

Sharing and dissemination of environmental information

Draft country maturity report: Armenia

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Implementation of the Shared Environmental Information System principles and practices in the Eastern Partnership countries (ENI SEIS II East)

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Terms and abbreviations

Term	Definition
CEPA	Comprehensive and Enhanced Partnership Agreement
CIT	Communication and Information Technologies
EaP	Eastern Partnership
EGDI	E-Government Development Index
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
EMIC	Environment Monitoring and Information Centre
EPI	Environmental Performance Index
IAC	Information and Analysis Centre
MA	Ministry of Agriculture
MEINR	Ministry of Energy Infrastructure and Natural Resources
MES	Ministry of Emergency Situations
MOE	Ministry of Environment
MT	Ministry of Transport
NGO	Non-Government Organisation
NIS	National Institute of Standardisation
ODIN	Open Data Inventory
OGP	Open Government Partnership
OSI	Online Service Index
REC	Regional Environmental Centre
RLC	Reference Laboratory Centre
SEA	Strategic Environmental Assessment
SEI	State Environmental Inspectorate
SEIS	Shared Environmental Information System
SGB	Self-Governmental Bodies
SNCO	State Non-Commercial Organisation
WRMA	Water Resources Management Agency

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Note

The current draft report was built on publicly available information up to October 2018. This draft version will be reviewed during the year 2019. It is not intended to be a comprehensive analysis of environmental information, open data and e-government in the country but a collection of the main elements shaping the national environmental information landscape.

In particular, this report contains information obtained or derived from a variety of publicly available sources described within the report in more detail.

This draft report was produced by PricewaterhouseCoopers as part of the EEA service contract No. 3437/R0-ENIE/EEA.57335 for 'developing a roadmap and identify feasible and practical means for integrating environmental information in national e-governance/Open Data processes and platforms'. This action is done in the context of the ENI SEIS II East project 2016-2020.

It is expected that during the 2019 the draft report will be reviewed by the national authorities involved in the environmental information management, and use at national level and enriched with more specific, up to date information available.

1 Executive summary

Armenia is now ranked 87th in the world E-government Development Index (EGDI, 2018), and ranked 45th according to the Open Data Inventory (ODIN) score (2017). Multiple initiatives were undertaken in the last 5 years, for instance the establishment of the e-government portal and the Shared Environmental Information System (SEIS) for Lake Sevan. Nonetheless, the country still requires to further develop its e-government portal and e-service, to launch an Open Data Portal, and to improve the dissemination of environmental information through the implementation of multiple measures at legal, organisational and technological levels.

In terms of ICT statistics, Armenia has now around 86% of Households with Internet access at home¹, which is higher than other EaP countries.

A key challenge for the country is now to leverage on e-government and Open Data initiatives and to foster collaboration between environmental information holders in order to improve environmental information sharing and dissemination.

E-Government

Armenia is a participant of the Open Government Partnership. In this context, the country undertook a series of initiatives in the area of e-government, which mainly targeted transparency increase. Overall, for the period 2016-2018, the country achieved mitigated results, with 1 project fully completed out of 15 commitments².

Nonetheless, the country developed a sound and promising digital strategy for 2018-2030, which is at this moment still not adopted by the Government. One of the priority of the strategy will be to ensure that data will be used to its maximum potential in decision-making processes. In that sense, Open Data is a high priority topic in the Digital Agenda. Nonetheless, environmental information is not integrated in the digital agenda, and it might lead to duplication of initiatives across environmental and sectorial institutions.

Regarding e-services, the Government developed the e-government portal (www.e-gov.am), which also provides content on Regulations and other initiatives such as e-signature. Hence, Armenia does not have a dedicated e-service portal based on a public service metadata standard, such as the European Core Public Service Vocabulary. Besides, the number of services remains little compared to European Union member States.

Last, the country also lacks of interoperability standards for exchanging information and provisioning e-services. The creation of e-government re-usable building blocks, such as the EU CEF building blocks³, might support the implementation of e-services. The country also lacks a geoportal provisioned with all environmental data.

Open Data

The main national act constituting civic right to access to public information is the Law on Freedom of Information (adopted in 2003). The current legislation is relatively good, but needs to be adapted to include the concept of “Open Data” portal and also to provide governance mechanism and enforcement for Open Data.

¹ <https://www.itu.int/net4/itu-d/icteye/CountryProfileReport.aspx?countryID=17>

² https://www.opengovpartnership.org/sites/default/files/Armenia_End-Term_Report_2016-2018_EN.pdf

³ <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/About+CEF+building+blocks>

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Consequently, the country doesn't have an Open Data portal and as such it is possible to consider the country as a "beginner" in the field of Open Data. Public information is therefore spread on public websites, and usually published in non-machine readable format (i.e. pdf). Public websites also do not provide metadata on the report and data published. Besides, the lack of Open Data portal and clear procedures for the selection, cleaning and publication of Open Data undermines the publication of public information.

Environmental information

The Armenian Development Strategy 2014-2025 does not put high priorities for environmental issues. Nonetheless, the ratification of the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters in 2001 (Aarhus Convention)⁴ and the signature of the Declaration on Cooperation on Environment and Climate Change in the Eastern Partnership (EaP) contributes to the development of environmental information system. In this regard, the Armenia received international support in terms of knowledge and material resources. More particularly, the OSCE became the prime promoter of access to environmental information under the Aarhus Convention principles, through the establishment of countrywide Aarhus Centres Network and the State University Centre on Sustainable Development. It is to be noted that at the moment insufficient country structures undermines - both from human and technical perspective - the implementation of the Aarhus Convention. It is to be noted that the Republic of Armenia signed the UNECE Protocol of the Aarhus Convention on Pollutant Release and Transfer Registers on 21 May 2003 but has not ratified it yet.

Regarding environmental information published, the Republic of Armenia has not yet developed an "eco-portal" which would provide access to all environmental information. At the moment, environmental data and reports are spread across websites and no metadata standards is available to search for reports. Quality procedures and results are not published, which makes difficult the assessment of the information published. Portals are also poorly translated and most relevant information is not available in English. In that sense, the portal providing the best usability is the Statistical Committee website, which enables the consultation of UNECE indicators and comparison across time.

In addition, throughout 2014 and 2015, the European Environment Agency supported the Armenian authorities to develop a pilot project aiming to establish a Shared Environmental Information System (SEIS) for Lake Sevan. This activity was conducted within the regional project "Towards a Shared Environmental Information System in the European Neighbourhood" (ENPI-SEIS, 2010-2015). The pilot project aimed to develop a model/mechanism enabling the integration of data from a variety of sources, as a step towards regular data sharing among key partners.

Last, the mechanism of exchange of public environmental information between institutions is not clear, even though "Forms" are available on the Statistical Committee website. It is hence not clear whether the exchange of information enables the provision of quality and timely environmental information. Consequently, a common environmental platform equipped with e-signature, the provision of web services, and an automatic gathering of environmental metadata would improve the process of exchange of environmental information.

⁴ In addition, the Republic of Armenia signed the UNECE Protocol of the Aarhus Convention on Pollutant Release and Transfer Registers on 21 May 2003. It is to be noted that the protocol has not been ratified.

Main challenges

Armenia faces a number of challenges in the field of environmental information.

At the moment, international commitments made towards the Aarhus Convention and the Open Government Partnership are unfortunately difficult to achieve. On one hand the legal framework does not foresee all the mechanisms to implement them, and on the other hand, the combination of a lack of resources, procedures, technology, and skills undermine their fulfilment.

In regard with environmental data, the country has not officially adopted environmental indicators, even though the Statistical Committee publishes UNECE indicators. Environmental data and reports are scattered on different websites and platforms, and none of them offers a holistic view of the environmental situation in the country. In addition, the country has not equipped itself with an Open Data portal, and hence no Regulation is in place to frame and enforce the publication of public information on a central portal.

Besides, the absence of metadata standards both for public information and environmental information undermines findability of information for citizens, and interoperability of systems. The country would also benefit from a central geoportal dedicated to environmental data, where citizens could observe the real-time state of the environment on a map.

The exchange of environmental information between institutions is also unclear, and no central system enables the collection of environmental data available, as well as their exchange in a secure manner. Furthermore, requesting public information goes through a cumbersome process, where a technological solution would enable to retrieve automatically the information requested while decreasing operational costs.

Finally, international collaboration is also a challenge from a financial and practical perspective. Indeed, the country needs mechanisms to strengthen collaboration with other countries, NGOs and international organisations. It is to be noted that public websites also offer a poor translation to English and public information (or metadata) are usually not published in English.

2 Environmental information readiness

2.1 E-government, Open Data and environmental information legal and institutional framework

This section contains a summary of the national documents on legal policy and institutional framework in terms of e-government, open data and environmental information.

2.1.1 National policy and legal framework

2.1.1.1 E-government

In general, e-Government in the Republic of Armenia is poorly regulated. The E-Governance Infrastructure Implementation Unit OJSC is the legal coordinator of e-Government projects in the Republic of Armenia, whose website concentrates mostly on technical documents for e-signature.

2018-2030 Digital Transformation Agenda⁵

The draft paper sets out six main directions in which further actions will be implemented to ensure Armenia's digital transformation. The framework document focuses on Armenia's digital conversion on the basis of "SMART government", digital labour force, infrastructure, cybersecurity, private sector competitiveness, and institutional framework. The following strategic perspectives for implementing the digital transformation process in the Republic of Armenia are as follows:

- 2018 - 2020, Digital Jump (emphasis placed on large-scale infrastructure investment and updated assets)
- 2021 – 2025, Digital Acceleration (investment to maximise productivity)
- 2026 – 2030, Digitalised development (strong emphasis on growth innovation)

Draft of the agenda has been put up for public discussion and circulates among the country's executive agencies. There is no indication how this strategy will be put in place.

Decision 1093-N on 31.09.2015 for interoperability and technical requirements for electronic system

In order to implement the digital strategy, the Government of Armenia has adopted the decision 1093-N on 31.08.2015 which sets certain security, interoperability requirements for electronic systems. The decision also regulates the relations regarding the technical requirements for access to those systems by natural persons and legal entities.

The aforementioned decision has attributed to the E-Governance Infrastructure Implementation Unit OJSC the functions of the operator responsible for the technical support and coordination⁶ of the state information systems. At this moment, the website of E-Governance Infrastructure Implementation Unit OJSC only has documentation related to e-signature – hence technical and organisational interoperability, e-services, etc. are not described.

⁵ <http://www.gov.am/en/news/item/9307/>

⁶ Including administration of sub-registries.

2.1.1.2 Open data

Law on “Freedom of Information” of the Republic of Armenia

The Law on “Freedom of Information” of the Republic of Armenia was adopted in September 2003 and was widely considered as a progressive document, greatly appreciated by the international community.⁷ Since the adoption of the Law, the civil society and the journalists’ community have advocated for the need to pass Regulations that would further support and improve the implementation of the Law. Such Regulations were finally adopted in October 2015, when the Armenian Government approved a procedure for improving the procedure to access public information by streamlining the classification, maintenance and provision of information from the Government to the public.⁸

According to the Law, people can obtain information from: central Government bodies, self-governing bodies, state institutions, organisations financed from central or local Government finances, organisations with public functions, i.e. organisations providing public services (for instance, private universities, schools, hospitals, energy provider companies, etc.). Each body has a person that is responsible for the “freedom of information” and is in charge of dealing with information requests. Nonetheless the access to information remain unstructured and lacks of standardisation. Indeed, the Law on “Freedom of Information” lacks the attribution of clear responsibilities to a single body overarching public information sharing.

In practice, many governmental bodies and officials were reluctant to grant such access, and as such, in 2015, the Government adapted the degree N1204 to support Freedom of Information Law and regulate information collection, classification and maintenance.

Decision N 192-N on transfer of personal Open Data⁹

On February 16 of 2017 the Republic of Armenia Government adopted the decision N 192-N which regulates the interconnection of databases and the electronic transfer of personal data, stored and processed by state and local self-Government bodies and other delegated entities, between state and local self-Government bodies and to Republic of Armenia resident legal entities and investment funds.

2.1.1.3 Environmental information¹⁰

Governmental resolutions are the main legal instruments for implementing the environmental Laws. Environmental field is also regulated by presidential orders, Prime-Minister’s resolutions and ministerial decrees. Between the time of the Declaration of Independence in September 1990 and September 1999, nearly 150 Government resolutions on the environment were passed (some of them are no longer in force).

Nonetheless, it is to be noted that the Republic of Armenia lacks specific legislation regarding the collection and management of environmental information. To bridge the gap, the Republic of Armenia adopted the Government Protocol Decree N 49-8 of December 8, 2016 on “Approval of the List of Measures to be implemented in the Fulfilment of the Republic of Armenia’s Obligations Emanated from a Number of International Environmental Conventions”.¹¹

⁷ Report on the state of Media in Eastern Partnership Countries, Eastern Partnership Civil Society Forum, 2015

⁸ Country Report on Human Rights Practices for 2015 Armenia, Freedom of Information Centre for Armenia, 2016

⁹ <https://www.arlis.am/DocumentView.aspx?DocID=111991>

¹⁰ Lifeline road network improvement project. Environmental and social management framework final draft, Ministry of Transport and Communication, 2015

¹¹ <http://www.nature-ic.am/en/news/Armenia%E2%80%99s-Second-Biennial-Update-Report-is-submitted-to-the-UNFCCC-Secretariat/10555>

Law on Environmental Control¹²

This Law regulates the organisation and implementation of control over the implementation of the environmental legislation in the Republic of Armenia. It also establishes the legal and economic bases of controlling the peculiarities, procedures, conditions, relationships and environmental control over the implementation of the environmental legislation in the Republic of Armenia.

