. Overview of economic instruments for water management in Georgia	35
3.1. The purpose of economic instruments	36
3.2. The main types of economic instruments	36
3.3. The justification of economic instruments	37
3.4. A typology of economic instruments for Georgia	38
3.5. Fees for abstractive and non-consumptive use of water resources	38
3.6. User charges for water supply and sanitation	40
3.7. Water metering and tariffs in Georgia	41
3.8. Irrigation water supply tariffs	42
3.9. Fines for non-compliance and the environmental liability payment system	45
Notes	47
References	47
Chapter 4. Options for economic instruments for water management in Georgia	49
4.1. “User pays” principle	50
4.2. “Polluter pays” principle	56
4.3. “Beneficiary pays” principle	60
4.4. Pro-environmental incentives	65
Notes	68
References	69

Chapter 5. Evaluation and ranking of options for economic instruments reform	71
5.1. Criteria to be applied	72
5.2. Evaluation and ranking of options	72
Note	76
References	76
Annex A. Costs of water resource management in Armenia and South Africa	77
Annex B. International experience with water abstraction and pollution charge	81
Figures	
Figure 3.1 Governmental financing of the irrigation sector in 2009-14 (GEL, mln)	43
Figure 3.2 Increase of the irrigated land area in the period 2012-16	44
Figure A.1 South Africa: Financing WRM	78
Tables	
Table 3.1 Classification of economic instruments for water management	38
Table 3.2 Fee rates for use of water resources	39
Table 3.3 Tariff rates for WSS services in Georgian urban settlements 2016	41
Table 3.4 Operation and maintenance cost of UASCG and its income in 2013	45
Table 3.5 Offences arising from water-related legislation detected by DES	46
Table 5.1 Overview of options for Economic instruments in Georgia	74
Table 5.2 Summary of evaluation of options for Economic instruments for water management	75
Table A.1 Armenia: Budgets for water resource management	77
Table B.1 Features of water abstraction charges in selected countries and regions	82
Table B.2 Features of water pollution charges in selected countries	86
Boxes	
Box 2.1 Article 9 of the EU Water Framework Directive, 2000	22
Box 2.2 Pricing policies for enhancing water use efficiency	22
Box 2.3 Current state of municipal wastewater in Georgia	25
Box 4.1 Reform of abstraction charges in Armenia	53
Box 4.2 Environmental liability payments and insurance schemes in Central Asia	59
Box 4.3 Payments for ecosystem services in Georgia	63
Box 4.4 Main conclusions of the St. Petersburg guidelines on Environmental Funds (EFs)	66
Box B.1 Water royalties in Tajikistan	85

Acronyms and abbreviations

AMD	Armenian Dram
DES	Department of Environmental Supervision
EF	Environmental Fund
EI	Economic instrument
EIA	Environmental Impact Assessment
EIP	Environmental Impact Permit
GAC	Georgian Amelioration Company
GBP	British Pound
GEL	Georgian Lari
GNERC	Georgian National Energy and Water Supply Regulatory Commission
GWP	Georgian Power & Water Co.
IFAD	International Fund for Agricultural Development
IWRM	Integrated Water Resources Management
KZT	Kazakhstani Tenge
MENRP	Ministry of Environment and Natural Resources Protection
NEA	National Environmental Agency
NGO	Non-Governmental Organisation
O&M	Operation and Maintenance
OECD	Organisation for Economic Cooperation and Development
PES	Payment for Ecosystem [or Ecological] Services
RBM(P)	River Basin Management (Plan)
TJS	Tajikistani Somoni
UASCG	United Amelioration Systems Company of Georgia
UNECE	United Nations Economic Commission for Europe
USAID	United States Agency for International Development
UWSCG	United Water Supply Company of Georgia
WFD	Water Framework Directive (of the EU)
WRM	Water resources management
WSS	Water supply and sanitation
WWTP	Wastewater treatment plant

Exchange rates (1 July 2016)

GEL 1.0 = EUR 0.39 = USD 0.43

Executive summary

Georgia is well endowed with water resources and has no overall water scarcity. However, there is unsustainable abstraction of groundwater and surface water in a number of localities. Water variability, in the form of flooding and the occurrence of local and seasonal shortages, is a serious problem in many regions. There is an urgent need of better water resources management. This will require better and more systematic funding of these activities.

In 2014 Georgia signed an Association Agreement with the EU and made a commitment to approximate to the EU's Water Framework Directive. In order to harmonise Georgia's environmental legislation with the EU Directives the Ministry of Environment and Natural Resources Protection (MENRP) has drafted a new Framework Law on Water Resources Management. The draft law aims to encapsulate all aspects of integrated water resources management. The WFD also includes the systematic use of economic instruments, including water pricing, to recover the cost of water services provided to households, industry, and farmers.

At present, Georgia applies four categories of economic instruments for managing its water resources:

- fees for water abstraction
- user charges for water supply and sanitation in the form of water tariffs
- irrigation water supply tariffs
- fines for non-compliance with regulations concerning water resources.

In practice, water abstraction charges only apply to groundwater, since surface water is not subject to licensing. The charge is very low. The tariffs for water supply, sanitation and wastewater services are also very low, and combined with low collection rates mean that the revenues of water utilities fail to cover their costs of operation and maintenance. Only a minority of users are metered. Irrigation charges are likewise very low but this is part of more general problems in this sector. Institutional weaknesses, compounded by chronic mismanagement and under-investment have resulted in the major degradation of irrigation and drainage infrastructure.

In addition to the fines for non-compliance there is a liability payment system in the form of environmental damage compensation, which is levied if the concentration of pollutants in discharged wastewater exceeds maximum allowed levels. However, the environmental damage is estimated according to methodologies dating back to the Soviet era. In general, the level of fines and penalties greatly reduce the disincentive effect of these provisions.

A shortlist of economic instruments to be reformed has been identified in this study, following the assessment of the various options under a number of criteria. The main focus of this study was on actions that are (i) likely to be effective in achieving their aims, (ii) are considered feasible for Georgia at the current time, and which (iii) fall within the competency of the lead environmental ministry, the MENRP.

Identified *priority options for early implementation by MENRP* are:

- Restoration of a licensing regime covering both surface and groundwater abstraction, with abstraction charges based on the size of the licensed amount. This would include a category for non-consumptive abstraction, initially targeted at hydropower companies.
- Restoration of licensing of polluting discharges into surface and groundwater bodies, with pollution charges based on the amounts of licensed polluting substances.
- The more rigorous enforcement of the above licensing regimes, backed by fines set at levels that would deter offenders.

Complementary actions for implementation by other bodies and agencies are the following:

- Raising tariffs for water supply, sanitation and wastewater collection and treatment to cost-recovering levels, with an accelerated programme of metering for water users. This action would generate more funds for investment in new wastewater treatment plants (WWTPs) which are urgently needed to curb surface water pollution. They would also create incentives for more careful and efficient water use by consumers.
- Raising irrigation charges, with a more vigorous effort to collect fees due. Its purpose would be similar to that of the economic instruments above, namely to raise revenues necessary for investment and on-going costs in irrigation development, and to encourage farmers to adopt more water-efficient practices.
- Raising entry fees to National Parks and Protected areas, with concessional rates for deserving groups and higher rates for foreign visitors. Proceeds would be returned to agencies operating these facilities to contribute towards their upkeep and enhancement (the Ministry of Tourism and individual national parks and protected areas.).

Measures for serious further study and possible piloting

Within a longer time horizon, the following economic instruments are also worthy of consideration:

- The further development of the existing legal principle of environmental liability to reinforce the current regime of deterrence to the over-abstraction and pollution of water.
- The scope and potential for setting up one or more schemes of Payments for Ecosystem Services.
- Exploration with Azerbaijan of the feasibility of cost- and benefit-sharing projects to reduce pollution of transboundary rivers and lakes. Pollution of rivers and lakes in Eastern parts of Georgia is of concern both to Georgia and to the downstream parts of Western Azerbaijan.
- Study of the feasibility of creating an Environmental Fund, including its scope, potential beneficiaries, and the various options of financing this. Environmental Funds can be funded from various sources, which in some cases includes earmarking some of the proceeds from the abstraction and pollution charges. However, earmarking is not universally accepted as good practice. Nevertheless, Environmental Funds have been successfully used by many countries as an instrument of environmental policy and this option should be kept in reserve by the Georgian Government.

Priorities

Implementing the three economic instruments and enforcement measures recommended in this report will be greatly facilitated by the enactment of the new Water Law now being examined by the Government of Georgia. The Law contains several elements that are pre-conditions and essential complements for implementation of the economic instruments concerned.

The creation of a comprehensive and effective licensing regime is essential before viable abstraction and pollution charges are introduced. The draft Law provides the legislative grounding for this, but the monitoring and enforcement capacities of the National Environmental Agency will need to be strengthened, or in certain cases created afresh.

Chapter 1

Recommendations for economic instruments for water management in Georgia

This chapter presents the key recommendations of the study and a shortlist of economic instruments identified following the assessment of the various options.

The chapter describes the priorities in implementation of economic instruments reform and timetable. The draft Water Law is central to implementation of economic instruments for water management, hence top priority should go to completing its passage through parliament, leading to its eventual enactment. While this is on the critical path, a number of other actions need to be carried out in preparation for use of the economic instruments, each with its own timetable and duration, and involving different institutions and players.

It also discusses some measures for serious further study and possible piloting within a longer time horizon, e.g. payments for ecosystem services, sharing costs and benefits in transboundary basins.

1.1. Overall conclusions

A shortlist of economic instruments has been identified in this study, following the assessment of the various options under a number of criteria. Some of these were rejected as unrealistic or premature for the present situation of Georgia. The economic instruments remaining from this filtering are discussed further below. The main focus of this Report is on actions that are (i) likely to be effective, (ii) are considered feasible for Georgia at the current time, and which (iii) fall within the competency of the lead environmental ministry, the MENRP.

Another category of economic instruments is also discussed, though in lesser detail. These economic instruments are important to proceed with and complementary to the first type, but their implementation would fall to other Government agencies or other parties. A final category are potential economic instruments worthy of further study and possible piloting, but not appropriate for serious implementation at present.

An overriding factor is that the shortlist of economic instruments should fit with the trajectory of Georgia's water policies and institutions, exemplified in the draft Water Law now under consideration by the Government, and other ways in which the Government is responding through the "road map" of measures for approximation for implementing the EU-Georgia Association Agreement. Economic instruments would evolve in a policy and institutional framework shaped by the on-going programmes and projects supported by the EU, OECD, UNECE, World Bank, and other external agencies.

1.1.1. Priority options for early implementation by MENRP

These are:

- Restoration of a licensing regime covering both surface and groundwater abstraction, with Abstraction Charges based on the size of the licensed amount. This would include a category for non-consumptive abstraction, initially targeted at hydropower companies.
- Restoration of licensing of polluting discharges into surface and groundwater bodies, with Pollution Charges based on the amounts of licensed polluting substances.
- The more rigorous enforcement of the above licensing regimes, backed by fines set at levels that would deter offenders.

The economic instruments listed above will be discussed in more detail later in this section.

1.1.2. Complementary actions for implementation by other bodies and agencies

These are the following:

- Raising tariffs for water supply, sanitation and wastewater collection and treatment to cost-recovering levels and accelerating the programme of metering of water users. This is an area of responsibility for water companies, acting under the regulation of GNERC, and with technical assistance and financial support from the World Bank and other agencies. This action would generate more funds for investment in infrastructure, especially new wastewater treatment plants (WWTPs) which are urgently needed to curb surface water pollution. They would also create incentives for more careful and efficient water use by consumers (households, businesses, etc.).

- Raising irrigation charges, with a more vigorous effort to collect fees due. This would be the responsibility of the Georgian Amelioration Company, with regulation by GNERC. Its purpose would be similar to that of the EI above, namely to raise revenues necessary for investment and on-going costs in irrigation development, and to encourage farmers to adopt more water-efficient practices. This will not be easy, and rapid results should not be expected. Irrigation farmers have witnessed great turbulence and changes in recent decades, and current institutional arrangements need time to take effect. Equally importantly, the quality of irrigation infrastructure and services needs visible improvement if farmers are to pay higher charges.
- Introduction of reasonable entry fees to selected protected areas, with concessional rates for deserving groups and higher rates for foreign visitors. Proceeds would be returned to agencies operating these facilities (the Agency of Protected Areas and individual protected areas) in order to contribute towards their upkeep and enhancement. Some of the expenditure of local agencies responsible for the parks and protected areas contributes to water resource management (catchment protection, river and stream clearance, protection of wetlands, etc) so it is appropriate that visitors, the immediate beneficiaries of this work, pay towards it.

1.1.3. Measures for serious further study and possible piloting

Within a longer time horizon, the following economic instruments are also worthy of consideration:

- The further development of the existing legal principle of Environmental Liability to reinforce the existing regime of deterrence to the over-abstraction and pollution of water. This would include study of the feasibility of requiring compulsory environmental damage insurance by parties incurring these risks. In the first instance, the conclusions should be awaited of an EU project currently examining this issue.
- The scope and potential for setting up one or more schemes of Payments for Ecosystem Services. PES schemes exist in a number of countries, especially in Latin America where a number of Water Funds channel money into local water resources management. PES projects are voluntary agreements between local stakeholders with an interest in better WRM, and typically involve payments by the beneficiaries of WRM (e.g. water companies, hydropower generators, municipalities) to farmers and other land users in compensation for changing their land use practices (ACTeon, 2010). The initiative for scoping and implementing PES can be left to local communities acting with other key local stakeholders, with potential support from international networks and NGOs.
- Exploration with Azerbaijan of the feasibility of cost- and benefit-sharing projects to reduce pollution of transboundary rivers and lakes. Pollution of rivers and lakes in Eastern parts of Georgia is of concern both to Georgia and to the downstream parts of Western Azerbaijan. Both countries have an interest in reducing this pollution, a major cause of which is inadequate treatment of municipal and industrial effluent. In principle, Azerbaijan has an interest in implementing and contributing to the financing of such projects. In practice, any agreement on this would need to be part of a wider agreement on transboundary issues. The project of the OECD EAP Task Force on “The potential benefits of transboundary co-operation in Georgia and Azerbaijan – Kura River Basin” recommended capacity building, data collection, and international support for the Bilateral Commission established on this topic (OECD, 2015).

- Study of the feasibility of creating an Environmental Fund to further the objectives of the new draft Water Law, including study of its scope, potential beneficiaries, and the various funding options. Environmental Funds are stand-alone funds for subsidising projects and practices with national environmental benefits. They can be funded from various sources, which may include earmarking some of the proceeds from the abstraction and pollution charges. However, earmarking is not universally accepted as good practice, and is often resisted by national finance ministries since it complicates the management and allocation of budgets. Environmental Funds, however they are financed, have been successfully used by many countries as an instrument of environmental policy and this option should be kept under review by the Georgian Government.

1.2. Implementation

1.2.1. Priorities in implementation

The three main economic instruments recommended in this report are, firstly, the introduction of a licensing regime and charges for surface-, as well as ground-water abstraction, secondly, the restoration of a licensing and charging regime for the pollution of surface- and ground-water, and, thirdly, more rigorous enforcement of these measures, including more active monitoring and higher fines for offenders.

Implementing these measures will be greatly facilitated by the enactment of the new Water Law now being examined by the Government of Georgia. The Law contains several elements that are pre-conditions and essential complements for implementation of the economic instruments concerned, including:

- Statement of the User Pays (“payable usage of nature”¹) and Polluter Pays Principles as the basis for charges for the abstraction and pollution of water (Chapter XI).
- Definition of the scope of activities subject to the Law: whereas “general” (i.e. non-commercial) use is free, the extraction of water in excess of 50 m³ per day is governed by the Law; surface water abstraction is specifically included in the licensing regime; extraction of water for non-consumptive use (incl. hydropower generation, irrigation, etc.) is included; licences for abstraction of water for urban drinking purposes are to be issued for periods of up to 25 years; abstractors are required to install water meters at the point of intake, etc.
- For the purpose of administering pollution licensing and charges, water bodies are to be classified according to water typology and quality.
- River basin management plans will be developed by the MENRP using consultation and co-ordination councils.

The creation – or in respect of pollution the reinstatement – of a comprehensive and effective licensing regime is essential before viable Abstraction and Pollution charges are introduced. The draft Law provides the legislative grounding for this, but the monitoring and enforcement capacities of the MENRP’s National Environmental Agency and Department of Environmental Supervision and other bodies will need to be strengthened, or in certain cases created afresh.

Abstraction and Pollution charges would be payments made for the licence to, respectively, abstract and pollute surface and groundwater bodies. The charges would be based on *licensed amounts* of, respectively, raw water and polluting substances in wastewater

releases. *Actual* abstraction and pollution would only be taken into account to check whether this fell within the licensed amounts. This would be established from monitoring of intake meters (for abstraction) and water quality sampling (for pollution) (OECD, 2012).

In the case of water abstraction, charges based on licensed amounts are inferior to charges based on actual use, since they provide no incentive for water conservation or reduced pollution *within* the licensed amount once a licence has been issued and for the duration of that licence. Both systems require measurement of actual use, in the one case for setting the level of charges, in the other for checking actual offtake against the licensed amount. However, full volumetric charging would require the completion of comprehensive metering (as required in the draft Water Law) and meter reading by authorities.² In the absence of these conditions, e.g. in the initial phase of introducing these charges, the use of licensed amounts as the basis of charges, backed up by periodic or random checks, may be more feasible. While the majority of countries operating Abstraction Charges use actual metered amounts as the basis of charges, some countries use licensed amounts instead. A third option which is sometimes used for agricultural withdrawals is to base charges on the acreage of irrigated land.

It will be important that the scope of the eventual Water Law includes urban water utilities both as abstractors and potential polluters. Abstraction and Pollution charges set at meaningful levels will create incentives for these utilities to make efficient use of raw water and to treat their wastewater effluents.

Likewise, the abstraction licensing and charging regime should include so-called “non-consumptive” use – which, despite its name – imposes costs and inconvenience on other water users. It is customary to levy abstraction charges on non-consumptive use at a fraction of rates applying to consumptive use, with the precise rate dependent on sector, location, and other local circumstances. It is recommended that early action is taken to develop a regime of non-consumptive use charges for hydropower generation.³ A number of such projects are at an active stage of preparation and development, with potentially high impacts on river flows affecting downstream riparians. An abstraction licensing and charging regime for hydropower would be timely, and could generate revenues useful for defraying costs of water resources management, amongst other purposes.

For pollution charges different considerations apply. The charges are likely to relate to discharges of a specified number of different polluting substances, and will vary according to the specific circumstances of different water bodies (rivers, lakes, aquifers, wetlands). Charges based on metering alone are unlikely to be feasible. An effective charging system is more likely to be based on licensed amounts of specific pollutants, established after investigations of the major polluting agencies, with due consideration of the status of water bodies receiving these pollutants. Regular monitoring of compliance would be required, both of the status of receiving waters and of the behaviour of the polluting agencies (WWTPs, industries, mines, large farmers, food processors, etc.). In practice, for a relatively small country such as Georgia, 90% of water pollution is likely to be caused by a few dozen of the major polluters, which will facilitate checks on compliance at source – though regular monitoring of water status will be needed, and the current monitoring and data collection systems will need to be reinforced.

Drawing up river basin development plans as proposed in the draft Water Law and required by the EU WFD should be done in parallel with the reforms in the abstraction and pollution licensing and charging regimes. There is strong synergy between the two processes: effective licensing requires information about all actual and potential uses of water within river basins. Conversely, putting a river basin development plan into practice

will be easier within a framework of sanctions and incentives provided by effective licensing and charging systems. There is also the option of earmarking some or all of the proceeds of abstraction and pollution charges to the budgets of the new river basin management councils.

1.2.2. Agenda and timetable for implementation

The draft Water Law is central to implementation of economic instruments for water management, hence top priority should go to completing its passage through parliament, leading to its eventual enactment. While this is on the critical path, a number of other actions need to be carried out in preparation for use of the Economic instruments, each with its own timetable and duration, and involving different institutions and players.

The Government of Georgia (MENRP) has created a series of Road Maps for EU Approximation in the Environmental and Climate Action Fields. One of these concerns water quality and water resources management. This includes – amongst other actions – finalising the draft Law on WRM and drafting related by-laws by 2018, finalising a bilateral agreement with Azerbaijan for co-operation on the Kura River by 2018, developing guidelines, criteria and priorities for river basin management plans and the preparation of these (by 2024), and the establishment of programmes for monitoring water quality (by 2022 for groundwater and 2019 for surface water).

Some of the abovementioned actions in the Road Map would be on the critical path for the Economic Instruments (EI) agenda. For instance, the creation of effective surface- and ground-water quality monitoring would be a pre-condition of the new pollution licensing regime. It is recommended that the actions summarised below should be taken to further the EI agenda in the context of the Road Map, and synchronised with the timetable set out in the latter.

- Evaluate capacity and skills of MENRP and other key Ministries and agencies in the light of the new demands posed by the WFD, specifically the introduction of new and reformed Economic instruments.
- Carry out a study of the costs entailed in water resources management, how much is currently being spent, and how WRM could be funded in future.
- Elaborate details of the proposed water abstraction and pollution licensing and charging systems; fix level of charges and determine what impact these would have on water and energy costs.
- Assess what resources would be required to carry out the abovementioned tasks and functions; what these would cost, how they could be funded, and the potential sources of external support for them.

Notes

1. English translation of the draft Law.
2. Alternatively, self-reporting by users, with random checks by authorities.
3. Without prejudice to its extension to other sectors in due course.

