

**EUROPE'S ENVIRONMENT**  
**AN ASSESSMENT OF ASSESSMENTS**  
**FOR THE SOUTH CAUCASUS REGION**

**REGIONAL ENVIRONMENTAL CENTRE**  
**FOR THE CAUCASUS**  
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## List of Abbreviations

ASH	Armenian State Hydro-Meteorological Service
BOD	Biological Oxygen Demand
CCMA	Caspian Complex Monitoring Administration
CEH	Centre for Epidemiology and Hygiene
CEP	Committee on Environmental Policy
CPP	Consumption and production patterns
DPSIR	Driving forces-Pressures-State-Impacts-Responses
EIMC	Environmental Impact Monitoring Centre
ENVSEC	Environment and Security
FWUA	Federations of Water Users Associations
GES	Geological Exploration Service
GIS	Geographic Information Systems
GMES	Global Monitoring of Environment and Security
GTZ	German Society for Technical Cooperation
G20	The Group of Twenty Finance Ministers and Central Bank Governors
ICPDR	International Convention for Protection of Danube River
ICZM	Integrated Coastal Zone Management
IFI	International Financing Institutions
INSPIRE	Infrastructure for Spatial Information in Europe
IPPC	Integrated Pollution Prevention and Control
JICA	Japanese International Cooperation Agency
LCA	Life-cycle analysis
MENR	Ministry of Ecology and Natural Resources of Azerbaijan
MEP	Ministry of Environment Protection
MNP	Ministry of Nature Protection
MOA	Ministry of Agriculture
MOED	Ministry of Economic Development
MOES	Ministry of Emergency Situations
MOIE	Ministry of Industry and Energy
MOUD	Ministry of Urban Development
NEAP	National Environmental Action Plan
NHD	National Hydro-Meteorological Department
NIS	Newly Independent States (NIS)
NDEM	National Department of Environmental Monitoring
NEA	National Environmental Agency
NSOG	National Statistical Office of Georgia
OJSC	Open Joint Stock Company
QA/QC	Quality assessment/Quality control
RAP	Regular Assessment Process
SCWS	State Committee on Water Systems
SIAD	State Information and Archive Database
SIDA	Swedish International Development Agency
SNC	Second National Communication
SSC	State Statistical Committee
SWC	State Water Cadastre
SWCIS	State Water Cadastre Information System
SEE	South-Eastern Europe
SIA	Strategic impact assessment
W&WW	Water and Wastewater
WEAP	Water Evaluation and Planning

WRMA	Water Resources Management Agency
WUA	Water Users Association
WWTP	Wastewater Treatment Plant

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## 1 Introduction and Background

The European Environmental Agency (EEA) is an agency of the European Union. The EEA's task is to provide sound, independent information on the environment. It is a major information source for those involved in developing, adopting, implementing and evaluating environmental policy, and also for the general public.

The EEA has a great capacity and rich experience, dating from 1994, in collecting background information on the state of the environment and transferring the data to reports and assessments demanded by policymakers and the general public. ***Europe's Environment: An Assessment of Assessments (EE-AoA)*** takes stock of the existing European environmental assessments, particularly in the fields of water and related ecosystems and the green economy, and asks whether these are appropriate to support the policy process given the complex interconnected nature of the environmental challenges faced today.

The EEA shares its experience with the regional environmental centres of Moldova, Russia, Central Asia and the Caucasus. Transfer of AoA knowledge using learning-by-doing methods enriches the capacity of the regional environmental centres (REC) to develop further AoAs and use the knowledge on a regular basis in their regions and countries.

This report has been prepared by Regional Environmental Centre for the Caucasus as the part of the Assessment of Assessments (AoA) exercise that is aimed at providing an overview of the existing assessments of the state of the environment in Pan-European region and the main information sources used for providing a relevant picture to be considered at 7th Environment for Europe (EfE) Ministerial Conference to be held in Astana, Kazakhstan, 21–23 September 2011.

The report reflects on the status of environmental assessments within the South Caucasus countries and is based on a series of elements, such as country fiches, review templates of the major reports and assessments, and part of the virtual library that includes all major reviews and assessments covering the South Caucasus Countries.

## 2 Water resources and water-related ecosystems

This chapter assesses the regional needs, priorities and sustainable long-term mechanisms of the South Caucasus and focuses on one of the two main themes decided for the Astana Ministerial Conference – Sustainable management of water and water-related ecosystems.

There are several national organisations involved in water assessments in the South Caucasus, which provide statistical information on the environment; assess water resources; produce state of environment reports (SoER) and national communications on climate change; and assess surface-water quantity and quality, drinking-water quality and groundwater quantity and quality. This AoA is looking at assessments from 2005 onwards.

Parallel to national organisations numerous international organisations are involved in producing water assessments for the South Caucasus countries or the Kura-Aras river basin, including the European Union (EU), United Nations Development Programme (UNDP), Global Environment Facility (GEF), United States Agency for International Development (USAID) and Swedish International Development Cooperation Agency (SIDA). On a wider scale, several assessments have been prepared for the Eastern Europe, Caucasus and Central Asia region or Middle East region by organisations, such as United Nations Economic Commission for Europe (UNECE), European Commission (EC), the Food and Agricultural Organization of the United Nations (FAO) and the Organisation for Economic Cooperation and Development (OECD).

The main water assessments, which comprise part of the wider SoERs in the South Caucasus countries, include environmental performance reviews (EPR), SoERs, statistical yearbooks and 2nd National communications on climate change. In addition, several assessment reports have been prepared that solely focus on water. These reports include regional reports mainly focusing on the South Caucasus region, national reports targeted on Armenia, Azerbaijan or Georgia, or sub-national/local reports concentrated on pilot river basins. Most of these reports have been prepared by international organisations and are not part of regular assessment processes conducted periodically, but rather are project-based initiatives.

In addition to the assessment reports mentioned, water assessments were also conducted, which focus on specific thematic areas, including drinking-water supply, surface-water quality, groundwater resources, surface water quantity and so on.

Since the vast majority of the water assessments in the countries of the South Caucasus were initiatives of different international organisations and projects, the types of analysis covered varies significantly. Most of the organisations and projects have used in-house expertise in producing the assessment reports, and in some cases neither the framework for organising the assessment report nor the methodological approach are clearly specified.

Different types of analysis are covered by the water assessments. They include EPRs, SoERs, national communications, statistical reports, annual reports, water-quality norms and standards, and others. Despite the fact that these reports are considered assessments, the analysis in most of the reports is weak and there is a need to increase this in future.

The assessment reports included different sets and types of indicators. They can be grouped as follows: social indicators; drinking-water indicators; hydro-morphological indicators; physical-chemical quality indicators; biological-quality indicators; bacteriological-quality indicators; water-infrastructure indicators; water-monitoring data indicators; water-use and discharge and other indicators. The assessments have identified significant gaps in data

availability. The gaps mainly relate to surface- and groundwater-resources quantity and quality monitoring and drinking-water supply systems.

The main water issues in Armenia, Azerbaijan and Georgia, according to the assessment reports, include pollution of surface and groundwater resources; reduction of river flow and water shortage; policy, legal and institutional deficiencies; inadequate monitoring; low data reliability and accessibility; poor infrastructures; low awareness and inadequate capacities. Also, several regional issues have been identified that are common to all South Caucasus countries, such as different approaches, standards and methods for management of water resources between the countries; absence of a reference laboratory in the entire Kura river basin; and an absence of a harmonised classification scheme in the South Caucasus. The assessment reports have identified several emerging issues in water sector and options for future action taking into consideration the identified problems and pressures on water resources, such as the identification of water-use functions in transboundary watersheds; development of agreements on applicable maximum allowable concentrations of pollutants, principles and methods for calculation of a water-quality index; establishment of a common transboundary water cadastre; the development of a regional information system for the countries; and the development of an early warning system.

Based on the analysis, the following recommendations are made for the South Caucasus countries in this report:

- increase the sustainability of producing regular assessments by the national actors focusing on a limited number of reports, more policy relevant and underpinned by regular data flows and a gradual development of SEIS;
- make the assessment reports more relevant to the needs of the South Caucasus countries in support of improved management of water resources;
- bridge the decision-makers' needs for data and information through assessments which should be adapted to make them more efficient, useful and relevant;
- institutionalise the networks established in the course of production of the assessments. This will build corresponding capacities in the countries, establish common data platforms for subsequent assessments and promote regular data collection. In this context the networks established by projects are rarely institutionalised, and the international organisations implementing projects should re-consider their intervention at the project design/approval stage in terms of institutional sustainability.
- use spatial data sets and spatial tools in conducting assessments, including GIS and RS software, and EU related spatial data infrastructures, such as European Spatial Data Infrastructure, INSPIRE, and GMES.
- aim at addressing the entire DPSIR framework in the future in a more balanced way for proper analysis, modelling and/or scenario tools;
- improve accessibility of the assessments, including on-line access and translation into English or Russian.

### **2.1.1 Setting the scene**

The 7th Ministerial Environment for Europe Conference to be held in Astana, the Republic of Kazakhstan on 21-23 September 2011 has water and water-related ecosystems as one of its

two themes. This theme is of the high relevance for the South Caucasus region and this assessment of water assessments has to mirror this relevance.

This report has been prepared as part of preparation by the European Environment Agency (EEA) of Europe's Environment Assessment of Assessments (EE-AOA) report for the Astana (2011) Ministerial Conference Environment for Europe. It assesses the regional needs, priorities and sustainable long-term mechanisms of the South Caucasus and focuses on one of the two main themes of the Astana Ministerial Conference – Sustainable management of water and water-related ecosystems. Within this AoA exercise, a total of 41 reports and corresponding review templates were considered, which served as basis for development of this report.

In the future both European and national assessments may benefit from closer co-operation between European (EC, EEA and other) organisations, UNECE and countries. This would, among others things, ensure that, through the shared water assessment system, there is access to relevant national assessments that can be used for European assessment. Direct access may reduce data reporting and transfer costs and ensure that there is access to disaggregated data. It is assumed that such an assessment, being produced in cooperation between countries and international organisations (EEA, UNECE, etc.), would imply more ownership to assessments; closer connection between European and national assessments; mutual use of results – from national assessments into European assessments and from European and neighbouring countries into national assessments.

The South Caucasus countries lie within the Kura-Aras river basin. This spreads across the major part of eastern Georgia; more than 60 per cent of Azerbaijan, excluding the northeast of the country and the Lenkoran region; and the entire area of Armenia. In all three countries virtually all the water resources are considered to be part of national wealth, and the national legislation in the basin countries stipulates the basic principles of management, utilisation and protection of the water resources and water systems. All countries in the region are committed to managing water resources in a sustainable manner and this commitment is reflected in national development and environment policies and plans, including MDG-based poverty reduction and development strategies, and national environmental action programmes.

The main priority transboundary problems in water sector in the South Caucasus relate to variation and reduction in hydrological flows, deterioration of water quality and ecosystem degradation. Only through transboundary cooperation can these issues be successfully addressed. The cooperation includes information and data exchange, including the development of shared water-resources information systems, joint protection of shared water resources and development and implementation of transboundary agreements.

### **2.1.2 National organisations involved in water assessments**

**Statistical information on environment** in the South Caucasus is provided by national statistical agencies: the National Statistical Service (NSS) of Armenia, which reports directly to the president; the State Statistical Committee (SSC) of Azerbaijan; and the National Statistical Office of Georgia (NSOG). The main tasks of the statistical agencies is the state policy in the field of statistics, adoption of normative documents and coordination of activities of different statistical sectors.

In Armenia, in relation to water, NSS produces the following publications:



- monthly reports on the social and economic state of the country with a chapter *Monitoring of the environmental pollution* (including surface water quality). Number of copies printed: 50-75;
- annual statistical reports in Armenian, Russian and English, which also have chapters related to the state of the natural resources and environmental protection, including water. Number of copies printed: 500;
- annual statistical collection *The environment and natural resources of the Republic of Armenia* in Armenian and English. It includes sections on the quality of water bodies, water protection, financial resources and funding of water activities, emergency situations of natural and technological characters which impact the environment. The document contains many tables and illustrative materials, a dynamic range of data covering more than 20 years with changing trends in some parameters;
- statistical collection *Housing and municipal services in the Republic of Armenia*, which contains statistical data on the municipal water supply and sewage – for some parameters, the data covers a 20-year period.

In Azerbaijan the SSC produces the following publications on water issues:

- annual statistical yearbook on the environment – *Environment in Azerbaijan*. This trilingual publication – Azeri, English and Russian – with a print run of 150 copies contains statistical data on the population, land resources, forests, the protection and use of water resources, the protection of the atmosphere, waste, geological exploration and energy, environmental expenditures and international comparisons.
- regular bulletins on hazardous waste and air emissions in Azerbaijan. Environmental statistics are regularly uploaded to the website of the committee ([www.azstat.org](http://www.azstat.org)). Core environmental data are also published annually in the statistical yearbook.
- in 2006, the SCC published the findings of the statistical survey on the impact of environmental pollution on human health.

In Georgia NSOG produces following publications on water issues:

- annual statistical reports in Georgian and English, which have chapters related to the state of natural resources and environmental protection, including water. Chapter 8 of the statistical yearbook relates to natural resources and environmental protection, and includes statistical information on freshwater consumption and wastewater discharge into surface water bodies;
- annual statistical collection *Natural resources and environmental protection in Georgia* in Georgian and English. It includes sections on the quality of water bodies, water protection, financial resources and funding of water activities, emergency situations of a natural and technological character that impact the environment.

Overall **assessment of water resources** in all three South Caucasus countries is implemented by the environmental/nature protection ministries: the Ministry of Nature Protection (MNP) of Armenia; the Ministry of Ecology and Natural Resources (MENR) of Azerbaijan and the Ministry of Environment Protection (MEP) of Georgia.

In Armenia, MNP has broad mandate for natural-resource management and protection, which is fulfilled through various agencies of the MNP. Among other things the ministry implements strategic management, protection and allocation of water resources using water-use permits as the main enforcement tool. Through its website<sup>1</sup> the Ministry of Nature Protection provides information on the water resources of the country. However, the information is fragmented, not categorised and not comprehensive. Hence, the following information is available in the section on water: water use and discharge in the republic for

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<sup>1</sup>) Available from [http://www.mnp.am/index\\_eng.htm](http://www.mnp.am/index_eng.htm)

2008, water use permits issued by the Water Resources Management Agency in 2008 and 2009, monitoring results of the pollution of surface waters of the country, level of Lake Sevan, and a report from the State Environmental Inspectorate on violations of water-use and discharge conditions.

In Azerbaijan, MENR circulates bulletins with water-monitoring results. These bulletins are submitted to the president's administration, the cabinet, parliament, selected ministries, other public entities and municipal authorities. Monitoring data are uploaded to the MENR website<sup>2</sup>. In addition, monitoring organisations of Azerbaijan submit annual reports to MENR on the results of monitoring activities for air, surface waters, soils, radioactivity and biodiversity. These reports are available to the public and can be easily downloaded from the MENR website. MENR prepares monthly uploads on its website covering brief reviews of monitoring activities conducted by its monitoring organisations and other subordinated institutions.

In Georgia MEP is in charge of protection and management, as well as control and monitoring, of water resources. The ministry's website<sup>3</sup> contains information on water resources of Georgia. The country's hydro-geographical network is presented on the website, including surface- and underground-water resources, and thermal- and mineral-water springs. The temporal and spatial distribution of water resources is also analysed in the information contained on the website. Details of forecast future supplies and exploitation are also provided, including groundwater storage in the lower slopes of Great Caucasus and on the Akhalkalaki and Marneuli plateau. The main pollutants of surface water are identified as the communal sector – sewerage of towns and populated areas, industry and solid waste landfills. Finally, the website contains information on the wastewater treatment activities implemented only in the Tbilisi-Rustavi region.

In Armenia, Azerbaijan and Georgia the environmental ministries are also in charge of the preparation of SoERs, some of which were prepared with the assistance of international organisations. In addition, all three environmental ministries are responsible for preparation of national communications on climate change. The 2nd National communications of Armenia, Azerbaijan and Georgia were prepared by these ministries in 2010.

Information on surface-water quality is provided by the monitoring organisations of the South Caucasus countries: Environmental Impact Monitoring Centre (EIMC) under the MNP of Armenia; National Department of Environmental Monitoring (NDEM) under the MENR of Azerbaijan and National Environmental Agency (NEA) under the MEP of Georgia.

***Text Box 1: Monitoring surface-water quality in the South Caucasus***

Since 2005 the EIMC in Armenia conducts monitoring at 131 sampling points throughout the country, and annually takes 1200 samples from surface-water resources. For each collected sample analysis of up to 48 parameters is being conducted. EIMC publishes monthly and annual bulletins in Armenian, which contain data on surface-water quality. Because of the economic crisis, activities included in the Action Program for Environmental Monitoring in 2007-2011, according to the Concept on the State Environmental Monitoring approved by the Armenian Government, have not been implemented. Thus, the efforts of the EIMC to introduce a biological monitoring system in country's rivers and lakes has been unsuccessful and only physical-chemical monitoring takes place at the moment. This is despite the fact that in 2009-2010 a complex of equipment for biological monitoring of surface water and bottom

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<sup>2</sup>) Available from <http://www.eco.gov.az>

<sup>3</sup>) Available from <http://moe.gov.ge>

sediments was obtained and installed within the framework of European Union (EU) project Transboundary Management of Kura River - Phase II, Armenia, Azerbaijan and Georgia. With the equipment provided, about 20 biological monitoring parameters can be defined, which will allow the calculation of an index of biological quality of rivers, as one of the three main biological indicators of water. However, the installed equipment has not been used to due lack of methodology and properly trained personal.

In Azerbaijan, NDEM monitors surface water quality in 50 observation points in 42 water bodies – 27 rivers, 4 water reservoirs, a port, and 10 lakes. The central laboratory of MENR is supplied with equipment to conduct hydro-biological monitoring. Since 2006, NDEM has been taking water samples in transboundary segments of the Kura and Aras rivers near the border with Georgia. NDEM submits annual reports to MENR on the results of its monitoring activities for air, surface waters, soils, radioactivity and biodiversity. MENR prepares monthly uploads to its website covering brief reviews of monitoring activities conducted by NDEM and other subordinated institutions. NDEM receives monitoring data on a regular basis from other monitoring institutions in the country. Data are submitted according to a special form approved by the MENR. In addition, it receives statistical data for checking reported by enterprises on their emissions into the atmosphere, discharges into water bodies and the generation of hazardous waste. In addition to NDEM, in Azerbaijan there is also a Caspian Complex Monitoring Administration (CCMA) laboratory, which circulates a weekly bulletin with monitoring results to 14 public authorities. Its monthly monitoring bulletin and a summary of its annual report are uploaded to the MENR website.

In Georgia, NEA carries out surface-water quantity and quality monitoring. The number of water-quality observation points on the rivers and lakes is 41 sites on 24 water bodies. The current network provides data on a total of 33 chemical parameters. The presence of heavy metals is monitored only in some rivers. In 2009, pesticides measurement was introduced at some observation points. The same year, measurements were extended to three to four microbiological parameters at eight points. The NEA publishes monthly and annual bulletins on surface-water quality in Georgia.

Joint monitoring of surface-water quality and bottom sediments is being implemented in transboundary Araks river between Armenia and Iran. In addition, within the framework of the EU project Transboundary management of Kura river - Phase II, Armenia, Azerbaijan and Georgia joint monitoring of surface-water quality in the transboundary rivers basins Debed-Khrami and Alazani between Armenia, Azerbaijan and Georgia is underway.

Surface-water quantity is being monitoring with hydro-meteorological services of the three countries: the Armenian State Hydro-Meteorological Service (ASH) of the Ministry of Emergency Situations; the National Hydro-meteorological Department (NHD) of the MENR of Azerbaijan and NEA under the MEPNR in Georgia. These hydro-meteorological services are the only authorized bodies in their respective countries to carry out surface-water quantity monitoring among other hydro-meteorological services. They operate hydrological stations (centres) and hydrological observation posts – gauging stations. The data are collected at each point twice a day. At a lesser frequency, a discharge measurement is made at each point – about 30 observations annually. The monitoring activities consist of water level and flow, water and air temperature, and precipitation. With the data collected from all observation points, the ASH, NHD and NEA prepare annual reference books. All data are stored in paper or electronic databases which are not available on-line in any of the South Caucasus countries. With limited resources the following measurements and analyses are not implemented in ASH, NHD and NEA: water turbidity and solid substances; snow pack; flood forecast; avalanche forecast; semi-annual survey of cross-section at each observation point; and reservoirs and lakes analyses – sediments, deformations, dam stability, etc.

Different organisations in the South Caucasus countries possess information on drinking-water quality. In Armenia it is the State Committee on Water Systems (SCWS) under the Ministry of Territorial Administration and the State Hygiene and Anti-Epidemiological Inspectorate (SHA EI) of the Ministry of Health; in Azerbaijan it is the Centre for Epidemiology and Hygiene (CEH) under the Ministry of Health; and in Georgia it is the Ministry of Agriculture (MOA).

In Armenia SCWS is the state authorized body for water-systems management and is responsible for the management and operation of the state owned drinking-water supply, irrigation-water supply, drainage structures and public wastewater collection, treatment and disposal facilities. On its website, SCWS uploads numerous assessment reports, including the annual report on the activities in the fields of drinking-water supply, wastewater treatment, irrigation-water supply and management of water infrastructure – reservoirs, other hydro-technical structures), etc Information on the performance indicators of the five drinking-water supply and four irrigation-intake companies is provided, including a financial-economic analysis. In addition to SCWS, the SHA EI, under the Ministry of Health, performs the actual monitoring of drinking-water quality and holds corresponding database on sanitary violations of drinking-water quality.

In Azerbaijan the CEH, under the Ministry of Health, monitors surface waters used for the drinking water-supply and for recreational purposes. The centre manages a database with the results of monitoring air quality in residential areas and indoors, quality of bathing water and water used as drinking-water, soil quality in residential areas, noise, vibration and other physical impacts, radiation exposure and food quality. The centre has recently started developing a database that is expected to help in assessing the impact of environmental pollution on human health. Data from NDEM on air, water and soil quality are being linked with morbidity data. The ministry of health regularly uploads information on the quality of drinking and bathing water in the country to its website ([www.mednet.az](http://www.mednet.az)).

In Georgia the MOA fulfils a key function due to its responsibility for monitoring drinking-water quality. The responsibility of monitoring of the drinking-water quality comes under the Food Safety, Veterinary and Plant Protection Department of the Ministry of Agriculture, which organises tenders for analysis of the drinking-water quality by accredited laboratories. Emergency situation results are reported to the municipalities and health risks to the Public Centre for Diseases of the Ministry of Health, Labour and Social Protection (MHLSP) and even to the cabinet when necessary.

In the South Caucasus countries, no groundwater quantity and quality monitoring has been carried out since 1990s except in Azerbaijan, where the Geological Exploration Service (GES) under the MENR, publishes a monthly bulletin on groundwater and submits an annual report on the results of its groundwater-monitoring activities. It maintains a groundwater cadastre with 18 types of geo-referenced information on over 2,500 boreholes in the country. The GES has a database about ground water quality in Azerbaijan. MENR updates its State Information and Archive Database (SIAD) on environmental protection and the use of natural resources. The hydro-meteorological and geological databases, together with the environmental monitoring bulletins and monthly and annual reports of the main departments and regional environmental committees of the ministry provide the basis for the database. Many data sets and much information stored in the SIAD are not in electronic form and are not easily accessible to users, including the general public.

Table below summarizes the main agencies and institutions involved in performing national water-related assessments in Armenia, Azerbaijan and Georgia.

**Table 2.1 Agencies involved in National Assessments**

Type of assessment/data	Armenia	Azerbaijan	Georgia
Environmental statistics	NSS	SSC	NSOG
Water resources assessments	MNP	MENR	MEP
State of environment reports	MNP	MENR	MEP
Surface water quality	EIMC	NDEM, CCMA	NEA
Surface water quantity	ASH	NHD	NEA
Drinking water	SCWS, SHAEI	CEH	MOA
Groundwater quantity and quality	N/A	GES	N/A
UNFCCC 2 <sup>nd</sup> national communication	MNP	MENR	MEP
Environmental performance review	UNECE	UNECE	UNECE

### 2.1.3 Overview of other organisations involved in water assessment

There are no regional institutions involved in water assessment in the South Caucasus countries. However, since 2005 several donor-funded water-management projects have been implemented in the Kura-Aras basin.

The USAID Transboundary integrated water-resources management (Armenia, Azerbaijan and Georgia) project was implemented in 2005-2008. Among other things it aimed at improvement of the institutional framework for transboundary basin management and the development of scientific potential for data management.

The UNDP)/Swedish International Development Cooperation Agency (SIDA) Reducing transboundary degradation in Kura-Aras river basin (Armenia, Azerbaijan and Georgia) project was implemented in 2004-2005 and aimed at assessing the institutional and technical needs for integrated river-basin management and planning.

The UNDP/GEF Reducing transboundary degradation in Kura-Aras river basin (Armenia, Azerbaijan, Georgia and Iran) project was implemented in 2005-2007 and aimed to promote transboundary cooperation, support integrated river-basin planning, provide for improvements of water quantity/quality at specific river sections and promote reforms in economic sectors causing transboundary degradation.

The EU project Transboundary river management Phase II – Kura river basin – Armenia, Azerbaijan, Georgia is being implemented in 2008-2011 and, among other things, aims to conduct assessment and surveys, implement monitoring, promote information management, and ensure institutional capacity and training.

Table below summarizes the water-related sub-regional assessments about the South Caucasus or Kura-Aras basin countries, developed since 2005 within the above-mentioned projects.

**Table 2.2 Water-related Sub-regional assessments**

Title of the assessment	Institution	Geographic coverage	Publication year
Surface water quality monitoring guideline documents for decision makers	EU	Armenia, Azerbaijan, Georgia	2010
Analysis of the baseline situation in the Kura-Aras river basin	EU	Armenia, Azerbaijan, Georgia	2009

Groundwater resources of the Kura-Aras river basin	UNDP/GEF	Armenia, Azerbaijan, Georgia	2007
Analytical assessment of the laboratories	USAID	Armenia, Azerbaijan, Georgia	2006
Assessment of the scientific and analytical capacity	USAID	Armenia, Azerbaijan, Georgia	2006
Existing databases, data-collection techniques and data management, monitoring and standards	UNDP/SIDA	Armenia, Azerbaijan, Georgia	2005
Legal and institutional framework for the water sector in Armenia, Azerbaijan, Georgia and Iran	UNDP/GEF	Armenia, Azerbaijan, Georgia, Iran	2005
Water policy of Armenia, Azerbaijan and Georgia	UNDP/SIDA	Armenia, Azerbaijan, Georgia	2005
Water quality in the Kura-Aras river basin	UNDP/GEF	Armenia, Azerbaijan, Georgia, Iran	2005

In addition to sub-regional assessments, several wider, regional water-related assessments have been carried out since 2005, which have included the South Caucasus region. These assessments were conducted by the EU, UNECE, FAO and OECD.

The EU-funded Water governance for western Eastern Europe, Caucasus and Central Asia (EECCA) (Armenia, Azerbaijan, Georgia, Ukraine, Belarus, Moldova) project was implemented in 2008-2010. Its overall objective was to contribute to the reduction of pollution, to fair sharing and effective use of scarce water resources, and to the improvement of the quality of shared water resources such as transboundary rivers. Within the project a new system of proposed system of water-quality standards was proposed for the western EECCA countries.

Several regional assessments were prepared by UNECE on the EECCA region which mostly relate to various aspects of implementation of the UNECE Water Convention and its Protocol on water and health, including topics such as transboundary-water cooperation, transboundary flood-risk management, river basin commissions and first assessment of transboundary rivers, lakes and groundwater.

In 2008, FAO published *Irrigation in the Middle East region in figures – Aquastat survey*.