The Government Decision of the Republic of Armenia "On Approving the State Environmental Monitoring Concept" dated 25.01.2018, N 3-16 Protocol Decision 25.01.2018 N 3-16¹³

The Decision is at this stage still a summary of environmental monitoring and a presentation of the concept of a State Environmental Monitoring.

The Concept provide a framework on the State Environmental Monitoring set of activities aimed at gathering, analysing, evaluating, presenting and maintaining state-related information on the environment in order to provide the state and the public to have a comprehensive understanding of the environmental phenomena, including the state of the environment, the country's ecological security and sustainable development basics.

Law on Environmental Impact Assessment and Expertise¹⁴

The Law on Environmental Impact Assessment and Expertise (EIAE), adopted in 2014, provides legal basis for the implementation and introduction of state expertise of planned activities and concept frameworks.

Planned activities are classified into three categories reflecting different levels of environmental impact assessment according to the severity of possible environmental impacts. Based on national and international experts' opinion, the Environmental Impact Assessment Expertise does not meet international standards. It also has gaps and does not cover neither Strategic Environmental Assessment nor the Environmental Impact Assessment conventions. Last, it lacks a mechanism for enforcement and so far no environmental and/or health impact assessment was conducted.

It also presents the standard steps of the Environmental Impact Assessment (EIA) process for various projects and activities in Armenia. It establishes the general legal, economic, and organisational principles for conducting mandatory state EIA of various types of projects and concepts of sectoral development (e.g., energy, mining, chemical industry, construction, metallurgy, pulp and paper, agriculture, food and fishery, water, electronics, infrastructure, services, tourism and recreation, etc.). In particular, the current environmental assessment legislation provides environmental impact assessment (EIA) procedures and grants rights on access to environmental information via public hearings at the national and transboundary level. The legislation contains elements of strategic environmental assessment (SEA) as well.

To better address public participation in decision-making, the Government adopted the Decision N1325 (in 2014), on "Defining the Procedure of Holding Public Notification and Discussions". However, within the legislation framework, access to environmental information - and thus effective public participation - remains a challenge.

Finally, the Law does not use an "ecosystem approach" as stipulated in the Convention on Biodiversity. Moreover, climate change considerations are not taken into account as stipulated by the Article 4.(f) of the UN Framework Convention on Climate Change.

¹² <https://www.arlis.am/DocumentView.aspx?docid=120771>

¹³ <https://www.arlis.am/Annexes/4/QaxvackENX002.doc>

¹⁴ <https://www.arlis.am/DocumentView.aspx?DocID=93148>

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The list of major environment-related legislation:

Table 1 - List of major environment-related legislation

No	Law	Date
1.	"On Approving the Strategy for Environmental Education and Upbringing Development" 22.02.2018 Protocol Decision 7-11	2018
2.	Law on Environmental Impact Assessment and Expertise ¹⁵	2014
3.	Mine Code	2014
4.	Law on the Code on Underground Resources Agriculture	2011
5.	Law "On Atmospheric Air Protection" ¹⁶	1994, amended in 2008
6.	Law on Specially Protected Areas ¹⁷	2006
7.	Law on National Water Program ¹⁸	2006
8.	Law on Rates of Environmental Charge (a Law with the same title was first adopted in 2000) ¹⁹	2006
9.	Forest Code ²⁰	2005
10.	Law on Compensation Tariffs for the Damage Caused to Flora and Fauna due to Environmental Violations ²¹	2005
11.	Law on Fundamentals of National Water Policy ²²	2005
12.	Law on Wastes ²³	2004
13.	Law on Energy Conservation and Renewable Energy	2004
14.	Water Code ²⁴	2002
15.	Law on the Lake Sevan ²⁵	2001
16.	Land code ²⁶	2001
17.	Law on Flora	2000
18.	Law on Fauna ²⁷	1999

¹⁵ <https://www.arlis.am/DocumentView.aspx?DocID=93148>

¹⁶ <https://www.arlis.am/DocumentView.aspx?DocID=112454>

¹⁷ <https://www.arlis.am/DocumentView.aspx?DocID=29624>

¹⁸ <https://www.arlis.am/DocumentView.aspx?DocID=113051>

¹⁹ <https://www.arlis.am/DocumentView.aspx?DocID=118446>

²⁰ <https://www.arlis.am/DocumentView.aspx?docid=121312>

²¹ <https://www.arlis.am/DocumentView.aspx?docid=120773>

²² <https://www.arlis.am/DocumentView.aspx?DocID=1784>

²³ <https://www.arlis.am/DocumentView.aspx?docid=122729>

²⁴ <https://www.arlis.am/DocumentView.aspx?DocID=121550>

²⁵ <https://www.arlis.am/DocumentView.aspx?DocID=77097>

²⁶ <https://www.arlis.am/DocumentView.aspx?DocID=123518>

²⁷ <https://www.arlis.am/DocumentView.aspx?DocID=120790>

2.1.2 Main international policies and legal agreements

The Republic of Armenia has been gradually building its international cooperation network in the field of environment since its independence. It has already ratified a number of multilateral environmental agreements and there is a great interest in moving closer to the EU and the international community in general²⁸. The main policies and legal frameworks, in which the country is involved, are presented below.

2.1.2.1 Multilateral Environmental Agreements with public access to information and reporting obligations

Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)²⁹

The Republic of Armenia was involved in the drafting of the Aarhus Convention, signed it in 1998 and ratified on 1st August 2001. The Convention sets out Parties' obligations to provide effective public access to environmental information within its broad scope hold by various public authorities, public participation in decision-making and access to justice in environmental matters. The progress of its implementation by Armenia is reflected in national implementation reports for the Convention.³⁰

Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Protocol on PRTRs)³¹

PRTR is a national environmental database or inventory of potentially hazardous chemical substances released to air, water and soil and transferred off-site for treatment or disposal. As such, it allows the public authorities to track each release and transfer of a hazardous chemical substance consistently over time.

The Republic of Armenia signed the UNECE Protocol of the Aarhus Convention on Pollutant Release and Transfer Registers on 21 May 2003. It is to be noted that the Protocol on PRTRs has not been ratified³².

Espoo Convention on Environmental Impact Assessment (EIA)

The country accessed the convention in 21 February 1997. The Espoo Convention on Environmental Impact Assessment sets out the obligations of parties to assess the environmental impact of certain activities at an early stage of planning. It also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.

The Convention` legislative review outlined³³ that the legislation on Environmental Assessment and Environmental Expertise (adopted in August 2014), although it already contains elements of the strategic environmental assessment, is still not fully compliant with the provisions of the Espoo Convention on EIA and SEA Protocol and the relevant EU legislation. The review was conducted by UNECE Experts based on the Espoo Convention Implementation Committee. This review provided

²⁸ Environmental Performance Reviews Armenia, UNECE, 2000

²⁹ <https://www.unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf>

³⁰ <https://aarhusclearinghouse.unece.org/national-reports>

³¹ <http://www.oecd.org/chemicalsafety/pollutant-release-transfer-register/>

³² https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-13-a&chapter=27&clang=en

³³

https://www.unece.org/fileadmin/DAM/env/eia/sea_protocol/Summary_opinion_Arm_EIALaw_ENG_30052014_AS_clean.pdf

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recommendations for changes of existing legal framework in order to fully comply with the requirements of the Espoo Convention.

Protocol on Strategic Environmental Assessment (Protocol on SEA)

The Republic of Armenia is party to the in the Protocol on Strategic Environmental Assessment of the UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) since 2011. Strategic Environmental Assessment elements are now gradually introduced into the national planning system under the leadership of the Ministry of Environment³⁴.

2.1.2.2 Other international forums promoting sharing and accessibility of environmental information

Open Government Partnership Initiative³⁵

The Republic of Armenia is part of the Open Government Partnership initiative since 2011. It is a multilateral initiative, a platform for national reformers, aimed to make governments more responsive to the needs of citizens.

Overall, the Republic of Armenia in regards completed 1 commitment out of 8, completed substantially 3, completed partially 3 and 1 not started.

UNECE Environmental Performance Review for Georgia

The United Nations Economic Commission for Europe (UNECE) together with its partners has been working with target countries to produce and share environmental data for 8 indicators:

- Emissions of pollutants into the atmospheric air
- Ambient air quality
- Consumption of ozone-depleting substances (ODS)
- Greenhouse gas (GHG) emissions
- Biochemical oxygen demand (BOD) and concentration of ammonium in rivers
- Nutrients in freshwater
- Protected areas
- Waste generation

The Republic of Armenia is produces 7 out the 8 indicators - Nutrients in freshwater

Eighth Environment for Europe Ministerial Conference Batumi, Georgia

The Eighth Environment for Europe Ministerial Conference (Batumi, Georgia, 8-10 June 2016) adopted the Ministerial Declaration inviting countries to continue their efforts and to further develop their national information systems to have shared environmental information system in place in the countries of Europe and Central Asia by 2021.

EaP Connect Project³⁶

³⁴ Greening economies in the EU Eastern Partnership countries: Armenia. Recent and ongoing activities, 2015

³⁵ <https://www.opengovpartnership.org/countries/armenia>

³⁶ <https://www.eapconnect.eu/>

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The project aims to link the National Research and Education Networks in the partner countries to the pan-European research and education network GÉANT, and connects over two million scientists, academics and students from 700 institutions across the region. The joint initiative of EU, Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine is an example of effort undertaken to foster the creation of digital economies and promote Open Data in the EU Neighbouring countries³⁷. The programme was launched in July 2015.

“Environment for Europe” process

The Republic of Armenia has been actively involved in the “Environment for Europe” process since the second ministerial meeting in Lucerne, Switzerland. Participation in the process fits well into country’s goal to move closer towards the EU, and is thus considered as very important. The Republic of Armenia is trying to implement the decisions taken in the framework of the process.

2.1.2.3 Cooperation with the European Union

EU-Armenia Comprehensive Enhanced Partnership Agreement³⁸

The EU-Armenia Comprehensive Enhanced Partnership Agreement (CEPA) was signed on 24 November 2017 in the margins of the Eastern Partnership Summit. In the field of environment, the EU will support the country’s adoption of EU environmental standards as well as its development of clean sources of energy.³⁹

Declaration on cooperation on environment and climate change in the Eastern Partnership⁴⁰

In 2016, The European Union (EU) and Eastern Partnership (EaP) countries adopted the Declaration on Cooperation on Environment and Climate Change. The declaration aims to strengthen regional cooperation on environment, climate action and sustainable development in the Eastern Partnership framework, through implementing relevant international agreements such 2030 Agenda for Sustainable Development and Paris Agreement on Climate Change, raising awareness among and cooperate with relevant stakeholders, supporting the involvement of civil society in decision-making, strategic planning and implementation, and results' monitoring of environmental policy, programmes and plans, and other commitments.

The second Eastern Partnership (EaP) ministerial meeting on Environment and Climate Change took place on 9th November 2018 in Luxembourg, co-organised by the European Commission and Austrian Presidency. The progresses of the countries was discussed. For Armenia, the last progresses are reflected in the country factsheet: https://eeas.europa.eu/sites/eeas/files/eap_factsheet_armenia_eng_web.pdf.

2.1.3 National standards, interoperability and quality control

2.1.3.1 Metadata standards

The following table presents the list of metadata standards used in the Republic of Armenia:

³⁷ EDP Analytical Report, Open Data in the European Union Neighbourhood, page 9

³⁸ https://eeas.europa.eu/headquarters/headquarters-homepage/36141/new-agreement-signed-between-european-union-and-armenia-set-bring-tangible-benefits-citizens_en

³⁹ https://eeas.europa.eu/headquarters/headquarters-homepage/36141/new-agreement-signed-between-european-union-and-armenia-set-bring-tangible-benefits-citizens_en

⁴⁰ Declaration on Cooperation on Environment and Climate Change in the Eastern Partnership, European Commission 2016.

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Component	Metadata standards
Open Data	No standard (no Open Data portal)
Health	No standard publicly available, but the development of a central system is on-going.
Spatial	There are spatial data in place and reporting exists (e.g. http://ace.aua.am/projects/). Nonetheless, common standards for geospatial information are not publicly mentioned. No reference to the European directive INSPIRE or European metadata standard such as GeoDCAT-AP is made (not compulsory as not part of the EU). ⁴¹
Environmental information	<p>The Government of Armenia did not develop state environmental standards or national Sustainable Development Goals indicators, though the Statistical Committee has been working on this and implemented international guidance for its reports on a voluntary basis.</p> <p>Besides, the country still uses some methodology from USSR, in particular air pollution calculation methodology (from 1983). Nonetheless, according to the Constitution adopted in 1995 all the previous legislation are void. It is therefore indispensable to set up additional requirements for environmental information standards and norms.</p> <p>The main standardisation body in the country is the National Institute of Standards (NIS). It operates under the jurisdiction of the Ministry of Trade and Economic Development of Armenia. NIS works on development, research, publication and dissemination of national (AST), interstate (GOST) and international (ISO, EN, CEN) standards.</p> <p>NIS is a certification body in the field of environmental management system – ISO 14001. It is an internationally agreed standard that sets out the requirements for an environmental management system. It helps organisations improve their environmental performance through more efficient use of resources and reduction of waste, gaining a competitive advantage and the trust of stakeholders. NIS is responsible for granting the following standards:</p> <ul style="list-style-type: none"> • AST ISO 14001-2016 – Environmental Management Systems; • AST ISO 14015-2012 – Environmental management. Environmental Assessment of sites and organisation (EASO)⁴². <p>More information can be found on http://www.sarm.am/en/standarts/browse/5/40/119</p>

⁴¹ <https://inspire.ec.europa.eu/document-tags/metadata>

⁴² <http://www.sarm.am/en>

2.1.3.2 Quality control

Quality control for statistics publications

The management of data quality in the Republic of Armenia is based on three official documents. These documents are also applicable for the collection of environmental statistics.

