Working Group on Environmental Monitoring and Assessment

Twenty-forth session, Geneva and online, 11-12 April 2022

Agenda Item 7. Progress in environmental monitoring and assessment, including institutional and regulatory mechanisms and infrastructure at the national level

Major actions taken in Armenia, 2020-2021

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Recent developments

- Production of environmental reports, analyses and assessments based on environmental information and indicators, including through the use of SEIS.
- Modernization and upgrading of national monitoring networks
- Improvements in data quality assurance and control, as well as management of data.
- Improvements in data policy & institutional and regulatory mechanisms & technical solutions for data exchange between various ministries and agencies & with other users, including the public.
- Implementation of recommendations regarding environmental monitoring & assessment made in national environmental performance reviews.
- **Development at country level to enhance digitalization & digital transformation related to environmental information including through the use of new technologies, big data, artificial intelligence & Earth observation for environmental monitoring.**
- Remaining challenges

Improvements in data policy & institutional and regulatory mechanisms & technical solutions for data exchange between various ministries and agencies & with other users, including the public

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- In January 2020, three state non-commercial organizations carried out environmental monitoring; Hydromet Service of Ministry of Emergency Situation, Environmental Monitoring and Information Center and Forest Monitoring Center, have been merged and formed the Hydrometeorology and Monitoring Center of the Ministry of Environment in order to establish united environmental monitoring system and to improve data exchange between services.
- The Division of Nature Protection Statistics was formed within the Statistical Committee.
- To faster data exchange between national organizations the several memorandums has been signed between HMC, ME and other governmental organizations, academic institutions, and etc.

Modernization and upgrading of national monitoring networks

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➢ **Upgrading meteorological stations**

- In 2020-2021, 23 meteorological stations have been equipped with automatic instruments
- In 2021, 6 automatic meteorological stations have been installed for forest fire forecasting, highway maintenance, monitoring of agricultural sector.

➢ **Upgrading hydrological stations**

- In 2020-2021, 6 hydrological observation points were renovated, equipped and modernized with the financing of the EUWI + project.

➢ **Upgrading groundwater monitoring stations**

- In 2020-2021, 13 groundwater monitoring stations were renovated and 12 new stations were built in Sevan and Hrazdan river basin management areas within the EUWI + project.

Modernization and upgrading of national monitoring laboratory

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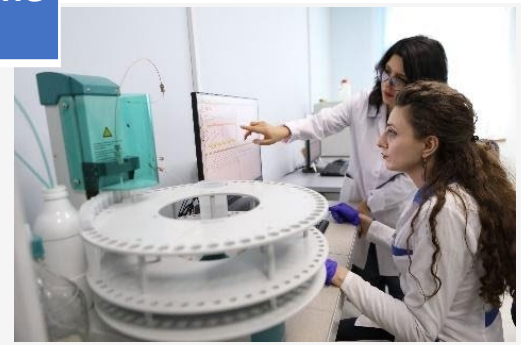
In January 2020, the newly equipped laboratory of the "Hydrometeorology and Monitoring Center" SNCO of the Ministry of Environment of the Republic of Armenia has been opened renovated with the co-financing of the European Union and the Government of Armenia in the framework of the EU-funded project "European Union Water Initiative Plus for Eastern Partnership Countries".



With the support of EUWI+ project the following activities took place:

- **Technical assistance: Purchase new equipment and sphere parts, installation and trainings**
  (Ion chromatograph, spectrometers, field multiparameter instruments, high precision scales and etc)
- **Methodology harmonization and proficiency testing**
- **Purchased standard ISO methods for conducting analyzes (in English and Armenian)**
- **Preparation Laboratory Accreditation documents**
  (Quality Manual and SOPs)

Developing of national monitoring system (programs)

