NATIONAL ASSESSMENT OF BIODIVERSITY INFORMATION MANAGEMENT AND REPORTING BASELINE FOR KOSOVO

ABBREVIATIONS

BIMR - Biodiversity Information Management and Reporting
CBD - Convention on Biological Diversity
CITES - Convention on International Trade in Endangered Species
EEA - European Environmental Agency
EIA - Environmental Impact Assessment
EIMMS - Environmental Information Management and Monitoring System
EIONET - European Environment Information and Observation Network
EPA - Environmental Protection Agency
GEF - Global Environmental Facility
GIZ - Deutsche Gesellschaft für Internationale Zusammenarbeit
IUCN - International Union for Conservation of Nature
KEERC - Kosovo Environmental Education Research Center
KEPA - Kosovo Environmental Protection Agency
MAEP - Ministry of Agriculture and Environmental Protection
MESP - Ministry of Environment and Spatial Planning
MAFRD - Ministry of Agriculture, Forestry and Rural Development
NGO - Non Governmental Organization
NP - National Park
ORF-BD - Open Regional Fund for South-East Europe - Biodiversity
PA - Protected Area
SDGs - Sustainable Development Goals
SEA - Strategic Environmental Assessment
SEE - South-East Europe
UNDP - United Nations Development Programme

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Preface

South-East Europe (SEE) is one of the richest parts of Europe in terms of biodiversity. In order to conserve and sustainably use these biodiversity assets and valuable natural resources under a concerted regional approach, a regional consensus on principles and key elements of a biodiversity information management and reporting (BIMR) mechanism in line with Convention on Biological Diversity (CBD) and European Union (EU) requirements is required. It will enable regional exchange of data and information for collaborative monitoring, reporting and management of (shared) biodiversity resources. Accession to the EU constitutes a common goal for economies of SEE, where an important pre-requisite is the transposition and full implementation of the environmental acquis communautaire, especially the Birds Directive (2009/147/EC) and Habitat Directive (92/43/EEC) and the EU Biodiversity Strategy 2020. Therefore, BIMR is a crucial component for all economies in the SEE region and improvements are needed.

In general, the SEE region has significant gaps at different levels in each economy regarding BIMR issues. For instance, key challenges in all economies relate to insufficient technical, organizational and financial capacities of the institutions involved (especially environmental ministries, environmental agencies and nature parks' institutions), as well as missing standards for data collection, verification and validation and indicators for monitoring of the implementation of national action plans and Aichi goals according to CBD recommendations.

One of the attempts to successfully contribute to the establishment or improvement of biodiversity information systems in the SEE region has commenced with this publication. It was scaled up from existing regional projects and initiatives, as well as European and global standards. This publication describes the current situation of BIMR elements at the national and regional level considering contributions from key stakeholders in the period from September 2016 to April 2017. The focus of the approach taken was on findings of high relevance adding value to related ongoing and future initiatives. Subsequent collaborative and coordinated efforts on implementing the recommendations are needed.

The German Federal Ministry for Economic Cooperation and Development (BMZ) supports this ongoing process including development of BIMR Regional Guidelines and piloting through the *Regional Network for Biodiversity Information Management and Reporting* project as part of the GIZ Open Regional Fund for South-East Europe-Biodiversity (ORF-BD) in close dialogue and coordination with relevant stakeholders and partners.

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Acknowledgement

1. INTRODUCTION AND BACKGROUND

1.1. ORF-BD BIMR activities and the focus of this Assessment

Exceptionally high biodiversity exposes the South-East Europe (SEE) region as a true hotspot of European biodiversity. Diversity of species and habitats, environments, intraspecific and interspecific variations as well as extremely high level of endemism in comparison to the rest of the Europe makes the SEE a prime area for conservation objectives. Even more as this area is usually an unknown white spot in all biodiversity relevant assessments. As such, it is essential for this region to be considered, assessed and included in any strategic document and process related to conservation of biodiversity on global and especially European level. This is becoming regionally and globally more relevant as demonstrated by increasing demands for consolidated and trans-boundary biodiversity related monitoring and reporting.

Taking into account the complex physical geography and recent history, the SEE region is unfortunately still insufficiently explored. Furthermore, despite many similarities among these economies there exist also significant differences that have to be considered, especially in regards to different level of knowledge and availability of data about species and habitats and the extent to which they have been researched and used.

In order to adequately assess the biodiversity status in the SEE region, digitized, structured and verified data on biodiversity is needed. Additionally, there is a need for the establishment of (regional) mechanisms for the exchange of data, standards and experiences. This can be achieved through the review and implementation of common technical and biodiversity standards for data exchange, species and habitats lists as well as through continuous dialogue, coordination and communication among all relevant stakeholders in the region.

When discussing a term such as biodiversity information system, it is useful to begin by examining different elements of which this phrase is comprised. Biodiversity is defined as the variety of plant and animal life in the world or in a particular habitat while information system is any organized system for the collection, organization, storage and communication of information.

Therefore, it is important to note that biodiversity information system in context of biodiversity information management and reporting (BIMR) does not only include some specific databases or applications but in fact it includes a wide range of dynamic and continuous operations and activities that various stakeholders conduct in order to collect, filter, process and analyse, create and distribute data on biodiversity. In that sense biodiversity information system is a set of different databases, applications, processes, protocols and services that are intended for biodiversity data storage, maintenance and sharing. Its main purpose is to bring together facts on biodiversity in a structured format. The system needs then to be linked with related policies, research results as well as other information systems in order to support expert work of all involved stakeholders and facilitate biodiversity related management decisions at various levels (government, communal, private sector).

The understanding of biodiversity information system is quite often distorted and as such prevents stakeholders to perceive complexity of biodiversity information system as one

integral set of smaller interconnected modules. Not having a clear understanding and vision necessarily leads to inadequate financial planning and strategic decisions, and often leads to situations where economies and their projects related to setting up or enhancing biodiversity information systems fail to reach their objectives. This consequently results in significant financial losses, inadequate reporting to Convention on Biological Diversity (CBD) and European Union (EU) as well as wasting experts' time and efforts. Furthermore, the clear understanding of information system is a prerequisite to valid planning of financial, human and technical capacities. Development of some specific database or module or collection of specific data does not make the information system completed and finalized. In fact, it is of utmost importance to keep in mind that each information system is an ever growing formation that requires sustainable long term of financial, technical and staff support.

This lack of understanding is present in all stakeholder organisation/institutions despite their background, level of activity, financing, governmental/non-governmental status etc. Without information system, the capacity to adequately store, process, analyse and share biodiversity data is severely disrupted thus contributing to the ongoing biodiversity loss and consequently losing the chance to achieve EU Biodiversity Strategy 2020 targets as well as the 2030 Agenda of Sustainable Development Goals (SDGs) which integrates Aichi Biodiversity Targets.

As the Open Regional Fund for South-East Europe - Biodiversity (ORF-BD) supports regional projects which aim at implementing the EU Biodiversity Strategy 2020 through increased regional cooperation, the idea of BIMR (Biodiversity Information Management and Reporting) project was to help SEE region economies to assess the current status of biodiversity information system setup on both regional and national level and improve the partner institutions' capacities to conform with the reporting requirements to the CBD and with other EU requirements (e.g. Natura 2000 network).

Significance of improving BIMR on both regional and national levels was recognized by stakeholders in the target economies of SEE region in the project identification mission in 2014 and was therefore addressed as one of the three priority intervention areas of ORF-BD. The continued project consultations up to now, including those held at the ORF-BD Kick-off meeting in Belgrade, in February 2016 reconfirmed the need for intervention and resulted in the development of a BIMR project which commenced in July 2016.

The objective of BIMR project is that capacities of partner institutions needed to meet CBD and EU reporting requirements have been improved in the SEE region. Within this objective, there are three BIMR building blocks identified:

1. **Regional Assessment of BIMR Baseline**, whose objective is to develop and publish detailed regional and national assessment documents analysing current stakeholder situation, policy, legal and institutional framework and information system set-up. It is believed that this baseline assessment process and result will be a first step to assist stakeholders in improving processes related to BIMR in their own institutions/groups.
2. **Development of BIMR Regional Guidelines** aims to improve existing systems in managing data and reporting on species diversity, ecosystems and genetic diversity. They cover aspects such as standardized biodiversity methodology, mechanism for

data validation and verification, tools for monitoring and reporting and both tailor-made and generic solutions for national biodiversity information systems. The final published BIMR Regional Guidelines represent common regional framework for biodiversity reporting to CBD in line with EU requirements in the SEE region and contribute to enhanced regional capacity.

3. In **Piloting of BIMR Regional Guidelines**, the BIMR approach is to assist at least 3 economies in using and introducing findings from BIMR assessment and BIMR Regional Guidelines in existing systems. It follows consultations and agreements with relevant country stakeholders and supports regional exchange and improved cooperation with all economies. The full implementation of the guidelines in the entire SEE region is expected to require additional financial resources and significant time.

In order to better understand and assess complex relationships between relevant stakeholders, data sources and established data flows on both regional and national level, it is important to assess each country's true potential to manage biodiversity data on an adequate quality level and in line with EU standards and obligations. In addition, six assessments for each SEE economy have also been prepared as an integral part of regional assessment with the aim to provide thorough insights regarding stakeholders, policy and information system setup on national level.

Although the thematic focus of the assessment was put on EU obligations related to biodiversity data, CBD reporting obligations, as well as Natura 2000 commitments, the assessment as such delivered much broader results. The Assessment was not only limited to data, information and capacities necessary for reporting towards CBD and relevant EU directives, but it provides insights about broader scope and usage of biodiversity data.