1. The quality policy⁴³: The Statistical Committee of Armenia approve in the Resolution № 17-A of the State Council on Statistics of Republic of Armenia dated of 20 June 2016. The Statistical Committee of the Republic of Armenia's Quality Policy is aimed at the systematic improvement of statistical products and processes through the development of relevant methodologies and tools, focusing on high quality services, increasing the work efficiency and cost effectiveness.

Unfortunately, no further details are made public for the data quality policy. The principles defined by the quality policy are in practice difficult to evaluate. For instance, the Statistical Committee portal provides a lot of information in non-machine-readable format, and measurement methods are not depicted into details.

2. The quality assurance framework of the European Statistical System⁴⁴: approved through the resolution 31 of the State Council on Statistics on 21 November 2016. This demonstrates the will of the Republic of Armenia to align its statistical evaluation with European standards. Nonetheless, in practice, no public information regarding its implementation is available.
3. The quality declarations⁴⁵: the quality declarations describe the regulatory background of the statistics, the purpose and the methodology of the statistics, its' dissemination and other important information for the users of the statistics. The quality declarations were developed during 2011 and 2012 for each of the statistical products of Statistical Committee of the Republic of Armenia. Currently, the 139 statistical products are organised under 17 statistical domains. In regard with environment, the quality declarations officially provide rules for reporting in the field of agriculture, forestry, fishery environment and energy and food security. Note that these environmental statistics are taken from the "production" and "commercial" perspectives (i.e. there is no mention of sustainable development, environmental protection, etc.).

Especially, for environmental statistics, the quality declarations do not address every principles defined in the data quality policy.

⁴³ <https://www.armstat.am/file/doc/99497808.pdf>

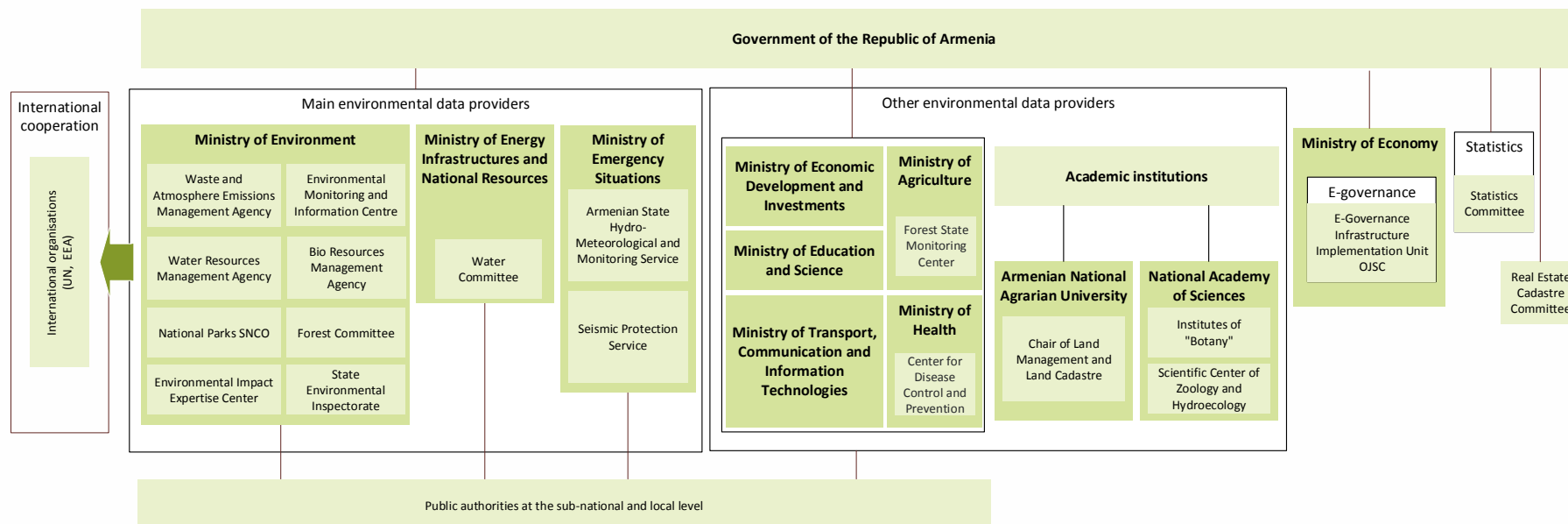
⁴⁴ <https://www.armstat.am/file/doc/99499353.pdf>

⁴⁵ <https://www.armstat.am/en/?nid=26>

2.1.4 Institutional framework for environmental information managements and stakeholders' involvement

The following diagram illustrates the main environmental information as well as the open data and e-governance stakeholders.

Figure 1. Environmental and e-Government stakeholders of the Republic of Armenia



The Ministry of Environment, along with his subordinated entities and agencies, is responsible for the collection, analysis and sharing of environmental information. Environmental indicators and the national report “Environment and Natural Resources in the Republic of Armenia” are produced and published by the Statistical Committee. In general, the institutional framework in the Republic of Armenia is complex and environmental components are generally split across multiple institutions. This is the case for instance for water monitoring, biodiversity and forests. As such, a review of the institutional framework to concentrate responsibilities in single institutions could simplify the exchange of environmental information and improve the quality of environmental data.

Ministry of Environment - <http://www.mnp.am/>

The Ministry of Environment is a governmental body of executive authority, which elaborates and implements the policies of the Republic of Armenia in the areas of environmental protection and sustainable use of natural resources⁴⁶. In regard with the functions⁴⁷ related to environmental information, the Ministry of Environment is responsible for:

- Development of the environment-related legislation, standards and technical regulations, and review of legal acts developed by the other agencies
- Development of main directions of the environment strategy, including education and awareness campaigns about the environment
- Development of regulations for the implementation of environment State monitoring, including State Orders for the implementation of special and regime monitoring, researches and forecasts for environmental situation, and compliance with international obligations
- Management of Cadastres and registries of natural resources (except mineral reserves)
- Definition of procedures for maintenance of red books on plant and animal species of the Republic of Armenia
- Development of national water policy and monitoring of its implementation of the Republic of Armenia
- State accounting and definition of quantity of emissions of harmful substances in the atmosphere
- State accounting of wastes, creation of state cadastre, facilities of processing and utilization of wastes and disposal sites, definition of maintenance procedures
- Classification of produced and used chemicals
- Participation in the development of international treaties of the Republic of Armenia

Ministry of Emergency Situations (MES) - <http://www.mes.am/en/>

The Ministry of Emergency Situations (MES) is responsible for ensuring the governance and the safe operation of the State-owned water systems, and ensuring the development and the implementation of the management policy of the water systems.

The Ministry hosts the Armenian State Hydrometeorological and Monitoring Service SNCO, which is leading monitoring of surface water quality data. In particular, it is responsible for the provision of hydrometeorological services aimed at obtaining information on hydrometeorological phenomena and satisfying needs of public, state, governmental bodies and different physical and legal entities. In this context, it provides observations on air, surface waters, soil, crops, pastures, ozone layer, ultraviolet radiation, actinometrical and upper air stations, their data inventory and storage. It provides the compilation of official forecasts and alerts, and also produces forecasts and observation data to the areas of national economy depending on weather events in order to ensure their timely awareness and readiness. Finally it also participates to the development of Laws and legislative Norms regulating or related to hydrometeorological activities.

⁴⁶ <http://www.gov.am/en/structure/5/>

⁴⁷ More information can be found on the Ministry website : <http://www.mnp.am/en/pages/246>

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Ministry of Agriculture – <http://www.minagro.am/>

The objectives of the Ministry of Agriculture are:

- development and implementation of the economic policy for agriculture
- promote agricultural technologies and cooperation
- elaborate and monitor agriculture and food security projects
- approve relevant administrative statistical forms, maintain statistical registers based on the collected data and information

Ministry of Health - <http://www.moh.am>

In the context of environmental information, the Ministry is responsible for assesses emission sources (air) and their physically hazardous effects, and is also involved in the monitoring of biodiversity.

Ministry of Foreign Affairs - <https://www.mfa.am/en/>

The Ministry of Foreign Affairs is the responsible entity for International Conventions as a part of foreign environmental policy. The Ministry is officially responsible for official international communication related to the Conventions signed.

Water Resources Management Agency (WRMA) - <http://www.wrma.am/>

Part of the Ministry of Environment, the Water Resources Management Agency is an administrator and a manager of the State Water Cadastre Information System. It is also storing and processing the water quality data provided by the Armenian State Hydrometeorological and Monitoring Service SNCO.

The State Water Cadastre by the Law is a permanent operating system, which keeps comprehensive records of quantitative and qualitative indices on water resources, water intake, watersheds, composition and quantities of materials and biological resources, which are extracted from water basin beds and coasts, as well as records of water users, water use permits and water systems use permits.

Environmental Monitoring and Information Centre - <http://www.armmonitoring.am/>

Part of the Ministry of Environment, plays the role of a repository institution in terms of data management and processing. It is responsible for collecting raw data from laboratories, aggregate and storing them in hardcopy or digital format and disseminate them to users.

Individual departments of the Environmental Monitoring and Information Centre are responsible for surface waters quality monitoring (Monitoring Department) and for groundwater quality monitoring (Hydrogeological Sub-Department⁴⁸). The Monitoring Department is more advanced concerning data management and processing. It is to be noted that the activities of the Centre sometimes overlap the ones from the Ministry of Environment (e.g. separate database of the surface waters quality data which are “overlapping”). The Centre is responsible for monitoring and evaluation of atmospheric air, surface and ground water, atmospheric precipitation, soil and groundwater quality.

The monitoring of Water Resources is done through a regulated system of observations of hydrological, hydrogeological, hydrophysical and hydrochemical indices, which ensures collection and analyses thereof (and is a subject to dissemination).

⁴⁸ Hydrogeology Department now is the part of the Environmental Monitoring and Information Centre.

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Besides, surface water monitoring strategy and normative-methodological approaches to implementation should be reviewed and adapted to the requirements of the European Water Framework Directive.

Real Estate Cadastre Committee - <https://www.e-cadastre.am/en/> and <https://www.cadastre.am/>

The Real Estate Cadastre Committee is a separate entity subordinated to the Government. It maintains the State Cadastre of Real Estate, creates information systems on property, geodesy and cartography, and develops/establishes the property rights & restrictions.

State Environmental Inspectorate⁴⁹

The State Environmental Inspectorate under the Ministry of Environment. It is responsible for supervising the implementation of norms and standards prescribed by the Law in the field of environmental and natural resources protection. In the scope of environmental quality monitoring, it is responsible for the inspection of the sets of permitted emission standards. Regarding water quality, the State Environmental Inspectorate monitors the quantity and the quality of harmful substances in wastewater.

Committee of Forest of the Ministry of Environment “Hayantar”

In the context of environmental information, the Committee is in charge of:

- Registration, stock tacking and inventory of forests
- Analysis of forest soil fertility
- Determination of forest areas and forested lands

Statistical Committee⁵⁰ of the Republic of Armenia - <https://www.armstat.am/en/>

The Statistical Committee of the Republic of Armenia publishes information, annual reports and selected aggregated datasets on environment. It is to be noted that the Statistical Committee, in partnership with the Ministry of Environment, is coordinating the ENPI-SEIS project at national level.

Territorial bodies

The range of responsibilities of regional administration includes:

- Direct land management, the lands being under the jurisdiction of self-governed communities, including the sale or lease of reserve lands
- The preparation and registration of land permits
- Ensuring an optimal balance between lands of different use categories
- The collection of statistics on land use, crops and agricultural production

Marzpetarans carry out their work with the help of regional representatives of different ministries, including regional inspectors of the Ministry of Environment, state land inspections of the Ministry of Agriculture, sanitary-epidemiological and hygiene inspections of the Ministry of Health.

The environmental administration is characterised by a strong vertical management structure with limited authority for the regional agencies. In line with the general organisational structures of the regions, the Government implements its regional policy in the Marzes through the Marzpetarans, agricultural and environmental protection affairs department, operating under the supervision of the Deputy Governor in each region. The Inspectorate for Nature Protection and Mineral Resources

⁴⁹ <https://www.arlis.am/documentview.aspx?docid=9815>

⁵⁰ <https://www.armstat.am/file/doc/99508113.pdf>

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exercises supervision on the implementation of environmental legislation over Marzpetarans` projects and cooperates with the regional administrations within the framework defined by the Law on Environmental Control.

A majority of Municipalities do not have staff members responsible for environmental affairs, in spite of number of important responsibilities stipulated by the Law on Self-Governmental Bodies.

Local governments are partly involved in nature protection and nature conservation, as well as in environmental monitoring. The competencies of the local self-governing bodies are generally defined in the principles of the Law on Nature Protection. Organisational structure of municipalities differ and usually their responsibilities are combined with other functions, for example urban development, agriculture or healthcare. Briefly, these structures are not well prepared to fulfil environmental tasks. This is partly due to the absence of relevant legislation on the responsibilities and competencies of the municipalities in environmental management.

Last, the regions and municipalities develop the Social-Economic development program and Annual Action Plan, both addressing environmental information. The Programs, Plans and Reporting are available on regional (Marzpetarans) and municipalities websites.

Non-governmental organisations

Government programs focus on NGO partnerships and participation at various levels and hence the cooperation with NGO has improved. In particular, the Government has developed policies for NGOs' participation in state programs and aims to strengthen NGOs' capacities. Although NGOs provide a wide array of services related to sustainable development, a considerable number of them have low capacities and are grant dependent.⁵¹

Since 1997, the Ministry of Justice has registered a total of over 2000 NGOs. Nearly 70 are environmental NGOs, and around half of them are active on site. Key members of the main NGOs have been informally involved in governmental policies and decisions on environment and conservation issues.