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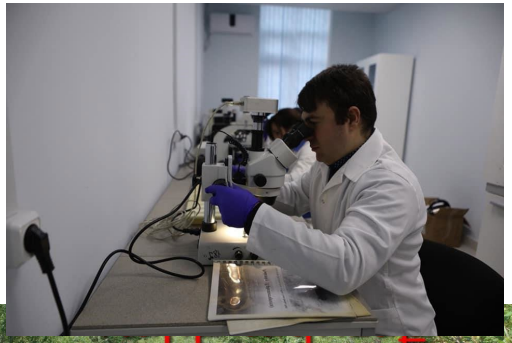
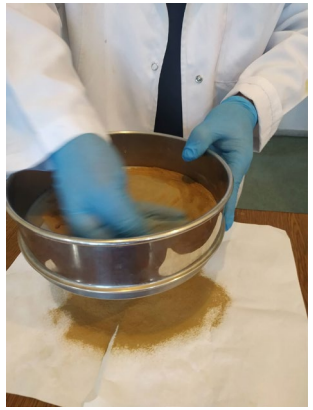
- Hydrobiological monitoring has been started to implement regularly
  - Since June 2020, the implementation of the hydrobiological monitoring has been started regularly. The hydrobiological network has been established based on the previous investigations in the pilot river basins in Armenia within EU funded project (EUWI+, EPIRB and etc) and considering the provisions of EU water framework directive.

- Since June 2020, the soil pollution monitoring has been started to implement a wide range
  - The soil pollution monitoring network includes basic river basins in Armenia aimed to understand the influence of pollution of basins on the rivers. Besides basic monitoring programs, in 2019-2020, the investigation monitoring has been carried out in rehabilitate abandoned, ownerless sites.

- In March 2020, the new network of the surface water quality and groundwater quality and quantity monitoring has been approved by the Order of the Ministry of Environment.
  - According to the new network, the list of monitoring sites has been expanded essentially and consist 144 (from 131) surface water quality sites on rivers, reservoirs and Lake Sevan, and 109 ground water quality and quantity monitoring sites (from 100).



Since 2021 January, within the framework of the "EU4Climate“ regional project (funded by EU and implemented by UNDP) the Austrian Environment Agency has started to develop a comprehensive concept for improvement of air quality monitoring in Armenia, which is based on the Armenia-EU Comprehensive Extended Partnership Agreement (harmonized with the EU Air Quality Framework Directive).



Production of environmental reports, analyses and assessments based on environmental information and indicators, including through the use of SEIS

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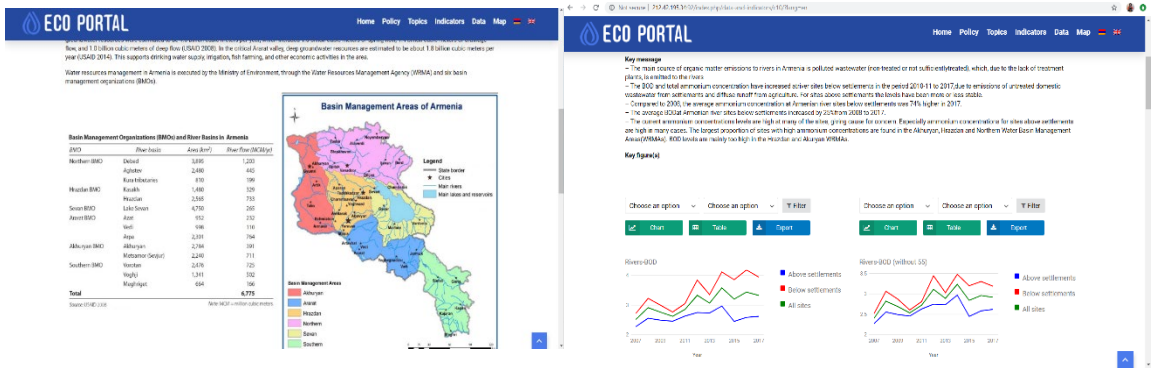
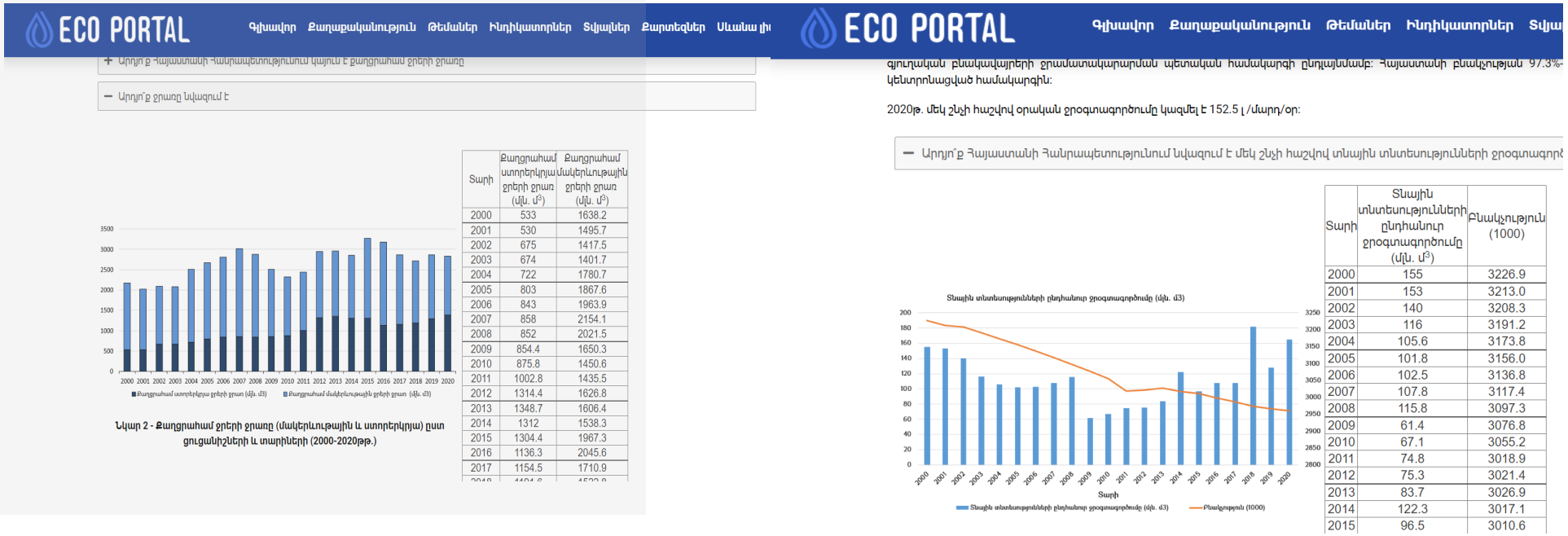
In the Republic of Armenia, EcoPortal-water component has been developed within the ENI SEIS II East project