1.2. Background information on Biodiversity Information Management and Reporting in Kosovo

Kosovo is characterized as an important part of the Balkan Peninsula's biodiversity hotspot in Europe with many stenoendemic, endemic, rare, important but also endangered, threatened and vulnerable plant and animal species. Despite this, the country still faces difficulties in terms of important investments in biodiversity conservation, comprehensive surveys and establishment of baseline information. Even though important, mainly legislative, steps have been undertaken in terms of designation of protected areas, during the past years in Kosovo, biodiversity still does not receive enough attention in terms of data collection, data reporting and management and creation of effective legal basis for obligatory data flow.

The Ministry of Environment and Spatial Planning (MESP) is the main governmental institution responsible for managing environment in Kosovo including nature conservation. The Kosovo Institute for Nature Protection is responsible for establishing and maintenance of Nature Conservation Information System and the Environmental Information System Sector is responsible for the establishment and maintenance of Environmental Information System. Both of these institutions are part of the Kosovo Environmental Protection Agency (KEPA).

Other departments of MESP are responsible for information systems which indirectly are related to biodiversity and environment such as the Water Department, Hydrometeorological Institute, then Ministry of Agriculture, Forestry and Rural Development (MAFRD), mainly through its forestry and fishing sectors. Other institutions important in biodiversity data collection and processing are: Faculty of Mathematics and Natural Sciences of the University of Prishtina, University of Peja, directorates of two national parks and NGO sector.

Streamlining of Kosovo legislation with the recent activities in Europe related to biodiversity and environment has been an ongoing process during the last decade. It is assessed that more than 60% of the overall EU environmental acquis has been transposed into Kosovo's national environmental legislation. However, in practice, the importance of stakeholder coordination in terms of biodiversity information management and reporting has not been adequately addressed so far, although as an issue it has been tackled in several strategic documents, most lately in the Strategy and Action Plan for Biodiversity 2011-2020 aiming at integrated sectoral policies, effective management and sustainable use of biodiversity in close cooperation with relevant stakeholders. Governmental strategic documents in this regard have identified several areas which are important in the process of effective biodiversity information management and reporting such as: clarification of institutional competences and ways of cooperation, improvement of capacity building activities and management of protected areas, advancement of cooperation between academic institutions, governmental and nongovernmental sector in mapping and identifying biodiversity values, as well as creation and proper functioning of databases aiming at registering and monitoring biodiversity values and associated impacting activities. The need for tailored activities in this regard is identified as the key issue in many documents produced during the past years tackling biodiversity, nature conservation, protected areas and environment.

There is still no comprehensive inventory or monitoring of biodiversity in Kosovo and information related to biodiversity and environment are mainly generated through different projects or individual scientific efforts of academic institutions. Biodiversity and environmental data is thus not stored or processed in integrative way. The information systems are still not functional and thus proper management of biodiversity data is still lacking. In addition to this, data flow is ineffective.

Kosovo authorities have made important efforts during the past years in taking part in regional and international initiatives and conventions related to biodiversity and environment conservation, but this process has been continuously burdened with political problems. Kosovo has become a cooperating member country of the European Environmental Agency (EEA), few years ago, together with the other five other SEE economies which are non-members of the EU. Due to political reasons, Kosovo still did not ratify any of the international agreements in the field of biodiversity and/or environment.

2. METHODOLOGY

The assessment methodology consisted of four main steps along with a set of sub-steps, as follows:
1) Stakeholder identification by means of local expert knowledge.
2) Stakeholder analysis by means of ranking stakeholders according to their relevance to BIMR, political influence and capacity.
3) Policy analysis by means of desk-reviewing all relevant sources
4) Stakeholder meetings:
    a) National briefings
    b) Stakeholder interviews (in person and by telephone)
5) Collecting the data on information system set-up by conducting online questionnaire.

1) Stakeholder identification

In order to get detailed insight into information about legal, organisational and technical background of biodiversity data management and data flow among different entities in each country, all relevant stakeholders engaged in biodiversity data inventory, storage, processing and reporting were identified. For this purpose, as well as later stakeholder analysis, three local experts have been engaged which provided valuable knowledge and insights related to BIMR stakeholder identification in their respective countries. With their help, the initial stakeholder list was prepared and all relevant stakeholders were identified. This list was additionally extended after the feedback from national briefings and stakeholder meetings held in October and November 2016. In addition to the identification they also provided important information about stakeholders and ranked them according to their political influence, relevance, capacity, roles and reporting obligation.

2) Stakeholder analysis

All stakeholders were first ranked in respect to their political influence, relevance, capacity, roles and reporting obligations by means of local expert knowledge and other available information.

After the initial screening all stakeholders have been divided into their respective groups according to the roles they have in BIMR context. The first role and "the first link in the chain" are individuals that collect biodiversity field data (**biodiversity data collectors**) about species, habitats and/or landscape features that are important for biodiversity. The collected data can be used for individual purposes (publishing scientific papers for instance) or can be integrated with data that comes from other data collectors.

Stakeholders that integrate biodiversity data from different sources into a single database (**biodiversity data integrators**) must take care about standardisation of structure and harmonisation of collecting methodologies of different sources.

Stakeholders willing and ready to share their structured data with other individuals or organisations (by granting access to their biodiversity data or providing structured digital data) are **biodiversity data providers**.

Data providers that provide data, which is not directly related to biodiversity data but is useful for better understanding of biological patterns and processes (like ortho-photo or satellite images, land use maps etc.) are **supporting data providers**, and are also important for efficient biodiversity data processing and reporting.

Stakeholders that are not directly involved in activities on biodiversity data collecting and processing but are ready to provide support (logistical, in-kind or financial) are **financial supporters**.

In addition to stakeholder ranking, detailed data flow between all the stakeholder groups have been mapped to show specific relationships between stakeholder and to give insights in all existing and planned information systems and databases.

3) Policy set-up analysis

By reviewing all relevant sources (legislative, studies, reports etc.) related to policy set-up of biodiversity information system, the list of all relevant legislative documents that mention the obligation of establishing biodiversity information system in any of the stakeholder institutions has been compiled.

4) Stakeholder meetings

To gain additional information about specific stakeholders two types of meetings have been organised.

First, in each country national briefings were organised for Ministries and Agencies for nature protection and environment. The objective was to follow up on BIMR Kick-off meeting held in Sarajevo and particularly to ensure engagement of national stakeholders involved in BIMR project. "Development of the Croatian National Nature Protection Information System" has been presented to the meeting participants as an example of Croatian experience with dissemination at the national level.

In parallel with meetings, individual stakeholder consultations have been conducted which involved in person (or in some situations telephone) meetings with relevant stakeholders (mostly academia and NGOs) related to biodiversity data collection, provision, integration and management.

5) BIMR questionnaire

For the purposes of acquiring specific information related to information system set-up and data management for each stakeholder organisation the online questionnaire has been implemented and hosted on Google Form platform. BIMR questionnaire was published and sent to stakeholders on 11 November 2016 and remained online until the end of December 2016.

Questionnaire was intended to be filled by each stakeholder organisation and each group received explanations before: biodiversity data collectors, biodiversity data integrators and biodiversity data providers as those three groups are most important and relevant for BIMR assessment.

Complete questionnaire with all the questions is available in Annex 3.

3. STAKEHOLDER ASSESSMENT

The process of stakeholder identification was conducted during the period September – December 2016. During this time-period there were identified stakeholders from governmental institutions, academic institutions, international organizations and nongovernmental sector important in the process of generation, management and processing of biodiversity data. During this time there were also identified different projects in the past which were important in terms of biodiversity data management and also actual initiatives related to the establishment of biodiversity/environment information systems. The most relevant stakeholders from the list were approached either in direct meetings or through interviews, questionnaire or email in order to have them involved in the process of assessing the BIMR for Kosovo.

3.1. Consultation process with stakeholders

During September, October and November 2016 several meetings were held with different stakeholders involved in biodiversity data collection, provision, integration and management. These institutions have been contacted either through direct meetings, telephone or email ensuring feedback on relevant topics and issues related to BIMR: different departments and sectors of the MESP (Department for Nature Protection, Institute for Spatial Planning, Institute for Nature Protection, KEPA), University of Peja, University of Prishtina and NGOs such as KEERC, EkoViciana, ERA, FINCH, etc. In these meetings biodiversity information management and reporting setup have been emphasized along with the expected chronology of system development with emphasis on strategic aspects of system development, financial sources and challenges and lessons learned during system implementation.

The national briefing was organized on 4th of November 2016 in Prishtina with participation of representatives from different sectors of MESP as well as GIZ experts. During this meeting the concept of BIMR was presented and there were discussed possibilities of assisting Kosovo institutions in the process of managing biodiversity information. Representatives from MESP emphasized the need to assist Kosovo institutions particularly in the process of building biodiversity and environment information system. Croatian experience related to development of Nature Protection Information System presented during the national briefing raised attention of participants who in particular showed interest for knowledge transfer from Croatia. During the meeting with academic institutions there was discussed the situation where the universities are in the process of generating biodiversity data and management of generated information. Staff from all departments of MESP welcomed the initiative of assistance in matters relevant to biodiversity data collection, information, and management and reporting. They were interested in receiving assistance related to the standardization methods of collecting biodiversity information and data. The low number of staff in Kosovo governmental institutions dealing with biodiversity and environment data maintenance, processing and reporting was seen as one of obstacles in the process. During the meetings with universities there was strongly stressed the importance of stakeholder cooperation in the process of generating, processing and sharing biodiversity information. Even though universities are involved in several projects related to biodiversity and environment, biodiversity data is not centrally managed, and there is no standardized protocol for data maintenance, data sharing and data reporting (Annex 1).