Aarhus Centre - <https://aarhus.osce.org/armenia>

The Republic of Armenia hosts a network of fifteen Aarhus Centres working on environmental issues throughout the country. The first Aarhus Centre was established in the city of Yerevan in 2002. The other Aarhus Centres were inaugurated between 2005 and 2010 in the cities of Dilijan (2005), Gavar (2007), Goris (2005), Gyumri (2007), Hrazdan (2007), Kapan (2005), Vanadzor (2005), Alaverdi (2008), Aparan (2008), Ijevan (2005), Stepanavan (2008), Yeghegnadzor (2008), Yeghvard (2008) and Ararat (2010). The Aarhus Centres work on all three pillars of the Aarhus Convention including promoting public participation in the decision-making process and raising awareness of the public regarding environmental issues and their rights. They deal with various environmental hotspots, disaster risk reduction, environmental legislation and other issues.

REC Caucasus – <https://www.rec-caucasus.org>

The mission of the REC Caucasus is determined as “to assist in solving of environmental problems in the Caucasus region through the promotion of co-operation at national and regional level among NGOs, governments, business, local communities, and all other environmental stakeholders, in order to develop a free exchange of information, in line with the principles of the Aarhus Convention; offer

⁵¹ Civil Society Briefs: Armenia, Asian Development Bank, 2011

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assistance to all environmental NGOs and other stakeholders; and increase public participation in the decision-making process, thereby assisting the states of the Caucasus in the further development of a democratic civil society". REC Caucasus has been established within the framework of the "Environment for Europe Process" based on the decision made at the Sofia Ministerial Conference in 1995. The founding document of REC Caucasus - its Charter - was signed in September 1999 by the governments of Azerbaijan, Armenia, Georgia and the European Union. In March 2000 REC Caucasus was officially registered as an independent, not-for-profit, non-advocacy foundation in Tbilisi, Georgia.

Institutional framework for e-Government and Open Data

The E-Governance Infrastructure Implementation Unit OJSC was established in 2009 by the Government of the Republic of Armenia and is chaired by the Minister of Economy of the Republic of Armenia (www.mineconomy.am). The E-Governance Infrastructure Implementation Unit OJSC is responsible for the technical implementation of eSociety in Armenia according to the Concept of e-Society development approved by the Government.

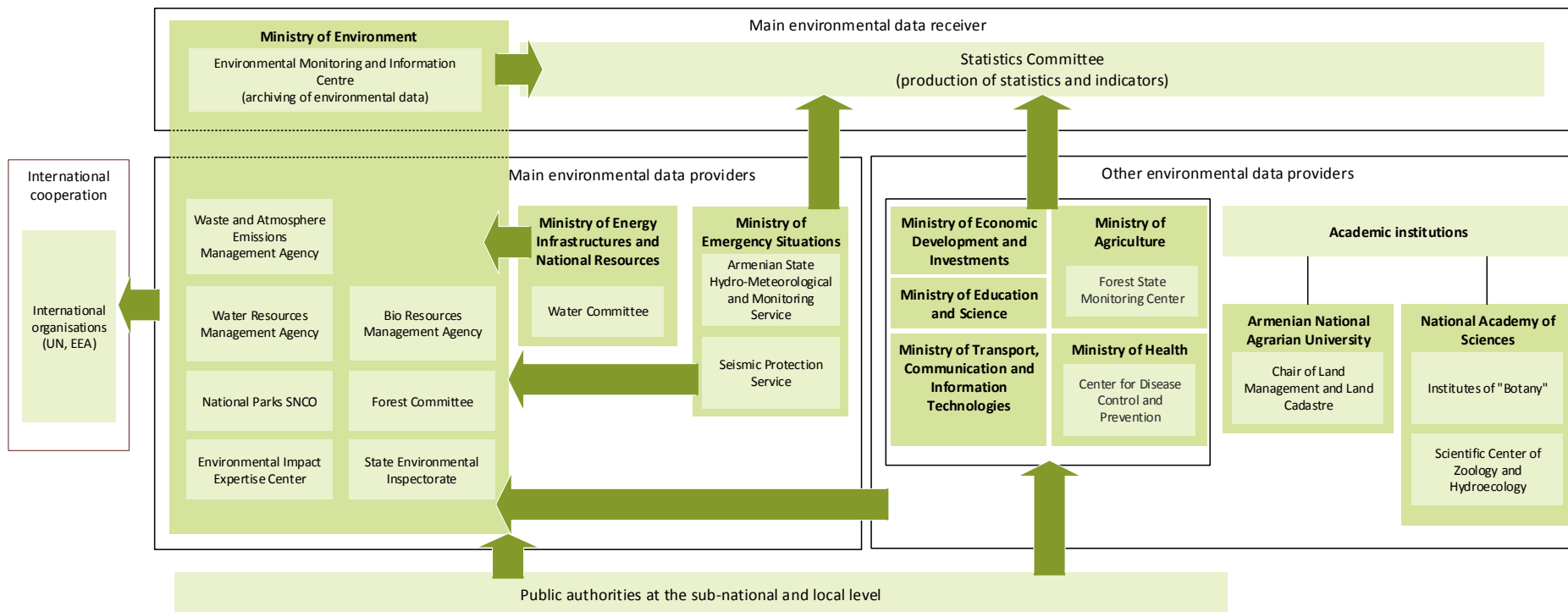
The Government of the Republic of Armenia develops and maintains the platform <https://www.e-gov.am/>. To this date, there is no dedicated institution for the implementation of open data.

Last, the e-Government activities are not related to environmental issues at the moment. The digital agenda 2018-2030 does not mention any environmental initiative in exception with the reduction of the ecological footprint of datacentres.

2.2 Environmental data flows

This section describes the main state actors in the environmental data sharing and the flows between them.

Figure 2. High-level environmental data flows in the Republic of Armenia



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Institutional cooperation inside of the country is based on bilateral agreements between organisations that deal with environmental information, though the data provided and analytics require significant improvement. The main organisations responsible for collecting, producing, managing and sharing environmental data and information in the Republic of Armenia are the Ministry of Environment and various supporting environmental organisations which are listed in the previous section of this document. The two main institutions collecting end environmental data are:

- The Environmental Monitoring and Information Centre (EMIC) collects and store raw data
- The Statistical Committee collects and disseminates environmental information. The collection, processing and dissemination of information are conducted within procedures and practices according to the national legislation and documents published on the Statistical Committee website⁵²

The following table depicts the environmental information and main stakeholders:

Table 2. Collection and storage of environmental information: responsibility of public authorities of the Republic of Armenia

	MES	MOE	MA	MEINR	MT	WRMA	SGB
A. Air pollution and ozone depletion	■	■					
B. Climate change		■					
C. Water	■	■				■	
D. Biodiversity		■	■				
E. Land and soil	■	■	■	■			■
F. Agriculture	■		■				
G. Energy	■			■			
H. Transport					■		
I. Domestic Waste & waste Hazardous	■	■					■
J. Environmental financing		■					

Abbreviations are listed in the abbreviation section of this document.

⁵² State of SEIS implementation in 2018 - Country Factsheet the Republic of Armenia, UNECE.

2.2.1 Environmental administrative information, statistics and assessment reports

2.2.1.1 Statistics and reports

The following table presents the environmental reports available in the Republic of Armenia. Most of environmental reports are published under the section “Environment” of the website of Ministry of Environment.

Table 3. Environmental assessment reports⁵³

Type of Report	Report ?	Institution publishing the report
National environmental reports	Yes / Last 2007-2011	<p>Ministry of Environment</p> <p>Report: Environmental status report, produced once in 2002</p> <p>Frequency: reports in the context of the Aarhus convention</p> <p>Note: due to Aarhus Convention Compliance Committee decision on Armenia, a report will have to be produced on a yearly basis.</p> <p>Link: http://www.mnp.am/?p=169</p> <p>Report: Environmental monitoring</p> <p>Frequency: Quarterly</p> <p>Link: http://www.mnp.am/am/pages/217</p> <p>Statistical committee</p> <p>Report: Environment and Natural Resources in the Republic of Armenia for 2017</p> <p>Frequency: annually</p> <p>Link: https://www.armstat.am/en/?nid=81&id=2074</p> <p>Report: Environmental Monitoring Results</p> <p>Frequency: quarterly</p> <p>Link: http://www.mnp.am/uploads/1/1549373208IV%20Eramsyak%202018.pdf</p>
Specialised reports - climate (national communications to UNFCCC)	Yes	<p>Ministry of Environment</p> <p>National Communication on Climate Change: https://unfccc.int/resource/docs/natc/armnc3.pdf</p> <p>UNFCCC</p> <p>Different Reports are produced based on the Convention requirements: National Communications; Technical Analyses; National Inventory Report, Biennial Updated Report etc.</p> <p>https://unfccc.int/documents?f%5B0%5D=country%3A1376</p> <p>Second Biennial Updated Report: http://www.mnp.am/uploads/1/15302535542BUR_eng_final.pdf</p>
Specialised reports – air	Yes	<p>Ministry of Environment</p> <p>Emissions, Monthly: http://www.mnp.am/en/pages/155</p> <p>Greenhouse gas, Yearly: http://www.mnp.am/en/pages/44</p>

⁵³ List extracted from the ENI-SEIS II East project page, and completed according to publicly available information. <https://eni-seis.eionet.europa.eu/east/countries/armenia>

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		Ozone depleting substances, Yearly: http://www.mnp.am/am/pages/190
Specialised reports - water	Yes	<p>Ministry of Environment</p> <p>Water resources, Yearly: http://www.mnp.am/en/pages/189</p> <p>Water use permits, Yearly: http://www.mnp.am/am/pages/187</p> <p>Maximum permissible discharge, ad hoc: http://www.mnp.am/am/pages/175</p> <p>Hydro Meteorological Bulletin, Daily: http://www.mnp.am/en/pages/47</p> <p>Water Resources Management Agency</p> <p>Frequency: ad hoc</p> <p>Link: http://www.wrma.am/8.php</p>
Specialised reports - biodiversity	Yes	<p>Ministry of Environment</p> <p>Licenses and Permits, Yearly: http://www.mnp.am/en/pages/211</p> <p>Hunting Areas, ad hoc: http://www.mnp.am/am/pages/218</p> <p>Red Book, ad hoc: http://www.mnp.am/am/pages/254</p>
Specialised reports - waste	Yes	<p>Ministry of Environment</p> <p>Management, ad hoc: http://www.mnp.am/am/pages/182</p> <p>One-time use licenses, ad hoc: http://www.mnp.am/am/pages/206</p> <p>Hazardous waste passports, Yearly: http://www.mnp.am/am/pages/207</p> <p>Cadastre and registry, ad hoc: http://www.mnp.am/am/pages/208</p>
Specialised reports – soil	Yes	<p>Ministry of Environment</p> <p>Soil balance, Yearly: http://www.mnp.am/am/pages/209</p> <p>Environmental protection fund, Quarterly: http://www.mnp.am/am/pages/210</p> <p>Reports about subsoil, from Ministry of Environment:</p> <p>General reports, Yearly: http://www.mnp.am/am/pages/233</p> <p>Subsoil: http://www.mnp.am/am/pages/234</p>
Specialised reports – climate	Yes	<p>Hydro-Meteorological and Atmospheric Activity Services SNCO</p> <p>Frequency: monthly</p> <p>Link: http://www.mes.am/en/2Fmeteo-management</p>
Indicator-based reports	No	Note: indicators published are not Regulated.
National Statistical Yearbook	Yes	<p>Statistical Committee</p> <p>Frequency: annual</p> <p>Link: https://www.armstat.am/en/?nid=586&year=2018</p>
National Statistical Yearbook on environment	Yes	<p>Statistical Committee:</p> <p>Frequency: annual</p> <p>Link: http://www.armstat.am/en/?nid=586&year=2016</p>
Report on sustainable development	Yes	<p>United Nations</p> <p>Link: https://sustainabledevelopment.un.org/content/documents/800Armenia_Report_Final.pdf</p>

Environmental information on request

To submit a request to access information, applicants have to apply to the information holder with a written or verbal inquiry to be addressed to specific departments in the appropriate body or organisation. Civil society organisations advocating for access to information suggest to apply with a written inquiry so that a complain can be done in case of rejection. To be taken into consideration, both written and oral inquiries have to meet the requirements stated by the Law. The inquirer is not obliged to justify the enquiry and to state the reason for it nor how the information requested is going to be used.

If the body/organisations does not possess all the details concerning the information required, the information holder has to provide the available parts and mention the name and the location of other possible information holders who might be in possess of other details concerning the information requested. Information are provided free of charge. Only technical expenses (i.e. marginal cost of production) information provision (photocopies, electronic supports, etc.) can be charged.⁵⁴

Ensuring the right to information to citizens is one of obligations of the Human Rights Defender Office. In case of non-provision of the required information, citizens can appeal to the Ombudsman for assistance. The Ombudsman issues its annual reports where the performance of all the governmental structures are assessed and the recommendations are provided.

2.2.1.2 Indicators

The domestic legislation does not have an obligation to produce environmental indicators. Besides, the national strategic documents⁵⁵ do not commit to implement the UNECE Environmental Indicators or develop National Environmental Indicators⁵⁶.

