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Progress in establishing a Shared Environmental Information System in Europe and Central Asia



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Foreword

The Environment for Europe process has – since 1991 – provided a framework for countries in the pan-European region to work together to improve environmental protection and to promote sustainable development throughout the region. In this context, Ministers of the Environment have continuously highlighted the importance of environmental information for policymaking and public awareness.

At the Astana Environment for Europe Conference in 2011, Ministers requested that a Shared Environmental Information System (SEIS) be developed to underpin a regular environment assessment process across the pan-European region. More recently, at the Batumi Environment for Europe Conference in 2016, Ministers welcomed progress in developing SEIS, but reiterated the need for countries to continue their efforts and to develop further their national information systems to have SEIS in place in the countries of Europe and Central Asia by 2021.

As an integral part of this process, the United Nations Economic Commission for Europe (ECE) Working Group on Environmental Monitoring and Assessment has been engaged in efforts to make environmental monitoring an effective instrument in policymaking and, in particular, to assist countries of Eastern and South-Eastern Europe, the Caucasus and Central Asia. In doing so, the Working Group has cooperated closely with the European Environment Agency and the United Nations Environment Programme – as the three organizations have agreed on a common approach to support national and regional reporting on the state of the environment – and other relevant partners.

ECE member States, with the support of the secretariat, have made significant progress in establishing SEIS, and there is a renewed and strengthened momentum for environmental monitoring and assessment following the Batumi Environment for Europe Conference and in the lead up to the next Ministerial Conference, expected in 2021. [To be developed]

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Introducing the Shared
Environmental Information
System

Introducing the Shared Environmental Information System

To assume that there is a positive correlation between better availability and access to information and better decision-making in all instances is misleading. However, the availability, timeliness and quality of relevant information will most often form a solid foundation for sound policymaking and provide factual evidence on whether policy is effective long-term. The availability of information also represents a strong tool against the degree of uncertainty surrounding many issues requiring governance, while also enhancing public participation and awareness if that information is made public and easily accessible. This is particularly true when it comes to the preservation and improvement of environmental conditions, the formulation of sound environmental policy at all levels of governance, the attainment of global targets such as the Sustainable Development Goals and sound state-of-the-environment reporting at the national level (Aggestam, 2019; Vardon et al, 2018).

It is with this rationale that, in 2008, the European Commission set up a policy instrument known as the Shared Environmental Information System (SEIS) (European Commission, 2008). This development was a clear response to the need for an integrated platform for the sharing of environmental data and experiences in developing knowledge-based environmental policy and a knowledge-based economy, making such data accessible to a vast array of users to increase environmental awareness and increasing the efficiency of environmental data production to inform decision-making. SEIS should facilitate regular environmental assessments and reporting. At its heart are existing data and information flows relevant at the country and the international levels. These flows should be linked with the support of modern technologies, such as the Internet, and shared between existing networks.

Since then, SEIS has not only expanded geographically in its scope, but it has also evolved into a multi-actor governance structure. A number of regional agencies and international organizations are operating and cooperating towards implementing SEIS: the European Environment Agency (EEA), the United Nations Economic Commission for Europe (ECE) and the United Nations Environment Programme (UNEP) have gradually undertaken leading roles in jointly implementing SEIS across the pan-European region, working closely with national authorities in making environmental data available, accessible and harmonized.

Principles, pillars and indicators of the Shared Environmental Information System

The goal of SEIS is to create an improved, decentralized system for the simplification, streamlining and modernization of existing environmental information gathering systems. Such system would improve the quality and facilitate the availability, accessibility and harmonization of environmental data. To meet this objective, the European Commission set out a list of seven principles underpinning the SEIS framework and operating mechanism (European Commission, 2008).

According to such principles, information relating to the environment should be:

- Managed as close as possible to its source
- Collected once and shared with others for many purposes
- Readily available to easily fulfil reporting obligations
- Easily accessible to all users
- Accessible to enable comparisons at the appropriate geographical scale and the participation of citizens
- Fully available to the general public and at national level in the relevant national language(s)
- Supported through common, free, open software standards.

SEIS is thus based on three particular aspects of data quality: accessibility, interpretability and coherence of data.¹ Accessibility relates to the degree of ease with which different users may have access to particular data and the sustainability of the means through which information is made available (Vardon et al. 2018: 84). SEIS aims to move away from paper-based reporting and take full advantage of the latest Information and communication technologies to provide a common platform for data derived from different sources, enabling harmonization, multi-purpose use and compatibility. Interpretability requires the availability of information that will help provide insights into the data collected. Finally, coherence refers to the consistency in data collection, production and release and the comparability of data to broader analytical frameworks (Vardon et al, 2018: 84). Based on these combined aspects, SEIS provides a powerful tool to improve data monitoring and sharing to provide better state-of-the-environment reports and sounder policy for the environment.

SEIS is a set of principles, operationalized as a distributed environmental information system that is connected and integrated with the help of modern technologies. Reinforcing and building upon the SEIS principles, EEA established three pillars defining the core elements needed for effective and functional SEIS (EEA, 2008). These pillars are content, infrastructure and cooperation. Content refers to the type of content required and the identification of potential sources to acquire such content. It also comprises information necessary to understand the changes in the state of the environment as per specific thematic areas (e.g. air, water, waste) and the interlinks between them (as tackled also under the multilateral environmental agreements). Such data are available from various institutions at various levels and are crucial in terms of policymaking, but also awareness-raising. They need to follow agreed, common format requirements, at least for these data and information constituting international flows.

The SEIS pillar of infrastructure refers to an “effective, web-enabled technical infrastructure”, taking full advantage of the pioneering information and communication technologies, including web services, to provide easy access to a wide range of environmental information and data flows so that it could be accessed by users, including experts, who could analyse the information and share it for further use.

The last pillar, cooperation, indicates the need for positive interaction between relevant actors at the various levels in the country and the designation of governance structures to manage human resources, inputs and networking. This pillar includes issues such as: development or amendment of the legal framework and data policy agreements and protocols to enable data exchange, cooperation and coordination while ensuring trust building and confidence between various data providers and between them and users.

SEIS operates based on data flows belonging to particular environmental indicators compliant with international standards. In collaboration with EEA, the ECE Working Group on Environmental Monitoring and Assessment agreed in 2007 upon a set of environmental indicators and their guidelines for application, eventually falling under 10 environmental thematic areas and comprising 49 indicators. The indicators aim at providing up-to-date data flows relating to the state of the environment, to inform policymaking and provide a basis for the evaluation of policy implementation across the pan-European region.² Environmental indicators have an important role in allowing countries and the international community to make better choices to preserve the environment and grow economically in a sustainable way. Improving

¹ Various data quality frameworks produced by international statistical agencies, such as Eurostat, identify a range of principles for data quality including, relevance, accuracy, timeliness, accessibility, interpretability and coherence (Vardon et al., 2018: 84)

² ECE, 2019. Indicators and reporting. <https://www.unece.org/environmental-policy/environmental-monitoring-and-assessment/areas-of-work/enveuropemonitoringandr-en/glossary-of-terms-on-environmental-indicators.html>

data quality for environmental information is crucial to allow countries to meet their reporting duties and abide by their international commitments, as well as raising public participation in environmental decision-making and awareness of the environmental conditions at the local and national levels.

The governance of SEIS is trans-scalar in nature and involves a high degree of cooperation between international organizations, regional agencies, member States, national environmental authorities and other relevant stakeholders.

Chapter I below provides a picture of the multi-actor governance of SEIS and its functioning. It provides an overview of the structure of governance, with a description of each actor presently involved in the governance of SEIS, their particular responsibilities and activities in relation to SEIS and how these have evolved over time. Through such descriptions, it highlights the milestones since 2008 in the establishment and implementation of SEIS, framing how each actor has increased its role and how cooperation between all actors has increased over time since 2008 towards the common goal of implementing SEIS at the pan-European level.

Chapter II examines briefly all major events and developments related to SEIS implementation. It presents the summary of results and gaps identified in the first progress report on the establishment of SEIS (2016). Also, Chapter II offers an analysis of the mid-term review (2019) from a pillar and regional perspective, including the SEIS assessment framework.

Chapter III provides a detailed analysis of the implementation of SEIS, environmental policies and capacity-building activities in Central Asia. The second part of the Chapter III deals with European Union projects – ENPI-SEIS and ENI SEIS II East – in the Eastern Partnership countries.

Chapter IV proposes recommendations on how to strengthen and improve countries' capacities for production, sharing and use of the ECE environmental indicators in Eastern Europe, the Caucasus and Central Asia.



Chapter I

Governing the Shared Environmental Information System

Chapter I.

Governing the Shared Environmental Information System

A. European Commission

SEIS was initiated by the European Commission with a communication in 2008. Since inception, the European Commission envisioned SEIS as a collaborative initiative and designated several agencies to implement it, including EEA and its European Information and Observation Network (Eionet).

European Environment Agency

EEA is an agency of the European Union, established through a regulation adopted by the European Union in 1990, with the mandate of helping “the Community and member and cooperating countries make informed decisions about improving the environment, integrating environmental considerations into economic policies and moving towards sustainability”.³

EEA coordinates Eionet, a partnership network of EEA with its 33 member countries and six cooperating countries in South-Eastern Europe. Through Eionet, EEA works with designated national focal points, usually based in national environmental agencies and ministries, which bring together the bodies involved in producing environmental information.⁴

EEA has been one of the leading proponents and major operators of SEIS since the beginning. It has taken a leading role in laying out the core components of a functioning SEIS, namely the three pillars: content, infrastructure and cooperation.⁵

Since 2008, EEA has also undertaken visits in over 50 countries, including its member countries, cooperating countries and neighbouring countries, aiming to inform national authorities of the benefits of data-based environmental policy and SEIS, encouraging implementation, monitoring progress and identifying the existence of SEIS-compliant initiatives at the regional and national levels.⁶ EEA has led the projects supporting the implementation of SEIS principles funded by the European Union’s European neighbourhood instrument (ENI-SEIS) since 2011, paying visits to the European Neighbourhood countries.⁷ To assist countries in the implementation of SEIS, EEA commissioned the “SEIS Cookbook”, a practical guide for understanding and implementing SEIS (EEA, 2015a).

Over the past decade EEA has been leading other SEIS-compliant initiatives. One example is the SENSE project, which began in 2010 and was renewed for a second phase in 2012, setting up an automated, decentralized, online process for environmental data sharing and for countries to report on their state-of-the-environment information. SENSE is therefore a practical implementation of SEIS.

³ EEA, 2018. Who we are. <https://www.eea.europa.eu/about-us/who/who-we-are>

⁴ EEA, 2019. About Eionet. <https://www.eea.europa.eu/about-us/countries-and-eionet/intro>

⁵ EEA, 2016. SEIS initiatives. <https://www.eea.europa.eu/about-us/what/seis-initiatives/seis-initiatives>

⁶ Ibid.

⁷ Countries included in the European Union’s European Neighbourhood are Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Republic of Moldova, Syria, Tunisia and Ukraine.

Over the years, EEA has cooperated closely with the United Nations system, including ECE and UNEP, to bring SEIS implementation forward.

B. United Nations Economic Commission for Europe

ECE has had an increasing role in the governance and practical implementation of SEIS across the pan-European region through several of its processes, tools and bodies dedicated to environmental policy and more specifically environmental monitoring and assessment. These include the Committee of Environmental Policy, the Environment for Europe Ministerial process, the Working Group on Environmental Monitoring and Assessment, the Joint Task Force on Environmental Statistics and Indicators and the use of ECE environmental indicators in the harmonization of environmental data across the ECE region, all of which are briefly outlined below.

1. Committee on Environmental Policy

The Committee on Environmental Policy was established by ECE in 1994 and focuses on promoting sustainable management of environmental resources and contributes towards the improvements in the environment conditions in the ECE region. The Committee acts as a cooperation forum on matters relating to the environment across the ECE region. One of the stated mandates of the Committee is to “strengthen environmental information and observation capacity, particularly in countries of Eastern Europe, Caucasus and Central Asia and South-Eastern Europe, in order to provide reliable and relevant information on the state of the environment as a basis for improved policymaking and public awareness, and use indicators to assess progress as appropriate” (ECE/CEP/2017/5, annex). The Committee has established a variety of bodies that have taken a leading role in the governance of SEIS across the region. In 2000, the Committee formed an ad hoc working group on environmental monitoring, later renamed the Working Group on Environmental Monitoring and Assessment. In 2009, the Committee on Environmental Policy and the Conference of European Statisticians established the Joint Task Force on Environmental and Indicators, later renamed the Joint Task Force on Environmental Statistics and Indicators. At its nineteenth session (22–25 October 2013), the Committee on Environmental Policy set up temporarily the Group of Friends of SEIS, a coordinating mechanism for the development of SEIS across the ECE region.

2. Environment for Europe Ministerial process

The Environment for Europe Ministerial process involves a wide range of state and non-state stakeholders, including ECE member States, United Nations organizations in the region, other intergovernmental organizations, regional environmental centres, non-governmental organizations, the private sector and other relevant stakeholders. The Ministerial Conferences of the Environment for Europe process provide the main platform for stakeholders to discuss, decide upon and cooperate on environmental matters relevant to the ECE region and the sustainable development of its member States. The Environment for Europe process began with the First Ministerial Conference in Czechoslovakia in 1991 and, since the initiation of SEIS in 2008, it has also served as a crucial platform for stakeholders to agree upon the implementation of SEIS across the pan-European region and provided an opportunity to monitor progress.

The need for environmental monitoring and state-of-the-environment reporting has been a central topic of discussion at Environment for Europe Ministerial Conferences. In the Declaration of the Fifth Environment for Europe Ministerial Conference, held in Kiev in 2003, Ministers recognized the importance of ECE efforts in strengthening environmental information and observation capacities across the region (ECE/CEP/94/Rev.1). At the following Conference held in Belgrade in 2007, the Ministers stressed “the need to further improve the indicator-based environmental assessments and reporting in the region” and invited ECE “to continue its efforts, in cooperation with EEA and other partners, to make monitoring an effective instrument in environmental policymaking in countries of

Eastern Europe, Caucasus and Central Asia and South-Eastern Europe”
(ECE/BELGRADE.CONF/2007/8).

All these declarations built towards one of the milestones of SEIS implementation, at the Seventh Environment for Europe Ministerial Conference in Astana in 2011. For the Conference, EEA produced an assessment report of national environmental assessment reports across the region, in cooperation with countries, regional environmental centres and other stakeholders. The report (EEA, 2011) highlighted the need for a system to address multiple needs, for example necessary capacity building or further assessment of assessments, and for a policy process from national to pan-European levels (EEA, 2011: 151). Following the report, Ministers established the goal of developing SEIS across the pan-European region as a system for regular and integrated environmental assessment to keep the pan-European environment under review (ECE/ASTANA.CONF/2011/2/Add.1). At the Eighth Ministerial Conference in Batumi, Georgia, and having reviewed progress in establishing SEIS, Ministers took an extra step in strengthening SEIS implementation by setting a 2021 goal for the full implementation of SEIS across Europe and Central Asia (ECE/BATUMI.CONF/2016/2/Add.1).

3. Working Group on Environmental Monitoring and Assessment

The Working Group on Environmental Monitoring and Assessment was initially set up as a platform for ECE countries to exchange information and good practice and strengthen cooperation across the region within initiatives relating to environmental monitoring and assessment. It is composed of members from national institutions engaged and responsible for environmental monitoring. In 2007, the Committee on Environmental Policy mandated the Working Group with assisting countries of Eastern Europe, the Caucasus and Central Asia, as well as interested countries from South-Eastern Europe, to improve environmental reporting in order to make monitoring an effective tool for sound environmental decision-making (ECE/CEP/148, annex III).

In 2014, the Committee on Environmental Policy expanded mandate of the Working Group to review progress in developing the Shared Environmental Information System (SEIS) based on targets (ECE/CEP/2014/2) and performance indicators (ECE/CEP/2014/8). Since then, the Working Group has focused on providing technical assistance to countries and monitoring the progress in the establishment of SEIS across the region. Between 2015 and 2016, with support from UNEP, the Working Group prepared its first progress report on SEIS implementation in support of environmental reporting in the pan-European region, and the European regional assessment within the Sixth Global Environmental Outlook of UNEP. Subsequently, in 2017 and 2018, the Working Group prepared a mid-term review report on the establishment of SEIS in Europe and Central Asia.

4. Joint Task Force on Environmental Statistics and Indicators

The Committee on Environmental Policy set up the Joint Task Force on Environmental Statistics and Indicators with the objective of creating a body charged specifically with improving environmental statistics and the production of ECE environmental indicators, agreed upon by countries of Eastern Europe, the Caucasus, Central Asia, and interested countries in South-Eastern Europe.

The Joint Task Force was set up specifically to assist the Working Group and its target countries with the indicators used for assessment. It is thus largely involved in supporting the implementation of SEIS by assisting national statistical agencies and institutions responsible for environmental data and information to improve the collection, processing and validation of environmental data underpinning the environmental indicators, in line with internationally-accepted methodologies and statistical classifications.

5. The Group of Friends of the Shared Environmental Information System

The Group of Friends of SEIS was established with the aim of forming a coordinating mechanism for the development of SEIS across the ECE region (ECE/CEP/2013/2), in order to strengthen the work of the Committee on Environmental Policy at the political level and the work of the Working Group at the technical level in developing of SEIS. The Group of Friends was composed of experts generally coming from national environmental authorities in the ECE region.

The focus of the Group of Friends lay, firstly, on the preparation of clear targets and performance indicators to monitor and evaluate the development of SEIS in region, and secondly, on shaping a regular environmental assessment process including SEIS. In 2014, therefore, the Group of Friends made a proposal for targets and performance indicators aiming to facilitate the monitoring and operation of SEIS, overseen by the Working Group. These targets and performance indicators (ECE/CEP/2014/8) were adopted by the Committee on Environmental Policy at its twentieth session (28–31 October 2014). The Group of Friends also submitted a proposal to the Committee on Environmental Policy in 2015 for the setting up of the regular environmental assessment process (ECE/CEP/2015/10). The document was drafted with support from the ECE secretariat, UNEP and EEA.