Information gained through the questionnaire has also been incorporated in this report.

3.2. Stakeholder analysis
Overview of stakeholders by institution/organization type

In total 30 stakeholder institutions have been identified from government, academia, NGOs, public institutions and international organizations. Most of these stakeholders relevant for the process of biodiversity information, management and reporting belong to governmental institutions within the MESP, and to a lesser degree to the MAFRD. There are 6 identified NGOs relevant to a certain degree in the process. Five academic institutions mostly belonging to the University of Prishtina Faculty of Mathematics and Natural Sciences are identified while the sixth one belongs to the newly established University of Peja. Despite the fact that in the past many international organizations have been involved at least indirectly in the process of biodiversity, there are currently only two international organizations (UNDP and SIDA) which recently may have realized or are realizing biodiversity projects. Annex 2 provides a complete list of identified stakeholders important for the process of BIMR.
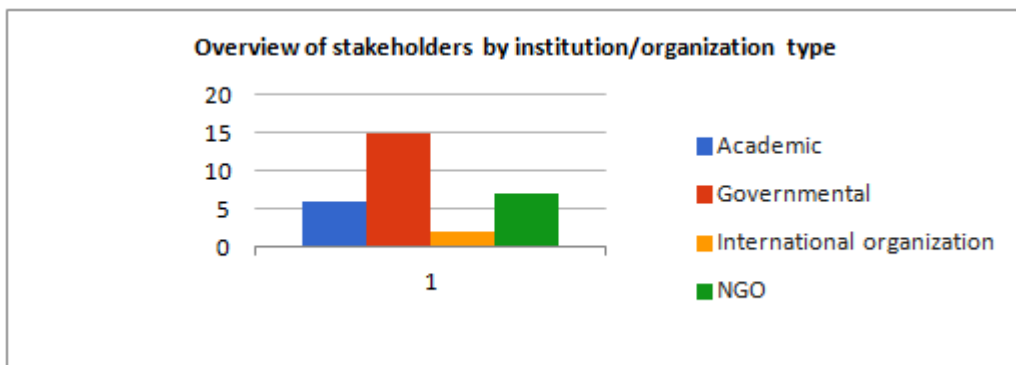
Figure 1. Overview of stakeholders by institution/organization type

Overview of stakeholders by city/region

There is a strong centralization in terms of distribution of stakeholders relevant for BIMR. Most of organizations are located in the capital City of Prishtina. Faculty of Agribusiness and University of Peja from academia and ERA NGO are located in Peja as well as Directorate of Bjeshkët e Nemuna National Park, one of two national parks in Kosovo. The Directorate of Sharr National Park and FINCH NGO are located in Prizren. In Prizren, there is University of Prizren, but so far no programs or activities related to biodiversity have been undertaken. This year is expected to see the start of a bachelor program in Forestry. KEERC NGO is located in the town called Junik. From NGOs only Ecological Network EkoViciana is located in Prishtina.
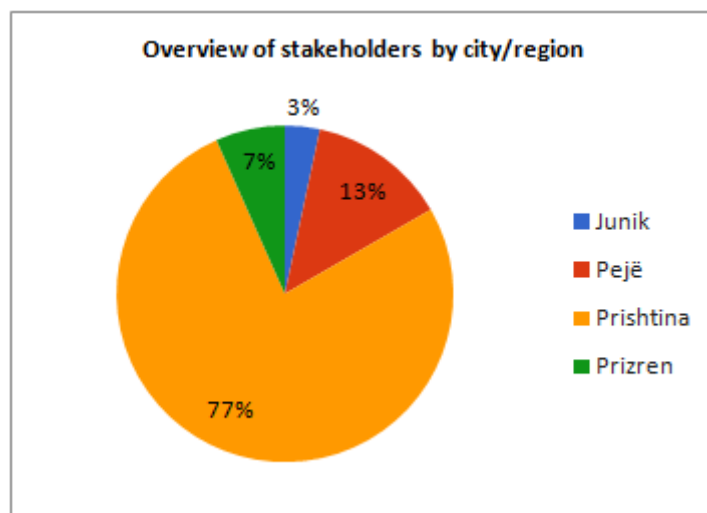
Figure 2. Overview of stakeholders by city/ region

Overview of stakeholders by political influence and relevance

The most relevant institutions in BIMR process are institutions directly involved in data collection and/or provision and integration such as departments of Faculty of Mathematics and Natural Sciences of the University of Prishtina, University of Peja and some NGOs. Departments of MESP and MAFRD also belong to the group of the most relevant institutions due to their role and legal obligations related to biodiversity. The Nature Section of the Kosovo Museum is also supposed to be amongst the most relevant institutions in terms of generating and processing and providing biodiversity data. However, during the last years, the Nature Section has been degraded to a degree that currently makes it dysfunctional. From an independent institution it has been first brought under the Museum of Kosovo and evicted from their building. The existing collections have been put in a basement of the Museum of Kosovo in unsuitable conditions. It has operated in these conditions afterwards with one member of staff only and currently it is without staff at all, after the retirement of its director. The newest development related to this museum is that towards the end of November 2016 the Ministry of Culture competent for this institution, has planned 200,000 Euros for new building which is planned to be located in Sllatine e Vogel village, about 16 km far away from capital City of Prishtina. In most of the cases, especially in cases of departments belonging to MESP or MAFRD, the relevant institutions are also politically influential.

However, when it comes to academic institutions, Nature Section of Kosovo Museum and NGOs, although they are the most relevant institutions in terms of biodiversity information they score medium to low regarding their political influence. Ministry of European Integrations, Department for European Integration and Coordination of Policies within MESP, even though being politically influential institutions they are not specifically directly relevant to biodiversity information and management. They are only important in certain cases as political support institutions. Most of NGOs identified as stakeholders during this process do not possess political influence or even impact in creating or pushing forward issues and processes related to biodiversity. There are only two NGOs (ERA and FINCH) which are at least

sporadically importantly involved in biodiversity issues, but mostly concentrated on environmental campaigns, which may have more influence in terms of political and public impacts. Two other NGOs, EkoViciana and KEERC are mostly concentrated on biodiversity research and are relevant in that regard.

Overview of stakeholders by relevance and capacity

In most cases, the most relevant biodiversity institutions are also ranked with highest capacity scores compared to others. However, no institution was assessed as having full capacity in terms of biodiversity information management and reporting. Human resources capacities in the Kosovo Institute for Nature Protection within the KEPA are not satisfactory and this will be one of the greatest obstacles in the management and update of biodiversity data as well as in the incoming process when Kosovo will be obliged to report for different international environmental and biodiversity conventions. The capacities of the Department of Nature Protection within MESP, which covers legal basis for nature and biodiversity protection and management are also not satisfactory. Same is the case with the Sector of Environmental Information System within the State of Environment Directorate which is designated as a managing authority of the Environmental Information System. University of Prishtina as the most relevant academic institution has satisfactory capacities to cover some biodiversity fields while several biodiversity groups remain uncovered and unstudied by this and other academic institutions due to the lack of human recourses. While flora diversity is well covered, fauna, fungi, microorganisms and other smaller groups are not satisfactorily covered in academic institutions. The capacity of governmental institutions is also not fully operative to cover biodiversity information management and reporting. Neither of the two directorates of national parks in Kosovo have satisfactory capacities to monitor and manage their designated protected areas in terms of biodiversity. While most of NGOs are active in terms of environmental (including biodiversity) awareness campaigns their capacities remain unsatisfactory in terms of biodiversity data collection and monitoring. Two most important NGOs ERA and FINCHES are mostly focused on awareness activities related to the large carnivores and birds on local level, while KERC as a new NGO has been focused mostly on Junik area. EkoViciana is involved in biodiversity research and campaigns on national level. The highest discrepancy between relevance and capacities is noted in the Nature section of the Museum of Kosovo for reasons explained above.

Overview of stakeholders by political influence and capacity

Stakeholders with highest political influence are also ranked better in terms of capacity compared to other institutions except Ministry of European Integrations and Department for European Integrations and Coordination of Policies within MESP. These two institutions do not have satisfactory capacities in terms of pushing forward or managing processes related to biodiversity under their responsibilities.

Stakeholder roles overview

Most of the stakeholders assessed during this process are data collectors and data providers. However, the level of data collection or data provision amongst different institutions is not equal. The Faculty of Mathematics and Natural Sciences of the University of Prishtina is the main and probably almost the only institution in comprehensive primary data collection on

biodiversity. Other universities, governmental institutions and NGOs only sporadically collect information on biodiversity and environment. Eight institutions (all governmental ones belonging to the MESP and MAFRD) are data integrator institutions while only four financial support institutions are identified – MESP, Inter-ministerial Water Council to some degree, and two international development agencies (SIDA and UNDP).

Data collector institutions are almost all involved since they collect to some degree and at some time certain information related to biodiversity. The number of data providers is smaller than data collectors and as a such there are identified mainly different departments of academic institutions and central departments of the MESP (such as Institute of Spatial Planning, Kosovo Institute for Nature Protection), then MAFRD, Inter-ministerial Water Council etc. Three NGOs are also identified as data providers: EkoViciana, KEERC and FINCH.