Nonetheless, UNECE environmental indicators are used in visual materials (time-series graphics, tables, maps) in some national documents such as 2011 Armenia Ministerial Report⁵⁷, 2017 National Statistical Yearbook on National Resources and Environment⁵⁸, 2016 Environmental statistics of Armenia for 2016 and time-series of indicators for 2012-2016 and on the Ministry of Environment and Statistical Committee website (<http://armstatbank.am>).

In particular, the website from the Statistical Committee - ARMSTATBANK.AM - publishes UNECE indicators. The website has been functioning since 14th September 2012, and developed with the support of Statistics Denmark within the framework of EU Twinning project “Forwarding Armenian Statistics Through Twinning”.

Although the website has many indicators, it is to be noted that these indicators are not published in the context of a specific legislation (i.e. voluntary basis). Hence, there is no guarantee regarding the control mechanisms in place for the quality of the information published.

Besides The system on which the website relies is similar to the Republic of Moldova.

⁵⁴ <http://www.foi.am/en/faq/>

⁵⁵ https://eeas.europa.eu/sites/eeas/files/armenia_development_strategy_for_2014-2025.pdf

⁵⁶ <http://www.gov.am/am/prsp/>

⁵⁷ Armenia Ministerial Report (2011, in English and in Armenian) for 2007-2011. For an overview of overall user perspectives on SoER, its role and impact on the country’s environmental policy , see the 2017 report “Effectiveness and relevance of recent environmental assessments for policy-making and public information in the Republic of Armenia” (in English and in Armenian). Thematic reports produced in Armenia (<http://www.mnp.am/en/pages/148>) (reports on air, climate change, water, biodiversity, sustainable development) cover a number of UNECE environmental indicators.

⁵⁸ 2017 National Statistical Yearbook on National Resources and Environment provides data that correspond to UNECE environmental indicators. Another important statistical report is the – Environmental statistics of Armenia for 2016 and time-series of indicators for 2012-2016.

2.2.2 Environmental data sharing arrangements

This section describes the main actors in the environmental data sharing and the flow of environmental information between them.

The information on all the stages are provided electronically via official communication. Nonetheless, there is no central environmental system, and no standard for exchange of information. In order to exchange information, the Statistical Committee publishes “Forms” which are available online⁵⁹. These forms are accompanied with instructions. The following table provides information about the inter-institutional cooperation agreements and data exchanged.

Table 4. Inter-institutional cooperation for environmental data exchange

Institution	Component of the environment	Inter-institutional cooperation for data exchange
Ministry of Environment (MOE) http://www.mnp.am/en/	Natural Resources Waters Fauna Flora Soils and land Waste Climate Forests	The national environmental authority collaborates with other ministries and agencies on the basis of inter sectoral commissions. They are convened when specific environmental protection problems have to be solved and common measures have to be taken. However, there is no integrated environmental policy; few formal mechanisms exist for cross-sectoral coordination ⁶⁰ .
National Academy of Sciences of the Republic of Armenia - Institute of Geological Sciences http://www.geology.am/en/	Soils Geology Minerals	The Institute conducts basic scientific research on general and regional geology, seismic tectonics, seismic hazard assessment, geodynamics phanerozoic biostratigraphy, lithogenesis of sedimentary and volcanic-sedimentary formations, geology and petrology of magmatic and metamorphic formations, volcanology, geology of mineral resource deposits, metallogeny, geochemistry and mineralogy of hydrothermal ore formations, geological informatics, engineering geology and hydrogeology, efficient use and protection of geological environment, mapping and assessment of natural landscape geosystems. There is no formal agreement publicly available about information exchange with other institutions.
Armenian State Hydrometeorological and Monitoring Service SNCO http://www.mes.am/en/meteo-management	Atmospheric air Surface waters Soil Ozone layer	The collected data is kept in an internal database, which is not available on-line. There is no information about cooperation with other institutions.

⁵⁹ <https://www.armstat.am/am/?nid=48&thid=eco>

⁶⁰ <http://www.thegef.org>: The link provides information on the International projects implemented by the MOE.

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Institution	Component of the environment	Inter-institutional cooperation for data exchange
Environmental Monitoring and Information Centre SNCO http://www.armmonitoring.am/#monitoring	Soil and land Waters Air Fauna Flora Waste Radiation Geology	Actively participates in the European Monitoring and Evaluation Program for monitoring of transboundary air pollution under the Convention on Long-Range Transboundary Air Pollution (LRTAP). There is no formal agreement publicly available about information exchange with other institutions.
Water Resources Management Agency http://www.wrma.am/index.php	Waters	The Agency provides collected data to the Ministry of Environment; afterwards, the data is published on the Ministerial website. There is no formal agreement publicly available about information exchange with other institutions.
The Ministry of Agriculture http://www.minagro.am/	Surface waters Soil Crops Fauna Forests Persistent organic pollutant	General data and information are available on the ministry's website. The website provides information on international cooperation, but no national inter-institutional cooperation details are provided.
"ArmForest" SNCO of the Ministry of Environment "Hayantar" http://hayantar.am/en/	Soil Forest vegetation Fauna	The website is quite poor. No actual data or maps are provided, and it only contains general information on international cooperation. There is no formal agreement publicly available about information exchange with other institutions.
Ministry of Energy Infrastructures and Natural Resources http://www.minenergy.am/en	Energy Radiation Natural resources	There is no formal agreement publicly available about information exchange with other institutions.
Statistical Committee https://www.armstat.am/en/	Atmospheric air Sources of emissions Surface waters Sources of discharge Land resources	The Statistical Committee regularly produces various monthly and annual statistical reports and collections on environmental data which are available on the Committee's website. The Committee receives data from various governmental institutions to create its reports.

Institution	Component of the environment	Inter-institutional cooperation for data exchange
	Forest resources Waste	
Ministry of Emergency Situations http://mes.am/en/	Atmospheric air Surface (including marine) waters Ground waters Soils and lands Radioactive waste	The Ministry actively exchanges information with other governmental bodies such as Ministry of Agriculture and Ministry of Environment. There is no formal agreement publicly available about information exchange with other institutions.
Regions and municipalities	Regional and Municipalities environmental information	There is no formal agreement publicly available about information exchange with other institutions.

2.2.3 Licensing norms

At the moment, Armenia does not have an open data portal. Therefore there are no standard licensing norms for open datasets in Armenia at the moment. Resources published are available on public institutions websites are accessible free of charge. No licence is referenced on any website.

2.3 Progress so far

2.3.1 Main initiatives

According to the open Government Partnership⁶¹, around 26 e-Government commitments are now in post-implementation phase, and 8 are currently on-going.

The Republic of Armenia acknowledges⁶² the poor results of the previous commitments as well as the delays, essentially due to financial constraints.

The current commitments of the Republic of Armenia are mostly focused on transparency and Open Data, which remains weak at the moment. The digital agenda of the Republic of Armenia is sound and contains the main elements necessary for e-government.

Development of transactional e-governance in Armenia

The project was executed between 2012 and 2014, and financed by EuropeAid/131-445/L/SER/AM.

The project strengthened the development of e-governance initiatives through the improvement of the legal framework and the deployment of different e-applications in the country. This project aimed to transform the way in which the Government interacts with citizens and businesses, as well as to change the way Government agencies interact with each other.

The main goal for this project was to introduce transactional e-services for Armenia:

- creating a web-based communication environment for the communications between citizens and the government agencies "mail Armenia"
- creating a digital Civil Status Registry and digitalize the registry records
- piloting e-police services
- providing policy advice for the government on further development of Information Society and e-Government
- providing e-Gov support for Statistics Office

EU4Armenia: e-Gov Actions⁶³

The project is funded by the EU and is aimed at enhancing the efficiency, quality, accessibility and transparency of public services in the Republic of Armenia. A large-scale project on establishing "One stop shop" system in the Government of Armenia is implemented within the scope of the program and is coordinated by the Foundation "Digital Armenia", and is executed on behalf of the Government of the Republic of Armenia. The project has two components: "Governmental Interoperability Platform" and "Single Electronic Window." The project started end of 2017 and aims to finish by 2020, for a budget of 5.6M EUR.

Current commitments towards the e-Government Partnership (extract)

Open data in official declarations (2018)

Government grant transparency (2018)

State water cadastre (2018)

Land cadastre (2018)

Commitments Post-Implementation (extract)

Transparency of the state budget (2016)

"Open data" in official declaration: (2016)

Digitisation and publication of data in the "Republican Geological Fund" snco (2014)

Ensuring transparency in mining (2014)

⁶¹ <https://www.opengovpartnership.org/countries/armenia>

⁶² <https://www.opengovpartnership.org/documents/armenia-end-of-term-report-2016-2018-public-comment>

⁶³ https://eeas.europa.eu/delegations/armenia_en/41316/EU4Armenia:%20e-Gov%20Actions

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The “Governmental Interoperability Platform” will ensure reliable, safe, efficient and swift exchange of information flows and data among all public administration institutions. The establishment of the platform will result in significantly improved quality of public service delivery by simplifying the procedures and reducing required time for getting services.

The “Single Electronic Window” will secure electronic exchange of data among all state agencies and economic agents in border crossing procedures. This will lead to simplified communication among all involved parties, elimination of administrative burden and acceleration of processes.

SEIS Lake Sevan⁶⁴

Throughout 2014 and 2015, the European Environment Agency supported the Armenian authorities to develop a pilot project aiming to establish a Shared Environmental Information System (SEIS) for Lake Sevan. This activity was conducted within the regional project "Towards a Shared Environmental Information System in the European Neighbourhood" (ENPI-SEIS, 2010-2015).

The pilot project aimed at developing a model/mechanism to allow the integration of data from a variety of sources, as a step towards regular data sharing among key partners. To limit the scope/range of data sets to consider, it had been agreed that only data pertinent to the management of water resources should be included in a first phase (i.e. datasets underpinning a small set of essential water indicators).

The Statistical Committee of Armenia was leading the development of the Lake Sevan portal in cooperation with the Information Analysis Centre of the Ministry of Environment (MOE). The Ministry of Territorial Administration and Emergency Situations, the Ministry of Energy and Natural Resources, the Ministry of Agriculture, and the Environmental Impact Monitoring Centre of the MOE were among key data providers to SEIS Lake Sevan during this pilot project.

This pilot project aimed in turn to support the implementation of Resolution No. 947-N “On Approving the Procedures for the Establishment of an Electronic Database, Information Collection, Registration, Processing and Provision based on the Monitoring Data in Lake Sevan and its Watersheds”, adopted by the Government of Armenia on September 4, 2014.

The final report of the pilot project included a chapter with conclusions and recommendations to continue the development of this system.

The SEIS Lake Sevan initiative is described in more details in the section “International platforms”.

E-health initiative⁶⁵

E-health in the Republic of Armenia is not yet fully implemented. The Integrated Health Information System of Armenia (IHISA) requires a universal modernisation of the healthcare system, implementing modern information and communication technologies providing high-quality, safe, accessible and cost-effective medical services to the public.

In December 2010 the Ministry of Economy and the Ministry of Health of the Republic of Armenia signed a Memorandum of Understanding, and the E-Governance Infrastructure Implementation Unit OJSC CJSC was appointed to coordinate and execute the implementation of Armenia’s e-Health system. In November 2012 the Government of the Republic of Armenia approved the action plan and schedule of the IHISA project implementation. In September 2013 the Government Staff of the Republic of Armenia Ericsson through its associated Croatian company Ericsson Nikola Tesla was selected to supply and implement the IHISA.

⁶⁴ <http://seis-sevan.am/?p=about-us>

⁶⁵ <https://www.ekeng.am/en/ehealth/>

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In December 23, 2015 the pilot of the Integrated Health Information System of Armenia (IHISA) has been finally implemented in 6 medical institutions in Armenia. According to the strategy of the Government of Armenia, the system planned to be rolled out throughout the country and by the end of 2016 all medical institutions in Armenia would use the system. There is no official information whether the project has been completed.

Digital signature⁶⁶

The Republic of Armenia introduced the concept of digital signatures in 2013. It is based on a certification authority which provides electronic digital signature certificates and other services related to electronic digital signatures. It also manages the life-cycle of certificates, including the issuance, cancellation, expiry and renewal of a certificate.

As a result of the implementation of this system the number of e-services has increased considerably because secure identification is a precondition for the development of electronic environments.

⁶⁶ <https://www.ekeng.am/en/certificationauthority/>

2.3.2 International rankings

E-Government Development Index⁶⁷

As a composite indicator, the EGDI is used to measure the readiness and the capacity of national institutions to use ICTs to deliver public services. In 2018, the Republic of Armenia scored 0.5944 and was ranked in #87 out of 193 countries. The figure below shows the change of EGDI.

