UNECE

Current state and development of the Shared Environmental Information System (SEIS)




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Bosnia and Herzegovina

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BACKGROUND

IMPROVED ENVIRONMENTAL MONITORING AND ASSESSMENT IN SUPPORT OF THE 2030 SUSTAINABLE DEVELOPMENT AGENDA IN SOUTH-EASTERN EUROPE, CENTRAL ASIA AND THE CAUCASUS

Led by the United Nations Economic Commission for Europe (UNECE) and implemented together with the United Nations Environment Programme (UNEP), this project aims to strengthen the national capacities of seven target countries: Armenia, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, North Macedonia and Tajikistan. The target countries have requested support to improve environmental monitoring and assessment for the 2030 Agenda, highlighting the need to enhance the comparability of environmental statistics in the UNECE region.

The project will focus on the following expected accomplishments:

- strengthened capacities of national environmental authorities and statistical agencies to collect and produce required data and application of environmental indicators in accordance with the Shared Environmental Information System (SEIS) principles and practices;
- improved accessibility and use of regularly updated and high-quality environmental indicators, within the framework of SEIS, to respond to international indicator-based reporting obligations, including monitoring progress towards the Sustainable Development Goals (SDGs).

The current report intends to address some of the national gaps and needs identified for this project on SEIS establishment and on the collection and management of environmental information and data for regular reporting, such as for the 2030 Agenda. The gap analysis also intends to address the use of environmental data and information in decision-making processes and communication.

The gap analysis review will serve multiple purposes, including defining existing gaps in data collection in the target country as a basis for developing training materials and as a background paper for two national workshops with national officials and experts responsible for environmental data collection. It will also contribute towards the development of national roadmaps to monitor the SDGs for each target country to support country ownership and future endorsement and implementation.

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INTRODUCTION

Bosnia and Herzegovina is situated on the Balkan Peninsula in South-Eastern Europe. Of the total area of the country (51,209 km^2), 42 per cent is covered by mountains while 61 per cent is covered by forests and other natural vegetation. The Dinaric Alps cross the country from its western border with Croatia to the south-east. Bosnia and Herzegovina has two main river basins: the Black Sea basin, which drains 76 per cent of the country, and the Adriatic Sea basin, which drains 24 per cent.

Bosnia and Herzegovina is a sovereign state with a decentralized political and administrative structure. It is divided into two entities and one district: Republika Srpska, the Federation of Bosnia and Herzegovina (hereinafter, the Federation) and Brčko District. The Federation is subdivided into 10 cantons. Decision-making involves the Council of Ministers of Bosnia and Herzegovina, the Federation, the 10 cantonal governments, Republika Srpska, and Brčko District.

Bosnia and Herzegovina is an industrial and agriculture country. The sectors with the highest share of GDP in 2016 by value added were trade (14 per cent), manufacturing (12 per cent), public administration (8 per cent) and agriculture, forestry and fishing (6 per cent).

Bosnia and Herzegovina is a member of the European Environmental Agency (EEA), one of the group of six West Balkan cooperating countries. It reports on some indicators to the European Environment Information and Observation Network (Eionet) through its national focal point.

According to national and subnational strategies, action plans and reports to multilateral environmental agreements (MEAs), the main environmental problems of Bosnia and Herzegovina are:

- Air pollution;
- Waste management;
- Biodiversity preservation;
- Land degradation;
- Climate change.

The Stabilization and Association Agreement, which serves as a basis for the implementation of the European Union (EU) accession process, entered into force on 1 June 2015 and in 2016 Bosnia and Herzegovina submitted its EU membership application.

STATUS AND DEVELOPMENT OF SEIS

The Transport, Environment, Energy and Regional Statistics Department of the Agency for Statistics of Bosnia and Herzegovina (BHAS) plays an active role in support of establishing SEIS and in regular reporting in the pan-European region. The head of that department is a member of both the UNECE Joint Task Force on Environmental Statistics and Indicators and the UNECE Working Group on Environmental Monitoring and Assessment. As its member of the Working Group on Environmental Monitoring and Assessment, the department head is also the SEIS focal point for Bosnia and Herzegovina.

The 2016 progress report on the establishment of SEIS, in terms of availability and accessibility of the 67 SEIS data sets, showed that for Bosnia and Herzegovina more than half of the data sets (63 per cent) are published online and located on one platform that provides easy access to published data sets. The country's self-assessment, conducted in 2018, based on only seven mandatory data flows, revealed an overall good performance score of 89 per cent. This good score achieved for chosen data

flows[1] confirms positive developments such as the multipurpose use of data (due to an increased reporting burden) and that national legislation or programmes related to regular production and sharing of data were in place. Only the BHAS web platform is identified as a data-sharing platform, however, other available platforms are not mentioned. This may imply the strong determination and intention of BHAS for sharing data collected from other data producers.

SEIS PILLAR I CONTENT

Current system of collection of environmental data

Environmental monitoring falls within the legal and institutional frameworks of the Federation, Republika Srpska and Brčko District. In Bosnia and Herzegovina, there is no environmental agency at state or entity levels.

The established monitoring programmes include air quality monitoring, air emissions monitoring (entity hydrometeorological institutes), water pollution monitoring (entity watershed agencies and public health institutes), monitoring of agricultural land (entity institutes for agropedology and agriculture), waste (entity environmental funds[2]) and monitoring of forests (at entity and cantonal levels). There is partial monitoring of biodiversity (mainly project-based). There is no monitoring of land use. Statistical institutes collect data on waste (according to Regulation on waste statistics 2150/2002/EC).

Data on land and soil resources for the country or entities of Bosnia and Herzegovina can be only obtained through the international EEA spatial database CORINEL and Cover (CLC).[3]

These are individual systems for collecting and reporting data on the environment. The current systems for the collection of environmental data can be seen as fragmented, partial, closed and insufficient regarding information gathering, indicator production and data accessibility for the public. Data are stored digitally in institutions and they are accessible to a third party only upon request based on laws on free access to information.

The effect has been policy incoherence between the state and entity level as well as between entities.

An overview of the environmental data at the state level can be obtained through data collected by BHAS, which is an official provider of data needed for national purposes and international reporting. BHAS also reports some environmental data to Eurostat (the EU statistical office), the Food and Agriculture Organization of the United Nations (FAO), UNECE, the United Nations Statistical Division and others. Article 8 of the Law on Statistics says in part that BHAS is to "collect, process and disseminate Statistics of Bosnia and Herzegovina in accordance with internationally accepted standards based on data submitted by the Entity Institutes and/or data collected directly by the Agency. For these purposes the Agency may (i) where it considers necessary for the performance of its statutory functions provided herein collect statistical data from any Statistical Unit in the Entities; and (ii) collect data for its statutory functions provided herein from Institutions of Bosnia and Herzegovina; legal entities at the State level; international organizations operating within the borders of Bosnia and Herzegovina and foreign owned and controlled companies."