Regarding the category of biodiversity data collected, academic institutions (and mainly Faculty of Mathematics and Natural Sciences) encompasses all levels: species, biological communities, ecosystems but landscape features and land use as well. Most of the NGOs and governmental institutions are either focused only on species level or they gather and report information only related to landscape features or ecosystems.
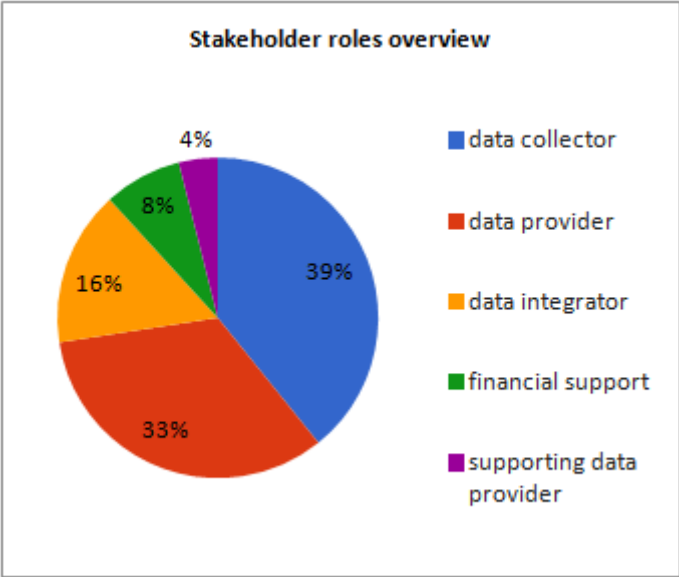
Figure 3. Stakeholders role overview
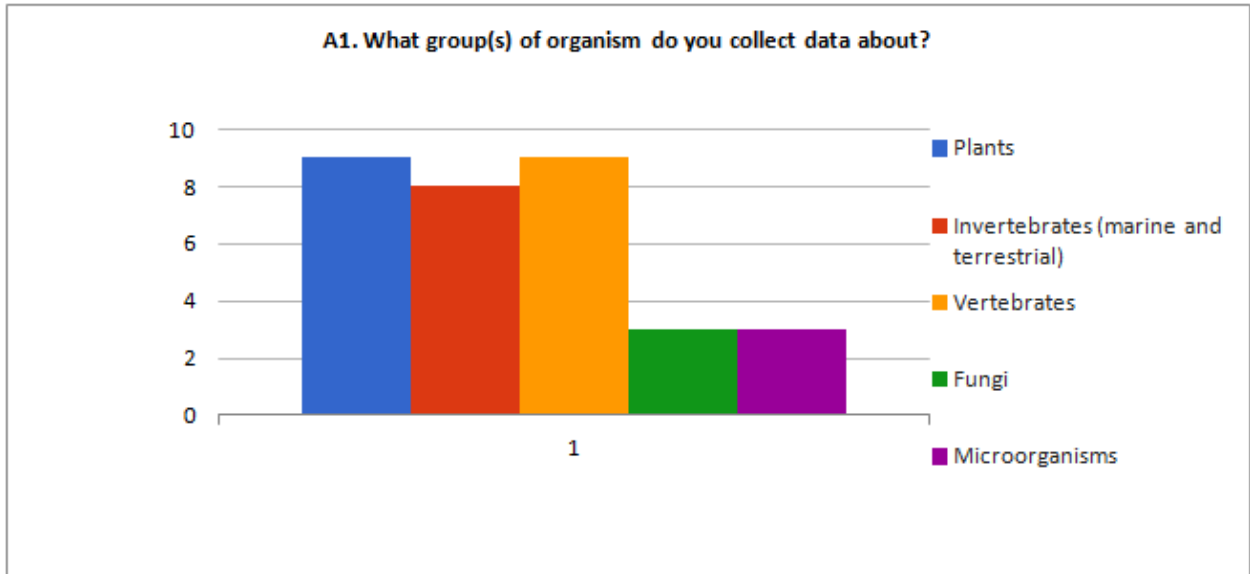
Figure 4. Information regarding the groups of organisms which stakeholder institutions collect (based on questionnaire completed by stakeholders involved in the BIMR)
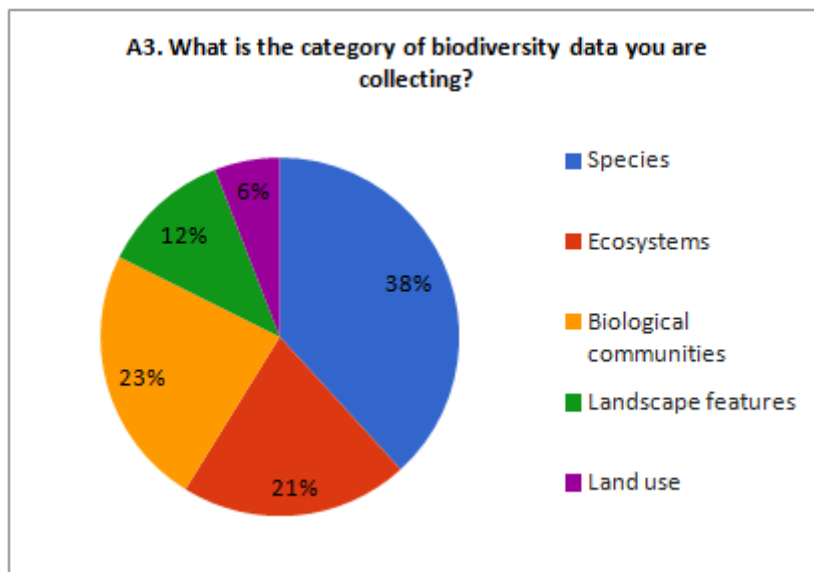
Figure 5. Information regarding the category of biodiversity data being collected by stakeholders (based on questionnaire completed by stakeholders involved in the BIMR)

Stakeholder relationship mapping

The issue of data flow is not adequately addressed in the Kosovo legislation concerning environment and biodiversity (see more section 4.6. Data flow) and this makes this process difficult and uncertain. There is an adequate data flow between different departments of the MESP and at certain degree between this Ministry and MAFRD. However, since forestry is managed by MAFRD and environment and biodiversity by MESP, there is a considerable gap in the efficiency of proper management and data exchange of data belonging to these sectors.

International organisations also share information with governmental institutions through the biodiversity and environmental projects where certain ministries are beneficiaries. The level of exchange of biodiversity and environmental data between academic institutions and governmental institutions is however dysfunctional and inadequate. There is no legal prerequisite regulating this issue and it mainly depends on voluntary level and individual contacts not being based on regular and continuous time-frames. Data flow between NGOs and governmental and academic institutions is also based on voluntary and individual basis. During the consultation process with stakeholders the issue of the low level of integration of biodiversity and environmental data was particularly stressed. Data flow and cooperation between different stakeholders, even in cases where stakeholders are part of the same Ministry, are weak in terms of integrating these data into strategic overall policies. The level of exchange of data between local/regional institutions and central institutions having certain roles in biodiversity and environment is not satisfactory, mainly due to the fact that responsibilities are not clearly defined and there is a lack of exact procedures. Local/regional institutions dealing with biodiversity and environment are not enough empowered to serve as main feeding authorities of biodiversity/environmental information systems, thus creating a gap in terms of data flow.

This fragmentation of responsibilities and absence of legal procedures for data exchange and share, interfere planning and efficient implementation of biodiversity programmes, especially in protected areas.
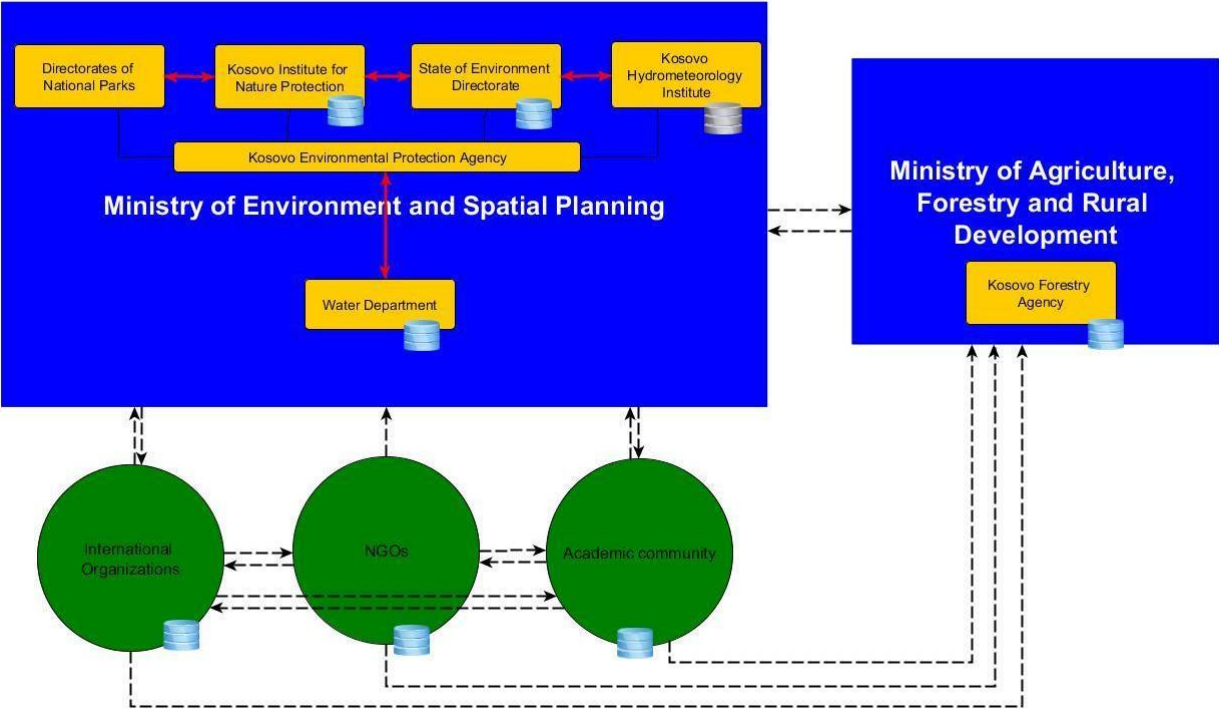
Figure 6. Conceptual chart of biodiversity data flow in Kosovo

Legend: Red arrows - regular/obligatory reporting and data flow. Black arrow - occasional reporting and data flow. Interrupted lines - data flow not regulated by laws or procedures, data flow occasional. Blue barrel - biodiversity databases management system. Grey barrel - database with data useful for BIMR framework.