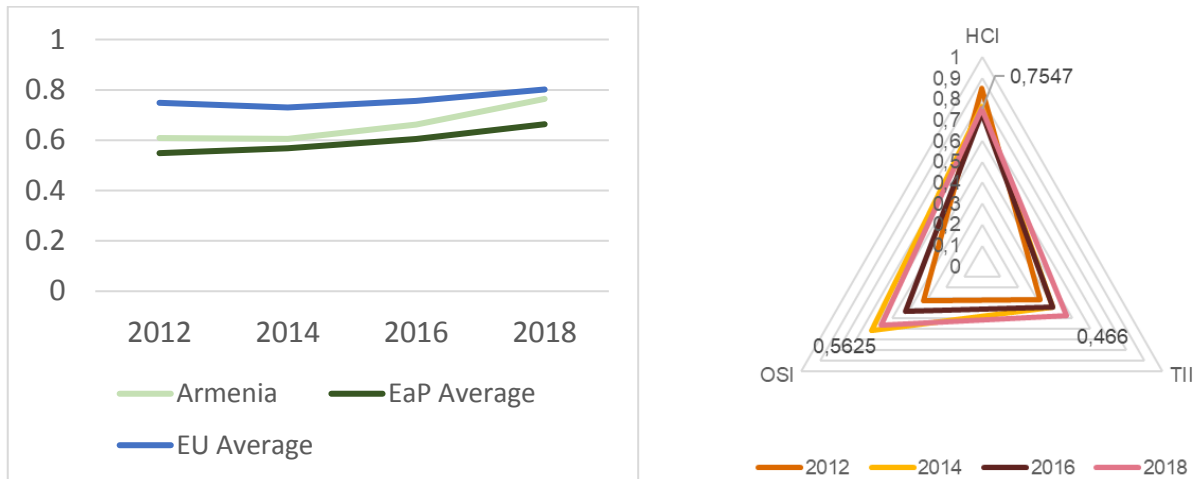


Figure 3. EGDI indicator for the Republic of Armenia

These figures show the change in value of EGDI components between 2012 and 2018. Online Service Index fluctuated in the last 6 years reaching the highest level in 2014 (0.6142). In 2018 the value of OSI was 0.5625. The Human Capital Index decreased from the level of 0.8505 in 2012 to the level of 0.7547 in 2018. Telecommunication Infrastructure Index has the lowest score out of these 3 categories, but it has been experiencing steady growth in recent years and is currently at the level of 0,466.

In general, the score increase for e-services is due to the introduction of digital signature, and the development of e-services on the e-gov.am portal. It is to be noted that the Republic of Armenia initiated in 2018 the implementation of a one-stop-shop for e-services⁶⁸.

⁶⁷ <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/8-Armenia/dataYear/2018>

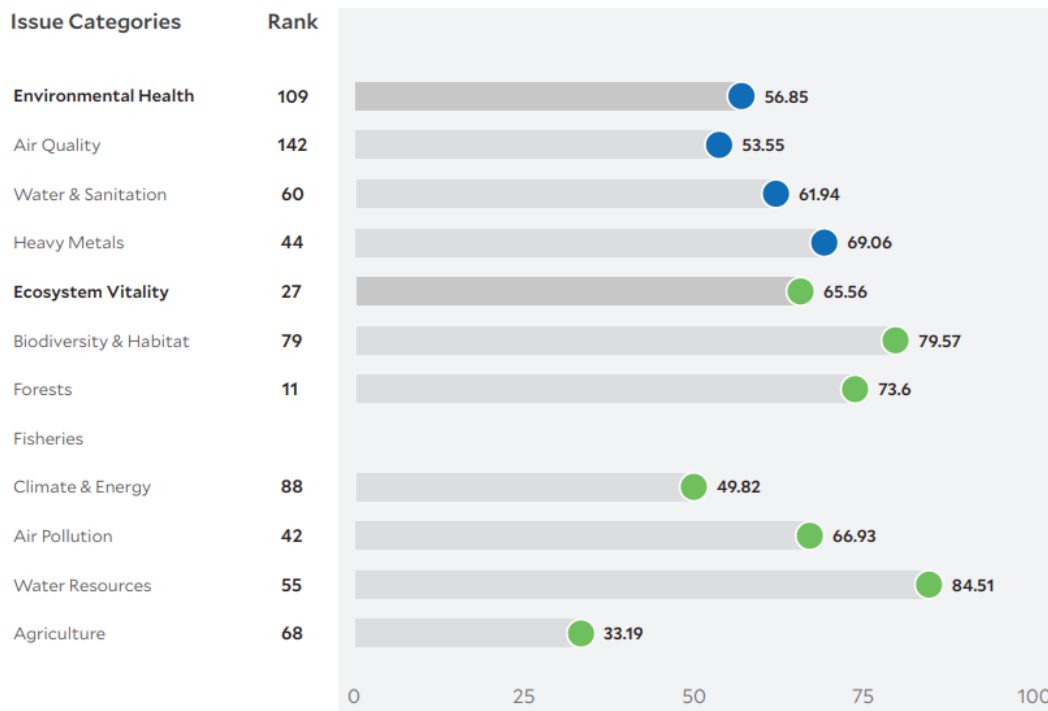
⁶⁸ <https://www.e-gov.am/en>

Environmental Performance Index⁶⁹

The Environmental Performance Index (EPI) ranks 180 countries on 24 performance indicators across ten issue categories covering environmental health and ecosystem vitality. These metrics provide a gauge at a national scale on how close countries are to established environmental policy goals.

In 2018, the Republic of Armenia ranked 63 out of 180 countries with the score 62.07, which is above the regional average of 58, but still below the EU average of 74. The figure below shows the main indicators of Environmental Performance Index.

Figure 4. Indicators of EPI of the Republic of Armenia



According to “Report for the UN High-level Political Forum on Sustainable Development of 9-18 July 2018”, the main challenge for the environment are deforestation risks, use of solid fuel by householders, and deepening negative impact on environment caused by mining activities. The poorest indicator relates to the agriculture⁷⁰.

Historically, Armenia undertook a massive privatisation programme of its lands at the fall of the Soviet Union, which account now for more than 75%. The “Report for the UN High-level Political Forum on Sustainable Development of 9-18 July 2018” pinpoints the main causes of food waste and loss as outdated storage facilities and access to refrigerated storage and cold storage.

Sustainable agriculture is a big challenge in Armenia. The key document which sets up a framework and defines targets, priorities thus a sustainable path for the development of agriculture and rural areas is the “Strategy for sustainable development agriculture and rural communities of the Republic of Armenia for 2010-2020”. Along with an action plan, this policy document serves as a basis for enhancing

⁶⁹ <https://epi.envirocenter.yale.edu/epi-country-report/ARM>

⁷⁰ Agriculture and Food Processing in Armenia – Limush Publishing House, Yerevan 2010, <https://www.chamber.org.il/media/149433/%D7%A1%D7%A7%D7%99%D7%A8%D7%94-%D7%90%D7%A8%D7%9E%D7%A0%D7%99%D7%94.pdf>

Armenia, The challenges of Reform in the Agricultural Sector, 1995, WorldBank: <http://documents.worldbank.org/curated/en/110001468740422505/pdf/multi-page.pdf>

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continuity of agrarian reform policies aimed at poverty reduction in rural poverty and migration from rural population. The Action Plan annexed to the Strategy includes the development and implementation of a national programme on conservation and sustainable use of genetic resources of crops and their wild relatives in Armenia. This Programme, envisaged by the strategy document, is currently under development as part of the Eastern Neighbourhood Partnership for Agriculture and Rural Development (ENPARD), a project component funded by the European Union and implemented by the Food and Agriculture Organisation of the United Nations.

ODIN score

The Open Data Inventory (ODIN) assesses data provided by national statistical offices (NSOs) through their principal websites for topical coverage and openness. The results are tabular to allow comparisons across different datasets within the country and between countries. ODIN's unique methodology has so far been applied to 180 countries.

In 2017, the Republic of Armenia had 40 points (out of 100) in terms of data coverage and 56 points (out of 100) when it comes to data openness. This translates into combined result of 48 points. The overall ODIN score (which includes also social and economic statistics) was 53 points (#45 in the world). When it comes to environmental statistics the situation is as follows:

Table 5. ODIN Score for the Republic of Armenia between 2015-2017

	2015	2016	2017
Coverage	44	48	40
Openness	50	48	56
All elements	47	48	48

The Republic of Armenia has a rather high score in the ODIN evaluation, which is aligned with the European Union average. In fact, the evaluation took into account the UNECE indicators published on the Statistical Committee website, but these indicators are adopted on a voluntary basis at the moment, and hence there is no certitude the information published has been formally controlled and verified. This evaluation should therefore be taken with precautions.

Besides, it is to be noted that the Republic of Armenia does not have an Open Data portal. The national portal for national statistics contains the few datasets available, but these are mostly related to commercial/economic indicators.

Open Data Barometer

There were four editions of the Open Data Barometer report. No data regarding the Republic of Armenia was included in any of the reports.

2.3.3 ICT related statistics

The ICT infrastructure in Armenia developed very fast. In 2009, only 15% of people had access to internet and multiple international reports⁷¹ mention monopolies owned by foreign companies (or organisations, such as the European Bank for Reconstruction and Development) as a blocking factor for free market. Currently, three telecommunications operators in Armenia offer mobile internet services: ArmenTel, K-Telecom, and Ucom. In Armenia, they provide mobile connections based on 3G, 4G, and 4G+ network technology. Though the 3G network is available in the capital and in the regions, the 4G network is available only in the capital and other big cities in the country.

According to the International Telecommunication Union⁷², the Republic of Armenia had end of 2017:

- Fixed-telephone subscriptions per 100 inhabitants: 17.2
- Mobile-cellular subscriptions per 100 inhabitants: 119
- Fixed (wired)-broadband subscriptions per 100 Inhabitants: 9.4
- Mobile-broadband subscriptions per 100 inhabitants: 64.3
- Households with a computer (%): 84.1
- Households with Internet access at home (%): 86.4
- Individuals using the Internet (%): 69.7

⁷¹ Harvard, READINESS FOR THE NETWORKED WORLD,
https://cyber.harvard.edu/itg/libpubs/Armenia_eReadiness_Report.pdf
USAID, ICT Country profile, Armenia 2013 :
http://www.rciproject.com/itprofiles_files/ICT_Country_Profile_Armenia_2013_1.0.pdf

⁷² Link to country profile with the latest data : <https://www.itu.int/net4/itu-d/icteye/CountryProfileReport.aspx?countryID=17>

3 Technology enablers for environmental information sharing

3.1 Portals

In this section, the platforms available for the dissemination of environmental information at a national and international level are presented.

3.1.1 Open Data portal

Currently, the data provided by the state are dispersed and, to this date, no Open Data portal is planned. In general, the website of the Statistical Committee is the principal environmental data platform, hosting the UNECE indicators.

Government websites are difficult to navigate; i.e. the search engine is unpractical, and no metadata standards are in place to make environmental information accessible. Besides, many public entities publish PDF documents named by administrative order number and date of implementation. The only source of categorised and systemised open data is the Statistical Committee's website (<https://www.armstat.am/en/>).

3.1.2 Environmental portals

3.1.2.1 *Implementation of national eco-portal*

In the Republic of Armenia, the following institutions are involved in the implementation and use of the EcoPortal within the ENI SEIS II East project. The "EcoPortal" is on early stages of development:

- The Ministry of Environment (MOE), Environmental Monitoring and Information Centre and Water resources management agency (WRMA)
- The Ministry of Emergency Situations (MES), Armenian State Hydrometeorological and Monitoring Service
- The Statistical Committee of the Republic of Armenia

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3.1.2.2 National platforms

There are multiple platforms in the Republic of Armenia which are used to publish environmental information. The following table summarises the main environmental national platform in place:

Portal	Description
Ministry of the Nature Protection http://www.mnp.am	<p>The Ministry of Environment website () is available in English, Russian and Armenian. The website contains a summary of Laws, decisions and decrees in environment related.</p> <p>It also hosts reports on the environment which are categorised by theme/topic in “atmosphere”, “water”, “wastes”, “biodiversity”, “soil” and “environmental monitoring”. It is to be noted that few reports are available and not all environmental themes are available (i.e. energy is not present, and no link is available to re-direct user).</p> <p>Besides, the English translation of the websites does not provide access to all the content. Links for the English and Armenian version are also different and causes troubles during the navigation. Besides, links seem to be dynamic and hence it is difficult to share them⁷³.</p> <p>Last, the information is not updated regularly – for instance, many environmental data (e.g. air, water) date from 2017.</p>
Statistical Committee (ArmStat) www.armstat.am http://armstatbank.am/	<p>The Statistical Committee of the Republic of Armenia publishes official statistics on various topics, mostly from a commercial/economic perspective.</p> <p>Both websites are available in English.</p> <p>www.armstat.am: lack usability and has very environmental information. It would be better to reference to armstatbank.</p> <p>http://armstatbank.am/: high usability, the portal enables cross sectoral and time series analysis. Environmental data are published as UNECE indicators. This portal is an example for other EaP countries.</p>
Environmental Monitoring and Information Centre Armmonitoring.am	<p>The website hosts environmental data about atmospheric air, surface water, groundwater, waste, soil coverage. It presents a series of graphs and data, but unfortunately the website is still not finished and not totally available in English.</p>
Water Resources Management Agency Armmonitoring.am	<p>The website provides access to activities reports, permits and water resources specific reports. It has a section “spatial data” which is under construction. The website is user-friendly, but the English version is not completed.</p>
Armenian State Hydrometeorological and Monitoring Service SNCO http://www.mes.am/en/meteo-management	<p>The website provides access to monthly hydrometeorological reports. The website is not totally available in English.</p> <p>Usability of the website could be improved.</p>

⁷³ In that sense, few links in the section « Statistics and reports » might not work.

Implementation of the Shared Environmental Information System principles and practices in the Eastern Partnership countries (ENI SEIS II East)

Portal	Description
<p>The Ministry of Agriculture</p> <p>http://www.minagro.am/</p>	<p>The website provides information about licensing, Agro-processing, Animal husbandry Horticulture, fisheries and Foreign trade.</p> <p>The website is user-friendly but usability could be improved. It is also not totally available in English.</p>
<p>Ministry of Energy Infrastructures and Natural Resources</p> <p>http://www.minenergy.am/en</p>	<p>The website contains energy and natural resources statistics. It is available in English but reports are mostly in Armenian.</p>
<p>Real Estate Cadastre Committee, RoA Maps</p> <p>https://www.e-cadastre.am/en/map</p>	<p>The website provides access to a map view of the Cadastre. No environmental information is published. The website is also difficult to use.</p>
<p>E-Government platform</p> <p>https://www.e-gov.am/</p>	<p>The Republic of Armenia has a central portal for e-services, even though it seems to be more an “e-government portal”. Hence, the website that is the closest to the notion of e-service portal is https://www.e-gov.am/.</p> <p>It brings together the electronic governance tools and databases of the Armenian state agencies as well as provides comfortable environment for their use. It contains links to the various e-service sectoral portals, but the website does not provide any categorisation of the public services, neither any standard description, as for example described in the Core Public Service Vocabulary.</p>

3.1.2.3 International platforms

Shared Environmental Information System (SEIS)⁷⁴

The European Environment Agency supported the Armenian authorities develop a pilot project aiming to establish a Shared Environmental Information System (SEIS) for Lake Sevan as part of regional cooperation within the EU-funded project "Towards a Shared Environmental Information System in the European Neighbourhood" (ENPI-SEIS, 2010-2015).