[1] Ambient air quality, BOD and concentration of ammonium in rivers and total protected areas.
[2] Since 2018 the Environmental Protection Fund of the Federation has conducted monitoring activities and is establishing an information system for all categories of waste.
[3] So far three CORINE projects were implemented in the country – CLC 2000, CLC 2006 and CLC 2012.

Production of environmental indicators

BHAS annual workplans envisage international reporting and the development of environmental indicators defined by EEA, Eurostat, UNECE, the Organization for Economic Co-operation and Development (OECD), FAO and others. These indicators are mainly used for international reporting and some correspond to national indicators published in statistical yearly publications, available on the BHAS website. BHAS has already issued some SDG indicators.[4]

BHAS reported that 33 UNECE indicators out of 49 are produced.[5]

The current process of revision of the state-of-the-environment report (2013–2017) for selected topics and related EEA indicators[6] confirms the following: data on air are aligned with related EEA indicators, there is a methodological inconsistency with some of the chosen EEA surface and groundwater indicators, and data on medical hazardous waste and hazardous waste generated by households are missing.

UNECE environmental indicators are mainly available on BHAS platforms, but platforms of hydromets and the entity ministries of the environment, the website of the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina,[7] national web platforms for the United Nations Framework Convention on Climate Change (www.unfccc.ba) and the Convention on Biological Diversity and other platforms where publications with data are available have been considered for some indicators.

These platforms have been analysed using the SEIS quality criteria. As an integrated platform that provides access to all data sets and key environmental indicators, the BHAS platform provides data in the form of thematic bulletins, statistical releases and Excel spreadsheets (for UNECE environmental indicators). The analysis of the main set of indicators identified the following gaps:

1. The majority of the indicators include no metadata, narrative assessments,[8] or recommendations for use in state environmental policy.
2. Not all indicators completely meet the accuracy criterion. Some indicators do not contain a full set of data flows. Not all indicators are accompanied by information on other available data on the same topic.
3. The absence of time series and the unavailability of data or the lack of necessary details for some indicators preclude the broad application of those indicators.
4. The absence of references to internationally agreed-upon techniques for measurement and calculation means that users cannot tell if these techniques are used.
5. Data produced by statistical agencies or MEA national websites are available in English and presented visually, but without interactive visualizations.
6. The first state-of-the-environment report revealed discrepancies between official Bosnia and Herzegovina data and data obtained from other sources.
7. Statistical agencies ensure data quality by developing and prescribing methodologies for the whole data compilation process. BHAS collects user feedback through an online user survey to

[4] http://www.bhas.ba/tematskibilteni/TB_I_odr_razvBiH_BS.pdf
[5] Eighth Environment for Europe Ministerial Conference (2016 Batumi), Report on progress in establishing the Shared Environmental Information System in support of regular reporting in the pan-European region.
[6] Land and soil resources, Surface and Ground Waters, Air Pollution and Ozone Depletion, Waste Management.
[7] http://www.mvteo.gov.ba/Content/Read/vodni-resursi-zastita-okoline-izvjestaji-publikacije?lang=hr
[8] An example of a narrative assessment of indicators and recommendations in the context of designing or evaluating environmental policies is given in a recently launched publication on Sustainable Developments Goals in Bosnia and Herzegovina or in the national communications report on greenhouse gases.

determine user satisfaction. Strengthening cooperation with domestic and foreign data users for better identification of their needs is a continuous process.

8. The use of data checking and revision procedures includes quality management procedures in BHAS, Eurostat's Statistical requirements compendium, and the recommendations of Eurostat's Leadership Group on Quality.
9. Some common and obvious data, such as a map of protected areas network in Bosnia and Herzegovina,[9] are still missing due to missing geospatial data and to poor coordination among institutes regarding data exchange.

Annex 1 provides the detailed assessment results.

Uses of environmental information

BHAS is the competent body for processing, disseminating and endorsing Statistics of Bosnia and Herzegovina for both MEA reporting and national environmental reporting.

SEIS PILLAR II INFRASTRUCTURE

Data collection

At the country level, the main organization responsible for environmental data collection and production of some environmental indicators for reporting purposes is the Agency for Statistics of Bosnia and Herzegovina. Legislation, however, requires that environmental monitoring be carried out at entity level. Several institutions are in charge of environmental monitoring and data collection:

- The Hydrometeorological Institute of Federation of Bosnia and Herzegovina for air quality and water quality;
- The Hydrometeorological Institute of Republika Srpska for air quality, emissions into the air (PRTR, GHG inventory) and water quality;
- The Federal Institute on Agropedology, Agricultural Institute of Republika Srpska for agricultural soil contamination;
- The Agricultural Institute of Republika Srpska for agricultural soil contamination;
- The Sava River Watershed Agency, the Adriatic Sea Watershed Agency, and the Public Enterprise, Vode Srpske for water pollution monitoring;
- The Federal Ministry of Environment and Tourism for PRTR
- The Federal Institute for Geology and the Geological Survey of Republika Srpska for Cadastre of Land Sliding Sites;
- The Institute for Protection of Cultural, Historical and Natural Heritage of Republika Srpska for biodiversity monitoring;
- The Department for Urban Development and Property Rights Matters of the Brčko District of Bosnia and Herzegovina for air monitoring.

Much of the entity environmental legislation and corresponding environmental strategies and reports to MEAs provide for the establishment of relevant information systems.

In general, there is some progress in terms of IT systems for data management, for example a database on air pollution in the Federation; an information system on water monitoring in Bosnia and Herzegovina; an information system on biodiversity in Republika Srpska; a database of contamination

of agricultural land in the Federation; and the development of pollution release and transfer registers in both entities.

An information system on waste, in accordance with the Federal Rulebook on Information System on Waste[10] (intended to be a set of interconnected databases on waste categories) is to be built on the SEIS principle of inter-operability.

A recent Federal Government decision puts the Federation's Fund for Environmental Protection in charge of establishing and developing an information system on environment and nature. In addition, all relevant institutions and data providers responsible for data collection on air pollution, water, waste, land, and nature are required to submit data regularly to the Fund in order to establish integrated software and prepare environmental reports.

Processing and analysis

Within the entity and cantonal public authorities that perform environmental monitoring, data are processed mainly by using office applications or specially developed software.[11] On the other hand, these institutions are not familiar with innovative solutions based on free open software for data harmonization or for management of ETL (extract, transform and load) data flows.