References

- ACTeon (2010), *Economic Instruments for mobilising financial resources for supporting IWRM*, <https://www.oecd.org/env/resources/46228724.pdf>.
- OECD (2015), *The Potential Benefits of Trans-Boundary Cooperation in Georgia and Azerbaijan – Kura River Basin*, [https://www.oecd.org/env/outreach/EAP\(2015\)%2011%20%20THE%20POTENTIAL%20BENEFITS%20OF%20TRANS.pdf](https://www.oecd.org/env/outreach/EAP(2015)%2011%20%20THE%20POTENTIAL%20BENEFITS%20OF%20TRANS.pdf).
- OECD (2012), *A Framework for Financing Water Resources Management*, OECD Studies on Water, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264179820-en>.

Chapter 2

Water problems and management framework in Georgia

This chapter presents the context of Georgia's commitments taken in the framework of the signed Association Agreement with the European Union in 2014. More specifically, the chapter analyses the set of EU Water Directive and some key provisions of the Water Framework Directive. It also considers the role of water-pricing policies to ensure adequate incentives for efficient water resources use, and thereby contribute to the environmental objectives.

The chapter describes the current state of water problems and priorities in Georgia. It considers the issues like water quality which is an overriding concern, with widespread water pollution causing outbreaks of water-related diseases and harm to aquatic ecosystems, and water variability in the form of flooding and the occurrence of local and seasonal shortages. The chapter also discusses the need for water policy development in Georgia and the shortcomings of the current legal and institutional frameworks.

2.1. Context of the EU Water Framework Directive in Georgia

In 2014 Georgia signed an Association Agreement with the EU and made a commitment to implement the EU's Water Framework Directive (WFD).

Amongst other measures aimed at achieving “good water status” in all water bodies, the WFD (in Article 9) includes the systematic use of economic instruments, including water pricing, to recover the cost of water services provided to households, industry, and farmers (see Box 2.1 and Box 2.2).

Box 2.1. Article 9 of the EU Water Framework Directive, 2000

“Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex B, and in accordance in particular with the polluter pays principle.

Member States shall ensure by 2010:

- That water-pricing policies provide adequate incentives for users to use water resources efficiently, and thereby contribute to the environmental objectives of this Directive.
- An adequate contribution of the different water uses, disaggregated into at least industry, households and agriculture, to the recovery of the costs of water services, based on the economic analysis conducted according to Annex B* and taking account of the polluter pays principle.”

*Annex B of the WFD states: “The economic analysis shall contain enough information in sufficient detail (taking account of the costs associated with collection of the relevant data) in order to:

- Make the relevant calculations necessary for taking into account under Article 9 the principle of the recovery of the costs of water services, taking account of long term forecasts of supply and demand for water in the river basin district and, where necessary:
 - Estimates of the volume, prices and costs associated with water services, and
 - Estimates of relevant investment including forecast of such investments.
- Make judgements about the most effective combination of measures in respect of water uses to be included in the programme of measures under Article 11 based on estimates of the potential costs of such measures.”

Source: Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

Box 2.2. Pricing policies for enhancing water use efficiency

“A price directly linked to the water quantities used or pollution produced can ensure that pricing has a clear incentive function for consumers to improve water use efficiency and reduce pollution”.

Efficient water pricing policies have a demonstrable impact on the water demand of different uses. As a result of changes in water demand, efficient pricing reduces the pressure on water resources. This is particularly true of the agricultural sector.¹

Source: European Commission (2000), *Pricing policies for enhancing the sustainability of water resources*. COM(2000) 477 of 26.07.2000.

In addition to raising money to fund the cost of water management and services, the WFD stresses the role of water pricing in providing incentives for water users to use water efficiently, for the benefit of the environment.

A key provision of the WFD (Articles 3, 4 and 5) is for the development of river basin management plans, requiring an assessment of costs and scope for cost recovery from all stakeholders in such river basins.

Progress in the application of water pricing in the EU Member States has been halting and uneven, with major differences between Member States in their interpretation, as well as implementation, of the Directive. In its latest implementation review of the WFD, the European Commission notes:

...incentives to use water efficiently and transparent water pricing are not applied across all Member States and all water-using sectors, partly due to the lack of metering. In order to implement incentive pricing, consumptive uses should by default be subject to volumetric charges based on real use. This requires widespread metering, in particular for agriculture in basins where irrigation is the main water user. (European Commission, 2015)

The Government of Georgia has recently agreed a “road map” for implementing the WFD. Its main elements as they apply to topics relevant to this study are:

- WFD (Directive 2000/60/EC amended by Decision 2455/2001/EC). The new Law on Water Resources Management (WRM) is being developed, with support from a UNECE project. The Ministry concerned (MENRP) already has basic information on major basins and sub-basins, including some on GIS maps. Pilot basins have been identified. The assessment of pressures on several river basins have been carried out under an EU regional project. Monitoring of surface water quality (from 43 sampling sites) is limited, and there is no groundwater monitoring. There are gaps in collection of chemical and physico-chemical data, especially hydromorphological and biological. Draft river basin management plans have been prepared for pilot basins.
- Directive 2007/60/EC on assessment and management of flood risks. There has been no progress on the adoption of national legislation, nor the designation of competent authorities. The National Environmental Agency has data on national flooding events 1916-96 and provides information on forecasted probability and frequency of floods. This Agency develops flood hazard maps in GIS format for regional of Georgia.
- Directive 91/271/EEC on urban wastewater treatment, amended by Directive 98/15/EC and Regulation (EC)1882/2003. The adoption of national legislation and designation of competent authorities will be partly covered by the new Law on Water Resources Management. A national wastewater management strategy is under preparation by the Ministry of Infrastructure and Regional Development, with the support of the World Bank. Feasibility studies of wastewater management in five locations have been done by the Joint Water Supply Company of Georgia with support from the World Bank. Wastewater Treatment Plants are under active preparation for 7 urban areas (World Bank, 2015).
- Directive 98/83/EC on quality of water for human consumption, amended by Regulation (EC)1882/2003. Relevant national legislation already exists, but may need review. A Technical Regulation for drinking water quality was adopted in 2007, based on WHO standards and the EU Directive.

- Directive 91/676/EC on protection of waters against pollution caused by nitrates from agricultural sources as amended by Regulation (EC) 1882/2003. National legislation and designation of competent authorities will be partly covered by the new Law on WRM. The National Environmental Agency monitors nitrate concentrations only in selected sites in fresh surface waters, and there is no monitoring of groundwater, nor systematic monitoring of coastal waters and estuaries. There are currently no action plans or codes of good agricultural practices (World Bank, 2014a).

2.2. Overall availability and use of water

With an average annual availability of 3 144 cubic metres of renewable water per head Georgia is not “water scarce” nor “water stressed” in the normal sense of these terms (UNECE, 2016). Unlike in many other countries the gross quantity of available water appears to be ample¹ and water-saving is not an overriding priority for most users and use sectors, though shortages recur in some Eastern regions of the country.

However, while this judgement may apply at the national level, certain regions and water bodies are exposed to the risk of over-abstraction due to unsustainable management practices.

In 2012 out of a total national water consumption of 1 241 million cubic meters, excluding hydropower, the main sectors of use were agriculture (64%), households (28%), industry (4%), fisheries (3%) and other (1%). There is also a sizeable non-consumptive abstraction of water for hydropower at a number of plants on the Kura River and its tributaries, and for cooling in the thermal power station at Gardabani. Although largely non-consumptive, these operations in the power sector do have an impact on river flow, hydro morphology and the transport of sediments, which affect water use elsewhere.

Total water consumption has been falling since the end of the Soviet Union and the cessation of a number of industrial units. Irrigation demand has also fallen due to the collapse of some large-scale operations; the total area of irrigated land fell from 370 000 ha in 1990 to 167 000 in 2003, and has fallen further since then. In the Kura Valley, the major river basin of Georgia, total water use in 2003 was less than one-third of its level in 1979 (OECD EAP Task Force, 2012). Water use efficiency in both industry and irrigation is low. With the rapid development of hydropower in the last few years non-consumptive use of water in energy production has increased from 20.6 billion m³ in 2011 to 26.5 billion m³ in 2013.

2.3. Variability of water flow

The variability of natural water flows does pose problems. Local flooding and local seasonal water shortages are common.

Between 1995 and 2013 there were 210 flooding and flash-flooding events in Georgia, causing economic damages estimated at USD 298 million, with loss of 38 lives. Prior to this, in 1987 flooding in the Tbilisi region caused 110 deaths and economic losses of USD 546 million. Flooding is due to natural seasonal variation of river flows, aggravated by widespread damage to watersheds due to deforestation, overgrazing, soil erosion and siltation, and blockages caused by widespread dumping of solid waste (OECD, 2015). These problems are made worse by the deterioration of existing flood defences and a lack of an adequate monitoring and flow forecasting system that would allow effective early warning.

This variability should be addressed by better water resource management and more rigorous environmental protection. Some variability is also due to abstractions for hydropower generation (even though mostly “non-consumptive”) and irrigation (partly consumptive, with some return flow).

2.4. Water services

Existing water services to urban and rural households, farmers, and other users, are inadequate. This is due to low levels of investment, inadequate maintenance and poor management, all interrelated and made worse by poor cash flows and sub-economic tariffs. In this case, higher tariffs (which may also provide an incentive for more efficient water usage) are essential to generate the financial resources needed for the investment and ongoing operation of water services. This is particularly true of the underdeveloped wastewater services (ADB, 2014).

2.5. Water quality and pollution

Water quality is an overriding concern, with widespread water pollution causing outbreaks of water-related diseases and harm to aquatic ecosystems. Some of this pollution is caused by widespread and indiscriminate dumping of solid waste, but a greater source is discharges of untreated sewage from municipal water utilities (World Bank, 2014b).

In most of Georgia's urban settlements, the quality, coverage and maintenance of basic infrastructure has declined since the break-up of the Soviet Union, due to inadequate funding of maintenance and new investment. The infrastructure concerned is old, over-designed in relation to current usage, inefficient in its use of energy, and expensive to maintain. 35% of the national population in 45 urban centres is served by sewage collection from the United Water Supply Company of Georgia (UWSCG). The sewerage pipes are old and in poor condition (OECD EAP Task Force, 2009).

Hence most of Georgia's sewage is released in an untreated or only very partially treated, state into its principal rivers and lakes. This untreated municipal sewage is a major source of water pollution.

Box 2.3. Current state of municipal wastewater in Georgia

Municipal wastewater remains a major polluter of surface waters in Georgia. On average, 70% of the urban population is served by collection systems but only 26% of wastewater is treated. Currently, sewage collection systems exist in only 41 towns and urban centres but most of the municipal wastewater treatment plants (WWTPs) are inoperable. The exceptions are Gardabani WWTP, built in 1988, which only has mechanical pretreatment, and the Sachkhere and Batumi WWTPs (operating since 2013), which have biological treatment.

Source: UNECE (2016), *Third Environmental Performance Review of Georgia*, p.78, <https://www.unece.org/environmental-policy/environmental-performance-reviews/enveprpublications/environmental-performance-reviews/2016/3rd-environmental-performance-review-of-georgia/docs.html>.

Although the UNECE reports no contamination from phosphates and pesticides, the level of nitrogen compounds in rivers exceeds legal limits. However, the source of this pollution – whether from untreated domestic wastewater, agricultural run-off, or elsewhere – cannot be precisely determined due to a lack of systematic monitoring of water quality.

Likewise, the condition of groundwater is difficult to assess, though any contamination would be a serious matter since groundwater accounts for a high proportion of national water consumption, reaching 90% in rural areas. The recent shift of farming out of

irrigated arable cultivation into livestock and rain-fed systems is likely to have had some effect on the pattern of pollution, such as greater risks from disposal of liquid animal manures, but this cannot be accurately assessed without greater monitoring and assessment (Entec, 2010; OECD, 2012).

Water pollution of shared rivers and lakes is a growing transboundary issue with the downstream riparian Azerbaijan.

The main conclusions to be drawn about Georgia's water status are as follows:

- The country is well endowed with water resources and has no overall water scarcity. However, there is unsustainable abstraction of groundwater and surface water in some localities.
- Water variability, in the form of flooding and the occurrence of local and seasonal shortages, is a serious problem in many localities.
- There is an urgent need of better water resources management (watershed and river basin management, water storage and flood control, habitat and ecosystem protection, etc.). This will, amongst other things, require better and more systematic funding of these activities.
- Water quality is an urgent problem. Water pollution is serious and widespread, needing action on municipal wastewater treatment, control of industrial and mining effluent, and improved solid waste management.
- Water services for municipalities, rural households, businesses and public services are inefficient, dilapidated and short of funds and need to be placed on a stronger and sustainable financial basis.

In its 2016 Environmental Performance Review of Georgia, the UNECE concluded:

The absence of effective pollution prevention and water extraction control mechanisms is one of the major problems related to water resources in Georgia. There are no special permits for surface water abstraction and wastewater discharge.

The management of environmental pollution does not rely on pollution charges to create economic incentives for reducing emissions of air and water pollutants to acceptable standards.

The Ministry of Environment and Natural Resource Protection should... develop by-laws regarding the quality criteria for surface water abstraction and wastewater discharge and re-establish the permit for these activities.

Water is used with little curb from economic instruments. There are no charges for surface water abstraction, and fees for ground water abstraction are low. Pollution charges were abolished in 2005. As already noted, tariffs for water supply and sewerage for households are low and not cost-reflective, and a large proportion of households have no water meters and pay a flat fee per person.

2.6. Policy framework

Georgia does not have an officially adopted policy, programme or plan for the management of its water resources. However, several strategic documents address some of the key issues.

The Socio-Economic Development Strategy of Georgia (Georgia 2020) sets as the overall strategic objectives the provision of the entire Georgian population with continuous (24h) water supply and the rehabilitation of drainage systems and treatment. However, no specific timeframe or plan is established for achieving these objectives.

The State Strategy for Regional Development of Georgia 2010-2017 contains a component for water supply, sanitation and wastewater. The strategy calls for (a) development of an effective sector management system; (b) improvement of water supply to the population, improvement of water metering and reduction of water losses; (c) rehabilitation and expansion of water supply and sanitation systems, and (d) improvement of tariff collection and enhancing the financial sustainability of water companies. This document does not, however, include a programme or plan with timeframes or details of financial resources for achieving the strategic goals.

The Second National Environmental Action Programme 2012-2016 (NEAP-2) of Georgia is a strategic document setting long-term goals and short-term targets for protection of the environment and natural resources, including water resources management. Its stated goal is to “ensure safe water quality and adequate water quantity for human health and aquatic ecosystems.” To achieve this goal four short-term targets are established:

- target 1 – establishment of an effective water management system
- target 2 – establishment of effective pollution prevention and water abstraction control mechanisms
- target 3 – reduction of water pollution from untreated municipal wastewater
- target 4 – reduction of water pollution from diffuse sources in agriculture.

NEAP-2 recognises the ineffectiveness of the current centralised system of water resources management and calls for a shift to river basin management approaches. This would ensure the integration of surface and groundwater resources, the incorporation of special planning and the efficient allocation of water resources to different economic sectors taking into account also interests of ecosystems integrity. The document advocates a new water law to legally establish river basin management. Such a law is now in preparation.

NEAP-2 specifically provides for:

- implementation of river basin management (RBM) pilot projects in selected river basins
- extension of the water pollution monitoring network
- amendments to the Law on Environmental Impact Permits to include industrial sectors producing nutrient-rich wastewater in the list of activities requiring environmental impact permits and mandatory EIA
- completion of the rehabilitation and construction of municipal wastewater collection and treatment systems in 10 cities and towns (Batumi, Kobuleti, Ureki, Poti, Borjomi, Bakuriani, Kutaisi, Mestia, Anaklia, Marneuli) and development of a national programme for rehabilitation and construction of municipal wastewater collection and treatment systems in Bakuriani, Kutaisi, Mestia, Anaklia, Marneuli settlements.

Currently, there are no policies, strategies, mechanisms or systematic tools for the promotion of efficient water use and the prevention of pollution by industry and households. NEAP-2 calls for development of a national action plan for the sustainable use of pesticides,

herbicides and fertilizers by 2016. However, at present, there are no policies or programmes for the promotion of efficient use of water in agriculture, nor for the prevention of water pollution from agriculture (UNECE, 2016).

2.7. Legal framework

Georgia has a number of laws and regulations governing water resources. The Water Law of 1997 defines the main objectives and principles of water policy including protection and rational use, priority to the supply of drinking water, and the prevention and control of harmful impacts. It defines different categories of water resources such as waters of special national and local importance and establishes competencies of the national and local authorities with respect to water resources management. The law provides for the development of national and local actions for water resources management, water use accounting, water quality and quantity monitoring, oversight of water use and water pollution.

Article 68 of the Water Law is the legal basis of economic instruments for water management such as water use charges, state subsidies for water protection and fines for violation of regulations related to water protection and use. The Law relates mainly to the protection and use of surface inland waters, rather than the regulation of groundwater and coastal waters.² Most of the provisions of the Water Law have a questionable legal validity, and subsequent legislation has not been fully consistent with it (UNECE, 2016).

A major legislative change in Georgia's environmental law was brought about with the 2004 Tax Code and the 2005 Law on Licences and Permits. According to the Tax Code, charges for environmental pollution, including water pollution charges (introduced in 1993), were abolished. The Law on Licences and Permits radically reduced the number of activities that were classified as environmentally sensitive and in need of special environmental permit to be issued by the environmental authorities. The licensing system for surface water abstraction and for wastewater discharges was eliminated.

Water abstraction and discharges are now regulated by environmental impact permits (EIPs). According to the 2007 Law on Environmental Impact Permits EIPs are required for new developments and already operating industries which started their activities up to 1996 (before the Law on Environmental Permits came into force). EIPs are issued by the MENRP, subject to an Environmental Impact Assessment (EIA).³

The Water Law has not been amended to bring it into conformity with the 2005 Law on Licences and Permits, nor to the environmental and other sectorial laws that have been adopted in the last decade. Currently, the legislation on water resource management contains many contradictory provisions, which limits its implementation.

At present there is effectively no control of wastewater, as the systems for its licensing, supervision and management are practically non-existent and rely on the self-monitoring of emissions.

Nor are there mechanisms to regulate, define priorities and establish rules for the allocation and distribution of water in the event of conflict. According to the UNECE's Third Environmental Performance Review no conflicts between different water users in Georgia are reported. The MENRP is not required to be informed about conflicts between water users and is not involved in negotiation meetings (UNECE, 2016). However, this does not apply to some transboundary rivers and groundwater aquifers.

There are growing concerns by Azerbaijan and Georgia to avoid conflicting use of the transboundary rivers of Kura and Alazani, and of the Alazani-Agirchai groundwater

aquifer and Jandar Lake. Currently, the Organization for Security and Co-operation in Europe (OSCE) and UN Economic Commission for Europe (UNECE) support Georgia in facilitating co-operation with Azerbaijan over protection and sustainable use of the water resources of the Kura River basin. The agreement seeks to resolve inter alia the issue of shared water from the Kura River for agricultural use. Since 2010, a number of bilateral consultations between Georgia and Azerbaijan took place with the objective of developing a text for the future bilateral agreement on the shared water resources (UNECE, 2016). The conflicts between the use of water for hydropower, the development of irrigation in the Alazani-Iori Basin and the preservation of water flow for aquatic ecosystems are a source of increasing concern. Such tensions are likely to grow with climate change.

Georgia has committed under the Association Agreement to harmonising its environmental legislation with the EU Directives. MENRP has established a time schedule to develop legal acts in line with these directives. As part of the process the MENRP drafted a new Framework Law on Water Resources Management in 2014 which has been forwarded for inter-ministerial consultation. The draft water law aims to encapsulate all aspects of integrated water resources management (IWRM). As reported by the MENRP some sub-laws for the implementation of the Framework Law have also been developed, including:

- identification of Water Bodies and Establishing the Watershed Boundaries
- procedures for Development and Approval of Watershed management Plans
- procedures for Planning and Implementation of Water Resources Monitoring
- establishing of River Basin Management Councils and their Statute.

Considering the imminent approval of the new Framework Law, the MENRP plans to develop river basin management plans (RBMPs) for the whole territory of Georgia in the next 10 years. The preparation of the RBMPs has begun with development of the management plan for the Chorokhi-Adjaristkali pilot basin, with the assistance of the EU-funded project Environmental Protection of the International River Basins. The Government's strategy is based on replication of this study in other hydrographic basins. The MENRP intends to create new river basin management units for water resources management (UNECE, 2016).

The new draft Law addresses several key issues and omissions highlighted in the current report, including the re-introduction of licensing (*permitting*) for surface water abstraction and wastewater discharges, and the revival and more active use of charges for water abstraction and pollution. Specific provision is made for the use of economic instruments for water management following the principles of User Pays and Polluter Pays.

2.8. Institutional framework

The period 2005-12 witnessed turbulent changes in the legal framework and institutional basis of Georgia's environment and natural resources, including water. In 2013 various aspects of environmental management and a number of relevant institutions were consolidated under the umbrella of the Ministry of Environment and Natural Resources Protection (MENRP). Currently this Ministry is the major official body responsible for sustainable management of water resources. However, some functions related to water management are devolved to various other national and local authorities, and public and private organisations.

2.8.1. Ministry of Environment and Natural Resources Protection (MENRP)

MENRP is responsible for developing national policies for water resources management, related legal and regulatory frameworks, river basin planning, issuing environmental permits, etc. It is also responsible for implementing the policies, assuring compliance with environmental legislation, issuing licences for groundwater abstraction, monitoring of surface and groundwater quantity and quality, collecting statistical information on water uses and wastewater discharges, etc. The ministry undertakes these tasks through the subdivisions described below.