At the time, a prototype system, with on-line services, was developed and maintained by the Statistical Committee of Armenia; <http://seis-sevan.am/>

To limit the scope of the pilot project, only data pertinent to the management of water resources around Lake Sevan were considered at the time, to underpin the regular production of 16 water-related indicators:

1. Hydrometeorology and renewable freshwater resources
2. Renewable water resources
3. Freshwater abstraction
4. Water use
5. Domestic water use per capita
6. Centralized water supply
7. Access of population to centralized water supply
8. Water losses
9. Reuse and recycling of water
10. Drinking water quality
11. BOD and concentration of ammonium Nitrogen in rivers
12. Concentration of nutrients in freshwaters
13. Concentration of pollutants in lake water and in bottom sediments
14. Population connected to wastewater treatment
15. Wastewater treatment facilities
16. Polluted (non-treated) wastewater

The main objective of the pilot project was to develop a model/mechanism to allow the integration of data from a variety of sources, as a step towards regular data sharing among key partners.

In its current phase of cooperation within the ENI SEIS II East project (2016-2020), the European Environment Agency has continued its dialogue with the Armenian authorities to help identify actions that would build on previous efforts to develop SEIS Lake Sevan. National workshops were organised in Armenia in 2018 to discuss how a National Water Information System could be conceptualised - considering at the same time existing resources and tools such as the SEIS Lake Sevan and the desire in Armenia to develop a national "Eco-portal". Institutional reforms in Armenia throughout 2019 have impacted the practical implementation of a National Water Information System or the water component of the Eco-portal for Armenia. Nonetheless, the support from the European Environment Agency has focused primarily on providing guidance on practical steps to allow the regular production of a limited number of key indicators related to water quality and water quantity at national level. Today, the latest data and statistics found in the SEIS Lake Sevan portal (<http://seis-sevan.am/>) date from 2015.

⁷⁴ SEIS in Armenia : <https://eni-seis.eionet.europa.eu/east/countries/armenia>

3.2 Portal maturity for environmental data

3.2.1 Statistics over availability of environmental data

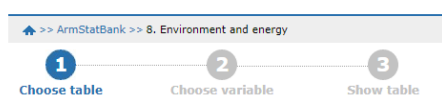
Due to the big amount of platforms at national level, the Republic of Armenia has a large spread of environmental data; the environmental reporting is mostly spread across website.

Open Data portal

There is no official Open Data portal.

Statistical Committee website - <http://armstatbank.am>

The website publishes numerous environmental in the field (A) Emissions of pollutants into the atmospheric air, (B) Climate change, (C) Water resources, (D) Biodiversity, (E,F) Land and Agriculture, (H) Transport, (I) Waste, (J) Environmental financing. For each category, it is possible to select the indicators and the year. In total, the website provides access to 45 datasets of environmental data, which are available free of charge.



ArmStatBank

- 1. Economy and finances
- 2. Population and social processes
- 3. Industry, construction, trade and services
- 4. Transport and tourism
- 5. Foreign trade
- 6. Agriculture, forestry and fishing
- 7. Food Security
- 8. Environment and energy
 - 8.1 Environment
 - (A) Emissions of pollutants into the atmospheric air
 - (B) Climate change
 - (C) Water resources
 - (D) Biodiversity
 - (E,F) Land and Agriculture
 - (H) Transport
 - (I) Waste
 - (J) Environmental financing
 - Mining of solid minerals by indicators and years
 - Environmental economic accounts
- 8.2 Energy



(A1)Emissions of pollutants into the atmospheric air by pollutants and years

Select variable About table

Mark your selections and choose between table on screen and file format. Marking tips
For variables marked * you need to select at least one value

pollutants *	years *
Total 36 Selected 1	Total 20 Selected 2
<input checked="" type="checkbox"/> Sulphur dioxide(SO ₂), total, 1000 t/year	<input type="checkbox"/> 2012
<input checked="" type="checkbox"/> Sulphur dioxide(SO ₂) from stationary sources, 1000 t/year	<input type="checkbox"/> 2013
<input checked="" type="checkbox"/> Sulphur dioxide(SO ₂) from mobile sources, 1000 t/year	<input type="checkbox"/> 2014
<input checked="" type="checkbox"/> Nitrogen oxides(NO _x), total, 1000 t/year	<input type="checkbox"/> 2015
<input checked="" type="checkbox"/> Nitrogen oxides(NO _x) from stationary sources, 1000 t/year	<input type="checkbox"/> 2016
<input checked="" type="checkbox"/> Nitrogen oxides(NO _x) from mobile sources, 1000 t/year	<input type="checkbox"/> 2017

Search

Beginning of row

Number of selected data cells are: 2 (maximum number allowed is 100,000)
Presentation on screen is limited to 1,000 rows and 30 columns

Chart - Line

3.2.2 Re-usability of data

Statistical Committee of the Republic of Armenia - <http://armstatbank.am>

The website contains annual statistical parameters published in form of graphs, tables or various types of output files. Data can be downloaded in Excel and other machine-readable format.

Other environmental portals described in section “National platforms”

Data available on public institutions websites are either available in html format (on the web page) or in pdf. Hence, the data are not provided in machine-readable format.


4 Achieving a high level of maturity for environmental information management

4.1 Main challenges

4.1.1 E-government

The major problems and challenges related to the implementation and maintenance of e-Government initiatives in the Republic of Armenia are presented in the table below following the SEIS 3 pillars structure.

Table 6. Major problems related to e-governance

<p>Content</p> 	<ul style="list-style-type: none"> • Lack of e-services available. The Republic of Armenia does not have a separated official e-service portal with a full inventory of basic services. Hence, the current display of the e-government portal can be misleading and cumbersome for citizens. • Lack of standards for the description of public services. The description of public services on the e-government portal is not made according to international standards and misses key information such as price, requirements, service flow, etc. Using the Core Public Service Vocabulary published by the European Union, as in implementation in the Republic of Moldova, could be an option. • Lack of unified standards concerning facilitation of legal data browsing. Legal documents are published in pdf format, without any metadata on the respective government websites. This means that Laws are difficult to find and analyse⁷⁵. • Lack of regulation for the implementation and management of spatial data.
<p>Infrastructure</p> 	<ul style="list-style-type: none"> • Weak technical interoperability. According to the E-Governance Infrastructure Implementation Unit OJSC CJC, not all Government agencies are at the same level in terms of e-governance and capacity⁷⁶. It is necessary to develop technical interoperability and to ensure common standards for all state services in order to increase effectiveness of e-governance. • Weak IT structure and know-how of territorial Government entities. Digitalisation of public administrations require trained staff, clear procedures, and technical standards to follow. • Lack of geospatial initiative. At the moment, there is no central geoportal available, hence there is a need to develop a central and standard platform for the dissemination of environmental information with spatial data.

⁷⁵ <https://www.opengovpartnership.org/commitment/05-portal-community-decisions>

⁷⁶ <https://www.ekeng.am/en/egovernance/>

Network



- Collaboration for the development of digitalisation. There is a need to assess common functions in public institutions and to find solutions which are generic, applicable and interoperable between them. In that regards, there is a need for a cross-sectorial approach to digitalisation, which involves the participation from all Ministries.
- Scarce financing of NGOs and international. Armenian NGOs lack funding, and hence their monitoring and contribution to development of e-Government tools is hampered. Rec Caucasus and Aarhus Centres could be considered as relatively independent NGOs due to some saved funds from EU and OSCE respectively. However, both structures need support for effective operation and can't survive without international assistance.
- Lack of financing. The Open Government partnership highlighted the poor results of the initiatives launched, due to lack of financing. A developed comprehensive strategy with clearly identified key targets and better planning of activities as well as on resources availability and leverage on financing sources would help to address the issue.

4.1.2 Open data

The major problems and challenges related to electronic access of public information are presented in the table below.


Table 7. Major problems related to open data

<p><i>Content</i></p> 	<ul style="list-style-type: none"> • Lack of extended legal basis concerning the open data access. The Law on Freedom of Information (adopted in 2003) is the main legal source concerning open data in the country. The last Regulation has been adopted in 2015, it concerns procedures of handling access to public information requests. There is a need for a regulation for building of a central and unique open data portal, which has to be mandatory filled by public information and comply to a set of legal requirements (e.g. metadata, main functions, request procedures, definition of responsibilities, etc.). Besides, the regulation should also be consistent with the procedure to request public information and not compete with other regulations defining responsibilities for the publication of public information. • Lack of inventory of public information available for disclosure. Institutions publish their information on their website but very few datasets are published and no inventory of the total amount of data available exists. • Gaps in translation. Most of provided data is not translated to any foreign language, which significantly hampers the usage by users and international organisations. • Lack of published data in machine-readable formats. Formats of data published by administration bodies differ from each other, which hampers usage. Procedures related to formats of data files and way of its dissemination should be unified to improve re-usability and digital processing. • Absence of metadata standard for the publication of public information. At the moment public information is published differently across websites and there is no complete metadata standards for the description of data published (e.g. description, validity period, format(s), etc.).
<p><i>Infrastructure</i></p> 	<ul style="list-style-type: none"> • Lack of open data portal. The absence of an open data portal undermines the access and publication of public information. Without the creation of an open data portal, finding data might become problematic in the nearest future. • Standardisation of exchange of information with the Statistical Committee. There is a need to standardise the technical exchange of public information between all public institutions and the Statistical Committee system.
<p><i>Network</i></p> 	<ul style="list-style-type: none"> • Absence of a leading organisation assigned with the development and management of an Open Data portal. • The inter-institutional cooperation potential is not exploited. The Statistical Committee, as the main publisher of public data, does not receive data from all public organisations. Many of them collect data, but do not share it further.

4.1.3 Environmental information sharing



The main problems related to environmental information management is presented in the table below.

Table 8. Major problems related to environmental information management

Content	
	<ul style="list-style-type: none"> • High spread of environmental data. There are too many platforms publishing environmental data and reports in the Republic of Armenia, and it is difficult to know which platforms holds which information. • Lack of time standards for measurements and lack of conformity with international standards. Data are not updated at regular intervals and some researches do not include sampling date⁷⁷. Hence data are difficultly comparable over time. For example, the Environmental Monitoring Centre measures CO2 emissions and provide respective data on their website. Climate factors as temperature, precipitation etc. are monitored by the Ministry of Emergency “Service of the hydrometeorology and active influence on atmospheric phenomena” SNCO. However, the Centre does not analyse the impact of these emissions on climate change on the ground. Consequently, the climate data reported by the “Climate Change Information Centre” is not reliable and consistent with the data collected by independent organisations. • Lack of timely availability of environmental information. The preparation of a coherent environmental policy has also been hampered by the lack of adequately compiled and analysed environmental information. As long as accurate and timely information is not regularly available, decision-making as well as policy control and enforcement remain too difficult. • Lack of applicable models for the vulnerability assessment of water resources. Insufficient database at the State Water Cadastre on water resources and on the sector in general. Data on water resources, water use, quality and quantity available at the State Water Cadastre is incomplete and, as a result, it is impossible to fully compare and assess climate change impact on water resources. • Lack of resources to perform Climate Change reporting The Ministry of Environment is lacking necessary professional and knowledge capacity and financial resources in all required fields for addressing climate change challenges. • The Ministry of Environment should take all possible initiatives to strengthen the priority level of environmental policies by: <ul style="list-style-type: none"> - Developing an Aarhus Convention implementation Strategy and Action Plan, thus access to environmental information and public participation into decision-making - Implementing the Espoo Convention Experts recommendations as a priority - Raising technical and managerial competence, organizational competence, accountability and transparency;

⁷⁷ State of SEIS implementation in 2018 - Country Factsheet Belarus, UNECE

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	<ul style="list-style-type: none"> - Enhancing access to environmental information and greater public awareness as well as proving public monitoring instruments upon international commitments and national projects implementation. - Developing training programs and conducting regular training, seminars and workshops for staff on national and local level.
<p><i>Infrastructure</i></p> 	<ul style="list-style-type: none"> • Lack of technical equipment. Provision should be made for upgrading the technical equipment of the Ministry of Environment key departments. <p>For example: the State Environmental Inspectorate is not equipped enough to conduct periodic observations concerning wastewater quality. The inspection of main sources is performed once a year, but non-prioritised sources are observed on less frequent basis. Hence the State Environmental Inspectorate can't provide other institutions with complete and up-to-date data/information.</p>
<p><i>Network</i></p> 	<ul style="list-style-type: none"> • Legal gaps in inter-institutional data exchange and sharing. At the moment, data sharing agreements are not made publicly available and might not be regulated in terms of content, frequency, quality and means. • Lack of coordination between the Environmental Monitoring and Information Centre (EMIC) and the National Security Service (NSS). EMIC is in charge of providing environmental information. The cooperation between EMIC and NSS could be more sufficient if EMIC delivered data in structured format and time series. • Lack of coordination with the e-government institutional framework. • Necessity for a structure coordination of national environmental programmes and projects. In addition, project management should include the management of international assistance where it occurs in order to avoid duplication and ensure the rational use of the financial resources granted. • Need for implementation and appropriate use of the top-down and bottom-up approach with clear division of roles and responsibilities among governmental institutions on national and local level. • Initiating programmes aiming at implementation of the Strategies and the Action Plans via involvement of educational and scientific institutions, non-Governmental and civil society organization; <p>Financial bases should be facilitated for strengthen the capacity of NGOs to be a solid partner. The Ministry should involve not only individuals but also NGOs as such in the preparation and discussions of the environmental Laws and Regulations. NGOs should also be involved in discussions of Environmental Impact Assessments, and should be involved in the preparation of national and regional programs for environmental management.⁷⁸</p>

⁷⁸ Environmental Performance Reviews Armenia, UNECE, 2000

4.2 Roadmap

This section presents key areas of development for the Republic of Armenia. It is to be noted that these initiatives should be undertaken considering regional and international collaboration. Initiatives which were undertaken in other countries could be leveraged. In addition, the development of national standards would benefit if developed regionally and/or aligned to international standards. This especially is true for the design of information systems, metadata standards, portals and interoperability standards.