Dissemination of environmental information

In addition to the platforms of statistical agency or institutes, there is some progress towards establishing web infrastructure related to visibility (and availability) of environmental data, such as the recently launched web platforms on biodiversity,[12] disaster risk analysis,[13] and the atlas on territorial attractiveness of the Danube Region.[14] ATTRACTIVE DANUBE focuses on strengthening multilevel and transnational governance and institutional capacity of policy planners working to develop the Danube Region. On 12 March 2019, the Agency for Statistics of Bosnia and Herzegovina signed a memorandum on "Managing a Platform for Monitoring Territorial Attractiveness in Bosnia and Herzegovina" with representatives of six Bosnia and Herzegovina institutions on data transfer to this platform.

But all these donor-supported platforms are still at an initial phase and further development is needed. Reporting to some MEAs is accompanied by national web pages, created for the purpose of informing the wider public on implementing the related convention, such as a web page for tracking climate change issues.

The reporting to MEAs is often facilitated by technical support with the conventions themselves offering Parties open source solutions for using global data or for uploading the country's data. Corresponding webinars help users learn these tools.[15]

A further development is the use of the EEA land cover database, CORINE.

[10] The Rulebook on Information System on Waste (Official Gazette of the Federation no. 97/18).
[11] For example, the Soil and Terrain database (SOTER), EMEP/CORINAIR emission inventory, software for greenhouse gas emissions, developed by IPCC guidelines and others.
[12] GIZ sub-project "Regional Network for Biodiversity Information Management and Reporting". For Republika Srpska, see: http://e-priroda.rs.ba/en/. In the Federation, the developed page is not still public.
[13] http://dras.undp.ba
[14] www.interreg-danube.eu/attractive-danube, http://cotamp.gis.si/attractive_danube/, http://tamp.gis.si/bih/
[15] UN Biodiversity Lab online platform or MapX, which allows interested parties to access global data layers, upload and manipulate their own data sets, and query multiple data sets to provide key information on the Aichi Biodiversity Targets and nature-based SDGs.

Most governmental websites, as a means of data dissemination, offer data in the form of publications or reports, although content updates on these sites can be rare. Public access to data on websites depends on having a known website, server or databases that are supported by IT infrastructure and skilled staff and a policy of transparency for open data. Most of the government websites are non-editable (static), but some offer editable brochures and more user engagement or have a content management system.

SEIS PILLAR III COOPERATION

Basis and practice of inter-agency exchange of environmental information

Memorandums of understanding or laws are often used to set the terms for sharing environmental data among institutions. Data are mainly shared through standardized forms of office applications. There is no standardized system of environmental data transfer and reporting of environmental data at the state level. Data are scattered by topics and subtopics among numerous institutions and so there is little coordination.

The missing or un-integrated data make the whole process of reporting on the state of the environment difficult, time consuming, uneconomical and inefficient.

These gaps were addressed through two projects – the development of a national environmental monitoring system[16] and the strengthening of environmental institutions[17]– by which donors tried to establish the system of environmental monitoring and reporting to Eionet by channelling data collection and data flows and establishing national reference centres on environmental topics. Still, a clear reporting system in Bosnia and Herzegovina has never been established.[18]

Some National Reference Centres report their data directly to EEA/Eionet, often without publishing them on national or entity platforms for a variety of reasons – insufficient IT infrastructure; the lack of coordination by the Ministry of Foreign Trade and Environmental Relations of Bosnia and Herzegovina;[19] the lack of obligation to make these data transparent; the lack of knowledge regarding SEIS; and the unwillingness of institutions or national focal points, which are (often) at lower administrative levels, including faculties or individuals, to provide integrated data to a third party, even BHAS.

Inter-sectoral exchange: producers vs. users of information

Entity statistical institutes regularly publish statistical yearbooks on their websites, and BHAS publishes thematic bulletins by topic. The yearbooks, thematic bulletins and statistical releases are published in the local language and English. Air quality monitoring stations and water level monitoring

[16] EU project "Development of a National Environmental Monitoring System of Bosnia and Herzegovina".
[17] EU IPA 2008 project "Strengthening of Bosnia and Herzegovina Environmental Institutions and Preparation for Pre-Accession Funds".
[18] The proposal for monitoring the environment was submitted in the form of a memorandum of understanding and signed by the Council of Ministers, the Federation, Republika Srpska and and the EUD on behalf of the EU. But the proposal was not legally binding.
[19] Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina is responsible for defining policies, basic principles, coordinating activities and harmonizing plans of entity authorities and bodies at the international level in the areas of, inter alia, environmental protection, development and use of natural resources.

stations offer data in real time, while reports on air quality and emissions, water and other data are available as yearly publications on the websites of institutions performing the environmental monitoring. On the website of the federal hydrometeorological agency, users can download data by using open software solutions or an application programming interface (API), and the data can be made inter-operable by any interested third party or platform such as OpenAQ.[20]

International exchange and reporting

In the framework of reporting to secretariats of MEAs, reporting is enabled, supported and facilitated by international organizations and donors. The country regularly reports on the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the United Nations Convention to Combat Desertification. These reports are available in the local and English languages on the website of the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina.[21]

SEIS PRINCIPLES AND CONCLUSIONS

There is slow progress at the state and entity levels of government regarding creation and implementation of the SEIS content, infrastructure and cooperation elements. Progress is slowed due to issues with data availability on the web platform of BHAS, but the main gap is in cooperation and data exchange among institutions due to the absence of vertical and horizontal coordination.

In Bosnia and Herzegovina, neither the state nor the entity level maintains an official policy on the implementation of SEIS principles.

Various laws provide for the establishment of monitoring, data collection and data sharing, but there is little progress in establishing IT systems for data management. Some entities lack specific laws or bylaws regarding the introduction of information systems, and where the laws exist, the implementation is inadequate. There are some separate, individual systems for collecting and reporting data on the environment, but there is no system of data aggregation at the state level.

Web pages of institutions usually host data in the form of publications or reports, but databases are unavailable. Modern free open source solutions and services that enable inter-operability are not used in data sharing or data exchange. Data sharing is based on an official request by an institution or an established data flow among institutions. Generally, Excel spreadsheets and e-mails are used, though they do not constitute a data exchange or management system. Public access to information is based on entity laws on free access to information and on whether the medium is paper or electronic. Some of recent initiatives such as web platforms[22] with environmental reports towards MEAs although mainly developed with donor support do not contain databases (e.g. GHG emission inventory) related to these reports. With support from international organizations and donors in reporting to MEAs is mainly project-based and rarely focuses on implementation of SEIS principles.

Further improvements and development are needed for e-government solutions in government-to-citizens and government-to-government communications. The Agency for Information Society of Republika Srpska prescribes regulations on access to records and public data exchange as well as guidance on developing information systems in Republika Srpska institutions.