The Water Resources Management Service, responsible for the following general functions:

- development of legislation
- organisation of river basin planning
- ecological expertise for environmental permitting for surface water
- setting technical regulations and norms for surface water abstraction and wastewater discharge
- the destination, quantity and quality of wastewater discharged.

The Department of Environmental Impact Permits, responsible for issuing permits for new development projects for activities needing environmental ecological expertise according to the Law on Permits and Licences (2005). The permits are issued on the basis of State Ecological Examination, a prototype of environmental impact assessment. Separate licences/permits for surface water abstraction or wastewater discharges are not issued.

The Department of Environmental Supervision, an inspection body of the Ministry responsible for monitoring of water pollution checking and compliance with the terms of environmental permits issued by the MENRP. The department has eight regional units, one being for the Black Sea.

The National Environmental Agency (NEA) under the MENRP, responsible for monitoring surface and ground water quantity and quality. The NEA is organised by departments dedicated to quality analyses (water, air and soil) and has three regional laboratories for water quality control: a central one (in Tbilisi), and one each in Kutaisi and Batumi.

Currently, the operational hydrological monitoring network consists of 55 hydrological monitoring stations including 35 automated hydrological stations, 12 manual and 8 mixed stations (automated and manual measurement). For reference, 40-160 manual hydrological stations were functioning from the 1940s to the 1970s (UNECE, 2016).

With government support and funding from donors, the monitoring network for surface water quality has improved from 41 points in 2009 to 116 points in 2014 at 64 water bodies including rivers, reservoirs and lakes.

Groundwater monitoring was reactivated with the establishment of two monitoring wells in the Alazani-Agrichai aquifer in 2014. The number of monitoring points across the country has increased to 34 by May 2016. Eight of the monitoring wells have been arranged with financial support from the Czech Government and the rest through the NEA budget. NEA plans to add 6 more monitoring wells in 2016.⁴

The Natural and Technological Hazards Management Service of the MENRP is responsible for identifying the risks, and providing early warning, of extreme events (floods and droughts). It prepares annual reports, sent to all Ministries, identifying risks and defining measures (for local authorities) and recommendations for the Ministry of Regional Development and Infrastructure.

2.8.2. Other Institutions

The Ministry for Labor, Health and Social Affairs establishes environmental quality standards, including those for drinking water, bathing water groundwater and coastal waters.

The Ministry of Agriculture through its **National Food Agency** has been responsible since 2006 for the monitoring and state control of drinking water quality across the country. The water supply companies, on their side, have their own laboratories for conducting self-monitoring of drinking water quality, and implement their monitoring plans autonomously.

The Ministry of Regional Development and Infrastructure (MRDI) is responsible for policies, programmes and regulations for the infrastructure of water supply, sanitation and flood protection.

The management of water supply and wastewater drainage systems is exercised by three companies, with different territorial responsibilities:

- **United Water Supply Company of Georgia (UWSCG)** founded under the MRDI in 2010 provides water supply and sanitation services throughout the country in urban settlements excluding Tbilisi metropolis and the Autonomous Republic of Adjara. The company currently serves about 300 000 residential and 15 000 non-residential customers, with 51 service-centers and employing around 2 400 staff members. UWSCG is 100% state-owned and provides services to more than one million people and more than 5 000 industrial and commercial customers. The company receives loans from the European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD) and Asian development Bank (ADB) for rehabilitation projects.
- **Georgian Water and Power (GWP)**, a private company, operates in the capital city Tbilisi and neighbouring cities of Mtskheta and Rustavi since 2007. The company services about 400 000 customers throughout Tbilisi, including 2 000 public and 15 000 commercial organisations.
- **Batumi Water Utility** (established in 2016) provides water supply and sanitation services to the capital city of the Ajara Autonomous republic Batumi and neighboring rural settlements. In other urban settlements of the Ajara Autonomous Republic water services are provided by municipal water companies including Kobuleti, Khelvachauri, Shuakhevi, Keda and Khulo water municipal companies.

The Georgian Amelioration (GA) company, formerly United Amelioration Systems Company of Georgia (UASCG), operating under the Ministry of Agriculture, is responsible for managing the national irrigation and drainage infrastructure. It has 20 local service centers managing water irrigation and drainage in various municipalities.

The National Energy and Water Supply Regulatory Commission (GNERC) regulates tariffs charged in drinking water supply, sanitation and irrigation.

Local self-governance bodies are responsible for management of water resources of “local importance”. These local authorities have only limited competences and are of peripheral importance to water management (UNECE, 2016).

In summary, in Georgia water resources management is highly centralised, with minimal roles for local bodies. There are no river basin organisations formally established or functioning. MENRP plays a key role in water resource management but does not handle all types of water bodies. Although responsibilities for water are distributed between various ministries, integrated water resource management is hampered by poor co-ordination between these institutions, and the fact that local authorities do not feel responsible for the protection of their local water bodies.

2.8.3. Estimation of cost of water resources management (WRM) in Georgia

As the above account demonstrates, in Georgia responsibilities for WRM are spread across a number of different agencies of government, and no single institution is fully responsible.

The Ministry of Environment and Natural Resources Protection (MENRP) has several Departments involved in aspects of WRM (e.g. the Water Resource Management Service, the Department of Environmental Supervision, and the Department of Environmental Permits) but it is difficult to determine – and therefore to cost – what proportion of these resources are dedicated to WRM. Likewise, the National Environment Agency (NEA) has several units – the Hydrological Monitoring Department, the Water Quality Monitoring Department and the Geological Department, all performing WRM roles, but alongside other functions, hard to separate from WRM. There is also the Food Safety Agency of the Ministry of Agriculture, performing monitoring of drinking water quality.

Nor is the above an exhaustive list of departments and agencies involved in WRM: this would have to include the Ministry of Regional Development, Ministry of Infrastructure, the Water Companies, the Amelioration Agency, and others. It is also relevant to note that the new (2014) draft Water Law requires the establishment of Water Basin Councils, needing their own budgets.

The diffusion of WRM responsibilities amongst a significant number of Georgian institutions and agencies, and the conflation of WRM with other functions within them, has made it impossible to reach credible estimates of the overall costs of WRM in the country. To produce this would require a much deeper analysis, in a separate exercise. It is recommended that a detailed assessment of the current costs of WRM in Georgia, and estimation of necessary future levels for these, be carried out urgently.⁵

2.8.4. International reference points

As already stated above, it is important for Georgia to have a more accurate understanding of the financial costs entailed in adequate water resources management, starting with an estimation of what is currently being spent. Annex A contains information on WRM costs in Armenia and South Africa which may provide some useful pointers. However, while comparative international evidence is informative, it cannot substitute for better data on Georgia’s specific situation.

Notes

1. There are no reliable data on average national water consumption per head. A high and wasteful level of household water consumption may be inferred from the high level (650 litres/head/day) of household wastewater treated at the Gardabani sewage treatment works (Adeishvili, 2012, p. 25), but this cannot be extrapolated to the rest of the population.
2. Ground water is regulated by the 1996 Law on Mineral Resources. Marine Code (1997) and Law on Marine Space (1998) provide pollution prevention and control measures of coastal waters.
3. Economic activities, not listed in the Law on Environmental Impact Permit, are regulated by the Environmental Technical Requirements approved by the Ministry of Environment and Natural Resource Protection (hereafter MENRP) in 2008 (order #745). The technical environmental regulations define water abstraction and discharge standards for activities not subject to environmental impact permit. The abstraction of groundwater is regulated by the licence regime for use of mineral resources. Currently the National Environmental Agency (NEA) under the MENRP is responsible for the issuance of groundwater and mineral water abstraction licences.
4. Interview with the Head of Geological Department of the NEA Mr. Merab Gaprindashvili.
5. This section has benefited from advice from Malkhaz Adeishvili and Khatuna Gogaladze.

References

- ADB (2014), *Country Partnership Strategy: Georgia 2014-2018*, Asian Development Bank, <https://www.adb.org/sites/default/files/institutional-document/153660/cps-geo-2014-2018.pdf>.
- Entec (2010), *Managing Scarce Water Resources – Implementing the Pricing Policies of the Water Framework Directive*, http://ec.europa.eu/environment/water/water-framework/economics/pdf/pricing_policies.pdf.
- European Commission (2015), *Communication from the Commission to the European Parliament and the Council: The Water Framework Directive and the Floods Directive: actions towards the “good status” of EU water and to reduce flood risks*, COM(2015)120, 9.3.2015.
- OECD (2015), *The Potential Benefits of Trans-Boundary Cooperation in Georgia and Azerbaijan – Kura River Basin*, [https://www.oecd.org/env/outreach/EAP\(2015\)%2011%20%20THE%20POTENTIAL%20BENEFITS%20OF%20TRANS.pdf](https://www.oecd.org/env/outreach/EAP(2015)%2011%20%20THE%20POTENTIAL%20BENEFITS%20OF%20TRANS.pdf).
- OECD (2012), *Water Quality and Agriculture: Meeting the Policy Challenge*, OECD Studies on Water, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264168060-en>.
- OECD EAP Task Force (2012), *Strengthening the Economic and Financial Dimension of Integrated Resources Management in Armenia, Azerbaijan and Georgia*, [www.oecd.org/env/outreach/EAP\(2012\)10_Report%20on%20Kura%20basin_ENG.pdf](http://www.oecd.org/env/outreach/EAP(2012)10_Report%20on%20Kura%20basin_ENG.pdf).

- OECD EAP Task Force (2009), *Financing Strategy for the Urban Water Supply and Sanitation Sector in Georgia*, <https://www.oecd.org/countries/georgia/36472918.pdf>.
- UNECE (2016), *Third Environmental Performance Review of Georgia*, United Nations Economic Commission for Europe, <https://www.unece.org/environmental-policy/environmental-performance-reviews/enveprpublications/environmental-performance-reviews/2016/3rd-environmental-performance-review-of-georgia/docs.html>.
- World Bank (2015), *Supporting Sustainable wastewater management project: Georgia*, World Bank, [http://documents.worldbank.org/curated/en/968591467986284656/pdf/81096-PAD-P145040-PUBLIC-Box391460B-Project-Appraisal-Document-May-12-2015.pdf](http://documents.worldbank.org/curated/en/968591467986284656/pdf/81096PAD-P145040-PUBLIC-Box391460B-Project-Appraisal-Document-May-12-2015.pdf).
- World Bank (2014a), *Irrigation and land market development project: Georgia*, World Bank, <http://documents.worldbank.org/curated/en/421351468031549537/pdf/PAD8620PAD0P13010Box385199B00OUO090.pdf>.
- World Bank (2014b), *Georgia: Winds of Optimism*, World Bank, <http://documents.worldbank.org/curated/en/417251468251451738/pdf/916970NWP0Georgia0ER0Box385342B00PUBLIC0.pdf>.

Chapter 3

Overview of economic instruments for water management in Georgia

This chapter presents the purpose of economic instruments for water resources management and describes the main types of economic instruments, i.e. user charges, abstraction and pollution taxes, subsidies and penalties. The chapter also describes four broad principles used to justify the use of economic instruments for water management.

The chapter discusses the current status of economic instruments in Georgia. At present, the country applies four categories of economic instruments for managing its water resources: fees for water abstraction, user charges for water supply and sanitation, irrigation water supply tariffs and fines for non-compliance with regulations concerning water resources. The chapter also discusses water pollution charges which were introduced in 1993 and then abolished in 2005.

3.1. The purpose of economic instruments

Compliance with the EU’s Water Framework Directive (WFD) requires the use of economic instruments, including water pricing, to cover the costs of water services. Economic instruments have a two-fold purpose:

- Providing incentives for sustainable water use by the various user groups (households, farmers, businesses, hydropower plants, and others) in order to address current problems of water management and use in Georgia, including excessive abstraction and use, losses, waste and pollution.
- Furnishing the financial resources needed for the management of national water resources (including storage, flood control and hydropower) and for the supply of water services to users. This is particularly important in present circumstances, where water infrastructure and services are chronically short of money for their operation, maintenance and new investment (Pegram and Schreiner, 2009).

Water pricing also serves to *signal the economic value* (and cost¹) of the use and abuse of water. User charges, set at proper levels, are a reminder to water user sectors of the cost of the resource being consumed. Water prices are also useful to public decision makers (Ministers, regulators) in deciding the allocation of water when it is scarce and on the allocation of public budgets and investment programmes to water, rather than other types of public infrastructure and services. Abstraction and pollution pricing through charges and taxes are means towards the *internalisation* of environmental costs into prices (WS Atkins International, 2012).

3.2. The main types of economic instruments

In the context of water resource management and services, the main categories of Economic instruments are:

- ***User charges*** – payments by water consumers for the delivery of water services (water supply, sewerage, wastewater treatment). This includes households, municipalities, businesses, public institutions, farmers, etc. It also includes non-consumptive water users such as hydropower companies and thermal power companies and industries using water for cooling purposes, before returning it to a public water course.
- ***Abstraction charges and pollution taxes*** – the former are payments for the use of “free” natural resources, whereas the latter penalise those causing environmental pollution.
- ***Creation of water and pollution markets*** – allowing abstractors and polluters to trade their licences with each other in order to facilitate the working of the licensing regime and minimise the cost of compliance to themselves and society.
- ***Subsidies for environmentally beneficial actions (creation of positive environmental externalities)*** – rewards (to households, farmers, businesses) for investment in water-efficient or pollution-reducing methods.
- ***Penalties for offences to environmental legislation*** – fines and other financial penalties for non-compliance with environmental laws and regulations, or for non-observance of the terms of licences awarded for water abstraction, water use and discharge of pollutants. Although these penalties are theoretically part of a “command and control” regulatory regime, in practice these fines are often treated more like a “cost” of doing business, akin to a tax (OECD EAP Task Force, 2012b).

3.3. The justification of economic instruments

Economic instruments such as those stated above are only one of the tools available for water management. Other means include legal and institutional reforms, direct administrative edict and coercion, education and influence, public investment, voluntary actions involving civil society and private businesses, and the various other elements of water *governance*.

Actions in other sectors can have equal or greater impact on the water sector than actions in the “Water Box” itself – examples include electric power subsidies in irrigation, the level of farm support prices, policies towards construction, housing and land use, regional development, etc. Removing “perverse incentives” affecting water can make a big contribution to water management (Verbruggen, 1998).

There are also other ways of obtaining the funds required to support water management and investment in its infrastructure and services, such as government grants and soft loans, external aid, contributions in kind (e.g. by farmers and rural villagers), etc.

Economic instruments are often compared with “command and control” (C&C) methods, in which governments attempt to achieve their ends through legal and administrative *diktat* rather than market-based methods such as pricing. Economic instruments have the following advantages over C&C:

- They provide continuing (*dynamic*) incentive effects, whereas C&C impacts are normally one-off (e.g. forcing a change in technology).
- They are more flexible – firms with a high cost of abatement can continue in production, even though they pay pollution taxes, whereas under C&C they may have to cease business.
- Economic instruments tend to reward firms that can do abatement more efficiently, whereas C&C imposes universal compliance, whatever the cost to different firms.
- Economic instruments can generate public revenue, unlike C&C (except where the latter involves charging for the issue of licences).
- Tradeable permits for water pollution can enable the desired reduction in pollution to be carried out at least cost to the perpetrators, and to society (Winpenny, 1998).

Set against these benefits of economic instruments, pollution taxes and charges are a less certain method of achieving environmental targets than a well-enforced system of C&C. The theoretical benefits of pollution charges depend on the authorities having good information about polluters’ abatement costs, a predictable response from polluters, and the tax set at the correct level. These conditions are rarely present. In addition, taxes are always unpopular with the public, compared with the (more opaque) costs of regulation.

In practice, economic instruments can be only part of the armoury of water management and tend to work best in combination with other methods. For instance, pricing can only work with the basic infrastructure of data, monitoring and enforcement which forms part of the licensing (C&C) regime. But equally, water policies that do not include Economic instruments or which do not make effective use of them, are unlikely to succeed.

3.4. A typology of economic instruments for Georgia

The aim of this study is to review the scope and feasibility of using economic instruments for managing water in Georgia. In some cases, this will involve the reform of existing economic instruments, or their more purposeful application (OECD EAP Task Force, 2012a). Other economic instruments would be new to the country, though not to some of its neighbours.²

Economic instruments can be justified by any of four broad principles. *User Pays Principle* requires the consumers of a water service (water supply, sewerage, irrigation etc) to contribute to recovering the cost of providing the service. The *Polluter Pays Principle* entails the agent causing pollution to pay a charge that discourages further pollution and which helps to fund the cost of cleaning up the pollution. *Beneficiary Pays Principle* involves parties that stand to gain from environmental improvements being required to contribute towards their cost. Finally, *pro-environmental subsidies* are payments made to create incentives for individuals and other economic agents to make more efficient and socially-beneficial use of water. These subsidies compensate agents for the creation of (unpriced) environmental *goods*.

Based on the aforementioned principles, the following menu of economic instruments will be used in Table 3.1 (OECD EAP Task Force, 2016).

Table 3.1. **Classification of economic instruments for water management**

Justification	Selected economic instruments
User Pays	<ul style="list-style-type: none"> • Tariffs for water supply, sanitation and sewerage for households, businesses and public institutions; • Irrigation charges; • Abstraction charge as part of licensing regime for surface- and ground-water; • Charges to hydropower companies, thermal power stations and industrial operations for non-consumptive use of water
Polluter Pays	<ul style="list-style-type: none"> • Pollution charge as part of licensing regime for discharge of specified polluting substances; • Product Tax on specific agrochemicals; • Tradeable Pollution Permits; • Larger fines and more stringent enforcement of environmental laws and regulations
Beneficiary Pays	<ul style="list-style-type: none"> • Entry Charges in national parks and protected areas • Tourism Tax on establishments in Protected Areas; • Payments for Ecosystem Services; • Transboundary Cost- and Benefit-Sharing projects
Pro-environmental Incentives	<ul style="list-style-type: none"> • Environmental Funds; • Tax relief on pro-environmental products and investments

Source: OECD EAP Task Force, 2016, *Reforming economic instruments for water management in EECCA countries: Policy Perspectives*, https://issuu.com/oecd.publishing/docs/policy_perspective_economic_instrum.

3.5. Fees for abstractive and non-consumptive use of water resources

Charges for abstractive and non-consumptive use of water resources were introduced in Georgia in 1994. In 1997, charges for the use of natural resources, including water, were established by the Georgian Tax Code. Later, in 2004, natural resource use charges were dropped from the newly adopted Tax Code and replaced by fees for the use of natural resources governed by the Law on Fees for Use of Natural Resources (2004).

Fee rates for the abstraction of surface water resources vary depending on the river basin where the source is located and water use category (see Table 3.2). Three different “base fee” rates have been established for water bodies in the Caspian Sea basin, Black Sea basin, and for Black Sea water. For instance, the fee rate for water abstraction from rivers, lakes and reservoirs in the Caspian Sea Basin (east Georgia) is GEL 0.01 per m³ (EUR 0.40 cents/m³). Water abstraction for thermal power stations and irrigation systems is charged at 1% of the “base fee”. For hydropower stations the effective fee rate is only 0.01% of the “base fee”. The abstraction of surface water for municipal and rural water supply is charged at GEL 0.0001 per m³ (EUR 0.0045 cent/m³).

Table 3.2. Fee rates for use of water resources

Water bodies and their use categories	Fee rates	
	GEL/m ³	EUR/m ³
1. Surface water bodies		
	Base fees	
Group I. Caspian Sea basin rivers lakes and other reservoirs	0.010	0.004
Group II. Black Sea basin rivers lakes and other reservoirs	0.005	0.002
Group III. Black Sea water	0.003	0.0012
Use categories		
Surface water abstraction for municipal and rural water supply	0.0001	0.00004
Water abstraction for thermal power production	1% of the base fee	
Water abstraction for hydropower	0.01 % of the base fee	
Water abstraction for irrigation	1% of the base fee	
2. Groundwater		
Freshwater for bottling	4	1.59
Freshwater for other commercial/industrial uses	0.005	0.0020
Freshwater for municipal and rural drinking water supply	0.0001	0.00004

Note: Exchange rate EUR 1 = GEL 2.52 average monthly exchange rate for May 2016.

Source: Ministry of Environment and Natural Resources Protection of Georgia (2004), Law on Fees for Use of Natural Resources, <https://www.matsne.gov.ge/ka/document/download/28948/24/en/pdf>.

In practice, *surface* water abstraction fees have not been operative for the last decade due to an unresolved conflict between the Law on Fees for Use of Natural Resources, which stipulates the need for a licence for use of water resources, and the Law on Licences and Permits (2005), which does not require any type of licence for surface water resources since the amendments made in 2007. The Third Environmental Performance Review for Georgia reports that the Government has been turning a blind eye to this issue of free surface water abstraction, possibly related to fears that water abstraction charges for HPPs could lead to higher electricity prices (UNECE, 2016).

In contrast, fees for abstraction of fresh *groundwater* have been in effect in Georgia since the abstraction of groundwater is subject to licensing. However the fee rates are very low: Abstraction of groundwater for municipal and rural water supply is charged at GEL 0.0001 per m³ (EUR 0.0045 per m³). The fee for groundwater abstraction for bottling is GEL 4 per m³ (EUR 1.6 per m³) and for other commercial/industrial activities the fee rate is GEL 0.005 (EUR 0.0022) per cubic metre.