In addition, the following roadmap assumes that few elements are already in place for its smooth implementation. If some of these elements are not in place in the country, it is heavily recommended to first address issues related to these topics. In particular:

- Long term Digital and Open Data strategy: a national strategy and action plan for Open Data should be in place. It should ensure scoping, management and funding of the national Open Data portal, as well as that enough resources are allocated to open data awareness raising activities with both publishers and potential re-users.
- General interoperability framework: the country should have in place an interoperability framework or at least its foundation in place. This is especially required for building environmental information systems and ensuring smooth integration / exchange of environmental data.
- Open Data policy: the open data policy provides the foundation for a structured approach for public sector information dissemination.
- E-government, Open Data and geo-portals: the country should have effective e-government, open data and geo-portals on which environmental information can be shared / disseminated, and where services can be built.
- Environmental strategy: this strategy should contain key objectives for fostering sharing and dissemination of environmental information.
- Enforcement mechanisms for the collection, sharing and dissemination of environmental information.

Some of these measures are already in place (or ongoing) in the Republic of Armenia, but nonetheless, it is advised to look at these elements from a perspective of environmental information sharing and dissemination, and to update them where appropriate. It is to be noted that these elements are under continuous development and hence reviewed periodically.

4.2.1 Content

Measure	Priority	Description
Revision of legal framework to promote accessibility and re-use of non-sensitive public sector information (PSI) online	High	<p>Review of the legal framework for data governance related to environmental monitoring, decision-making and control, natural resources, ecosystems and pollution inventories and environmental assessments, in accordance with the Aarhus Convention, the Protocol on PRTRs (as appropriate). This can include:</p> <ul style="list-style-type: none"> • improving environmental information system(s) by defining themes, sources (lists, registers, databases, funds, etc.), formats, metadata and interoperability requirements in accordance with the Aarhus Convention, Protocol on PRTRs, ECE environmental indicators and other international commitments and the e-government/open data framework • improving procedures for environmental data collection in electronic forms • improving procedures for environmental data update, quality assurance, reporting, online dissemination and other means of dissemination • proving public participation in the design, use and update of the environmental information system(s) of the and taking on citizens science and citizens engagement initiatives • division of responsibilities of the public authorities at all levels and across the sectors to ensure their clear roles and coordination • reviewing the application of the exceptions in disclosure of environmental information and establishing a clear and predictable legal framework to ensure the legitimate application of these exceptions and the disclosure of information on emissions in accordance with the Convention • Setting out the requirement to separate non-confidential information of public importance for its further disclosure <p>Adopt guidance defining the practical arrangements for environmental information management, sharing and dissemination:</p> <ul style="list-style-type: none"> • scope of environmental information system(s) with their metadata description and registry (to be explained) • environmental data management system (data architecture, data stewardship, database administration, data privacy, data security, data quality) • decision-making procedure on non-confidential themes or datasets to be shared and published online and the relevant online portals (e.g. website of the public authority, environmental portals (one web

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		<p>access points for environmental information), geospatial portals, statistical, open data and other portals)</p> <ul style="list-style-type: none"> • separation of non-confidential information as appropriate • data quality assurance mechanism <p>stakeholder communication, including public participation procedure in the design, use and update of the environmental information system(s)</p> <hr/> <p>Adopt an environment data policy:</p> <ul style="list-style-type: none"> • Types and scope of environmental information available • Basic terms of availability and accessibility, including open access and sharing policy • Stakeholder care and support • Licensing standards <p>Point of contact for access to environmental information</p>
<p>Timely and regular collection and delivery of environmental data in accordance with the Aarhus Convention, the Protocol on PRTRs (as appropriate) and the decisions and recommendations of the Meeting of the Parties to the Convention and the Protocol</p>	<p>High</p>	<p>Consider the possibility of ratification of the Protocol on PRTRs and define practical arrangements for establishing pollutant release and transfer registers within integrated environmental information system(s).</p>
<p>Definition of metadata description standard for all environmental information</p>	<p>High</p>	<p>This action will aim to define standards for the dissemination of environmental data and the dissemination of environmental reports. As a result, it will be easier for institutions to exchange and manage environmental data, while also making easier for citizens to find information.</p> <p>An example could be implementation of EU DCAT-AP standard, which would also enable integration with the European Data portal.</p> <p>Refer to the best practice report to get more information about metadata standards for Open Data.</p>
<p>Update/adopt interoperability standards for environmental systems and establishment of norms regarding inter-institutional data flow exchange/sharing, its format and improvement of the management of data collected.</p>	<p>High</p>	<p>This action will review the existing standards for exchanging environmental data between institutions and systems, and standardise the exchanges. This action is a prerequisite for building an effective central environmental information system.</p>

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Develop and publish quality control mechanisms for environmental data	Medium	<p>This action will:</p> <ol style="list-style-type: none"> 1. Assess the current quality control mechanisms from the collection (monitoring) of environmental data to the publication (aggregation, sorting, enhancement) 2. Provide a standard mechanism for quality control and set minimum standards to respect during the data flow (data gathering, data preparation and cleaning, data publication). 3. Provide the legal framework for setting obligations at different levels, and penalties in regards with quality controls of environmental data 4. Implement the quality control mechanisms and set up an annual reporting process for the evaluation of the quality of environmental data <p>To implement these actions, refer to the best practice report to get examples.</p>
Transformation of data published to machine-readable format	Medium	<p>The true potential of environmental data lies in their usability. Ensure the publication of environmental data in machine-readable format.</p>
Inventory, re-engineering and publication of public services as e-services	Medium	<p>Ensure that environment services are described and accessible through the electronic service portal, in accordance with the national standards.</p> <p>For more information about the standardisation of the description of e-services and the development of an electronic service portal, please consult the best practice report.</p>
Harmonise licensing terms and conditions of environmental data to promote its public use and re-use	Low	<p>This action will harmonise all licensing terms and conditions on the different portals used for publishing environmental data. More information about licensing are available in the best practice report.</p>
Carry Open Data impact analysis framework in relation to the environment	Low	<p>Carry on the assessment of the impact of environmental data on the environment, as part of the open data impact assessment framework. For instance, evaluate the following criteria:</p> <ul style="list-style-type: none"> • Number of environmental data downloaded and re-used • User feedback received/collected • Apps developed using environmental data • Applications and apps developed using environmental data and having an impact on the environment (including re-use of environmental data in other disciplines, for instance transport). <p>More information about the general open data impact assessment can be found in the best practice report.</p>

4.1 Infrastructure

Measure	Priority	Description
Establish a single and user-friendly web-access point for environmental information	High	<p>As recommended by the meeting of the parties of the Aarhus Convention, in the annex 6.1, establish a single web access point to environmental information.</p> <p>The portal should have a standard metadata tool and a tool for the verification of the metadata quality.</p> <p>The portal should act as a public awareness and communication tool for environmental information.</p> <p>Authorities should also consider which environmental data to publish to the “eco-portal”, and:</p> <ul style="list-style-type: none"> • Ensure the continuous maintenance of the access point through the execution of an action plan to ensure the portal’s sustainability over time • Increase the discoverability of environmental data and information by having : <ul style="list-style-type: none"> - a content-driven structure of the menu and - advanced search functionality that allow the user to use multiple field search and filter options (e.g. file format) to refine a search; combining the keywords with Boolean operators; - offer the possibility to download datasets - Specific “Request data” button - Public consultations for addressing environmental data demand <p>The design of the web-access point should be done through the public consultation on its functionality and design.</p> <p>More information about single access point can be found in the best practices report.</p>
Enhance Interoperability of geospatial, statistical, health and environmental information systems	High	<p>At the moment, different information systems and portals produce, consume and disseminate environment data. This action will:</p> <ul style="list-style-type: none"> • Undertake a comprehensive review of portals and information systems, including their interfaces and technological implementation • Provide standards for the design of systems consuming, producing or disseminating environmental data • Provide interoperability standard for exchange of environmental information between public information systems (e.g. health, environment, energy, and statistics) and provide external APIs for external data consumers. • Provide mechanisms for consolidating environmental data across time and space

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		<p>These actions can be also addressed within an overarching national interoperability framework.</p> <p>Refer to the best practices for more details about this action.</p>
Build an electronic registry of public environmental information	High	<p>This action will aim to make a registry of environmental information available in each institution (i.e. metadata management system), and publishable in light of the legal framework defined. This action could be coupled with the standardisation of metadata for environmental information as well as the definition of standard “environmental information” access points which would enable the registry to collect automatically these information. The registry will be used by public servants to support the continuous development of environmental information systems and the dissemination of environmental information. In particular, it will map systems, databases, institutions, datasets and reports published.</p>
Improve accessibility and use of available environmental data and information by improving the multi-lingual aspect	Medium	<p>This action will provide a full translation to English/Russian of public institutions websites, yearly reports and environmental information metadata.</p> <p>An example of multilingual portal is the GEMET⁷⁹, which provides a thesaurus translated in 23 languages, including Russian.</p>
Development of e-services for the environment	Medium	<p>To describe the environment services according to the national standards (service passports)</p> <p>Development of environment services as e-services according to service interoperability standard (e.g. e-signature, e-payment).</p> <p>More information about the description of public services can be found in the best practices report.</p>
Strengthening of technical capacity for environmental monitoring	Medium	<p>Provision of modernised monitoring equipment</p>
Develop and/or continue to enhance an integrated system for environmental information management, including environmental information in accordance with the Aarhus Convention and the Protocol on PRTRs.	Low	<p>Development of an Integrated Environmental Management System, which will ensure management of data on environmental quality or long-range forecasting. To do so, this action will:</p> <ul style="list-style-type: none"> • Make an inventory of all systems used for management of environmental information • Define requirements for a central system for environmental information management • Implement the system • Train users and institutions on how to use it

⁷⁹ <https://www.eionet.europa.eu/gemet/en/concept/4438>

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		<p>In particular, this action will foresee the development of an efficient system for integrating various environmental factors.</p> <p>Note: 1) the system should provide a standard API and a possibility to upload data manually so that compatibility with legacy and external systems can be maintained, and 2) this action should be executed taking into consideration the fact that Armenia has not ratified the Protocol on PRTRs yet.</p>
Develop applications to engage citizens in environmental protection through technology, especially extending the scope of existing widely used one regarding meteo forecasts or citizens engagement tools	Low	<p>This action should aim to create a series of apps and/or an “environmental data ecosystem” which would enable citizens to consult and interact with environmental data.</p> <p>For instance, through apps:</p> <ul style="list-style-type: none"> • consult environmental information in real time according their location • public could report poaching, mark polluted areas, etc. • public could take part into environmental friendly events in their neighbourhood to fight pollution <p>Integration of environmental data with popular national apps, where possible</p>

4.2 Institutional cooperation (Network)

Measure	Priority	Description
Establish a collaborative institutional framework for the implementation of an Open Data concept	High	<p>This action will strengthen the necessary institutional framework for managing open data.</p> <p>This action will emphasis on the need to create a strong cooperation between institutions in order to ensure the publication of public sector information (PSI).</p>
Continuously ensure availability of adequate capabilities for handling environmental and open data issues	Medium	<p>This action will assess existing capacity of organisations for dealing with environmental information. It will continuously address methods, procedures, mandates, tools & technical maturity, skills and resources for handling environmental data.</p>
Promote international and regional cooperation on good practices, challenges and lessons learned in the implementation of the points of this roadmap	Medium	<p>Identify forums and meetings where experience can be shared.</p>
Building capacity for environmental monitoring	Low	<p>Provision of human resources for performing environment monitoring.</p> <p>Professional development/ training plan for civil servants and/or data stewards or data officers working with data (organised in the frame of the professional development programmes for civil servant).</p>

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		Capacity building – official training plan (Mandatory) for people responsible for data publication and recognised certifications for these people to increase the motivation and to be formally recognised as professional development training within the public bodies.
Develop a framework for measuring the social, political, environmental and economic impact of Open Data	Continuous	This action will develop a framework for measuring the social, political, environmental and economic impact of Open Data. The framework will be tailored to take into consideration environmental data.
Implementation of policies regarding improvement of public awareness	Continuous	Raise public awareness on environmental information, its accessibility and related issues.
Raise awareness about open government and open data among the citizens and economic operators	Continuous	Driving demand for open government and data through greater awareness. Undertake a series of activities for promoting re-use and sharing of environmental information: <ul style="list-style-type: none"> • Hackathon • Forums • Promotion campaigns • Develop incubators • Develop public private partnership Develop cooperation between national bodies and NGOs and the academic sector