At their meeting in Almaty in October 2000, EECCA ministers of environment, finance, and economy, ministers and senior representatives from several OECD countries, as well as senior officials from international financial institutions (IFI), International organisations, non-governmental organisations and the private sector recognised the critical condition of the urban water supply and sanitation sector in EECCA and endorsed guiding principles for the reform of the urban water-supply and sanitation sector in the newly independent states (NIS). Participants requested the OECD Environmental Action Plan (EAP) Task Force to assess progress in implementing these guiding principles and, thus, in 2007 OECD prepared *Financing water supply and sanitation sector in EECCA countries, including progress in achieving water-related Millennium Development Goals (MDGs)*, a report to serve as an input paper for the Environment for Europe Conference in 2007.

The table below summarizes the water-related regional assessments developed since 2005, which, among other countries, include the South Caucasus region.

**Table 2.3 Water-related Regional Assessments**

<b>Title of the assessment</b>	<b>Institution</b>	<b>Geographic coverage</b>	<b>Publication year</b>
Effects of air pollution on rivers and lakes	UNECE	Europe, EECCA, Balkans, Russia	2010
Proposed system of water-quality standards	EC	Armenia, Azerbaijan, Georgia, Ukraine, Belarus, Moldova	2010
Regional report on the status of implementation of the protocol. The protocol on water and health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes	UNECE	Europe, EECCA, Balkans, Russia	2010
Report on national policy dialogues and vision for the future developments of the dialogues	UNECE	EECCA, Russia	2010
River basin commissions and other institutions for transboundary water cooperation capacity for water cooperation in Eastern Europe, Caucasus and Central Asia	UNECE	EECCA	2009
Transboundary flood risk management. Experiences from the UNECE region	UNECE	Europe, EECCA, Balkans, Russia	2009
Irrigation in the Middle East Region in figures - Aquastat survey	FAO	Middle East Region, including Armenia, Azerbaijan and Georgia	2008
Financing water supply and sanitation sector in EECCA countries, including progress in achieving water-related MDGs	OECD	EECCA	2007
Our waters: joining hands across borders - first assessment of transboundary rivers, lakes and groundwater	UNECE	Europe, EECCA, Balkans, Russia	2007
Transboundary water cooperation: trends in the newly independent states	UNECE	EECCA, Russia	2006

## **2.2 Overview of water assessments**

### **2.2.1 Water assessments as part of wider SoERs**

Environmental performance reviews (EPRs) in the South Caucasus countries are prepared with the UNECE support. Their frequency varies by countries – in Azerbaijan and Georgia in 2010 the second EPRs were published, whereas in Armenia only one EPR was produced back in 2000.

Armenia’s latest EPR, published in 2000, consists of 13 main chapters. Chapter 8 deals with the management of water resources and quality. The main outcome of the EPR is the recommendations, which, however, are outdated given recent extensive reforms in the legal and institutional frameworks of the Armenian water sector, including adoption of a new water code (2002), national water policy (2005), national water programme (2006), and more than 120 new regulations and by-laws since 2002. Thus, a second EPR for Armenia is needed.

The 2<sup>nd</sup> EPR of Azerbaijan was published in 2010. It consists of an introduction and nine main chapters. Chapter 6 deals with the sustainable management of water resources and protection of the Caspian Sea. In total, the EPR consist of 194 pages, of which 19 relate to water. The water chapter includes analytical information on water quantity, water quality, groundwater, hotspots, investments, policies and strategies with reference to recent developments in cooperation on transboundary rivers. Recommendations, which were elaborated by the expert group, peer reviewed, discussed with a high-level delegation from Azerbaijan and adopted by the UNECE Committee on Environmental Policy on November 2, 2010, point to a legal and policy-making framework and sectoral integration mechanisms; compliance and enforcement mechanisms; information, public participation and education; implementation of international agreements and commitments; economic instruments and expenditures for environmental protection; environmental pollution prevention; sustainable management of water resources and protection of the Caspian Sea; waste management; and forestry, biodiversity and protected areas.

Georgia's 2<sup>nd</sup> EPR was also published in 2010. It consists of 9 main chapters. Chapter 6, on water, addresses water-quantity and quality issues, water use and the anthropogenic impact on quality. It also includes sections on permits and licenses, EIA procedure, protection of the Black Sea and legal and institutional frameworks. The main outcome of the EPR is the recommendations, which included a policy-making framework for environmental protection and sustainable development; compliance and enforcement mechanisms; information, public participation and education; implementation of international agreements and commitments; economic instruments and expenditures for environmental protection; sustainable management of water resources and protection of the Black Sea; waste management; risk management of natural and technological/anthropogenic hazards; and forestry, biodiversity and protected areas.

Despite the fact that the South Caucasus countries are obliged to produce SoERs according to their obligations under the Convention of Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Article 5.4), no regular SoERs are being produced in Armenia, Azerbaijan and Georgia. In addition, in none of the South Caucasus countries is a legal and institutional framework established for producing regular environmental assessment reports, as recommended by the *Guidelines on the preparation of governmental reports on the state and protection of the environment* and the *Guidelines for the preparation of indicator-based environment assessment reports in Eastern Europe, Caucasus and Central Asia*, which were endorsed at the 2003 Kiev and 2007 Belgrade Ministerial Conferences Environment for Europe, respectively.

Thus, the latest SoER in Armenia was published in 2003, developed in cooperation with UNECE and published with the financial support of the EU. In Azerbaijan the latest SoER was prepared with the support of GTZ back in 1998. Thus, both reports, given the water-sector developments in Armenia and Azerbaijan since then, are out of date and do not reflect the current situation leading to an urgent need to develop new SoERs for the two countries.

Unlike Armenia and Azerbaijan, Georgia's SoER – still in the process of approval – covers the period 2007-2009. The section on water protection contains four chapters on water-resource use, Black Sea coastal waters, water protection, and groundwater. The section on water protection roughly comprises 21 per cent of the entire report, while about 42 per cent of the total report of some 202 pages relates to water. The SoER includes a detailed assessment of sewerage systems serving urban areas, describes large-scale projects aimed at improving the sewerage networks and recent developments in installing wastewater-treatment systems in many towns, and assesses the impact of landfills on water resources. The report also includes



water-quality monitoring information as well as a section on cooperation with neighbouring countries with the aim of improving the water-quality monitoring system of surface-water bodies. Regular joint monitoring of transboundary rivers – the Kura, Khrami, Debed and Alazani – conducted together with Azerbaijan and Armenia, and subsequent periodic meetings to exchange information are analysed in the report.

The national statistical agencies of all three South Caucasus countries prepare statistical yearbooks, which include a chapter on natural resources and environment. In the statistical yearbook of Armenia this chapter accounts for roughly 2.5 per cent of the entire book, and water-related statistics less than 1 per cent of the total volume. In addition to this, the National Statistical Service publishes an annual statistical report, *Environment and natural resources in the Republic of Armenia*, which includes data and time series of data since 2004. The latest edition was published in 2010. About 28 per cent of this 154-page statistical report relates to water. In Azerbaijan, the latest statistical yearbook, which includes annual data and time series since 2007, was published in 2010. About 2 per cent of the report's 150 pages relates to water. In Georgia, the latest statistical yearbook was published in 2010. Significantly, the data presented were calculated by using the methodology, classifications, nomenclature and concepts recommended by the United Nations and its specialized institutions, the Statistical Office of the European Community – Eurostat – the OECD, etc. Due to this, it is possible to compare Georgian and international indicators. The chapter on natural resources and environmental protection makes up roughly 3 per cent of the yearbook, and water-related statistics less than 1 per cent of the yearbook.

As party to the United Nations Framework Convention on Climate Change (UNFCCC) all South Caucasus countries periodically produce national communications. The latest are the *2<sup>nd</sup> National communications to UNFCCC (SNC)* produced by Armenia, Azerbaijan and Georgia in 2010.

About 7.5 per cent of the SNC of the Republic of Armenia is dedicated to water resources, not only from the point of view of adaptation. The SNC of Azerbaijan provides information on climate change impacts on water, on the assessment of vulnerability of water resources to climate change and adaptation measures.

In Georgia's SNC, prepared in 2010, about 10 pages of the 240-page report – about 4 per cent – relate to water. The report includes forecasts runoff changes in the Rioni river, in the Black Sea coastal zones; projections on water vulnerability to climate change for the Alazani and Iori rivers in the Dedoplistskaro region, and for the Tskhenistskali river in Kvemo-Svaneti region. Finally, another section of the report includes an assessment of glaciers, including forecasts on projected retreats, which are currently undergoing a process of intensive degradation.

Table below summarizes the national-level water assessments as parts of wider SoE reports in the South Caucasus described above, their content and main addressed topics.

**Table 2.4 Water assessments as part of wider SoE reports**

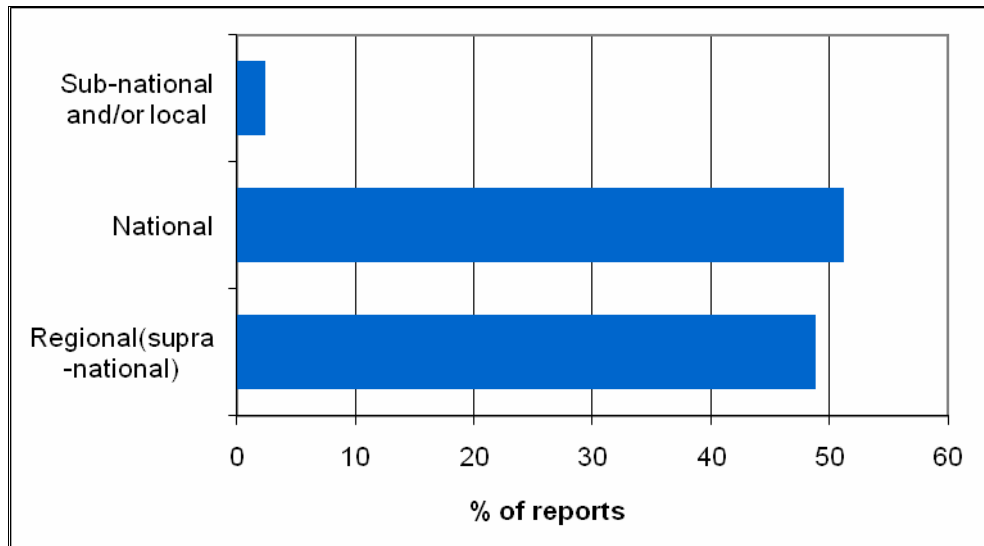
		EPR water management chapter	SoER 2007-2009 Water protection	2 <sup>nd</sup> national communication to UNFCCC	Statistical yearbook
Pages	Armenia	19/216	-	10/137	6/608
	Azerbaijan	19/194	-	4/83	3/150
	Georgia	14/255	42/202	10/240	56/697

		EPR water management chapter	SoER 2007- 2009 Water protection	2 <sup>nd</sup> national communication to UNFCCC	Statistical yearbook
water (per cent of total)	Armenia	9 per cent	-	7.5 per cent	1 per cent
	Azerbaijan	10 per cent	-	5 per cent	2 per cent
	Georgia	6 per cent	20.8 per cent	4 per cent	8 per cent
Type	Armenia	Chapter	-	Chapter	Statistical
	Azerbaijan	Chapter	-	Chapter	Statistical
	Georgia	Chapter	1 section with 4 chapters	Chapter	Statistical
Frequency	Armenia	Irregular	-	Periodic	Annual
	Azerbaijan	Periodic	-	Periodic	Annual
	Georgia	Periodic	Annual	Periodic	Annual
Water availability	Armenia	x	-	x	x
	Azerbaijan	x	-	x	x
	Georgia	x	-	x	x
Water demand	Armenia	x	-	x	x
	Azerbaijan	x	-	-	x
	Georgia	x	x	-	x
Water quantity impact	Armenia	x	-	x	-
	Azerbaijan	x	-	x	-
	Georgia	x	-	x	-
Water quality - subst.	Armenia	x	-	-	x
	Azerbaijan	x	-	-	-
	Georgia	x	x	-	x
Water quality – nutrients	Armenia	x	-	-	-
	Azerbaijan	x	-	-	-
	Georgia	x	x	-	x
Water quality - hazardous substances	Armenia	x	-	-	x
	Azerbaijan	-	-	-	-
	Georgia	-	x	-	-
Ecological status	Armenia	-	-	-	-
	Azerbaijan	x	-	x	-
	Georgia	-	-	-	-
Biology	Armenia	x	-	-	-
	Azerbaijan	-	-	-	-
	Georgia	-	x	-	-
Wastewater treatment	Armenia	x	-	-	x
	Azerbaijan	-	-	-	-
	Georgia	x	x	-	x
Wastewater emissions	Armenia	x	-	-	x
	Azerbaijan	x	-	-	x
	Georgia	x	x	-	x
Drinking water	Armenia	x	-	-	x
	Azerbaijan	x	-	-	x
	Georgia	x	x	-	x

## 2.2.2 State of water reports

### 2.2.2.1 National reports

The assessments prepared since 2005 solely focus on water. They are regional – mainly focusing on the South Caucasus region, national – focused on Armenia, Azerbaijan or Georgia, or sub-national/local – targeted to pilot river basins. For this AoA exercise, a total of 41 reports and corresponding review templates were considered, mostly regional and national-level assessments (Figure 2.1).



**Figure 2.1: Geographical coverage of the assessment**  
*Source: AoA portal review template*

It should be noted that these reports come from project-based initiatives rather than being part of regular assessment processes conducted periodically. Thus, the scope and nature of these assessments varies significantly, taking into consideration the in-house expertise and interests of the given project/organisation. It should be noted that no assessment reports focusing solely on water have been produced in Azerbaijan since 2005, thus this section presents the assessment reports prepared for Armenia and Georgia only.

*Vulnerability of Water Resources in the Republic of Armenia under Climate Change (2009)*, prepared within the UNDP Armenia 2<sup>nd</sup> national communication to the UNFCCC project, assessed the current and forecast vulnerability of water resources to global climate change.

The State Water Cadastre Information System's *Status report and recommendations* was prepared within the USAID programme for institutional and regulatory strengthening of water management in Armenia in 2008. It included an assessment of activities for construction and deployment of the State Water Cadastre Information System of Armenia, and presentation of further recommendations for improvement.

Another report prepared in 2008 within the USAID water programme in Armenia is *Annual report on Armenia's national water programme: status, activity and issues (2008)*. This sets performance indicators to measure the progress in implementation of the measures of Armenia's national water programme.

*Model guidelines for river-basin management planning in Armenia* was prepared within the USAID programme for institutional and regulatory strengthening of water management in

Armenia in 2008. It assesses the water balance, the water economic balance and floods in Meghritget pilot river basin, classifies surface- and underground-water resources according to quality and assesses the minimum ecological flow. Based on the assessment, guidelines for river-basin management planning have been proposed for the entire country.

*Baseline conditions and pressures on for IWRM in the Marmarik river basin of Armenia* was prepared within the UNECE component of the EU Water Initiative National Policy Dialogue process in Armenia in 2007. It assesses the achievements and bottlenecks on the introduction of integrated water-resource management (IWRM) in Armenia and tests on Marmarik pilot river basin. The assessment was prepared as an input to the Government of Armenia's resolution on model guidelines for development of integrated river basin management plans.

*Proposed system of water-quality standards for Georgia* was prepared within the EU's Water Governance for Western EECCA project in 2009. The report provides an overview of the current system of surface-water quality standards in Georgia, and brings parallels with the surface-water quality standards systems in the EU's International Convention for Protection of Danube River region, Moldova and the UNECE region. Detailed analysis of the current system of surface-water quality standards in Georgia is made and a new system of water-quality standards is proposed. The proposal is to implement the use-based classification system as the first task in implementing the reforms required. The proposed system was based on the system developed by an OECD project for Moldova, and the report incorporates the core features of the OECD project's proposal, which has been adapted to the local conditions.

*Identification of the Legal and Institutional Needs for Accession and Implementation of the UNECE Water Convention by Georgia* was prepared within the UNECE-Organisation for Security and Cooperation of Europe (OSCE) project in 2009. OSCE and UNECE have started a joint project under the environment and security (ENVSEC) umbrella to support Georgia in the ratification and implementation of the UNECE Transboundary Water Convention as well as support the development of a bilateral agreement on the management of transboundary waters shared by Georgia and Azerbaijan, including the establishment of a joint body. Thus within the assessment, measures for meeting national environmental-policy objectives and legislative requirements were analysed, and incremental measures for bilateral and multilateral cooperation, joint monitoring and assessment, and the exchange of information between the riparian countries were identified. The report provides indicative cost estimates for Georgia to implement the requirements of the UNECE Water Convention.

*Financing strategy for the urban water-supply and sanitation sector in Georgia* was prepared by OECD Task Force in 2006. The report includes a detailed assessment of the existing situation in the Georgian water- and wastewater- (W&WW) treatment sectors and analysis of water supply and wastewater collection in the capital city of Tbilisi. The baseline scenario analysis identifies the possibility of gradual elimination of financial gap for the W&WW sectors. Finally, the report also assesses the MDGs for the W&WW sector and their achievement through the proposed costing approach.

*Assessment of coastal-water resources and watershed conditions at Fort Pulaski National Monument, Georgia* was prepared in 2006 by the National Park Service of the United States Department of the Interior. The assessment provides descriptive information on the park and hydrological information, including details of groundwater and aquifers of the park. The section of the assessment on water resources includes analysis of water quality, water-quality impairments and major sources of pollutants. Among other water-resource issues of concern, the report assesses water withdrawals, species of concern, anthropogenic alterations, as well as coastal erosion and shoreline changes.

The above-mentioned reports have identified some major data and information gaps, such as the absence of actual groundwater-monitoring and biological-monitoring data, lack of surface-water quantity and quality data in small ungauged river basins, absence of up-to-date hydrological data from hydrological posts that are no longer operational, absence of surface-water quality reference sites, and insufficient information on the exact volumes of actual water use and water return after use.

With regards to indicators, the assessment reports included the following: biological, physical-chemical and hydro-morphological indicators of surface waters, as well as indicators related to vulnerability to hydro-meteorological hazards, data populated in the water cadastres and water-supply services.

#### **2.2.2.2 Regional reports**

*Analysis of the baseline situation in the Kura-Aras river basin* was prepared within the EU funded Transboundary management of the Kura river - Phase II, Armenia, Azerbaijan and Georgia project in 2009. It evaluates the current status of the available data and information on water resources in Kura river basin organized according to the DPSIR framework.

*Existing databases, data-collection techniques and data management, monitoring and standards*, prepared within the UNDP/SIDA Reducing transboundary degradation of the Kura-Aras river basin project in 2005, reviews the existing surface- and groundwater-quantity and quality databases, data collection and data-management techniques and systems of the South Caucasus and presents recommendations on improvement.

*Legal and institutional framework for water sector in Armenia, Azerbaijan, Georgia and Iran*, prepared within the UNDP/GEF Reducing transboundary degradation of the Kura-Aras river basin project in 2005 analyzes and assesses the legal and institutional framework of water management in the Kura-Aras basin and provides policy recommendations. Based on the assessment, the study proposed certain institutional improvements, improvements in legal frameworks and sets a pathway for the introduction of IWRM principles and approaches.

*Water policy of Armenia, Azerbaijan and Georgia*, prepared within the UNDP/SIDA Reducing transboundary degradation of the Kura-Aras river basin project in 2005, assesses the existing policy frameworks in Armenia, Azerbaijan and Georgia and identified the policy needs for integrated river-basin planning and management. Based on the assessment conducted, the report proposed a pathway for development of water policy in line with the EU Water Framework Directive and integration of water policy into general socio-economic and long-term development policy.

The above-mentioned reports have identified some major data and information gaps, such as the short time-series of existing water-quantity and quality data and absence of key monitoring data. With regards to indicators, the assessment reports included the surface- and groundwater-quality standards, as well as drinking water standards.

### **2.3 Thematic Water Assessments**

#### **2.3.1 National assessments**

The national-level assessments provided below, as in the section above, solely focus on water. However, these assessments focus on specific thematic areas, including drinking-water supply, surface water quality, groundwater resources, surface water quantity and so on.

The Environmental Impact Monitoring Centre of the Ministry of Nature Protection of Armenia publishes monthly and annual bulletins in Armenian, which contain data on surface-water quality. The bulletin provides monthly and annual information of pollution of surface waters in the country. It includes detailed analysis of surface-water pollution – exceeding of maximum allowable concentrations – in all river basins of Armenia; a list of parameters defined in the water samples; and criteria for control of surface water resources.

The Armenian State Hydro-Meteorological Service of the Ministry of Emergency Situations of Armenia publishes annual hydrological reference books that include information on surface-water quantity in the country. The hydrological yearbook is based on information obtained from the seven currently-operating hydrological stations/centres and 92 hydrological observation posts/gauging stations throughout the country.

*The study for improvement of rural water-supply and sewage systems in the Republic of Armenia* was prepared in 2009 within the framework of a project funded by the Japanese International Cooperation Agency (JICA). The assessment aimed to formulate an improvement plan for water-supply systems and transfer the knowledge of the plan formulation to Armenian counterparts through participation in the study process.

*Water utility service-quality monitoring for water systems in Armenia* was prepared in 2008 within the USAID programme for institutional and regulatory strengthening of water management in Armenia. It aimed at setting service-quality performance indicators to evaluate the performance of water-supply service through monitoring.

The Ministry of Ecology and Natural Resources of the Republic of Azerbaijan periodically publishes bulletins on surface-water quality. The brochure includes information on water quality from 50 observation points in 42 water bodies – 27 rivers, 4 water reservoirs, a port, and 10 lakes) – related to hydrology physical and chemical properties; basic ions; biogenic cases and specific pollutants. In addition, special bulletins are prepared on the monitoring results from transboundary rivers, which are disseminated through mass media and are placed on the internet.

The National Environmental Agency of the Ministry of Environment Protection of Georgia publishes monthly and annual bulletins in Georgian, which contain data on surface-water quality and quantity. The bulletin provides monthly and annual information on pollution of surface waters in the country. It includes detailed analysis of surface-water pollution – exceeding of maximum allowable concentrations – in 22 large rivers of Georgia; lists the parameters defined in the water samples; and criteria for control of surface water resources.

*Fisheries and aquaculture in Georgia – current status and planning* was prepared by FAO in 2006 within the Strengthening the capacity of the Department of Fisheries to support fisheries sector rehabilitation technical assistance project. The aim of the assessment was to inform those interested in fisheries and aquaculture in Georgia about the current situation with regard to fishery resources and their utilisation in the country. Secondly, the report provides an example of a consultative and participative policy- and legal-framework development process. A review of the current status of fisheries resources and utilization in Georgia is presented in the first part of the report. The second part contains the final version of the Master plan for fishery sector development in Georgia, 2005–2020, while the third part provides an action plan for fishery-sector management and development in Georgia, 2005–2008. The final draft version of the Law of Georgia for Fisheries and Aquaculture is presented in the fourth part.

*Integrated Coastal Zone Management (ICZM) Strategy for Georgia* was prepared in 2009, within the EC-funded Environmental collaboration for the Black Sea project, which was

implemented in Georgia, Moldova, Russia and Ukraine. The report provides analytical information on the ICZM process in Georgia, assesses the natural and socio-economic factors related to the coast. It further develops the vision, goals and objectives of the proposed ICZM strategy, and identifies the ICZM principles, including coastal protection and conservation, as well as land and resource use.

The above-mentioned reports have identified some major data and information gaps, such as insufficient monitoring data in the field of overall water-resource management, and absence of proper drawings of the existing water-supply facilities in communities in the field of sectoral management of water resources.

With regard to indicators, the assessment reports included the following: bacteriological-quality indicators; social-security indicators; weighted average cost of capital; water-utility service quality indicators; hydrology indicators; physical-chemical indicators and others.

### **2.3.2 Thematic regional assessments**

*Surface-water quality monitoring: guideline document for decision makers* was prepared within the framework of the EU funded project Transboundary management of Kura River - Phase II - Armenia, Azerbaijan and Georgia in 2010. Based on the assessment conducted within the study, a guideline for surface-water quality monitoring practitioners was developed, to bridge the gap between decision makers' needs and water-quality data and information generated by monitoring programmes.

*Groundwater resources of the Kura-Aras river basin* was prepared in 2007 within the UNDP/GEF project Reducing transboundary degradation of the Kura-Aras river basin. The report assesses the groundwater reserved in the Kura-Aras river basin, identifies groundwater-quantity and quality issues, institutional needs and proposes a new programme for monitoring groundwater resources in the basin.

*Water quality in the Kura-Aras river basin* was prepared in 2006 within the UNDP/GEF Reducing transboundary degradation of the Kura-Aras river basin project. It provides for a comprehensive assessment of surface-water quality in transboundary rivers of the Kura-Aras river basin and defines the main sources of pressures.

The FAO's *Irrigation in the Middle East Region in figures* is a survey conducted in 2008 on the irrigation sector in Middle East countries, including Armenia, Azerbaijan and Georgia. This thematic assessment analyses the irrigation potential of the South Caucasus countries, provides an inventory of all irrigation canals and reservoirs, and explores irrigation efficiency. Main types of irrigation in the country are explored, including furrow and border-strip irrigation, as well as sprinkler irrigation, which is mainly used on perennial plantations and vineyards. The survey also assesses the total area equipped for irrigation, including power-irrigated areas, harvested irrigated area and drainage network. The survey identifies the rehabilitation of irrigation and drainage systems as priority issue to be addressed to ensure the sustainability of the sector. Finally, the report assesses the main institutions involved in irrigation-water management, including the environmental ministries of the South Caucasus countries, which have overall responsibility for the conservation of water resources and the prevention of pollution, the water-supply and water-monitoring organisations.

The above-mentioned reports have identified some major data and information gaps, such as insufficient data on heavy metals, nutrients, organic pollutants and specific organic compounds; absence of up-to-date groundwater-quantity and quality monitoring data; and the

absence of water quality sampling sites and thus corresponding data in several key transboundary locations.

As regards indicators, the assessment reports included the following: physical-chemical and biological water-quality indicators; groundwater-quantity indicators; groundwater-quality indicators and bacteriological indicators; and maximum allowable concentrations for surface-water quality applicable in the South Caucasus countries.

## **2.4 Country Water Profiles**

### **2.4.1 National profiles**

The website of the Ministry of Nature Protection of the Republic of Armenia<sup>4</sup> includes information on the water resources of the country – the following information is available from the section on water: water use and discharge in 2008, water-use permits issued by the Water Resources Management Agency in 2008 and 2009, monitoring results on the pollution of surface waters, level of the Lake Sevan, and reports from the State Environmental Inspectorate on violations of water-use and discharge conditions.

The website of the Public Services Regulatory Commission of Armenia<sup>5</sup> contains a country profile of drinking and irrigation water, including information on licensed companies, reports, monitoring results, tariffs and service-quality indicators. In the section on licensed companies, detailed information is provided on the water-use permits issued to five drinking water supply and discharge companies and to four irrigation-water supply companies. The section on reports includes all the annual and quarterly reports produced since 2005, including the irrigation-water balance, irrigation supplies and payments, supply and discharge balances, and potable water supply and payments. The section on monitoring provides information on the monitoring of service quality conducted at the water-supply companies against the service-quality indicators established for all drinking-water supply companies. Finally, the section on tariffs provides the retail and wholesale tariffs for the potable-water supply, discharge and wastewater treatment and tariffs for the irrigation-water supply.

The website of the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan<sup>6</sup> contains a section on the water resources of the country. The web page on surface-water resources includes information on rivers, lakes and reservoirs, including information on the hydrological and hydro-graphic peculiarities of the local, republic and transboundary lakes. For major lakes and reservoirs the area and storage volumes are presented. Information on the 93 hydrological points in the stationary hydrological-observation network of the National Hydro-meteorological Department in republic's water objects – rivers, lakes and reservoirs – is also presented in the website.