The fiscal yield of groundwater abstraction fees has recently been as follows: in 2012 – GEL 687 000; in 2013 – GEL 497 000; in 2014 – GEL 730 000. According to the Budget Code of Georgia (18 December 2009), fees for groundwater use accrue to the budgets of municipalities where the natural resources exploited are located.

3.6. User charges for water supply and sanitation

Before 2007, municipal authorities in Georgia were responsible for providing water supply and sanitation (WSS) services in urban settlements. They owned the water utilities and also set tariffs for WSS services. It has been customary for local governments to set “socially acceptable” tariffs without due regard to the financial implications for the water utilities.

Very low water tariffs, combined with low collection rates, meant that water utilities’ revenues have been largely insufficient to cover their operational and maintenance costs. According to OECD calculations, even in the case of 100% bill collection, revenues would have generally been insufficient to ensure full cost recovery given the low level of household water tariffs. In Tbilisi, for example, the household water tariff covered only some 30% of the operating and capital costs of the water supply system up to 2007. Given the lack of sufficient offsetting subsidies from local governments, there was a progressive deterioration of water infrastructure.

To remedy this situation, the Georgian government undertook major reforms in the period 2007-10.

Tbilisi’s water utility, together with those in neighbouring Rustavi and Mtskheta, were privatised in 2007.³ The resulting Georgian Water and Power (GWP) Company now provides water and sanitation services to Tbilisi and its neighbourhoods (more than one-third of the Georgian population).

In 2007 the Georgian National Energy Regulatory Commission (GNERC) was charged with the task of regulating water supply and sanitation tariffs throughout the country and ensuring effective tariff reform in this sector.⁴ In effect, tariff setting for water supply and sanitation services was moved from the local self-government level to GNERC.

In 2010, the Georgian government founded the United Water Company of Georgia (UWCG) which became responsible of providing water supply and sanitation services in other settlements, excluding the Tbilisi metropolis and the Autonomous Republic of Adjara. In Ajara water supply and sanitation services are provided by the Batumi Water Company (BWC) and a few other municipal water utilities.

GNERC adopted a tariff methodology in August, 2008⁵ which states that tariffs must be based on the full cost recovery principle and should include costs of operation, maintenance, rehabilitation and development plus a normal rate of profit. Moreover, tariffs should also include the costs of wastewater collection and treatment, and other costs of environmental protection. Tariff setting is subject to the provision that the national socio-economic situation and customers’ ability to pay should be taken into account.

In practice, tariff-setting has been strongly influenced by social policy considerations. In 2010, responding to these concerns, GNERC established maximum levels of water supply and sanitation tariffs applicable throughout the country.⁶ Water supply companies are expected to use the tariffs-setting methodology for calculating the charges for their services in each municipality. However, tariffs cannot be higher than the threshold levels established by GNERC. In fact, tariffs in most of the urban settlements served by GWP and UWCG are set now to maximum levels established by GNERC. Table 3.3 shows tariff rates currently applied in most of the urban areas in Georgia.

Table 3.3. **Tariff rates for WSS services in Georgian urban settlements 2016**

Company/Customer group	Unit	Drinking water	Sewerage	Total, GEL	Total, EUR
UWSCG					
Residential (volumetric)	GEL/m ³	0.419	0.08	0.499	0.20
Residential (no meter)	person/month	varies by settlement in the range 0.3-2.51 GEL/person/month		0.12-1.0	
Non-residential	GEL/m ³	3.375	0.932	4.307	1.71
GWP					
Residential(volumetric)	GEL/m ³	0.215	0.051	0.266	0.11
Residential (no meter)	Person/month	2.543	0.604	3.147	1.25
Non-residential	GEL/m ³	3.555	0.845	4.4	1.75
Batumi Water Company					
Residential (volumetric)	GEL/m ³			0.51	0.20
Residential (no meter)	person/month			1.85	0.73
Governmental organisations	GEL/m ³			3.5	1.39
Commercial organisations	GEL/m ³			4.0	1.59

Note: Exchange rate: EUR 1 = GEL 2.52 (average monthly rate for May 2016).

Sources: Georgian Water and Power (www.gwp.ge/en/prices).

The current tariff structure distinguishes two main consumer categories: residential consumers (private households) and non-residential consumers (industry, commerce and public institutions). Households with meters pay a volumetric charge per m³, while those that do not have meters installed pay a flat fee per family member per month. All non-residential consumers are equipped with water meters and pay volumetric charges. Until September 2010, installation of water meters was voluntary for the population. The right of water companies to install meters for residential consumers was only established by 2010 GNERC Resolution No. 18. Water metering has greatly expanded in recent years, though its impact on consumption is debateable.

3.7. Water metering and tariffs in Georgia

The percentage of households that are equipped with meters is still relatively low, though it has been increasing in recent years, reflecting the nationwide programme to install meters started in 2011. Among households serviced by the UWSCG, there are currently some 50% with individual meters, compared with only 6.5% in 2010. In Tbilisi, which is serviced by GWP, only some 20% of households (mainly in private housing) are currently equipped with meters.

The tariff structure provides large cross-subsidies from non-residential to residential consumers. Tariffs for water supply and sanitation for non-residential customers are more than eight times the tariff for households in the case of the UWSCG, and 16 times in the case of GWP. Tariffs for sewerage services in Georgia are much lower than drinking water tariffs for all customers, reflecting the low standards of sewerage services, where they exist at all.

Households that pay a flat fee for water consumption have no incentives for water savings. Given that there are no meters, there are no reliable estimates of their water consumption. In Tbilisi, the monthly charge for metered households (GEL 0.225 per m³) would be equal to the monthly bill of an unmetered household (GEL 2.67 per person), if the metered household

consumes some 12 m³ per person/month or some 400 lcd. In principle, therefore, households should have an incentive to have meters installed if they consume less than 400 lcd.

Average tariffs for unmetered water consumption in the UWSCG service area suggested that this threshold is much lower, at some 80 lcd, i.e. incentives for having a meter installed are much reduced compared with the Tbilisi area. For comparison, average water consumption is within a range of 150-200 lcd in many European countries.

The current tariff methodology has a number of weaknesses as regards the calculation of allowable costs, which means that tariffs are not cost reflective. Depreciation allowances are based on historic cost (as opposed to current replacement costs), which implies that there are insufficient financial provisions for the effective maintenance of the capital stock. In addition, the assigned rate of return on capital is insufficient to ensure the long-term financial sustainability of the water companies. GNERC has started work on a reform of the water tariff methodology with the aim of ensuring a tariff structure and level that progressively eliminate cross-subsidies and also ensure full cost recovery. But this requires determining the standards and level of services to be provided by the water companies.

Current revenues from user charges of the UWSCG amount to some GEL 33 million, which is insufficient to cover operating costs of GEL 45 million. This financial gap is being bridged by transfers from the state budget. There is scope for reducing operating costs by improving the current low level of energy efficiency and raising the rate of bill collection. There is also scope for reducing levels of non-revenue water, currently amounting to 30% of water production. This reflects a combination of low bill collection rates, mainly from households, and technical losses due to leakages in the water transport system. The low rate of household bill collection is due to a combination of low service quality, which affects households' willingness to pay, and weak enforcement of payment. Investments in infrastructure have been mainly financed with funds provided by foreign development agencies, supplemented by funds from state budgets.

Affordability is a constraint on raising tariffs, due to low family incomes and widespread poverty. However, the average share of WSS in total household expenditure was only 0.4% in 2013, masking a share of 0.7% in urban areas and 0.1% in rural areas. A recommended affordability threshold for water supply and sanitation in Georgia is 2.5% of household expenditure. While public subsidies designed to ensure affordability for vulnerable groups of persons are justified, the current tariff system also provides an indiscriminate subsidy to higher income groups, and fails to provide incentives for the rational use of water resources (UNECE, 2016).

3.8. Irrigation water supply tariffs

Since the break-up of the Soviet Union irrigation and drainage systems in Georgia have been badly managed. Institutions responsible for the maintenance and operation of irrigation canals have been grossly underfunded, fee rates for irrigation water supply set at minimal levels and rates of collection have been very low. Institutional weaknesses, compounded by chronic mismanagement and under-investment have resulted in the major degradation of irrigation and drainage infrastructure.

The area of land provided with irrigation and drainage services has greatly declined in recent decades. In 1988 the irrigated area was 386 000 ha, of which 95 000 was pumped. By 2005 this had fallen to 105 600 ha and declined further to its current estimated level of 25 000-45 000 ha. The drained area (mostly in west Georgia) declined from 114 000 ha in

1988 to its present level, estimated to be below 14 000 ha. Due to poor maintenance and increased energy prices the pumped irrigation infrastructure collapsed.

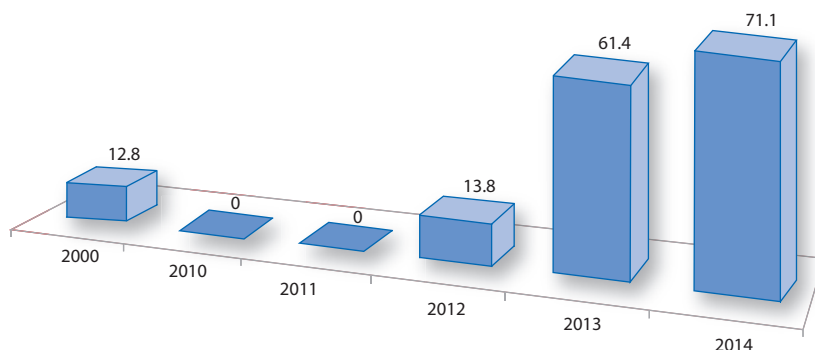
The first wave of reforms in the irrigation and drainage sector started in 2006 with the establishment of four state-owned limited liability companies: Mtkvai-M, Alazni-M, Sioni-M and Kolkheti-M. These companies became responsible for providing irrigation and drainage services as well as collection of the service charges – set at GEL 75 per hectare per year in eastern Georgia, and GEL 45 per hectare per year for water and GEL 40 per hectare per year for drainage in western Georgia.

In 2010 attempts were made to privatise these companies, without success. In March 2012, the Government established the fully state-owned United Amelioration Systems Company of Georgia (UASCG) under the Ministry of Agriculture, which took over the four irrigation companies established in 2007. UASCG was renamed as the Georgian Amelioration Company (GAC) in 2015.

Tertiary canals and some secondary (on-farm) canals were owned and managed by Amelioration Service Cooperatives in the early 2000s, but these were soon turned into Ameliorative Associations (AAs) – effectively water user associations – to own and manage on-farm systems across 237 000 ha. However, following the withdrawal of government support and funding after 2006 the majority of the 259 AAs collapsed and they were formally dissolved in 2010. Formal ownership of on-farm systems now rests with the Ministry of Economy.

In parallel with the institutional changes the Georgian government commenced vigorous rehabilitation works in 2012. This was reflected in a sharp increase in irrigation water supply to 341 million m³ in 2012, up from 122 million m³ in 2011 (UNECE, 2016). The government increased financing of the sector from zero in 2011 to GEL 71.1 million in 2014 (see Figure 3.1). The total amount of governmental investments over the period 2009-14 amounted to GEL 146.3 mln.

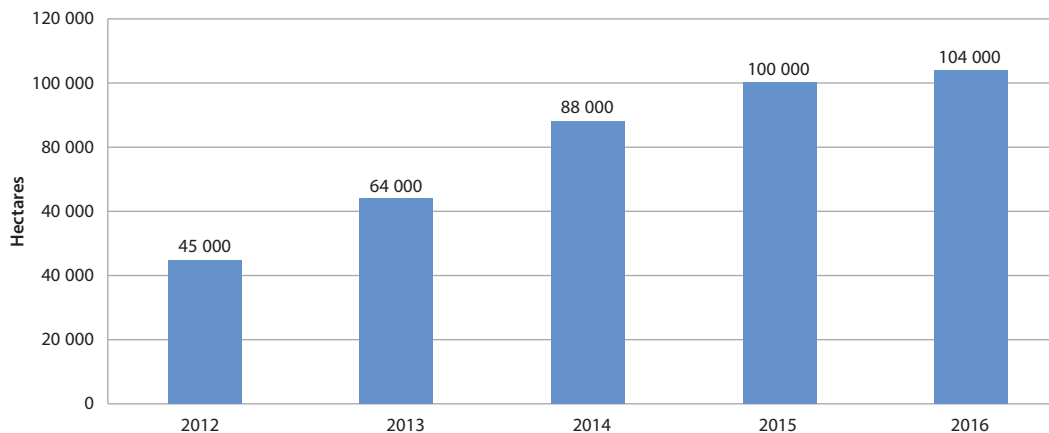
Figure 3.1. Governmental financing of the irrigation sector in 2009-14 (GEL, mln)



Source: Georgian Amelioration Company (<http://ag.ge>), accessed in May 2016.

The Georgian Amelioration Company reports that all main irrigation channels in the country have been rehabilitated at present. Since 2012 the area of irrigated lands has increased to 104 000 ha (see Figure 3.2). The longer term strategic objective of the company is to increase the irrigated land area to 278 000 ha. Irrigated agriculture is expected to become a major source of employment in rural areas, with the sector aiming at eventual viability and sustainability.⁷

Figure 3.2. Increase of the irrigated land area in the period 2012-16



Source: Georgian Amelioration Company (<http://ag.ge>), accessed in May 2016.

Investments in the irrigation sector are being supported by international donors in the framework of the Irrigation and Land Market Development Project (backed by international donors, the International Fund for Agricultural Development (IFAD), the World Bank and United States Agency for International Development (USAID), the Agricultural Support Project (backed by, notably, IFAD, the World Bank and USAID) and the Orio project organised by the Netherlands (UNECE, 2016).

Despite these institutional changes and increased financing of the sector, irrigation water tariffs have not been changed since 2007. The current tariff of GEL 75 per hectare per year is not cost-recovering. The tariff rate does not reflect the types of crops irrigated nor the number of times water is supplied during a year. Furthermore, not all farmers pay this tariff for the services provided.

Revenues collected from fees have so far been insufficient to cover GAC's operational costs. In 2013, the Government provided some GEL 8 million (some EUR 3.5 million) to the company to compensate for the shortfall of revenues from non-payment of water bills (UNECE, 2016). Farmers' use of irrigation water is unmetered and they have no incentive to use water more efficiently or to avoid waste. This creates a tendency for the overuse of water and the diversion of water to adjacent land plots that are not registered in the system.

The absence of an official tariff setting methodology based on economic cost parameters is a major shortfall in the current irrigation management model. This problem is recognised by the Government, in 2014 the Georgian State Audit Service reported that the established tariff is not cost reflective, and is fixed in consideration of the low income of irrigated farmers and their need for social protection (State Audit Service, 2014). Some of the messages and conclusions of the report are as follows:

- Currently the state provides financing to cover both capital expenditures and operation and maintenance costs of the irrigation system.
- In 2013, income generated by the United Amelioration Systems Company of Georgia (UASCG) through irrigation tariff collection amounted to about GEL 1.6 mln covering only 22.4% of the actual O&M (Operation and Maintenance) costs incurred by the organisation; the collection rate was 63% in 2013.
- The government should continue subsidising O&M in the medium term.

- UASCG estimates that annual O&M costs for gravity irrigation systems vary in the range GEL 200-250 with substantial increases for pumped irrigation systems.
- Actual spending on O&M costs are currently (2013) GEL 166 per ha, which are lower than the levels needed for sustaining the irrigation system after it is fully rehabilitated.
- The current irrigation tariff is not related to the amount of water supplied and provides no incentive to farmers to use water resources more efficiently, nor apply water-saving technologies.

To address these problems the State Audit Service has recommended that the Government

Table 3.4. **Operation and maintenance cost of UASCG and its income in 2013**

Land area provided with irrigation services (ha)	Income to be generated through tariffs	Collected income (GEL)	Collection rate	Operation and maintenance costs* (GEL)	Expected Income vs costs	Actual income vs O&M costs
34 495	2 587 149	1 634 665	63%	7 286 057	35.5%	22.4%

*The O&M cost does not include costs of electricity used for operating the pumping stations amounting to GEL 3 mln in 2013.

Source: Georgian Amelioration Company (<http://ag.ge>), accessed in May 2016.

develops a new irrigation water supply tariff structure which will provide for efficient water use and promote the development of a modern irrigation system (State Audit Service, 2014).

3.9. Fines for non-compliance and the environmental liability payment system

According to Georgian legislation, fines for environmental offences are imposed to penalise and to deter the regulated community from future violations of legal standards. The Administrative Code (1984) includes a number of provisions (e.g. articles 48, 58, 58¹, 58², 60, 61, 61¹, 79¹, 79², 82²) related to the protection of water resources and sets fines for contraventions by individuals and legal persons. Fines related to the protection of freshwater resources vary in the range GEL 100-600. The rates for different offences are as follows:

- pollution of water objects and dumping of waste into water bodies (GEL 200-300)
- discharging industrial and household wastewater, as well as discharging of drainage water, into drinking water sources or their protection zones (GEL 400-600)
- water pollution with chemicals, oil, mineral and organic fertilizers and pesticides discharged from transport, pipes, boats etc. (GEL 300-600)
- discharging water pollutants in excess of the levels determined by the technical regulations (GEL 500)
- fresh water pollution exceeding the levels determined by the technical regulations (GEL 500)
- Pollution of the Black Sea exceeding the levels determined by the technical regulations (GEL 1 000).

The abovementioned fines for contravening regulations related to fresh water are unlikely to be large enough to persuade offenders to change their behaviour.

Fines for pollution of the Black Sea are much higher. For instance, the fine for pollution of the Black Sea from ships can be as high as GEL 65 000.

In addition to the fines for non-compliance there is a liability payment system in the form of environmental damage compensation. With respect to water resources protection, companies are liable to pay environmental damage compensation for wastewater discharges if the concentration of pollutants in discharged wastewater exceeds maximum allowed levels. The polluter, identified by the Department of Environmental Supervision (DES) of the MENRP, receives a demand to pay compensation. However, the environmental damage is estimated according to methodologies dating back to the Soviet era.⁸ The methodology defines a formula for estimating the amount of pollutants discharged and establishes cost per ton of pollution, applying to discharges of 42 pollutants as established in the ministerial order. This liability payment system also applies to pollution of the Black Sea, using a methodology similar to that applying to freshwater resources.

The scale of offences, and fines collected, under water-related environmental regulations, is set out in Table 3.5.

Table 3.5. **Offences arising from water-related legislation detected by DES**

	2014	2015
Number of offences of water related administrative legislation detected by DES	484	289
Imposed fines (GEL)	168 950	122 080
Imposed environmental damage compensation liability payments (GEL)	4 323 001	46 039

Note: As explained by the DES, the relatively higher amount of the imposed environmental damage compensation payments in 2014 is related to the inspections undertaken by this organisation in the major water polluting companies that year.

Source: Authors' findings.

Even though environmental inspectors of DES have the power to impose administrative sanctions in the form of non-compliance fines and damage compensation payments, the duty of sanctioning enterprises and physical persons (enforcement) has been totally transferred to the courts. Data on enforcement action are fragmented. There is no systematic analysis of compliance monitoring data (collected by the DES) and enforcement data (collected by the courts). This undermines the evidence base for analysing the effectiveness of the regulatory management cycle.

The design of the environmental liability regime is a source of continuous tension between the regulated community and regulators. Liability payments estimated by the DES are not commensurate with the actual environmental loss. In some cases they are far from what could be realistically paid by the companies and impose an economically unacceptable burden on them. The legislative definition of liability focuses on revenue rather than environmental behaviour. Compensation payments are not earmarked and remediation is most often not undertaken. As a result, the liability system undermines the authority of regulators, who attract the reputation of being revenue-seekers (UNECE, 2016).

To address such problems, at the request of the MENRP the development of the Law on Environmental Liability has started under the EU funded project “Support to the Approximation in Various Fields as Part of the Environmental Provisions of the EU-Georgia

Association Agreement” in 2016. The project is being implemented by the German company “Particip GmbH” and will include development of a methodology for assessment of environmental damage and a proposed concept for effective remedial and compensatory measures related to environmental liability. The project is planned to be completed in January 2017.

Notes

1. The full economic cost of water in each use comprises the resource cost of raw water (the opportunity cost to other users), plus the cost of providing water services, plus the “external” cost caused by water usage in the form of damage to the natural environment, including over abstraction and pollution.
2. The report contains a comparison of economic instruments for water management currently used in Armenia, Azerbaijan and Georgia. Pollution charges are used in the first two countries, but not in Georgia.
3. Mtskheta is located about 20 km north-east of Tbilisi, with a population of about 19 500. The municipality comprises part of the water sector infrastructure of the Tbilisi water supply system (Aragvi River gorge). Rustavi (population approximately 115 000) is located about 35 km south-east of Tbilisi.
4. The agency is now officially known as the Georgian National Energy and Water Supply Regulatory Commission. However, official abbreviation GNERC still remains.
5. GNERC Resolution No. 18 on the Approval of the Methodology for Setting Water Use Tariffs. 19 August, 2008.
6. GNREC Resolution #17 on Water Supply Tariffs, 17 August 2010.
7. Georgian Amelioration Company, <http://ag.ge/>, accessed in May 2016.
8. Established in the Order of the Minister of Environment and Natural Resources on Establishing the Methodology for Environmental Damage Estimation (order # 538, 5 July 2006).

References

- ACTeon (2010), *Economic Instruments for mobilising financial resources for supporting IWRM*, <https://www.oecd.org/env/resources/46228724.pdf>.
- Entec (2010), *Managing Scarce Water Resources – Implementing the Pricing Policies of the Water Framework Directive*, http://ec.europa.eu/environment/water/water-framework/economics/pdf/pricing_policies.pdf.
- Ministry of Environment and Natural Resources Protection of Georgia (2004), Law on Fees for Use of Natural Resources, <https://www.matsne.gov.ge/ka/document/download/28948/24/en/pdf>.