C. United Nations Environment Programme

UNEP has supported a variety of processes concerning SEIS since its inception, collaborating with EEA and ECE in the development of environmental indicators and the practical implementation of SEIS across the pan-European region. In particular, UNEP has been a central actor in the development of an online reporting tool for SEIS.

1. Environment Live platform

One of the most important contributions of UNEP to the governance of SEIS is the development of the environmental reporting tool on its “Environment Live” platform. Environment Live is an online platform available to countries to share data and knowledge to keep the environment under review. The platform harvests data from national designated authorities’ websites and makes it accessible and available on one platform.⁸ The platform was launched in 2014 and, in 2015, it was designated by the Committee on Environmental Policy to serve as the main platform at the pan-European level, linking with national platforms to provide centralized access to the knowledge base, including assessments, the data and information regularly published by countries (ECE/CEP/2015/10).

2. Regional assessment and Pan-European Sixth Global Environment Outlook

UNEP is also the leading authority carrying out global assessment reports providing an integrated analysis of the social, economic, political and environmental trends shaping the state of the environment at the global level. These reports are meant to inform policymakers and world leaders in making sound decisions to address environmental challenges.⁹ The Sixth Global Environment Outlook published in 2019, included a regional assessment for the pan-European region, issued already in 2016 for the Eighth Environment for Europe Ministerial Conference. The pan-European assessment drew largely from the work of ECE, UNEP and EEA on SEIS implementation in the region. This showed that SEIS could provide a powerful tool for feeding global state-of-the-environment assessments and inform environmental policy at the global level.

⁸ UNEP, 2019. Environment live. <https://environmentlive.unep.org/>

⁹ UNEP, 2019. Global Assessments. <https://www.unenvironment.org/global-environment-outlook/why-global-environment-outlook-matters/global>

Chapter II.

Reviewing implementation of the Shared Environmental Information System

A. Overview of Shared Environmental Information System implementation

The period since the launch of SEIS by the European Commission in 2008 has witnessed a continuous improvement of environmental monitoring and data sharing (European Commission, 2008). Several crucial developments have occurred with regards to SEIS and its expansion beyond the European Union. At the same time, the organization of a vast array of environmental data and information and their integration with economic and social data remain challenging tasks. Even more challenging is to make this information and data available for analysis to produce further recommendations for decision makers and the public or for the purposes of national reporting. Recognizing these challenges, the international community has facilitated the discussion and the sharing of experience between the various countries on the management and use of environmental information throughout the pan-European region.

A major development that expanded the scope of SEIS beyond the European Union occurred at the Seventh Environment for Europe Ministerial Conference in Astana in 2011, when the ministers of environment from pan-European region decided to establish a regular process of environmental assessment and develop SEIS across the region to keep the pan-European environment under review. Ministers emphasized that SEIS should serve multiple policy purposes, taking into account the needs of the multilateral environmental agreements, and that the work on SEIS and its development should include support and capacity-building for countries in Eastern and South-Eastern Europe, the Caucasus and Central Asia. Therefore, they invited EEA in cooperation with its partners to develop an outline for SEIS activities and implement them under the auspices of the Committee on Environmental Policy. Furthermore, Ministers requested the Committee to convene a mid-term review in 2013 to assess progress of the implementation of the Astana Conference outcomes to be reported at the next Environment for Europe conference.

At its nineteenth session, in 2013, the Committee on Environmental Policy carried out the mid-term review of the Astana Conference outcomes. EEA presented its review of SEIS-related developments with an impact on environmental assessment and reporting since the Conference (ECE/CEP/2013/18).

B. First progress report on the establishment of the Shared Environmental Information System

At its twentieth session, in 2014, the Committee on Environmental Policy mandated the Working Group on Environmental Monitoring and Assessment to review progress made by pan-European countries in developing SEIS. The Committee requested that the progress be reviewed against the agreed targets and performance indicators and noted that the review should serve as a basis to prepare an evaluation report on SEIS development for the Eighth Environment for Europe Ministerial Conference.

At its sixteenth session (16–17 April 2015), the Working Group on Environmental Monitoring and Assessment agreed that the data and information included in the first progress report on the establishment of SEIS should allow the measurement of progress towards agreed global and regional priorities and, as relevant, with global and regional multilateral environmental agreements. It also

agreed on a first development milestone: 67 specific data flows that every country in the pan-European region should aim to make available and accessible online during 2015.

The themes covered were:

- Air pollution, air quality and ozone depletion (3 indicators, 25 data flows)
- Climate change (3 indicators, 4 data flows)
- Water (16 indicators, 20 data flows)
- Biodiversity (4 indicators, 2 placeholders, 4 data flows)
- Land and soil (2 indicators, 2 data flows)
- Energy (4 indicators, 2 placeholders, 4 data flows)
- Waste (4 indicators, 8 data flows).

The remaining six ECE environmental indicators relating to agriculture, transport and environmental expenditures (see annex) were not included in the assessment.

Each data flow was to be accompanied by information explaining the data production methodology and how the data should be interpreted. It should also be up to date for the latest production period and indicate sources of additional information.

In 2016, at the Eighth Environment for Europe Ministerial Conference, the progress report on SEIS implementation in the pan-European region was presented (ECE/BATUMI.CONF/2016/8). The report was based on an analysis of the availability and harmonization of environmental data in the ECE member States. Progress was analysed following five criteria: online accessibility, update regularity, production methodology, data interpretation and use, and data sources. Results were given ultimately in the form of an aggregated performance score, indicating the overall progress in implementing SEIS in each country of the region.

Overall, the report produced positive results as it showed that the building momentum in the implementation of SEIS across the region was indeed beneficial on the capacity of countries to provide environmental information, meeting their reporting obligations, and increasing public accessibility. Relating to this latter, the report concluded that 32 out of the 50 countries had increased the online accessibility of their data flows since the beginning of the process in 2015. These results highlighted the great potential of SEIS as a policy instrument in incrementing pan-European cooperation to set up a shared framework for environmental data collection.

However, the first progress report outlined many challenges to the implementation of SEIS by 2021, among which was the incomplete participation of all countries in the pan-European region. Further, since the available resources were limited, the assessment was able to take into account neither internationally accepted standards for data set production nor data quality. Therefore, it was suggested that these shortcomings should be rectified in the next review round.

Another challenge outlined by the first progress report was that continued efforts were needed to measure progress in establishing SEIS. The following assessment would therefore benefit from an adequate review of all three SEIS pillars — cooperation, content and infrastructure — and the expansion of the review criteria when assessing its establishment in order to enhance data quality for environmental reporting.

Despite these limitations, the first assessment constituted a baseline for future reviews. It underlined gaps such as the necessity to achieve or maintain high levels of SEIS performance through continuous and regular data production, the publishing of environmental information online and greater cooperation between environmental authorities and national statistical agencies. In this

way, international organizations such as ECE, UNEP and EEA could further support regular reviews with greater coordination. Data accessibility could be also enhanced in the reporting mechanism through an assessment of data quality and national barriers. In parallel to this, a follow-up exercise could review the comparability of data sets across ECE countries and contribute to the production of a framework for internationally-comparable statistics on the environment linked to the economy.

C. Mid-term Review Report on the establishment of the Shared Environmental Information System

The first SEIS progress report identified some gaps and a continuous need for assistance to achieve the production and sharing of the ECE environmental indicators and associated data flows. Therefore, at the Eighth Environment for Europe Ministerial Conference (Batumi, Georgia, 8–10 June 2016), ministers invited countries to develop their national information systems to have the Shared Environmental Information System in place by 2021 (ECE/BATUMI.CONF/2016/2/Add.1, para. 10). They also invited the Committee on Environmental Policy to convene in 2018 a mid-term review to assess progress in the implementation of the Batumi Conference's main outcomes (ibid., para. 16). At its twenty-third session, in 2018, the Committee agreed the modalities of the mid-term review of the Batumi Conference's main outcomes, including a template for mid-term reports.

Prior to the submission of the mid-term review, a SEIS assessment framework was developed and further piloted by the Working Group at its nineteenth session (27–28 June 2017). The template (eventually produced as ECE/CEP/AC.10/2018/5) was developed over an extended period.

The Working Group presented its mid-term review report to the Committee on Environmental Policy at its twenty-fourth session (29–31 January 2019). The report (ECE/CEP/2019/7) focused on the progress made since the decision taken in 2016 to establish SEIS by 2021. The review highlighted considerable progress in the implementation of SEIS at the regional level in harmonizing data and increasing accessibility online, although the review suffered from the lack of participation by some countries in the region.

The mid-term review report provided a more holistic and complete picture of data sharing and access, data practices and quality and information infrastructure than the 2016 report. The newer report described the assessment framework, the method of data collection and re-examined the SEIS pillars. The report focused mainly on the introduced quality component and on a limited number of indicators and underpinning data flows. However, it also revealed limitations in using certain data flows for multiple purposes and that only some countries explicitly used the indicators for environmental policymaking, for example, tracking progress towards policy targets and reporting on implementation of the Sustainable Development Goals. It was agreed that, if the revised review criteria and SEIS reporting tool proves to be effective during the trial of the mid-term review reporting exercise, then in a next step the number of environmental indicators and underpinning datasets to be implemented by countries would be gradually increased during the planned regular reporting exercise by using the SEIS assessment framework.

1. Shared Environmental Information System assessment framework

To support the development of SEIS across the pan-European region the Committee on Environmental Policy at its nineteenth session, in 2013, established a Group of Friends of SEIS, that was entrusted to deal with two issues: prepare clear targets and performance indicators to monitor and evaluate the development of SEIS in the pan-European region and to answer the question on how to organize and shape the regular environmental assessment process, taking into consideration the benefits of SEIS.

Pursuant to the mandate given by the Committee on Environmental Policy, the Group of Friends of SEIS during their first meeting in Geneva on 12 May 2014 agreed on a framework with a view to support each country to measure progress in the development of its national SEIS and with support of the ECE secretariat, UNEP and EEA elaborated the proposal for the organization and shape of the regular environmental assessment process. The framework is designed to meet the national needs as well as to comply with international commitments made by the country, including under the multilateral environmental agreements. As an approach to link relevant data and information in support of integrated assessments, SEIS makes agreed data and information easily available and accessible online.

At its twentieth session, in 2014, the Committee on Environmental Policy adopted the targets and performance indicators elaborated by the Friends of SEIS and mandated the Working Group on Environmental Monitoring and Assessment to review the progress in developing SEIS based on those targets and performance indicators, with a view to preparing an evaluation report on progress made since Seventh Environment for Europe Conference in developing SEIS in the pan-European region for the Batumi Environment for Europe Ministerial Conference in 2016.

Following upon the first progress report, the Working Group at its eighteenth session (28–29 June 2016) agreed that the secretariat will revise the review criteria and integrate a quality component as part of the assessment framework. The purpose of that continuing review of the assessment framework was to utilize the revised assessment framework in the preparation of the mid-term review that would be submitted to the Committee on Environmental Policy.

At its nineteenth session, in 2017, the Working Group examined the results of the review of the assessment framework and agreed to pilot the assessment framework and its associated reporting application before moving on to data collection for the mid-term assessment. The assessment framework further was revised in the light of comments received during the fifteenth session of the Joint Task Force on Environmental Statistics and Indicators (25–26 October 2018) and a technical workshop between ECE, EEA and UNEP (6–7 December 2018).

As part of the assessment framework the Working Group together with ECE, UNEP and EEA developed a self-assessment questionnaire (ECE/CEP/AC.10/2019/5, table 2). The questionnaire comprises 25 questions in 7 categories (review criteria): relevance, accuracy, timeliness and punctuality, accessibility, clarity, comparability and institutional and organizational arrangements (the categories are described in table 1). These categories follow the three building blocks of SEIS (three SEIS pillars) – content, cooperation and infrastructure.

The assessment framework questionnaire was made available as an online reporting tool¹⁰ and as a Microsoft Excel workbook. These two reporting tools provided the basis to pilot the reporting across the pan-European region and for conducting the mid-term review of progress in establishing SEIS. The questionnaire was specific to the data flow underlying the environmental indicator that it targets and has to be answered once for each separate data flow. Replies to 15 of the 25 questions contained in the questionnaire were mandatory. Other questions were optional, but countries were encouraged to answer all questions. A performance score was calculated based on the answers to the mandatory questions. Some questions contained a follow-up request for further information, depending on the response. For the pilot reporting exercise, the calculation of a national performance score serves as information for countries only as part of their self-assessment. Countries were invited to provide feedback on the proposed scoring of questions and calculation of

¹⁰ UNEP, 2019. Shared Environmental Information System. <https://environmentlive.unep.org/seis>

a national performance score. The assessment framework was developed further after the mid-term review in preparation for the final review of progress at the Ninth Environment for Europe Ministerial Conference (see box).

Table 1. Categories for review

Category	Description
Relevance	The degree to which the information meets the real or perceived needs of users (e.g., in terms of coverage, content and detail)
Accuracy	The degree to which the information correctly describes the phenomena it was intended to measure
Timeliness and punctuality	Timeliness describes the length of time between data availability and the event or phenomenon they describe Punctuality describes the time lag between the actual delivery of the data and the target date when it should have been delivered.
Accessibility	The ease with which users are able to access at any time the data and its supporting information online
Clarity	The degree to which information is presented in a clear and understandable form and released in a suitable and convenient manner, with supporting metadata and guidance
Comparability	The extent to which differences between statistics can be attributed to differences between the true values of the statistical characteristic, or to methodological differences. Comparability includes: (a) comparability over time — the extent to which data from different points in time can be compared; (b) comparability through space — the extent to which data from different countries and/or regions can be compared (the application of international standards is particularly important here); and (c) comparability between domains — the extent to which data from different statistical domains can be compared
Institutional and organizational arrangements	The degree to which institutional and organizational arrangements are in place to ensure regular production and sharing of environmental indicators, data and information

Revised assessment framework of the Shared Environmental Information System

In order to report to the Ninth Environment for Europe Ministerial Conference on progress in the establishment of SEIS in line with the Astana and Batumi Conference mandates, the assessment framework has been further reviewed and revised with the aim to support countries in establishing the System and developing a mechanism capable of monitoring countries' performance.

At its twenty-first session, the Working Group on Environmental Monitoring and Assessment decided that pillar-based performance score option would be included in the assessment framework for use in the final review of progress in establishing SEIS in Europe and Central Asia. Another prominent change made to the assessment framework is the introduction of levelling which means that the questions in the assessment framework will be asked at three different levels, namely the macro, thematic and data flow levels (ECE/CEP/AC.10/2019/5, table 2). Macro level questions would only be asked once for a country, the thematic question would be asked for each theme (e.g., climate change and biodiversity) and the data flow questions would be asked for each data flow.

It was further agreed that the online reporting tool would be used as the primary tool for data collection for the final review of progress and should be finalized for the sixteenth session of the Joint Task Force (28–29 October 2019). It will act as a data interface by providing a link to the data, an online assessment framework to be completed by the countries, a scoring mechanism and ultimately evaluate to what extent SEIS is being established in the pan-European region and allow subregional comparisons in support of a regular process of environmental assessment, as well as an overall assessment of regional performance towards the implementation of SEIS principles.

2. Data collection for the mid-term review report

The mid-term assessment was carried out against seven data flows underlying three of the ECE environmental indicators (see table 2). The full set of ECE environmental indicators are included in annex.

Table 2. Selected data flows

Theme	Indicator	Data flow
A. Air pollution and ozone depletion	<i>A2. Ambient air quality in urban areas</i>	Annual average concentration of particulate matter with a diameter of 10 micrometres or less (PM ₁₀) – validated
		Annual average concentration of sulphur dioxide – validated
		Annual average concentration of nitrogen dioxide – validated
		Annual average concentration of ground-level ozone – validated
C. Water	<i>C10. BOD and concentration of ammonium in rivers</i>	Mean concentration of five-day biochemical oxygen demand (BOD ₅) in major rivers
		Mean concentration of ammonium in major rivers
D. Biodiversity	<i>D1. Protected areas</i>	Total protected areas (by International Union for Conservation of Nature categories)

Data collection, based on the self-assessment questionnaire, and data analysis for the mid-term review report was conducted in the period from March–June 2018. Self-assessments were submitted by 34 of the 53 ECE member States in Europe and Central Asia: Albania, Armenia, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Estonia, Finland, France, Germany, Georgia, Hungary, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Montenegro, North Macedonia, Poland, Republic of Moldova, Romania, Russian Federation, Serbia, Slovakia, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan. All member States with economies in transition submitted self-assessments.

EEA pre-filled the self-assessment questionnaire for its 33 members and 5 cooperating countries in South-Eastern Europe; for EEA members that did not submit a self-assessment, the default values were used for the review at the suggestion of the Agency.

Countries were invited to report on other data flows underpinning the ECE set of environmental indicators, in addition to the seven listed, but none did so. They were also invited to review the assessment framework, test an online reporting tool and provide suggestions for improvement of the framework and tool. Several countries did so, and their comments were later used to refine the two instruments.

Of the 34 countries that responded, 30 submitted results for all seven data flows and answered all 15 mandatory questions. Four countries (Kyrgyzstan, Poland, Tajikistan and Ukraine) did not answer some of the mandatory questions for one or two data flows. Of the countries that responded, 19 answered all 10 non-mandatory questions for at least one data set: Albania, Belgium, Bulgaria, Croatia, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Poland, Republic of Moldova, Romania, Russian Federation, Sweden, Switzerland, Turkmenistan and Ukraine.