[20] API was developed by the platform https://openaq.org, which promotes open data policy through IT solutions such as github and APIs.
[21] http://www.mvteo.gov.ba/Content/Read/vodni-resursi-zastita-okoline-izvjestaji-publikacije
[22] www.unfccc.ba, http://www.bih-chm-cbd.ba/Bos/fq_bos.htm

Statistical data and indicators are disseminated in the form of publications, and the use of some data visualization is foreseen for the near future. The Transport, Energy, and Environment Department in the Agency for Statistics developed an e-publication, but it is not yet available on the new BHAS website.

Some progress would be visible when the new BHAS website (www.bhas.gov.ba) becomes fully functional with databases and UNECE indicators.

So far there were no activities undertaken or action plans made regarding introduction and reinforcement of implementation of SEIS principles among institutions such as ministries, expert institutions, national focal points of MEAs and EEA, statistics, Aarhus centres and NGOs.

SDG MONITORING AND REPORTING FRAMEWORK

The United Nations plays an active and supporting role in Bosnia and Herzegovina, aiming at development of a set of national SDG indicators and an SDG roadmap for the implementation of the SDGs in the country in the next 15-year period. In April 2017, a high-level SDG conference was held as an official launch of Agenda 2030. The Bosnia and Herzegovina Directorate for Economic Planning is taking the lead, supported by the Council of Ministers and the UN, and in cooperation with all relevant institutions in the country, gathered through working groups that actively inform all stakeholders on the objectives of the 2030 Agenda. In addition, three working subgroups have been formed to prepare material related to the SDG framework in Bosnia and Herzegovina and voluntary national reports, and to strengthen the collection of the necessary data.

As an initial step, the United Nations Mainstreaming, Acceleration and Policy Support (MAPS) Rapid Integrated Assessment (RIA) tool was used to assess the state of the alignment of the SDGs with the priorities in the country. A comprehensive policy review was undertaken in order to assess the level of preparedness for implementation and monitoring of the SDGs. Yet given the hundreds of sectoral strategies that have been developed across the various administrative levels in the country and the fact that no fully-fledged development strategies were in place, a policy review was technically impossible. Therefore, key institutional partners, engaged in the SDGs, agreed to a list of 69 strategic documents as the subject of the review.

Two of the main objectives of this assessment were to identify detailed linkages between the preselected key strategies and action plans in Bosnia and Herzegovina, and to identify the extent of alignment with the SDGs at the SDG target and indicator level. The assessment mapped the existing policy landscape across different levels of governance. This provided a basis for vertical and horizontal policy integration and coherence. The RIA analysis developed comments and recommendations on the measures required to guide the incorporation of the SDGs adapted for Bosnia and Herzegovina into government policy at all administrative levels and to inform international partners supporting the implementation of reforms and SDGs in Bosnia and Herzegovina.

The development of the strategies, reviewed through RIA, shows that sustainable development in Bosnia and Herzegovina is generally well covered. The strategic documents, programmes and action plans reflect all 17 SDGs of the 2030 Agenda.

Data and statistics are paramount in the adequate planning, implementation, monitoring and reporting on the SDGs. SDG dashboards were created for the state level. Based on the dashboard data, a complexity analysis was conducted for the country, SDG complexity maps were produced for Bosnia and Herzegovina and a network of SDG targets and their mutual influences were identified.

All levels of the government have approved the first voluntary review – implementation of the 2030 Agenda and the Sustainable Development Goals in Bosnia and Herzegovina. For 2019, 47 countries have volunteered to present national reviews on the implementation of the 2030 Agenda, for the first time, including Bosnia and Herzegovina national reviews.

BHAS finalized the SDG statistical dashboard for Bosnia and Herzegovina. The dashboard should highlight progress being made based on available data. So far, according to the 2017 SDG index Bosnia and Herzegovina is ranked 84th with a score of 65.5. The initial SDG data collection roadmap of Bosnia and Herzegovina consists of 69 SDG targets and 104 Indicators.

In 2019, BHAS launched the first bulletin, "*Bosnia and Herzegovina Statistics for Sustainable Development Goals*".

Even though ambient air pollution has been a major concern in recent years in Bosnia and Herzegovina and databases on ambient air pollution in cities are available, these indicators are not marked as national in the country's indicator framework. For example, for SDG indicator 11.6.2, "Annual mean levels of fine particulate matter (i.e. PM2.5 and PM10) in cities (population weighted)", BHAS reported only the year 2010 with data provided by the World Health Organization (WHO). For SDG indicator 3.9.1, "Mortality rate attributed to household and ambient air pollution", WHO is reported as data provider for 2015 and 2016, but WHO has recently built the capacity of public health institutes and hydrometeorological agencies to calculate this indicator using air pollution and mortality data on AirQ+software.[23]

Data on land uptake, land degradation, erosion and material footprint are incomplete. For example, SDG indicator 15.3.1, "Proportion of land that is degraded over total land area", is reported only for 2012 although these data can be obtained through the CORINE Land Cover national focal point.

Data for indicator 15.1.1 are collected annually, but otherwise data on SDG 15 are generally missing. There are, however, data for 2007–2018 for indicators 15.4.1 "Coverage by protected areas of important sites for mountain biodiversity" and 15.1.2 "Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type".

In addition to the national SDG indicator framework, lower administrative levels may develop their own indicator framework for relevant SDGs. So far, the country's biggest challenge is leveraging cooperation and partnership in the data collection process.

In accordance with the terms of reference of the UNDA project, Annex II assesses progress on environmental indicators. According to the assessment, 33 indicators should be ranked as global environmental indicators. Those indicators are included in the following nine SDGs: 3, 6, 7, 9, 11, 12, 14 and 15. The analysis shows data consistency in time series for 10 of 13 national environmental indicators developed by BHAS. See Annex II for details.

GAPS AND SUGGESTED ACTIONS

An important step regarding the creation and use of environmental indicators at national and sub-national levels would be the final adoption by the Council of Ministers of Bosnia and Herzegovina of the list of 59 selected environmental indicators for country reporting under the three Rio Conventions. Entity governments have already adopted the list, which provides data mapping across given legal and

[23] See http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/activities/airq-software-tool-for-health-risk-assessment-of-air-pollution.

institutional frameworks and existing reporting among institutions. Many environmental and other reports confirm the importance of generating environmental indicators in regular times series of harmonized and comparable data sets.

Implementation of SEIS in Bosnia and Herzegovina requires technical solutions and the political will to introduce and accept SEIS as a decentralized yet integrated system that improves the quality, availability, data integrity, accessibility and understanding of environmental information.