- OECD (2016), *Water, growth and finance: Policy Perspectives*, <https://www.oecd.org/environment/resources/Water-Growth-and-Finance-policy-perspectives.pdf>.
- OECD (2012), *A Framework for Financing Water Resources Management*, OECD Studies on Water, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264179820-en>.
- OECD EAP Task Force (2016), *Reforming economic instruments for water management in EECCA countries: Policy Perspectives*, https://issuu.com/oecd.publishing/docs/policy_perspective_economic_instrum.
- OECD EAP Task Force (2012a), *Strengthening the Economic and Financial Dimension of Integrated Resources Management in Armenia, Azerbaijan and Georgia*, [www.oecd.org/env/outreach/EAP\(2012\)10_Report%20on%20Kura%20basin_ENG.pdf](http://www.oecd.org/env/outreach/EAP(2012)10_Report%20on%20Kura%20basin_ENG.pdf).
- OECD EAP Task Force (2012b), *Improving the Use of Economic instruments for Water Resource Management in Kyrgyzstan: the Case of Lake Issyk-Kul Basin*, https://www.oecd.org/env/outreach/2013_Kyrgyz%20report%20on%20Eis%20for%20WRM%20Eng%20Web.pdf.
- Pegram G. and B. Schreiner (2009), *Financing water resource management: the South African experience*, Pegasus.
- UNECE (2016), *Third Environmental Performance Review of Georgia*, United Nations Economic Commission for Europe, <https://www.unece.org/environmental-policy/environmental-performance-reviews/enveprpublications/environmental-performance-reviews/2016/3rd-environmental-performance-review-of-georgia/docs.html>.
- Verbruggen, A. (1998), “Economic Instruments for Environmental Management”, in B. Nath (ed.), *Environmental Management in Practice*, Routledge, London and New York.
- Winpenny, J. (1998), “Application of economic instruments for environmental management”, in B. Nath (ed.), *Environmental Management in Practice*, Routledge, London and New York.
- WS Atkins International (2012), *Evaluation of subsidies impacting the water sector in the Kyrgyz Republic*.

Chapter 4

Options for economic instruments for water management in Georgia

This chapter analyses the options for reform of existing and introduction of new economic instruments for water management in Georgia. The analysis is organised according to whether the economic instruments are justified by the User Pays, Polluter Pays, Beneficiary Pays Principles, or as the creation of Pro-Environmental Incentives.

The chapter discusses transboundary water issues which have major impacts on the political and economic relations between Georgia and its neighbouring states, specifically Azerbaijan and Armenia. This is due to their upstream/downstream geographical status, and their sharing of river basins and water bodies with common problems. Using economic instruments for water management in a transboundary context has specific challenges, additional to those arising in the national realm.

4.1. “User pays” principle

This section discusses water supply and sanitation tariffs, irrigation charges, an abstraction charge for the use of raw water, and – as a variant of the latter – charges for the non-consumptive use of water.

4.1.1. *User charges for water and sanitation services*

Over the last decade Georgia has taken major steps to introduce policies and institutions aimed to improve cost recovery in urban water supply, sanitation and sewerage. The majority of municipalities are now served by one of two large utilities, one of which is in private ownership. A minority of towns in the Adjara Autonomous Region are served by other, smaller, utilities.

The tariff methodology adopted by the regulator GNERC requires “full cost recovery”, where costs are defined as the expenses of operation, maintenance, rehabilitation and development plus a normal rate of profit. These costs include both water supply and wastewater collection and treatment. Metering of households has made substantial progress.

Much, however, remains to be done, and reforms are incomplete. The main problems are the following:

- The overall level of tariffs is still too low for cost-recovery, necessitating continuing public subsidies to the utilities and starving them of financial resources to upgrade and develop their infrastructure.¹
- Water and sanitation bills represent, on average, only 0.4% of household spending, well short of the 2.5% which has been recommended as an appropriate threshold. This indicates scope for raising average tariffs, and providing support to the poorest and most vulnerable consumers, either through the national social security system or through an appropriate household tariff structure.
- To pay for the necessary expansion of wastewater treatment, still in its infancy in Georgia, an increased level of the wastewater component in tariffs is inevitable.
- The degree of cross-subsidy in the water tariff from non-residential to residential users seems excessive by international norms and could produce undesirable distortions.²
- The majority of the population are still unmetered and lack a clear incentive to use water efficiently.

4.1.2. *Irrigation water supply charges*

Irrigated agriculture in Georgia has had a chequered and turbulent history in recent decades, and reforms to irrigation charges need to be part of wider programmes for the development and reform of this sector. Such programmes are under way with support from the World Bank, IFAD, EU, Netherlands and USAID.

The share of agriculture in GDP fell from 25% in 1999 to 8% in 2012, against a background of the Russian ban on Georgian wine and mineral water, and the appreciation of the local exchange rate. In the 1990s public services and infrastructure crucial for agriculture, including irrigation, collapsed. Sectoral reforms initiated in 2006 proved to be ineffective.

The failure of the model consisting of 4 limited companies serving a large number of AAs can be ascribed to several factors. There was insufficient public investment in the improvement of infrastructure in order to restore good services. Water charges were raised *before* service delivery was improved – charges were raised by a factor of 12 at a time when the condition of infrastructure and water supply remained very poor. Also, the organisation of the client based collapsed with the demise of the AAs. The combined effect of these factors was that in 2008 only 16% of fees due were being collected from farmers.

As part of its Socioeconomic Development Strategy for 2020 the Government is committed to rebuild institutional support and financing for irrigation, with strong support from international donors and development finance institutions. In this context, improved cost recovery from farmers for their irrigation services is a realistic prospect in the medium and long term.

However, all international experience with irrigation tariff reform points to the essential link between farmers’ willingness (and ability) to pay for water, and the quality of service received. Until the latter shows tangible improvements, serious cost recovery is unlikely. In this context, the Georgian Amelioration Company reports that all major irrigation channels have been rehabilitated, and its longer term aim is to increase its irrigated area to 278 000 ha.

The main conclusions of the analysis in section are as follows:

- Irrigation tariffs have not changed since 2007. Their current level (GEL 75 per ha) do not recover the cost of supply. Moreover, the collection rate is low. In 2013 the Government provided a subsidy of GEL 8 million (EUR 3.5 million) to the Company to cover its operating costs.
- The supply of water to farmers is unmetered, and the tariff does not reflect the type of crop nor the number of times water is supplied throughout the year. This has led to the excessive use of water and the diversion of water to adjacent plots that are not registered in the system. Farmers have no incentive to introduce more water-efficient production methods.

There is no official tariff-setting methodology for irrigation that could form the basis of economic cost-recovery. To address these problems the State Audit Service in 2014 recommended that the Government develops a new irrigation water supply tariff structure which will provide for efficient water use and promote the development of a modern irrigation system.

4.1.3. Abstraction charge

Georgia has an official schedule of charges for the abstraction of water from both groundwater and surface water sources. However, since these only apply to “licensed” entities, and since surface water use does not require a licence, there is effectively no charge on the abstraction of surface water.

Compliance with the EU’s Water Framework Directive would require the use of abstraction charges for both groundwater and surface water. This would entail the introduction of a licensing regime for surface water abstraction – a measure recommended in the latest Environmental Performance Review of Georgia by the UNECE and included in the new (2014) draft Georgian legislation shortly to come before Parliament.

Water abstraction charges have several functions. They create an *incentive* for water abstractors to minimise their drawings of water, reduce its waste and loss in transit, and pass on

these charges to the final users who, in turn, have an incentive to economise on consumption. Abstraction charges signal the real resource cost³ of the water. Abstraction charges are also a source of financial cost recovery, enabling funds to be raised either for water resources management and other environmental improvements, or for general public expenditure.

Reforming the system for regulating water abstraction in Georgia would require making a number of choices, and taking complementary actions in a number of domains. Relevant international practice, and experience, of the use of abstraction charges is reviewed in Annex B. In the light of this, the following points, amongst others, would need to be considered:

Creation of licensing system for both surface and ground water abstraction

Operating an effective Abstraction Charge would require the introduction of a licensing regime for the abstraction of surface water to complement the existing one for groundwater. This has been envisaged in the draft Law of Georgia on Water Resources Management (2014). This would entail revision of the Law on Licence and Permits of 2005. Creating the necessary licensing regime would have implications for staffing and funding of the relevant section of the Ministry of Environment.

Development of capacity for administering a licensing and charging regime

Regular assessments would be required of the status of the different river catchments and other main hydrological regions of Georgia (including groundwater aquifers) to establish their hydrological status and potential for water abstraction. It is clear that Georgia's river and lake basins differ in their water problems and priorities, and the abstraction licences and charges would need to reflect these local factors. In this context, it is relevant to note that the 2014 draft Law on Water Resources Management now being considered by the Georgian Government includes a provision (Article 26) on assessment of the status of the different river basins and the development of river basin management plans. This will directly support the development of capacity for administering a licensing and charging regime.

Scope of regulatory regime – minimum levels of abstraction

Fixing a minimum level of abstraction, below which an Abstraction Licence would not be required. This is a matter for local judgement about water availability, the population of major abstractors, the administrative feasibility of dealing with many small applicants, etc. (For information, the threshold used in England and Wales is 20 m³/day). The threshold being proposed in the draft 2014 Water Resources Management Law in Georgia is 50 m³/day.

Criteria for issue of licences

These could include: hydrological and ecological status of region, impact on other abstractors, social and economic benefits expected, etc.

Sectors to be covered

These would normally include water for municipal and household use, agriculture, industry, hydropower, thermal power and industrial cooling, amongst other purposes. It would be desirable for licensing and charging to apply to all major actual and potential sectors abstracting water. The various kinds of consumptive and non-consumptive use could

be allowed for in the charge structure, based on local evidence and judgements. Withdrawals for hydropower are likely to increase in future along certain stretches of river, and it would be important to have a regulatory control over these, likewise for cooling water for thermal power and industry. Large scale irrigation and livestock farming should also be included since these are sizeable consumptive water users despite their losses and run-off.⁴ The special case of non-consumptive use charges for hydropower is dealt with below in more detail.

Criteria for setting the level of Abstraction Charge (AC)

The basic choice to be made is whether the charge should be set at a level that would have a real impact on water withdrawals, or whether its main purpose is to raise revenues to cover the cost of administering the licensing regime. Most countries incline towards having a cost-recovering approach. Few (Denmark being one) have used ACs purposefully to create incentives for efficient water use. In this context, the maximum incentive effect would come from using volumetric charging based on metered withdrawals. Using charges based on licensed amounts provides only a partial incentive. Countries that do aim to use ACs as incentives need to make provision for use of any “excess” proceeds from this charge, over and above what is needed for the costs of administering the licensing and charging regime.

Fixing the level of the AC

As noted above, this depends on how far the charge is used as an incentive, rather than to defray costs. The current nominal charge in Georgia for both surface water and groundwater abstraction for municipal and rural water supply is EUR 0.00004/m³, or effectively zero. This is a small fraction (by several orders of magnitude) of the lowest groundwater rate in Poland, and of the minimum standard rates in England and Wales, Netherlands and Denmark. For reference, the current nominal abstraction charge in Georgia of EUR 0.00004/m³, if added to the current tariff for metered household water and sewerage in Tbilisi (EUR 0.20/m³) would raise the final tariff by c. 0.02%. If, on the other hand, the level of the AC were fixed at Netherlands levels, this would entail more than doubling the household water tariff in Tbilisi.⁵

In Georgian circumstances, a pragmatic first step would be to conduct a study of the costs of water resources management, at present and in future. These would include costs that are not currently being funded, but which are entailed for the sustainable development and management of national water resources. The study should also include the extra costs implied by the adoption of new measures considered in this report as part of Georgia’s EU Accession process. If it were considered appropriate for the proposed Abstraction Charge to help fund these costs, then this would set a baseline for the level of the charge. If it were decided to use the AC actively to influence abstractors’ behaviour, a higher rate of charge should be fixed.

Box 4.1. Reform of abstraction charges in Armenia

Currently, abstraction charges are based on actual water use. Managing this system and monitoring water use is administratively burdensome and costly. It also distorts the allocation of water between users in water-stressed areas, because there is no penalty on users “hoarding” licences, which they may not fully use, and which block their use by other potential abstractors. It is argued that changing the basis of abstraction charges from actual use to permitted use would be easier and cheaper to administer and would allow abstraction to be based on need rather than historic entitlement.

Box 4.1. Reform of abstraction charges in Armenia *(continued)*

For a shift to the use of permitted quantities to have these benefits, the permits would need to be for relatively short duration, and the charges would need to be high enough to “bite”. Both factors would in theory make the allocation of abstraction licences a more realistic fit to likely demand. Otherwise, abstractors would have incentives to take out licences for long periods in excess of what they really needed, in order to cover themselves against all eventualities, and possibly to thwart rival users.

The use of permitted amounts as the basis for charging could bring undesirable effects of its own. Once a permit were awarded, and paid for, the holder would have an incentive to fully utilise it: there would be no penalty on increased usage, however wasteful, up to the permitted amounts. Compared with the current regime, the shift to permitted amounts as the basis for charging could result in increased abstraction in water-stressed districts.

Source: OECD EAP Task Force, 2016, *Reforming economic instruments for water management in EECCA countries: Policy Perspectives*, https://issuu.com/oecd.publishing/docs/policy_perspective_economic_instrum.

Enforcement

The current level of fines and penalties would need to be reviewed in the context of creating an effective abstraction licensing and charging regime. In 2014 there were 484 cases of freshwater offences, with an average fine per case of GEL 349 or EUR 145. In 2015 these figures were, respectively, 289 and GEL 422 or EUR 176. These levels of fine are unlikely to provide sufficient deterrent. Consideration would need to be given to strengthen enforcement, and to include financial penalties that reflect the cost to society of restoring any damage done to water resources or to other water users.

Application of the proceeds of fines, penalties and AC

This depends partly on the objectives of the AC. If its aim is solely to recover the cost of administering the abstraction licence fee, it would be appropriate for the proceeds to be returned to the administration budget of the Ministry of Environmental Protection. If the AC is allowed to generate a surplus, this could either be returned to the central Ministry of Finance, or earmarked for spending on water resources management or other environmental purposes. It could also be fed into an Environmental Fund. It is relevant to note that in Australia, the Capital Territory (where Canberra is located) adds a water abstraction charge to municipal water tariffs. The proceeds are paid by the water utility to the state government for general expenditure purposes, and identified separately in water bills.

4.1.4. Charges for the non-consumptive use of water

Although the charge for non-consumptive water withdrawal is a category of abstraction charge, in the current context it is sufficiently important to be considered as an instrument in its own right.

Under the current regime in Georgia, abstractors of water for hydropower generation, or for cooling purposes in thermal power generation and industrial processes, pay little or nothing for their use of the water. According to the current schedule of fees, the abstraction of water from Caspian Sea Basin rivers, lakes and other reservoirs for thermal power cooling

and irrigation pays only 1% of the base fee, namely EUR 0.00004/m³. Water abstracted for hydropower is even smaller, at 0.01% of the base fees, amounting to EUR 0.0000002/m³ and EUR 0.0000004/m³ in the Black Sea and Caspian Sea basins, respectively.

In reality, even water user activities classed as “non-consumptive” impose costs on other potential water users, which should be reflected in the abstraction charge they pay (OECD, 2012b). All hydropower schemes, for instance, disrupt river regimes, to different degrees and in different ways. Projects involving water storage interrupt the downstream flow, and the timing and location of releases may be inconvenient for other riparians. Annual evaporation from reservoirs typically amounts to several percentage points of the stored water volume, and larger rates in warm climates. Run-of-river hydropower schemes tend to be less disrupting, but even they can involve diversions which affect other water users (OECD EAP Task Force, 2012b). The same is true for withdrawals for cooling in thermal power and industrial plants, where volumes of water are typically very large, and with the added impact caused by the release of water at higher temperatures into recipient water bodies (World Bank, 2014).

Irrigation has a much bigger impact on other riparians through the high proportion of water lost to evapo-transpiration,⁶ and the release of effluent contaminated by agrochemicals and salt into public water bodies. There is no justification for the current practice in Georgia of treating the abstraction of irrigation water on the same footing as thermal power cooling for the purpose of levying abstraction charges. It may be significant that in the UK, which has a cooler summer than Georgia and therefore less evapotranspiration, the Abstraction Charge for certain types of agriculture (spray and trickle irrigation, and water for horticulture) incurs a higher charge than that for any other purposes, due to its high “loss factor” (Winpenny, 1998).

In conclusion, the Abstraction Charge, whether for ground- or surface-water, should more truly reflect the impact of the withdrawal of water for irrigation, hydropower and cooling for thermal power generation and industrial uses, on other water users (Pegram and Schreiner, 2009). The rates should bear some relation to typical consumptive losses, and should be at a level high enough to register with abstractors when they consider how much water to withdraw. This conclusion is timely given the active consideration being given to the development of a series of hydropower projects in Georgia.

“Water royalties” on non-consumptive water abstraction for hydropower

The use of water for the generation of energy through hydropower creates an *economic rent* for hydropower companies, analogous to the exploitation of oil and natural gas. Part of the economic benefit that arises can be tapped by society through an abstraction charge which in this case is akin to a royalty payment for the use of the water. In principle, the level of royalty charge could be varied according to the location, timing and seasonality of withdrawal, and whether the projects are of the stored or run-of-river variety, in order to reflect the *opportunity costs* of abstractions on other water users, including impacts on river basin ecology and hydrology (OECD, 1997).

A number of countries (Brazil, Cameroon, several in the EECCA⁷ region, and elsewhere, discussed in Annex B) levy a charge for water used for hydro-power production. Such charges are either based on the water that runs through the turbines or on the amount of electricity produced (SIWI, 2016).

4.2. “Polluter pays” principle

The measures discussed in this section are the pollution tax, a product tax levied on polluting agrochemicals, tradable pollution permits, the active use of fines and enforcement of environmental regulations.

4.2.1. *Pollution tax on discharges into public water bodies*

The Polluter Pays Principle is a basic tenet of EU environmental policy and enshrined in the EU’s Water Framework Directive. Many countries in the EU, OECD and elsewhere implement different versions of a water pollution tax (see Annex B for further description) (Entec, 2010). These taxes are partly intended to discourage pollution, and partly to raise revenues. In a number of countries the revenues raised by pollution taxes are directly *earmarked* for the finance of Environmental Funds, used to promote investment in water-efficient and pollution-reducing projects.

Georgia abolished its Pollution Tax in 2005. At present “There are no economic instruments applied for stimulating reduction of wastewater discharges from industrial, agricultural and municipal sectors”. This section explores the feasibility of re-introducing a Pollution Tax in Georgia, similar to those now used in Armenia, Azerbaijan and many other EU and OECD countries. The public acceptability of such a tax might be improved if its proceeds were earmarked for the funding of a new Environmental Fund, which is a fairly common practice in other countries (FitchRating, 2003; OECD/PHARE, 1998). However, in this report the two instruments, Pollution Tax and Environmental Funds, are treated separately.

Quite apart from the requirement of compliance with the EU Water Framework Directive, there is a strong economic case for the use of a Pollution Tax to discourage the contamination of public water bodies. If a tax can be levied proportional to the amount of pollution emitted, the polluter (business, utility, household) has an incentive to reduce that pollution. If the pollution tax is high enough, the polluter will cease polluting emissions completely (or, in the case of a company, cease trading). The response of the polluter to a pollution charge will depend on the cost, or inconvenience, of making the effort to reduce pollution. Where this is very high, the polluter may prefer to carry on polluting, and pay the tax. If, on the other hand, the tax is greater than the cost of pollution abatement, the polluter has an incentive to take abatement action (ACTeon, 2010).

The Netherlands has made active use of a Pollution Charge at a level having a serious influence on polluters’ behaviour. The Pollution Charge introduced in 1970 had, by 1990, led to a reduction of 50% in total organic emissions, and of 75% in industrial organic emissions (OECD, 2016).

Very high pollution charges will eventually shrink the revenues from this source as polluters take action to abate their emissions, or are driven out of business. Many countries rely on the revenues from pollution charges to fund environmental policy, regulation and enforcement. Hence in most cases the level of pollution taxes are fixed as a compromise between creating *some* incentives, and raising *sufficient* revenues.⁸

The following are some of the major choices involved in using pollution charges.⁹

- **Sources *and* sectors.** In principle the tax should cover all the major sources of water pollution in Georgia – municipal water and sewerage utilities, landfills and other sources of solid waste, mines, industrial processes, hotels, individual farmers and irrigation concerns, etc. In practice, some of these are difficult to monitor and enforce

– e.g. non-point source pollution from farming or other diffuse sources of pollution. Large identifiable polluters such as water utilities, large industrial companies and mines are obvious starting points. It may be more expedient to deal with agricultural pollution through taxes on specific products used as inputs (FAO, 2007).

- ***Pollutants and specific tax base.*** A number of OECD countries schedule a list of pollutants targeted, and charge per kg of pollutant. Armenia lists 19 water polluting substances, with a specific tax rate per kg for each. Others target a few major pollutants, such as the nitrate, phosphate or organic content of wastewater. (It is usual to ban outright the release of particularly noxious substances such as mercury).
- ***Use of the proceeds of the pollution tax.*** The two broad choices can be considered. First, to return the proceeds to the central tax authorities for use on general public expenditure. Second, to earmark the proceeds for specific purposes, such as local environmental programmes or provisioning an Environmental Fund. Many Ministries of Finance or central Treasuries oppose the earmarking of tax proceeds for specific purposes on the grounds that they complicate the task of national fiscal management. Others take a pragmatic view that the application of proceeds to popular local purposes can defuse opposition to the introduction of a new tax of this nature. The case for earmarking proceeds of the pollution tax to funding a new Environmental Fund in Georgia is made separately.