Piloting the assessment framework in preparing the mid-term review report was a significant step forward in assessing the establishment of SEIS. The mid-term review report was thus a milestone in reviewing SEIS, particularly as the assessment framework considers all three pillars of SEIS in contrast to the earlier assessment. Nevertheless, due to the limited scope of the progress report, it was not yet possible to determine whether countries are fully on track to establish SEIS by 2021.

Moreover, despite a clear upward trend since 2016, further steps to achieve higher participation were needed. The purpose of a regular self-assessment would be to encourage countries to implement measures that address gaps in the establishment of the System over time.

3. Pillars of the Shared Environmental Information System

All three pillars – common content, infrastructure and cooperation were considered within the mid-term review report to account for the entire data value chain. The overview and main achievements by pillar presented below are based on the outcomes of the mid-term review report in the establishment of the Shared Environmental Information System (ECE/CEP/2019/7) and a series of country factsheets on the status of implementation of SEIS in 2018.

Content

For the SEIS pillar of content, countries were invited to answer several questions mainly under the categories of relevance, accuracy, accessibility, timeliness and punctuality, clarity and comparability. The results set out below are based on the 30 submissions for the mandatory questions that were grouped under the SEIS pillar content and for each data flow.

In the category of relevance, in 95 per cent of cases countries specified that data flows were used for multiple purposes (see **Figure 1**), including, among others, for reporting under European Union

directives, ECE multilateral environmental agreements, provision of data for the European Air Quality Portal, EEA and Eurostat environmental indicators, production of national state-of-the-environment reports, policymaking at the national level and public information.

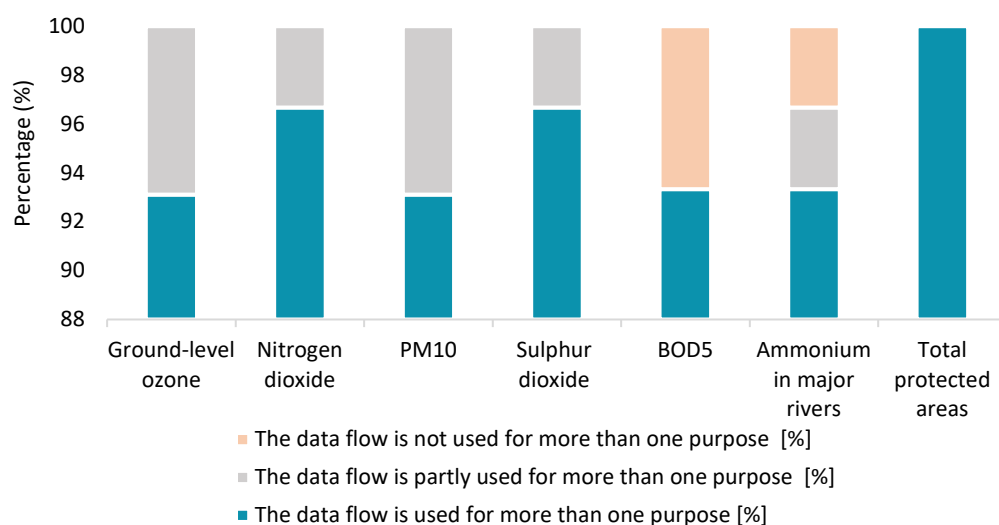


Figure 1. Use of data flows for more than one purpose

With regard to a degree to which the information meets the real or perceived needs of users (e.g., in terms of coverage, content and detail), in 45 per cent of cases user feedback was actively collected to assess whether the data flow met the needs of users. For PM₁₀ and sulphur dioxide, in 40 per cent of cases user feedback was collected passively (Figure 2).

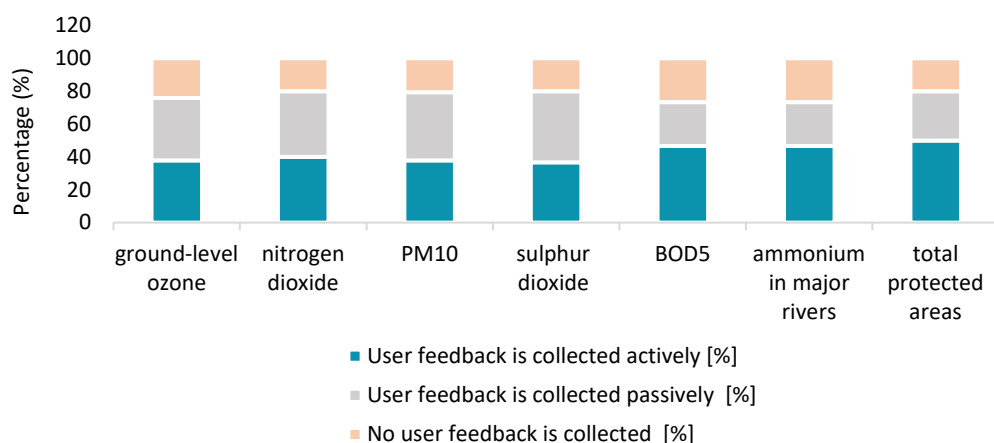


Figure 2. Collection of user feedback

In the majority of countries, data was regularly improved. However, gaps remained above all for nitrogen dioxide, PM₁₀, sulphur dioxide, BOD₅ and ammonium in major rivers (Figure 3).

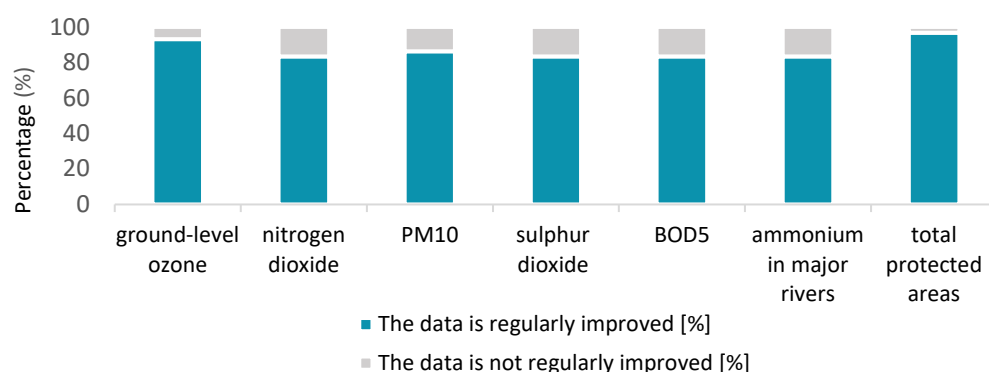


Figure 3. Data improvement

The data were systematically compared with data from other sources. While for BOD₅ and ammonium in rivers data were systematically compared in about 80 per cent of cases, the performance for ground-level ozone, nitrogen dioxide, PM₁₀ and sulphur dioxide and total protected areas was lower (Figure 4).

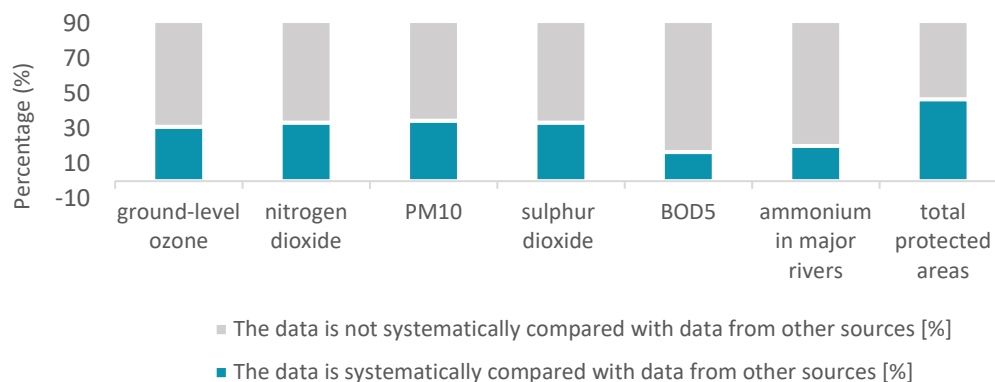


Figure 4. Comparison of data with data from other sources

A positive development was that, in 80 per cent of cases for ground-level ozone, nitrogen dioxide, PM₁₀, sulphur dioxide, BOD₅ and ammonium in rivers, countries reported that data validation procedures were in place. Further improvements were, however, still needed for all seven data flows (Figure 5).

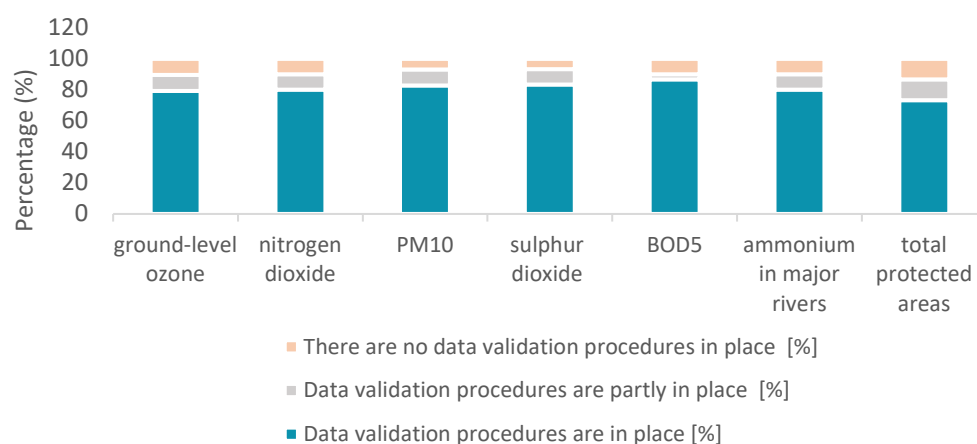


Figure 5. Validation procedures

In most cases the regular revision to data was carried out. While for ground-level ozone, nitrogen dioxide, PM₁₀, sulphur dioxide, BOD₅ and ammonium in major rivers, regular revisions to data occurred in around 65 per cent of the cases, for the total protected areas revisions happened in around 40 per cent of cases (Figure 6).

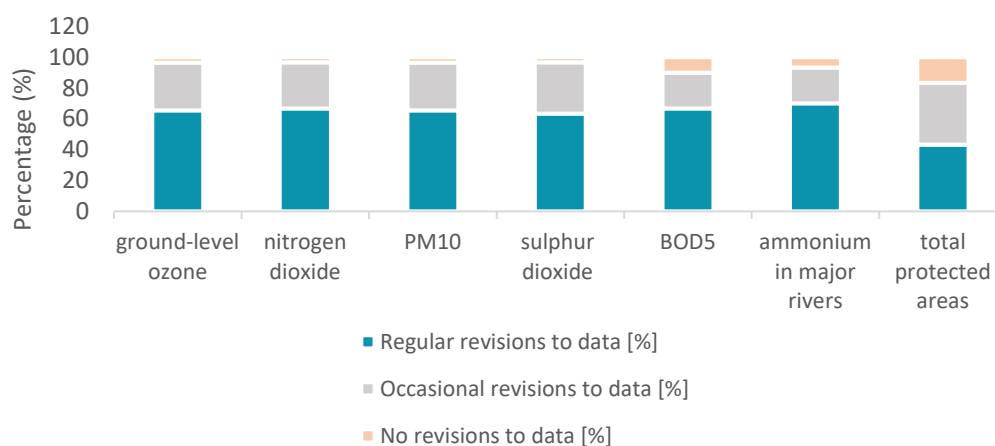


Figure 6. Revisions to the data

In the category of “timeliness and punctuality”, most countries specified that dissemination of data flows occurred on an annual basis for BOD₅, ammonium in major rivers and total protected areas in 70 per cent of cases, while for ground-level ozone, nitrogen dioxide, PM₁₀ and sulphur dioxide, disseminated happened in 55 per cent of cases (Figure 7).

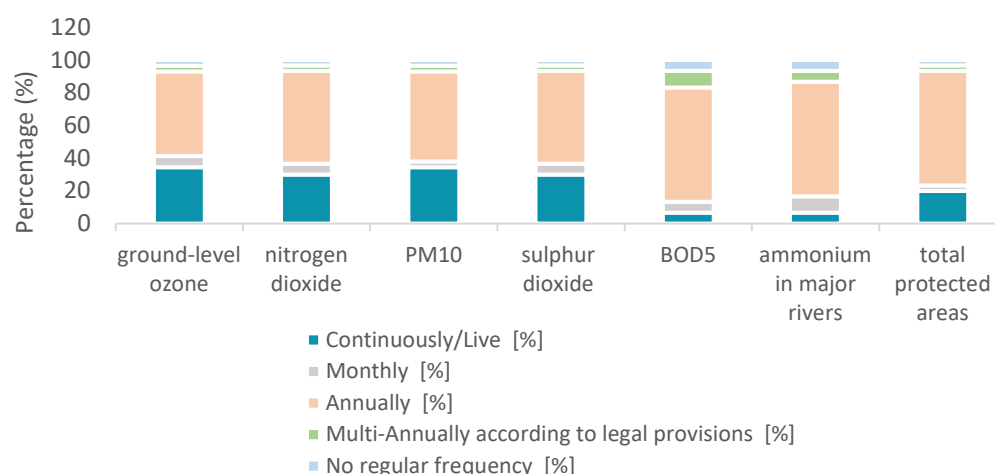


Figure 7. Frequency of the dissemination of the data flow

With respect to punctuality of the online release, the deviation for BOD₅ and ammonium in major rivers was, in 50 per cent of cases, between four days and eight weeks, whereas for other data flows and in majority of cases the deviation was less than four days (Figure 8).

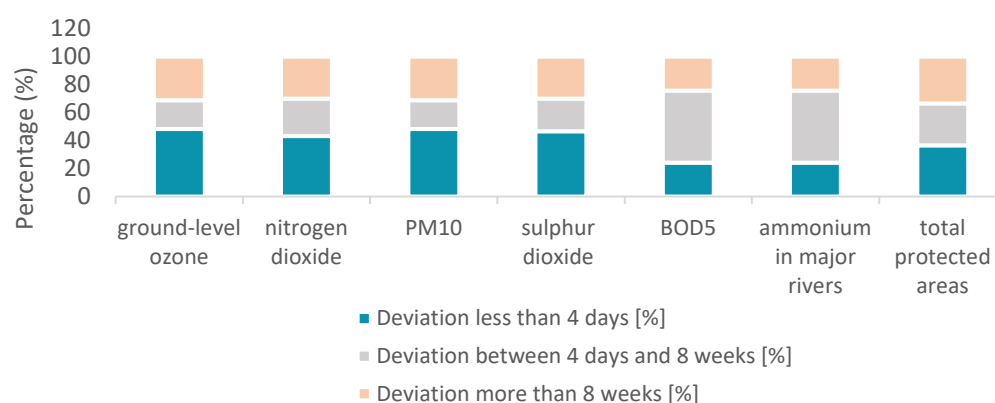


Figure 8. Punctuality of the data flow's online release

As to the timeliness of the data flow, for ground-level ozone, nitrogen dioxide and PM₁₀ and total protected areas in 80 per cent of cases data were released within one year. For BOD₅ and ammonium in major rivers, in 40 per cent of cases release took between one and two years (Figure 9).

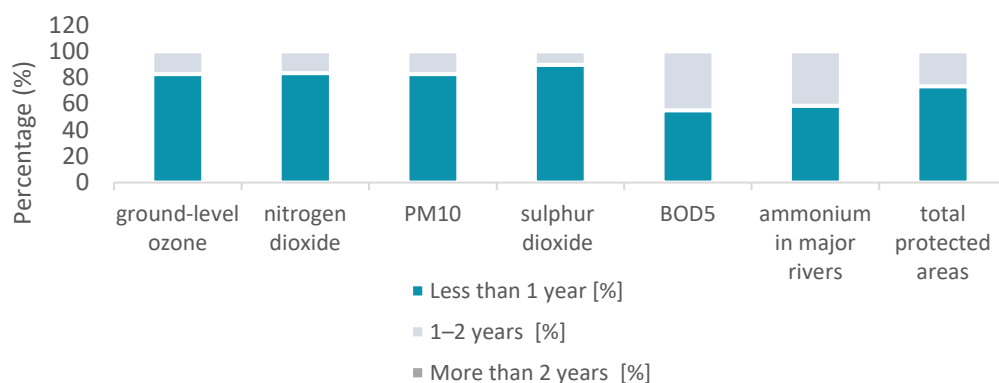


Figure 9. Timeliness of the data flow

The degree to which information was presented in a clear and understandable form and released in a suitable and convenient manner, with supporting metadata and guidance, and whether procedures and guidelines for data quality management exist were also assessed. The result showed that procedures and guidelines for data quality management existed for the data flow sulphur dioxide in all 30 countries that submitted a self-assessment. According to the self-assessments submitted, the data flow with the least procedures and guidelines for data quality management in place was total protected areas (Figure 10).

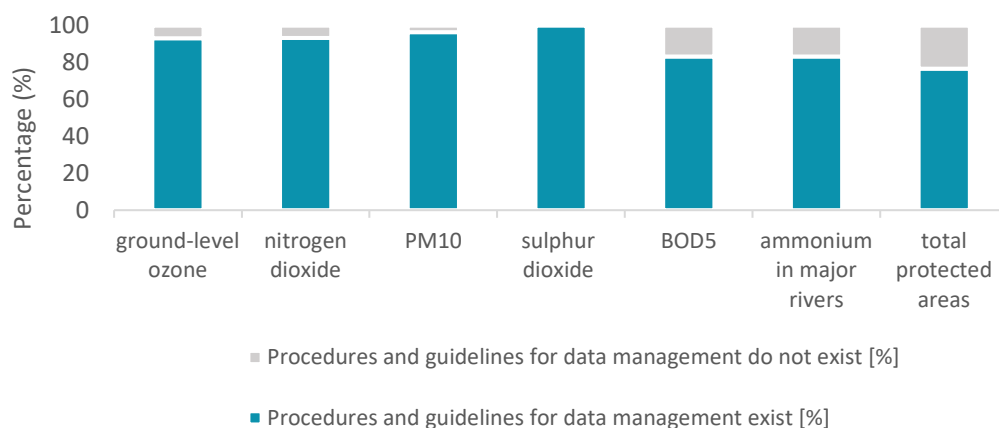


Figure 10. Procedures and guidelines for data quality management

The availability of metadata for the data flows was also assessed. It was a positive development that, in most cases, countries reported that metadata were available. The data flow nitrogen dioxide was the data flow with the highest performance in this regard, whereas it was lowest for the data flow BOD₅ according to the self-assessments submitted by the countries (Figure 11).