The complex administrative structure that includes a second tier of government in Bosnia and Herzegovina could favour implementation of SEIS principles, especially those related to the management of data as close as possible to its source, public access to data and the collection once for multiple purposes. These principles also promote an economical way of using data. A reduction in the administrative burden of public authorities, and the associated cost savings from improved efficiencies are added benefits of SEIS.

The following table presents the main project-specific priorities of SEIS implementation in Bosnia and Herzegovina for 2019–2020.

Gaps	Long-term actions not directly associated with the UNDA Project	Short-term actions that can be taken by UNDA Project partners
Incomplete production or presentation of selected indicators as per UNECE standards: not all required data flows are included, no metadata, visualisation, narrative analysis, policy use recommendations.		Assist in further development of environmental indicators.
Missing some UNECE indicators (or other indicators) on the BHAS web platform, with corresponding metadata, narrative and databases.	Publication of the UNECE indicators (or other indicators) on the BHAS web platform, with corresponding metadata, narrative and databases. This process has been already started with establishing new web site of BHAS.	Translation of metadata and preparation of a narrative on indicator use in local languages. Advocate or influence the Department for international cooperation and IT department within BHAS on importance and necessity of this process. Transport, Environment, Energy and Regional Statistics Department should lead this process.
Missing visualization tools which could enable data visualisation of chosen environmental indicators on BHAS web platform.	Use modern and free open data technologies on data visualization (static and interactive).	Training for IT staff on appropriate tools on data visualization.
Decision makers or relevant ministries, national focal points for MEAs and EEA, statistical institutes, the inter-entity environmental body, the Agency for Information Society of	Introduce the SEIS concept with the help of the international community, the Ministry of Foreign Trade and Environmental Relations and	

Republika Srpska, representatives of Aarhus Centres are not mainly familiar with the SEIS concept and how it works.	the BHAS SEIS focal point to relevant stakeholders. Organize a conference or a workshop with presentations by regional and international experts and SEIS practitioners and IT experts on open free software solutions. Reporting to SDGs and environmental indicators could serve as a starting point.	
Statistical data providers (the administrative sources of data) and entity statistical institutes are not mainly familiar with the SEIS concept.	The BHAS workplan envisages the improvement of collaboration with data providers in order to avoid an increased burden of data provision, and the facilitation of the whole process of data collection. Introduce the SEIS concept to statistical data providers by BHAS.	Assist in organizing a workshop with presentations by experts and practitioners in SEIS and IT experts in free open software solutions.
Data providers within national SDG indicator framework mainly are not mainly familiar with the SEIS concept.		With the help of the international community organize a workshop with presentations by experts and practitioners in SEIS and IT experts in free open software and SEIS concept generally.
Policymakers and decision makers are more or less familiar with the availability of the environmental indicators on BHAS website.	Organize an Open day on Statistics. Promote environmental indicators on BHAS website among policymakers for enhancing their usage as well as facilitating data collection process.	Assist the first Open day on Statistics.

The following steps may help address the gaps in the development and implementation of national indicators based on global SDG environmental indicators.

1. The UNECE environmental indicators could be used more widely in the development of national indicators for global SDG indicators. Building capacity in producing and reporting missing UNECE indicators could also contribute to the development of national indicators for global SDGs.
2. Reporting on SDGs could provide an opportunity to promote SEIS principles and pillars as monitoring and reporting requirements for this SDG framework, and to review statistical systems and capacities, improve inter-operability between different data systems and better integrate data from external sources.

3. Stronger connections and coordination could be established among organizations responsible for the UNECE environmental indicators and nationalization of global SDG indicators. The authorities and ministries responsible for coordination of this work should be clearly identified.
4. The statistical institutions in Bosnia and Herzegovina could be encouraged to complement existing indicators with disaggregated indices and indicators to cover cross-cutting dimensions of economic, social and environmentally sustainable development at all administrative levels. Missing national indicators could be developed further instead of being restricted by use of separate data that characterize global SDG environmental indicators.
5. Time series for all national indicators could be extended to include data from 2016–2018.

CONCLUSIONS

To date, certain activities have been carried out within the administrative structure of Bosnia and Herzegovina to promote the e-governance concept, to start implementation of SDGs and to introduce the green economy principles. Most of these activities started under the auspices of the international organizations that have for years been offering governments in Bosnia and Herzegovina support to address these and other development challenges. The interventions are also intended to support the country's efforts in fulfilling international commitments, such as reporting under MEAs, achieving growth through sustainable planning and the efficient management of natural resources.

The proposed actions contemplate the implementation of the SEIS principles, the monitoring of progress in achieving SDGs and the accomplishment of green economy principles. Most of these activities should be implemented at the national level and subnational – entity, cantonal – levels.

International organizations, in collaboration with Bosnia and Herzegovina governments, continue to be to a driving force in increasing the potential of the country to achieve the set of goals through the implementation of the following steps.

LONG-TERM ACTIONS (international and bilateral technical aid programmes)

- Assistance in equipping laboratories and monitoring networks with up-to-date technical and analytical facilities;
- Assistance in software development or free open software solutions in data management regarding the alignment of data sets for international use and for implementing and reporting under MEAs (by agreement with BHAS).

MID-TERM ACTIONS (UNECE, UNEP, EEA and UNDP)

- Training in modern methods and calculations of environmental parameters that meet the acknowledged international standards, and their implementation in environmental monitoring practice;
- Capacity-building within the relevant institutions regarding the preparation of regular environmental reports and use of official environmental indicators in the reports associated with the fulfilment of the requirements of MEAs and processes in which Bosnia and Herzegovina participates (climate change, desertification, SDG reporting and green growth);
- Continued support regarding capacity-building for the aggregation and processing of environmental data and statistics;

- Integration of national monitoring data into regional and global environmental assessments and reports (EEA, OECD);
- Making country data reported to EEA by national focal points available on national platforms;
- Implementation of national pilot projects demonstrating data sharing and integration, SEIS (EEA, EEA topic centres) and open data platforms, including entity decisions on SEIS use and implementation;
- Modernization of data collection through the implementation of electronic reporting systems;
- Establishment of a SEIS national implementation team, whose members should be national focal points and agency representatives;
- Training of the SEIS national implementation team on Eionet practices;
- Assistance in the development of a biodiversity monitoring system in protected areas using advanced technologies (Copernicus, CORINE, etc.);
- Methodological assistance in the creation and implementation of waste and land monitoring and SDG reporting;
- Dynamic development of new statistical products and services and improved communication with users to increase the use of statistical data;
- Annual meetings to inform data providers of the latest statistical achievements, legal acts and statistical survey activities;
- Development of statistical areas based on national and international cooperation (e.g., statistical outputs will be supported with professional comments and metadata).