The website of the Ministry of Environment Protection of Georgia<sup>7</sup> contains information on the water resources of Georgia. Hydro-geographical network of the country is presented, including surface- and underground-water resources, and thermal- and mineral-water springs. The temporal and spatial distribution of water resources is also analysed. The natural supply of fresh groundwater of the country is estimated as about 18 000 million cubic meters. The total estimated and exploitation supplies are also provided, including groundwater storage in the lower slope of Great Caucasus and on Akhalkalaki and Marneuli plateau. The main

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<sup>4</sup>) Available from [http://www.mnp.am/index\\_eng.htm](http://www.mnp.am/index_eng.htm)

<sup>5</sup>) Available from <http://www.psrc.am/en/?nid=237>

<sup>6</sup>) Available from <http://www.eco.gov.az/en/hid-chay-gol-suanbar.php>

<sup>7</sup>) Available from [http://moe.gov.ge/index.php?lang\\_id=ENG&sec\\_id=42](http://moe.gov.ge/index.php?lang_id=ENG&sec_id=42)



pollutants of surface water are identified as the sewerage systems of towns and populated areas, industrial and solid waste sectors. Finally, the website contains information on the mechanical wastewater cleaning activities implemented only in Tbilisi-Rustavi regional purification system.

## 2.4.2 Regional profiles

FAO's information system on water and agriculture, FAO/AQUASTAT, provides country profiles of Armenia<sup>8</sup>, Azerbaijan<sup>9</sup> and Georgia<sup>10</sup>. These include information on water resources and use in the South Caucasus countries, international water issues, irrigation and drainage development and prospects for agricultural water management. The water-resources section provides information on total internal renewable surface-water resources, internal renewable groundwater resources, overlap between surface water and groundwater, annual internal renewable water, outflow from the country through transboundary rivers, the border flow, as well as detailed information on the lakes and reservoirs of Armenia, Azerbaijan and Georgia. In the section on water use, an assessment is made of total water withdrawal, classified according to uses for agriculture, municipal and industrial purposes. Information on non-consumptive use – to generate hydropower – is also provided. The section on water use presents information on water discharge, on total quantity of wastewater produced, and on treated water. The section of the country profile dealing with international water issues provides information on agreements on the use of transboundary rivers of Armenia, Azerbaijan and Georgia, including agreements from the Soviet era with Turkey and Iran, as well as agreements between each other concerning the use of the Debed, Arpa, Vorotan, Aghstev and Tavush rivers. The section on irrigation and drainage provides information on the actually irrigated area in Armenia, Azerbaijan and Georgia, assesses the area equipped for full or partial control of irrigation, the irrigation infrastructure, the irrigation potential, horizontal and vertical drainage, and on irrigation land that is waterlogged. Finally, the section on prospects for agricultural water management presents the main direction of development in the irrigation sector of the South Caucasus countries.

The World Bank data warehouse by country includes country profiles of Armenia<sup>11</sup>, Azerbaijan<sup>12</sup> and Georgia<sup>13</sup>. The data are measured against 420 indicators from the world development indicators. The following categories include information on water in Armenia, Azerbaijan and Georgia: agriculture and rural development, aid effectiveness, environment, infrastructure and urban development. The section on agriculture and rural development includes information on irrigated agricultural land and improved rural water sources. The section on aid effectiveness includes contains information on improved sanitation facilities. The section on the environment includes information on organic water-pollutant emissions, and pollution from different industries as a percentage of total biological oxygen demand (BOD) emissions – chemical, food, metal and other industries. The section on infrastructure contains information on total annual freshwater withdrawals and withdrawals by the agricultural, domestic, and industrial sectors, improved rural and urban water sources, as well as renewable internal freshwater resources per person and total. Finally, the section on urban development contains information on improved urban-sanitation facilities and improved urban water sources of the South Caucasus countries.

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<sup>8</sup>) Available from <http://www.fao.org/nr/water/aquastat/countries/armenia/index.stm>

<sup>9</sup>) Available from <http://www.fao.org/nr/water/aquastat/countries/azerbaijan/index.stm>

<sup>10</sup>) Available from <http://www.fao.org/nr/water/aquastat/countries/georgia/index.stm>

<sup>11</sup>) Available from <http://data.worldbank.org/country/armenia>

<sup>12</sup>) Available from <http://data.worldbank.org/country/azerbaijan>

<sup>13</sup>) Available from <http://data.worldbank.org/country/georgia>

The wiki for water professionals worldwide includes country profile on Armenia<sup>14</sup>, Azerbaijan<sup>15</sup> and Georgia<sup>16</sup>. It provides information on water bodies and resources, trends in water use, management and sanitation, major lakes and reservoirs, urban/rural coverage of water services, water quality and pollution, and the legal and institutional environment of the South Caucasus countries.

In the waterwiki country page on Armenia, the section on water bodies and resources includes information on rivers, lakes, reservoirs, underground waters and water-balance components for Armenia. The section of Lake Sevan includes information on the level of the lake, chemical composition and changes in classification of the status of the lake. The section on urban/rural coverage assesses access to water, the reliability and quality of water services, and water-borne diseases such as typhoid and diarrhea. The section on water quality and pollution provides information on annual total wastewater generated and discharged, on wastewater-disposal systems and collectors, the wastewater removal system in Yerevan, biological wastewater-treatment facilities, and on contamination caused by agricultural areas and urban sewage. Finally, the section on the legal and institutional environment includes information on Armenia's obligations for international waters and recent trends in water use, management and sanitation.

The waterwiki country page on Azerbaijan assesses the water bodies and resources of the country, including elements of the water balance. Trends in water use, management and sanitation are included in the assessment and cover water supply and quality, accessibility to the water and sanitation networks, and other aspects of drinking-water supply and wastewater discharge. Recent measures on constructing the Oghuz-Gabala-Baku water pipeline for Baku are also discussed. Finally, the country profile presents the 50 water-treatment facilities installed by the government to serve the villages, and water and sanitation pipelines that are being build or extended in various regions.

The waterwiki country page Georgia includes analytical information on the surface- and underground-water resources of the Georgian part of the Black Sea and Caspian Sea basins. Despite insufficient data, trends in pollution from municipal wastewater downstream from the cities of Borjomi, Gori, Tbilisi and Rustavi are assessed, as well as pollution from the mining industry in Madneuli. The legal and institutional frameworks are analysed, including the 1997 Law on Water (amended in 2000), the draft concept paper on a national water policy, as well as the main institutions involved in different aspects of water-resources management in the country – the Ministry of Environment and Natural Resources Protection, the Ministry of Economic and Sustainable Development, the Ministry of Labour, Health, and Social Affairs, the Ministry of Food and Agriculture (Department of Amelioration and Water Resources) and the Ministry of Finance. The main challenges and opportunities in water-resource management of Georgia are also provided.

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<sup>14</sup>) Available from [www.waterwiki.net/index.php/Armenia](http://www.waterwiki.net/index.php/Armenia)

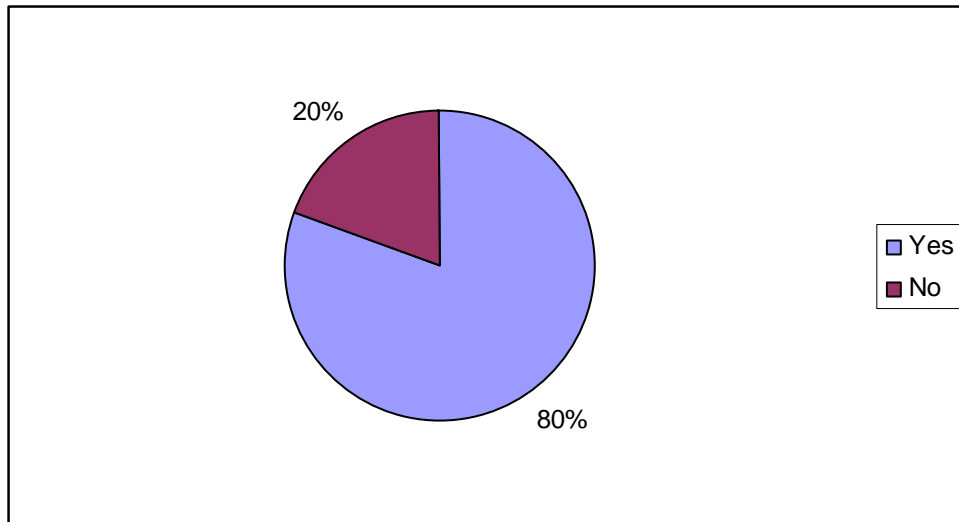
<sup>15</sup>) Available from <http://waterwiki.net/index.php/Azerbaijan>

<sup>16</sup>) Available from <http://waterwiki.net/index.php/Georgia>

## 2.5 Water assessment highlights

### 2.5.1 Type of analysis covered by water assessments

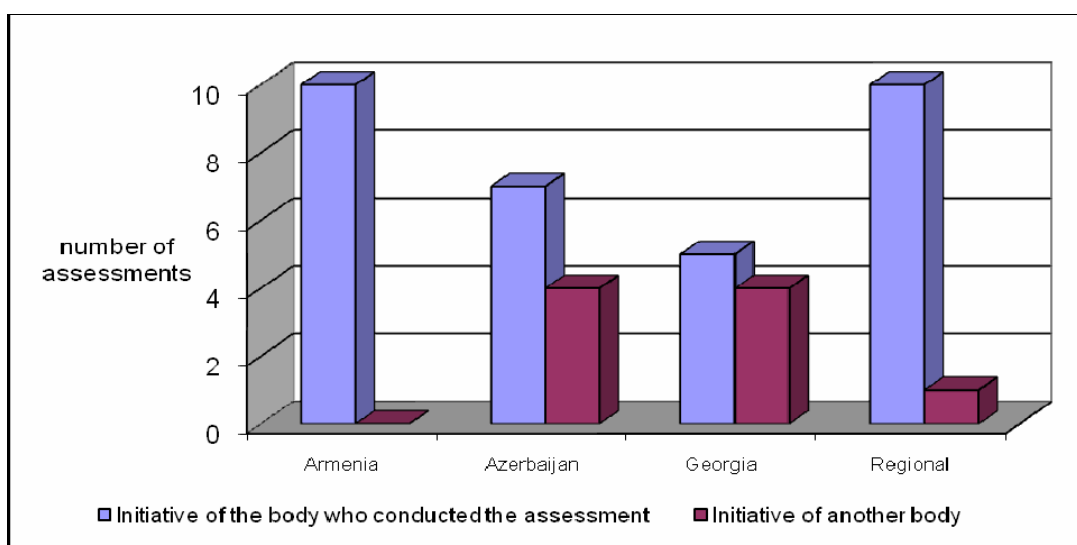
Since the vast majority of the water assessments in the South Caucasus countries were initiatives of different international organisations and projects, and in most cases the assessments were initiated by these organisations in the frameworks of their projects. Review templates show almost 80 per cent of the assessments reviewed were result of an initiative by the body which conducted the assessment (Figure 2.2).



**Figure 2.2: Was the assessment the result of an initiative by the body which conducted the assessment?**

*Source: AoA portal review template*

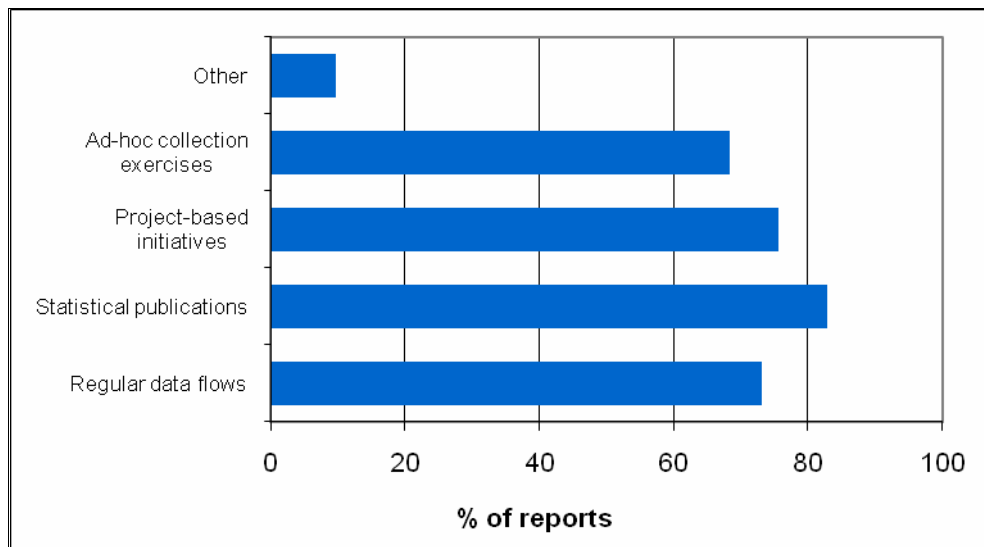
There are some differences among the countries in terms of the initiation of assessments. In Armenia all the reports included in the review templates were the initiative of the body which conducted the assessment, whereas in Georgia and Azerbaijan several reports were initiated by other bodies (Figure 2.3).



**Figure 2.3: Breakdown of initiation of assessments by country**

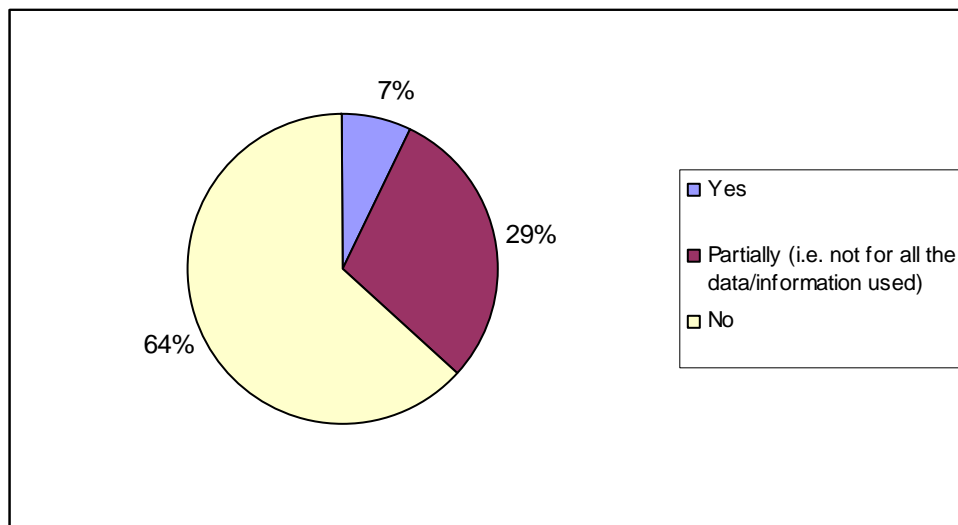
*Source: AoA portal review template*

As the main source of data the review templates cited statistical publications, including statistical yearbooks, regular data flows from monitoring organisations, as well as project-based initiatives and *ad-hoc* collection exercises (Figure 2.4).



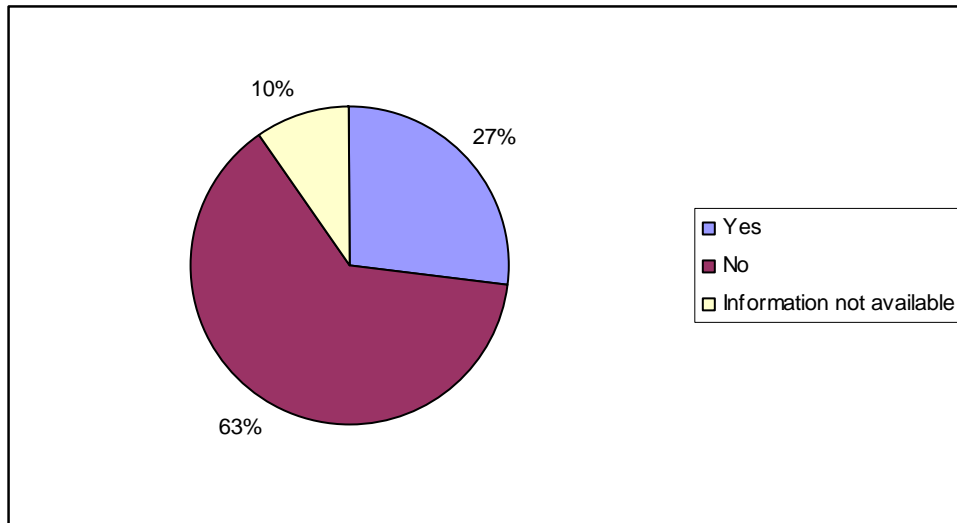
**Figure 2.4: Which were the main sources of data?**  
*Source: AoA portal review template*

In most of the reviewed assessment reports, no metadata were available on the data and information used (Figure 2.5).



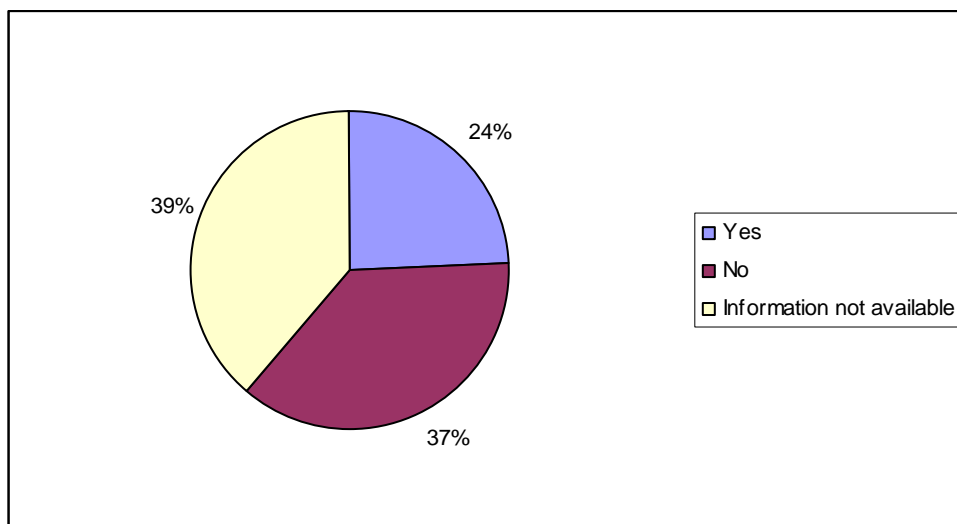
**Figure 2.5: Were metadata available on the data/information used?**  
*Source: AoA portal review template*

The types of analysis covered varied significantly. Most of the organisations and projects used in-house expertise in producing the assessments, and in some cases neither the framework for organisation of the assessment nor the methodological approach are clearly specified. In addition, since these assessments are part of project-based initiatives, they tend to be one-off assessments, rather than regular ones. Thus, the majority of the reviewed assessments were not part of regular processes, but rather project-based initiatives (Figure 2.6).



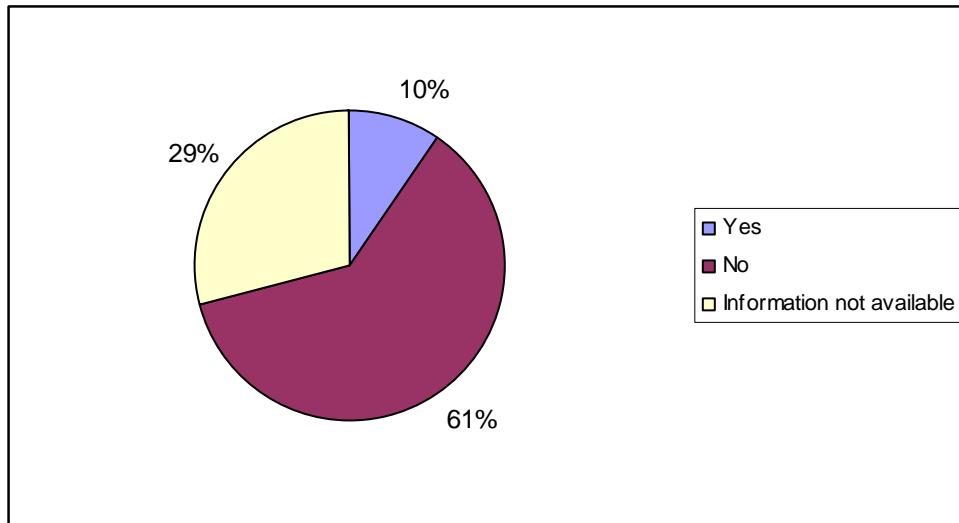
**Figure 2.6: Is the assessment part of a regular process for assessment?**  
**Source: AoA portal review template**

Only in 24 per cent of the reviewed assessments was there an indication that any information system supporting the data management and sharing was established while preparing the assessment (Figure 2.7).



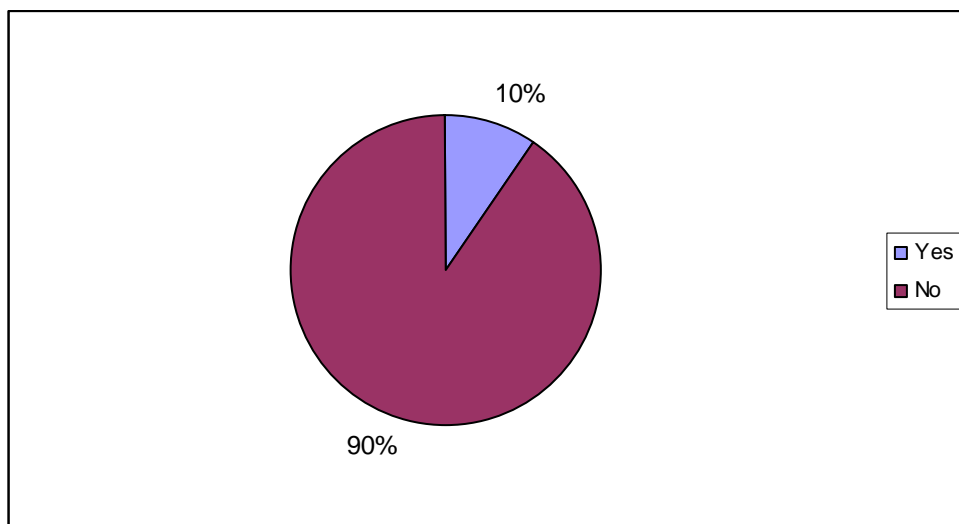
**Figure 2.7: Was there any information system supporting data management/sharing/exchange while preparing the assessments?**  
**Source: AoA portal review template**

Moreover, only 10 per cent of the reviewed assessments indicated that some sort of institutional arrangements were made for ensuring a regular flow of the information included in the assessment. This confirms that the majority of the assessments were one-time, project-based initiatives (Figure 2.8).



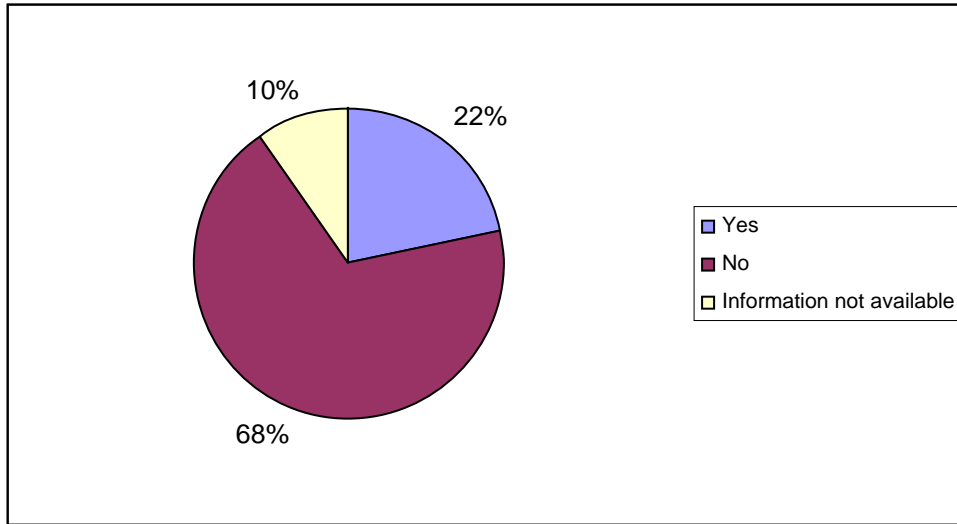
**Figure 2.8: Were any legal agreements/institutional arrangements made for ensuring regular flows of the data/information included in the assessments?**  
**Source: AoA portal review template**

Over 90 per cent of the reviewed assessments did not use modelling and scenario tools (Figure 2.9).



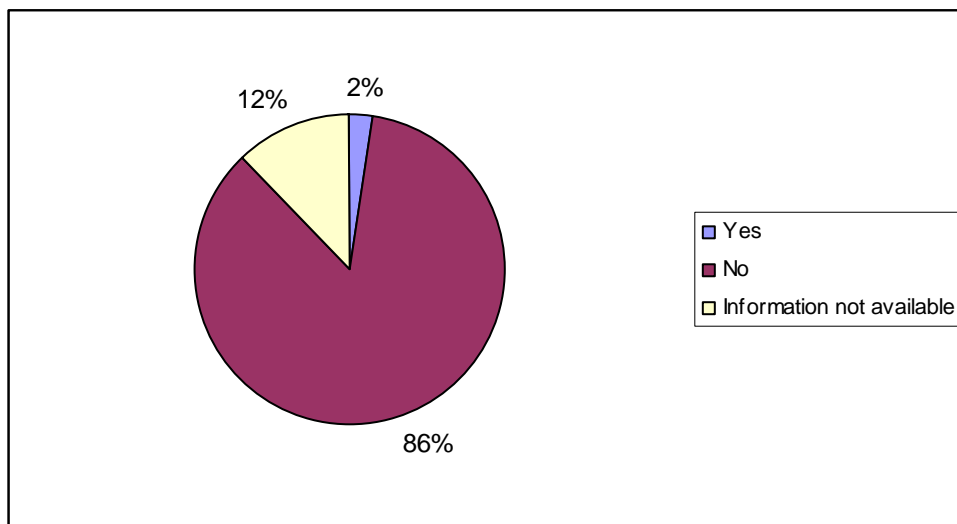
**Figure 2.9: Were modelling and scenario tools used in the assessments?**  
**Source: AoA portal review template**

Only 22 per cent of the assessments included in this study have clearly used the DPSIR framework. *Analysis of the baseline situation in the Kura-Aras river basin (2009)* clearly follows the DPSIR framework through establishing sets of indicators for driving forces, pressures, state, impact and responses and conducting corresponding analyses (Figure 2.10).



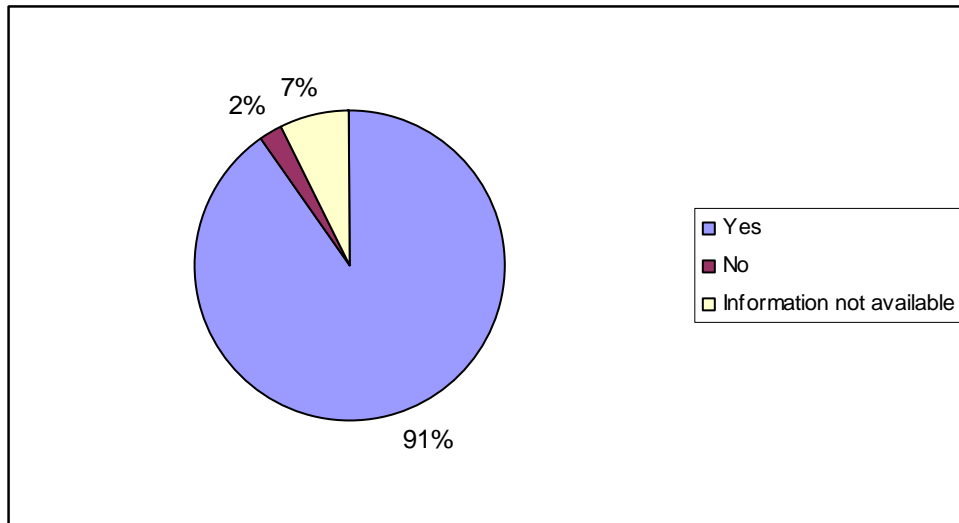
**Figure 2.10: Was a DPSIR-type of framework used to organize the assessment?**  
**Source: AoA portal review template**

Moreover, only 2 per cent of the reviewed assessments clearly included INSPIRE/GMES/Reportnet-compatible developments (Figure 2.11).