3.3. Conclusions

- Assignment of roles for different levels of biodiversity data management has not been clearly defined in the legislation, and neither have been the procedures which would functionalize the scope and level of responsibilities.
- Interaction of governmental institutions with academic institutions in terms of primary biodiversity data collection is not properly addressed in legislation, regulations or practice. As the capacities of governmental institutions in this regard are very weak, this cooperation would enhance generation, management and integration of biodiversity data. In this regard, the quality of data provider institutions is not fully operational and understood, and needs considerable improvement.
- There is no procedure or clearly defined system of collecting structured biodiversity data for providing reports to EPA or international conventions related to biodiversity and environment.
- Since the biodiversity/environmental information systems are not in place yet, there is no procedure on how and what kind of information directorates for national parks shall submit to the KEPA.
- Low level of financial support institutions makes difficult the process of generating continuous and structured biodiversity data.
- Low level of data integrator institutions makes the usability of existing data difficult in management level and also for reporting obligation level.

All above identified gaps in terms of generation, management and update of biodiversity data make data flow between different stakeholders difficult, ineffective or completely lacking which is mostly the case.

4. POLICY SET-UP ASSESSMENT

MESP has the primary mandate for biodiversity protection in Kosovo through the Department of Environment. The Division of Nature Protection within the Department of Environment performs administrative and professional services related to the protection and conservation of biodiversity. The KEPA which is also a part of the MESP is in charge of management of national parks and protected areas, environmental monitoring, environmental information and continuous reporting on the environmental situation. The Kosovo Institute for Nature Protection (KINP) is mandated to provide scientific support. The Kosovo Forest Agency (KFA) within MAFRD is responsible for forest management on public and private lands including the collection of non-wood forest products. Part of responsibility of KFA is the hunting and wildlife management based on Hunting law. Department of forestry, under MAFRD, with main responsibilities of forest policy and strategies in forestry sector, drafting the laws and administrative instruction ensuring sustainable use of forest resources, training and public awareness. The Directorate of National Park "Sharri" and the Directorate of National Park "Bjeshket e Nemuna" are in charge of management of the two National Parks in Kosovo. They also collect sporadically biodiversity and ecosystem information from the field. The Inspectorate for Environment Protection is in charge of inspection regarding nature protection, while the inspectorate of forestry is under KFA, with main responsibility of monitoring of sustainable forest management, wildlife management and non-wood forest products collection.

There are thirteen laws which are directly related to nature protection, biodiversity and environment and eighteen other laws which are indirectly related to biodiversity and nature protection. Criminal activities regarding biodiversity are sanctioned through the Criminal Code of Kosovo (chapter XXVIII: criminal activities against environment, animals, plants and cultural objects – Article 347 to Article 364).

4.1. Nature conservation

Law on Nature Protection No.03/L–233 (9 November 2010) in Article 72 says that the Institute (for Nature Protection) shall manage the Nature Protection Information System as a part of an integral information system of the Ministry, in compliance with internationally agreed standards and commitments. This Law in its Article 7, which provides definitions, mentions the Register of nature protected values which has to do with protection areas: - strict nature reserve, national park, special area, nature park, nature monument, protection landscapes and monument of park architecture, - protected plant species, mushrooms and animals including exemplars of carrion of protected wild species based on this Law and international legal acts, parts of their derivatives and also minerals, fossils, and protected exfoliations. Furthermore, Article 28 this Law explains that the content and keeping manner of the Register of nature protected values, shall be determined by the minister through a bylaw. Same Article also stipulates that data from the Register of nature protected values shall be public, except if it is determined that data of nature protected values shall remain confidential for the sake of protection thereof. This law makes mandatory creation of a Speleological Cadastre which is foreseen to be part of the Register of Nature Protected Values and which is also to be drafted by the Institute for Nature Protection. Article 38 of this law mentions another register, which

is Register of important habitat types in danger, which is to be issued by the minister. According to Article 148 a register of data concerning the state and protection of nature is also mandatory and to be kept by Municipal authorities. Article 46 mentions another cadastre to be kept in the Institute of Nature Protection, which is Cadastre of Ecosystems.

4.2. Environment

Law on Environment Protection No. 03/L-025 (26 February 2009) dedicates its Article 52 to the System of Environmental Information as a tool for more efficient identification, classification, processing, monitoring and record keeping of natural values and environmental management in Kosovo. According to this Article, SEI shall serve as platform with gathered, classified, maintained, presented and distributed numerical, descriptive and spatial databases on: 2.1. quality of the environmental media; 2.2. monitoring the state of the environment; 28 2.3. legal, administrative and organizational and strategic measures, 2.4. scientific-technological information about planning measures of pollution prevention; 2.5. exchange of information with other information systems etc. Thus, SEI shall provide access for other information systems and harmonization of all relevant information and data at national and international level. So all information systems and databases mentioned in Law on Nature Protection are to become part of this System of Environmental Information. At the end of 2016 MESP issued a new administrative instruction (no 07/2016) dedicated solely to the Environmental Information System where it is further emphasized that this system will serve as a platform where all other systems dealing with environment are linked.

Article 53 of the Law on Environment Protection stipulates as obligatory the establishment of the Cadastre of Polluters, which is a cadastre of records of substances discharged into environment, discharge and transferring of polluters into environment, used water, energy and natural resources. Cadastres of polluters shall be managed by the Ministry and public.

According to the Article 25 of the Regulation of MESP no. 13/2014 of Responsibilities, Internal Organization and Systematization in the KEPA, the authority responsible for maintenance of the Environmental Information System is the Environmental Information Sector which belongs to the State of the Environment Directorate within the KEPA. According to Article 25, duties and responsibilities of the Sector of Environmental Information System are: 1. To create, organize and maintain Information System for Environmental Protection and advance and compare the quality of environmental data; 2. To establish and maintain databases from environmental monitoring, socio-economic notes, environmental pressures, condition and environment quality; 3. To ensure delivery and access to environmental information by using modern technologies and communication standards in accordance with European requirements; 4. To perform data mapping and geo-reference and vectorization of satellite images, ortho-photos and different maps; 5. To ensure harmonization, standardization and exchange of information and environmental data with other systems and environmental subjects in the national and international level; 6. To perform preparation and completion of the GIS database, make preparation of thematic mapping and collect spatial data via GPS; 7. To perform other professional tasks in compliance with the legislation in force. Further this regulation stipulates that the head of the Sector for Environmental Information System reports directly to the Head of the State of Environment Directorate. The number of employees in this sector is 4.

Article 77 of the Law on Environmental Protection foresees creation of the Environmental Fund to support and advance activities for environment protection. This Article says that the regulations for the source of this fund, way of functioning and usage of Environmental Fund will be regulated by the new Law. Creation of this Fund is foreseen also in National Action Plan for Environment Action (2011-2021).

4.3. Waters

According to the Law on Waters of Kosovo No. 04/L-147 (19 March 2013), river basin authorities are obliged to manage and maintain the register of water protected zones. Chapter XI of this law under the Article 81 stipulates that Water Information System includes measures and activities relating to the registration, transfer, protection, data use and other issues important for waters managing. More precisely, this Information system includes the following data: a. quantity and quality of water; b. water protocol and water cadastre system; c. record of all permits; d. register of substances discharged by water permit holders; e. measures for rehabilitation and programs for the protection of waters; e. incidents of water damage and environmental accidents; f. registry of harmful and dangerous materials for water resources; g. activities that are dangerous to public health and the environment; h. analysis of impacts of hazardous materials; and i. database of construction, testimony or existing storages that are dangerous; j. reporting on conditions of surface and underground waters. According to this law this system is public except for the data considered to be official secret. Furthermore, the law explains that the MESP shall issue bylaws which will determine the work in more details, manner of operation and other important issues related to the Information Water System. This system is supposed to be linked with the Environmental Information System.

4.4. Agriculture, livestock and hunting

Law on Plant Protection no. 04/L-120 (13 December 2012), Article 45 stipulates that the competent body for the purpose of analysing and conducting protection measures may collect data from: The Register of Agricultural Producers and Processors, Statistical database of agricultural land and forest land, data on public property land, customs database of plant consignments, database of Hydro Meteorological Institute of Kosovo. Article 47 mentions that competent body of the MAFRD collects, maintains and regularly edits registers and databases which are linked to the Information System in the use. Article 56 says that competent body in the MAFRD (without specifying the name of this competent body), amongst other duties, has also to undertake setting out and keeping an information system on plant protection. Law on Fishery and Aquaculture No. 02/L-85 (10 October 2006), Article 12 stipulates that a fishing register regulated by a bylaw shall be kept at the ministry. This register will contain information related to area of fishing regions, borders, the quantity and species of fish and fishing rights. Law on Livestock No. 04/L-191 (6 June 2013), Article 28 describes that the Ministry, animal breeders and enterprisers in animal husbandry under this law shall maintain registers and databases in the field of animal husbandry. Law on Hunting 02/L-53 (16 December 2005), Article 44 mentions that Ministry is responsible for keeping the register of wild animals in all hunting areas in Kosovo based on information generated by managers of hunting areas.

