

REGIONAL REPORT ON GROUNDWATER OUTPUTS 1.1 and 1.4



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EU4Environment
Water and Data in Eastern Partner Countries

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EU⁴Environment
Water and Data in Eastern Partner Countries

EU4Environment in Eastern Partner Countries:
Water Resources and Environmental Data (ENI/2021/425-550)

ABOUT THIS REPORT

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ABOUT EU4ENVIRONMENT – WATER RESOURCES AND ENVIRONMENTAL DATA

This Programme aims at improving people's wellbeing in EU's Eastern Partner Countries and enabling their green transformation in line with the European Green Deal and the Sustainable Development Goals (SDGs). The programme's activities are clustered around two specific objectives: 1) support a more sustainable use of water resources and 2) improve the use of sound environmental data and their availability for policy-makers and citizens. It ensures continuity of the Shared Environmental Information System Phase II and the EU Water Initiative Plus for Eastern Partnership programmes.

The programme is implemented by five Partner organisations: Environment Agency Austria (UBA), Austrian Development Agency (ADA), International Office for Water (OiEau) (France), Organisation for Economic Co-operation and Development (OECD), United Nations Economic Commission for Europe (UNECE). The programme is principally funded by the European Union and co-funded by the Austrian Development Cooperation and the French Artois-Picardie Water Agency based on a budget of EUR 12,75 million (EUR 12 million EU contribution). The implementation period is 2021-2024.

<https://eu4waterdata.eu>

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List of abbreviations

ADA.....	Austrian Development Agency
BQE	Biological Quality Elements
DoA.....	Description of Action
DG NEAR.....	Directorate-General for Neighbourhood and Enlargement Negotiations of the European Commission
EaP	Eastern Partners
EC.....	European Commission
EECCA	Eastern Europe, the Caucasus and Central Asia
EMBLAS.....	Environmental Monitoring in the Black Sea
EPIRB.....	Environmental Protection of International River Basins
ESCS	Ecological Status Classification Systems
EU	European Union
EUWI+.....	European Union Water Initiative Plus
GEF.....	Global Environmental Fund
ICPDR	International Commission for the Protection of the Danube River
INBO.....	International Network of Basin Organisations
IOW/OIEau	International Office for Water, France
IWRM	Integrated Water Resources Management
NESB	National Executive Steering Board
NFP	National Focal Point
NGOs.....	Non-Governmental Organisations
NPD	National Policy Dialogue
OECD.....	Organisation for Economic Cooperation and Development
RBD	River Basin District
RBMP	River Basin Management Plan
Reps	Representatives (the local project staff in each country)
ROM.....	Result Oriented Monitoring
ToR.....	Terms of References
UBA.....	Umweltbundesamt GmbH, Environment Agency Austria
UNDP	United Nations Development Programme
UNECE.....	United Nations Economic Commission for Europe
WFD	Water Framework Directive

Country Specific Abbreviations Armenia

EMIC	Environmental Monitoring and Information Centre (until January 2020)
HMC.....	Hydrogeological Monitoring Centre (since February 2020)
MNP.....	Ministry of Nature Protection
SCWS.....	State Committee on Water Systems
SWCIS.....	State Water Cadastre Information System of Armenia
WRMA	Water Resources Management Agency

Country Specific Abbreviations Azerbaijan

Azersu JSC.....	JSC Water Supply and Sanitation of Azerbaijan
MENR.....	Ministry of Ecology and Natural Resources
WRSA	Water Resources State Agency of Ministry of Emergency Situations

Country Specific Abbreviations Georgia

MENRP.....	Ministry of Environment and Natural Resources Protection
NEA	National Environment Agency
NWP.....	National Water Partnership

Country Specific Abbreviations Moldova

AAM.....	Agency “Apele Moldovei”
AGMR.....	Agency for Geology and Mineral Resources
AMAC.....	Association of Apacanals
EAM	Environment Agency Moldova
MoAgri.....	Ministry of Agriculture (of the Republic of Moldova)
MoENV.....	Ministry of Environment (of the Republic of Moldova)
Moldova.....	Republic of Moldova
SHS.....	State Hydrometeorological Service

Country Specific Abbreviations Ukraine

MENR.....	Ministry of Ecology and Natural Resources
NAAU	National Accreditation Agency of Ukraine
SAWR	State Agency of Water Resources
SEMS.....	State Environment Monitoring System
UkrHMC	Ukrainian Hydrometeorological Center

Executive Summary

This report summarizes the main activities carried out in Armenia, Azerbaijan, Georgia, Moldova and Ukraine in the framework of the Eu4Environment Water Resources and Environmental Data Program for groundwater. The implemented activities comprised theoretical and practical trainings, sampling audits towards sampling certification and groundwater surveys in specific national areas as well as at transboundary level.