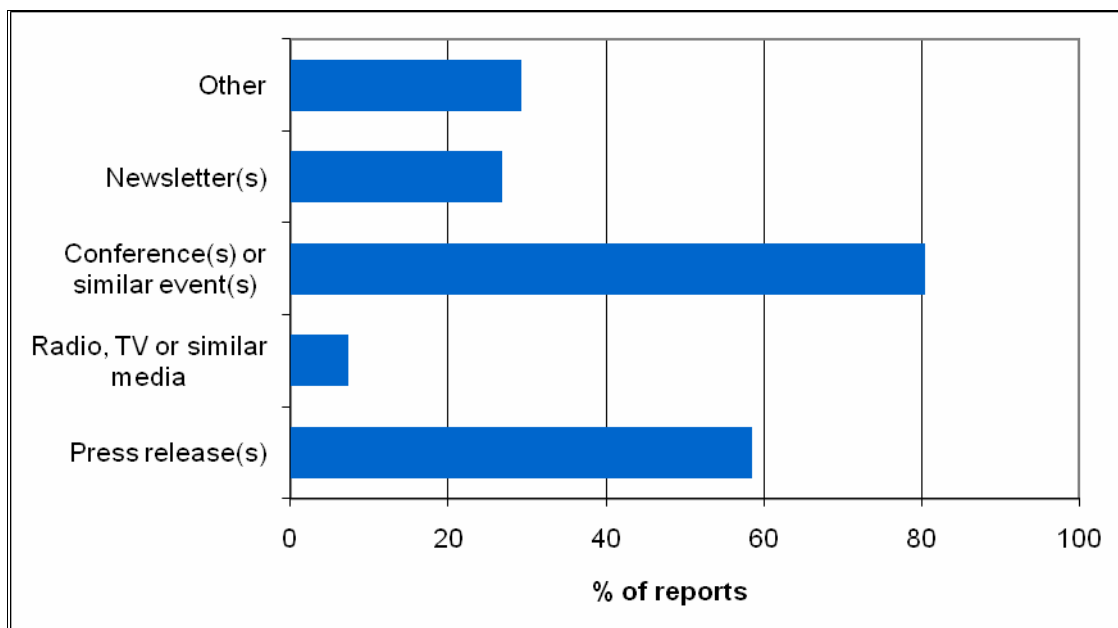
**Figure 2.11: Are any INSPIRE/GMES/Reportnet-compatible developments mentioned in the assessment?**  
**Source: AoA portal review template**

With the exception of one or two, none of the assessments use modelling or scenario tools, which might be largely due to limitations in data availability. Most of the data used in the assessments was a result of *ad-hoc* collection exercises rather than from regular data flows. More than 90 per cent of the reviewed assessments indicate efforts made to strengthen the institutional, scientific and technical capacities as part of the process. In most cases these efforts focused on capacity building of the institutions impacted by the assessments (Figure 2.12).



**Figure 2.12: Were specific efforts made to strengthen the institutional, scientific and/or technical capacity as part of the assessment process?**  
*Source: AoA portal review template*

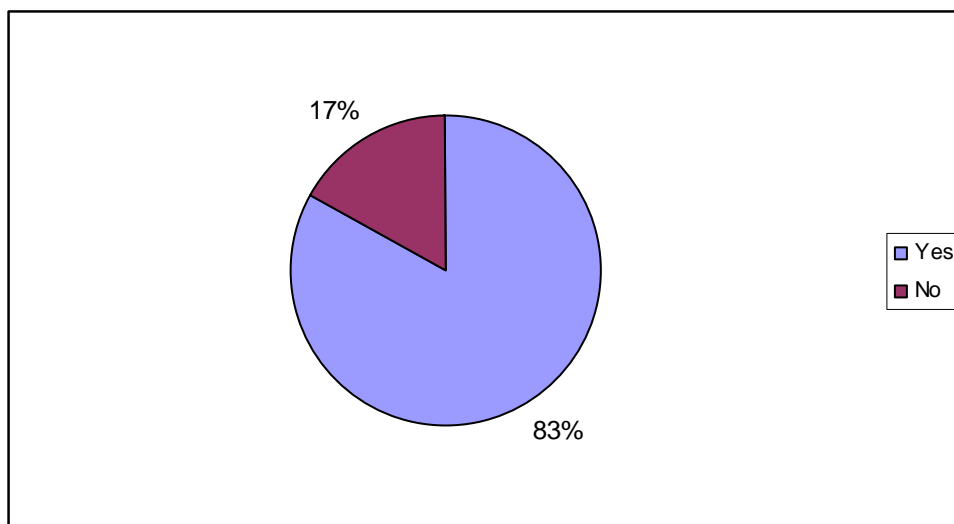
As regards communication of the results of assessments, the majority of the reviewed templates relied on conferences or press releases (Figure 2.13).



**Figure 2.13: How were the findings of the assessment communicated?**  
*Source: AoA portal review template*

Indicators of some sort were included in more than 80 per cent of the reviewed assessments. The indicators were developed mostly using international methodologies (Figure 2.14).





**Figure 2.14: Did the assessment use any type of indicators?**  
**Source: AoA portal review template**

Different types of analysis are covered by the water assessments. These include EPRs, SoERs, national communications, statistical reports, annual reports, water quality norms. and standards, and others.

The EPRs for countries with economies in transition were initiated by environment ministers at the 2<sup>nd</sup> Environment for Europe Ministerial Conference (Lucerne, 1993). Subsequently, the UNECE CEP decided to make the EPRs part of its regular programme. The first cycle of reviews that began in 1994 covered 23 countries from the UNECE region and was carried out until 2004. At the fifth Environment for Europe Ministerial Conference (Kiev, 2003), the ministers affirmed their support for the EPR programme, in particular as an important instrument for countries with economies in transition, and decided that the programme should continue with a second cycle of reviews. This support was reconfirmed at the 6<sup>th</sup> Environment for Europe Ministerial Conference (Belgrade, 2007). This second cycle, while assessing the progress made since the first review process, puts particular emphasis on implementation, integration, financing and the socio-economic interface with the environment. Through the peer-review process, EPRs also promote dialogue among UNECE Member States and the harmonisation of environmental conditions and policies throughout the region. As a voluntary exercise, EPRs are undertaken only at the request of the countries concerned.

SoERs conduct analyses of legal and institutional frameworks, water-resource use, water protection, and groundwater. The reports include detailed assessments of sewerage systems serving urban areas, describe large-scale projects aimed at improving sewerage networks and recent developments in preparations to install wastewater treatment systems in many towns in the South Caucasus, and assess the impact of landfills on water resources. The assessments include monitoring information from different agencies. Finally, the SoERs include analyses of transboundary cooperation between neighbouring countries with the aim of improving the water-quality monitoring system of surface-water bodies.

Annual reports are provided by those organisations in charge of monitoring surface and groundwater quantity and quality in the South Caucasus countries. These are hydrological yearbooks, water-quality bulletins and archives, and current information on the quantity and quality of groundwater resources.

Assessments are also presented in the water-resources chapter of the SNCs of the South Caucasus countries to the UNFCCC. These assess the vulnerability of water resources to

climate change in terms of changes in surface-water quantity. None of the SNCs assesses the impact of climate change on surface water quality, nor groundwater quantity and quality, which is a major gap.

The statistical yearbooks produced by the national statistical services of the South Caucasus countries include information on natural resources and environmental protection. These statistical analyses are stored in a concentrated form, and calculated by using the methodology, classifications, nomenclatures and concepts recommended by the UN and its specialized institutions, the EC's statistical office – Eurostat, the OECD and others. Due to this, the indicators of the South Caucasus countries are internationally comparable.

Water-quality norms and standards are used within the EU funded water governance for western EECCA countries project, implemented in 2008-2010 in Ukraine, Belarus, Moldova, Armenia, Azerbaijan and Georgia. The project report assesses the existing systems of surface-water quality standards, including the relevant laws and regulations, water-classification systems, and standards for surface water used for the drinking water supply, recreation and irrigation, as well as providing an overview of surface-water quality systems in the EU, ICPDR, Moldova and UNECE. Based on the assessment, a system of surface-water quality standards in each of the western EECCA countries was proposed.

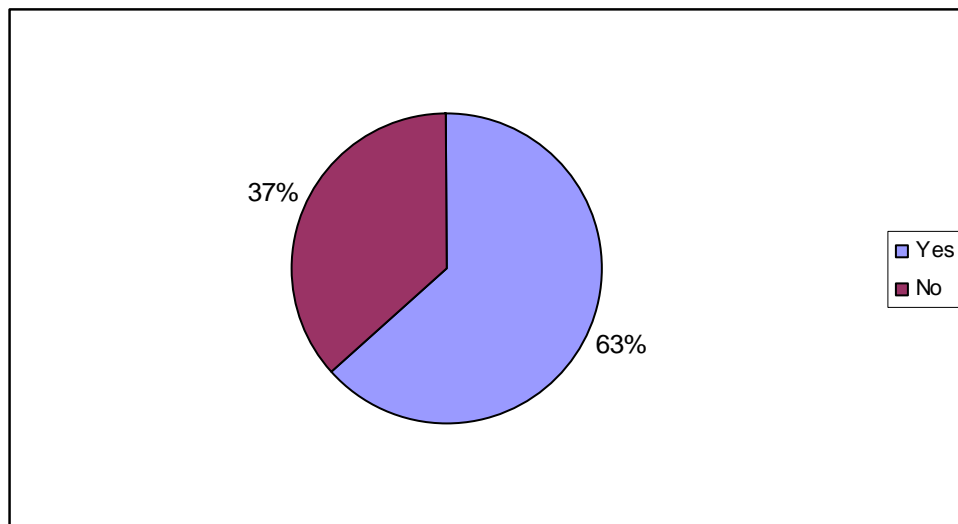
The assessment reports included sets and types of indicators, which vary from country to country. They can be grouped as follows: social; drinking water; hydro-morphological; physical-chemical quality; biological quality; bacteriological quality; water-infrastructure; water-monitoring data; water use and discharge; and other indicators.

**Table 2.5 Types and Description of the Main Indicators Used within the Assessment Reports**

<b>Types of indicator</b>	<b>Description</b>
Social	Gross domestic product; total population; forested area; number pensioners, unemployed, and receiving benefits; number of people served; weighted average cost of capital; water sector public expenditures.
Drinking water	Drinking water standards, such as hygiene requirements and quality control, temperature, hydrogen value, total quantity of dissolved matter, drinking water quality.
Hydro-morphological	Changes in sediment transport; water flow; substrate conditions; river-water balance; floods and drought; as well as groundwater-quantity indicators, including piezometric head, abstraction, and plant species in relation to declining groundwater tables.
Physical-chemical quality	Surface-water quality index, Canadian index, water quality combinatorial index, complexity coefficient and irrigation coefficient; water accidental index; organic pollution index; nutrient river concentrations index; heavy metals concentration index; specific organic compounds concentration index; groundwater nitrate concentrations index; acidification status; biochemical demand for oxygen; chemical substances; conductivity; disease age; floating textures; heavy metals; hydrogen dioxide; hydrogen values; maximum allowable concentrations for organic compounds; nitrate; nitrates; nutrient status; oxygenation; pH; priority substances; salinity; scent and taste; sodium absorption ratio; specific organic compounds; suspended sediment; synthetic pollutants; temperature; thermal condition; transparency; violations in drinking water standards; water mineralization.

Types of indicator	Description
Biological quality	Phytoplankton, phytobenthos, macrofauna, fish, and macro-invertebrates. As for bacteriological quality indicators, they include total bacteria; total coliform bacteria; thermo-tolerant bacteria and species at risk.
Water infrastructure	Number of towns served by wastewater treatment plants; average daily duration of centralised water supply in urban households; proportion of rural population without access to safe drinking water in rural areas; proportion of rural population using transported water to the total number of rural water users; and proportion of population with access to improved sanitation.
Water use and discharge	Water abstraction from natural sources; wastewater discharge; total water consumption; wastewater purified according to standards; polluted wastewater; pure wastewater; water exploitation index; household-water consumption index; and urban wastewater treatment index.

The assessments have identified significant gaps in data availability (Figure 2.15).



**Figure 2.15: Did the assessment indicate gaps in the information needed for the analysis or in the scientific understanding of relevant processes?**

*Source: AoA portal review template*

The gaps mainly relate to surface- and groundwater-resource quantity and quality monitoring and drinking-water supply systems. Different gaps in monitoring have been identified by the assessment reports. Regarding the surface-water quantity and quality monitoring, the gaps mainly relate to the following: absence of water-quality sampling sites in several key locations; short time-series of existing water-quality data and absence of several years of key monitoring data; gaps in data on heavy metals, nutrients, organic pollutants and specific organic compounds; absence of reference surface-water quality sites; short time-span of some hydrological and water-quality data records and missing values; lack of water-quantity and quality data in small gauged river basins; and absence of up-to-date hydrological data from non-operational hydrological posts.

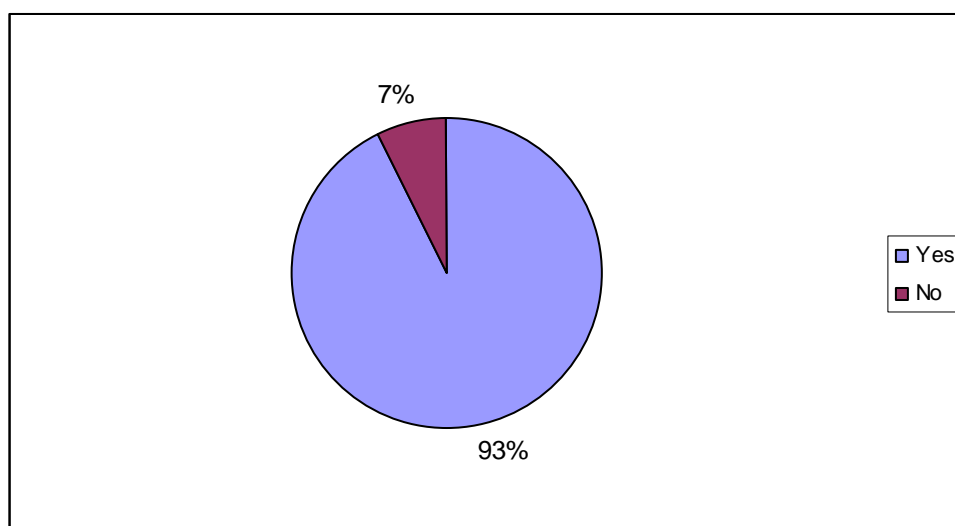
At present no groundwater-quantity and quality monitoring or biological monitoring is undertaken in the South Caucasus countries. Only partial monitoring of groundwater resources is undertaken in Azerbaijan and initial steps for the introduction of biomonitoring have been taken in Georgia. Thus, the assessment reports have identified the absence of groundwater-quantity and quality monitoring data and the absence of biological-monitoring data as major gaps.

For the drinking-water supply systems, the major gap identified by the assessment reports related to the following: absence of proper drawings of the existing water-supply facilities in the self-supplied rural communities; absence of information on protected or unprotected springs and/or wells; and lack of data on the water-supply systems from self-supplied rural communities.

## 2.5.2 Priority concerns, specific needs, emerging issues and options for future action

### 2.5.2.1 Main water issues in the South Caucasus

Most of the reviewed assessments identified priority concerns in water sector (Figure 2.16).



**Figure 2.16: Did the assessment identify priority concerns?**

**Source: AoA portal review template**

The main water issues in Armenia, Azerbaijan and Georgia, according to the assessment reports, include pollution of surface and groundwater resources; reduction of river flows and water shortage; policy, legal and institutional deficiencies; inadequate monitoring; data reliability and accessibility; poor infrastructure; low awareness and inadequate human capacity. Also several regional issues were identified in the assessment reports, which are common across the South Caucasus countries, such as differing approaches, standards and methods for management of water resources between the countries; the absence of a reference laboratory in the entire Kura river basin; and the absence of a harmonised classification scheme in the South Caucasus.

Pollution of surface and groundwater resources is due to pressures from different point and non-point sources. One of the major sources is the urban wastewater, which in most cases is discharged directly into open water basins without treatment. As a result, water quality in the recipient water bodies deteriorates, and cases of water-borne diseases have been observed.

In Armenia, only the Yerevan Wastewater Treatment Plant (WWTP) operates, but only performs mechanical treatment. No other WWTPs operate in the country. In Georgia, there is just one fully operational WWTP in Scahkhre, and a few others carry out only mechanical treatment. In Georgia, the untreated municipal wastewater is responsible for 67 per cent of all surface-water pollution. In Azerbaijan, the cost of treating water is quite high, inducing public health vulnerability. According to the assessment reports only about 3 per cent of all discharged water is treated – 8 per cent for extractive industries and 20 per cent for

manufacturing industry – and municipal wastewater is not treated at all. It is estimated that contaminated river water is used for drinking and agricultural purposes by around 80 per cent of the population.

Other major sources of pressure on water quality are crop production and livestock breeding, as well as the mining, oil-production and food-production industries. As a result, at several sampling points in Armenia, Azerbaijan and Georgia nutrient and heavy metal pollution has been recorded.

No data is available on groundwater pollution. This is due to the fact that at present Armenia and Georgia do not carry out any groundwater monitoring, and in Azerbaijan, which performs partial monitoring of groundwater resources, no groundwater quality standards exist.

The reduction in river flows and water shortage are major issues identified in the assessment reports. Although Armenia is not considered as water-stressed, there is a significant spatial temporal imbalance of water resources in the country. This implies a seasonal water-use deficit in many regions, and particularly seasonal water shortages for irrigation and drinking water. In Azerbaijan, which has water deficit issues particularly during the irrigation season, significant water losses aggravate the problem. The situation is somewhat better in Georgia, which, despite poor management of water resources and significant water losses, has abundant water resources.

According to the assessments, many self-supplied rural communities in Armenia, Azerbaijan and Georgia face water deficits. With forecast reductions of river flow due to climate change there will be significant socio-economic consequences of water shortage not only in these rural communities but throughout the entire region. Moreover, a decline in groundwater levels in hot spots, due to the overuse of resources, will aggravate the situation.

Despite significant reforms which introduce IWRM principles in the South Caucasus countries, most of the assessments have revealed significant policy, legal and institutional deficiencies in the water sectors of the South Caucasus countries. In Armenia, the legal framework in the water sector is new and dynamic, but requires significant support as it faces challenges as its implementation moves forward. Inconsistency of several legal documents is one area of concern as this sometimes creates confusion in the institutional framework as well. One of the key obstacles observed is the lack of coherence and consistency among laws, regulations, by-laws and decrees adopted by the government or water-sector agencies. Also there is a need to develop additional laws in the field of water resources, including development of new standards for water quality.

The situation is different in Azerbaijan and Georgia. There are no specific water-policy and water-strategy documents in Azerbaijan. National programmes and actions plans contain components addressing water issues and together these form the water policy. Given the number of actors involved in water issues and the limited communication between them, the lack of structural documents on water is an obstacle.

In Georgia, the current water-related legislation is fragmented. It lacks effective pollution-prevention mechanisms and mechanisms for preventing the overuse of water. The current water law of Georgia does not cover all aspects of water management and protection, and lacks links to other sectors. Moreover the current water law does not provide integrated, river-basin based approaches. In order to resolve all existing legislative inconsistencies and fully address water-related issues, it would be necessary to amend, review or adopt a new law on water along with related, detailed regulations.

Several agencies involved in water resources management in the South Caucasus need strengthening, both in technical and institutional terms. Agencies responsible for monitoring, compliance assurance and enforcement need considerable assistance in terms of institutional strengthening and equipment. Several other agencies, which are charged with various aspects of water-resource management, need to build their capacity. Among them are the agencies involved in spatial and environmental protection according to IWRM principles, since there is a need for significant cooperation between water-resource, nature-protection and land-use planning. In addition, there is a need for improved coordination and cooperation between the various national agencies. Particularly there is a lack of communication between the policy and decision makers on one side and surface-water quality monitoring experts on the other.

Another major issue in the water sector concerns inadequate monitoring. Despite the fact that all three South Caucasus countries have signed individual action plans with the EU to show their commitment to implementing jointly-agreed priorities in compliance with international and European norms and principles including IWRM and the EU Water Framework Directive (WFD), the monitoring system employed in these countries has not progressed much. According to most of the assessments, the current surface-water quantity monitoring in Armenia, Azerbaijan and Georgia does not correspond to river-basin management principles. The physical-chemical monitoring system is also inappropriate in terms of applying EU WFD methodology. Also no water-quality classification scheme is being applied at the moment. As for groundwater monitoring, in reality it does not take place and all groundwater data is based on old information, and only partial monitoring of groundwater takes place in Azerbaijan. Finally, there is no biological-monitoring system in place in South Caucasus countries, which is one of the prerequisites for implementation of EU WFD principles and approaches and the classification of water bodies according to their status.

According to several assessment reports, one of the main issues in the water sectors of all three South Caucasus concerns data reliability and accessibility for informed decision-making. Significant shortcomings in reliability, accuracy, completeness, homogeneity, length of records and spatial extent are mentioned for surface-water quantity and quality monitoring data. The situation is aggravated by the absence of data validation and insufficient quality-assurance and control methods employed by organisations involved in surface-water quantity and quality monitoring. As a result, there is insufficient reliable and accurate data for the decision making process.

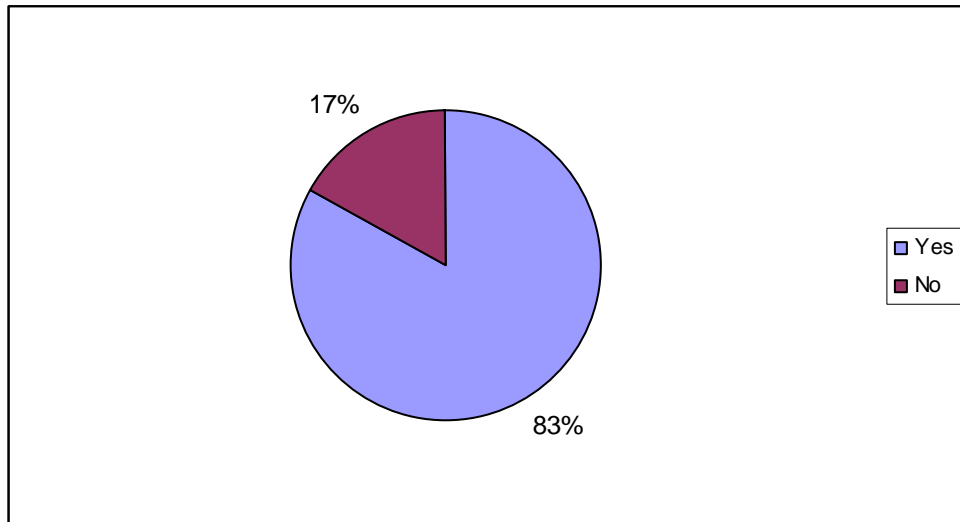
Poor infrastructure is a major problem. In Armenia and Georgia it includes run-down drinking-water supply facilities – capping, transmission pipelines, daily regulatory reservoirs, internal networks, and pumps – and poor sewage pipelines. As for wastewater treatment, the situation is even more critical. In addition to these problems, access to safe drinking water and the access to sanitation is still inadequate, particularly in rural communities. In Azerbaijan, the 2006 data related to the MDGs indicate that the proportion of the population using some sort of improved drinking water source is only 69 per cent in rural areas, in Georgia it is 73 per cent. In rural areas not connected to the network, people who cannot access springs, use water taken directly from rivers and canals. The national water company of Azerbaijan indicates that in 2010 some 34 per cent of the population was connected to sewerage systems, 54 per cent in urban areas and 8 per cent in rural areas.

In addition to water issues at the national level, some of which are common or similar, there are several regional issues that are common across Armenia, Azerbaijan and Georgia. In particular, although the countries share the same river basin – Kura-Aras – they use different approaches, standards and methods for managing its water resources. A harmonised classification scheme for water quality does not exist. There is no national reference laboratory in the entire Kura-Aras river basin, which the monitoring laboratories of Armenia, Azerbaijan and Georgia could use. No regular data-exchange mechanism exists between the countries, the only exchange of information between them occurs sporadically during the

implementation of donor-funded regional water projects. Finally, in all three countries there is no appropriate groundwater-monitoring system in place, in line with the requirements of the EU WFD and Groundwater Directive.

### 2.5.2.2 Emerging issues and options for future action

The assessments have identified several **emerging issues** and **options for future action** taking account of the problems of and pressures on water resources (Figure 2.17).

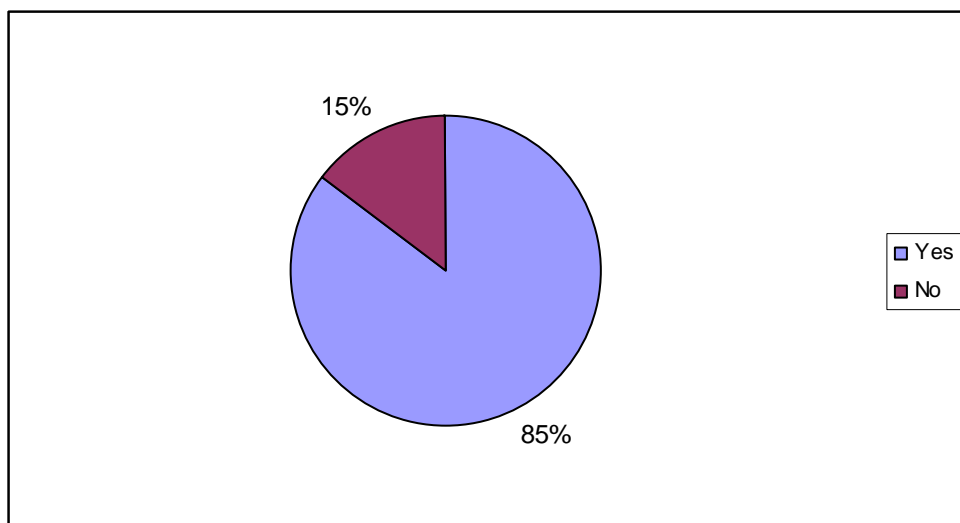


**Figure 2.17: Did the assessment identify specific needs and/or emerging issues to be addressed?**

*Source: AoA portal review template*

Several emerging issues were identified in the national assessments, including ones related to quality of surface and groundwater resources; water availability; policy, legal and institutional issues; monitoring; data reliability and accessibility; and water infrastructure and accessibility of services. In addition to national issues, regional emerging issues and options for future action have also been identified.

The vast majority of the reports reviewed also indicate that options for the future were provided (Figure 2.18).



**Figure 2.18: Did the assessment provide options for the future?**

*Source: AoA portal review template*

The assessments propose addressing the significant pressures on water bodies as a way of improving water quality. Given the different nature of the anthropogenic pressures, the reports propose three implementation routes. The first relates to the introduction of the principles of the Integrated Pollution Prevention and Control (IPPC) Directive, which requires all activities with a high pollution potential to have integrated pollution prevention and control permits. The second route relates to the implementation of Nitrates Directive, which deals with protection of waters against pollution caused by nitrates from agricultural sources. The third route relates to the introduction of the principles of the Urban Wastewater Treatment Directive in the major agglomerations.

Finally, the assessment reports propose using the principles of EU WFD, which require that policy to prevent and control pollution prevention be based on a combined approach that controls pollution at its source through establishing emission limits and environmental quality standards.