4.5. Forestry

Law on Forestry no. 2003/3 (14.10. 2004) in its Article 15 stipulates that Forestry Agency can do inventory and maintenance of registers about forest cover and volume in private forests. However, it does not mention any register of public forests. Neither does the addition to this law done in 2011. The new project law on Forestry in its Article 23 mentions Forest Informative System or Geographic Information System – Database stating that the Ministry through Forest Agency creates and keeps the Forest Informative System or Geographic Information System as data base for forests and forest lands. It further states that Geographic Information System provides all necessary measures on the status and changes in growing of stocks for the purposes of planning, monitoring and reporting. According to this law, data of forestry cadastre shall be reflected every year by the Forest Agency, through programmes of computer systems creating database at the country, region or municipal level. Article 22 is dedicated to the cadastre of forest and forest land. Forest Cadastre is defined as a basis for determining the forests geometric boundaries. Thus, Public Forest Cadastre shall include general indications on forests, types of their property, quantity, quality and economic value of forest resources.

4.6. Spatial data

The Law on Spatial Planning No. 04/L-174 (31 July 2013) in its Article 19 says that Ministry creates, organizes, updates and maintains the Spatial Planning Database for internal use by national and local bodies, and for public access to spatial planning documents, within one (1) year from the date of entry into force of this Law. The database contains information on spatial planning and zoning for cadastral zones and cadastral parcels for the entire territory of Kosovo.

4.7. Data flow

Law on Plant Protection no. 04/L-120, Article 46, explains that the Ministry can send data from its registers and databases to other administration and local organs in order to accomplish requirements under the provision of laws. This Article however does not make mandatory the data exchange, though it regulates it based on agreements. Regarding data exchange at international level, Article 48 of this law explains that the Ministry exchanges data at international level regarding these topics: a. competencies of Governmental bodies concerned with health protection of plants, b. list of points of entry where the import of plant consignments in Kosovo is permitted, c. lists of harmful organisms, d. records on the introduction and occurrence of harmful organisms included in the Lists and data concerning the application of phytosanitary measures, e. introduction, abnormal multiplication or data on the spread of harmful organisms not included in the Lists but which present economic potential risks, f. introduction of harmful organisms within a zone, which is proclaimed as a protected zone for certain organisms, g. systematic reports on the results of observations in the protected zone, h. sub-legal acts launched on the basis of this Law, i. ascertainment of harmful organisms and records on import consignment cases sent back or destroyed due to unsatisfactory health requirements, j. data and other information in accordance with this Law, based on the request of international organ or organization. According to the Law on Hunting, hunting area managers are obliged to collect data on number of wild animals within the

hunting areas and other data on state and conditions of living of animals in the hunting area. Article 44 of this law makes mandatory for hunting area managers to forward data collected to the Ministry of Agriculture.

The new administrative instruction dealing with the Environmental Information System (no 07/2016) in Article 8 predicts the issuance in future of Management Plans of the EIS where amongst other is to be given a list of institutions obliged to share information.

There are no other references in Kosovo legislation regarding data flow between different institutions related to the environmental and biodiversity information.

4.8. Reporting obligation overview

Kosovo is not a signatory party of any international convention or agreements in the field of nature protection and biodiversity which would make reporting on biodiversity mandatory. The government has, however, taken steps toward becoming a signatory party of the CBD and in this regard it also prepared National Biodiversity Strategy and Action Plan 2011-2020. Through this strategy it also aims fulfilling obligations toward CBD and other conventions such as CITES, Convention on Natural and Cultural Heritage- World Heritage Convention, Convention on Wetlands – RAMSAR Convention and Convention on Migratory Species. However, these efforts have not been successful up to now and signing of these international conventions and treaties depends on the political factors. Kosovo participated in several meetings organized during the past years within the RAMSAR group initiative. Kosovo, however, reports to EIONET and EEA. KEPA is a full member of this network since 2013 and submits its annual environmental reports to this organization. State of Environment Directorate is a department responsible for reporting.

Recently the MESP has created a state committee for Natura 2000 which is comprised of members by governmental institutions, academia and NGOs and which is mandated to prepare reports during the upcoming period within the Natura 2000.

4.9. Conclusions

- Most of primary legislation concerning the establishment of databases related to different sectors of nature resources has been adopted, including biodiversity and environment.
- The bylaws that will define standards and methodologies for storing data into a central management system, including guidelines for collecting and structuring data in institutions that are responsible for data providing, are missing.
- The interference and relationship between different databases related to management of data on natural resources has not been clearly defined yet. This may cause overlap of information, absence of important information and thus influence proper use of these databases in terms of management of natural resources.
- Since responsibilities in the field of natural resource management are scattered between MESP and MAFRD, inter-sectoral cooperation in terms of proper management of environmental and biodiversity data is still not fully operational.

- Fragmentation of competences is accompanied by underdeveloped inter-sectoral communication and has a negative influence on biodiversity data management, especially in protected areas.
- There is still no operational solution for systemic support of activities related to environmental protection (Environmental fund) in Kosovo although its creation is foreseen by law.

5. INFORMATION SYSTEM SET-UP ASSESSMENT

5.1. Ongoing initiatives related to biodiversity IS

Several projects in the past have invested efforts in storage and maintenance of their produced biodiversity data. Currently, the largest biodiversity data base is the one produced by the past UNDP project called Conservation of Biodiversity and Sustainable Land Use Management in Dragash which took place in Dragash Municipality and Sharr National Park during the period 2009-2013. An excel database with important information related to biodiversity reporting (such as interaction with different international conventions, interaction between biodiversity and land use and other important information) has been produced during this project for Dragash Municipality and Sharr National Park in Kosovo. Upon the closure of the project this database has been handed over to the MESP but also to other academic institutions such as the Faculty of Mathematics and Natural Sciences of the University of Prishtina.

Kosovo Institute for Nature Protection has undertaken an effort in collecting all biodiversity information for Kosovo in an excel database. The part of database dealing with fauna includes only the elementary data such as taxonomic information and locality data without GIS reference. The part of database dealing with flora diversity is more detailed and is mostly extracted from the Red Book of Vascular Flora of Kosovo. The Environmental Information System Sector of KEPA, in charge of creating and maintaining EIS, as mandated by law, does not have any system developed currently. The plan for near future is to design a website which would link all existing databases related to environment. NGOs have their own Excel databases with the most elementary information and which are mostly limited to particular areas in Kosovo. In their database, FINCH maintain information related to the birds of Sharr Mountains and Prizren area mostly. ERA maintains a database where mostly medium and large carnivores are included. EkoViciana has a database of birds of the whole territory of Kosovo. Entomological Society of Kosovo maintains more detailed database of insects, but mostly aquatic insects, all over Kosovo, with GIS reference, habitat preferences and other conservation criteria and information.

GEF Drin Project "Enabling Transboundary Cooperation and Integrated Water Resources Management in the extended Drin River Basin" is also planning to create Water Information Database for Drin basins in riparian countries (Kosovo, Albania, Macedonia, Montenegro and Greece) related to the management of water resources in Drin basin. The database will contain information related to water quality, water quantity and other environmental indicators impacting this basin. This database is planned to be GIS based.

5.2. Data collection

Institutions dealing with data collection in Kosovo are mainly universities and the Faculty of Mathematics and Natural Sciences of the Prishtina University. Information collected in field is mainly related to plant diversity while fauna diversity and other groups are presented at lesser degree. The category and level of biodiversity collected by data collector stakeholders is different and depends on speciality and expertise of the institution conducting the research. On the whole, plants, invertebrates and vertebrates are the main categories present in the

research of involved stakeholders. Faculty of Mathematics and Natural Sciences of the University of Prishtina collects biodiversity information related to: vascular plants, algae, aquatic and terrestrial invertebrates, fish and at a lesser degree mammals, lichens, fungi and microorganisms. The staff of the newly established University of Peja has mainly been involved lately in collection of biodiversity data related to aquatic insects, aquatic macro-invertebrates and vascular plants. Sporadically the Kosovo Institute of Nature Protection has collected biodiversity data and mainly related to mammals and birds. The FINCH NGO collects only information related to birds, ERA NGO has mainly been involved in collecting biodiversity information related to large carnivores while KEERC as a newly established NGO has collected, during its first year of activity, data on terrestrial insects, fish, aquatic insects, reptiles, birds and amphibians. EkoViciana NGO collects data on birds, fish, butterflies and vascular plants. Important contribution in data collection comes from other NGOs such as Entomologist Society of Kosovo, Society for Protection of Birds and Mammals and Society of Ecologists of Kosovo also collect biodiversity data for particular groups but not continuously or as a structured effort. Other environmental information, indirectly related to biodiversity is continuously collected by governmental institutions such as Hydrometeorological Institute, Institute for Public Health and other. There have been few projects financed by international organizations which have contributed to biodiversity studies. The UNDP's "Conservation of Biodiversity and Sustainable Land Use Management in Dragash" has contributed to the collection of data about freshwater invertebrates, mammals, amphibians, reptiles, butterflies and other insects in Dragash Municipality and Sharr National Park. The ongoing Kosovo Environment Program financed by SIDA will be implementing a three-year project which among other will be doing Red Book of Animal Species for the first time in Kosovo.

5.3. Data processing and analysis

Collected data in field are stored in different formats but mostly in excel databases. Data processing and analysis has been identified as one of obstacles in most of the institutions dealing with biodiversity information especially in terms of statistical approach which would make these data usable in terms of monitoring, management and planning efforts.