All activities built on the results of the work of the previous program (EUWI+, 2016–2021). They aimed at further strengthening local staff capacities, the availability of more quality-assured data for better groundwater governance and management, the communication and cooperation with neighbouring countries and finally, and at enabling and improving the implementation of the WFD as the main planning and management instrument for all water resources.

The types of offered and implemented activities in the countries varied, as they have been identified and implemented according to the individual needs and available resources in each country.

1. Activity 1.1.1 – Support to the preparation of River Basin Management Plans

Overall aim was to strengthen the capabilities in establishing new RBMPs respectively to improve existing RBMPs for the next planning cycle. Hence, building up on the activities implemented under EUWI+, focus was on the training of how to establish appropriate methods for the assessment of the groundwater chemical and quantitative status according to the WFD requirements, considering related EU CIS Guidance (EU Common Implementation Strategy) vis-à-vis the situation in the countries in terms of groundwater bodies, monitoring networks and availability of data. Furthermore, if requested, the aspect of groundwater body delineation was jointly discussed.

1.1. Training on groundwater status assessment

In 2023, **three 2-day trainings** were held in Armenia (February 2023, Yerevan), Georgia (June 2023, Tbilisi) and Moldova (September 2023, Chisinau) on the establishment of appropriate methods for the assessment of groundwater chemical and quantitative status according to the WFD requirements. In the preparatory phase of the trainings, monitoring data from the countries were gathered to prepare the training tailored to the national circumstances and needs. Aim was to stipulate the elaboration of such methods in each country, which is needed for assessing the status of groundwater bodies as part of the RBMPs.

1.2. Training on groundwater delineation

In Georgia, the delineation of groundwater bodies was discussed and reviewed several times at targeted **meetings** between 2022 and 2024, back to back with meetings and trainings under Activity 1.4.1. The discussions were related to the preparation of the new RBMPs for the Enguri and Rioni RBDs but also for the already existing RBMPs.

1.3. Contribution to River Basin Management Plans

In Armenia, Georgia and Ukraine, the elaboration of **twelve new RBMPs** was **supported** between 2022 and 2024. Ukraine prepared nine RBMPs covering the entire country, Armenia developed another one for the Northern RBD and Georgia two RBMPs for the Enguri RBD and the Rioni RBD. For all RBMPs various groundwater-related guidance was given focussing on reviewing all related chapters on groundwater bodies, characterisation, monitoring, risk and status assessment, on the Programmes of Measures and the corresponding maps. Proposals on improvements were given, and the improved chapters were quality-checked again.

1.4. Azerbaijan

In Azerbaijan, no groundwater input on Activity 1.1.1 was possible. The previous groundwater contact point was no longer available and there was no replacement reported upon several inquiries.

2. Activity 1.4.1 – Water monitoring and surveys

Overall aim was to strengthen the monitoring and sampling capacities to produce more and quality-assured groundwater chemical monitoring data and to stipulate the communication and cooperation between neighbouring countries. The implemented activities comprised of:

- theoretical and on-site trainings on quality-assured groundwater sampling
- sampling audits towards sampling certification
- trainings on the quality checking and interpretation of groundwater chemical monitoring data
- national surveys in specific areas
- monitoring development plans

Groundwater monitoring is a key activity for the proper management of groundwater resources and the preparation of RBMPs. Groundwater management, the implementation of measures and the assessment of the effectiveness of the implemented measures is based on monitoring data. Hence, sufficient reliable data are needed to derive correct conclusions and to implement the most appropriate, effective and efficient measures.