- **The water related (C1, C2, C3, C4, C5, C10, C11) and Protected Areas (D1) indicators have been developed jointly by the European Environment Agency (EEA), European Topic Centres on Inland, Coastal and Marine waters and national experts from Armenia under the ENI SEIS II East project funded by the European Union and published on the EcoPortal.**
  http://212.42.195.34:92/index.php/data-and-indicators/?lang=en



- C1 for 2000-2020,
- C2 for 2000-2020,
- C3 for 2011-2020,
- C4 for 2000-2020,
- C5 for 2000-2017,
- C10 for 2000-2020,
- C11 for 2000-2020,
- D1 for 2000-2017



Տարի	Քաղցրահամ ստորերկրյա ջրերի ջրառ (մլն. մ³)	Քաղցրահամ մակերևութային ջրերի ջրառ (մլն. մ³)
2000	533	1638.2
2001	530	1495.7
2002	675	1417.5
2003	674	1401.7
2004	722	1780.7
2005	803	1867.6
2006	843	1963.9
2007	858	2154.1
2008	852	2021.5
2009	854.4	1650.3
2010	875.8	1450.6
2011	1002.8	1435.5
2012	1314.4	1626.8
2013	1348.7	1606.4
2014	1312	1538.3
2015	1304.4	1967.3
2016	1136.3	2045.6
2017	1154.5	1710.9

Տարի	Տնային տնտեսությունների ընդհանուր ջրօգտագործումը (մլն. մ³)	Բնակչություն (1000)
2000	155	3226.9
2001	153	3213.0
2002	140	3208.3
2003	116	3191.2
2004	105.6	3173.8
2005	101.8	3156.0
2006	102.5	3136.8
2007	107.8	3117.4
2008	115.8	3097.3
2009	61.4	3076.8
2010	67.1	3055.2
2011	74.8	3018.9
2012	75.3	3021.4
2013	83.7	3026.9
2014	122.3	3017.1
2015	96.5	3010.6

Development at country level to enhance digitalization & digital transformation related to environmental information including through the use of new technologies, big data, artificial intelligence & Earth observation for environmental monitoring.