4.2.2. Product tax levied on agricultural chemicals and lubricants causing non-point source pollution

In many countries there is widespread pollution of surface and groundwater bodies from discharge of fertilizer, pesticide and other agrochemicals. However, such diffuse (“non-point source”) pollution is difficult to monitor and control directly, where it results from the activities of many farmers dispersed over a large area of the country (Nath, 1998).

In these circumstances one solution would be to levy a tax on the import, production or sale of the agrochemical products mainly responsible for this pollution. The assumption would be that the use of the product is a proxy of pollution caused by its uncontrolled discharge into water bodies. If the *price elasticity of demand*¹⁰ for the product is sufficient, a tax should induce less consumption and more careful use, leading to lower discharges of waste elements into the environment. Farmers would have an incentive to switch to alternative methods of fertilising crops and controlling pests, such as organic cultivation methods or Integrated Pest Control, entailing lower water pollution.¹¹ In circumstances where the prices of agrochemicals were subsidised, the removal of the subsidy would have an equivalent effect to an increase in tax on these products (OECD, 2012b).

While the above is a fair description of the situation in many countries, it is not obvious that this is a general and widespread problem in Georgia, and therefore the case for a product tax is weakened. According to the UNECE’s latest Environmental Review (2016) “The main problems related to agriculture are linked to the unsustainable use of water for irrigation, with losses exceeding 50%, and diffuse pollution caused by the drainage of the land. There are no contamination problems with phosphates and pesticides.” However, contamination from nitrogenous compounds is present in some cases.

On balance, and taking into account the political and administrative challenges of introducing a new tax, this measure is not taken forward for more detailed evaluation in Chapter 5., though it should be kept in consideration for when more urgent water management problems have been addressed.

4.2.3. *Creation of tradeable pollution permits*

An alternative to the use of pollution taxes is the creation of a “market” for pollution permits, which polluters can buy and sell amongst themselves. Its aim would be to concentrate the abatement of pollution amongst those parties (firms, utilities) that can do so at the least cost to themselves and society. This solution may be appropriate for a specific bounded water body such as a lake or reservoir, where there are a limited number of identified polluters (typically industrial companies, wastewater utilities or mines) whose discharges have a clearly identifiable impact on surface water quality.

In a pollution trading regime, environmental regulators set an upper limit on the total amount of acceptable pollution in the water from specific polluting substances, and regularly monitor the presence of these substances in the water. Polluting agents (firms, utilities, etc.) would receive licences to emit a stated amount of pollutant, which could be based on their current or historic levels. Polluters would be allowed to buy and sell these licences. The total volume of licences could be reduced over time with the aim of reducing overall pollution.

In theory, firms that could abate their water pollution easily and at lower cost would be able to sell part of their licence to other firms, for whom abatement would be more costly. The latter would save money by buying licences rather than undertaking abatement themselves. In time, the desired amount of pollution abatement would gravitate towards “efficient” polluters, at a lower cost to society compared to the situation where every firm was obliged to abate, whatever the cost. All firms would have an economic incentive to reduce pollution, but each would have a choice about how to do this, and over which time scale.

A limited number of water pollution markets have developed, in the USA, Canada, Australia and New Zealand (ADB, 2016). Such schemes have been slow to emerge elsewhere, and several have been problematic and little-used, for several reasons.

- There is a need for good and regularly updated information about the pollutant level in the water bodies concerned, and regular monitoring of the polluting behaviour of individual polluters in the trading scheme, and their compliance with licences held. This calls for regular and thorough monitoring and regulation.
- Changes in the ownership of licences may lead to unwelcome changes in the pattern of pollution – e.g. in the location and timing of polluting discharges into the water body, producing “hot spots”. In their attempt to control such eventualities the regulatory authorities risk adding to the bureaucratic complexity, and the costs of participation, in the schemes.
- Polluters may be reluctant to trade licences, especially where they are in competition with each other, trying to preserve a market share in the sector, or unwilling to share information with the regulator or other polluters. Some licence holders may wish to hold onto their licences to preserve a monopoly position against new competition. Some polluters, e.g. publicly owned utilities or state enterprises, are simply not motivated to achieve relatively minor cost savings by entry into such trading schemes.

The relatively little successful water pollution trading schemes have the following features:

- binding limits on pollution levels in the waters concerned
- sufficiently large differences in pollution control/abatement costs between the main polluters
- clear rules for trading that are not too complex, onerous or costly for participants
- a credible and trustworthy institution for organising the trades.

In conclusion, water pollution markets are most appropriate at a local scale, with well-defined hydrological boundaries. They are likely to be most successful in situations where there is already a well-developed system for water pollution control, and where the issue is to make this more cost effective for all parties involved (OECD EAP Task Force, 2012b). These conditions are not currently present in Georgia, and it would seem premature to consider market mechanisms in advance of the creation of the more basic institutions and instruments necessary for pollution control.

Due to the abovementioned factors, this measure is not taken forward for more detailed evaluation in Chapter 5.

4.2.4. Larger fines and more stringent enforcement

As described in Chapter 4, the current regime of fines for non-compliance with national legislation to protect water resources has very little effect on the behaviour of polluters. There needs to be a two-fold approach to compliance – raising fines to levels where they “bite”, and enforcing compliance more rigorously.

The level of fines and the degree of enforcement are complementary. Raising fines alone will have little effect if polluters know there is a very small chance of their being caught and fined. Likewise, improved efforts at enforcement will have little impact if the penalties (fines) are insignificant. Potential polluters are very likely to take a “probabilistic” approach to fines – judging the likelihood of being caught against the size of the likely fine to arrive at an “expected value” of the fine, which is likely to be very much lower than even the low nominal rate of such penalties (Verbruggen, 1998). On this scenario, the potential fine can be regarded as a cost of doing business, i.e. as an economic instrument, rather than a penal measure.

It is important for all major polluters to be included in the scope of the pollution penal system, whether private or public. Much of the worst water pollution in Georgia is caused by publicly-owned water and wastewater utilities, and it is essential for the credibility of legislation that it is applied even-handedly to public as well as private offenders.

In principle, fines should not only reflect a penalty for non-compliance but also the cost of environmental restoration (e.g. clean-up costs) where these are greater than the fine itself. As described in Chapter 3., there is already a system of liability payments in the form of environmental damage compensation. This needs to be toughened and anomalies removed. At the present time, much of the cost of environmental restitution following pollution falls on the Georgian state, where this exceeds the proceeds of fines on the polluting agent. With the strengthening of environmental liability, more of these costs would transfer to the polluter. The latter could seek insurance against these costs. In a well-functioning market, the premiums charged the insured party would reflect the scale and probability of its pollution risk (see Box 4.2).

Box 4.2. Environmental liability payments and insurance schemes in Central Asia

All Central Asian countries have established systems of environmental liability or damage compensation payments which are complementary, or work in parallel, to the system of pollution charges and natural resource payments. Polluters and users of water resources can become liable for damages to the environment from accidental discharges or non-compliance with licence and permit requirements. Elaborate rules exist for determining the size of damage compensation payments. Tajikistan uses a complex Soviet-era methodology for assessing environmental damage and levying liability payments for the violation of water legislation.

Box 4.2. Environmental liability payments and insurance schemes in Central Asia (continued)

Theoretically, liability for environmental damage or clean-up costs may lead to the creation of a market for environmental insurance. In a well-functioning market, insurance premiums would be expected to reflect the probable damage or clean-up costs and the likelihood that the damage will occur. This would create pro-environmental incentives for polluters, who would enjoy lower premiums for industrial processes with a lower risk of pollution or accident. However, it is probably unrealistic to expect such an insurance market to develop in the short or medium term in countries such as Tajikistan and Kyrgyzstan where the evolution of a well-functioning market economy with efficient financial markets is a matter for the longer term.

In Kazakhstan, a civil liability insurance system has been established for the imposition of damages arising from accidental environmental contamination. This is a compulsory environmental insurance scheme for companies performing “ecologically dangerous” types of economic activities. It applies to types of environmentally risky activities determined by national environmental legislation. The insurance system is regulated by the Law of the Republic of Kazakhstan on “Compulsory Ecology Insurance” adopted in 2005. Insurance payments are required from legal or natural persons, to reimburse for damage inflicted to life, health, property of third parties and/or the environment resulting from accidental pollution. Nine insurance companies were involved in environmental insurance activities by 2009 and the insurance market is in the process of development.

Source: OECD EAP Task Force (2012b), *Improving the use of economic instruments for water resource management in Kyrgyzstan: the case of Lake Issyk-Kul Basin*, <https://www.oecd.org/env/outreach/2013/Kyrgyz%20report%20on%20Eis%20for%20WRM%20Eng%20Web.pdf>.

4.3. “Beneficiary pays” principle

The measures considered in this section are a surcharge tax on bills of hotels and tourism establishments, schemes of Payments for Ecosystem Services, and cost- and benefit-sharing in transboundary projects.

4.3.1. Surcharge tax on hotel bills, tourism facilities and charges for entry into national parks

Much of Georgia’s tourism and hospitality business depends on the country’s magnificent natural environment. A number of these facilities feature the use of spa water and mineral springs. It is reasonable for the cost of maintaining and enhancing this environment, including catchment protection and other aspects of water resources management, should be shared with businesses directly benefiting from these activities, and passed on to consumers of their services. Proceeds of this surcharge could accrue to national or local programmes for environmental protection and water resource management.

Any new tax, or amendment to an existing one, would be subject to the Georgian Constitution and National Tax Code, and require parliamentary approval, which would be an obstacle. This might be avoided by using instead a levy charged on entry to national parks and nature reserves, the proceeds of which would accrue to the specific parks and reserves in question. The largest of these are Borjomi-Kharagauli, Mtirala, Algeti, Kolkheti, Kazbegi, Tbilisi, Tusheti, Machakhela, Lagodekhi and Vashlovani. Some of these have visitor centres, guest houses and official rangers and guides, whereas in others arrangements are

more informal. A number require active management to control deforestation, soil erosion and other forms of land degradation.

The option taken forward for evaluation in Chapter 5. is raising charges for entry into National Parks and Protected Areas, with concessional rates for deserving groups and a differential rate for nationals and foreign visitors. Proceeds from these charges would be returned to the organisation responsible for operating and maintaining the facility.

4.3.2. Payments for Ecosystem Services (PES)

In many countries the prime aim of PES schemes is the preservation of ecosystems and biodiversity. This report focuses on the related issue of how PES can contribute to the strengthening and financing of water resource management.

PES schemes involve payments to the managers of land or other natural resources in exchange for the provision of specified ecosystem services (or actions anticipated to deliver these services) over and above what would otherwise be provided in the absence of payment. Payments are made by the beneficiaries of the services in question, for example, individuals, communities, businesses or governments acting on behalf of various parties (Department for Environment Food & Rural Affairs, 2013).

In recognition of the importance of schemes specifically to preserve watersheds, a subset of PES has arisen – Payments for Watershed Services (PWS).¹²

Land degradation, soil erosion, loss of forest cover and non-point source pollution from crop and livestock farming in upland catchments are liable to cause flooding and siltation downstream, as well as the contamination of water sources. The aim of PES and PWS schemes is, amongst other things, to help preserve upland catchments by giving incentives for local land owners and land users to convert to more sustainable land use practices, paid for by the downstream water users that stand to gain from these changes. These downstream water users may include hydropower producers, industries, municipalities, tourism businesses, or others. In countries where the preservation of ecosystems and biodiversity is the prime motive for PES, “users” would also comprise public agencies, NGOs and international environmental networks (Forest Trends, 2008).

PES schemes are currently being piloted in Georgia, as well as Armenia and Azerbaijan, through the Regional Environment Centre (REC).¹³ These schemes involve the improvement of agricultural techniques, the introduction of agro-forestry and agro-biodiversity conservation, the collection and processing of medicinal plants, wild fruits and non-timber resources, the creation of sustainable hunting areas, and the establishment of aquaculture.

There is growing international experience with PES – in 2010 there were 300 or more schemes of this kind worldwide. Among the better known are those involving water utilities protecting the quality of water in their catchments (New York/Catskills, Wessex Water, England), water bottling businesses protecting groundwater aquifers (Vittel, France), hydropower companies conserving their watersheds to reduce erosion and siltation (Costa Rica) and municipalities seeking to reduce the risk of flash flooding through land management and woodland creation in their vicinities (Pickering, England).

PES principles lie behind the growing number of Water Funds set up in Latin America to finance watershed conservation and other aspects of WRM. These schemes may be on a voluntary basis or they may have statutory basis, but all involve payments by water users which are channelled to farmers and other landowners and users in compensation for the latter’s conservation work of various kinds.

There are various “How To” guidebooks on the creation and operation of PES. Some key principles for the successful launch of PES/PWS schemes are:

- Voluntary: parties should enter the PES on a voluntary basis.
- Beneficiary pays: these could include individuals, communities, businesses or governments. These are the “buyers” of ecosystem/watershed services.
- Credibility: buyers will need to have confidence that the actions they are paying for will actually happen, and that they are likely to produce the intended results. This may require the involvement of an independent monitor (e.g. a university or NGO).
- Direct payment: payments made directly to the providers of the ecosystem services (the “sellers”).
- Additionality: the actions that are the subject of the PES should be genuinely new, rather than existing or planned actions repackaged as new for the sake of the PES payments.
- Conditionality: payments should depend on agreed actions being performed by the “sellers”. It is more realistic to base the PES on the implementation of specific measures, rather than the achievement of environmental outcomes – which would normally take longer, and which are likely to depend on other, extraneous, factors.
- Sustainability: PES actions should be planned and implemented according to a sufficiently long time horizon, and not be easily reversible.
- Avoidance of “leakage”: actions agreed in a PES should not be at the expense of measures happening, or likely to happen, elsewhere (e.g. shifting tree planting to the PES zone rather than somewhere else previously planned).
- Acceptable transactions cost: creating a PES could be complicated and time-consuming. Success is more likely if the agreement is between a small number of parties, or if the stakeholders are represented by collective bodies (e.g. farmers’ associations).

In the Georgian context, the feasibility of PES/PWS schemes would be improved by choosing situations with a limited number of stakeholders, either on the “buying” or “selling” side, or both. As noted above, this might entail working through collective associations of the interested parties. In the first instance, a PES would have better prospects of success if it were voluntary, and tried initially on a pilot basis.

The following situations could be ripe for further study:

- Hydropower producers taking action to protect their watersheds in order to preserve inflows and to reduce siltation in reservoirs and damage to turbines.
- Similar actions by water utilities to protect both the quantity and quality of their raw water.
- Actions by major water-using businesses (e.g. water-bottling plants) to ensure continued access to water of the desired quantity and quality.
- In areas of touristic interest, action by hotels and other tourism establishments to protect and enhance their local landscapes.
- Environmental NGOs funding their operations through voluntary contributions from communities and businesses.

These and other ideas are further developed in Box 4.3.

Box 4.3. Payments for ecosystem services in Georgia

In the absence of a specific regulatory framework there is no mechanism in Georgia for mandatory involvement of beneficiaries of ecosystem services in PES schemes. Therefore, engagement of ecosystem service users in PES schemes can be voluntary only depending solely on the environmental and social responsibility of the beneficiaries and their willingness to pay for improved management of Protected Areas (PAs) or improving the livelihoods of local people living in and around them.

In the Ajara PAs there is a potential to create PES schemes, on a voluntary base, private or municipal users (e.g. hydropower companies, water utilities) of watershed/hydrological services provided by the target PAs. For instance, Batumi Water Utility (BWU) uses water resources originating in Mtirala National Park to supply drinking water to its clients including about 124 000 residents of Batumi, commercial and other organisations. Theoretically, it may be possible to engage this organisation and the Batumi Municipality voluntarily in a PES scheme. In this scheme BWU would pay a part of its income to Mtirala National Park for improving the management of the protected areas, specifically for the management of watershed services. However, engagement of the BWU and Batumi Municipality in the PES scheme will depend on the financial health of the BWU and its attitude to corporate social responsibility.

Another target group for involvement in PES scheme is that of power companies with hydropower plants located downstream of rivers originating in the target PAs. Examples include the Kintrishi and Khelvachauri Hydro Power Plants (HPP), the construction of which is ongoing in the downstream reaches of the Kintrishi and Machakhela rivers. The functioning of these hydro power plants depends crucially on the hydrological services/water flows in the Kintrishi PAs and Machakhela National Park. Companies involved in the development of the HPPs may be willing to pay for improved management of the protected areas to ensure stable water flow for the hydro power plants.

Note: Options for Generating Sustainable Revenues for Target Protected Areas in Ajara. Prepared for the UNDP/GEF Project Expansion and Improved Management Effectiveness of the Ajara Region's Protected Areas.

Source: OECD EAP Task Force (2012a), *Strengthening the Economic and Financial Dimension of Integrated Resources Management in Armenia, Azerbaijan and Georgia*, [www.oecd.org/env/outreach/EAP\(2012\)10_Report%20on%20Kura%20basin_ENG.pdf](http://www.oecd.org/env/outreach/EAP(2012)10_Report%20on%20Kura%20basin_ENG.pdf).

4.3.3. Transboundary cost- and benefit-sharing projects

Transboundary water issues have major impacts on the political and economic relations between Georgia and its neighbouring states, specifically Azerbaijan and Armenia. This is due to their upstream/downstream geographical status, and their sharing of river basins and water bodies with common problems.

These transboundary water issues include:

1. Downstream water pollution from Georgian WWTPs sited close to the border. Specifically, untreated and partly-treated wastewater effluent from the Georgian Gardabani WWTP is a serious source of pollution in the Kura River downstream in Azerbaijan, which flows into Mingcevir Reservoir.
2. Non-point source pollution from farming and pollution from residential areas in Georgia contaminates Lake Jandari, a water body shared by the two countries and used for fishing and for the abstraction of irrigation water. According to an

agreement in 1993¹⁴ Georgia has to provide a minimum volume of water flowing into the Lake for irrigation in Azerbaijan and preservation of the ecological status of the lake.

3. The Kura River Basin on both sides of the border is subject to frequent flooding related to poor water management (catchment degradation, deforestation, soil erosion, waste dumping, sedimentation, etc.) both in Georgia and Azerbaijan.
4. Unregulated abstraction of water for irrigation has led to periodically low river and lake levels in both countries. Water levels in the shared Lake Jandari have recently been declining.

Using economic instruments for water management in a transboundary context has specific challenges, additional to those arising in the national realm. From Georgia's point of view as an upstream¹⁵ riparian, the following complications arise:

- Investments and/or policy measures may incur costs that exceed the expected benefits, where the latter accrue to the downstream country.
- The benefits of investments and policies, though real, may not arise in monetary form, hence financial recuperation is not possible (e.g. restoration of ecological status, recreational benefits).
- Benefits may be joint, but may disproportionately favour one party (e.g. reduced flood risk throughout a river basin, lower river and lake pollution, restoration of lake levels).
- Joint benefits are likely to require co-ordinated actions by both parties to be effective or to produce optimal results (e.g. action to reduce pollution).

Georgia and Azerbaijan have signed the “Agreement on Cooperation in the Protection of the Environment between the Government of the Republic of Azerbaijan and the Government of Georgia” in 1997, which includes some aspects of the use of water in the Kura River and Jandari Lake. Different policy solutions are appropriate to meet these challenges. The key factors in each case are:

- the size of the costs and benefits of action *versus* inaction, for each country
- benefits of joint or co-ordinated action, compared with independent actions
- the comparative costs of actions in the respective countries
- the existence of feasible methods of compensation, from the other country partner, or from international sources.

The key issue for Georgia is what instruments would make transboundary water management economically and financially viable, in view of the factors set out above. In case, Georgia would bear the direct cost of upgrading the WWTP in question, though the benefits of lower water pollution would accrue largely to Azerbaijan. This suggests there is scope for a deal between the two countries, which could involve political, economic or financial concessions from Azerbaijan to Georgia. The transaction could be facilitated by external donors (e.g. EU grants or a concessional loan from an IFI for the WWTP upgrade).

In cases the costs of inaction currently fall on both countries, both of which would stand to benefit from the active use of economic instruments in Georgia to curb pollution (e.g. pollution tax, product tax on agricultural chemicals, fines, etc.) and to improve water resources management in order to limit over-abstraction and flooding. In the case of Lake

Jandari, a shared water body, both countries would need to take remedial action, which should be co-ordinated in order to have maximum effect.

The likelihood of joint benefits does not, of course, guarantee co-operation. It is practically inevitable that there would be some asymmetry in the balance of costs and benefits between the two countries, with one bearing a disproportionate share of costs relative to benefits. In the extreme case, one country could become a “free-rider”, and the other party would have to decide whether there would still be a case for acting alone. There is still some scope for deals between the two countries, not necessarily restricted to water but including all aspects of river basin management (including hydropower and forestry, for example).

In the scenario sketched above, the “deal” eventually struck would also need to take account of the comparative costs falling on the respective parties in implementing the actions. Such costs would include costs of mitigating pollution by industrial, mining and agricultural water users, the costs of introducing water-efficient processes in these sectors, and the affordability of tariffs and charges for all water users. The economically efficient solution would be for the country partner with the lower costs to bear the brunt of these measures, with financial compensation from the other party. A water or pollution market would achieve this result, but neither seems feasible in present circumstances. In practice the comparative costs and feasibility of actions would need to be taken into account as part of the bilateral deal between the countries concerned.