2.1. Sampling training and sampling audits

The aim of this task was to strengthen sampling capacities by putting more emphasis on quality assurance. This task built upon the sampling activities performed under the previous program and comprised **theoretical trainings, on-site trainings and witness audits**. In 2023 this task was implemented in **two countries**, in Armenia (October 2023, on-site near Bagratashen) and Georgia (June 2023, on-site near Tbilisi). This was documented in one audit report per country summarising all important aspects that need to be considered for quality-assured groundwater sampling, providing feedback on what is already implemented and working well, and what still needs to be improved towards certification of groundwater sampling.



Armenian audit, October 2023 (© Vahagn Tonoyan)



Georgian audit, June 2023 (© Andreas Scheidleder)

2.2. Checking and interpreting groundwater quality data

This task aimed at raising awareness that all field-measured data and all laboratory data need to be checked on reliability by the groundwater experts before any further data treatment. Such data can contain errors, either induced by issues during sampling and transport, in the laboratory or by simple data editing errors. Several Excel tools were presented and discussed. Finally, it was the aim to help transferring chemical data into information, along with information on hydrogeology and groundwater characteristic and on anthropogenic pollution.

In 2022 and 2023, **three 1-day trainings** were held in Armenia (February 2023, Yerevan), Georgia (July 2022, Tbilisi) and Moldova (June 2022, Chisinau) on the quality checking of groundwater chemical data delivered by the laboratories and the interpretation of data in relation to hydrogeology and pollution.

2.3. Groundwater surveys

In total **eight groundwater chemical surveys** were implemented in all countries, except for Ukraine. Aim was to gather data for GW-body characterisation, risk and status assessment and to identify new monitoring sites to be included in the national monitoring networks. The project support comprised

- the joint identification of the survey scope,
- the preparation of survey manuals,
- some financial contribution to the implementation of the surveys (mainly logistics, laboratory analytics and per diems),
- the quality-check of data and
- the preparation of survey reports.

In **Armenia** two groundwater surveys were performed (30 monitoring sites at each survey) in the Northern RBD, one in August 2022 and one in June 2023, to identify appropriate monitoring sites for inclusion to the national monitoring network, and to support the characterisation of GW-bodies and the risk and status assessment for the elaboration of the new RBMP.

In **Azerbaijan** one groundwater survey was performed in August 2023 (17 monitoring sites) in the Kura delta, to identify whether salinity is intruded into groundwater by surface waters moving inland from the Caspian Sea or by underground saline intrusion from the Caspian Sea. The results rather indicate the latter to be responsible for increased salinity of groundwater close to the coastline.

In **Georgia** two groundwater surveys were performed (20 monitoring sites at each survey), in the Rioni RBD (November 2022) and in the Enguri RBD (June 2023), to identify appropriate monitoring sites for inclusion into the national monitoring network, and to support the characterisation of GW bodies and the risk and status assessment for the elaboration of both new RBMPs.

In **Moldova** three groundwater surveys were performed in the Danube-Prut-Black Sea River Basin District. Two surveys in October 2022 (25 monitoring sites) and November 2023 (35 monitoring sites) focused at gathering additional data in the whole basin to support the characterisation of GW bodies. One survey in July 2024 (15 sampling sites) was implemented for the **first time** as a **joint surface/groundwater survey**, to identify connections and interrelations between the surface water and groundwater quality. Hence, the survey report addresses both aspects with the interpretation of the chemical data of both water compartments.

2.4. Monitoring development plans

During EUWI+ **monitoring development plans** had been prepared for each country. They summarise the state of groundwater monitoring (including the delineation of groundwater bodies), the existing monitoring network, the monitoring scope and frequencies as well as the provided support and trainings under EUWI+. Importantly, they give proposals of future activities still needed to improve groundwater monitoring and the availability of sufficient and appropriate data for integrated groundwater management.

In 2024, at the end of this programme, the monitoring development plans from 2020 for Armenia and Georgia were updated, to reflect and include the significant extension of groundwater monitoring with the new RBMPs for the Northern RBD in Armenia and for the Enguri and Rioni RBDs in Georgia.

Impressions from the surveys (© Nana Kitiashvili, Merab Gaprindashvili, Andreas Scheidleder)



3. Activity 1.4.3 – Monitoring and assessment of transboundary waters

Two transboundary groundwater surveys were planned and prepared. One between Armenia (in the Northern RBD) and Georgia (in the Khrami-Debed(a) RBD), and one between Azerbaijan (Kura-Araz RBD) and Georgia (Alazani-Iori RBD). The aim of transboundary surveys was to establish communication between neighbouring countries and to identify transboundary connected groundwater bodies and interrelations seen in chemical monitoring data. It was also the aim by this initial step to stipulate more communication and even coordination about future transboundary surveys and data exchange.