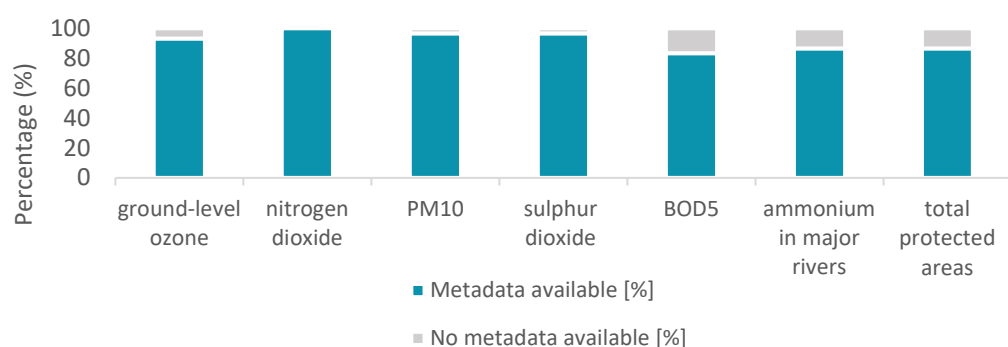


Figure 11. Availability of metadata

To identify the extent to which the internationally agreed procedures were applied to produce data flows, the results of country submissions were assessed and showed that they were applied in 72 per cent of cases, falling to 67 per cent for total protected areas (Figure 12).

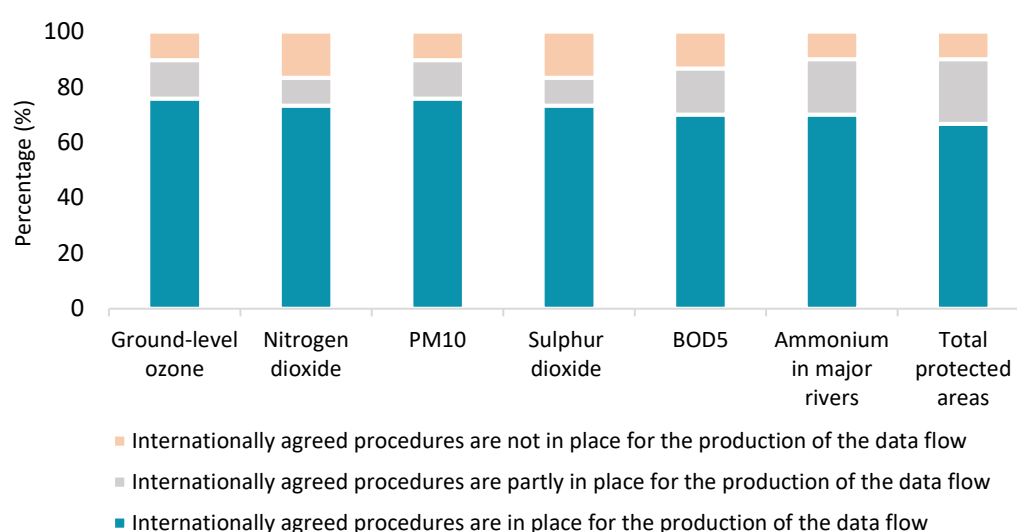


Figure 12. Application of internationally agreed procedures in the production of data flows

Countries described limitations in comparing data flows across regions and between countries owing to differences in, for example, densities of measurement stations and configurations of monitoring networks, the means of data collection, data flow definitions and legislation.

Overall, countries reported that nearly all the seven data flows were being produced at the national level (90 per cent). In most cases primary data from public authorities were accessible (71 per cent). Almost all countries reported that procedures and guidelines for data quality management existed (89 per cent) and that metadata were available for the seven data flows (92 per cent), thus ensuring greater clarity and quality of the information provided. However, with plenty of good practices available, there were still ways to improve the communication of indicators in terms of their

content, the completeness of meta-information, the visual representation of trends and patterns and, especially, the assessment of indicators in the context of environmental policy. The data flows were most often used to produce different types of content (69 per cent), such as reports and visual representations. This was a positive development, aside from the relatively low use of indicators in state-of-the-environment reporting.

Infrastructure

For the SEIS pillar of “infrastructure” in the category of “accessibility”, countries reported that data flows were readily available and accessible online in 90 per cent of cases, though that proportion dropped to 77 per cent for water-related data flows (Figure 13). The most popular formats were reports, such as state-of-the-environment reports, and visual presentations (Figure 14).

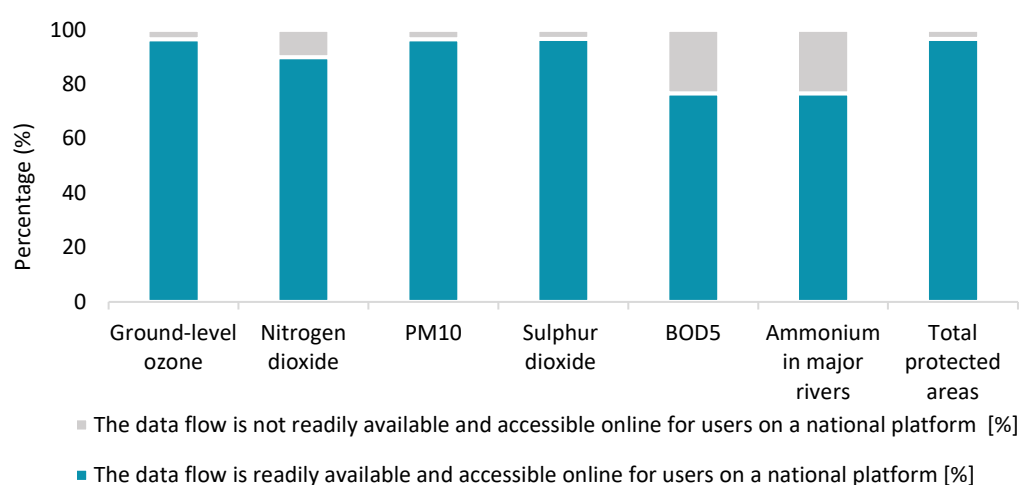


Figure 13. Ready online availability and accessibility of data flows on a national platform

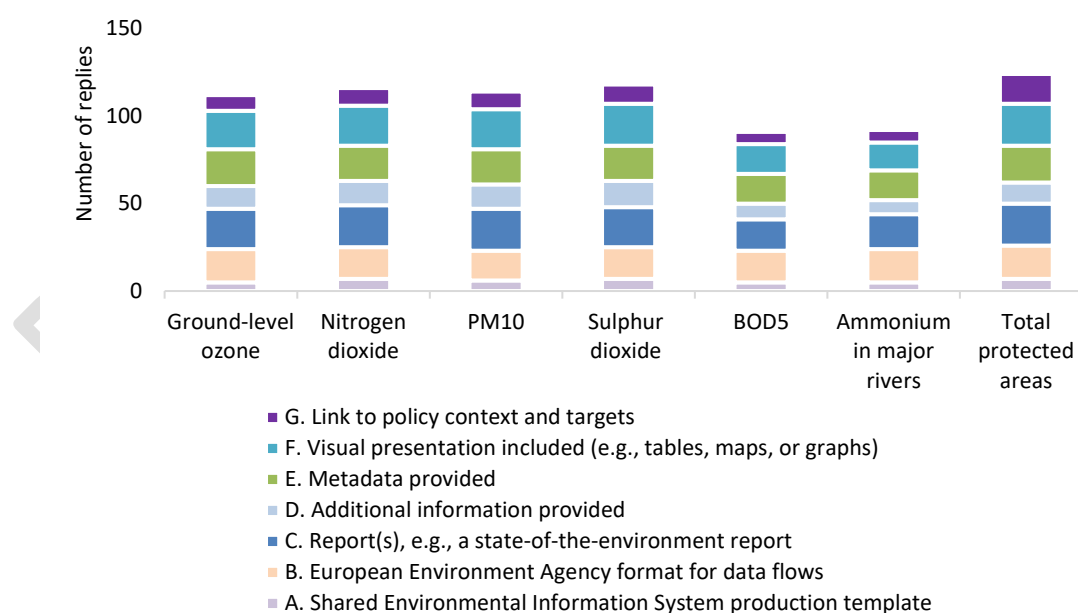


Figure 14. Formats in which information on the data flows is presented

As for the ease with which users were able to access at any time the data and its supporting information online, the results submitted showed that, in 20 per cent of cases for BOD₅ and ammonium in rivers, primary data were not yet made available and accessible for users (Figure 15).

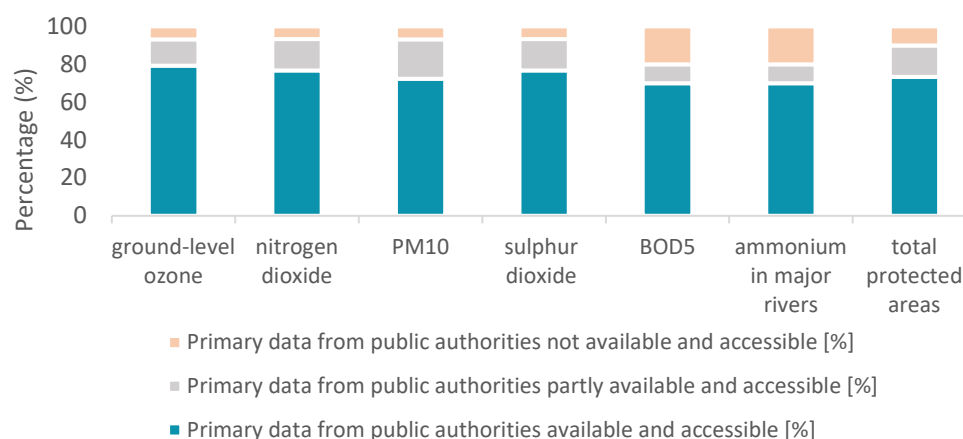


Figure 15. Availability and accessibility of primary data from public authorities

Nearly all the seven data flows were readily available and accessible online for users on national platforms. This suggested a positive development regarding the accessibility and availability of the data flows, in part, due to efforts to establish SEIS. Most countries also reported that the seven data flows were readily available and accessible on integrated platforms (90 per cent). Some limitations were reported, however, notably for BOD₅ and ammonium in major rivers and total protected areas. Inconsistencies were found, moreover, in the self-assessments regarding the links provided for the respective data flows, as many were not operational or did not indicate a relevant source or platform. Many countries have also established internal procedures, such as regular data validation (79 per cent) and revision (61 per cent) for all the seven data flows. The prevalence of internal procedures for how to use and manage the data flows implied that the trustworthiness of the data infrastructure had increased.

Cooperation

Regarding the degree to which institutional and organizational arrangements were in place to ensure regular production and sharing of environmental indicators, the question of whether national legislation, plans, programmes or strategies related to the production of the data flows in the ECE member States were in place was assessed. Most of the countries that submitted a self-assessment reported that national legislation, plans, programmes or strategies were in place to produce the data flows. For the data flows ground-level ozone, sulphur dioxide and total protected areas one country reported that no national legislation, plans, programmes or strategies were in place to produce the data flow (Figure 16).

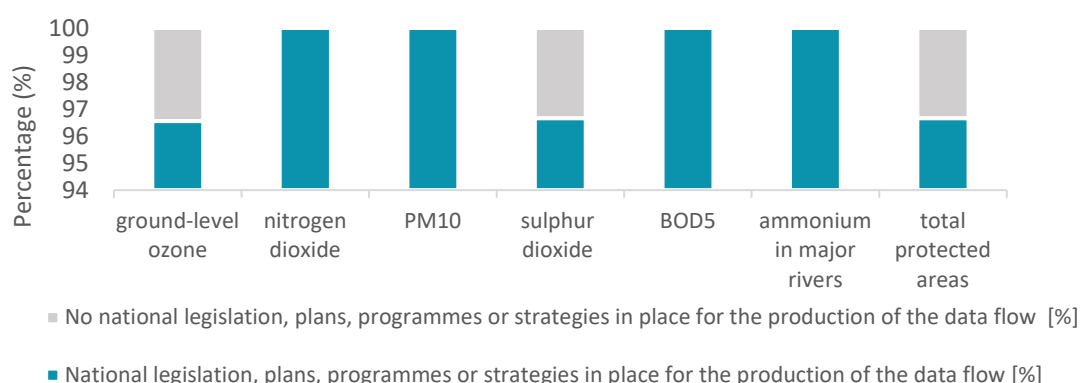


Figure 16. Availability of national legislation, programmes or strategies to produce data flows

Countries reported having in place national legislation, plans, programmes or strategies related to the production of the indicators and legal or institutional arrangements for regular production and sharing of data between various institutions at the national level (97 per cent). Effective institutional and administrative capacities at the local, regional and national levels are crucial for the establishment of SEIS. There remained a need to improve institutional cooperation between fragmented data producers and users.

4. Regional and national Shared Environmental Information System performance

The results of the self-assessments submitted by countries are presented below and are based on the Countries' factsheets on the status of implementation of SEIS in 2018¹¹ and the Annex to the Draft mid-term review of the establishment of SEIS.¹² The one of the major achievements of this review illustrates the progress made by countries in self-assessing their performance in the different categories.

Caucasus and Eastern Europe, as well as the Russian Federation

Of the seven countries in this group, no response was received from Georgia and Ukraine. Of the five reporting countries, Armenia obtained the highest ("very good") overall performance score for the seven data flows. The other four countries all achieved a "good" performance score. In Armenia, Azerbaijan, Belarus and the Russian Federation a common national platform was established to facilitate accessibility to environmental information. In Armenia and Azerbaijan 42 out of 49 ECE environmental indicators were available in 2018.

In Armenia the metadata for the collected data sets, including information relating to data sources, temporal and spatial coverage is available in the country. With the exception of protected areas, data is released on a monthly basis. User feedback is used to assess data quality and its dissemination. Concerning the 7 self-ranked data flows underpinning 3 environmental indicators,

¹¹ ECE, 2019. Shared Environmental Information System. <http://www.unece.org/environmental-policy/environmental-monitoring-and-assessment/areas-of-work/shared-environmental-information-system.html>

¹² ECE, 2018. Annex to the Draft mid-term review of the establishment of the Shared Environmental Information System. http://www.unece.org/fileadmin/DAM/env/europe/monitoring/20st_Meeting/INF_-_Annex_to_mid-term_review_of_SEIS.pdf

Armenia has long time-series of continuous monitoring. Armenia ranked its performances at 96.43 per cent.

Azerbaijan has a long time-series of continuous monitoring: 15 to 28 years (exceptions are PM₁₀ and O₃, for which the period is only 2 years). With the exception of protected areas, Azerbaijan receives primary data for the indicators from other organizations. Data is released annually. Azerbaijan ranked its performances as 90.48 per cent.

Belarus has been making significant progress in enhancing the accessibility of ECE environmental indicators. 40 out of 49 ECE environmental indicators were available in 2018 and are used as forecasts for environmental policy targets. Belarus has a long time-series of continuous monitoring: 12 years, except for data flows on protected areas (16 years). Data on protected areas is classified by national categories rather than categories of the International Union for the Conservation of Nature (IUCN). The country releases its data annually. Belarus ranked its performances as 84.29 per cent. This score could be higher if the IUCN categories were used to present data on protected areas.

Georgia has been making progress in making the ECE environmental indicators accessible, however, due to administrative reforms, many indicators are not available online. 23 out of 49 ECE environmental indicators are available in 2018.

In the Republic of Moldova 28 out of 49 ECE environmental indicators were available in 2018 and it has a long time-series of continuous data since 1990. The Republic of Moldova interacts actively with users, analysing feedback collected through an online questionnaire regularly. The Republic of Moldova ranked its performances as 77.86 per cent – good performance.

The Russian Federation has achieved progress in making ECE environmental indicators available and accessible. 32 out of 49 ECE environmental indicators were available in 2018. The Russian Federation has a long time-series of continuous water-related datasets since 1980 up to present. The metadata for the collected datasets, including information relating to data sources and quality is available in the country. Data flows are disseminated annually. User feedback is actively collected. The Russian Federation has ranked its performances at 91.67 per cent.

In this group of five countries, the theme with the highest rating was C, (water), followed by A (air pollution and ozone depletion) and D (biodiversity). The data flows with the highest performance scores were BOD₅ in major rivers and ammonium in major rivers, followed by annual average concentration of sulphur dioxide, PM₁₀ and ground-level ozone. According to the responses, the categories in which improvements are most needed are accuracy and accessibility. The six countries of Eastern Europe and the Caucasus are engaged in ENI SEIS East II project, funded by the European Union and carried out by EEA, to support implementation of the SEIS principles and practices. The project has contributed significantly to the overall good performance of Armenia, Azerbaijan, Belarus and the Republic of Moldova in the mid-term review. Similar support for countries with lower performance scores would enhance the establishment of SEIS in Europe and Central Asia.