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ANNEXES

ANNEX I EVALUATION OF SELECTED UNECE INDICATORS AGAINST THE SEIS ASSESSMENT FRAMEWORK CRITERIA

Core UNECE indicators							
Indicators (no. of data flows)	**Accuracy**	**Relevance**	**Timeliness & punct-uality**	**Access-ibility**	**Clarity**	**Comparability**	**Inst/org arrange-ments**
Air emissions (14)	**-/+**	**-/+**	**-/+**	**+/-**	**+/-**	**+/-**	**-/+**
Air quality (4)	**+**	**+**	**+**	**+/-**	**+/-**	**+**	**+**
OSD consumption (8)	+	+	+	+/-	+/-	+	+
Air temperature (1)	**+**	**+**	**+**	**+/-**	**+/-**	**+**	**+**
Precipitation (1)	**+**	**+**	**+**	**+/-**	**+/-**	**+**	**+**
GHG emissions (2)	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+**	**-/+**
Renewable water res (1)	**+/-**	**+/-**	**+**	**+/-**	**+/-**	**+**	**+/-**
Water abstraction (3)	**+**	**+**	**+**	**+/-**	**+/-**	**+**	**+**
Water use (4)	**+/-**	**+/-**	**+**	**+/-**	**+/-**	**+/-**	**+/-**
Water supply (1)	**+**	**+**	**+**	**+/-**	**+/-**	**+/-**	+/-
BOD and NH_4 in rivers (2)	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**
Nutrients in freshwater (5)	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**
Pop. connected to WWT (1)	**+/-**	**+/-**	**+**	**+**	**+/-**	**+/-**	+/-
WWT facilities (1)	**+**	**+**	**+**	**+/-**	**+/-**	**+/-**	+/-
Polluted wastewater (2)	**+/-**	**+/-**	**+**	**+/-**	**+/-**	**+/-**	**+/-**
Protected areas (1)	**+/-**	**-/+**	**+/-**	**-/+**	**-/+**	**+**	**+/-**
Forests and woodland (1)	**+**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**

Threatened and protect. species (2)	**-/+**	**-/+**	**-/+**	**+/-**	**-/+**	**+/-**	**+/-**
Land uptake[24],[25] (2)	**-/+**	**-/+**	**-/+**	**-/+**	**-/+**	**+/-**	**-/+**
Final energy consumption (2)	**+**	**+**	**+**	**+**	**+/-**	**+**	+
Primary energy supply (2)	**+**	**+-**	**+**	**+**	**+/-**	**+**	**+**
Waste generation (2)	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**
Hazardous waste management (6)	**-/+**	**+/-**	**-/+**	**-/+**	**-/+**	**-/+**	**-/+**
Supplementary UNECE indicators							
Indicators (no. of data flows)	**Accuracy**	**Relevance**	**Timeliness & punctu-ality**	**Accessi-bility**	**Clarity**	**Comparability**	**Inst/org arrange-ments**
Household water use per capita (3)	**+**	**+**	**+**	**+/-**	**+/-**	**+/-**	**+/-**
Conn. to public water supply (1)	**+**	**+**	**+**	**+/-**	**+/-**	**+/-**	**+/-**
Water losses (3)	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**
Fertiliser consumption (4)	**-/+**	**-/+**	**-/+**	**-/+**	**+/-**	**+/-**	**-/+**
Pesticide consumption (3)	**-/+**	**-/+**	**-/+**	**-/+**	**+/-**	**+/-**	**-/+**
Passenger transport (3)	**+/-**	**+/-**	**+**	**+/-**	**+/-**	**+/-**	**+/-**
Freight transport (3)	**+/-**	**+/-**	**+**	**+**	**+/-**	**+/-**	+/-
Age of motor vehicles (5)	**+**	**+/-**	**+**	**+/-**	**+/-**	**-/+**	**+**
Env protection expenditures *	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**+/-**	**-/+**

[24] Bosnia and Herzegovina is not reporting on this indicator as Agency for Statistics. Bosnia and Herzegovina did not develop this type of indicator.

[25] CORINE Land Cover CLC data for Bosnia and Herzegovina (In Bosnia and Herzegovina two CORINE projects are implemented, one in 2008 and the other one in 2014/2015). Data contained in CLC take into consideration changes of land structure on areas > 5 ha.

THE APPLIED RATING SCALE:

+	all is well
+/-	not all is well
- /+	all is not that well
-	all is not well

Notes:
All indicators are supposed to be placed on the recently launched BHAS web platform: www.bhas.gov.ba.
In addition to the indicators of the main list, the analysis includes data quality assessments of nine additional indicators.

ANNEX II STATUS AND ASSESSMENT OF SDG ENVIRONMENTAL INDICATORS

SDG indicators	National indicators of Bosnia and Herzegovina	National indicators monitoring data	UNECE Indicators
SDG target 3.9[26] By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination			
3.9.1 Mortality rate attributed to household and ambient air pollution	Mortality rate attributed to household and ambient air pollution	1. Age-standardized mortality rate attributed to ambient air pollution (deaths per 100,000 population) SH_AAP_ASMORT 2. Age-standardized mortality rate attributed to household air pollution (deaths per 100,000 population) SH_HAP_ASMORT 3. Age-standardized mortality rate attributed to household and ambient air pollution (deaths per 100,000 population) SH_STA_ASAIRP 4. Crude death rate attributed to ambient air pollution (deaths per 100,000 population) SH_AAP_MORT 5. Crude death rate attributed to household air pollution (deaths per 100,000 population) SH_HAP_MORT 6. Crude death rate attributed to household and ambient air pollution (deaths per 100,000 population) SH_STA_AIRP	A1. Emissions of pollutants into the atmospheric air; A2. Ambient air quality in urban areas.
3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (deaths per 100,000 population)	2015 2016 2017 N/A 0.1[E] N/A E- estimated data	C5. Water supply industry and population connected to water supply industry; C6. Connection of population to public water supply; C9. Drinking water quality; C14.Population connected to wastewater treatment.
3.9.3 Mortality from unintentional poisoning		2015 2016 2017 0.5[E] 0.5[E]	F4. Pesticide consumption.