To improve water availability in the region, the assessments propose several measures to address river-flow reduction and to deal with water-use deficits. Thus, to cope with the impact of the forecast climate change, public and private adaptation, measures are suggested to prepare for future water shortages. The management and regulation of water flow, including reservoir construction, are also proposed at locations facing seasonal water shortages. In addition to this, the reports propose the provision of incentives for efficient and rational water use and methods for the introduction of improved water-use practice.

The assessments suggest options for future action to improve policy, legal frameworks and institutions. In terms of policy, they proposed the further development of water policy in the South Caucasus countries in line with the principles and approaches of IWRM and the EU WFD, and the integration of water policy into general socio-economic and long-term development policy. To deal with institutional deficiencies, the reports propose several improvements, including improved coordination among agencies that deal with water resources. The proposed improvements in legal frameworks include filling the existing legal gaps, avoiding duplications and developing of new water quality standards.

The proposed options for improving monitoring system in Armenia, Azerbaijan and Georgia include surface- and groundwater-quantity and quality monitoring. They include establishing clear definitions of water-quantity and quality monitoring, in line with the requirements of the EU WFD.

As a first step for re-vitalisation of surface-water quality and quantity monitoring network, it is proposed to classify water bodies according to the logic of the EU WFD, and for all identified water bodies to conduct an analysis of pressures and impacts and identify the significant pressures. Then, as a second step, targeted physical-chemical and hydro-morphological monitoring programmes can be designed, including surveillance, operational, investigative and hydro-morphological monitoring.

For groundwater monitoring, a programme to identify groundwater bodies in each country is proposed, and then for identified bodies or groups of bodies to set a programme of groundwater-level, surveillance and operational monitoring.

Finally, it is proposed to implement a stepped approach to the introduction of a biological-monitoring system in the South Caucasus.



For ensuring data reliability and accessibility, it is proposed to introduce proper data-validation and quality-control mechanisms in the institutions involved in water-quantity and quality monitoring. Several assessments propose adoption and implementation of new, clearly defined approaches on data flow and information exchange between the institutions holding water-related information. This includes adoption and implementation of new procedures on data flow and information exchange and clear definitions of obligations on data provision with disciplinary actions, such as fines, for violations.

Regarding water infrastructure and accessibility of services, it is proposed putting specific investment programmes for improving the irrigation infrastructure and wastewater-treatment facilities in place. As for drinking-water supplies, particularly in self-supplied rural communities, phased options for rehabilitation and improvement of accessibility of water and sanitation services are proposed.

As for improving accessibility of services, measures to increase the length of time that water is available, to regulate the centralised water supply and to improve access of water in rural areas are all proposed. These proposals, which are mostly made by external donors, are based on consultation with local experts and authorities.

There are several emerging regional issues in the water sector, which are common for Armenia, Azerbaijan and Georgia. In terms of policy, the proposed options include the application of river-basin management principles and the identification of water-use functions in transboundary watersheds. For harmonisation of monitoring procedures, the assessment reports proposed to develop agreements on applicable maximum-allowable concentrations, together with principles and methods for the calculation of a water quality index. For groundwater resources, it is proposed to harmonise the methodology for hydro-geological zoning and revitalise the groundwater-quantity and quality monitoring system in the South Caucasus. The reports also proposed the establishment of a common transboundary-water cadastre and the development of a regional information system for the countries. Finally, to cope with the impacts of flooding and accidental pollution, the development of an early-warning system is recommended.

**Table 2.6 Summary of main water issues and options for future action from the assessments**

<b>Main water issues</b>	<b>Description</b>	<b>Options for future action</b>
POLLUTION OF SURFACE AND GROUNDWATER RESOURCES	Deterioration of water quality and water-borne health diseases; pollution from urban wastewater, household wastewater, crop production, livestock husbandry, mining, oil and food processing, road traffic, construction and deforestation; exceedence of maximum allowable concentrations of nutrients and some heavy metals at certain water quality sampling sites.	Introduction of the principles of the IPPC Directive; introduction of the Nitrates Directive; introduction of the principles of the Urban Wastewater Treatment Directive in the major agglomerations; combined approach using control of pollution at source through the setting of emission limits and of environmental quality standards.

<b>Main water issues</b>	<b>Description</b>	<b>Options for future action</b>
<b>REDUCTION IN WATER FLOW AND WATER SHORTAGE</b>	Forecast reduction of river flow due to climate change; socio-economic consequences of water shortage; seasonal water-use deficit; insufficient water in the springs in the self-supplied rural communities; seasonal water-shortages for irrigation and drinking water; decline of groundwater level in hot spots.	Public and private adaptation measures to prepare for future water shortages due to climate change; management and regulation of water flow, including reservoir construction; provision of incentives for efficient and rational water use and methods for introduction of improved water use.
<b>POLICY, LEGAL AND INSTITUTIONAL DEFICIENCIES</b>	Incoherent policy in water sector; legal, institutional and technical deficiencies; lack of communication between the policy and decision makers on one side and surface water quality monitoring experts on the other side; inadequate spatial planning; inadequate level of decentralized data and information management; absence of integrated water use and protection plan, including groundwater resource; application of old standards.	Further development of water policy in the countries in line with the principles and approaches of IWRM and EU WFD; integration of water policy into general socio-economic and long-term development policy of the country; improved coordination among agencies which deal with water resources; improvements in legal framework include filling gaps, avoiding duplications and development of new water quality standards.
<b>MONITORING</b>	Inappropriate physical-chemical and hydro-morphological monitoring systems; absence of water-quality classification scheme; absence of decent groundwater monitoring; absence of biological monitoring.	Re-vitalisation of surface water-quality and quantity monitoring network according to EU WFD; setting up a program of groundwater level monitoring, surveillance monitoring and operational monitoring; implementation of a stepped approach on introduction of biological-monitoring system.
<b>DATA RELIABILITY AND ACCESSIBILITY</b>	Insufficient data reliability, accuracy, completeness, homogeneity, length of record and spatial extent; absence of data validation and quality assurance and control.	Introduction of proper data-validation and quality-control mechanisms in the institutions involved in water-quantity and quality monitoring; establishment of sound integrated information system; ensuring data sharing among all institutions and the public; application of approaches on data flow and information exchange among the institutions holding water-related information.

Main water issues	Description	Options for future action
POOR INFRASTRUCTURE	Deteriorating irrigation infrastructure; deteriorating drinking-water supply facilities; poor sewerage pipelines; lack of water-treatment plants; inadequate access to safe drinking water; inadequate access to water sanitation.	Investment programmes for improved irrigation infrastructure; investment programmes for reconstruction of wastewater-treatment facilities; measures to increase water-supply duration, regulation of centralised water supply, improved access of water in rural areas.
REGIONAL ISSUES	Different approaches, standards and methods for management of water resources between the countries; absence of a national reference laboratory in the entire Kura river basin; absence of harmonised classification scheme; absence of decent groundwater monitoring in the Kura-Aras basin.	Development of policy in the South Caucasus countries in line with the EU WFD; identification of water-use functions in transboundary watersheds; development of agreements on applicable maximum allowable concentrations, principles and methods for calculation of a water quality index; harmonisation of the methodology for hydro-geological zoning and revitalising the groundwater quantity and quality monitoring system; establishment of a common transboundary water cadastre; development of a regional information system for the countries; development of early warning system.

## 2.6 Conclusions and Recommendations

- Despite the fact that the South Caucasus countries are obliged to produce SoERs according to their obligations under the Aarhus Convention (Article 5.4), no periodical SoERs have been produced. In addition, in none of the South Caucasus countries has a legal and institutional framework been established for producing regular environmental assessments, as recommended by the *Guidelines on the preparation of governmental reports on the state and protection of the environment* and the *Guidelines for the preparation of indicator-based environment assessment reports in Eastern Europe, the Caucasus and Central Asia*, which were endorsed, respectively, at the 2003 Kiev and 2007 Belgrade Ministerial Conferences Environment for Europe.
- At a state-agency level only the national statistical services of the South Caucasus countries produce annual statistical reports, including water statistics, and some ministries and agencies produce sectoral, thematic reports. The vast majority of water assessments produced since 2005 have been done by international donor organisations and projects carried out in the South Caucasus region. These organisations and projects follow their own agenda, thus the water assessments are tailored to satisfying the needs of that particular organisation or project. Thus, in many cases the frameworks and methodological approaches used in assessments are not consistent. In this regard there is a need to make water assessments more relevant to the needs of the countries so they provide more support to the policy process and better national water management.

- Water assessments provided by different ministries and government agencies are fragmented and not comprehensive. As a result, they are not as useful to decision makers as they could be, and are not tailored towards the specific needs. The objectives of the assessments also need to be clearly defined, particularly, at whom they are aimed and how they will be used by decision makers. This would allow assessments to become more relevant to decision-makers' needs, while making their production more efficient.
- In the development of some assessments temporary networks have been set up. These have proved to be very efficient mechanisms in terms of the facilitation of access to information and the provision of different types of services. Thus, the institutionalisation of such networks might be worth to considering, and would greatly help in conducting future assessments. The networks established by projects are rarely institutionalised, and the international organisations implementing projects should re-consider their intervention at the project design/approval stage in terms of institutional sustainability.
- Very few assessments have clearly used the DPSIR framework through establishing sets of indicators for driving forces, pressures, state, impact and responses, and conducting corresponding analyses. With one or two exceptions, the assessments have not used modelling or scenario tools, probably due to limitations in data availability. Most of the data used in the assessments resulted from *ad-hoc* collection exercises and only some from regular data flows. It is recommended that future assessments use the DPSIR framework, allowing a more comprehensive approach to analysis, and modelling and/or scenario tools, providing additional instruments for planning and decision making.
- Although it is obvious that better access to assessment reports will help the decision makers and the public at large. However, this has not been observed in recent years. All three ministries of nature protection/environment have websites, the contents of which, in terms of water-related information, could be significantly improved. Given the reluctance of some water institutions to provide open access to data in the South Caucasus countries, some water-management decisions are being based on non-technical motives, which create the risk of corruption. Thus, the establishment of clear mechanisms for improved data utilization and ensuring open access to data would promote informed and more transparent decision making. In addition to this, many assessments are in national languages, and it would be better have them also either in Russian or English languages, to ensure wider use, accessibility and transparency.
- There are clear benefits in terms of promoting cooperation between the basin countries in the course preparing such assessments, which include capacity building, exchange of experience, improved data availability and enhanced possibilities for data validation and quality control. Thus, parallel to national-level assessment, the continuation of regional assessments is recommended.

## 3 Green economy / Resource Efficiency

### 3.1 Introduction and background

#### 3.1.1 Setting the scene

Greening the economy: mainstreaming the environment into economic development is one of the two themes of the 7<sup>th</sup> Environment for Europe (EfE) Ministerial Conference to be held in Astana, Kazakhstan, 21–23 September 2011.

The subject is quite broad, and also relatively new to many parts of the world. Terms and definitions related to this theme are of at least two sorts: terms related to the process of greening an economy, and terms related to the result to be achieved, a green economy. There are several definitions in use, varying from region to region and from organisation to organisation, and depending on the context.

Naturally, definitions used in the developing world tend to be more concerned with the process of development. For example, the definition of green growth, as introduced by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), refers to the ‘environmentally sustainable, low-carbon and socially inclusive development’. In contrast, developed countries more frequently refer to the result. The crisis of 2008 has triggered positive thinking linking the economic recovery with the greening of economies. One of the G20 statements<sup>17</sup> refers to the need to ‘build an inclusive, green, and sustainable recovery’, including ‘the commitment to Millennium Development Goals, to combating climate change’ and ‘the transition towards clean, innovative, resource efficient, low carbon technologies and infrastructure’. Here, as well as in many other cases, the green economy implies better resource allocation, indeed UNEP refers to ‘the green economy that is able to allocate natural capital and financial capital in a far more effective and efficient manner into the foreseeable future<sup>18</sup>’. It is clear that practically all definitions relate to the economic and social issues along with narrowly defined environmental problems. In other words, the broad meaning of green economy implies a clear link to the sustainable development.

Some of the priority issues to be addressed in the framework of the Astana Conference under Theme Two are listed below, divided into two groups: green economy and resource efficiency. This division is for practical reasons only as some of the topics overlap, and for others it is not possible nor is there a need to set clear boundaries between them. However, all of these priority issues are relevant to the discussions on the green economy.

#### GREEN ECONOMY

- renewable energy (for example, hydropower, biofuels and biomass);
- energy efficiency;
- mobility (air quality, emissions and noise);
- industry (emissions and waste);
- innovation;
- environmental impact assessment (EIA) and strategic impact assessment (SIA);
- governance (including institutional arrangements, multilateral environmental agreements and environmental performance reviews);

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<sup>17</sup> G20 Leaders’ Statement – The Global Plan for Recovery and Reform. London, 02.04.2009. <http://www.g20.org/Documents/final-communicue.pdf>

<sup>18</sup> “Global Green New Deal”. Policy brief. United Nations Environment Programme. March 2009. [www.unep.org/pdf/A\\_Global\\_Green\\_New\\_Deal\\_Policy\\_Brief.pdf](http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf)

- corporate social responsibility and environmental reporting;
- futures and scenarios (including vulnerability, opportunities, competitiveness and migration).

#### RESOURCE EFFICIENCY

- use of natural capital (including forestry, agriculture, urbanization linked to the use and degradation of land, soil, water and biodiversity);
- water efficiency in industrial, rural and urban areas;
- life-cycle analysis;
- environmental accounting;
- consumption and production patterns;
- tourism.

Green economy/resource efficiency (GE/RE) related assessments have to include data and indicators on the above priorities.

For the Caucasus, green economy is new concept. Although some aspects are addressed on the national level through existing national-policy and institutional frameworks, others are not, and the complex relationships between the issues of the GE/RE have yet to be recognised. Therefore it is not surprising that assessments are scarce, fragmented and irregular, and data collection, categorisation and processing practices are uneven throughout the region.

#### **3.1.2 National resource efficiency / green economy related assessments**

Issues related to the green economy and resource efficiency fall within the competence of several government institutions in all three Caucasian states. Ministries of environment play major role in general environmental assessments. However, the responsibilities related to the priorities of GE/RE are not clearly defined as the concept green economy itself is new and not defined in any of three states' legal documents. As a result particular GE priorities are seen as exclusive domains of individual ministries, limiting the possibility of government-wide decision-making processes. This leads to some issues being subject to the duplication of responsibilities, while for others no clear mandate has been assigned to any government agency.

While working on assessment documents, state agencies generally put in place procedures for horizontal government-wide consultations, including consultations beyond the government to the general public where appropriate. This works better in case of the established and/or legally required assessments such as SoERs, some of which are, or should be, regularly updated. However, in case of the *ad hoc* assessments consultation procedures are generally not as well-defined.

The Table 3. 1 summarises the leading institutions involved in carrying out the most recent assessments in the Caucasus countries, as well as providing information on the frequency and availability of the reports:

**Table 3. 1 Summary of National Institutions involved in carrying the assessments**

Assessments	Armenia	Azerbaijan	Georgia
National Assessments			
National reports on state of environment (SoER)	Ministry of Nature Protection (MNP)	Ministry of Ecology and Natural Resources (MOENR)	Ministry of Environmental Protection (MEP) <sup>19</sup>
	Non-periodic	Non-periodic	Periodic (3 years)
MDG Assessments	Government	Government	Government
	Periodic, no clear time-frame	Periodic, no clear time-frame	Periodic, no clear time-frame
Poverty reduction assessments	Government	Government	Government
	Non-periodic	Non-periodic	Non-periodic
Housing sector assessments	Ministry of Urban Development (MOUD)	Ministry of Emergency Situations (MOES)	Ministry of Economic Development (MOED)
	Non-periodic	Non-periodic	Non-periodic
Energy sector assessments	Ministry of Energy and Natural Resources (MENR)	Ministry of Industry and Energy (MOIE)	Ministry of Energy and Natural Resources (MENR)
	Non-periodic	Non-periodic	Non-periodic
UNFCCC national communications	Ministry of Nature Protection (MNP)	Ministry of Ecology and Natural Resources (MOENR)	Ministry of Environmental Protection (MEP)
	Periodic, latest available: 2010	Periodic, latest draft 2010	Periodic, latest available 2009
UNCCD national reports	Ministry of Nature Protection (MNP)	Ministry of Ecology and Natural Resources (MOENR)	Ministry of Environmental Protection (MEP)
	Periodic, latest available: 2006	Periodic, latest available 2006	Periodic, latest available: 2006
2 <sup>nd</sup> EPR (by UNECE)	n.a.	Ministry of Ecology and Natural Resources (MOENR)	Ministry of Environmental Protection (MEP)
	n.a.	2010	2010
National statistical reports	National Statistical Service of the Republic of Armenia	State Statistical Committee of the Republic of Azerbaijan	National Statistics Office of Georgia
	Annual latest available: 2010	Periodic latest available :2008	Annual latest available: 2010

<sup>19</sup> Since March 18, 2011, the former Ministry of Environment and Natural Resources of Georgia has been reorganised into the Ministry of Environmental Protection of Georgia; also the former Ministry of Energy of Georgia has been reorganised into the Ministry of Energy and Natural Resources of Georgia, with the reallocation of some responsibilities between these two government entities.

National assessments – other than the UNECE EPRs and UNEP's *Scoping report on green economy in Azerbaijan* (in process) usually do not make explicit reference to the green economy" as such: in fact, only one document<sup>20</sup> apart from the EPRs, mentions it. Discussions on the national level are usually led by international organisations or bilateral partners and follow some concept from the relevant process. For example, in Georgia, the UNDP-lead public discussions on the private sector and development" have followed the approach of the *Global green new deal*<sup>21</sup> and highlighted energy-efficient buildings, sustainable energy, sustainable transport, sustainable agriculture and freshwater as sectors particularly important in the short term in terms of their economic, employment, and environmental benefits.

### 3.1.3 Regional organisations involved in green-economy related assessments

Due to the overall situation in the Caucasus there are very few regional institutions that work with the agreement of all three governments. Organizations with a Caucasus-wide mandate include the Regional Environmental Centre for Caucasus, which has a mandate from the EfE process, that was established by the three governments and the European Commission with the participation of other partner government organisations.

Regional assessments are also rare, for the same reasons. The most recent document complying with the criteria is the *Report on sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia* (EEA/UNEP, 2007) and UNEP's *Synthesis Report on the organic agriculture scoping studies from Armenia, Moldova and Ukraine*, which is in process.

### Overview of green-economy related assessments

From the 3 countries of the Caucasus, 25 national and one regional (EECCA/SEE) assessment relevant to the GE/RE were approved in the AoA process as relevant to this document (a further 6 relevant assessments are included in this chapter but are not included in the statistics shown in Chapter 3). Some of them are quite voluminous, exceeding 500 pages in length – statistical yearbooks particularly tend to be very large. For periodic assessments, the period between issues varies from one year for statistical yearbooks – mostly kept – to five years for some SoE-type reports and NEAPs although in reality the time gap between two issues may exceed 10 years.

At the national level there are few assessments that are both up-to-date and GE/RE relevant, but those that exist are quite useful. At a Caucasus-wide level there are practically no GE/RE relevant assessments; this gap is to some extent covered by UNECE-wide publications, especially by those linked to the EfE process and its ministerial conferences.

As has been mentioned, very few national assessments even recognize the green economy as such. Nonetheless, most recent publications do pay some attention to GE/RE issues, not as part of overall sector-relevant topics such as energy, but as sustainable development-related issues. This may be caused by two factors:

- 1) better knowledge of, more attention to and pressure from the subject; and
- 2) better standardisation of assessment methodologies – coming as a by-product of international developments in the area.

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<sup>20</sup> *Global green new deal*. Policy brief. UNEP. March 2009.

<sup>21</sup> [www.unep.org/pdf/A\\_Global\\_Green\\_New\\_Deal\\_Policy\\_Brief.pdf](http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf)

<sup>21</sup> Ibid



The first factor correlates well with the availability of local capacity; the second, with the availability of international cooperation. It should be noted that so far the second prevails as a driver on the national level in all three countries – the best quality assessments are produced with some sort of international assistance and/or cooperation. Document structure correlates with time too – most recent assessments use clearer methodological approaches, for instance, making better use of the DPSIR framework. Coordination within state institutions is very important; coordination between the state and non-governmental organisations (NGOs) is increasingly important, as more and more information is gathered by actors outside the state institutions – NGOs, industry, banks, etc.

These factors also affect the quality of assessments. Gaps in the raw data and weak processing capacity sometimes leave nothing else to rely on; as countries develop their data-collection and management systems, as well as intra- and inter-institutional coordination mechanisms, these gaps are narrowing, and the reliability of assessments is clearly increasing. Nevertheless it is premature to write off the issue of these gaps altogether, especially at a time when quality control is not yet guaranteed, indicators are sometimes of non-standard and hard to interpret, and methodologies are still of a one-off nature. These problems relate less to regularly produced documents, more to the one-off assessments or periodic assessments with long time gaps that usually are developed with a small amount or no international cooperation. Unfortunately, these latter, one-off documents tend to be of a greater significance – for example national or sectoral plans, programmes, or medium-term strategies, especially these more than 5 years' old.

### **3.2 Assessments made as part of wider state of the environment reports**

Green economy/resource efficiency (GE/RE) assessments are, to some extent, included as part of wider reports. It is worth mentioning that neither the set of such reports nor their content are uniform across the three countries; therefore there is some discrepancy between the reports reviewed for the three nations – in some states some types of reports are too old, or even do not exist.

One type of wider report is the State of the Environment report (SoER); usually each country in the UNECE region does have some national framework for issuing these periodically. However, in some states of the Caucasus region, the latest SoERs are so old that there is no point in reviewing them. Thus, if no recent SoER is available, the report that comes closest to a SoER in content included in this analysis instead. The following SoER (or similar) reports were reviewed:

- Armenia – the 2<sup>nd</sup> *National environmental action programme of Armenia*, (as it contains an analysis of the environmental issues covered in the plan);
- Azerbaijan – *Country environmental analysis of Azerbaijan* (Asian Development Bank, 2005);
- Georgia – *National report on the state of the environment of Georgia for 2007-2009* (final draft, December, 2010).

A general trend can be seen – the more recent the assessment is, the more standardised the methodology used. In the latest one – *National report on the state of the environment of Georgia for 2007-2009* – the *Guidelines for the preparation of indicator-based environment assessment report* (UNECE, 2007) were followed, but the application of this methodology was still limited by some practical factors – for example, data gaps.

Another type of wider report that may be relevant to GE/RE is the national statistical compendium. All three Caucasus states have particular frameworks in place for collecting and

publishing statistical information in the form of national statistical yearbooks, the latest of which are available online in national languages and English:

- *Statistical yearbook of Armenia, 2010*;
- *Statistical yearbook of Azerbaijan, 2008*;
- *Statistical yearbook of Georgia, 2010*

Their structure covers similar issues, reflecting the trend of standardising national statistical information using international practices. Core sets of indicators look comparable as well. However, only a few statistical indicators relevant to GE/RE are included in regular national statistical reporting procedures in the three countries. Usually these indicators are included in the environment section of the publication and under other topics – energy, transport, industry, land management, forestry, finances, etc. While the data sometimes contains GE/RE related information, it is not necessarily presented in a form that facilitates easy interpretation – for example, data on revenues from environmental taxes, usually under the finance section, is probably relevant to GE/RE, for consumption patterns for example, but it is difficult to interpret it this way without additional information. It is clear that there is no provision in any of the Caucasus countries to strengthen statistical data to reflecting GE/RE issues as such.

Finally, the most comprehensive and integrated type of assessment, that not only addresses national GE/RE issues but also recognizes them, comes through the UNECE Environmental Performance Reviews (2<sup>nd</sup> cycle). Two of these are used in this assessment:

- *Environmental performance reviews. Azerbaijan. 2<sup>nd</sup> review (2010)*;
- *Environmental performance reviews. Georgia. 2<sup>nd</sup> review (2010)*

Table 3. 2 shows the parameters of three larger types of assessment available in the Caucasus, and highlights way in which GE/RE priority topics are shown in these assessments. The X-s in the table may refer to the deep analysis of an issue, but, just as often, they may indicate just a brief mention of the topic in the document. More comprehensive analysis of the coverage of the thematic priority areas of GE/RE in the reviewed assessments is given later in this paper.

**Table 3. 2 Parameters of the available assessment on GE/RE in the South Caucasus**

	SoE reports / similar reports			Second EPRs		Statistical Yearbooks		
	AR	AZ	GE	AZ	GE	AR	AZ	GE
No. of pages related to the total	10/65	20/135	110/207	80/220	80/240	20/541	n.a.	20/299
% of total devoted to green economy / resource efficiency	15%	15%	53%	36%	33%	4%	n.a.	7%
Type	Chapter parts, indicators and statistics	Chapter parts	Chapters, chapter parts, indicators and statistics	Chapters, chapter parts, indicators and statistics	Chapters, chapter parts, indicators and statistics	Indicators and Statistic	Indicators and Statistic	Indicators and Statistic
Frequency	10 years	one-off	3 years	one-off	one-off	Annual	Annual	Annual
<b>Green</b>								

	SoE reports / similar reports			Second EPRs		Statistical Yearbooks		
	AR	AZ	GE	AZ	GE	AR	AZ	GE
<b>Economy</b>								
Renewable energy	X	X	X	X	X	-	X	-
Energy efficiency	X	X	X	X	X	-	-	-
Mobility	X	X	X	X	X	X	X	X
Industry	X	X	X	X	X	X	X	X
EIA and SIA	X	X	X	X	X	-	-	-
Innovation	X	-	X	X	X	-	-	-
Governance and environmental performance reviews	X	X	X	X	X	-	-	-
Corporate social responsibility and environmental reporting	-	-	-	-	-	-	-	-
<b>Resource efficiency</b>								
Use of natural capital	X	X	X	X	X	X	X	X
Water efficiency in industrial, rural and urban areas	-	X	X	X	X	-	-	X
Life-cycle analysis	-	-	-	-	-	-	-	-
Environmental accounting	X	-	-	X	-	X	X	-
Consumption and production patterns	-	-	X	-	X	X	X	-

Some GE/RE-relevant information can be also found in the planning documents – sustainable development programmes, national environmental action plans and sectoral plans of other economic sectors. Again, this information is the basis for planning decisions, but is sometimes therefore not identified as GE/RE related. In this AoA the following planning documents were considered:

- Armenia: Sustainable Development Programme, 2008;
- the 2<sup>nd</sup> National Environmental Action Programme of Armenia, 2008;
- State Programme on Poverty Reduction and Sustainable Development in the Republic of Azerbaijan for 2008-2015 (2008).

### 3.3 Specific green economy/resource efficiency related reports and indicator sets

Reports that explicitly target the green economy are extremely rare in the region. The only reports that fit into this category are a discussion paper on the opportunities for Georgia in the new green economy prepared in 2010 UNDP's *Private sector and development series* and UNEP's *Scoping report on green economy in Azerbaijan* and *Synthesis report on the organic agriculture scoping studies from Armenia, Moldova and Ukraine*, both of which are in active preparation. Although limited in size and depth due to their format, these papers represent the only attempt so far to initiate national discussion in the countries of the region.

### 3.4 Thematic assessments

Of the thematic reports, UNFCCC country communications cover many GE/RE related issues. Due to the nature of the subject, with its inherent relevance to the GE/RE itself, and the highly standardised structure of the reporting, these documents sometimes provides details that are not found elsewhere, and comes close to what could be called GE/RE assessments. Two of the available and recent 2<sup>nd</sup> National communications were reviewed in this context:

- *2<sup>nd</sup> National communication of Armenia to UNFCCC* (2010);
- *2<sup>nd</sup> National communication of Georgia to UNFCCC* (2009).

National reports of some other economic sectors are also useful for GE/RE purposes – the energy- and economic-sector documents, in particular, often contain GE/RE relevant information. Some of these sectoral assessments are broad and general, others are project-related and therefore full of technical data. While none of these sectoral assessments recognizes GE/RE issues explicitly, they do cover some topics of relevance to GE/RE. Examples of such documents that were reviewed under this assessment are:

- *The socio-economic impact of climate change in Armenia* (2009);
- *Azerbaijan: renewable energy development project* (2007).