5.4. Data provision and data use

Almost all institutions identified during the stakeholder assessment process are ready to share their data with individual researchers and especially with training and education institutions and decision making institutions.

5.5. Information system financial and staff capacities

There is no separate budget line in the state budget and MESP dedicated only for maintenance or creation of biodiversity information system in Kosovo. This issue is currently perceived only in terms of being a maintenance issue within the regular duties of certain departments which are obliged to deal with these information systems. However, at initial stages of establishing these systems there is a need for special budget, staff and time effort in gathering information, software design or adaptation, verification of information and standardization of information to be presented. Currently, staff capacities are far below the needs to maintain such system. Local and regional institutions which are supposed to provide biodiversity

information to KEPA are not adequately trained and do not have ready-to-use forms or software in order to make information provision smooth. In these conditions the office dealing with information system within the KEPA is unable to proceed adequately with all needed information for successful operationalization of the biodiversity information system.

5.6. Conclusions

- The level of biodiversity data collection is not organized and is mainly conducted in academic institutions within diploma theses on all levels or within different internationally funded projects which are not continuous.
- While there are several fields covered well by data collection academic institutions, there are several other taxonomic groups which are still not covered at all.
- Biodiversity data collection activities within NGOs are weak and sporadic and mainly conducted within internationally funded projects but with considerably limited scope compared to universities.
- Data provision and analysis remains one of the weakest points in management of biodiversity data in all institutions. The improvement of this level of dealing with biodiversity data will considerably facilitate and enhance the process of meeting international standards of management of biodiversity and environment as prescribed also in international conventions.
- Financial constraints dedicated to information systems and management of biodiversity data are extreme. There is no budget line dedicated solely to the building of biodiversity and environment information systems.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

Based on the stakeholder analysis through direct interviews, questionnaire, previously produced documents, activity and legal framework in the country related to the BIMR process the following conclusions can be drawn:

- Several laws of the Kosovo legislative system envisage and make obligatory the establishment and maintenance of information systems which are directly or indirectly related to biodiversity and environment with the law on Nature Protection and Law on Environment Protection specifically stipulating that the Kosovo Institute for Nature Protection and the Environmental Information Sector are institutions which create and maintain the Nature Conservation Information System and Environmental Information System, accordingly.
- Secondary legislation is still not completed in terms of defining the content, structure, maintenance procedure, information verification, technical requirements and financial constraints for the Nature Protection Information System and its constituent parts such as Register on Natural Protected Values, Register of Important Habitats and Cadastre of Ecosystems.
- Information systems dealing with biodiversity and environment has not been functional up to now. The Institute for Nature Protection is only at the beginning stages of gathering unstructured biodiversity information. The current model where this information is stored is very basic and will not be able to incorporate important information produced in some previous or actual databases which are owned by other institutions.
- The Register on Natural Protected Values and Cadastre on Ecosystems are currently not completed.
- While there exists specific expertise in academic institutions for some biodiversity groups in general capacities of responsible institutions for data collection, data processing and data analysis are not satisfactory in terms of staff, equipment as well as training for standardized data collection and usage of software solutions for this purpose.
- Comprehensive inventory and monitoring of biodiversity data is not established yet, monitoring programme and methodology are not developed and standardized.
- Accordingly, the infrastructure for meeting proper and adequate reporting towards international conventions is still not in place.
- The legal infrastructure in Kosovo related to biodiversity and environmental information systems are being continuously updated. However, it is still not clear and specific who feeds biodiversity and environmental information systems with information, what are the mandatory duties of institutions producing biodiversity and environmental data versus EISs.
- Data flow between institutions dealing with biodiversity and environment is conducted mainly on individual and voluntary basis. Procedures of data flow between institutions dealing with biodiversity are not adequately described in the existing legislation. It is only the Law on Plant Protection no. 04/L-120 which is specific in terms of flow of information at local but also international level. As for the legislation there is no clear and understandable relation between the Nature Conservation Information System (as per the Law on Nature Protection) and Environmental Information System (as per the Law on Environment Protection).
- There is almost no national budget dedicated mainly to biodiversity conservation in general (including data collection, data processing, verification of existing data).

6.2. Recommendations

Based on the conducted analyses of stakeholders, legal framework in the country related to BIMR process and the current situation with Information systems for biodiversity and environment the following recommendations can be given:

Improvement of legislation and participation in international initiatives

- Provide legal basis and exact procedures for smooth exchange of data between institutions entrusted with the management of natural resources.
- MESP to adopt a sub legal act defining the content and keeping manner of the Nature Protection Information System. This bylaw must also clarify arrangement and relationship between the system and other cadastres and registers mentioned in the Law on Nature Protection No.03/L –233.
- MESP to adopt a sub legal act defining the content and keeping manner of the Register of Nature Protected Values. This is foreseen also in Article 28 of the Law on Nature Protection No.03/L –233.
- MESP to adopt a bylaw defining the content and keeping manner of the Register of Important Habitats. This Register is mentioned in Article 38 of the Law on Nature Protection No.03/L –233 and is currently dysfunctional.
- MESP to adopt a bylaw defining the content and keeping manner of the Cadastre of Ecosystems. This Register is mentioned in Article 46 of the Law on Nature Protection No.03/L –233 and is currently dysfunctional.
- Assist MESP in advancing initiatives in becoming a member or signing international conventions related to biodiversity.

Standardisation and harmonisation of biodiversity data collecting and processing

- Prepare guidelines and protocols for all potential biodiversity data collectors in terms which are important for usage of these data for decision making authorities and management of biodiversity.
- In-site training for biodiversity data collection for local and regional staff employed and responsible for protected areas in Kosovo.
- Prepare ready to use software solution for biodiversity data collection institutions, especially for staff in charge of managing with protected areas.
- Introduce tools in management of protected areas such as Management Effectiveness Tracking Tool (METT) and generate important information related to biodiversity and environment through these tools.

Strengthening between and within sectoral cooperation

- Provide legal and technical conditions for efficient exchange of biodiversity data between institutions responsible for nature conservation with institutions responsible for management of natural resources.
- MESP and MAFRD to coordinate in terms of streamlining their databases concerning biodiversity: Nature Conservation Information System, Environmental Information System (with their constitutive registers and cadastres), Forestry Information System, etc.

Trainings relevant for BIMR process

- Training for staff of the KEPA, including directorates of national parks, in biodiversity data analysis and processing.
- Increase the number of staff, including IT experts, at the offices dealing with the Environmental Information System and Nature Conservation Information System within the KEPA.
- Assistance to governmental institutions dealing with biodiversity and environmental information in identifying all relevant biodiversity studies conducted during the last 30 years by foreign scientists and inclusion of this information in EISs and management plans for nature and biodiversity.
- Training for Customs Service and Customs Police in enforcing laws and regulations dealing with transportation from Kosovo of preserved or alive specimens of plants, animals and other organisms.

Capacity building and financial constraints

- Ministry of Environment and Spatial Planning to dedicate special budget line for maintenance of the Nature Conservation Information System and Environmental Information System.
- As foreseen with the Law on Environment Protection, creation of Environmental Fund which would support among other, activities related to the collection, management and reporting of biodiversity data. Creation of this Fund is also foreseen in National Action Plan for Environment Action (2011-2021).

7. CONSULTED LITERATURE

UNEP Vienna ISCC, 2010, Feasibility Study on establishing a transboundary protected area Prokletije/Bjeshkët e Nemuna Mountains

Department of Environment Protection, Ministry of Environment and Spatial Planning of Kosovo, 2011, Strategy and Action Plan for Biodiversity 2011-2020

Law on Nature Protection No.03/L –233 (30 September 2010)

Law on Environment Protection No. 03/L-025 (26 February 2009)

Law on Waters of Kosovo No. 04/L-147 (19 March 2013)

Law on Plant Protection no. 04/L-120 (13 December 2012)

Law on Fishery and Aquaculture No. 02/L-85 (10 October 2006)

Law on Livestock No. 04/L-191 (6 June 2013)

Law on Hunting 02/L-53 (16 December 2005)

Law on Forestry no 2003/3 (14.10. 2004)

Law on Spatial Planning No. 04/L-174 (31 July 2013)

Regulation of MESP no 13/2014 of Responsibilities, Internal Organization and Systematization in the Kosovo Environmental Protection Agency

8. ANNEXES

Annex 1. The list of stakeholders who participated in the process of gathering information through the interviews, meetings and questionnaires

- Department for Environmental Protection - Ministry of Environment and Spatial Planning
- Directorate of Bjeshkët e Nemuna National Park
- Directorate of Sharr National Park
- Forestry Agency of Kosovo - Ministry of Agriculture, Forestry and Rural Development
- Hydrometeorological Institute - Kosovo Environmental Protection Agency, Ministry of Environment and Spatial Planning
- Institute for Spatial Planning - Ministry of Environment and Spatial Planning
- Inter-ministerial Water Council
- Kosovo Environmental Protection Agency - Ministry of Environment and Spatial Planning
- Kosovo Institute for Nature Protection - Kosovo Environmental Protection Agency, Ministry of Environment and Spatial Planning
- Ministry of European Integrations
- State of Environment Directorate – Kosovo Environmental Protection Agency, Ministry of Environment and Spatial Planning
- Department of Biology, Faculty of Mathematical and Natural Sciences, University of Prishtina
- Department of Geography, Faculty of Mathematical and Natural Sciences, University of Prishtina
- Faculty of Agro-business, University of Peja
- Faculty of Mathematical and Natural Sciences, University of Prishtina
- Nature Section of the Kosovo Museum
- Ecological Association EkoViciana
- Environmentally Friendly Action Group (ERA)
- Kosovo Environmental Education and Research (KEERC)
- Society for Protection of Birds and Mammals
- Society of Ecologists of Kosovo
- FINCH