[26] http://apps.who.int/gho/data/node.sdg.3-9-data?lang=en

	Mortality rate attributed to unintentional poisonings, by sex (deaths per 100,000 population)	FEMALE: 2015 2016 0,4[e] 0,4[E] MALE: 2015 2016 0,6[E] 0,6[E]	
SDG target 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all			
6.1.1 Proportion of population using safely managed drinking water services	6.1.1.a Proportion of population using safely managed drinking water services, by urban/rural (%)	2015 2016 2017 88.82513[E] , 88.83336[E], 88.84189[E] Source: BHAS	C5. Water supply industry and population connected to water supply industry; C6. Connection of population to public water supply; C9. Drinking water quality.
SDG target 6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations			
6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	Population having neither a bath, nor a shower, nor indoor flushing toilet in their household by poverty status Population connected to at least secondary wastewater treatment	1.Proportion of population practicing open defecation, by urban/rural (%) SH_SAN_DEFECT 2. Proportion of population using safely managed sanitation services, by urban/rural (%) SH_SAN_SAFE 3. Proportion of population with basic hand-washing facilities on premises, by urban/rural (%) SH_SAN_HNDWSH	C4. Household water use per capita; C5. Water supply industry and population connected to water supply industry; C14. Population connected to wastewater treatment.
SDG target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally			
6.3.1 Proportion of wastewater safely treated (%)	6.3.1.a Proportion of safely treated domestic wastewater %	2015 2016 2017 2018 53.1 41.5 95.2 46.85 58.5 22.70747[E]	C16. Polluted (non-treated) wastewaters.
6.3.2 Proportion of bodies of water with good ambient water quality (%)	2015 2016 2017 NA		C10. BOD and concentration of ammonium in rivers; C11. Nutrients in freshwater.

[E] estimate

SDG target 6.4 By 20N30, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity			
6.4.1 Change in water use efficiency over time (%) E.g. Out of total abstracted water 44.8% was used in 2015	2015 2016 2017 NA		C3. Total water use; C4. Household water use per capita; C7. Water losses.
6.4.2 Level of Water Stress: freshwater withdrawal as a proportion of available freshwater resources	Level of Water Stress: freshwater withdrawal as a proportion of available freshwater resources	2015 2016 2017 2.7	C1. Renewable freshwater resources; C2. Freshwater abstraction.
SDG target.6 6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes			
6.6.1 Change in the extent of water-related ecosystems over time	1.Nationally derived extend of rivers (square kilometres) EN_WBE_NDRV 2.Nationally derived extent of open water bodies (square kilometres) EN_WBE_NDOPW 3.Nationally derived extent of wetlands (square kilometres) EN_WBE_NDWTL 4.Nationally derived proportion of water bodies with good quality (%) EN_WBE_NDQLTOT 5.Nationally derived quality of groundwater (%) EN_WBE_NDQLGRW 6.Nationally derived quality of open water bodies (%) EN_WBE_NDQLOPW 7.Nationally derived quality of river (%) EN_WBE_NDQLRVR 8.Nationally derived quantity of groundwater (millions of cubic metres per annum) EN_WBE_NDQTGRW 9.Nationally derived quantity of open water bodies (millions of cubic metres per annum) EN_WBE_NDQTOPW 10.Nationally derived quantity of rivers (millions of cubic metres per annum) EN_WBE_NDQTRVR 11.Nationally derived total extent (square kilometres)		D1. Protected areas; D2. Biosphere reserves and wetlands of international importance (indicator is not currently developed)

	EN_WBE_NDETOT 12.Nationally derived total quantity (millions of cubic metres per annum) EN_WBE_NDQTTOT 13.Water body extent (permanent and maybe permanent) (% of total land area) EN_WBE_PMPP 14.Water body extent (permanent and maybe permanent) (square kilometres) EN_WBE_PMPN 15.Water body extent (permanent) (% of total land area) EN_WBE_PMPR 16.Water body extent (permanent) (square kilometres) EN_WBE_PMNR		
SDG target 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services			
7.1.1 Proportion of population with access to electricity	Proportion of population with access to electricity, by urban/rural (%)	2015 2016 2017 100% 100% 100% Source: BHAS	G5. Final electricity consumption (indicator is not currently developed).
SDG target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix			
7.2.1 Renewable energy share in the total final energy consumption	Renewable energy share in the total final energy consumption (%)	2015 2016 2017 27.06 [E] 24.8 [E] -	G1. Final energy consumption; G4. Renewable energy consumption.
SDG target 7.3 By 2030 double the global rate of improvement in energy efficiency			
7.3.1 Energy intensity measured in terms of primary energy and GDP	Energy intensity level of primary energy (megajoules per constant 2011 purchasing power parity GDP)	2015 2016 2017 6,69[E] 7.09[E] .	G3. Energy intensity.
SDG target 9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all			
9.1.2 Passenger and freight volumes, by mode of transport	Share of collective transport modes in total passenger land transport by vehicle Share of rail and inland waterways activity in total freight transport	<table><tr><td></td><td>2015</td><td>2016</td><td>2017</td></tr></table>	H1. Passenger transport demand; H2. Freight transport demand.

		Freight volumes rail			1,221,840,348[C]	
		Passenger volumes rail			4,018,143,745 [C]	
		Freight volumes road			2,431,013,743[C]	
		Passenger volumes road			48,091,651,030 [C]	
SDG target 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities						
9.4.1CO2 emission per unit of value added	Carbon dioxide emissions per unit of manufacturing value added	Carbon dioxide emissions from fuel combustion (millions of tonnes) EN_ATM_CO2 Carbon dioxide emissions per unit of GDP (kilogrammes of CO2 per constant 2010 United States dollars) EN_ATM_CO2GDP Carbon dioxide emissions per unit of manufacturing value added (kilogrammes of CO2 per constant 2010 United States dollars) EN_ATM_CO2MVA				B3. Greenhouse gas emissions.
SDG target 11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries						
11.3.1 Ratio of land consumption rate to population growth rate	NA					E1. Land uptake; E2. Area affected by soil erosion.
SDG target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management						
11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban waste generated, by cities	Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities Municipal waste collected, total. Source BHAS	2015 2016 2017 76,4 76,6 74,0				I4. Final waste disposal; I3. Waste reuse and recycling.