National reporting on progress on achieving the Millennium Development Goals (MDGs) may represent yet another type of report that could interface with GE/RE issues. However, the set of indicators for reporting on the MDGs is limited, and only a few of them are related to GE/RE in all three states of the region. There are also other reporting frameworks that cover the same issues in a more comprehensively, for example, national reporting under UNFCCC. Therefore only the latest, *Armenia: MDG National Progress Report* (2010) was reviewed.

*Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia* (EEA/UNEP, 2007) is a good, comprehensive region-wide assessment of GE/RE issues. It is the only relevant assessment reviewed in this document.

### 3.5 Country profiles on green-economy/resource-efficiency related areas

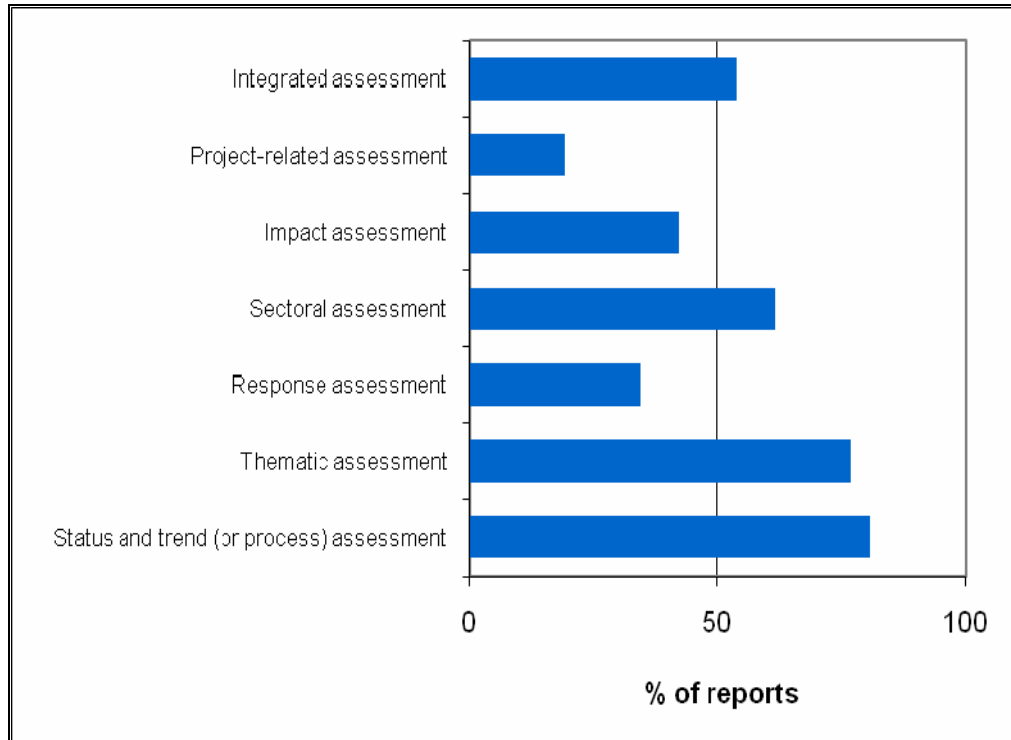
Country profiles of three Caucasus countries made under various frameworks and for various purposes are available both as hard copies and on the web – for example, UNECE profiles of the housing sectors, or various factbooks. However, these profiles are usually of no particular relevance to the GE/RE. They contain some applicable information, but not in a GE/RE shape; moreover the same information is usually found in other assessments. Therefore, such country profiles were not considered separately under the present review.

### 3.6 Highlights of green-economy assessments

The highlights are based on 26 assessments included in the AOA-approved list, out of which 25 are national, from the 3 countries, and one is regional (EECCA/SEE).

#### 3.6.1 Type of analysis covered by the green-economy related assessments

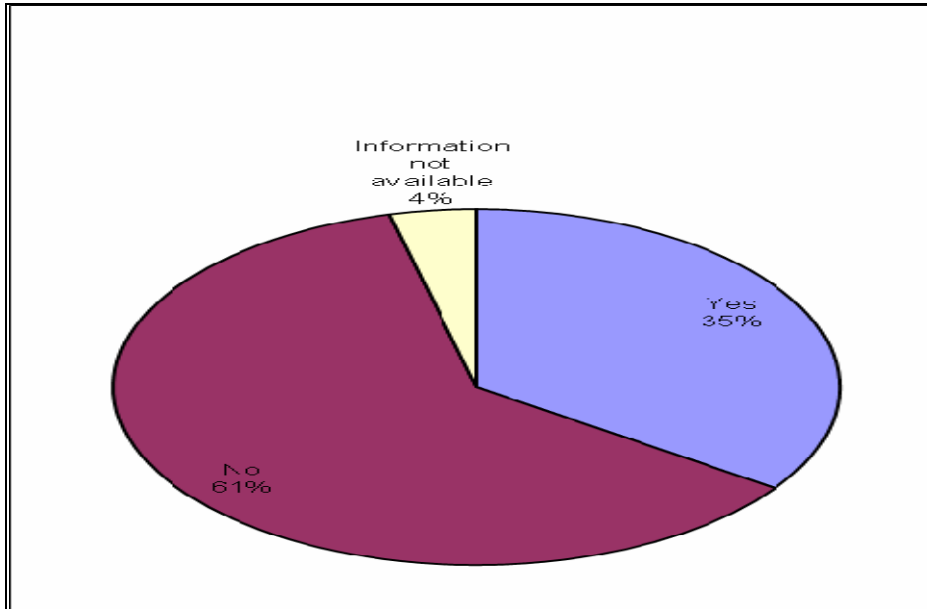
**General findings** from the reviewed assessments demonstrate the following (Figure 3.1):



**Figure 3.1: Type of assessments.**  
*Source: AoA portal review template*

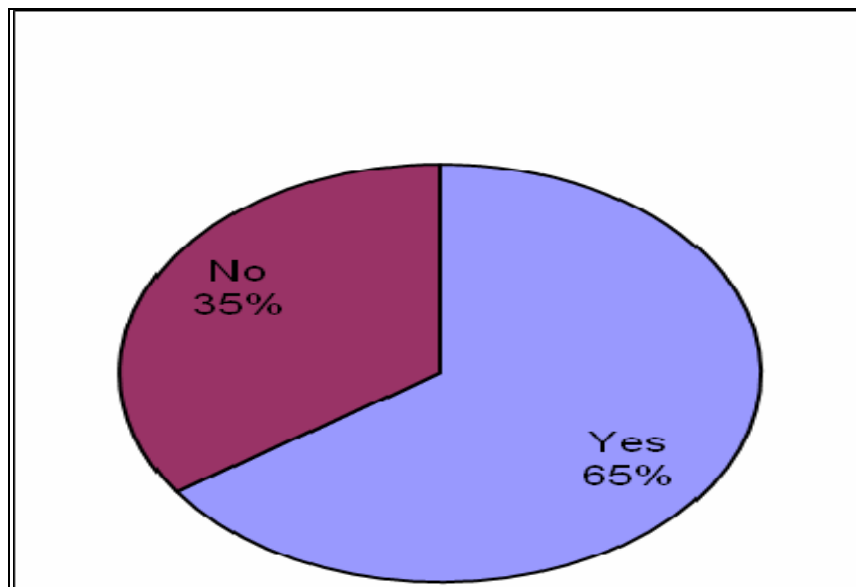
Types of assessments available in the region are diverse, status and trend assessments being most frequent. A number of integrated, sectoral, and thematic assessments are available. Impact assessments are less widespread, usually associated to a process under some particular international convention or agreement, and practically non-existent when it comes to the national policy or decision-making impacts. Response assessments are also rare, probably due to the same reasons. There are few project-related assessments, but their focus is usually very narrow and technical, lacking a broader GE/RE perspective.

Regularity of the assessments varies: most assessments are not part of a regular process (Figure 3.2).



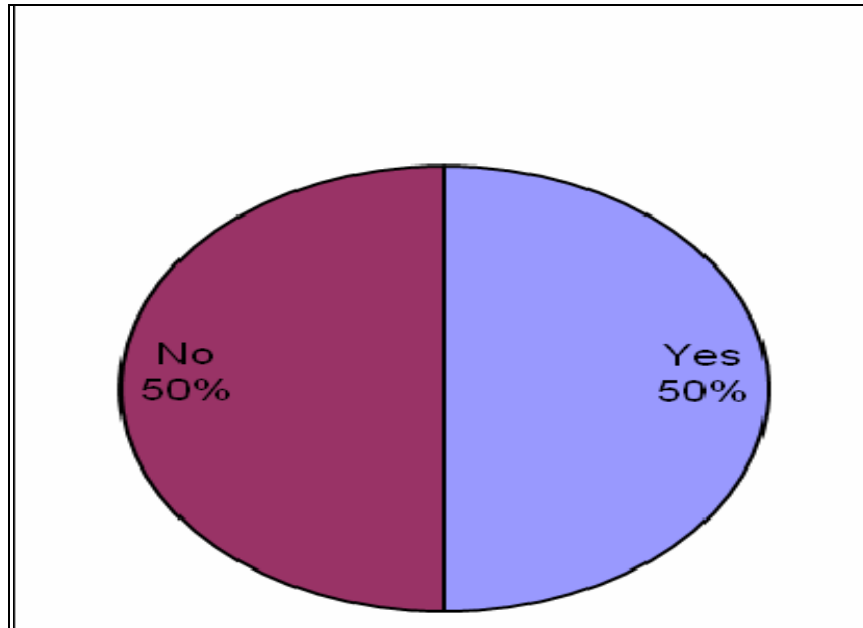
**Figure 3.2: Is the assessment part of the regular process of assessment?**  
*Source: AoA portal review template*

But even in the case of some national SoERs, the formal regularity does not guarantee that the next assessment will be issued on time. Most of the assessments were carried out by the body that initiated them. Exceptions relate to state institution asking an international partner to conduct a particular assessment; even in these cases an earlier process had usually taken place, and the initial initiative may have come from the partner in the form of invitation to consider the specific opportunity. This highlights the absence of the practice of commissioning or contracting assessments on the national level – when the state institution announces a call for national consultancy organizations to draft a specific assessment. Consequently, it appears that state bodies probably do not use the capacity of local experts and think-tanks to the extent possible (Figure 3.3).



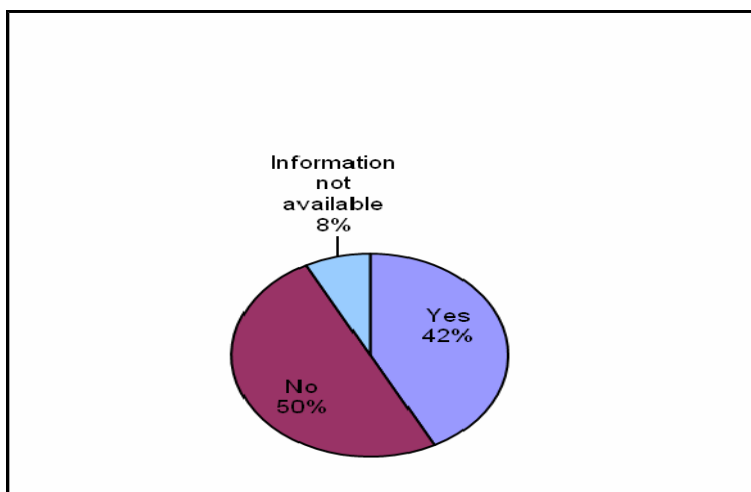
**Figure 3.3: Was the assessment the result of an initiative by the body who conducted the assessment?**  
*Source: AoA portal review template*

Half of the assessments involved several institutions but were coordinated by one. This consultation process is reflected in the final document (Figure 3.4).



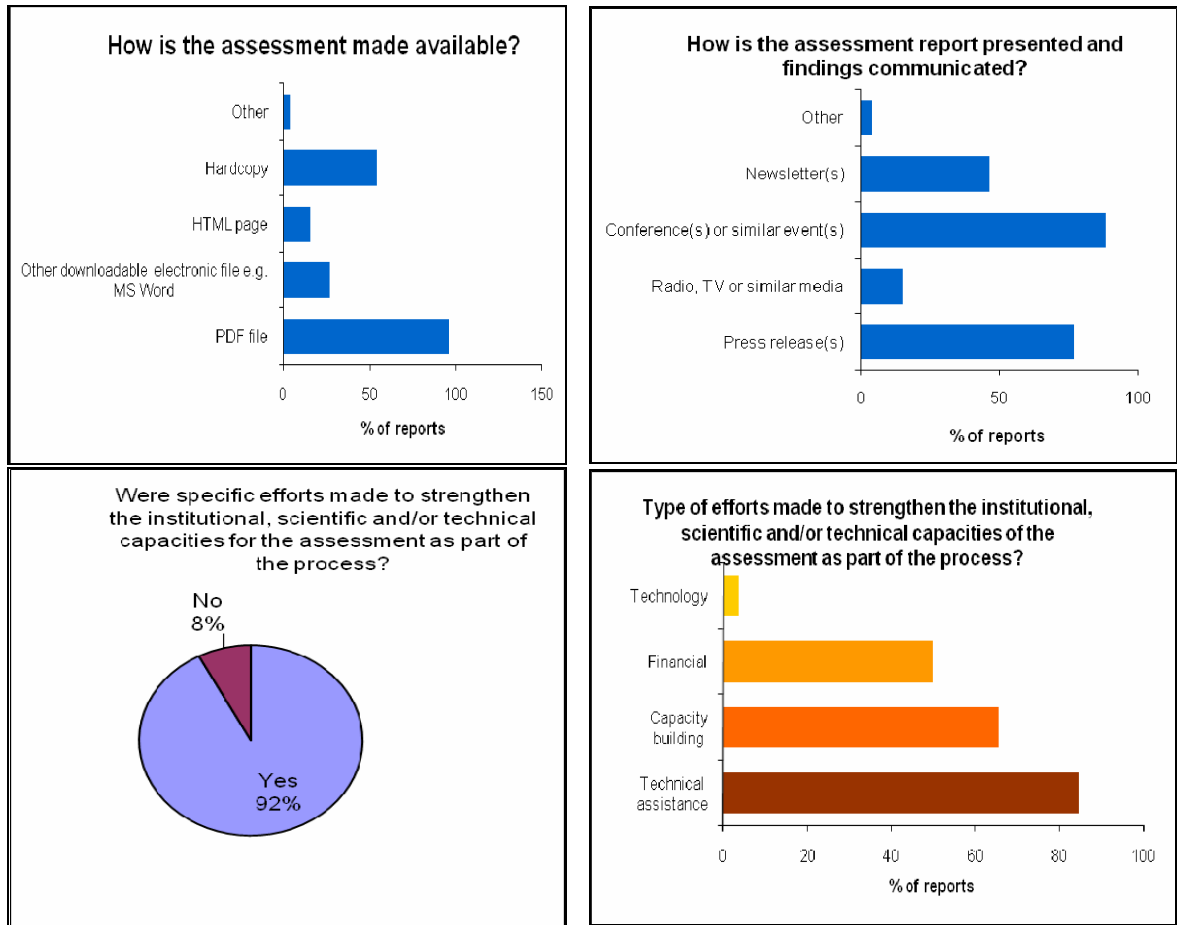
**Figure 3.4: Was more than one body involved in producing the assessment?**  
*Source: AoA portal review template*

Most assessments were not isolated but made within some broader framework, and therefore are coordinated with other assessments, at least in terms of their methodology (Figure 3.5).



**Figure 3.5: Were any specific arrangements made to coordinate the preparation of the assessment report with other ongoing assessment process?**  
*Source: AoA portal review template*

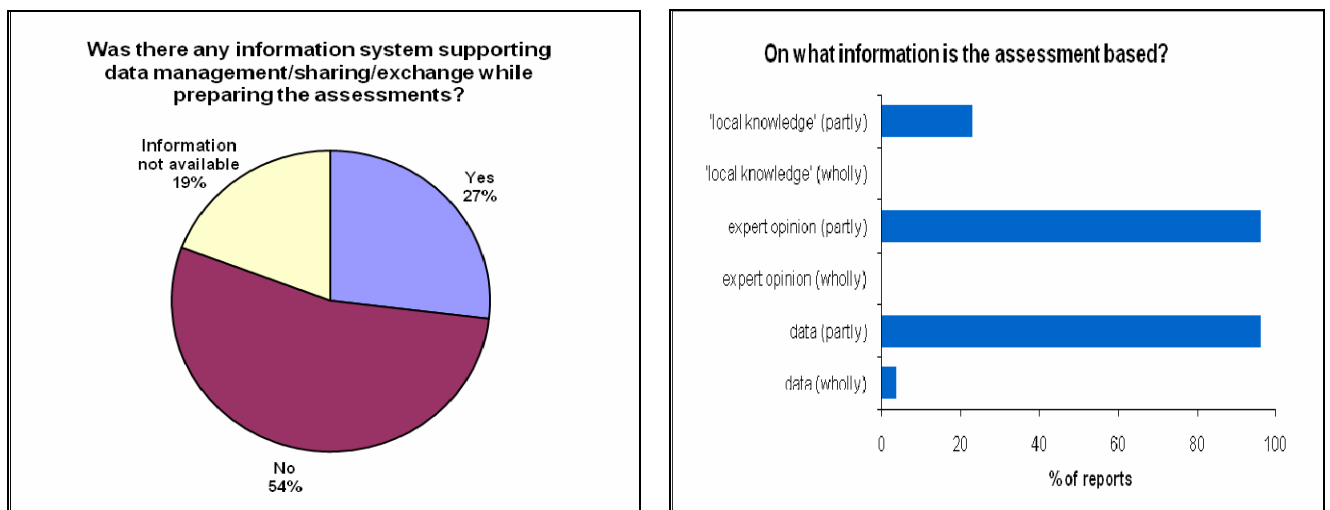
Findings on the **communication, access, and accountability** reveal the following (Figure 3.6):



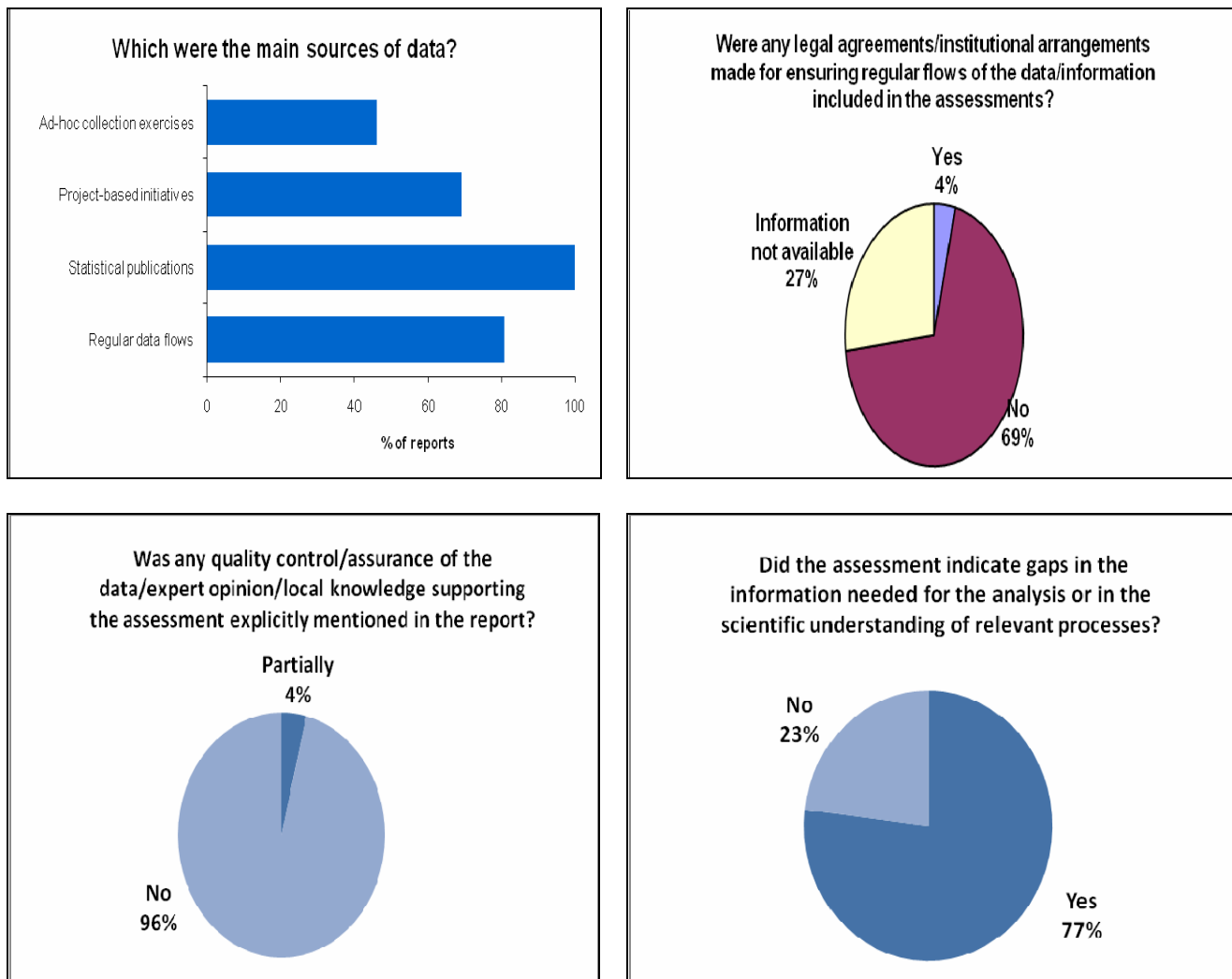
**Figure 3.6: Communication, access and accountability findings.**  
*Source: AoA portal review template*

In general, the documents are available online – PDF format being the most widespread –, as well as in hard copy. Less clear is the pattern of publication of the assessment reports, hinting at the possibility of some under-promotion of otherwise good assessments. In most cases, specific efforts were made to strengthen the institutional, scientific and/or technical capacities for the assessment as part of the process, technical assistance being prevalent.

Analysis of the **information used in the assessments** indicates the following (Figure 3.7):







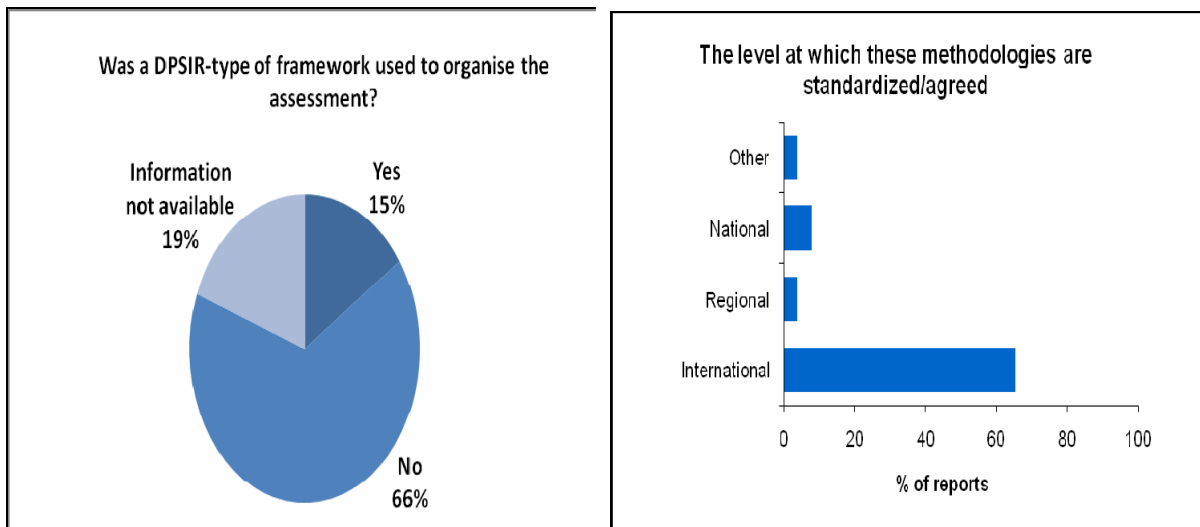
**Figure 3.7: Analysis of the information used in the assessments.**  
**Source: AoA portal review template**

Most of the information used was received through routes other than the existing systems supporting data management, exchange and sharing. Assessments largely, and almost equally, relied on data and expert opinion, rather than local knowledge. Only a few assessments exclusively use expert opinion or local knowledge. Regular data flows and statistical publications represent the main sources of information, but there is significant number of reports that have initiated their own procedures to collect specific data. Reviewed assessments did not clearly demonstrate any active attitude to influencing legal/institutional arrangements for ensuring regular flows of data/information, relying on – or at least not altering – existing frameworks. Quality control is still not present – almost all of the reviewed reports mentioned no clear provisions for quality control/assurance, although there probably was some procedure in place in most cases. In most of the reports information gaps – where they exist – were referred to explicitly. The most important information gaps relate to monitoring networks, their insufficient coverage, low frequency of monitoring, unclear QA/QC procedures, weak legislative and organisational frameworks undermine the reliability of primary data.

It should be noted that even the existence of primary data does not guarantee their proper application, as the use of data-based indicators is still uneven, and the indicator sets, such as those in statistical reports, are not always GE/RE-relevant, and not standardised, even in SoERs. Things are changing for the better, as there is increasing tendency to use internationally recommended indicator sets such as UNECE's, but their application, especially for nationally made assessments, is still limited. Most useful for comparisons

across three states are indicators that have been used for some time in traditional reporting – for example, for renewable energy and energy efficiency in the energy sector or mobility, under transport.

**Methodologies used in the assessments** show the following (Figure 3.8):



**Figure 3.8: Methodologies used in the assessment.**  
*Source: AoA portal review template*

The use of a DPSIR-type framework is gaining traction, with most recent assessments demonstrating greater alignment with this approach. However, the DPSIR framework was used for just a few of the assessments reviewed, and even where it was present, it was only partial used. On the methodology side, most of the reports were made following some internal rules of the particular institution, harmonised to some extent with international practice.

### 3.6.2 Priority concerns, specific needs, emerging issues, options for future action

Quantitative analysis of coverage of GE/RE priority themes by the reviewed assessments provided an informative snapshot of some issues that were addressed, to varying extents, in Caucasian states, and – even more spectacularly – others were completely missing. The graphs below indicate the following:

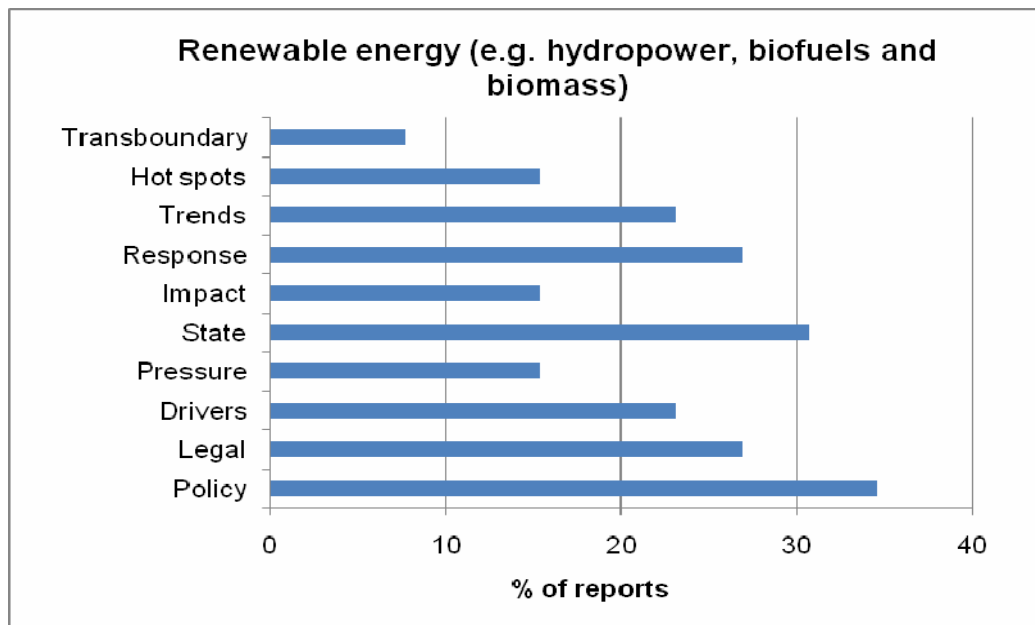
On the GE side, themes linked to the traditional sectors are covered better, as they still part of the assessment frameworks of respective sectors. Namely, **renewable-energy** and **energy-efficiency** issues were usually, albeit rather superficially, considered in assessments of the energy sector. Similarly, **mobility**-related GE issues were covered under environment – largely emissions; noise is practically never mentioned – or transport, and **industry**-related issues were covered either under environment – emissions, waste, etc. – or industry. Depending on the nature of the assessment, **governance** was covered where appropriate, but this is limited mostly to simple descriptions of structures and responsibilities; the same is true for **EIAs**, but **SIAs** are completely left out of the scope of the assessments reviewed. **Innovation** issues are present to some extent, but sometimes understood narrowly as a subject for the science and education sections. Finally, **corporate social responsibility and environmental reporting** does not seem to be an issue of interest in the region.