- The data base the surface and groundwaters has been developed with the support of the EUSWI + project.
- Hydrometorological data collection and redistribution software developed, as well as IMS CLDB integrated climate database. System management software allows to collect data, compile it, create and distribute messages in accordance with WMO standards, as well as manage data and metadata.
- Earth observation capacity development activities and projects are implemented in Armenia (CLC-pilot ENI SEIS II EAST, SEVAMOD2, Copernicus assisted environmental monitoring across the Black Sea Basin – PONTOS and etc).

Projects in regard to environmental monitoring and data

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- EU4Sevan- EU and Federal Ministry for Economic Cooperation and Development (BMZ)- funded Project "Environmental Protection of Lake Sevan" 2020-2024
  - **Enhance the capacities of Water monitoring and management for the Lake Sevan, raise awareness about the significance of the protection of Lake Sevan among the basin communities, the private sector, and other stakeholders. In cooperation with UNDP, the project aims at further and sustainable improvement of Lake Sevan ecosystem governance in Armenia.**

- EU4Environmnet-Water resources and environmental data-2021-2024
  - **Support a more sustainable use of freshwater resources through improved water policies and practices**
  - **Extend and improve the use of sound environmental statistics by the partner countries, and ensure greater availability of policy-relevant data for decision-makers and citizens.**

- UNDP
  - **UNDP-GEF "Building Armenia's National Transparency Framework under Paris Agreement" project to be implemented under the Capacity Building Initiative for Transparency (CBIT). This will allow the country to track its progress against its commitments under the NDC and ensure national reporting under the Convention and the Paris Agreement.**

Remaining chalenges

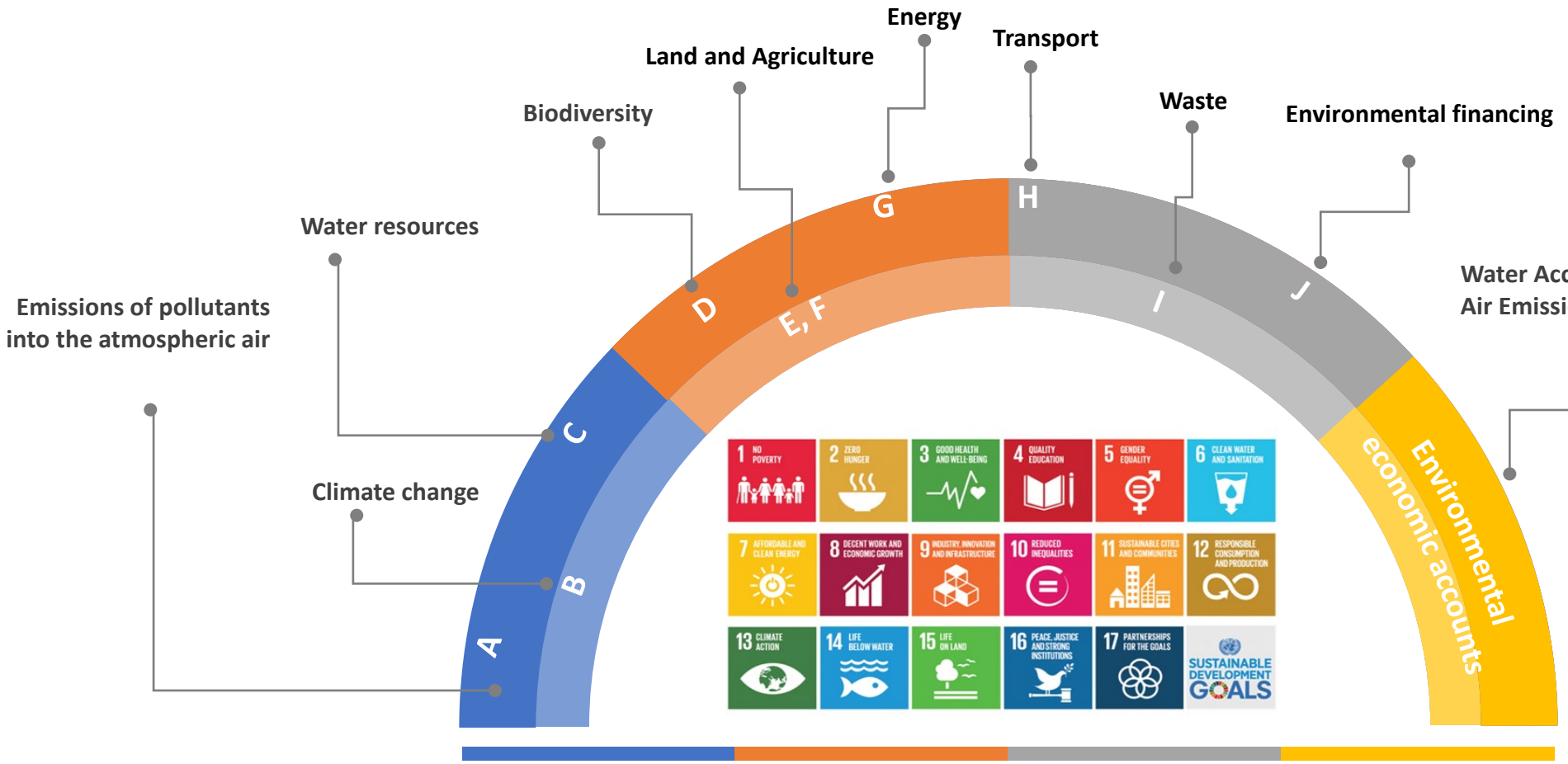
- Lack of geospatial initiative. At the moment, there is no central geoportal available, hence there is a need to develop a central and standard platform for the dissemination of environmental information with spatial data.
- Collaboration for the development of digitalisation. There is a need to assess 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.
- 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.
- 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.