[C] Country data

11.6.2 Annual mean levels of fine particulate matter (i.e. PM2.5 and PM10) in cities (population weighted)	BHAS: 2016 27.251688 [E]		A2. Ambient air quality in urban areas.
SDG target 12.2 By 2030, achieve the sustainable management and efficient use of natural resources			
12.2.1 Material footprint, material footprint per capita, and material footprint per GDP	NA		C2. Freshwater abstraction; D3. Forests and other wooded land; E1. Land uptake.
12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	Domestic material consumption (million tonnes) Domestic material consumption per capita (tonnes) Domestic material consumption per GDP %	2015 2016 2017 0.7[c] 0.8[c] 0.8[c] 10.2[c] 10.4[c] 10.7[c]	C3. Total water use; G1. Final energy consumption; G5. Final electricity consumption (indicator is not currently developed).
SDG target 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment			
12.4.2[27] Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment	kg per capita	2015 2016 2017 N/A N/A	I2. Management of hazardous waste; I3. Waste reuse and recycling.
SDG target 12.5By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse			
12.5.1 National recycling rate, tons of material recycled[28]	2015 2016 2017 N/A		I2. Management of hazardous waste; I3. Waste reuse and recycling; I4. Final waste disposal.
SDG target 14.1By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution			
14.1.1 Index of coastal eutrophication and floating	Not Available information		C12. Nutrients in coastal seawaters

[27] Basel Convention (http://ers.basel.int/ERS-Extended/FeedbackServer/fsadmin.aspx?fscontrol=respondentReport&surveyid=70&voterid=48659&readonly=1&nomenu=1)

[28] The Agency for Statistics is involved in an ongoing project with the UNEP and UN-Habitat Joint Expert Group Meeting on Waste SDG indicators 11.6.1, 12.4.2 and 12.5 on development of methodology for SDG 12.5

plastic debris density			
SDG target 14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information			
14.5.1 Coverage of protected areas in relation to marine areas	N/A		D1. Protected areas.
SDG target 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements			
15.1.1 Forest area[29] as a proportion of total land area[30] (ha)	Forest area as a proportion of total land area (ha)	2015 2016 2017 42.67578 [E]	D3. Forests and other wooded land.
15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	2015 2016 2017 1.Average proportion of Freshwater Key Biodiversity Areas (KBAs) covered by protected areas (%) ER_PTD_FRWRT 2. Average proportion of Terrestrial Key Biodiversity Areas (KBAs) covered by protected areas (%) ER_PTD_TERRS	D1. Protected areas.
SDG target 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally			
15.2.1 Progress towards sustainable forest management (thousands of hectares)	Above-ground biomass in forest per hectare (tonnes per hectare) AG_LND_FRSTBIOPHA Forest area certified under an independently verified certification scheme (thousands of hectares) AG_LND_FRSTCERT Forest area net change rate (%) AG_LND_FRSTCHG Proportion of forest area with a long-term management plan (%) AG_LND_FRSTMGT Proportion of forest area within legally established protected areas (%) AG_LND_FRSTPRCT		D3. Forests and other wooded land.
SDG target 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation neutral world			
15.3.1 Proportion of land that is degraded over total land area	Proportion of land that is degraded over total land area	2015 2016 2017 4 [C]	E2. Area affected by soil erosion.

[29] Areas considered as Forest trees and forest land are included.
[30] http://www.fao.org/countryprofiles/index/en/?iso3=BIH

SDG target 15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development				
15.4.1 Coverage by protected areas of important sites for mountain biodiversity	2016 NA 14.28571 [C]	2017 14.28571 [C]	2018 14.28571 [C]	D1. Protected areas.
SDG target 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species				
15.5.1 Red List Index	15.5.1.a Threatened and protected species, incl. species registered in the Red Book of Bosnia and Herzegovina [31]/Biodiversity representation of Bosnia and Herzegovina - 15.5.1.a.1 Registered vertebrate and invertebrate species, of which: - total -Registered in the Red Book of Bosnia and Herzegovina -Included in the specially protected natural areas - 15.5.1.a.2 Registered high and low plant species, of which: - total - High plant species registered in the Red Book of Bosnia and Herzegovina Included in the specially protected natural areas	2017 0.90485[e], NA	2018 0.90489[e],	2019 0.90493[e]	D4. Threatened and protected species
SDG target 15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species				
15.8.1 Proportion of countries adopting relevant national legislation and adequately	Not available in UN SDG database.			D6. Invasive alien species (indicator is not currently developed)

[31] So far, there is no Red Book of Bosnia and Herzegovina.

resourcing the prevention or control of invasive alien		
SDG target 15.9By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts		
15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	2015 2016 2017 Not available in UN SDG database	D4. Threatened and protected species.
SDG target 15 A Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems		
Indicator 15.a.1: Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems	2015 2016 2017 0.65514 [C] 3.99669 [C] 17.93435 [C]	

Source: https://unstats.un.org/sdgs/indicators/database/

Key to the table:
- blue - developed national indicators for global SDG indicators;
- black - data characterizing global SDG indicators;
- red - not developed national indicators for global SDG indicators;
- green - global indicators, not relevant for Bosnia and Herzegovina.

[C] Country data

ANNEX III SUPPLEMENTARY INFORMATION

The Climate Change Adaptation and Low-Emission Development Strategy for Bosnia and Herzegovina foresees that, by 2025, Bosnia and Herzegovina will have a sustainable and prosperous green economy. This document includes numerous measures for emission reductions in various sectors intended to advance the green economy approach. Generally, sustainable development is well covered within numerous strategic documents (state and entity level sectoral strategies, inter-sectorial strategies, cantonal-level development strategies and local development strategies.[32] A regulatory impact assessment, however, identifies that a number of strategic documents do not include quantitative performance of the indicators for the targets. In addition, there is no mechanism or system to regularly monitor the implementation of the strategies, and there are not sufficient funds.

BHAS reports to Eurostat with data on energy (production and consumption), the health sector, science and technology, innovation, waste management, water supply and water pollution protection. Data on green growth indicators are available through BHAS publications.[33] BHAS recently has launched two indicators[34] on sustainable development regarding the Europe 2020 Strategy.

The energy strategies of Bosnia and Herzegovina and its entities incorporate green growth goals into sector-specific policy documents related to the energy efficiency, energy transition, and environmental responsibility. The country's plans include the National Renewable Energy Action Plan, the Strategic Plan for Rural Development and the Republika Srpska's integrated water resources management strategy.[35] Cantonal development strategies, environmental action plans and municipality development strategies are now being developed or have been drafted and/or adopted. The Third Environmental Performance Review of Bosnia and Herzegovina, however, identifies the unavailability of financial mechanisms as one of the key obstacles to the implementation of energy efficiency measures and to the financing or incentivizing of the investments in green energy production. Numerous measures are needed to spur the development of the green economic activities.

The latest development is that Bosnia and Herzegovina actively participates in the development of Integrated National Energy and Climate Plans to define 2030 energy efficiency, renewable energy and greenhouse gas emission reduction targets that can be expected under aligned framework conditions in the Energy Community Contracting Parties.

[32] The 69 strategic documents were analysed through Rapid Integrated Assessment of strategic documents in Bosnia and Herzegovina.
[33] Some indicators are available at http://www.greengrowthknowledge.org/country/bosnia-and-herzegovina
[34] Indicator Share of energy from renewables in gross final energy consumption (%) – https://see2020.info
[35] The Federation's Strategy of water resources management 2010-2025 has never been adopted. However, it clearly expresses an economic concept of water pricing and the rationalization of water use.