Though Armenia, Azerbaijan and Belarus have yet to produce indicator-based reports, Georgia has gained experience through preparing an indicator-based chapter on air in its state-of-the-environment report and the Republic of Moldova has produced its first indicator-based report. In Azerbaijan, Belarus and the Republic of Moldova, concrete recommendations are needed, while in Azerbaijan the reports should cover sectoral issues and, in Belarus, up-to-date information is needed. Armenia, Azerbaijan, Belarus and the Republic of Moldova have each established a common national platform to facilitate accessibility to environmental information. Both Belarus and the Republic of Moldova are using environmental indicators as forecasts for environmental policy

targets. Armenia, Azerbaijan, Belarus and the Republic of Moldova could achieve the 2021 targets of having available the ECE indicators and SEIS being established.

The produced reports are not always available on the website of the responsible ministry or are difficult to find; in the case of Georgia, the website was under reconstruction, limiting user access to the information. In Azerbaijan and Georgia, some reports and information are available only in the national language, limiting access by international users. In all countries in the subregion, reporting under the multilateral environmental agreements remains one of the main tasks. Some reports to multilateral environmental agreements are available on the respective convention websites. In Azerbaijan and Georgia, the quality of the reports should be improved, while in Belarus and the Republic of Moldova, awareness of assessments is not sufficiently high. The use of environmental indicators for different purposes, including reporting under the multilateral environmental agreements should be promoted and strengthened. In Georgia, due to administrative reforms, many indicators were not available online. Azerbaijan lacks reference to methodological standards used for producing the data sets for the indicators. Between 23 (Georgia) and 42 (Armenia and Azerbaijan) out of 49 ECE environmental indicators (including 7 placeholders) were available in 2018. Armenia, Azerbaijan, Belarus and the Republic of Moldova have arrangements in place for interagency cooperation on information exchange.

Central Asia

In Central Asia, all five countries submitted a self-assessment with three of them responding to all of the mandatory questions. In Kazakhstan 36 out of 49 ECE environmental indicators were available in 2018 and they have been regularly calculated on the basis of relevant recommendations. Kazakhstan is a leader in environmental information in the region and has the potential to achieve the 2021 target on ECE indicators' availability, as well as on SEIS implementation. Kyrgyzstan has been working towards establishing SEIS while implementing SEIS principles and three pillars and in 2018 36 out of 49 ECE environmental indicators were available. In Kyrgyzstan and Tajikistan, the majority of data is still available in hard copy only. In Tajikistan in 2018 11 out of 49 indicators were available. In Turkmenistan environmental information and indicators are not available online, it is therefore difficult to determine the number of environmental indicators produced in 2018 and national reports are outdated. Availability of data online is not developed; data is provided mainly upon request and there is no unified platform for environmental data. In Uzbekistan in spite of the attempts to make data available online with the assistance of international organisations, the majority of data remains available in paper format only. Part of information is therefore readily available, while the remaining data is password-protected and only available to registered users.

In the case of Tajikistan, because some of the mandatory information was missing for one data flow (annual average concentration of sulphur dioxide) and, in the case of Kyrgyzstan, information was missing for two data flows (PM₁₀ and ground-level ozone), it was not possible to calculate an overall performance score for these two countries. Of the three other countries, Kazakhstan reported the highest performance score with an overall "good" performance. The other two countries' assessments showed an overall "moderate" performance score or a need for improvement. Tajikistan has achieved "very good" performance for total protected areas and "good" performance for ammonium in major rivers but requires improvement for the other four data flows. Kyrgyzstan requires improvement for all data flows. For the three countries that provided information on all data flows, the environmental theme with the highest rating was D (on biodiversity), followed by C (on water) and, lastly, A (on air pollution and ozone depletion). In all five countries, except for the annual average concentration of sulphur dioxide, PM₁₀ and ground-level ozone (for which only four countries could be considered), the highest average performance score was for total protected areas (80 per cent), followed by ammonium in major rivers (67 per cent). All five countries showed "medium" performance in the categories of relevance; accuracy; timeliness and punctuality; and

accessibility. The lowest score was in the “comparability” category. Accordingly, the categories in which improvement is most needed are comparability; relevance; accuracy; timeliness and punctuality; and accessibility.

South-Eastern Europe

Five (EEA cooperating) countries in South-Eastern Europe submitted self-assessments, responding to all 15 of the mandatory questions. All of them reported an overall “good” performance score for the seven selected data flows with North Macedonia reporting the highest score. The theme with the highest rating was A (on air pollution and ozone depletion). The data flows with the highest performance scores (the same score for all) were annual average concentration of sulphur dioxide, annual average concentration of nitrogen dioxide, PM₁₀ and ground-level ozone, followed by total protected areas. The five countries showed a “moderate” to “good” performance in relevance, accuracy, timeliness and punctuality; these are the categories where the greatest improvement is needed.

European Environment Agency members

Fifteen of the 33 EEA members completed self-assessments and responded to the questionnaire, with 14 responding to all of the mandatory questions. Poland responded to all of the mandatory questions for only six data flows; for the seventh (total protected areas), the default values provided by EEA were used to calculate an overall performance score. Those default values were used also for the 18 EEA members that did not submit self-assessments. Finland reported the highest overall performance score in the group of responding countries, followed in descending order by Estonia and (all with the same score) France, Germany, Hungary and Sweden. Most of the other nine responding countries reported an overall “good” national performance score, with only a few cases of a “moderate” score.

The 18 countries for which the default values were used achieved an overall “good” score. Among the 15 reporting countries, the environmental theme with the highest rating was A (on air pollution and ozone depletion). The data flows with the highest performance scores among the 15 reporting countries (all with the same score) were annual average concentration of sulphur dioxide and annual average concentration of nitrogen dioxide and PM₁₀, followed by ground-level ozone and total protected areas. The average performance scores per data flow for all 15 countries are slightly lower than the default values provided by EEA. The lowest performance scores were in the “accuracy” category, followed by “relevance”; these are the areas in which improvement is most needed.

All countries are making progress in making ECE environmental indicators publicly available, though rates of progress differ. The accessibility of environmental indicators is growing, and they are increasingly being published in compliance with ECE requirements on the websites of national environmental authorities, statistical agencies and open data portals. About 80 per cent of the 23 key indicators from the ECE set are now fully accessible online; the rest still require further work.

5. Overall findings

The mid-term review was pivotal in the progress made towards SEIS implementation in the region, as it reported for the first time on all pillars and principles of SEIS. Most importantly, the review highlighted the continued positive progress made by countries, as previously noted in the first review in Batumi, in harmonizing data and increasing accessibility and the alignment of national indicators to ECE indicators.

Countries noted that the self-assessment questionnaire facilitated communication between data producers that normally did not share or exchange information. This demonstrated the added value

of the assessment framework as an instrument that could improve communication between data producers. In addition, there is generally consistency between national and ECE indicators included in the review. However, the use of the indicators in state-of-the-environment reporting remains poor.

It also highlighted the need to improve institutional cooperation between fragmented data producers and users. For instance, figure 17 shows the overall national SEIS performance score, with the leading countries – Armenia, Latvia, Switzerland, Finland and the Russian Federation- based on the mandatory questions. Besides, table 3 presents the results of the countries performance in percent per data flow. They demonstrate a positive trend since the Batumi Conference.

Figure 18 below reveals that theme A (air pollution and ozone depletion) has the highest performance scores, followed by D (biodiversity) and C (water). The same applies to the indicator level, as only one indicator was assessed per theme. At the data flow level, the average score was highest for air quality (Sulphur dioxide, PM10, ground-level ozone and nitrogen dioxide), followed by total protected areas, ammonium in major rivers and BOD5 in major rivers.

Considering that the mid-term review ensured the review of all SEIS pillars, it could be seen as a major achievement of the review and progress of countries in self-assessing their performance in the different categories. Moreover, the mid-term review shows the inherent value of regular self-assessment of progress since SEIS improves the use of relevant environmental data flows across multiple contexts, bodies of knowledge and policymaking approaches.

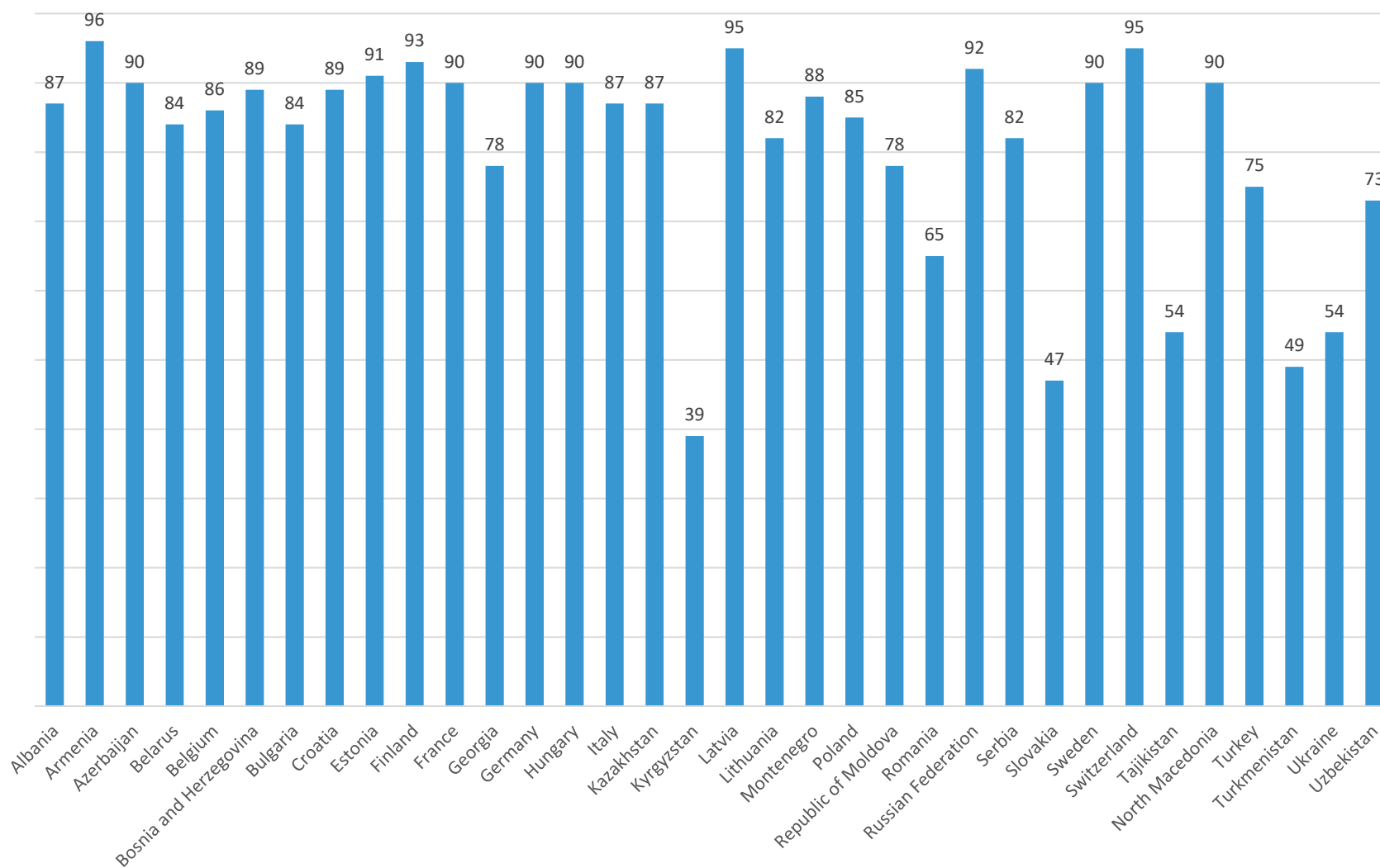


Figure 17. National SEIS performance scores

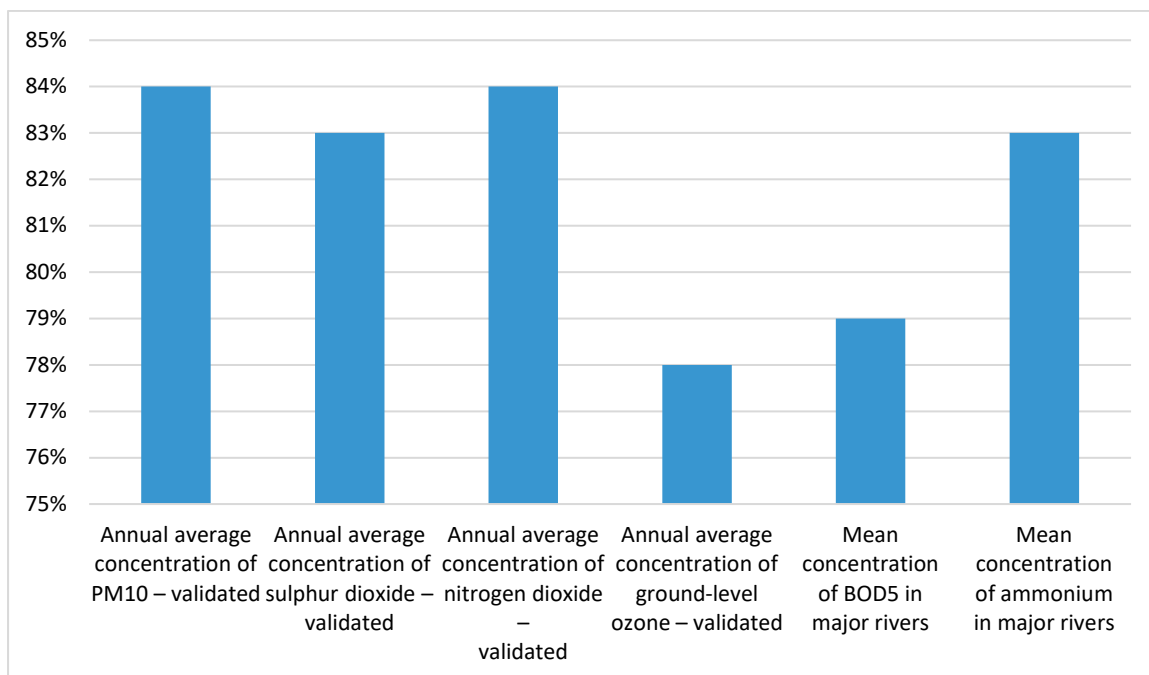


Figure 18. Aggregated SEIS performance scores, by indicator

Table 3. National Performance Scores (in per cent).

	A. Air pollution and ozone depletion <i>A2. Ambient air quality in urban areas</i>				C. Water <i>C10. BOD₅ and concentration of ammonium in rivers</i>		D. Biodiversity <i>D1. Protected areas</i>
	<i>Annual average concentration of PM₁₀ – validated</i>	<i>Annual average concentration of sulphur dioxide – validated</i>	<i>Annual average concentration of nitrogen dioxide – validated</i>	<i>Annual average concentration of ground-level ozone – validated</i>	<i>Mean concentration of BOD₅ in major rivers</i>	<i>Mean concentration of ammonium in major rivers</i>	<i>Total protected areas (by IUCN categories)</i>
Albania	87	87	87	87	87	87	87
Armenia	97	97	85	97	100	100	100
Azerbaijan	90	90	90	90	90	90	93
Belarus	90	90	90	90	85	85	60
Belgium	87	87	87	87	85	85	83
Bosnia and Herzegovina	90	90	90	90	92	92	82
Bulgaria	87	87	87	87	70	70	98
Croatia	90	90	90	90	92	85	85
Estonia	90	90	90	90	93	93	88
Finland	93	93	93	93	98	98	82
France	88	88	88	88	92	92	93
Georgia	80	80	80	80	78	78	68
Germany	100	100	100	100	73	80	77
Hungary	87	87	87	87	93	93	93
Italy	88	88	88	88	87	87	82
Kazakhstan	87	87	87	87	87	87	87
Kyrgyzstan	N/A	53	48	N/A	50	53	65
Latvia	100	90	100	90	95	95	97
Lithuania	85	85	85	85	80	80	73
Montenegro	100	100	100	100	77	77	65
Poland	97	97	97	97	62	62	82
Republic of Moldova	70	72	70	70	95	95	73
Romania	63	63	63	63	50	50	100

	A. Air pollution and ozone depletion				C. Water		D. Biodiversity
	A2. Ambient air quality in urban areas				C10. BOD ₅ and concentration of ammonium in rivers		D1. Protected areas
	Annual average concentration of PM ₁₀ – validated	Annual average concentration of sulphur dioxide – validated	Annual average concentration of nitrogen dioxide – validated	Annual average concentration of ground-level ozone – validated	Mean concentration of BOD ₅ in major rivers	Mean concentration of ammonium in major rivers	Total protected areas (by IUCN categories)
Russian Federation	93	93	93	93	87	87	95
Serbia	97	97	97	97	47	47	93
Slovakia	52	52	52	52	38	38	45
Sweden	87	87	87	87	93	93	100
Switzerland	95	95	95	95	95	95	95
Tajikistan	43	N/A	42	55	62	77	100
North Macedonia	93	93	93	93	83	83	93
Turkey	85	92	90	85	65	65	42
Turkmenistan	47	47	47	40	47	47	67
Ukraine	62	62	62	N/A	62	62	70
Uzbekistan	73	68	75	75	67	72	80

Abbreviation: N/A= Data not available; performance score for the indicator is assumed to be zero.

Notes: Calculation of the performance scores is explained in the assessment framework.

Legend:

	0–50 per cent: Requires improvement
	51–75 per cent: Moderate performance
	76–95 per cent: Good performance
	96–100 per cent: Very good performance

Chapter III.

Case studies

SEIS has become an integral part of the environmental policy of the countries of Europe and Central Asia. EEA, UNEP and ECE, working in close collaboration, place great emphasis on the implementation of SEIS in the countries of Central Asia and the Eastern Partnership countries. This chapter provides an overview of the interconnection between existing conventions, specifically the Aarhus Convention, and concepts such as Integrated Water Resource Management and Integrated Pollution Prevention and Control, and SEIS development in Central Asia. Further, the chapter presents UNEP-ECE capacity-building activities on SEIS and European Union projects and practices on SEIS implementation in the Eastern Partnership countries.