Recent analyses of transboundary water management in Georgia and Azerbaijan have focussed on flooding in the Kura Basin and reducing pollution in the Kura River downstream of the Gardabani WWTP (OECD EAP Task Force, 2012a). Specifically, the following options are proposed for further examination:

- joint funding of the Gardabani WWTP upgrade
- a form of PES in which the downstream riparian would compensate the upstream riparian for the costs of flood prevention and pollution control
- joint finance of a flood early-warning system for the Kura River Basin.

A precondition for any actions of this kind would be support for capacity building and data collection and analysis relating to the hydrology of the rivers and lakes concerned. In particular, the credibility of any new policy action will rest on the quality of relevant hydrological data, which is currently inadequate.

4.4. Pro-environmental incentives

The two measures discussed here are the creation of Environmental Funds and the award of tax concessions and subsidies for water saving and recycling technologies.

4.4.1. Environmental funds for subsidising water resource management and water-friendly investment

Globally there are many funds for the promotion and financing of environmental causes, including the protection and enhancement of vulnerable catchments, wetlands and other habitats. These funds show great variety in their size, ownership and purposes. Some are national and public, some are private and philanthropic, some are sponsored by international institutions, many are hybrids of all these.

The EAP Task Force of the OECD has promoted the use of environmental funds in transitional economies. A number of EU Member States have national public environmental funds (e.g. the Polish Ecofund, the Czech State Environmental Fund). Others benefit from access to funds sponsored by international networks and donor agencies (e.g. the Caucasus Protected Area Fund, supported by WWF and the German Government). A Sourcebook of 21 of these funds in Central and Eastern Europe and the New Independent States documents the experience and the pros and cons of this instrument.

Many Environmental Funds involve *earmarking* the proceeds of pollution taxes for programmes of environmental protection, restitution or beneficiation. Earmarking is not universally popular amongst fiscal policymakers. It complicates the task of allocating public expenditure, and can lead to institutional “lock-in” and the inefficient use of resources. In OECD Member States it is not seen as a “first best” policy.

Nevertheless, earmarking fiscal receipts for Environmental Funds is acceptable as a “second best” solution in economies in transition to market-oriented regimes with major environmental problems to address. Subsidies can be justified under the Polluter Pays Principle if they are well-targeted, limited in size and duration, and do not introduce significant distortions in markets, nor involve sizeable externalities. The St Petersburg Guidelines have been drawn up as a guide to good practice in this area (see Box 4.4) (OECD, 1999).

Box 4.4. Main conclusions of the St. Petersburg guidelines on Environmental Funds (EFs)

- To avoid or minimise the long-term economic inefficiencies inherent in earmarking of funds, expenditure should be targeted to environmental priorities and projects with large environmental benefits relative to their costs.
- EFs should play a catalytic role in financing environmental improvements and support, not compete with, emerging capital markets.
- EFs should reinforce other environmental policy instruments.
- EFs should develop an overall financing strategy, follow clear procedures for selecting projects in order to ensure cost-effective use of resources, adopt effective monitoring and evaluation practices, and make effective use of internal and external expertise to enhance administrative efficiency.
- EFs should leverage increased private sector resources and capital market financing for environmental investments.
- In designing and evaluating fund revenue mechanisms, environmental authorities should ensure environmental effectiveness, economic and administrative efficiency, equity and acceptability.
- EFs should ensure transparency and be accountable to government, parliaments, and the public for their actions.

Source: OECD (1999), *Sourcebook on environmental funds in economies in transition*, https://www.oecd.org/environment/outreach/Sourcebook%20on%20environmental%20funds%20in%20economies%20in%20transition_EN_complete.pdf.

Public EFs, as well as their private philanthropic counterparts, need to have a degree of operational and financial autonomy from their parent departments. Compared with reliance on public budgets, specialised funds have several advantages as tools of environmental policy:

- With a degree of independence from national budgetary processes, they can commit to multi-year planning and funding.
- They can blend funds from various sources (e.g. national budgets, earmarked tax revenues, international grants and soft loans, local philanthropy, sales of products and services).
- National public contributions can leverage sums from other sources, including international grants and loans (e.g. on a 50:50 basis).
- The fund can develop expertise and advocacy skills, useful in the promotion and funding of water resource management.

A number of funds rely on earmarking the proceeds of national environmental taxes. This can be helpful in gaining support for the use of abstraction, pollution and other taxes, since the use of the revenues for environmental purposes is transparent. However, this could make funding uncertain and unreliable, since tax proceeds will vary – hence the benefit of seeking a diversity of funding sources.

In summary, a good case can be made for using environmental funds to finance future water resource management in Georgia, supplementing existing sources of money for this purpose. These funds could be newly created, or involve public contributions to existing funds (e.g. the Caucasus Nature Fund), including those sponsored by international networks and donors. Consideration should be given to earmarking the proceeds of abstraction and pollution taxes and product taxes on polluting substances for use in environmental funds, though this issue is not inherent in creating EFs.

4.4.2. Tax concession on water-saving and recycling technologies

In theory, practices that promote good water management could be subsidised either directly through cash payments, or through the relief of indirect tax on the items concerned or concessions on direct taxation of income due to these practices. Examples would be companies' use of processes and technologies that recycle water or use it more efficiently, households that convert to water-efficient devices (toilets, washing machines, etc) or farmers introducing more water-efficient irrigation practices.

While the use of pro-environmental subsidies is sound in principle, and has been successfully used in some countries, there are difficulties in promoting this instrument in Georgia at present. One obvious objection would be its fiscal cost – unlike other instruments which would raise revenue, subsidies and tax concessions would have a negative impact on fiscal revenues. There would also be the risk of tax concessions being exploited as tax loopholes by businesses and individuals trying to reduce their tax liabilities. The definitions of eligible equipment and practices would need to be carefully and tightly drawn. It may be significant that there is little or no experience in the use of pro-environmental tax allowances in EECCA countries.

For all these reasons this potential economic instrument will not be taken forward for more detailed evaluation in the following chapter.

Notes

1. The current funding status of GWP, a private company, is unclear, though long term cost recovery is clearly a necessary part of its business model.
2. E.g. larger commercial users could boycott public supplies and develop their own sources, to the detriment of tariff revenues.
3. Including its “opportunity cost”, namely the economic opportunities lost elsewhere by other potential uses through the abstraction of the water in question, at that specific time and location. This includes opportunities lost for its future use.
4. Paradoxically, the more “efficient” irrigation techniques, such as spray and trickle methods, tend to be those with the highest rate of consumptive use of water through evapo-transpiration, whereas “less efficient” processes return more water for its potential use by others.
5. The Netherlands groundwater abstraction charge is assumed to be EUR 0.182/m³, added to the 2010 Tbilisi household metered tariff of EUR 0.12/m³.
6. Evaporation from open water and soil, and transpiration from plants and weeds.
7. Eastern Europe, Caucasus and Central Asia.
8. The economically optimal level of a pollution charge (the so-called Pigovian tax, after the British economist Arthur Pigou) is that which is set at the level where the marginal cost of abatement incurred by the polluter coincides with the marginal cost of pollution experienced by society. At this level, an “optimal” level of pollution is produced. This is at the point where the combined cost of abatement – incurred by polluters – and environmental damage – incurred by society – is minimised. In practice, neither of these cost curves is known with any precision.
9. Pollution taxes should be differentiated from user charges made for wastewater treatment services. The latter are imposed on wastewater emissions by industrial and other large water users who discharge into public sewers and who pay the utility according to the volume and strength of pollutants present in their wastewater. The charge reflects the cost to the utility of treating these pollutants. In contrast, a pollution tax applies to discharges into public water bodies such as rivers, lakes and groundwater.
10. A measure of the responsiveness of the demand for a product to changes in its price.
11. Product taxes on agrochemicals would not address the problem of liquid animal waste (slurry) which is a major water pollutant in many areas.
12. Currently being piloted in the USA by the World Resources Institute.
13. REC Caucasus, “Mainstreaming the Payments for Ecosystem Services for Green Growth in South Caucasus”.
14. Between the State Committee of Irrigation and Water Economy of the Azerbaijan Republic and the Department of Management of Melioration Systems of Georgia.
15. With the exception of the Debed River, which arises in Armenia and for which Georgia is a downstream riparian affected by water pollution caused by mining on the Armenian side.

References

- ACTeon (2010), *Economic Instruments for mobilising financial resources for supporting IWRM*, <https://www.oecd.org/env/resources/46228724.pdf>.
- Entec (2010), *Managing Scarce Water Resources – Implementing the Pricing Policies of the Water Framework Directive*, http://ec.europa.eu/environment/water/water-framework/economics/pdf/pricing_policies.pdf.
- FAO (2007), *Paying farmers for environmental services | FAO | Food and Agriculture Organization of the United Nations*, Food and Agriculture Organisation, Rome, www.fao.org/publications/sofa/2007/en/.
- FitchRating (2003), *Fitch Upgrades Czech Republic's Foreign Currency Rating To 'A-'*, <https://www.fitchratings.com/site/pr/89033>.
- Forest Trends, K. (2008), *Payments for Ecosystem Services: Getting Started Payments for Ecosystem Services Getting Started: A Primer*, www.forest-trends.org/documents/files/doc_2347.pdf.
- Nath, B. (1998), *Environmental management in practice*, Routledge, London and New York.
- OECD (2016), *Water, growth and finance: Policy Perspectives*, <https://www.oecd.org/environment/resources/Water-Growth-and-Finance-policy-perspectives.pdf>.
- OECD (2012a), *Water Quality and Agriculture: Meeting the Policy Challenge*, OECD Studies on Water, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264168060-en>.
- OECD (2012b), *A Framework for Financing Water Resources Management*, OECD Studies on Water, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264179820-en>.
- OECD (1999), *Sourcebook on environmental funds in economies in transition*, https://www.oecd.org/environment/outreach/Sourcebook%20on%20environmental%20funds%20in%20economies%20in%20transition_EN_complete.pdf.
- OECD (1997), *Evaluating Economic Instruments for Environmental Policy*, OECD Publishing.
- OECD EAP Task Force (2016), *Reforming economic instruments for water management in EECCA countries: Policy Perspectives*, https://issuu.com/oecd.publishing/docs/policy_perspective_economic_instrum.
- OECD EAP Task Force (2012a), *Strengthening the Economic and Financial Dimension of Integrated Resources Management in Armenia, Azerbaijan and Georgia*, [www.oecd.org/env/outreach/EAP\(2012\)10_Report%20on%20Kura%20basin_ENG.pdf](http://www.oecd.org/env/outreach/EAP(2012)10_Report%20on%20Kura%20basin_ENG.pdf).
- OECD EAP Task Force (2012b), *Improving the Use of Economic instruments for Water Resource Management in Kyrgyzstan: the Case of Lake Issyk-Kul Basin*, https://www.oecd.org/env/outreach/2013_Kyrgyz%20report%20on%20Eis%20for%20WWRM%20Eng%20Web.pdf.
- OECD/PHARE (1998), *Swapping Debt for the Environment: the Polish Ecofund*, <https://www.oecd.org/poland/35156800.pdf>.
- Pegram G. and B. Schreiner (2009), *Financing water resource management: the South African experience*, Pegasys.

- SIWI (2016), “Pricing instruments for sustainable water management – Stockholm International Water Institute”, *Working Paper 28*, Stockholm International Water Institute, www.siwi.org/publications/pricing-instruments-for-sustainable-water-management/.
- Verbruggen, A. (1998), “Economic Instruments for Environmental Management”, in B. Nath (ed.), *Environmental Management in Practice*, Routledge, London and New York.
- Winpenny, J. (1998), “Application of economic instruments for environmental management”, in B. Nath (ed.), *Environmental Management in Practice*, Routledge, London and New York.
- World Bank (2014), *Irrigation and land market development project: Georgia*, World Bank, <http://documents.worldbank.org/curated/en/421351468031549537/pdf/PAD8620PAD0P13010Box385199B00OUO090.pdf>.

Chapter 5

Evaluation and ranking of options for economic instruments reform

This chapter presents the evaluation and ranking of options for economic instruments reform in Georgia. A number of criteria were used to assess the final list of options: environmental, economic, social and fiscal impacts, cost-effectiveness, political acceptability, and their administrative and practical feasibility.

The chapter discussed the options which are expected to have major benefits for water management and/or the natural environment. Whether a tougher licensing and higher charges for water abstraction and pollution would have economic impacts mainly on water- and pollution-intensive undertakings or not? Would the most serious social impacts arise from increases in water and sanitation tariffs and increased irrigation fees? Could social impacts be mitigated and compensated in various ways?

5.1. Criteria to be applied

The following criteria will be used to evaluate the EI options brought forward from

- Environmental impact:
 - likely benefits to the water environment
 - force of incentives for water users/polluters to modify their practices
 - contribution to aims of Water Resource Management.
- Economic impact:
 - positive and negative impacts on key economic agents – businesses, farmers, tourism
 - impact on competition
 - dynamic impact (one-off effect, or on-going long-term impact on innovation and efficiency).
- Social impact:
 - impacts and costs on taxpayers and water users
 - affordability for vulnerable socio-economic groups.
- Fiscal impacts:
 - implications for public budgets
 - revenues generated or, in the case of subsidies, costs to Exchequer.
- Cost-effectiveness:
 - impact relative to the cost, effort or aggravation involved.
- Political acceptability:
 - political appeal/difficulty of the measure and obstacles to be overcome
 - congruence with other and wider social, economic and environmental policies.
- Administrative and practical feasibility:
 - other complementary measures required and are the pre-conditions for success present
 - compliance with existing laws and regulations
 - need for new institutions and capacity building
 - time-scale for implementation and likely speed of results (OECD, 1994; OECD, 1997).

5.2. Evaluation and ranking of options

This section applies the criteria listed in Section 5.1 to evaluate the following Economic instruments (described and discussed in more detail in :

- water supply and sanitation tariffs at cost-recovering levels
- higher irrigation charges to farmers

- effective application of surface and groundwater Abstraction Charge
- 3A. Abstraction Charge for non-consumptive use (“Hydropower royalty”)
- pollution Charge on wastewater discharges into public water bodies
- higher fines and more active enforcement for environmental violations
- 5A. Reform and strengthening of the existing legal concept of Environmental Liability as an effective instrument of environmental policy
- higher charges for entry into National Parks and Protected Areas
- payments for Ecosystem Services schemes
- transboundary cost- and benefit-sharing projects
- promotion of Environmental Funds.

5.2.1. Shortlisting of economic instruments

The options reviewed in comprise an assortment of measures of different kinds, with different likely impacts, which will receive different weights by government agencies involved in implementing water policies. It is assumed that all measures considered here comply with the relevant EU Directives. Given this, the final shortlist of economic instruments for water management recommended for consideration in Georgia is influenced by four factors in particular:

- the force of the incentive from the EI and its likely benefits to water management
- its net fiscal impact
- its political and social acceptability
- its practical and administrative feasibility in Georgian conditions.

There are several overriding considerations. The first is that the 2014 draft Water Law now under consideration by the Georgian Government contains several measures proposed in this report – namely the reintroduction of licensing for surface water abstraction and wastewater discharge and the revival of the surface water Abstraction Charge and reintroduction of the Pollution Charge. This is important when considering the acceptability and feasibility of these instruments (OECD EAP Task Force, 2012a).

Secondly, this Report is mainly addressed to the MENRP, the Georgian government ministry with principal¹ responsibility for water resources management. MENRP would be directly involved in the implementation of instruments such as abstraction and pollution licensing, the levying and collection of abstraction and pollution charges, and imposing fines for non-compliance. Tariff-setting for the use of water by households, industries, farmers and others rests with other agencies, including (in the case of GWP) private companies. While it is essential to include recommendations on cost recovery of water services in any report on water resources management, this Report recognises that its implementation would be a matter for agencies other than MENRP, hence does not dwell on these in any detail.

A third factor is the political and social stigma attached to the introduction of new taxes. This is a universal attitude across all countries, and in some circumstances taxes may be unavoidable, and “less bad” than other measures (Entec, 2010). However, the approach taken in this Report is to regard new taxes as a last resort. Instead, it is considered preferable to raise revenues, or regulate behaviour, through *charges for water services*

rendered or for the license to take or pollute water. Examples of the former would be tariffs for water and sanitation services and irrigation, and of the latter Abstraction and Pollution charges, respectively for the issue of licences to abstract and pollute.

A final factor concerns the balance between incentive and fiscal impacts, which is a real dilemma facing environmental policy-makers. OECD has noted: “When there are trade-offs between financial sustainability and other environmental policy objectives, economic instruments are often designed to contribute to the former” (OECD EAP Task Force, 2016). Countries such as Georgia with pressing fiscal challenges may incline towards fiscal yield where there is a trade-off between additional revenues and impact on environmental incentives.

Nevertheless, “win-win” opportunities are present. Economic instruments can be arrayed according to how each of them stands on the twin criteria of incentive effect and financial impact (OECD, 2012). The result is presented in Table 5.1.

Table 5.1. **Overview of options for Economic instruments in Georgia**

Impact on public finance (horizontal axis)				
Incentive effect (vertical axis)	Negative (net cost)	Neutral	Low-moderate	Potentially high
Potentially high				Water supply tariffs; Fines and enforcement; Abstraction charge; Pollution tax
Low-moderate	Environmental Funds	Environmental Funds; PES;	Irrigation charges	Non-consumptive use charge on hydropower companies
Zero or minimal			Entry Charges to national parks and protected areas;	

Note: Environmental Funds could be either negative or neutral in their fiscal impact, depending on whether or not they were sponsored by the Government.

Source: Authors’ findings.

Assigning measures to particular categories is an inexact process since much depends on how the measures are implemented. For instance, the creation of Environmental Funds need have no charge to the state, if they are set up as non-governmental agencies (e.g. with donor support) (OECD, 1999). Judgements about the likely fiscal impact of these measures depend crucially on the level of charges to be made – which will also determine their incentive effect. Implicit in this table is a view on the feasibility of levying charges at the required rate (including their “affordability”) which is subject to political and social factors.

With these reservations, the logic of Table 5.1 is that the measures contained in boxes in the top right hand side are worthy of the most serious consideration, since they offer the prospect of impact on both the incentives for good water management, as well as on the prospect of financial revenues to support this management. This does not rule out the other measures, for instance, those with little or no incentive but with potential revenue gains, or conversely those with some incentive impact but with negative or neutral fiscal impacts. A balanced programme of measures would include different types, though with “win-win” options deserving prior consideration.

5.2.2. Conclusions from evaluation of options

The conclusions of the evaluation of options are presented in summary form in Table 5.2.

Table 5.2. Summary of evaluation of options for Economic instruments for water management

	Environment	Economic	Social	Fiscal	Cost/effect	Political	Feasibility
Water and sanitation tariffs	***	-	--	***	***	--	***
Irrigation charges	***	--	---	*	**	---	*
Abstraction Charge	***	-	0	**	***	***	***
Abstraction Charge for non-cons use	***	--	-	**	**	**	**
Pollution Charge	***	---	-	**	**	***	***
Fines and enforcement	***	--	- **	?	**	***	***
Environmental Liability	***	--	-	**	?	***	**
Entry fees for National Parks	**	-	-	0	***	***	***
Payments for Ecosystem Services	***	- **	0	0	***	***	**
Transboundary cost/benefit sharing	***	0	- ***	**	***	***	*
Environmental Fund	***	**	*	?	*	?	*

Note: In interpreting this Table, more asterisks (***) indicate greater benefits, while more minuses (- - -) indicate more costs or disadvantages. Hence preferred options have most *** and fewest - - - overall.

Source: Authors' findings.

Practically all the options are expected to have major benefits for water management and/or the natural environment. Tougher licensing and higher charges for water abstraction and pollution would have economic impacts mainly on water- and pollution-intensive undertakings (including utilities, which it would be important to include in these regimes). The most serious social impacts would arise from increases in water and sanitation tariffs and increased irrigation fees, though in both cases social impacts could be mitigated and compensated in various ways.

A number of the options have potential fiscal benefits for the national Exchequer, but much depends on the level of tariffs/charges/fines that are set, and the arrangements for sharing the proceeds with local administrations (with or without formal earmarking to specific programmes). The majority of measures are likely to be cost-effective, since they do not entail serious investment, and largely involve improved administration (though this implies larger recurrent budgets in some cases).

Predicting the political acceptability of different measures is a matter for the Georgian Government. However, a telling indicator of political attitude is the presence of several of the above options in the 2014 draft Water Law now being examined in Government circles.

On the criterion of feasibility, the best scores go to measures for which existing systems and structures are already in place and enjoy a degree of public acceptance. This includes water and sanitation tariffs, the Abstraction Charge, the (revived) Pollution Charge, fines for environmental infractions, and entry fees for national parks and protected areas.

The above summary of evaluation of options is captured in recommendations for the implementation of a programme for the more active use of economic instruments for water management in Georgia.