Remaining chalenges

- Weak IT structure of territorial Government entities. Digitalisation of public administrations require trained staff, clear procedures, and technical standards to follow.
- To continue develop and upgrade the monitoring networks to have real-time and accurate data,
- To continue develop and use ecoportal for other indicators,
- Capacity building of the producing indicator based national state environment reports,
- To continue the use of CLC in the different sectors.
- To continue to establishment of SEIS in Armenia.

Aligning with UNECE Indicators

(36+7) assessed UNECE environmental indicators of Armenia (2021)



Mining of solid minerals

Twinning Partnership with the Statistical Committee of the Republic of Armenia for the Project Implementation within the World Bank's Implementation of the National Strategy Program for Strengthening of the National Statistical System

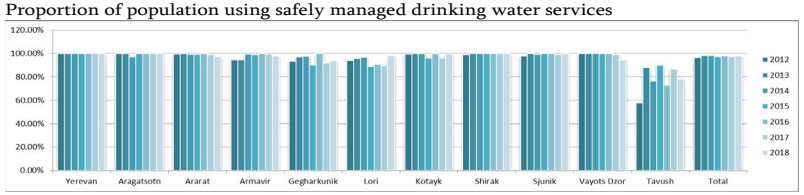
List of environmental indicators of quality of life

Target concept	Indicator
Impact of environmental hazards on human health:	
Environmental health	1. Mortality rate attributed to household and ambient air pollution 2. Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) 3. Mortality rate attributed to unintentional poisoning
Natural disasters impact	1. Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
Access to environmental services and amenities	
Intangible services and amenities	1. Terrestrial protected areas (% of total land area) 2. Forest area as a proportion of total land area
Objective services and amenities	1. Proportion of population using safely managed drinking water services 2. Exceedance of air quality standards in urban areas 3. Proportion of population using safely managed sanitation services 4. Green area per 100,000 inhabitants
Subjective services and amenities	1. Satisfaction with the quality of water supply 2. Satisfaction with the level of pollution 3. Satisfaction with the level of noise 4. Satisfaction with the quality of waste management 5. Satisfaction with the level of traffic 6. Satisfaction with the availability of green areas
Quality of the environment	1. Proportion of bodies of water with good ambient water quality 2. Level of water stress: freshwater withdrawal as a proportion of available freshwater resources 3. Annual mean levels of fine particulate matter in cities

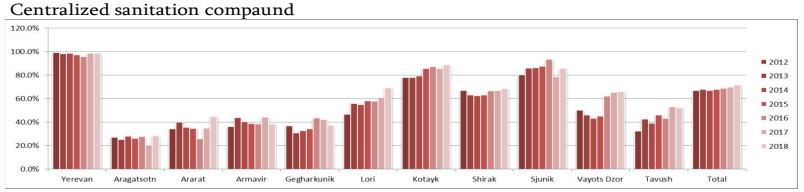
Basic Set of Environment Statistics (BSES) of the Framework for the Development of Environment Statistics (FDES 2013)

It follows the hierarchical structure of the FDES and serves as a tool to assess the national relevance, importance, availability and sources of the individual statistics contained in the BSES. It also helps to identify relevant quantitative and qualitative data gaps, and to develop a plan for filling them in with a view to strengthen environment statistics according to national priorities, needs and available resources.