A. Implementing the Shared Environmental Information System and environmental policies in Central Asia

Nikolai Dronin and Diana Mangalagiu¹³

1. Introduction

SEIS is a joint initiative of the European Commission and EEA to establish with the European Union member States an integrated and shared European Union-wide environmental information system (European Commission, 2008). The three dimensions of SEIS – content, infrastructure and cooperation – are meant to facilitate systematic environmental assessments and reporting, by interlinking existing data and information flows relevant for national authorities in their monitoring and assessment activities and by advancing sharing and comparability of environmental indicators to harmonize environmental monitoring requirements.

The ECE policy promoting SEIS and facilitating data harmonization across the 53 member States in Europe and Central Asia has had an observable positive impact on Central Asian countries' progress in the dissemination and comparability of environmental data and information. Despite joining SEIS only in 2011, Central Asian countries perform within the average. Kazakhstan and Kyrgyzstan are even comparable with the advanced European Union countries in terms of providing most datasets online. Kyrgyzstan is also advanced in terms of the accessibility of environmental datasets online on national websites and user-friendliness (ECE/CEP/S/2016/L.9). Overall, Central Asian countries provide most required datasets as well as information on the methodologies used to source and produce the data on their national websites.

While progress is real, problems regarding environmental data and information in the subregion remain. First, the coordination process of collection, storage and exchange between different data producers and users is weak. Second, data on some environmental indicators is absent and/or units of measurement are sometimes defined locally. Third, even when data is collected and used in state of the environment reviews, it is not necessarily taken into account in environmental policy design and implementation. Fourth and most importantly, progress along one fundamental principle of SEIS – making citizens active users of environmental data – has seen very limited advancement in Central Asia. In general, the public's demand for environmental information in the subregion is still weak and primarily limited to a few governmental agencies and research institutes (UNEP, 2018).

¹³ The opinions expressed are those of the authors and do not represent the views of the United Nations or its Member States.

We discuss the prospects of citizens' demand for environmental information in Central Asia in the course of implementing environmental policy reforms by reviewing three important policies being implemented in the subregion, namely the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), Integrated Water Resource Management and the introduction of the Integrated Pollution Prevention and Control system.

2. The Aarhus Convention and Shared Environmental Information System development in Central Asia

Experience shows that, when meaningfully implemented, the Aarhus Convention significantly increases the number of environmental data users (Andrusevych et al, 2011, and Leobet, 2013). In Central Asia, the Aarhus Convention plays the role of a mechanism guaranteeing certain rights and a healthy environment for private actors. The implementation of the Aarhus Convention is challenged by two major inherited problems deeply rooted in the Soviet tradition, namely centralized planning and governance that is coupled with generally low public interest in environmental problems.

Among the Central Asia States, only Uzbekistan has not joined the Aarhus Convention. Kazakhstan is assessed to be one of the most advanced post-Soviet states while Kyrgyzstan and Turkmenistan, the least advanced ones. In Kazakhstan, there are 15 Aarhus centres across the country, the first being established in 2001; in Tajikistan, there are 7 such centres, with the first dating from 2003. While Kyrgyzstan also implemented two Aarhus centres and Turkmenistan one, these are no longer active. Kazakhstan was also a pioneer in establishing in 2005 the State Fund of Environmental Information, designed to play the role of a hub concentrating all information flows, communicated, after appropriate processing, to the concerned data users (CAREC, 2013).

According to the SEIS principles, environment-related data and information should be stored in compatible and digitally interconnected electronic databases. However, today the national websites of Central Asian governments provide only highly aggregated and disconnected datasets on the state of the environment, rendering this information of little use for concerned citizens. Environmental NGOs attempt to collect their own local data, for example, for the assessment of green areas in cities. Thus, the issues of data availability and sharing – the content pillar of SEIS – have the highest priority in the Aarhus Convention, which requires that individuals participate in environmental decisions, acting as “informed citizens”, which necessitate access to information related directly or indirectly to plans or programmes likely to affect the environment.

The development of SEIS in Central Asia could help the network of Aarhus centres, by bringing together relevant stakeholders and coordinating activities, to become more effective in the Convention's implementation.

3. Integrated Water Resource Management and Shared Environmental Information System development in Central Asia

Central Asia has a long history of water management because of its importance to the region's economic development. The current structure of water management is inherited from the Soviet system, with responsibilities and tasks spread over different administrative bodies at various levels, governed by multiple ministries and financed according to varying criteria or rules and channels.

The Integrated Water Resource Management concept is based on a two-level system of national water resources management through the establishment of river basin management organizations and water user associations. Central Asia presents rather favourable conditions for the development of river basin management: its semi-arid climate makes water scarcity issues significant enough to stimulate action while the homogeneity of its water users presents few barriers to such action

(Kemper et al, 2005). The initial distribution of resources among basin stakeholders has clearly favoured irrigators in the basin, who account for more than 90 per cent of water consumption.

Introducing Integrated Water Resource Management in Central Asia is essential for the collection and sharing of data on water quantity and quality. Since 1991, the functions of monitoring institutions have been significantly disrupted or ceased completely for some, a situation that is only now improving slowly. National responsibility for monitoring water quality and quantity is shared between several ministries, agencies and institutes. Their monitoring activities are not well coordinated and have been hampered by dire financial constraints for many years, which caused a substantial reduction in their monitoring networks and capacities since the collapse of the Soviet Union.

So far, the establishment of basin administrations and basin councils for river systems shows little progress in all Central Asia States. In Kyrgyzstan, while the Water Code includes some provisions towards Integrated Water Resource Management, the river basin management principle has not been implemented except in two Europe Union-run pilot projects in the Talas and Chu basins. In Tajikistan, the introduction of Integrated Water Resource Management and river basin management has been postponed for the decade 2016–2025. In Uzbekistan, where water policy was established according to irrigation units, a transition from an administrative territorial approach to a two-level system of basin irrigation management was planned but progress is very slow. In Kazakhstan, the Water Code established in 2003 only mentioned the principle of water basin management and requirements for consultation of various governmental and non-governmental entities. In practice, the functioning changed little compared to the Soviet period. In Turkmenistan, the development of a roadmap for the implementation of Integrated Water Resource Management principles was started in 2016 and a series of training sessions has since been run by the Regional Environmental Centre for Central Asia.

The development of SEIS in the region could help primary water users, including companies, water utilities and water user associations improve data accuracy and completeness. Water users need also to introduce modern measurement devices and equipment to implement accurate accounting of water during intake and supply for domestic, household and agricultural use.

4. Integrated Pollution Prevention and Control and Shared Environmental Information System development in Central Asia

The Integrated Pollution Prevention and Control concept was defined by the European Commission in 1996. A fundamental part of the concept is that a facility should not only meet specific technical requirements but also be operated and maintained with the best available techniques. The best available techniques approach has proved to be difficult to implement in Central Asia. None of the Environment Performance Reviews of Tajikistan, Turkmenistan and Uzbekistan mention the approach. The analysis of environmental policy documents in Central Asia also reveals low or no priority for best available techniques and Integrated Pollution Prevention and Control.

The region's implementation of SEIS could impact the functioning of the compliance monitoring system in Central Asia and therefore help the introduction of Integrated Pollution Prevention and Control. Currently, emission limits for each stationary source are determined according to methods inherited from the Soviet era and often only rough estimates for emissions are made on the basis of energy and material inputs, raising doubts concerning basic environmental statistical accuracy.

Environmental self-monitoring and reporting do not yet exist in practice in the region, as only a few companies monitor their emissions properly. Since good international practices entail open access to self-monitoring data and other environment-related information, new regulations for self-

monitoring, self-reporting and handling confidential industrial data need to be introduced while facility-specific information of environmental significance needs to be made publicly available.

Thus, implementation of Integrated Pollution Prevention and Control suggests the need for a new level of decentralization and transparency in monitoring and reporting environmental data. The best available techniques approach contains a requirement for continuous monitoring when possible and appropriate or high-frequency monitoring at least. Monitoring quarterly, as is the norm in Central Asia countries, is insufficient to meet the requirements of best available techniques (World Bank, 2014). The role of self-monitoring is primarily to keep resource consumption and emissions low, which from an environmental point of view is the most essential task. In addition to this, companies' self-monitoring is used by authorities in enforcement as well as for yearly reporting purposes.

As noted previously, little progress has been made in advancing Integrated Pollution Prevention and Control in the region and substantive progress would require a higher level of cooperation, the third pillar of SEIS.

5. Implications for the implementation of the Shared Environmental Information System in Central Asia

The implementation of the three policies analysed above requires much better environmental data and information than presently available publicly at the national level in the subregion. Further development of SEIS in Central Asia could fill existing data gaps in relation to these particular policies as SEIS emphasizes the importance of the free flow of environmental information from providers to users ("easily accessible to all users") and localization of data collection and presentation ("managed as close as possible to its source"). As shown above, SEIS could help to improve the overall implementation of these policies by addressing different problematic aspects (content, cooperation and infrastructure) that are presently impeding progress.

Moreover, we argue that a formalistic approach of evaluating SEIS implementation as a typical top-down process is insufficient to transform citizens into active environmental data users. Creating demand for environmental data at the grassroots level is indispensable and, by analysing the conditions for increasing such demand in Central Asian countries, we have found significant potential for new users, within the three environmental policies – Integrated Water Resource Management, the Aarhus Convention and Integrated Pollution Prevention and Control. Further advancement regarding implementing SEIS pillars and principles in Central Asia could bring new means of collecting and accessing environmental data and thereby facilitate further implementation of policies such as the ones analysed in this section.

B. Implementation of the Shared Environmental Information System in Central Asia

1. Background

To be relevant and well informed, environmental decision making needs to be supported by credible data, state-of-the-environment reporting and agreed policy goals as well as by integrated environmental assessments. Such assessments – like the UNEP Global Environment Outlook reports, EEA State of Environment Reports and national state-of-the-environment reports – combine and interpret data, information and knowledge from across a wide variety of themes and sectors. They can facilitate understanding of the state of the environment and of environmental trends, as well as of progress towards agreed policy goals such as Global Environmental Goals drawn from existing international treaties and non-legally binding instruments, as well as progress towards the

Sustainable Development Goals. They can also be used as a basis to model scenarios and identify emerging issues.

The preparation of reports and integrated assessments is dependent upon the availability of reliable and regularly updated data and information that constitute a solid knowledge base. But in many countries, the development and use of numerous databases and knowledge portals that are often poorly connected and difficult to find (e.g., because they are located in different ministries or government agencies, not shared nor linked to any centralized repository) has become an obstacle in making environmental information readily accessible for reporting and assessment, both at national and regional or global levels.

Often, in many countries, the same data and information gets collected multiple times by different Ministries for multiple reporting and assessment processes as well as other purposes because of insufficient knowledge management and sharing. Insufficient cooperation and exchange of information between national stakeholders can thus result in duplicated efforts and high and unnecessary costs. Combined with a lack of reliable, timely, accessible and comparable data and information, reporting obligations and assessments become a burden and are unable to effectively support decision-making. Furthermore, once an assessment is completed, usually the social processes and networks created in its support cease to exist and gaps in knowledge sharing occur. In the intervening period new issues emerge that are not always captured in an effective way.

Finally, while all United Nations Member States have adopted the 2030 Agenda for Sustainable Development and accepted the task of monitoring the Sustainable Development Goals, few countries, especially developing countries, have undertaken a thorough analysis to determine which areas of environmental information to prioritize given the numerous policy demands at the national level as well as reporting requirements arising from multilateral environmental agreements.

Environmental data and information need to be effectively collected, managed and shared online to support multiple uses at different governance levels to meet multiple reporting obligations, including reporting on multilateral environmental agreements and on progress towards implementing the environmental dimension of the 2030 Agenda for Sustainable Development, including its Sustainable Development Goals.

Consultations with Governments have shown that there is a need for strengthening the knowledge base of integrated environmental assessments and reporting on the state of the environment by linking relevant data and information and making it easily available and accessible in line with SEIS principles of open access to data, notably that data is managed as close as possible to source, and that it is collected once and shared for many purposes.

Feedback from countries also indicates that the reporting burden to multilateral environmental agreements as well as to national and regional bodies is enormous and often further exacerbated due to shortage of human resources and sub-optimal institutional structures for sharing data at national level. In addition, to regularly report on the environmental dimension of the Sustainable Development Goals, countries need to improve and coordinate their current data sharing processes, in addition to strengthening their capacity to produce environmental indicators and statistics.

In the pan-European region, countries from Eastern Europe, Caucasus and Central Asia have reviewed and agreed to apply a set of 49 environmental indicators, including 7 placeholders (out of the available 127 SEIS environmental data sets) contained in the ECE Revised Guidelines on the

Application of Environmental Indicators.¹⁴ They cover ten thematic areas: air pollution and ozone depletion, climate change, water, biodiversity, land and soil, agriculture, energy, transport, waste and environmental financing). The 49 indicators are further subset into eighteen indicators and fifty-two of their underpinning datasets, referred to as 'core indicators', used to review process of a country's progress in the production and sharing of this core set. By agreeing on the same set of core indicators, countries can be compared with one another to identify challenges and encourage sharing of best practices in the production of environmental indicators and statistics and management of environmental data and information.

At subregional level in the pan-European region, Central Asian countries were involved in SEIS-related activities during 2013–2015 under the scope of the European Union-funded MONECA (Environmental Monitoring in Central Asia) project component¹⁵, which was implemented by the Regional Environmental Centre for Central Asia, the Austrian Environmental Agency and Zoï Environment Network with support from EEA.

MONECA was one of three components of the broader FLERMONECA project that aimed to enhance regional cooperation and partnership with Europe in the fields of forest and environmental biodiversity governance, including monitoring, through the support of sustainable use and management of natural resources in Central Asia by tackling issues such as climate change, forest governance, ecological restoration and environmental data collection, exchange, monitoring and assessment. EEA, the Austrian Environmental Agency, the Regional Environmental Centre for Central Asia and Zoï Environment Network supported the implementation of technical support and capacity building activities in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan under the scope of the MONECA project component in line with broader regional efforts towards the implementation of SEIS principles in the pan-European region.

2. UNEP technical support to online dissemination of environmental data and state-of-the-environment report findings

During 2016–2019, UNEP promoted additional SEIS technical support and capacity building activities in Central Asia under the scope of an European-Union funded project on "Capacity building for environmental data sharing and reporting in support of a shared environmental information system", under the European Union Thematic Programme for Environment and Sustainable Management of Natural Resources including Energy and the joint European Union-UNEP Global Public Goods and Challenges Programme.

Project activities were built upon the results of the European Union-funded MONECA project, which provided support to Central Asian countries during 2013–2015 in their efforts towards the implementation of SEIS principles, including support to the implementation of ECE recommendations regarding the production and sharing of environmental indicators, and the development/improvement of national webpages aimed at promoting public sharing of environmental data.

Building upon the results of the MONECA project, UNEP SEIS project activities in Central Asian further supported the population of country webpages established under MONECA with environmental indicators¹⁶ agreed under the scope of Joint Task Force on Environmental Indicators

¹⁴ ECE, 2019. Guidelines for the Application of environmental Indicators. <http://www.unece.org/env/indicators.html>

¹⁵ EEA, 2013. General information about MONECA. <http://naturalresources-centralasia.org/flermoneca/index.php?id=17>

¹⁶ UNEP. Capacity building for environmental data sharing and reporting in support of a shared environmental information system (SEIS).

and Statistics process. UNEP also supported the development or improvement of national portals for online sharing of environmental data and state-of-the-environment reports.

In **Kazakhstan**, an online interactive version¹⁷ of the 2016 edition of Kazakhstan's National State of the Environment Report was produced through the project's technical support and made available online in both Russian and Kazakh languages for broader use and public dissemination. Earlier in the summer of 2018, the Russian-language version of the report was welcomed by the Popular Advisory Board to the Ministry of Energy of Kazakhstan. The Kazakh edition was further presented at a national meeting dedicated to the implementation of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters and featured in several national publications.



Link: <http://newecodoklad.ecogofond.kz/2016/kz/>

Figure 19. Interactive version of Kazakhstan's National State of the Environment Report 2016.

A promotional video for the online interactive version of the 2016 National State of the Environment Report was also developed with support from UNEP and technical guidance from Zoë Environment Network.

https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.33/2016/mtg2/6.3_E_UNEP_SEIS_project_in_Central_Asia_Eng.pdf

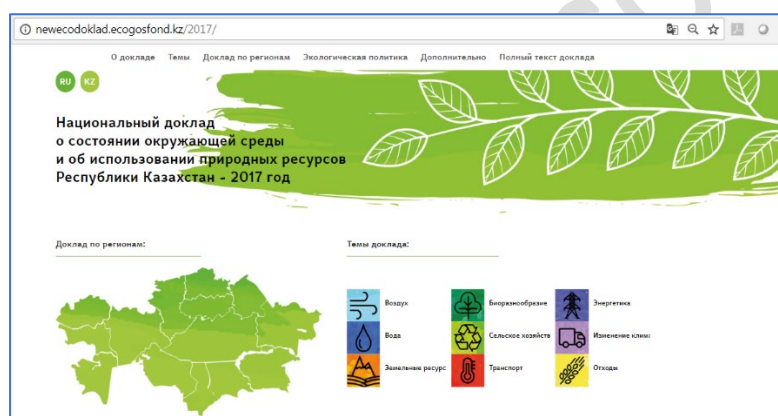
¹⁷ Ministry of energy of the Republic of Kazakhstan. Kazakhstan's National State of the Environment Report, 2016. <http://newecodoklad.ecogofond.kz/2016/kz/>



Promotional video (https://youtu.be/Arq4Ua1C_Mo)

Figure 20. Promotional video of Kazakhstan's National State of the Environment Report 2016.