Note

1. Though not exclusive, as described in Chapter 3.

References

- Entec (2010), *Managing Scarce Water Resources – Implementing the Pricing Policies of the Water Framework Directive*, http://ec.europa.eu/environment/water/water-framework/economics/pdf/pricing_policies.pdf.
- OECD (2012), *A Framework for Financing Water Resources Management*, OECD Studies on Water, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264179820-en>.
- OECD (1999), *Sourcebook on environmental funds in economies in transition*, https://www.oecd.org/environment/outreach/Sourcebook%20on%20environmental%20funds%20in%20economies%20in%20transition_EN_complete.pdf.
- OECD (1994), *Managing the Environment: the Role of Economic Instruments*, OECD Publishing.
- OECD (1997), *Evaluating Economic Instruments for Environmental Policy*, OECD Publishing.
- OECD EAP Task Force (2016), *Reforming economic instruments for water management in EECCA countries: Policy Perspectives*, https://issuu.com/oecd.publishing/docs/policy_perspective_economic_instrum.
- OECD EAP Task Force (2012a), *Strengthening the Economic and Financial Dimension of Integrated Resources Management in Armenia, Azerbaijan and Georgia*, [www.oecd.org/env/outreach/EAP\(2012\)10_Report%20on%20Kura%20basin_ENG.pdf](http://www.oecd.org/env/outreach/EAP(2012)10_Report%20on%20Kura%20basin_ENG.pdf).
- OECD EAP Task Force (2012b), *Improving the Use of Economic instruments for Water Resource Management in Kyrgyzstan: the Case of Lake Issyk-Kul Basin*, https://www.oecd.org/env/outreach/2013_Kyrgyz%20report%20on%20Eis%20for%20WRM%20Eng%20Web.pdf.

Annex A

Costs of water resource management in Armenia and South Africa

Armenia offers a natural comparator for Georgia. Its population is c. 3 mln (Georgia’s 4.3 mln), its area 30 000 sq.km. (Georgia 11 000 sq km) and GDP per head in PPP terms USD 7 780 (Georgia USD 7 160) (The Economist, 2015).¹ In addition, the climate, relief and other key geographical and environmental features of the two countries are not dissimilar (ADB, 2016).

As part of a recent exercise in Armenia for the OECD, an “optimal” budget was estimated for water management, control and monitoring (ACTeon, 2013).

Table A.1. **Armenia: Budgets for water resource management**

Agency	Main Functions	2011 annual budget, USD million	Optimal annual budget, USD million
Water Resources Management Agency	Overall management and protection of water resources. Distribution of water use permits	0.18	1.48
Environmental Impact Monitoring Centre	Surface water quality monitoring	0.44	0.75
Hydrogeological Monitoring Centre	Groundwater quantity and quality monitoring	0.03	0.16
State Environmental Inspectorate	Compliance assurance with Water Use Permits	0.12	0.40
Armenian State Hydro-meteorological and Monitoring Service	Surface water quantity monitoring	0.22	0.55
Total		1.01	3.35

Note: Exchange rate used USD 1.0 = AMD 490 (8 March 2016).

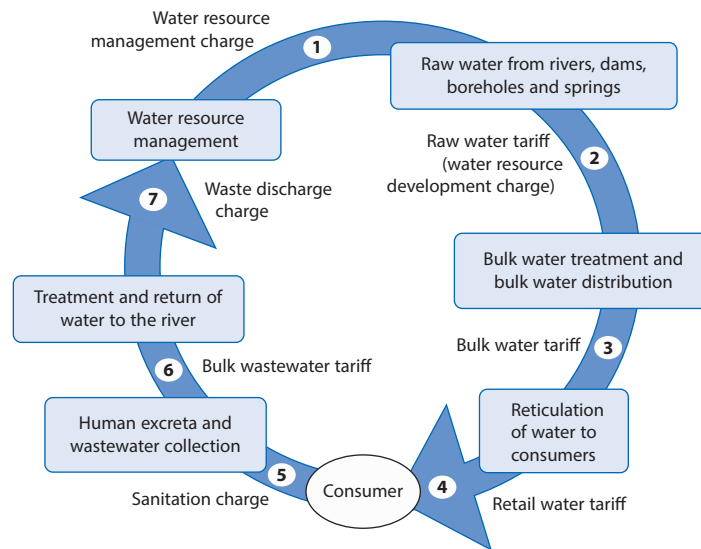
Source: ACTeon (2013), *Facilitating the reform of economic instruments for water management in Armenia.*, p.26, https://www.unece.org/fileadmin/DAM/env/documents/2013/wat/NPD_meetings/Armenia/AM_10SC_DePaoli_EN.pdf.

The activities included in the budgets for Water Resource Management (WRM) in Table A.1 relate mainly to administrative (including monitoring and compliance) costs, and appear insufficient to include any serious cost of works (e.g. flood control, afforestation, soil erosion checks, dredging, de-contamination, etc.). Any major development of infrastructure necessary for WRM would entail investment spending that would dwarf the above costs.

If Georgia adopted the same “optimal” WRM budget as Armenia, this would imply spending 0.0008 of its current budgetary expenditure on WRM in 2013. This is equivalent to less than 1/1000 of current government spending on all purposes.²

South Africa is another interesting comparator – a much larger country than Georgia, but also with a highly diverse geography and the full gamut of hydrological issues. South Africa has a coherent system of finance for WRM including a water resource management charge, a raw water tariff, a bulk water tariff, a retail water tariff, a sanitation charge, a bulk wastewater tariff and a water discharge charge (Pegram and Schreiner, 2009).

Figure A.1. South Africa: Financing WRM



Source: Pegram and Schreiner (2009), *Financing water resource management: the South African experience*, p. 24.

In 2008-09 South African spending on WRM was just under 0.5% of the total national budget for recurrent expenditure. This total was made up of governance (38%), recurrent spending on infrastructure (29%) and “on-budget”³ infrastructure (33%).

Notes

1. GDP per head in Purchasing Power Parity terms. In nominal terms (not PPP adjusted) GDP per head for Armenia was USD 2 382 (2014) and in Georgia USD 3 840 (estd.2014).
2. USD 3.35 million as a proportion of total current government expenditure of USD 4.01 billion in 2013.
3. Falling on the budget of the Department for Water Affairs. This excludes “off balance sheet” spending by the Trans-Caledon Tunnel Authority, which is funded by commercial finance.

References

- ACTeon (2013), *Facilitating the reform of economic instruments for water management in Armenia.*, https://www.unece.org/fileadmin/DAM/env/documents/2013/wat/NPD_meetings/Armenia/AM_10SC_DePaoli_EN.pdf.
- ADB (2016), *Government of Armenia: water supply and sanitation sector strategy: Annex 1. Financing Plan*, Asian Development Bank.
- Pegram G. and B. Schreiner (2009), *Financing water resource management: the South African experience*, Pegasys.
- The Economist (2015), *Pocket World in Figures 2016*, Economist Books.

Annex B

International experience with water abstraction and pollution charge

Many countries use one or both of these charges as a means of managing their water resources and exhibit great variety in the scope, method and level of charges.

Water abstraction charges

Water abstraction charges are in place in a number of EU, OECD and other countries. Most abstraction charges are based on the price per volume of water abstracted and charges are often differentiated according to the type and sector of user – e.g. agricultural, industrial or residential). In some cases other factors also apply, e.g. the season, or the scarcity of the resource (OECD, 2016).

Practice is not uniform between countries – the charges differ in a number of important respects. To complicate the picture further, in some countries (e.g. Germany, Belgium) different regions or states have their own charges, which can greatly differ from others within the same country (SIWI, 2016). Table A.1 illustrates this variety for a selection of countries from the OECD/EEA database.

The principal variables governing the type of charge are:

- Differential application to groundwater and surface water. Charges for groundwater are normally higher, due to the fact that it is often in part non-renewable, and difficult to restore once contaminated.
- Purpose. Various, the purpose of abstraction charges is to raise general revenue, to raise revenue for specific kinds of water resource management, to comply with the WFD, to create incentives for the efficient use of water, to limit water extraction in water-stressed areas, etc.
- Basis (methodology) of the charge. The choices are volumetric (where the measurement of water abstraction is feasible), fixed (e.g. per hectare of land farmed), or per licensed amount (e.g. according to the ceiling allowed on abstraction).
- Destination of the revenues. Proceeds of the charges could return to the general (national) budget, or be earmarked for specific programmes or spending headings in national or local budgets. (In Georgia revenues from the groundwater abstraction fee are currently returned to the budgets of municipalities in areas where the abstraction takes place).
- Sectors of application and type of user. The charges may apply only to certain sectors, some sectors might be excluded from the charge, or different rates applied according to sector (agriculture, industry, water utilities, fisheries, forestry, hydro and thermal power, etc). Smaller users are often excluded from the charge.

Table B.1. Features of water abstraction charges in selected countries and regions

Country	Basis for charge (va = volume abstracted)	Differences for sectors	Differences for other characteristics	Date introduced	Ground water	Surface water
Belgium (Flanders)	va	-	Scarcity in aquifer	1997	y	n
Canada (British Columbia)	va; Licenced amount; Per mwh (power)	y	-	-	-	-
Canada (Nova Scotia)	va; Licence fee	y	-	-	-	-
China	Minimum price per va	-	location	2013	y	y
Czech Rep	va	y	-	1980	y	n
Estonia	va	y	Source aquifer	1991	y	y
France	va					
Germany Baden Wurttemberg	va	y	-	1988	y	y
Germany Hamburg	Fixed amount for agriculture and private use; Fixed amount and price per va for commercial uses	y	-	1989	n	y
Germany Saxony	va.	y	-	1992	y	y
Hungary	va	-	region	-	y	y
Israel	va	y	season	1959	-	-
Japan	va	-	location	-	n	y
Korea	va	-	Source river	1999	n	y
Latvia	va	y	-	1995	y	y
Lithuania	va	y	-	1991	y	y
Luxembourg	va	-	-	-	-	-
Poland	va	y	Water quality and region	1990	y	y
UK	Licenced amount of va	-	-	2016	-	-

Source: Adapted from OECD (2016), *Water, growth and finance: Policy Perspectives*, <https://www.oecd.org/environment/resources/Water-Growth-and-Finance-policy-perspectives.pdf>.

- Level of charge. There is wide variation. In general, the level is low, and is limited by the requirement to recover only the costs of administering the regime of monitoring and regulation. Countries using the charge to create an economic incentive for efficient water use typically levy higher rates. One of the highest rates, applying to both groundwater and surface water abstraction, is in Denmark (EUR 0.84/m³). For groundwater, the Netherlands charges EUR 0.1826/m³, and Poland EUR 0.015-0.0255/m³. For comparison, the nominal rate for groundwater abstraction by municipal utilities in Georgia is EUR 0.004 cents (EUR 0.00004) per m³.
- Treatment of non-consumptive use. Sectors with a high proportion of non-consumptive use (commonly, hydropower and cooling for thermal power) are typically charged at a lower rate. Irrigated agriculture is sometimes classed as non-consumptive for this purpose, though this is not always warranted.

For the abstraction charge to be effective as an instrument of water management, it would need to vary to reflect different local circumstances. This would call for a degree of complexity in the structure, level, and criteria in the charge, and entail scope for regulatory judgement, compared with a simpler charge, less responsive to specific situations. The Abstraction Charges Scheme in England and Wales (E&W) has a structure that adjusts the standard charge to take account of local factors).

The abstraction charge in England and Wales (E&W)

The Environment Agency for E&W operates an abstraction charges scheme as part of its licensing regime for the extraction of water from ground and surface sources.

Abstraction licensing supports the aim of the EU Water Framework Directive, which the UK transposed into national legislation in 2003. The availability of water for abstraction in each catchment is assessed through a Catchment Abstraction Management Strategy (CAMS).

In principle, all abstractions of water of more than 20 m³ per day require a licence. The decision to award a licence depends on the amount of water available after the needs of the environment and existing abstractors are met, and whether the justification given is “reasonable”. A water balance is estimated for each CAMS area, and an Environmental Flow Indicator worked out to assess whether river flows are sufficient to support a healthy ecology. Licences are likely to be refused, or issued with conditions, for waters with insufficient or modified flow. Existing licence holders are allowed to trade their licences with new applicants, as an alternative to the issue of new ones.

New or varied licences are time-limited (12 years). The criteria used in the decision to replace them, or not, are:

- Is the abstraction environmentally sustainable?
- Does the applicant continue to have a reasonable need for the water?
- Is the water being used efficiently?

Most licences require the abstractor to measure the water taken, and to keep records. An abstraction meter will be required in most cases.

If abstractors do not comply with their licence conditions they are subject to follow-up action of various kinds – site warning, warning letter, formal caution, civil sanctions and prosecution. The civil sanctions available include:

- a compliance notice
- a restoration notice
- a fixed monetary penalty (fine)
- an enforcement undertaking (to make amends for non-compliance)
- a variable monetary penalty (depending on the severity of the offence)
- a stop notice.

The abstraction charge has three parts. There is a fixed application charge (currently GBP 135-1 500, with the higher rate applying to impoundment of water and its use for small-scale power production), an advertising administration charge (currently GBP 100) and an annual charge. The annual charge consists of a standard charge, which applies to the

licenced amount of abstraction, and is adjusted according to source, season and loss factor relevant to the applicant, plus a compensation charge to cover the cost of dealing with the revocation or variation of existing licences. The standard charge, to which factors are applied depending on the abovementioned factors, is different for each of 10 regions, and currently varies from a minimum of GBP 11.63 to a maximum of GBP 29.64 per 1 000 m³. (This is equivalent to EUR 13.84-35.28/1000 m³, or EUR 0.014-0.035 per cubic metre).

The loss factor element in the standard charge adjusts for non-consumptive use. Uses such as cooling, hydropower, fish farming, flood irrigation etc are deemed to be “low” or “very low” loss, which greatly reduces the effective charge. Conversely, “high” loss includes spray and trickle irrigation, whilst “medium loss” includes most public water supply, and industrial and commercial purposes (Environment Agency of England and Wales: “Managing water abstraction” and “Abstraction Charges Scheme 2016/17”).

Certain features of the E&W water abstraction regime are typical of many others. Charges are an adjunct to the licensing regime rather than an attempt to directly reflect the economic value of the water concerned (e.g. its opportunity cost). The charges are imposed explicitly to recover the costs of administering the licensing regime, and no more. The charge has some incentive effect insofar as licences for larger volumes of abstraction cost more than those for smaller ones. However, once licences have been awarded, the penalties from excessive and abusive water abstraction lie in the likely follow-up actions, such as fines,¹ prohibitions and court actions, rather than through higher payments of the abstraction charge, which is levied on licensed amounts rather than actual abstraction.

The E&W abstraction charge structure is necessarily complex, in order to reflect the many possible local factors involved in managing water abstraction. Monitoring the system calls for individual judgements by staff of the regulating agency and presupposes a sufficiently large and extensive system of water monitoring, abstraction inspection, regulation, and enforcement.

Non-consumptive water abstraction charges

Several EECCA² countries levy a charge for water used for hydro-power production. Such charges are either based on the water that runs through the turbines or on the amount of electricity produced. According to the OECD survey of economic instruments in EECCA conducted in 2001-03, in Armenia the charge for water for power production was USD 3 per 1 000 m³, in Ukraine USD 0.04 per 1 000 m³ and in Georgia it was USD 0.07 per 1 000 m³. In Russia the tax in 1999 varied between USD 0.05 and 0.5 per MWh electricity produced. In Kazakhstan, charge rate for water use in hydropower production was set at KZT 0.011 per KWh (USD 0.07 per MWh) in 2002, which still applies. In Tajikistan a proposal has been made for the introduction of a non-consumptive water use charge as a “royalty” on hydropower producers.

In Brazil hydropower producers are charged 6.7% of the value of energy produced, and the proceeds allocated to the states and municipalities where this activity takes place, to be used for water management amongst other things. In Cameroon a water tariff has been levied on hydropower producers to finance the construction of the Lom-Pangar regulatory dam (SIWI, 2016).

Box B.1. Water royalties in Tajikistan

The “water royalty” was introduced by Medzjlis, the supreme legislative body of Tajikistan, in the Tax Code of the Republic in 2009¹ and applies to companies using water resources for hydropower production. The legal ground for introducing water royalty was provided in the Water Law (2000) which stipulates that certain types of water uses must be subject to the payment of fees. The water royalty aims to capture the economic rent power companies earn in using the natural wealth of Tajikistan. Rent collection in the field of natural resource use and extraction is widely applied practice in the EECCA as well as in countries with more advanced economies.

The Tax Code of the Republic of Tajikistan sets the rate of water royalty for 1 MWh power generated at TJS 2.1 or about USD 0.05 cents per 1 KWh (USD 0.5 per 1MWh).²

Hydropower production in Tajikistan is currently around 15-20 billion KWh per year. If fully collected, funds raised by water royalties will amount to USD 7.5-10 million per year based on the current domestic capacities for hydropower generation, which are likely to increase in future. If national plans for new power stations are realised, annual revenues may double by 2015 amounting to about USD 14-20 million, and triple by 2020 amounting to about USD 22.5-30 million.

Notes: 1. Amendments to the Tax Code were approved by Medzjlis on 26 March 2009 establishing Royalty for Water (chapter 53).

2. Average rate in the period 2009-March 2010 was USD 1 = TJS 4.2.

Source: Authors’ findings.

Water pollution charges

International practice in the use of pollution charges also varies between countries, and between states and regions in the same country (Table B.2). It should be noted that a number of the examples in Table B.2 are of product taxes on polluting substances, typically used in agriculture. The main report argues that the introduction of such product taxes is not a current priority in Georgia, hence the more relevant examples of charges in are those based directly on emissions.³

In general, OECD countries have managed water quality through regulation (e.g. setting standards for ambient water quality, technology requirements and banning certain kinds of discharges into water bodies). Those countries that have made active use of pollution charges have done so partly to reinforce the disincentive for water pollution, and partly to raise revenues to fund environmental policies. As the main report points out, these motives may be inconsistent, and in most cases pollution taxes have been set too low to have a serious disincentive impact. The exceptions – where water pollution charges have had a serious impact on polluters’ behaviour – include Netherlands, Germany, the Czech Republic and Slovenia (OECD, 2016).

Another general point is that the environmental impact (and cost) of water pollution is highly specific, dependent on location, the nature and timing of the discharge, the dilution capacity of the water course, and other factors. Hence water pollution charges should vary to reflect these specific factors. In this key respect, water pollution differs from air pollution (OECD, 2016).

Table B.2. Features of water pollution charges in selected countries

Country	Type of instrument	Based on
Canada – British Columbia	Charge on discharge	Pollution content, weight
Canada – British Columbia	Charge on agricultural inputs	Volume of pesticides
China	Pollution charge	Class, volume of pollution equivalent
Denmark	Sewage discharge	Volume (water) weight (pollutant)
Denmark	Duty on chlorinated solvents	Weight. Pollution content
Denmark	Duties on nitrogen and pesticides	weight
Denmark	Tax on mineral phosphorus in feed phosphates	Weight
India	Tax for prevention and control of pollution	Pollutant content, sector, volume
Italy	Duty on pesticides	% of previous year's turnover on sale of pesticides
Mexico	Water effluent charges	Quantity of wastewater in excess of permissible contents of COD and TSS, depending on carrying capacity of recipient body
Netherlands	Levy on water pollution	Pollution unit, amount of effluent
Spain – Andalucia	Tax on coastal wastewater discharges	Pollution unit, sector
Spain	Tax on wastewater discharges	Sector, volume
USA – Florida	Water quality tax	Pollution content, volume
USA – Maryland	Bay restoration fund fee	End user, type of sewage disposal system
USA – Washington	Hazardous substance tax (pesticides)	% of wholesale value

Source: Adapted from OECD (2016), *Water, growth and finance: Policy Perspectives*, <https://www.oecd.org/environment/resources/Water-Growth-and-Finance-policy-perspectives.pdf>.

Notes

1. Although the financial penalties can be large enough to recover restoration costs.
2. Eastern Europe, Caucasus and Central Asia.
3. Excluding tariffs and surcharges on household and industrial water bills to cover the cost of wastewater treatment and disposal, which are payments for a service.

References

- OECD (2016), *Water, growth and finance: Policy Perspectives*, <https://www.oecd.org/environment/resources/Water-Growth-and-Finance-policy-perspectives.pdf>.
- Pegram G. and B. Schreiner (2009), *Financing water resource management: the South African experience*, Pegasys.
- SIWI (2016), “Pricing instruments for sustainable water management – Stockholm International Water Institute”, *Working Paper 28*, Stockholm International Water Institute, www.siwi.org/publications/pricing-instruments-for-sustainable-water-management/.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Union takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the Organisation's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

Facilitating the Reform of Economic Instruments for Water Management in Georgia

Water is essential for economic growth, human health, and the environment. Yet governments around the world face significant challenges in managing their water resources effectively. The problems are multiple and complex: billions of people are still without access to safe water and adequate sanitation; competition for water is increasing among the different uses and users; and major investment is required to maintain and improve water infrastructure in OECD and non-OECD countries. This OECD series on water provides policy analysis and guidance on the economic, financial and governance aspects of water resources management. These aspects generally lie at the heart of the water problem and hold the key to unlocking the policy puzzle.

This study assesses the use of economic instruments for water resources management in Georgia and considers options for reform following the 2014 signature of an Association Agreement with the EU committing to alignment with the EU's Water Framework Directive. This includes the systematic use of economic instruments, including water pricing, to recover the cost of water services provided to households, industry and farmers, among other measures.

Three main economic instruments are recommended in this study: 1) the introduction of a licensing regime and charges for both surface water and groundwater abstraction, 2) the restoration of a licensing and charging regime for all forms of water pollution, and 3) more rigorous enforcement of these measures, including more active monitoring and higher fines for offenders. Implementing these measures will be greatly facilitated by the enactment of the new Water Law now being examined by the government of Georgia.

Consult this publication on line at <http://dx.doi.org/10.1787/9789264281776-en>.

This work is published on the OECD iLibrary, which gathers all OECD books, periodicals and statistical databases. Visit www.oecd-ilibrary.org for more information.