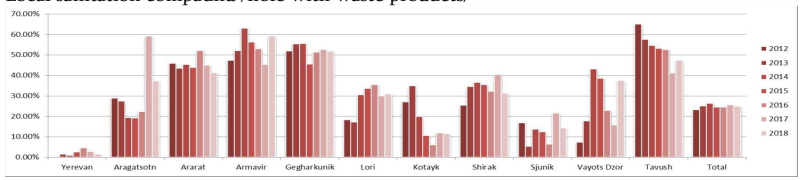
Proportion of population using safely managed drinking water services



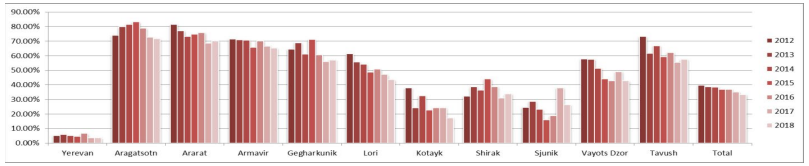
Proportion of population using safely managed sanitation services / Centralized sanitation compaund



Proportion of population using safely managed sanitation services / Local sanitation compaund /hole with waste products/



Proportion of population using safely managed sanitation services / Outside toilet

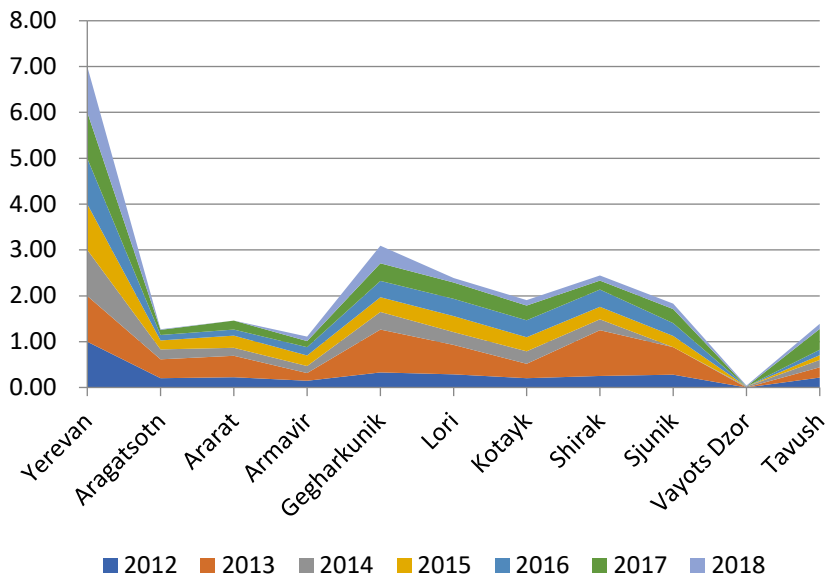


Factor Analysis / Normalization

2012	ind1	ind2	ind3	ind4	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12	ind13	ind14	ind15	ind16	ind17	Factor analysis_ CI	2012 Normalization
Yerevan	0.22	0.72	0.02	1	0	1	0.58	0.27	1	1	0.49	0.81	0.61	1	0.14	0.13	0.59	3.05	1.00
Aragatsotn	0	0.81	0	0.27	1	0.2	0.58	1	0.02	0.07	1	0.02	0	0.13	0.53	0.28	0.25	-0.34	0.21
Ararat	0.9	0.84	0	0.41	0	0.09	0.58	0.79	0.01	0.06	0.58	0.39	0	0	0.81	0.54	0.68	-0.26	0.22
Armavir	0	0.77	0.1	0.55	0	0.25	0.61	0.74	0.01	0.07	0.52	0.02	0	0	0.63	0.12	0.45	-0.60	0.15
Gegharkunik	0	0.85	0.22	0.07	0.19	0.4	0.62	0.73	0.01	0.08	0.65	1	0.07	0	0.94	0.56	1	0.19	0.33
Lori	1	1	0	0.2	0.19	0.11	0.62	0.58	0.03	0.09	0.67	0.07	0.18	0.33	0.49	0.05	0.78	0.01	0.29
Kotayk	0.92	0.71	0	0.49	0	0.14	0.58	0.35	0.02	0.14	0.5	0.16	0	0.15	0.37	0.17	0.51	-0.37	0.20
Shirak	0.47	0.87	0.42	0.25	0.18	0.27	0.58	0.4	0.02	0.16	0.66	0.02	0	0	1	1	0.83	-0.15	0.25
Sjunik	0	0.57	0	0.01	0	0.03	0.59	0.33	0.03	0.21	0.54	0.45	1	0.58	0.49	0.26	0.38	-0.02	0.28
Vayots Dzor	0	0.53	1	0.28	0	0.51	0.58	0.54	0.06	0.09	0.83	0.15	0	0	0.17	0.1	0.11	-1.22	0.00
Tavush	0	0.99	0.2	0.05	0	0.28	1	0.83	0.01	0.07	0.77	0.07	0	0.02	0.95	0.67	0.38	-0.29	0.22

Composite indicator by marzes (regions)

	2012	2013	2014	2015	2016	2017	2018
Yerevan	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Aragatsotn	0.21	0.41	0.22	0.20	0.12	0.11	0.01
Ararat	0.22	0.47	0.17	0.27	0.13	0.19	0.00
Armavir	0.15	0.17	0.15	0.23	0.18	0.13	0.09
Gegharkunik	0.33	0.93	0.38	0.32	0.36	0.38	0.38
Lori	0.29	0.64	0.28	0.35	0.38	0.36	0.10
Kotayk	0.20	0.32	0.27	0.30	0.37	0.32	0.12
Shirak	0.25	1.00	0.24	0.27	0.37	0.19	0.11
Sjunik	0.28	0.60	0.00	0.24	0.28	0.30	0.12
Vayots Dzor	0.00	0.00	0.02	0.00	0.00	0.00	0.02
Tavush	0.22	0.22	0.16	0.10	0.12	0.45	0.11