On the RE side, the picture is similar to GE: themes linked to traditional sectors are covered better, but are understood in a rather old-fashioned way. Namely, **use of natural capital** – agriculture, land, forests, etc. – seems to be sufficiently covered at a glance, however, even

where the relevant data are presented, the interpretation usually falls short of an understanding of the RE concept. **Water efficiency** issues come under the general water-use sections, rather than highlighting their relevance to the overall RE issues beyond water governance. Data and discussion on the **consumption and production patterns** also are scattered in various topics, making it difficult to develop any informed judgments. **Environmental accounting** is typically very limited in scope, information on environmental expenditure and tax revenue are the mostly widely covered topics in the statistical compendiums. Finally, the total lack of **life-cycle analyses** points to the critical absence of demand and a weakness of associated capacities in the region, that in turn highlight weak involvement of non-state actors in overall governance, as do the lack of coverage of **corporate social responsibility and environmental reporting**.

The assessments' coverage of the GE/RE priority themes in terms of analysis types is reviewed below topic by topic. Analysis types include framework analyses, policy, legal, etc.; DPSIR analyses; and analysis of trends, hot spots and transboundary issues.

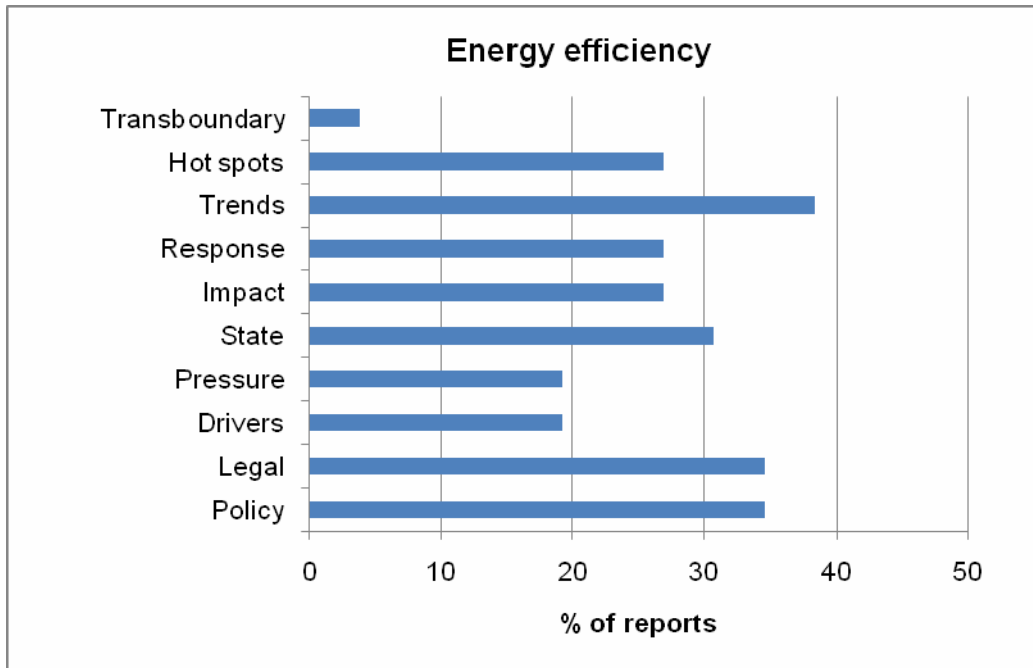
As for the GE themes, the situation is the following (Figure 3.9):



**Figure 3.9.1: Renewable energy coverage.**

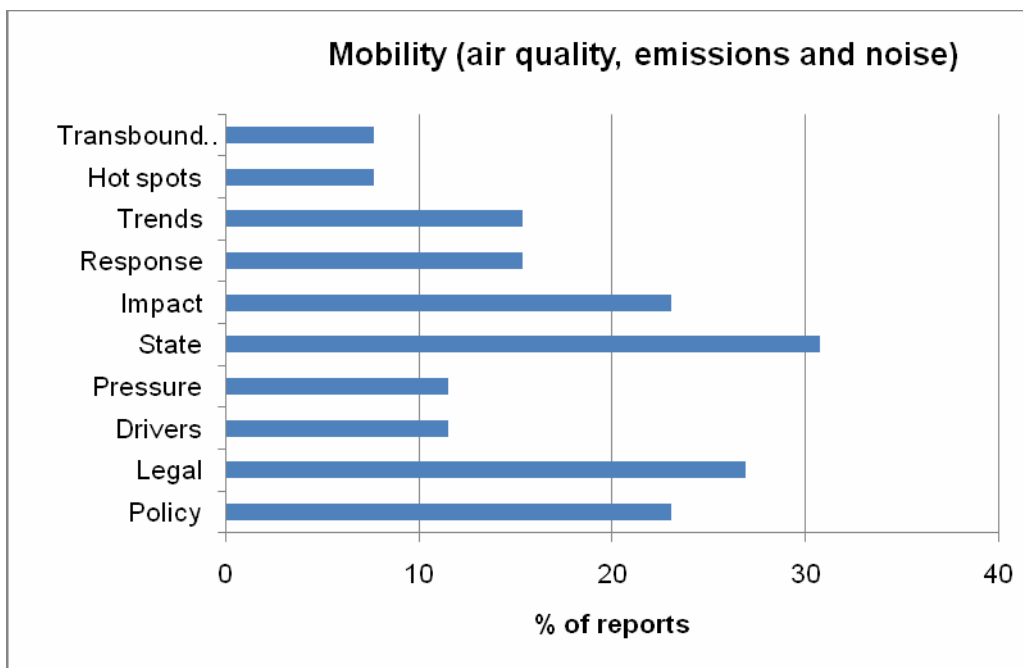
*Source: AoA portal review template*

As mentioned above, **renewable-energy** coverage looks extensive compared to other priority themes. It is also policy-oriented, attentive to the legal issues, less but still mindful of trends and to some extent compliant to the DPSIR framework.



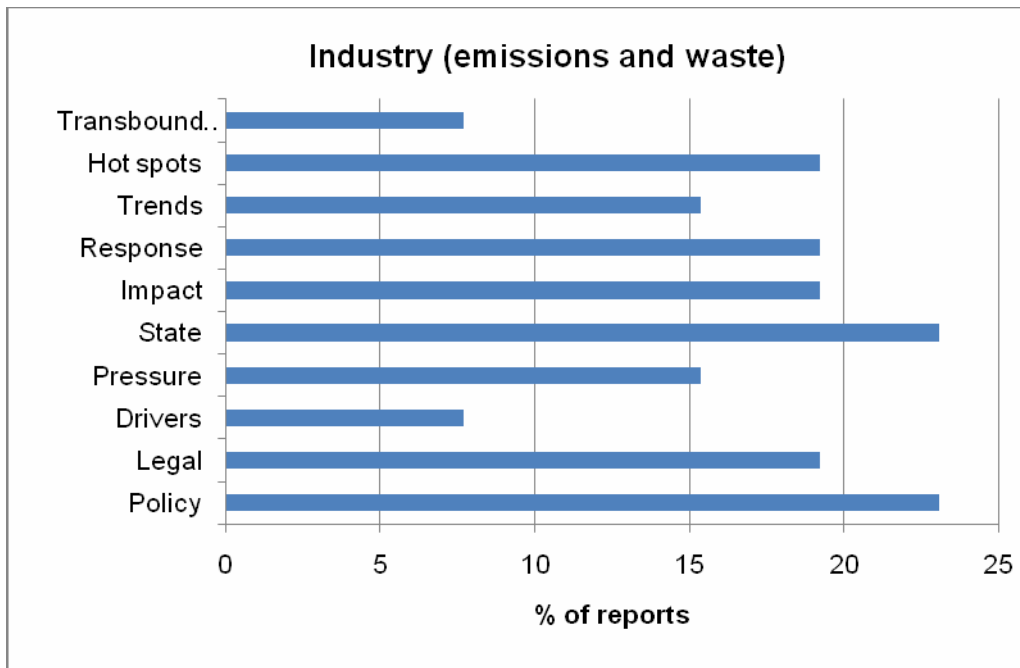
**Figure 3.9.2: Energy efficiency coverage.**  
*Source: AoA portal review template*

**Energy efficiency** largely follows the same pattern of the **renewable energy**. Hot spots, that are relatively easy to identify for this theme, are rarely referred to. **Renewable energy** has long been part of the overall energy reporting, while **energy efficiency** is a relative newcomer. Also it is clear that at present neither is regarded as a GE/RE theme (Figure 3.9.2).



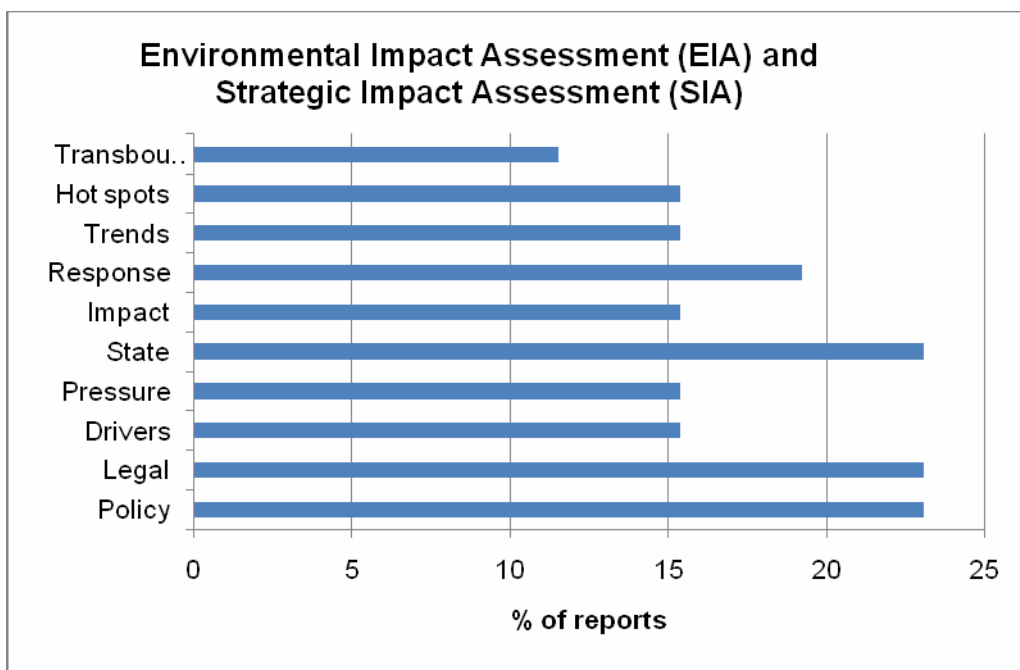
**Figure 3.9.3: Mobility-related theme coverage.**  
*Source: AoA portal review template*

The **mobility**-related theme is also relatively well covered: albeit this statistical look is misleading. Most of the information is distributed and interpreted as part to environment and transport topics, leaving the cross-cutting GE/RE problems essentially disregarded (Figure 3.9.3).



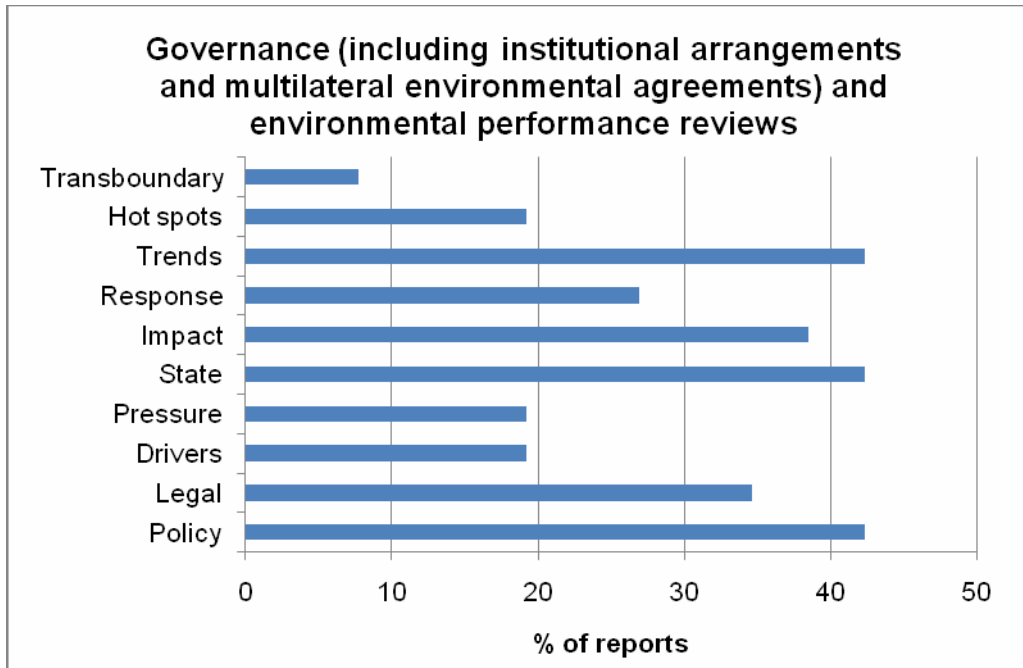
**Figure 3.9.4: Industry-related theme coverage.**  
*Source: AoA portal review template*

The situation is better for **industry**-related themes of the GE/RE: as in case of the **renewable** energy, this subject benefits from the established practice of routinely accounting for emissions and discharges of the industrial sector. Nevertheless, GE/RE relevance is not always recognised (Figure 3.9.4).



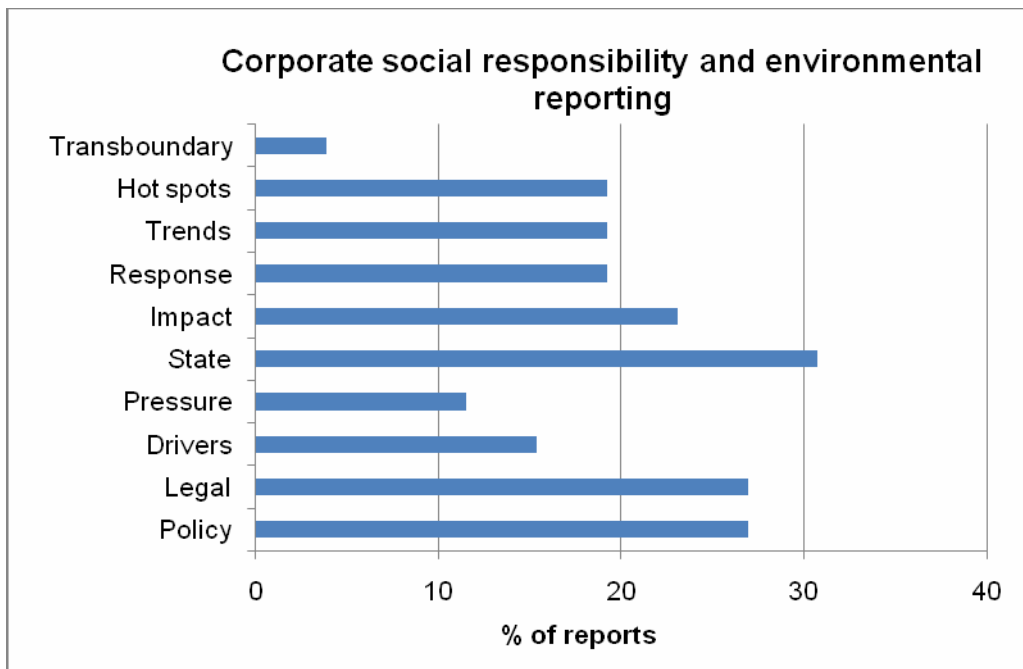
**Figure 3.9.5: EIA and SIA coverage.**  
*Source: AoA portal review template*

Coverage of the **EIA** is limited, despite the fact that in all three countries this instrument is in use. **SIA** is neither covered nor visibly present in any of the three states (Figure 3.9.5).



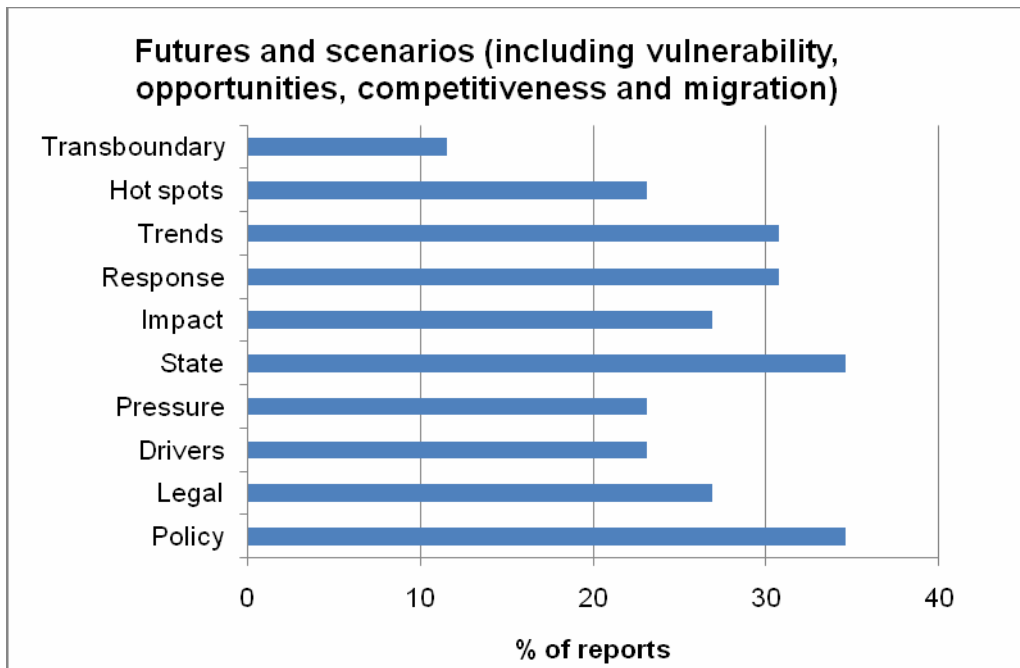
**Figure 3.9.6: Governance coverage.**  
**Source: AoA portal review template**

Governance, including institutional arrangements and multilateral environmental agreements (MEAs) and environmental performance reviews enjoy a high percentage of assessments addressing policy and legal aspects and trends. Nevertheless, deeper analysis is rarely applied (Figure 3.9.6)



**Figure 3.9.7: Corporate social responsibility and environmental reporting coverage.**  
**Source: AoA portal review template**

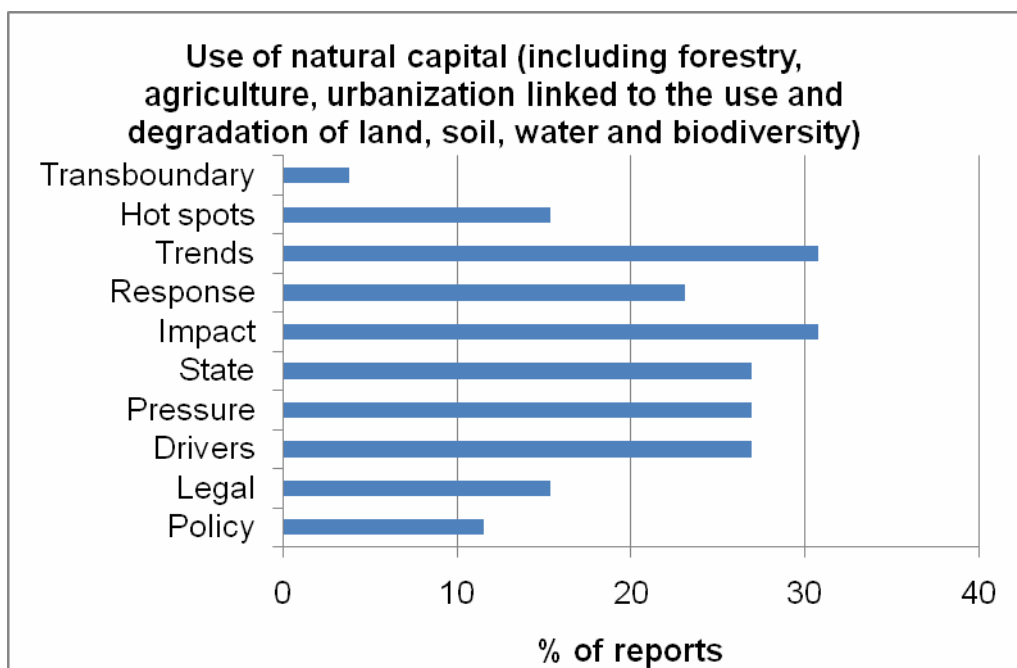
**Corporate social responsibility and environmental reporting** is among the least addressed of the GE themes, and the reason is clear – neither the regulators nor the regulated communities in the Caucasus region are ready to cooperate on this issue. This is a by-product of the transition to a market economy; markets are still not stable and mature enough to provide incentives for the regulated community to step up its commitments, and governments do not seek these commitments (Figure 3.9.7).



**Figure 3.9.8: Futures and scenarios analysis coverage.**  
*Source: AoA portal review template*

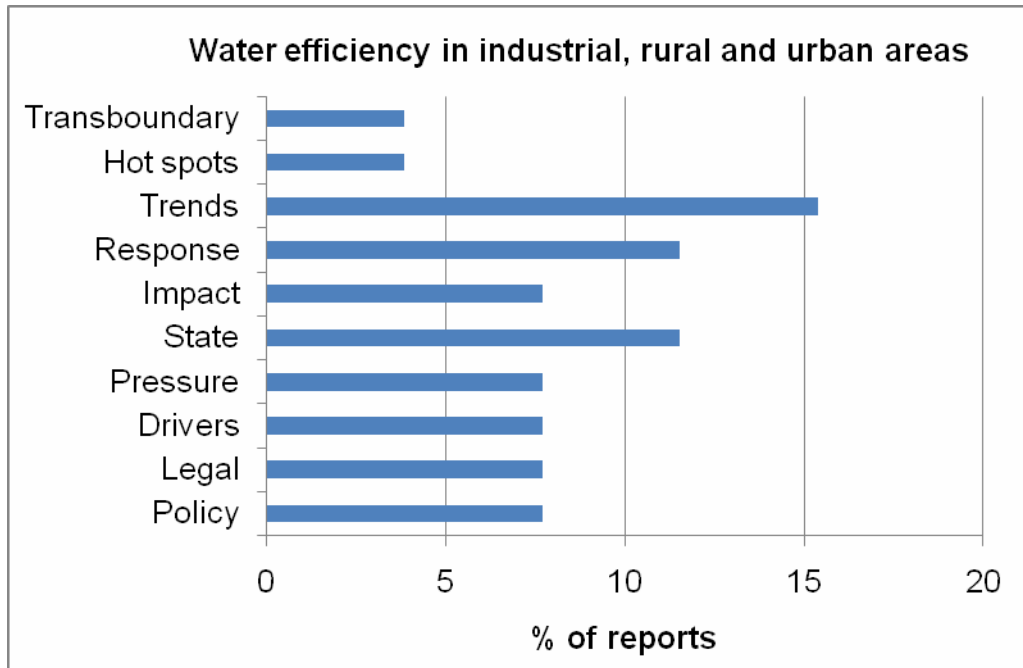
The assessments cover the analysis of futures and scenarios to some extent; however, the methodology and reliability are not always assured (Figure 3.9.8).

On the RE topics, the situation is as follows (Figure 3.10):



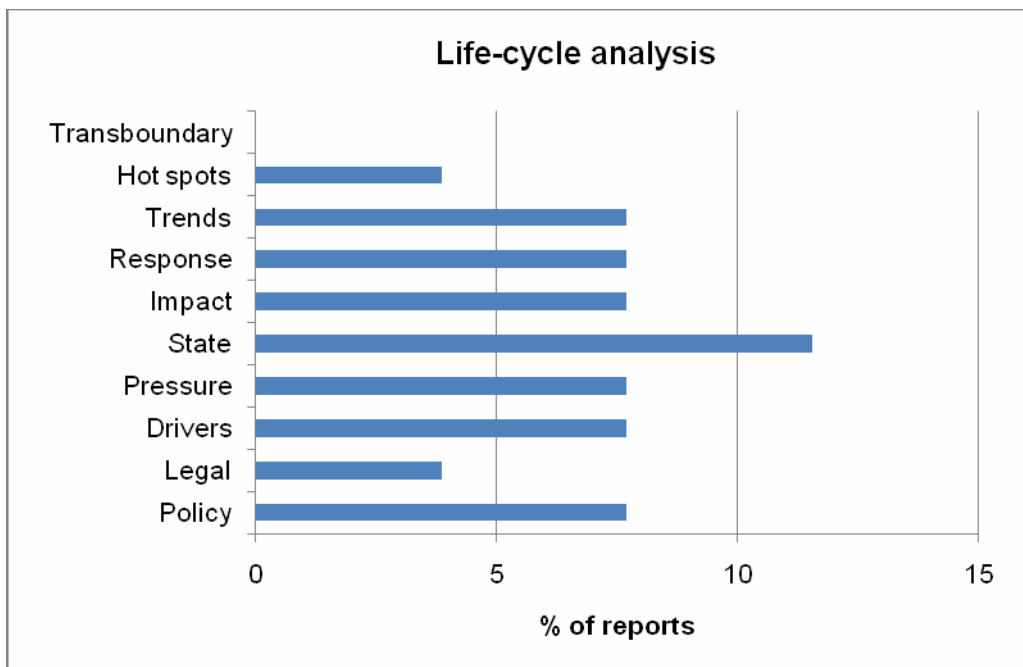
**Figure 3.10: Natural capital usage coverage.**  
*Source: AoA portal review template*

With the many aspects of the **use of natural capital**, including forestry, agriculture, urbanization linked to the use and degradation of land, soil, water and biodiversity, the proportion of assessments referring to these issues is sizable. The diversification of the information provided by the assessments under various topics also increases the DPSIR elements of the assessments. What is usually missing is the mechanism that could link these pieces of data and information together in an RE-relevant analysis.