In a similar fashion, an online interactive version¹⁸ of the latest edition of Kazakhstan's National State of the Environment Report (the 2017 edition) was produced to foster broader dissemination of assessment findings. Both online interactive state-of-the-environment reports are data-rich summaries of the often 500-page long source reports, structured under a DPSIR approach that also integrates interactive tools for enhanced data visualization, covering 36 environmental indicators out of the ECE list which are produced and published¹⁹ by the Committee on Statistics, as well as inputs from a variety of stakeholders organized by themes and by region. These online interactive National State of the Environment Reports were produced with support from UNEP and technical guidance from Zoï Environment Network.



Link: <http://newecodoklad.ecogofond.kz/2017/>



Link: www.stat.gov.kz

Figure 21. Interactive version of Kazakhstan's National State of the Environment Report 2017.

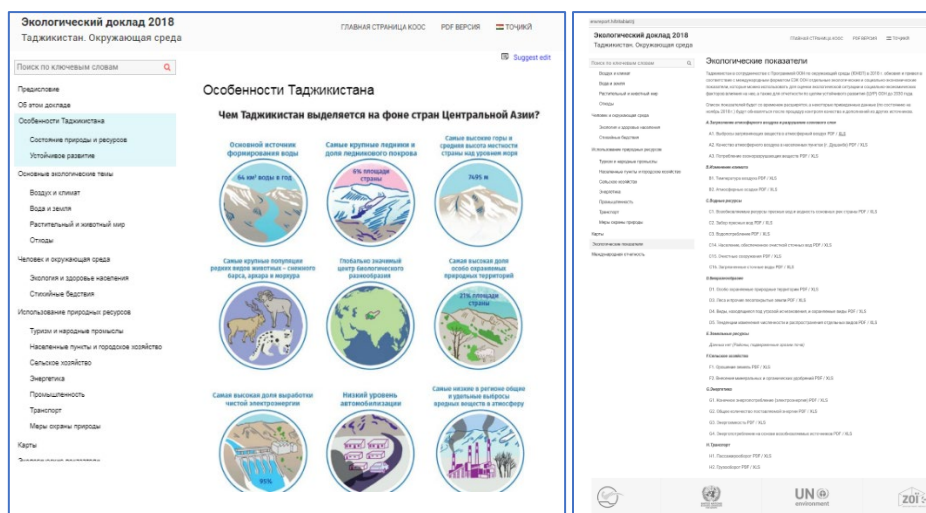
In **Tajikistan**, technical support activities under the same UNEP project resulted in the production of an online compact version of the State of the Environment report in Russian, based on the recent Third ECE Environmental Performance Review of Tajikistan.²⁰ Further support was provided to produce also a Tajik edition of the State of the Environment report, in both online and print-ready formats for improved dissemination at the national level.

¹⁸ Ministry of ecology, geology and natural resources of the Republic of Kazakhstan. Interactive version of Kazakhstan's National State of the Environment Report 2017. <http://newecodoklad.ecogofond.kz/2017/>

¹⁹ Kazakhstan's Committee on statistics, 2019.

http://old.stat.gov.kz/faces/homePage/ecolog?_afzLoop=13279257921312726%40%3F_afzLoop%3D13279257921312726%26_adf.ctrl-state%3D5wnd11vnt_25

²⁰ Committee for Environmental protection under the Government of the Republic of Tajikistan. Environment Report, 2017. http://tajnature.tj/?page_id=228



Link: http://tajnature.tj/?page_id=228

Figure 22. Online version of Tajikistan's State of the Environment Report.

Also, with support from UNEP and technical guidance from Zoë Environment Network, seven new indicators from the ECE list of environmental indicators started to be produced in collaboration with the Environmental Protection Committee of Tajikistan and the Agency of Statistics of Tajikistan. These new indicators were made available online to support environmental decision making and future State of Environment reporting exercises.

In **Kyrgyzstan**, an interactive portal for the National Environmental Report of the Kyrgyz Republic was developed building upon the National Environmental Report portal previously developed in 2014 under the scope of the MONECA project.²¹



Figure 23. Interactive portal for the National Environmental Report of the Kyrgyz Republic.

The new improved National Environmental Report portal ensures regular collection of environmental data to enable reporting on the state of the environment, both at the national level

²¹ State Agency for environmental protection and forestry under the Government of the Kyrgyz Republic. the National Environmental Report 2006-2011. <http://www.nd.at.kg/>

and in compliance with international obligations and recommendations, while also providing an open environmental data platform for the public and other interested stakeholders.

While the portal previously developed under the European Union-funded MONECA project provided for automated entry of data only on 4 environmental indicators under the ECE list of environmental indicators – notably data on emissions of pollutants into the air, atmospheric air quality in urban areas, biochemical oxygen consumption and ammonium nitrogen concentration in river waters, and on nutrients in fresh water – the new improved portal covers 44 data flows and is accessible also in a mobile version to facilitate usability and discoverability of data by the public.

At the **broader regional level in Central Asia**, UNEP project activities also aimed at supporting the Interstate Commission on Sustainable Development (ICSD) in the development of its ECOPORTAL,²² in response to the request made by the Interstate Commission ministerial-level meeting (Ashgabat, 16–18 June 2015)²³ to UNEP in representation of all five Central Asian countries – Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan – for support to the development of its ECOPORTAL. For this, UNEP involved the Scientific Information Center of the Interstate Commission in relevant activities with the aim to promote the long-term sustainability of this regional portal.

3. UNEP and ECE capacity-building activities in Central Asia on SEIS and environmental statistics for the Sustainable Development Goals

During 2016–2019, UNEP Europe Office and ECE Statistical Division organized a series of capacity building workshops in Central Asia with the aim to promote SEIS principles of open access to data and build national capacities to produce environmental statistics in support of national reporting on the environmental dimension of the Sustainable Development Goals.

These UNEP-ECE country workshops were mostly delivered in a true “One UN” format in partnership with other United Nations agencies – notably the United Nations Development Programme (UNDP), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and FAO – and in close coordination with respective United Nations Country Team’s activities to support national efforts to implement Agenda 2030 and develop national Sustainable Development Goal monitoring frameworks.

In 2017, 2018 and 2019 a series of capacity-building workshops took place in Central Asian countries: Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. These workshops held by UNEP, ECE Statistical Division, the UNDP country offices, Zoï Environment Network and the countries’ statistical bodies brought together the representatives of different ministries, regional statistical bodies and environmental and statistical focal points. The focus was on environmental information systems (including SEIS), environmental statistics for the Sustainable Development Goals and effective application of SEIS environmental data sharing principles.

4. Lessons learned from recent efforts towards SEIS implementation in Central Asia

The recent work of EEA, ECE, UNEP, interested United Nations agencies and respective United Nations Country Team’s on the SEIS implementation in Central Asia showed that it is necessary to follow one UN approach and to seek synergies with national United Nations processes promoted by UNDP and other United Nations Country Teams, regional programmes and conventions. Also, to strengthen regional cooperation, Central Asian countries should invite representatives from other countries in the region to attend national workshops, share their experience and benefit from

²² Interstate Commission on Sustainable Development (ICSD). Ecoportal. <http://ecoportalca.kz/en/>

²³ ICSD, 2015. Meeting of ICSD, 2015. <http://www.mkurca.org/2015/06/zasedanie-mkur-mfsa-2015-g/>

training. It is important to raise awareness and promote SEIS principles by carrying out technical trainings on Sustainable Development Goal indicator methodologies and the System for Environmental-Economic Accounting. Furthermore, there is a need to foster a national dialogue on the sharing of environmental data and information, making it publicly available in line with the related SEIS principles. Last but not least, engagement of Sustainable Development Goal indicator custodian agencies and coalition of financial resources from different UNEP, ECE and UNDP projects for capacity building funding would contribute to move forward in the implementation of SEIS in the region.

C. Implementation of the Shared Environmental Information System principles and practices in the Eastern Partnership countries

XXX

1. Introduction

In 2008, the European Commission confirmed its commitment to the implementation of SEIS across Europe and decided to extend the application of SEIS principles to the neighbouring countries, including the Eastern Partnership countries (European Commission, 2008, 2013).

In 2010-2015, the European Commission together with the European Environmental Agency launched the regional European Union-funded project “Towards a Shared Environmental Information System (SEIS) in the European Neighbourhood (ENPI-SEIS)”, to promote implementation of SEIS in the six countries of the Eastern European Neighbourhood (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine). The aim was to improve national capacities for managing and sharing environmental data and information.²⁴ During the implementation of the ENPI-SEIS, a regional set of eight pilot environmental indicators was developed, produced and shared across the six partner countries in the East region (EEA, 2015b). The implementation of ENPI-SEIS demonstrated that while the SEIS concept is generally well-accepted by relevant stakeholders, there were still inadequate exchange mechanisms for environmental information, inconsistencies of environmental data and information with international standards, as well as gaps in administrative and technical capacities for maintaining monitoring and information systems.

In 2016 the European Union launched a project ‘Towards a Shared Environmental Information System (SEIS) in the European Neighbourhood’ (ENPI-SEIS, €5.7 mil., 2009.12–2015.03), implemented by EEA. The ENPI-SEIS project supported the environmental and statistical authorities in 16 partner countries both in the East and South European Neighbourhood regions in promoting the SEIS principles.²⁵ During the implementation of the ENPI-SEIS project, a regional set of eight pilot environmental indicators was developed, produced and shared across the six partner countries in the East region.^{26,27}

²⁴ EEA, 2018. Shared Environmental Information System. <https://www.eea.europa.eu/about-us/what/shared-environmental-information-system-1/shared-environmental-information-system>

²⁵ Ibid.

²⁶ EEA, 2015c. ENPI-SEIS East Region Synthesis Report: <http://enpi-seis.pbe.eea.europa.eu/east/final-synthesis-report-enpi-east-march-2015>

²⁷ EEA, 2019. Progress in the production and sharing of core environmental indicators in countries of South-Eastern Europe, Caucasus and Central Asia. <http://enpi-seis.pbe.eea.europa.eu/data-and-indicators/enpi-east-production-and-sharing-core-set-indicators>

The second project 'Implementation of the Shared Environmental Information System principles and practices in the European neighbourhood regions (ENI SEIS II East)' builds on the outcome of ENPI-SEIS and runs from 2016 to 2020, led by EEA.²⁸

EEA has a central role in collecting and providing environmental information in Europe. With the help of its European environment information and observation network (Eionet),²⁹ it has been a leading proponent of SEIS from the start of the initiative. EEA, together with Eionet brings together 39 member and cooperating countries generating environmental information and knowledge across vast number of environmental topics. Following the engagement in the European Neighbourhood regions, EEA has built on the Eionet as the model, its experience, infrastructure, tools and good practices for supporting the implementation of SEIS. It is increasingly active in the six Eastern Partnership, where it supports capacity building activities on biodiversity, water and air quality, develop the institutional capacities of environmental and statistical authorities and supports the environmental reporting process. With support of EEA, a regular process of environmental assessment and the development of SEIS across the ECE region has contributed towards progress in comparable data delivery and improved quality of the indicators.

The development of common data structures and indicators for the Eastern Partnership countries during the implementation of the SEIS initiative since 2010 was done in close partnership with various ECE structures and entities such as the Joint Task Force on Environmental Statistics and Indicators and the Working Group on Environmental Monitoring and Assessment. All ENP East countries have been part of these structures for more than 10 years and the joint efforts with EEA through the above project in establishing a regular process of environmental assessment and the development of SEIS across the region facilitated a gradual progress in comparable data delivery, and improved quality of the indicators.

The ENI SEIS II East project³⁰ build on ENPI-SEIS project and the target countries – Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine – have long traditions in the fields of environmental information, assessment and reporting. The representatives from the national environmental and statistical authorities within the project's geographical area are the project's key partners.

The ENI SEIS II East aims to improve environmental governance and provide support to target countries to gradually develop and extend their national environmental information systems in line with the SEIS principles. The specific objective of the project is to strengthen the regular production of environmental indicators and assessment as a contribution towards knowledge-based policymaking and good governance in the field of the environment. The project addresses organisational, administrative and technical aspects related to the production of the agreed set of environmental indicators. Overall the shared set of indicators expected to grow from the 8 produced in ENPI-SEIS towards a full set of the agreed 36 indicators, however, conditioned by data availability which vary significantly across the region.

Producing regionally comparable information on and assessments of biodiversity, air pollution, land, waste, transport, energy, agriculture, water resources and support of a regular environmental reporting is one of the major activities of ENI SEIS II East. In that context, several indicators related to quantifying water resources and assessing water quality have been developed with the Eastern Partnership countries. To support the development of online services to access environmental information, capacity building activities for national experts for carrying out the implementation of

²⁸ EEA, 2019. European Environment Agency. <https://www.eea.europa.eu/>.

²⁹ Eionet, 2019. European Environment Information and Observation Network. <https://www.eionet.europa.eu/>

³⁰ EEA, 2019. ENI SEIS II East. <https://eni-seis.eionet.europa.eu/east>.

environmental indicators and reporting on environment have been conducted by the project in all six countries.³¹

A variety of methods are employed to build capacity and provide technical assistance to the target countries, including facilitating dialogue between institutions, expert visits, providing guidance in accordance with European Environment Information and Observation Network (Eionet)³² and study tours. Sharing knowledge of the EEA, EEA topic centres expertise and EEAcademy ENI Summer School on Integrated Environmental Assessments are among these methods. Notably the ENI Summer School on Integrated Environmental Assessment is an EEAcademy activity with the objective to strengthen the current knowledgebase on integrated assessments, improving coherence across assessments through establishing a common, foundational understanding of key theories, concepts and approaches. The overall programme covers the why, what and how of Integrated Environmental Assessment and will go in depth on how to advance from an Integrated Environmental Assessment to an Integrated Sustainability Assessment.

Starting from 2010 ECE has been ensuring cooperation and regular dialogue with EEA to implement of SEIS principles and practices, particularly through the dedicated groups under the ECE Committee on Environmental Policy such as WGEMA (Working Group on Environmental Monitoring and Assessment) and JTF (Joint Task Force on Environmental Monitoring and Indicators), where EEA has been an active ongoing participant. For instance, in 2012 ECE and EEA participated in the workshop on Progress made under the Eastern part of the ENPI-SEIS Project “Towards a Shared Environmental Information System (SEIS) in the European Neighbourhood” to facilitate dialogue and communication with the project partners in the East (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Ukraine and the Russian Federation) to enable smooth running of the project and to secure country perspective in the future implementation.³³ In 2017–2019, ECE provided support to the implementation of the project “Support production and regular update of the regional set of indicators and strengthening environmental statistics and accounting in the six Eastern Partnership countries under the ENI SEIS II East project”, in the framework of an agreement between ECE and EEA. A desk study under the project resulted in a report on “The current status of production, sharing and use of ECE environmental indicators in the EU Eastern Partnership countries”, which aims to contribute to the achievement of the objectives of ENI SEIS II East:

- Help strengthen capacities of national environmental authorities and statistical agencies of the Eastern Partnership countries to collect and produce the required data sets, with quality assurance and quality control standards comparable with those of the European Union and EEA, as input to the production and use of the ECE set of environmental indicators in accordance with the principles and practices of the SEIS ;
- Support the regular updating and production of high-quality comparable environmental indicators within the framework of SEIS and the ECE set of environmental indicators, so that the countries are better able to respond to international reporting obligations including progress towards monitoring the Sustainable Development Goals and SEIS regular reporting;
- Improve capacities of the countries to prepare regular state-of-the-environment and thematic assessments using comparable indicators and methodologies in line with European

³¹ EEA, 2019. ENI SEIS II East. Partner Countries. <https://eni-seis.eionet.europa.eu/east/countries>

³² Ibid 30.

³³ ECE, 2012. Workshop on Progress made under the eastern part of the ENPI-SEIS Project “Towards SEIS in the European Neighbourhood”. https://www.unece.org/fileadmin/DAM/env/europe/monitoring/workshops/Workshop_on_Progress_Made_under_the_ENPI-SEIS_Project/Workshop_on_ENPI_SEIS.pdf

Union and EEA and the ECE best practice, and to further development the System of Environmental-Economic Accounting.

The activities of ENI SEIS II East aim to support the implementation of SEIS principles and consist of several phases: preparing a gap analysis and development of four-year SEIS national work plans, improving implementation of regional/international commitments related to environmental reporting in line with European Union and EEA best practices, improving capacities in the national administrations to manage and use environmental statistics, data and information in support to decision-making process in line with European Union and EEA best practices, preparing a regular state-of-the-environment report and indicator-based assessments in line with European Union and EEA best practices.

2. Target countries

Since 2010 ENP-East countries (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine) have been targeted countries first in the ENPI-SEIS project (2010–2015) and then in the ENI SEIS II East project, with a view to supporting the building of SEIS at national and regional levels, in line with European Union practices.³⁴ The section provides an overview on each country separately.

Armenia

In Armenia, water has been identified as one of the thematic priorities for which the ENI SEIS II project should support the country in implementing indicators. Following a request from Armenia in May 2014 under the ENPI-SEIS, a pilot project, SEIS Lake Sevan was developed. This pilot project aimed at developing and testing a mechanism to allow the integration of data sets from a variety of sources. In addition, training session on building capacity of relevant stakeholders for upgrading Lake Sevan water information system to support policymaking and implementation of integrated water resources management has been conducted in Armenia in 2018.

Armenia receives support to strengthen IT infrastructure, institutional and expert capacities in managing water data and information. A centralised system to disseminate all environmental statistics and indicators, known as ArmStatBank,³⁵ represent the primary indicator management system in the country has been developed.

Azerbaijan

Although some progress on environmental policy has been made in Azerbaijan, there is a need to further develop its environmental monitoring network and information exchange.

One of the main priorities in Azerbaijan is to develop and implement an eco-portal, introducing the implementation of water assets and flow accounts in line with the System of Environmental-Economic Accounting for water and to ensure synergies with other relevant regional and national projects and initiatives.