Production of environmental reports, analyses and assessments based on environmental information and indicators, including through the use of SEIS

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- National environmental reports, State of environment report
  http://env.am/storage/files/report2007-2011-arm.pdf
- Specialised reports – climate
  http://env.am/storage/files/bur-report-arm.pdf
- Specialised reports – air
  http://meteomonitoring.am/public/admin/ckfinder/userfiles/files/ampopag/Odi%20Obzor%202020.pdf
- Specialised reports - water
  http://meteomonitoring.am/public/admin/ckfinder/userfiles/files/ampopag/Water%20report%202019.pdf
- Specialised reports - biodiversity
  http://mnp.am/uploads/1/15840212196-N.REPORT-ARMENIA-revised-eng-05.03.2019.pdf
- National Statistical yearbooks
  https://www.armstat.am/en/?nid=586&year=2021
- Environment and Natural Resources in the Republic of Armenia for 2020 (Statistical publications)
  https://www.armstat.am/en/?nid=82&id=2420
- Environmental Statistics of Armenia for 2020 and Time-Series of Indicators for 2016-2020
  https://www.armstat.am/en/?nid=82&id=2422
- Reports on the state of the environment (Annual reports produced by Hydrometeorology and Monitoring Center SNCO)
  http://meteomonitoring.am/public/admin/ckfinder/userfiles/files/texekanq/tarekan/Annual-19.pdf
- Report on the results of Environmental monitoring (Quarterly reports produced by Hydrometeorology and Monitoring Center SNCO, which has been expanded essentially and included the results of meteorological conditions, climate change, forests, and hydrological monitoring)
  http://meteomonitoring.am/public/admin/ckfinder/userfiles/files/texekanq/eramsjak/II%20Eramsyak%202020.pdf

Main issues to be addressed and supported

- Compile environmental-economic accounts
- Complete and improve biodiversity register
- Support to maintain forest register
- Support to develop administrative land register
- Improvement of management of complete shared environmental information system
- Participation in development and improvement sustainable systems of sustainable development and green economy
- Regularly study the needs of information users, prepare new publications, etc.

Thank you!

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