**Figure 3.10.1: Water efficiency coverage.**  
*Source: AoA portal review template*

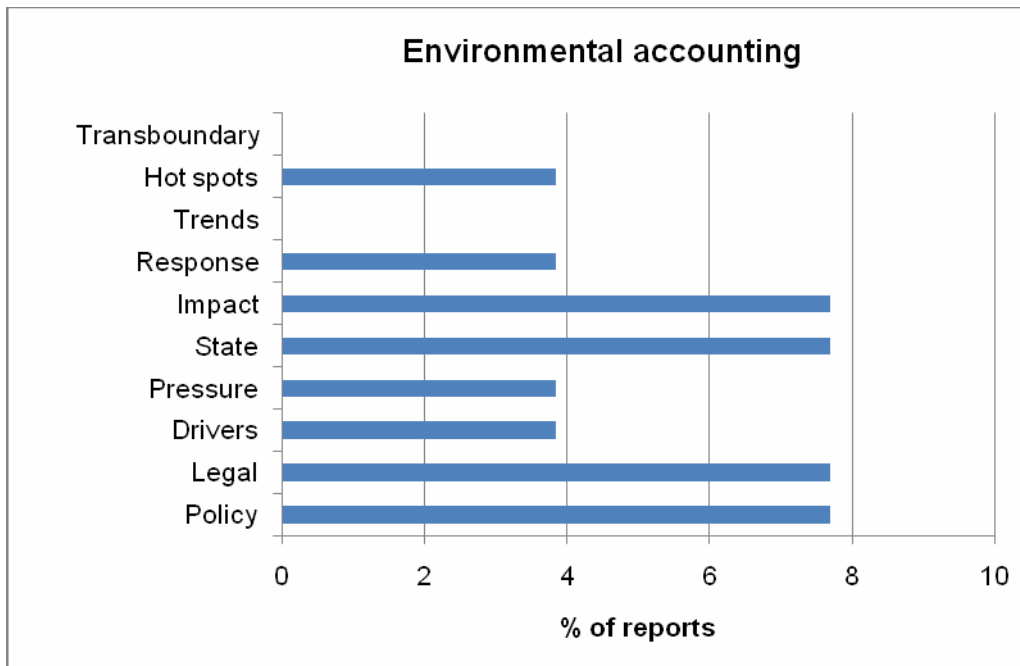
While other water concerns – abstraction, supply, use, discharge, treatment, etc. – are extensively covered in many assessments, **water efficiency** is not. This reflects the remains of the Soviet-style traditional heavy distortion towards supply management at the expense of demand management not only in this but also several other sectors of the economy, and highlights the whole category of largely untouched deep-rooted problems (Figure 3.10.1)



**Figure 3.10.2: Life-cycle analysis.**  
*Source: AoA portal review template*

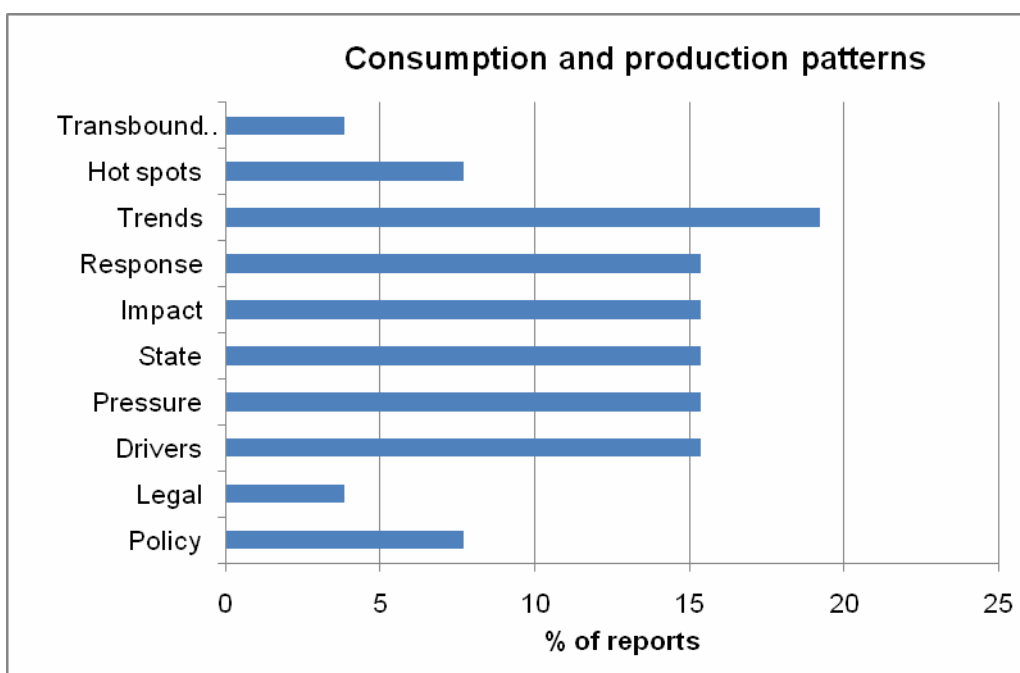
**Life-cycle analysis** is simply missing from the toolkits of policy makers in all three Caucasian states. Rarely known, barely mentioned, never applied – this is a clear manifestation of where the RE weaknesses lie (Figure 3.10.2).





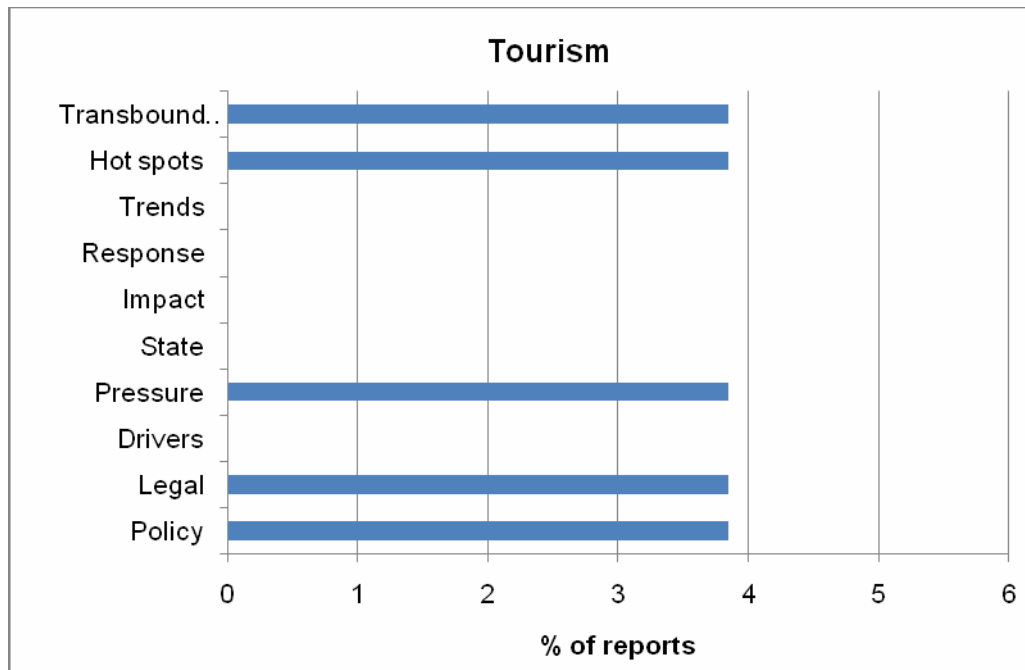
*Figure 3.10.3: Environmental accounting coverage.  
Source: AoA portal review template*

**Environmental accounting** is hardly better off than the **LCA**. Only fractured data are present in a few of the assessments reviewed, usually under a topic not related to the RE. Despite the early pilot projects completed in some countries, there is no sign that the **environmental accounting** could gain any significance soon (Figure 3.10.3).



*Figure 3.10.4: Consumption and production patterns' coverage  
Source: AoA portal review template*

**Consumption and production patterns** make up a broad and multi-faceted theme and, as a result there is some related information in national assessments, giving some basic data on state, trends and policies. In contrast, the EEA-UNEP joint EECCA-SEE-wide report of 2007 presents a clear picture of the CPP issues also for the Caucasus states (Figure 3.10.4).



*Figure 3.10.5: Tourism coverage.  
Source: AoA portal review template*

Lastly, **tourism** enjoys significant, at a glance, coverage because of the well-known links between tourism and the economy, and tourism and the environment (Figure 3.10.5). However, these links are rarely developed, and most of the data and information on tourism are superficial and broad, with GE/RE aspects practically never taken into consideration. Taking into account the cross-cutting character of GE/RE, there are two reasons that make the assessments less action-oriented:

1. **the general lack of an integrated approach** – particularly of the DPSIR framework – pre-empts the possibility of deeper analysis, and leaves a notion that even otherwise decent assessments remain isolated and disconnected from each other;
2. **the general weakness of national strategic planning frameworks:** without a strong unifying agenda, the assessments from state institutions are predestined to be limited to narrow sectors where the competence of the given institution is clear and undisputed. This leaves vast ‘grey areas’ of would-be shared competences, really environmental taxes, for example, lacking proper consideration.

The **main concerns** identified are usually restricted to narrow issues related to the state segment of the DPSIR: pollution of particular media, certain loss of biodiversity, etc. **Needs/emerging issues** highlighted in the assessments stem mostly from the trends in the particular indicator, and suggest remedies of rather a command-and-control type – again because these are easier to implement within the boundaries of the competencies of a single institution.

The **reference in assessments to the policy cycle** is rather weak. Again, the main reasons for this lies within the general weaknesses of longer-term planning frameworks that are observed, to varying degrees, in all three Caucasian countries. The internal demand is so weak for even the NEAPs – that should serve as a backbone for periodic policy planning and overview documents – that almost nobody, except some NGOs, notices that these are often delayed, creating long gaps often running to years with no legally-valid policy document in place.

### 3.7 Conclusions and recommendations

The analysis of the assessments related to GE/RE issues of in the Caucasus region (Armenia, Azerbaijan and Georgia) leads to the following conclusions:

#### **Geographical and thematic coverage, and quantity of assessments relevant to the AoA exercise is as follows:**

- few regional assessments exist, and those that do are all made by international organizations;
- sub-regional (Caucasus-wide) assessments are rare; there are virtually no recent examples;
- most of the existing assessments cover the national level. There are some periodic assessments, but time gaps are generally too long, with some of the most recent periodic assessments being more than 5 years old. Most strikingly, the periodic SoE reporting process seems weak in all three states – two of them have not produced comprehensive SoERs for the last 5 years.

#### **Institutions and mechanisms that are involved in assessment process:**

- most robust periodic assessments belong to international reporting mechanisms – MDGs, UNFCCC, UNCCD, UNECE conventions. One-off assessments are also made mostly with some international assistance/cooperation;
- assessments made without international involvement are relatively rare, with the exception of the statistical compendiums;
- usually the assessments involve several institutions, but coordination and consultation mechanisms are not always clear and formally defined;
- there is a clear lack of non-state and non-government actors involvement in all three states.

#### **Quality of the assessments:**

- quality control and assurance are not always satisfactory for the national-made assessments;
- use of internationally-accepted methodology is increasing but still not prevalent;
- data- and information-flow mechanisms are defined on the national level, but gaps exist;
- analysis is performed either by, or under the control of, state institutions. Requirements for corporate reporting on the national level virtually do not exist.

#### **Relevance of the assessments to GE/RE:**

- cumulatively, the assessments do contain data and information relevant to GE/RE;
- however, the data are not always reliable and up-to-date, and the information is incomplete;
- the analysis, except the regional assessments and a very few national ones, is usually completely misses a broader GE/RE perspective of the cross-cutting issues, and concentrates on traditional coverage of the themes by economic sector. Therefore additional work is needed to interpret existing information in GE/RE context.

Respectively, **the recommendations** are as follows:

- efforts must be concentrated on measures leading to more recognition at the national level of GE/RE as a cross-cutting, self-standing issue. Economic focus must be kept;
- capacity at the national level needs to be increased, as does already existing capacity, beyond the state institutions. Assessment methodologies must be improved and aligned with the international practice. Involvement of non-state actors must be considered and encouraged;
- there is a clear need for international cooperation. The EU, UNECE, UNEP, other UN institutions and international organisations already working in the area should take lead in these efforts.

## References

### Water resources and water-related ecosystems

1. Armenian State Hydro-meteorological Service of the Ministry of Emergency Situation in the Republic of Armenia, "Hydrological Yearbook", 2010.
2. Asian Development Bank, "Country Environmental Analysis – Azerbaijan", 2005.
3. Azerbaijan National Academy of Sciences, "Country Study on Biodiversity of Azerbaijan Republic", Fourth National Report to Convention of Biological Diversity, Baku, 2010.
4. Environmental Impact Monitoring Centre of the Ministry of Nature Protection of the Republic of Armenia, "Reference on the Status of Surface Waters", 2010 (in Armenian).
5. European Commission "Environmental Collaboration for the Black Sea" project (Georgia, Moldova, Russia and Ukraine), "Integrated Coastal Zone Management Strategy for Georgia", 2009.
6. European Union Project "Trans-Boundary River Management Phase II for the Kura River basin - Armenia Georgia Azerbaijan", "Surface Water Quality Monitoring Guideline Document for Decision Makers", 2010.
7. European Union Project "Trans-Boundary River Management Phase II for the Kura River basin - Armenia Georgia Azerbaijan", "Analysis of the baseline situation in the Kura-Aras River Basin", 2009.
8. European Union, "European Neighbourhood and Partnership Instrument: Azerbaijan – National Indicative Programme 2007-2010", 2007.
9. European Union, "European Neighbourhood and Partnership Instrument. Azerbaijan: Country Strategy Paper, 2007-2013", 2007.
10. European Union, "Neighbourhood Policy Action Plan 2006-2011", 2006.
11. European Union, "Neighbourhood Policy Country Report: Azerbaijan", 2005.
12. Food and Agricultural Organisation Fisheries Circular No. 1007, "Fisheries and Aquaculture in Georgia - Current Status and Planning", 2006.
13. Food and Agricultural Organisation , "Aquastat Survey – Azerbaijan", 2008.
14. Food and Agricultural Organisation , "Aquastat survey: Georgia", 2008.
15. Food and Agricultural Organisation , "Irrigation in the Middle East region in figures - AQUASTAT Survey", 2008.
16. Government of Armenia/United Nations Country Team in Armenia, "Armenia: Millennium Development Goals National Progress Report", 2010.
17. Government of Azerbaijan, "State Program on Poverty Reduction and Sustainable Development Republic of Azerbaijan, 2008-2015", 2008.
18. Japanese International Cooperation Agency, "The Study for Improvement of Rural Water Supply and Sewage Systems in the Republic of Armenia ", 2009.
19. Ministry of Ecology and Natural Resources " State Program on Environmentally Sustainable Socio-Economic Development 2003-2010 of Azerbaijan Republic", Baku, 2003.
20. Ministry of Ecology and Natural Resources of Azerbaijan, "Implementation Report of State Program of the Regions 2009-2013", 2010.

21. Ministry of Ecology and Natural Resources of Azerbaijan, "National Capacity Self Assessment for Global Environment Management in Azerbaijan", 2005.
22. Ministry of Environment Protection and Natural Resources of Georgia, Final Draft "Second National Environmental Action Plan of Georgia - 2011-2015", 2010.
23. Ministry of Environment Protection and Natural Resources, "Second National Communication of the Republic of Georgia to the UNFCCC", 2010.
24. Ministry of Nature Protection of the Republic of Armenia, "Second National Communication on Climate Change under the United Nations Framework Convention", prepared in the frame of UNDP/GEF "Enabling Activities for the Preparation of Armenia's Second National Communication to UNFCCC" Project, 2010.
25. National Statistical Office of Georgia, "Statistical Yearbook of Georgia", 2010.
26. National Statistical Office of Georgia, Statistical Publication "Natural Resources and Environment Protection of Georgia 2008", 2009
27. National Statistical Service of the Republic of Armenia, "Housing and Municipal Services in the Republic of Armenia", 2010.
28. National Statistical Service of the Republic of Armenia, "Social and Economic State of the Country", 2010.
29. National Statistical Service of the Republic of Armenia, "Statistical Yearbook of Armenia", 2010.
30. National Statistical Service of the Republic of Armenia, "The Environment and Nature Resources of the Republic of Armenia", 2010.
31. North Atlantic Treaty Organisation , "Management of Urban Water Resources in Azerbaijan", 2005.
32. Organisation for Economic Cooperation and Development, "Financing Strategy for the Urban Water Supply and Sanitation Sector in Georgia", 2006.
33. Organisation for Economic Cooperation and Development, "Financing Water Supply and Sanitation Sector in EECCA Countries, including Progress in Achieving Water-Related Millennium Development Goals", 2007.
34. State Statistical Committee of the Republic of Azerbaijan, "Environment in Azerbaijan 2008", 2009.
35. State Statistics Committee of the Republic of Azerbaijan, "Annual Bulletin of the Environment and Natural Resources", 2010.
36. United Nations Convention to Combat Desertification, "National Report on United Nations Convention to Combat Desertification implementation", 2006.
37. United Nations Development Program, "Capacity Building and On-the-Ground Investments for Integrated and Sustainable Land Management in Azerbaijan", 2006.
38. United Nations Development Program/Global Environmental Facility, "Enabling Activities for the Preparation of Armenia's Second National Communication to UNFCCC" Project, "Vulnerability of Water Resources of the Republic of Armenia due to Climate Change", 2008.
39. United Nations Development Program/Global Environmental Facility, "Reducing Transboundary Degradation in the Kura-Aras River Basin" project, "Groundwater Resources of the Kura-Aras River Basin", 2007.

40. United Nations Development Program/Global Environmental Facility, "Reducing Transboundary Degradation in the Kura-Aras River Basin" project, "Water Quality in the Kura-Aras River Basin", 2005.
41. United Nations Development Program/Global Environmental Facility, "Reducing Transboundary Degradation in the Kura-Aras River Basin" project, "Legal and Institutional Framework for Water Sector in Armenia, Azerbaijan, Georgia and Iran", 2005.
42. United Nations Development Program/Swedish International Development Agency, "Reducing Transboundary Degradation in the Kura-Aras River Basin" project, "Existing Databases, Data Collection Techniques and Data Management, Monitoring and Standards", 2005.
43. United Nations Development Program/Swedish International Development Agency, "Reducing Transboundary Degradation in the Kura-Aras River Basin" project, "Water Policy of Armenia, Azerbaijan and Georgia".
44. United Nations Economic Commission for Europe, "Baseline Conditions and Pressures on for IWRM in the Marmarik River Basin of Armenia", 2007.
45. United Nations Economic Commission for Europe, "Environmental Performance Review of Armenia", 2003.
46. United Nations Economic Commission for Europe, "Second Environmental Performance Review of the Republic of Azerbaijan", 2010.
47. United Nations Economic Commission for Europe, "Second Environmental Performance Review of the Republic of Georgia", 2010.
48. United Nations Economic Commission for Europe/Organisation for Security and Cooperation in Europe, "Identification of the legal and institutional needs for accession and implementation of the UNECE Water Convention by Georgia", 2009.
49. United Nations, STAT Environment and Energy statistics, " Environment Statistics Country Snapshots: Georgia", 2009.
50. United States Agency for International Development, Program for Institutional and Regulatory Strengthening of Water Management in Armenia, "State Water Cadastre Information System: Status Report and Recommendations", 2008.
51. United States Agency for International Development, Program for Institutional and Regulatory Strengthening of Water Management in Armenia, "Annual Report on Armenia National Water Program Status, Activity and Issues - Year 2008", 2008.
52. United States Agency for International Development, Program for Institutional and Regulatory Strengthening of Water Management in Armenia, "Water Utility Service Quality Monitoring for Water Systems in Armenia", 2008.
53. United States Agency for International Development, Program for Institutional and Regulatory Strengthening of Water Management in Armenia, "Model Guidelines for River Basin Management Planning in Armenia", 2008.
54. Water Resources Division of the Natural Resource Program Centre under the National Park Service, U.S. Department of the Interior, Technical Report "Assessment of Coastal Water Resources and Watershed Conditions at Fort Pulaski National Monument, Georgia", 2006.
55. World Bank, "Azerbaijan: Country Economic Memorandum", 2009.
56. World Bank, "Project Appraisal Document Proposed to the Republic of Azerbaijan for a National Water Supply and Sanitation Project" 2007.

## Website Links

1. Armenian State Hydro-Meteorological Service of the Ministry of Emergency Situations  
<http://www.meteo.am>
2. Convention on Biological Diversity: Country Profile - Azerbaijan  
<http://www.cbd.int/countries/?country=az>
3. EBRD Country Strategy for Azerbaijan  
<http://www.ebrd.com/country/country/azer/index.htm>
4. Environmental Impact Monitoring Centre of the Ministry of Nature Protection  
<http://www.armmonitoring.am>
5. Eurasia Partnership Foundation - Azerbaijan <http://epfound.az/>
6. European Bank for Reconstruction and Development: Georgia  
<http://www.ebrd.com/pages/country/georgia.shtml>
7. European Commission project "Transboundary River Management Phase II for the Kura River Basin - Armenia, Georgia, Azerbaijan" <http://www.kuraarasbasin.net>
8. FAO and Azerbaijan <http://www.fao.org/countryprofiles/index.asp?lang=en&iso3=AZE>
9. FAO's Information System on Water and Agriculture (FAO/AQUASTAT): Armenia  
<http://www.fao.org/nr/water/aquastat/countries/armenia/index.stm>
10. FAO's Information System on Water and Agriculture (FAO/AQUASTAT): Azerbaijan  
<http://www.fao.org/nr/water/aquastat/countries/azerbaijan/index.stm>
11. Ministry of Agriculture of Georgia <http://www.moa.gov.ge>
12. Ministry of Ecology and Natural Resources of the Republic of Azerbaijan  
[www.eco.gov.az](http://www.eco.gov.az)
13. Ministry of Economy and Sustainable Development of Georgia [www.economy.gov.ge](http://www.economy.gov.ge)
14. Ministry of Environment Protection of Georgia <http://www.moe.gov.ge>
15. Ministry of Nature Protection of the Republic of Armenia  
[http://www.mnp.am/index\\_eng.htm](http://www.mnp.am/index_eng.htm)
16. National E-Governance Network Initiative of Azerbaijan [www.e-government.az](http://www.e-government.az)
17. National Environment Agency of the Ministry of Environment Protection of Georgia  
<http://www.nea.gov.ge>
18. National Statistical Office of the Republic of Georgia <http://www.geostat.ge>
19. National Statistical Service of the Republic of Armenia <http://www.awmstat.am>
20. OECD: Environmental information Azerbaijan  
[http://www.oecd.org/infobycountry/0,3380,en\\_2649\\_34291\\_1\\_70255\\_1\\_1\\_1,00.html](http://www.oecd.org/infobycountry/0,3380,en_2649_34291_1_70255_1_1_1,00.html)
21. OSCE Office in Baku <http://www.osce.org/>
22. Public Services Regulatory Commission of the Republic of Armenia  
<http://www.psrc.am/en/?nid=237>
23. Regional Development Centre in Azerbaijan [www.azregionaldevelopment.az](http://www.azregionaldevelopment.az)
24. Regional Environmental Centre for the Caucasus <http://www.rec-caucasus.org>
25. State Committee on Water Systems under the Ministry of Territorial Administration  
<http://www.scws.am>
26. State Statistical Committee of Azerbaijan <http://www.azstat.org>

27. The Millennium Challenge Account - Armenia Program [http://www.mca.am/en/mca\\_armenia](http://www.mca.am/en/mca_armenia)
28. UN Department of Economic and Social Affairs: Georgia [http://www.un.org/esa/dsd/dsd\\_aofw\\_ni/ni\\_natiinfo\\_georgis.shtml](http://www.un.org/esa/dsd/dsd_aofw_ni/ni_natiinfo_georgis.shtml)
29. UNDP Azerbaijan projects <http://www.un-az.org/undp/>
30. UNEP/GRID-Arendal: State of Environment of Georgia <http://enrin.grida.no/soe.cfm?country=GE&groupID=2>
31. United Water Supply Company of Georgia under Ministry of Regional Development and Infrastructure <http://water.gov.ge>
32. Wiki for Water Professionals: Azerbaijan <http://waterwiki.net/index.php/Azerbaijan>
33. Wiki for Water Professionals: Georgia <http://waterwiki.net/index.php/Georgia>
34. Wiki for Water Professionals: Armenia [www.waterwiki.net/index.php/Armenia](http://www.waterwiki.net/index.php/Armenia)
35. World Bank Country Data: Azerbaijan <http://www.worldbank.org.az>
36. World Bank Country Data: Georgia <http://www.worldbank.org.ge>
37. World Bank data warehouse - Armenia <http://data.worldbank.org/country/armenia>



## Green economy / Resource Efficiency

1. *The 2<sup>nd</sup> national environmental action programme of Armenia*, 2008. <http://www.natureic.am/res/pdfs/documents/strategic/THE%20%20SECOND%20NATIONAL%20%20ENVIRONMENTAL%20ACTION%20%20PROGRAMME%20%20OF%20THE%20%20REPUBLIC%20%20OF%20%20ARMENIA.pdf>
2. *Country environmental analysis of Azerbaijan*. Asian Development Bank, 2005. [http://www.adb.org/documents/studies/ctry-environmental\\_analysis/2005/aze/default.asp](http://www.adb.org/documents/studies/ctry-environmental_analysis/2005/aze/default.asp)
3. *The final draft of the National report on the state of the environment of Georgia for 2007-2009*. <http://soegeorgia.blogspot.com/p/english-version.html>
4. *Statistical yearbook of Armenia*. 2010. <http://www.armstat.am/file/doc/99461648.pdf>
5. *Statistical yearbook of Azerbaijan*. 2008. <http://www.azstat.org/publications/yearbook/SYA2008/en/index.shtml>
6. *Statistical yearbook of Georgia*. 2010. [http://www.geostat.ge/cms/site\\_images/\\_files/yearbook/Yearbook2010.zip](http://www.geostat.ge/cms/site_images/_files/yearbook/Yearbook2010.zip)
7. *Environmental performance reviews. Azerbaijan. 2<sup>nd</sup> Review*. 2010
8. *Environmental performance reviews. Georgia. 2<sup>nd</sup> Review*. 2010. [http://www.unece.org/env/epr/epr\\_studies/Georgia%20II.pdf](http://www.unece.org/env/epr/epr_studies/Georgia%20II.pdf)
9. *Armenia sustainable development programme 2008*. [http://www.natureic.am/res/pdfs/documents/strategic/SDP\\_01\\_eng\\_20081030.pdf](http://www.natureic.am/res/pdfs/documents/strategic/SDP_01_eng_20081030.pdf)
10. *State programme on poverty reduction and sustainable development in the Republic of Azerbaijan for 2008-2015*. 2008. <http://www.cled.az/pdf/others/Azerbaijan%20Poverty%20Program%20for%202008-2015.pdf>
11. *The opportunities for Georgia in the new green economy* prepared in 2010 under the UNDP Private Sector and Development Series. [http://www.undp.org.ge/files/24\\_1182\\_476920\\_private-dev-eng.pdf](http://www.undp.org.ge/files/24_1182_476920_private-dev-eng.pdf)
12. *2<sup>nd</sup> national communication of Armenia under the United Nations Framework convention on climate change*. 2010. <http://unfccc.int/resource/docs/natc/armnc2e.pdf>
13. *Georgia's 2<sup>nd</sup> national communication to the UNFCCC*. 2009. <http://unfccc.int/resource/docs/natc/geonc2.pdf>
14. *The socio-economic impact of climate change in Armenia*. 2009. [http://www.natureic.am/res/publications/brochures/CC%20Impact%20Assessment%20Report%20Armenia\\_Resized\\_2009.pdf](http://www.natureic.am/res/publications/brochures/CC%20Impact%20Assessment%20Report%20Armenia_Resized_2009.pdf)
15. *Azerbaijan: renewable energy development project*. 2007. <http://www.adb.org/Documents/Reports/Consultant/39622-AZE/39622-AZE-TACR.pdf>
16. *Armenia: MDG national progress report*. 2010. [http://www.undp.am/docs/Armenia\\_MDG\\_National\\_Progress\\_Report\\_2010.pdf](http://www.undp.am/docs/Armenia_MDG_National_Progress_Report_2010.pdf)
17. *Report on sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia*. EEA, UNEP, 2007. [http://www.eea.europa.eu/publications/eea\\_report\\_2007\\_3](http://www.eea.europa.eu/publications/eea_report_2007_3)