To support the development of online services to access environmental information, capacity building activities for national experts for carrying out the implementation of selected indicators and reporting on environment have been conducted.

Belarus

³⁴ EEA, 2019. ENI SEIS II East Project. <https://eni-seis.eionet.europa.eu/east/governance>

³⁵ Statistical Committee of the Republic of Armenia, 2012. <http://www.armstatbank.am>.

In Belarus the main priority of work has focused on water resources and biodiversity. The development of water flow accounts was selected as a pilot activity to assess quantity and quality of water resources. That assessment supports policymaking and underpins the implementation of integrated water resources management.

Another focus has been to develop various components of the environmental accounts, to update the flow accounts annually and to visualise key outputs of the flow accounts on the websites and make available the underlying data.

In addition, with support of EEA, Belarus is enhancing national institutional capacities to support regular reporting on environment processes at the national level as well as assessing the state of the environment as linked with multiple national policy targets.

Georgia

Georgia has mainly focused on the following components: water, land, biodiversity and air. For the water component, the main priority is to develop water resources indicators and the Water Information System (WIS-Georgia), for the air component, the main priority has been to improve air quality monitoring, data exchange and assessment capabilities. With regards to the Biodiversity component, the capacity for the establishment of the Emerald Network, which is relevant to all the countries mentioned in this section, has been increased.

Overall, environmental decision-making processes, in compliance with the best practices of EEA, have been strengthened, including the implementation and promotion of the European Integrated Environmental Assessment practice.

Republic of Moldova

The Republic of Moldova aims to advance its integrated environmental monitoring and information management system according to the principles laid down in its national strategy on the environment. Development of a national concept with an action plan on how to enable different institutions to improve their information systems is included as priority area to be tackled in the framework of its ENI SEIS project.

The capacity-building activities on assessing state of water resources and on data collection, monitoring and assessments, which aimed at providing timely, relevant and reliable information to policymakers and the public, have been conducted. In addition, technical assistance on developing coordinated water information system, strengthening the capacity to produce streamlined environmental reports and implementation of integrated water resources management has been provided by EEA.

Ukraine

Building capacity for water indicator implementation, developing coordinated water information (data and indicators) that can support policymaking is one of the project areas of ENI SEIS II East in Ukraine. In addition, Ukraine put a great emphasis on air emission accounts and takes part in bilateral cooperation programme with Statistics Finland, organized by ECE Statistical Division and EEA, to check the methodology of air emission accounts in Ukraine.

With the support of EEA, Ukraine is building capacities for assessing the state of water resources as well as developing water information system that can support the implementation of integrated water resources management. As a result of project activities, a new procedure for the water monitoring program was approved by the Cabinet of Ministers of Ukraine in 2018. This procedure is

aligned with the European Union directives and contributes towards the provision of information about the state of water in Ukraine.

Moreover, a draft resolution for a procedure on the implementation of air monitoring was submitted in 2019 for the approval of the Cabinet of Ministers. The resolution is also based on the implementation of the European Union standards. This system will gather operational information and assess atmospheric air data, which will enable drafting and enforcing effective environmental policies.

3. Current status of ENI SEIS II East project

The accessibility and application of ECE environmental indicators in the Eastern Partnership countries is progressing towards a final stage and certain indicators are used to report to conventions and international fora. ECE environmental indicators have been increasingly published in compliance with ECE requirements on the websites of national environmental authorities, statistical agencies and open data portals and are accessible in national languages, with some pages also available in English and Russian. The countries are also trying to improve the content and user friendliness of the websites where information on the indicators is shared.

Armenia and Azerbaijan are the leading countries in sharing the information produced by the indicators and making progress on environmental policy priorities (see table 4). While Georgia and Ukraine still lack information on a majority of the indicators. In Belarus and the Republic of Moldova at least of 50 per cent of the information produced in relation to the indicators is available.³⁶

Table 4: The progress made (per cent) by the countries on environmental policy priorities as shown via UNECE environmental indicators.³⁷

ECE environmental indicators	Armenia	Azerbaijan	Belarus	Georgia	Republic of Moldova	Ukraine
A. Air pollution and ozone depletion	100%	100%	100%	25%	100%	100%
B. Climate change	100%	100%	100%	25%	100%	100%
C. Water	100%	75%	100%	25%	100%	100%
D. Biodiversity	100%	75%	75%	75%	100%	100%
E. Land and soil	100%	75%	75%	25%	100%	100%
F. Agriculture	100%	75%	100%	25%	100%	100%
G. Energy	100%	100%	100%	25%	100%	100%
H. Transport	100%	100%	100%	25%	100%	100%
I. Waste	100%	100%	100%	25%	100%	100%
J. Environmental financing	100%	100%	100%	25%	100%	100%
Total	100%	100%	100%	25%	100%	100%

Key:

0/no data	25 %	50 %	75 %	100%
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³⁶ EEA, 2017. ENI SEIS II East Project: expected results. <https://eni-seis.eionet.europa.eu/east/areas-of-work/communication/information-campaign/online-access-and-availability-of-environmental-information-in-the-east-region>

³⁷ Ibid.

ECE environmental indicators are widely used for national state-of-the-environment assessment and reporting, in country reports under multilateral environmental agreements and for international assessments. It helps to make the related information used for effective environmental decision-making and further contribute to the improved quality of indicators. All six countries produce at least some environmental reports. National state-of-the-environment reports are published according their national legislation (every five or four years). However, national state-of-the-environment reports are not published regularly, except in Belarus and Ukraine. The ministries responsible for the environment are the publishers of most environmental reports but they are often co-funded with external support. In almost all six Eastern Partnership countries, specialised environmental bulletins are published on a half-yearly, quarterly, monthly, weekly or even daily basis. They include monitoring data with interpretation but without detailed analysis.³⁸ Moreover, national statistical offices are producing key data for assessments and indicators and disseminate them in database or electronic statistical yearbook formats in their official websites.

All Eastern Partnership countries are actively developing frameworks for monitoring and reporting the attainment of the Sustainable Development Goals. A robust set of environment statistics is essential for measuring the environment-related Sustainable Development Goals and requires continued efforts and long-term perspective for reflecting new policy demands such as green growth and the circular economy. In most of the six eastern countries, thematic topics and reports are covered by national communication: UNFCCC, CBD, UNDP, ECE Conventions and Sustainable Development progress reports. These reports are using environmental indicators and include monitoring of their achievements as a part of the assessment process. Existing national Concepts of Transition to Sustainable Development cover environmental and socio-economic aspects. This includes monitoring of nationally identifies targets. “National Strategy for sustainable development for the period up to 2020 of the Republic of Belarus”, “National Environmental Policy of Ukraine: Assessment and Development Strategy”, “Nationalization of indicators for SDGs in Moldova” in contain list of national goals and targets to be achieved and monitored.

³⁸ Ibid.

Chapter IV.

Recommendations

The work of ECE, UNEP and EEA on SEIS development in the countries of Europe and Central Asia has proved SEIS to be an efficient tool for the production of state-of-the-environment assessments and implementation of environmental policy on the local, national and global levels. This publication makes a series of recommendations to achieve the full SEIS implementation by 2021. The recommendations are based on several sources – the case studies on the implementation of SEIS and environmental policies in Central Asia, the ENI SEIS II East project, the mid-term review on the establishment of SEIS and the series of country factsheets on the status of SEIS in 2018 – which are summarized below.

1. Recommendations on indicator development

Elevate indicator use for environmental policymaking

The mid-term review has identified both continued positive developments made by the countries since the first progress review in 2016 as well as certain limitations. The implementation of SEIS depends on the effective environmental policymaking, this is why countries should augment the use of environmental indicators for state-of-the-environment reporting and environmental policymaking, for example, tracking progress towards policy targets and reporting on the implementation of the Sustainable Development Goals.

Boost higher quality of indicators

The mid-term review of the establishment of SEIS concluded that countries should use best available practices to improve the communication of indicators in terms of their content, the completeness of metadata, the visual representation of trends and patterns, particularly, the assessment of indicators as a part of environmental policy.

Enhance the availability of the ECE environmental indicators

The country factsheets suggest that Armenia, Azerbaijan, Belarus and the Republic of Moldova need to make sure all environmental information is available online, including ECE environmental indicators, in line with the SEIS principles to achieve the full implementation of SEIS by 2021.

Use the core indicators

There is a need for countries to produce, share and make available the same set of the core indicators to facilitate the comparability of countries with one another. It will allow to identify issues and encourage countries to share the best practices in the production of environmental indicators and statistics and management of environmental data and information.

Promote and strengthen the use of indicators for different purposes

Generally, country factsheets propose countries to boost the use of ECE environmental indicators for different purposes, for instance under the multilateral environmental agreements by assessing and promoting the use of ECE environmental indicators to monitor the achievement of Sustainable Development Goals and green economy. and

2. Recommendations on national and international cooperation

Boost participation of the countries

The implementation of SEIS depends upon good cooperation and interaction between national environmental information producers. In spite of clear progress proved in the mid-term review, there is still a great need to enhance the participation of countries in the SEIS process by actively participating in SEIS-related activities and by producing regularly self-assessment. It will facilitate identification of existing gaps in the implementation SEIS over time and will allow proposing the measure to address them.

Strengthen cooperation at the national, regional and international levels

Countries are encouraged to improve institutional cooperation between fragmented data producers and users. Environmental authorities should work closely with their corresponding national statistical agencies to integrate and share information. In addition, strengthening of regional cooperation in Central Asia by bringing together relevant stakeholders and coordinating activities would make the work of such programs as Integrated Water Resource Management, the Aarhus Convention and Integrated Pollution Prevention and Control more effective. Last but not least, countries would benefit from joint consultations, training and other capacity-development activities, possibly with international support of such organizations as ECE, EEA and UNEP should involve both indicator producers and the editorial teams of statistical, environmental and other relevant publications. International cross-country support and capacity-building should focus on common gaps, such as indicator definitions, the completeness and quality of metainformation, accessibility and indicator quality.

3. Recommendations on data development

Ameliorate data availability and data demand

The case study proposes that to achieve better implementation of the three policies in the countries of Central Asia - Integrated Water Resource Management, the Aarhus Convention and Integrated Pollution Prevention and Control – would demand higher public availability of environmental information and data at the national level in the subregion. Besides, Central Asian countries should create demand for environmental data at a level of mass within these three policies since there is much room for new users. In addition, countries should use regularly international practices as it will lead to the public access to self-monitoring data, facility-specific information of environmental significance and other environment-related information.

Make collection, management and sharing online of data effective

The case study shows that it is indispensable for countries of the Central Asian region to strive to produce, manage and share online environmental data and information in order to promote usage of environmental information for different purposes and to meet different reporting obligations, including reporting on multilateral environmental agreements and on progress towards implementing the environmental dimension of the 2030 Agenda for Sustainable Development, particularly its Sustainable Development Goals. Furthermore, production and sharing of water quality and quantity data are also important in Central Asia when it comes to the implementation of Integrated Water Resource Management.

Strengthen and coordinate data sharing processes as much as vital for countries as enhancement of environmental indicators and statistics production to report regularly on the progress made towards the Sustainable Development Goals.

Improve data transparency in environmental monitoring and reporting

Countries of Central Asia should reach a new level of decentralization and transparency in monitoring and reporting environmental data when implementing Integrated Pollution Prevention and Control policy, according to the case study.

Increase the user-friendliness of online content

The current status on progress made on the ENI SEIS II East project suggests that the targeted countries (Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine) should continue improving the content and user-friendliness of the websites where SEIS-related information is published.

4. *Recommendations on environmental assessments and reporting*

Make environmental assessments as an effective tool of environmental reporting

Countries should produce environmental assessments (UNEP Global Environment Outlook reports, EEA State of Environment Reports and national state-of-the-environment reports) as they can be used as a starting point for designing of trends and tendencies and highlighting of emerging issues. Usually, they contain environmental information, statistics and data across various sectors and themes, this is why environmental assessments help to understand the state of the environment and progress towards agreed policy goals such as Global Environmental Goals drawn from existing international treaties and non-legally binding instruments, as well as progress towards the Sustainable Development Goals.

Bolster the knowledge base

After consultations with Governments of Central Asia, the case study concluded that there is a high demand for regional countries in strengthening the knowledge base of integrated environmental assessments and reporting on the state of the environment. It can be done, for instance, by connecting relevant environmental information and data and by making this information easily accessible and available for different users in line with SEIS principles of open access to data, especially to manage environmental information as close as possible to its source, collect it once and share for many purposes.

Enhance the quality of reports

Countries should improve, in the case of Azerbaijan and Georgia, the quality of reports, while Belarus and the Republic of Moldova should increase awareness of assessments. The three countries in the Caucasus should strengthen communication and the role of the environmental assessments, especially state-of-the-environment reports, in policy development and decision-making to be relevant and well-informed. Azerbaijan, Belarus and the Republic of Moldova need to improve the recommendatory sections of their state-of-the-environment or thematic reports and Azerbaijan should, in addition, strengthen the sectoral parts. In addition, Belarus needs to up-to-date environmental information.

Improve reporting under the SEIS Assessment framework

Piloting the assessment framework in preparing the mid-term review report was not only a significant step forward in assessing the implementation of SEIS by 2021, but it has most importantly identified gaps in the establishment of SEIS covering relevant pillars, thematic categories and data flows that should be dealt with. Therefore, the mid-term review shows that six countries of Eastern Europe and the Caucasus should enhance the accuracy and accessibility categories. In Central Asia improvements most needed in the comparability; relevance; accuracy; timeliness and punctuality; and accessibility. South-Eastern countries should enhance the relevance, accuracy, timeliness and punctuality categories. EEA countries the gaps should be addressed in the accuracy and relevance categories. In the long-term countries might use the SEIS assessment framework for self-assessment continuously as quality control and quality assurance tool for all ECE environmental indicators.

5. *Recommendations on Institutional and organisational arrangements*

Ameliorate reporting under multilateral environmental agreements

At the international level, there is a need to strengthen interaction and, where appropriate, joint work on specific indicators of common interest with global and regional multilateral environmental agreements. Countries in the subregion then need to increase their use of those indicators when preparing reports under multilateral environmental agreements. At the national level, countries should improve the quality of reports under multilateral environmental agreements. Moreover, there is a need for the use of ECE environmental indicators under multilateral agreements.

Adopt new regulations and policies

Countries should introduce new regulations for self-monitoring, self-reporting and handling confidential industrial. ENI SEIS II East project shows that continued efforts are required from countries to reflect new policy demands such as green growth and the circular economy. For instance, according to the country factsheets despite the progress made in Azerbaijan on environmental policy, there is still a need to strengthen its environmental monitoring network and information exchange. Countries need to better align data collection processes with national policy contexts and targets and improve the use of available data flows and related indicators in the production of environmental assessments and reports. In addition, new regulations and policies of the countries should be underpinned by reliable data, agreed policy goals, integrated environmental assessments and the state-of-the-environment.

6. *General recommendations*

Reinforce SEIS implementation

Further establishment of SEIS pillars and principles across the regions could help to facilitate not only implementation of regional policies— Integrated Water Resource Management, the Aarhus Convention and Integrated Pollution Prevention and Control – and fill existing data gaps in relation to these policies but also to create new means of collecting and accessing environmental data by dealing with different challenging elements content, cooperation and infrastructure) that are presently impeding progress. SEIS highlights the value of the free flow of environmental information from providers to users (“easily accessible to all users”) and localization of data collection and presentation (“managed as close as possible to its source”).

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Annex.

United Nations Economic Commission for Europe set of environmental indicators

<i>Environmental indicator</i>	<i>Update date</i>
A1. Emissions of pollutants into the atmospheric air	October 2014
A2. Ambient air quality in urban areas	October 2014
A3. Consumption of ozone-depleting substances	October 2014
B1. Air temperature	October 2014
B2. Atmospheric precipitation	October 2014
B3. Greenhouse gas emissions	October 2014
C1. Renewable freshwater resources	October 2014
C2. Freshwater abstraction	October 2014
C3. Total water use	October 2014
C4. Household water use per capita	October 2014
C5 and C6 (integrated) Water supply industry and population connected to water supply industry	October 2014
C7. Water losses	October 2014
C8. Reuse and recycling of freshwater	October 2014
C9. Drinking water quality	October 2014
C10. BOD and concentration of ammonium in rivers	October 2014
C11. Nutrients in freshwater	October 2014
C12. Nutrients in coastal seawaters	October 2014
C13. Concentrations of pollutants in coastal seawater and sediments (except nutrients)	October 2014
C14. Population connected to wastewater treatment	October 2014
C15. Wastewater treatment facilities	October 2014
C16. Polluted (not-treated) wastewaters	October 2014
D1. Protected areas	October 2014
D2. Biosphere reserves and wetlands of international importance	Placeholder
D3. Forests and other wooded land	October 2014
D4. Threatened and protected species	October 2014
D5. Trends in the number and distribution of selected species	October 2014
D6. Invasive alien species	Placeholder
E1. Land uptake	October 2014
E2. Area affected by soil erosion	October 2014
F1. Irrigation	Placeholder
F2. Fertilizer consumption	October 2014
F3. Gross nitrogen balance	Placeholder
F4. Pesticide consumption	October 2014
G1. Final energy consumption	July 2016
G2. Total primary energy supply	July 2016
G3. Energy intensity	July 2016
G4. Renewable energy consumption	July 2016
G5. Final electricity consumption	Placeholder
G6. Gross electricity production	Placeholder
H1. Passenger transport demand	October 2014
H2. Freight transport demand	October 2014
H3. Composition of road motor vehicle fleet by fuel type	October 2014
H4. Age of road motor vehicle fleet	October 2014
I1. Waste generation	October 2014
I2. Management of hazardous waste	October 2014
I3. Waste reuse and recycling	May 2015
I4. Final waste disposal	May 2015
J1. Environment protection expenditure	Placeholder