For both transboundary surveys the **preparatory phase** aimed at bringing groundwater experts together, identifying transboundary groundwater bodies and selecting monitoring sites for a joint survey. This preparation phase was crowned by **two bilateral 1-day meetings** in Tbilisi, the meeting between groundwater experts from Armenia and Georgia on the 29th March 2023 and the meeting between groundwater experts from Azerbaijan and Georgia on the 30th March 2023. The conclusions of these meetings are summarised in two Technical Reports on the transboundary groundwater bodies, which are bilaterally connected in the selected RBDs. The preparatory phase finally resulted in two joint survey manuals.

The **transboundary survey** between **Armenia and Georgia** was implemented in October 2023 at 1 monitoring site near Bagratashen in the Northern RBD of Armenia and at 2 monitoring sites near the villages of Burma and Damia in the Khrami-Debed(a) RBD of Georgia. Unfortunately, 1 additional monitoring site in Armenia could not be sampled for technical reasons.

As mentioned above, the preparation of the **transboundary** survey between **Azerbaijan and Georgia** was implemented and completed in 2023. Monitoring sites were selected and a joint survey manual was prepared. The survey was planned for autumn 2023 but had to be shifted to 2024. In March 2024, the survey was implemented in Georgia covering 6 monitoring sites in the South Eastern border area of Alazani-Iori RBD. Unfortunately, in 2024 Azerbaijan surprisingly declined to execute the survey, which had been planned at 7 monitoring points in the Kura-Araz RBD of Azerbaijan.

3.1. Transboundary agreement between Armenia and Georgia on water monitoring and data exchange

The lessons learned from the Armenian-Georgian transboundary groundwater survey fed directly into the drafting of the technical annex (Guidance Document on Transboundary Monitoring Programme of Water Resources in Khrami-Debed(a) River Basin) of the new transboundary Agreement between Armenia and Georgia on Water Monitoring and Data Exchange in transboundary Khrami-Debed(a) River Basin. This agreement had been prepared by UNECE and consulted with both Parties and UBA in 2023 and 2024. Both, the annex as well as the agreement were commented and finalised for undersigning. Regrettably, Georgia was unable in autumn 2024 to undersign it, while Armenia was then ready to do so.

4. Documentation and products

4.1. Activity 1.1.1 – Support to the preparation of River Basin Management Plans

Groundwater status assessment method training - Armenia 2023, Training Report, February 2023

Groundwater status assessment method training - Georgia 2023, Training Report, June 2023

Groundwater status assessment method training - Moldova 2023, Training Report, September 2023

4.2. Activity 1.4.1 – Water monitoring and surveys

Groundwater Survey Armenia 2022, Survey Report, August 2022

Groundwater Survey Armenia 2023, Survey Report, June 2023

Audit report on groundwater sampling - Armenia, Audit Report, October 2023

Groundwater monitoring development plan Armenia 2024

Groundwater Survey Azerbaijan 2023, Survey Report, August 2023

Groundwater Survey Georgia 2022, Survey Report, November 2022

Audit report on groundwater sampling - Georgia, Audit Report, June 2023

Groundwater Survey Georgia 2023, Survey Report, June 2023

Groundwater monitoring development plan Georgia 2024

Groundwater Survey Moldova 2022, Survey Report, October 2022

Groundwater Survey Moldova 2023, Survey Report, November 2023

Joint Surface and Groundwater Survey Moldova 2024, Survey Report, July 2024

4.3. Activity 1.4.3 – Monitoring and assessment of transboundary waters

Transboundary Groundwater Body Identification and coordination - Armenia and Georgia, Technical Report, March 2023

Transboundary Groundwater Body Identification and coordination - Azerbaijan and Georgia, Technical Report, March 2023

Transboundary Groundwater Survey 2023 - Armenia and Georgia, Survey Report, October 2023

Transboundary Groundwater Survey 2024 - Georgia, Survey Report, March 2024

Guidance Document on Transboundary Monitoring Programme of Water Resources in Khrami-Debed(a) River Basin, Guidance Document, 2024



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