Annex 2. The list of identified stakeholders relevant for the process of the Biodiversity Information Management and Reporting

Governmental Institutions

- Department for Environmental Protection - Ministry of Environment and Spatial Planning
- Department for European Integration and Coordination of Policies - Ministry of Environment and Spatial Planning
- Directorate of Bjeshkët e Nemuna National Park
- Directorate of Sharr National Park
- Division for Nature Protection - Department for Environmental Protection, Ministry of Environment and Spatial Planning
- Forestry Agency of Kosovo - Ministry of Agriculture, Forestry and Rural Development
- Hydrometeorological Institute - Kosovo Environmental Protection Agency, Ministry of Environment and Spatial Planning
- Institute for Spatial Planning - Ministry of Environment and Spatial Planning
- Inter-ministerial Water Council
- Kosovo Agriculture Institute - Ministry of Agriculture, Forestry and Rural Development
- Kosovo Cadastral Agency
- Kosovo Environmental Protection Agency - Ministry of Environment and Spatial Planning
- Kosovo Institute for Nature Protection - Kosovo Environmental Protection Agency, Ministry of Environment and Spatial Planning
- Ministry of European Integrations
- State of Environment Directorate – Kosovo Environmental Protection Agency, Ministry of Environment and Spatial Planning

Academic Institutions
- Department of Biology, Faculty of Mathematical and Natural Sciences, University of Prishtina
- Department of Geography, Faculty of Mathematical and Natural Sciences, University of Prishtina
- Faculty of Agro-business, University of Peja
- Faculty of Mathematical and Natural Sciences, University of Prishtina
- Nature Section of the Kosovo Museum

Non-Governmental Organisations
- Ecological Association EkoViciana
- Environmentally Friendly Action Group (ERA)
- Kosovo Environmental Education and Research (KEERC)
- Regional Environmental Center
- Society for Protection of Birds and Mammals
- Society of Ecologists of Kosovo
- FINCH

International Organisations
- Swedish International Development Agency
- United Nations Development Programme

Annex 3. BIMR questionnaire

Regional Network for Biodiversity Information Management and Reporting (BIMR) Assessment

This questionnaire is prepared in scope of Open Regional Fund (ORF) for South East Europe - Biodiversity Sub-project: Regional Network for Biodiversity Information Management and Reporting (BIMR).

The Open Regional Fund for South-East Europe Biodiversity (ORF BD) project promotes regional cooperation of biodiversity-related organisations – in particular the ministries in charge of environment and environmental protection agencies, institutes for nature conservation as well as the ministries that deal with or impact on biodiversity and environment , including forestry, agriculture, tourism, water and energy, the municipal administrations, academic institutions and research institutes as well as non-governmental environmental organisations. Activities of the ORF are bundled and channelled through so-called sub-projects (SP).
Importance of improving regional biodiversity information management and reporting was raised by stakeholders in the target economies of South-East Europe (SEE) region in the project identification mission in 2014 and therefore addressed as one of the three priority intervention areas of ORF BD. The continued project consultations up to now, including those held at the ORF BD kick-off meeting in Belgrade, in February 2016 reconfirmed the need for intervention and resulted in the development of a SP Biodiversity Information Management and Reporting (BIMR).
The objective of SP BIMR is that capacities of partner institutions needed to meet Convention on Biological Diversity (CBD) and EU reporting requirements have been improved in SEE.

This questionnaire is intended for collecting data regarding biodiversity information system set-up assessment in each country and are intended for: Biodiversity data collectors (data collector is an institution/organization/expert that collects biodiversity data through field inventory); Biodiversity data integrators (data integrator is an institution/organization that finances biodiversity data field research or an institution/organization that collects biodiversity data from external experts/institutions on the basis of legal obligation); Biodiversity data providers (data provider is an institution/organization that serves biodiversity data to other stakeholders in structured form - database, web service etc.).

BIMR questionnaire in PDF format is available at the following link:
https://drive.google.com/file/d/0B35G6cPOz8QjUTBNUTZlb0dkTXM/view

* Required

Skip to question 1.

Stakeholder general information

Institution/organisation contact information

Please enter the info regarding your institution/organisation

1. **Name** *

2. **Address** *

3. **Postal code** *

_____

4. **City** *

_____

Stakeholder person contact information

Please enter the info regarding the person filling the questionnaire

5. **Name and surname of the person filling the questionnaire** *

_____

6. **Position of the person filling the questionnaire** *

_____

7. **E-mail of the person filling the questionnaire** *

_____

8. **How would you describe your role in regards to the biodiversity data?** *
   Check all that apply.

   ☐ Biodiversity data collector (data collector is an institution/organization/expert that collects biodiversity data through field inventory)

   ☐ Biodiversity data integrator (data integrator is an institution/organization that finances biodiversity data field research or an institution/organization that collects biodiversity data from external experts/institutions on the basis of legal obligation)

   ☐ Biodiversity data provider (data provider is an institution/organization that serves biodiversity data to other stakeholders in structured form - database, web service etc.)

Important notice

Questions in this questionnaire are divided in sections and are organized in three groups - Group 1. Biodiversity data collectors, Group 2. Biodiversity data integrators and Group 3. Biodiversity data providers.

Please answer ONLY question group(s) based on your selected role (data collector, data integrator or data provider).

Please SKIP question group(s) that are not intended for your role by choosing Next option (button) on the bottom of each question group page.

Stakoholder that belongs in two or more categories has to complete each corresponding parts of the questionnaire

A. Data collectors specific questions
This question group is intended specifically for Biodiversity data collectors.

Leave answers empty if you (or your organization) does not fit into the stakeholder category.

9. **A1. What group(s) of organism do you collect data about?**
Check all that apply.

- [ ] Plants
- [ ] Invertebrates (marine and terrestrial)
- [ ] Vertebrates
- [ ] Fungi
- [ ] Microorganisms

10. **A2. What specific area of your country do you cover with biodiversity data?**
Check all that apply.

- [ ] Entire county territory
- [ ] Specific region(s)

11. **A2.1. If you collect data for specific region(s), please indicate which region(s) you cover with biodiversity data:**

_____

_____

_____

_____

_____

12. **A3. What is the category of biodiversity data you are collecting?**
Check all that apply.

- [ ] Species
- [ ] Ecosystems
- [ ] Biological communities
- [ ] Landscape features
- [ ] Land use
- [ ] Other: _____

13. **A4. What specific biodiversity data do you collect/store? (i.e. specific groups of species, animals, populations etc.)**

_____

_____

_____

_____

_____

14. **A5. In what form do you collect biodiversity data/information?**
    Check all that apply.

    ☐ Photographs, audio records etc.

    ☐ Processed/collected specimens or their parts

    ☐ Field observations

    ☐ Remote sensing (telemetry, photo-traps, satelit imagery etc.)

    ☐ Collecting biodiversity features from maps and GIS data Other:

    ☐ _____

15. **A6. Do you keep biodiversity specimens (collections)?**
    Mark only one oval.

    ◯ Yes

    ◯ No

16. **A6.1. If you selected "Yes" in the previous question, please describe the type of specimens you keep in your collection:**

    _____

    _____

    _____

    _____

    _____

17. **A6.2. If you selected "Yes" in the previous question, please indicate approximate number of specimens you keep in your collection:**

    _____

    _____

    _____

    _____

    _____

18. **A7. Do you use any predefined standardized forms for data collecting?**

Mark only one oval.

◯ Yes

◯ No

19. **A8. Do you use any software solutions for data collection (used on PDAs, mobile devices, laptops)?**

Mark only one oval.

◯ Yes

◯ No

20. **A8.1. If you selected "Yes" in the previous question, please describe which software solutions you use for biodiversity data collecting.**

_____

_____

_____

_____

_____

21. **A9. Do you use any software solutions for data storage (database systems, digital table formats or any other solution for storage of structured data)?**

Mark only one oval.

◯ Yes

◯ No

22. **A9.1. If you selected "Yes" in the previous question, please describe which software solutions you use for data storage.**

_____

_____

_____

_____

_____

23. **A10. In which format do you keep your biodiversity data?**

Check all that apply.

☐ Text documents

☐ Tables (e.g. Excel, CSV)

☐ Databases (e.g. Access, SQL Server) Geo tagged

☐ photographs

☐ Geospatial data (e.g. Shapefile, GPX, KML)

☐ Other: _____

24. **A11. Please specify where your biodiversity data is stored.**
    Check all that apply.

    ☐ Personal computer

    ☐ Local network

    ☐ Remote server

    ☐ Cloud service

25. **A12. What type of biodiversity data are you ready to share?**
    Check all that apply.

    ☐ Information on taxonomy and nomenclature

    ☐ Information on species occurrences

    ☐ Ecosystem information

    ☐ Genetic information

    ☐ Geographical information

    ☐ Information on natural resources

    ☐ Other: _____

26. **A13. Who are you ready to provide biodiversity information to?**
    Check all that apply.

    ☐ Individual researchers

    ☐ Training/educational institutions

    ☐ Research institutions

    ☐ Decision makers on governmental, regional and local level

    ☐ NGOs

    ☐ Media

    ☐ Companies dealing with EIA-SEA

    ☐ Other: _____

27. **A14. In your opinion which are major obstacles to sharing biodiversity data?**
    Check all that apply.

    ☐ Although the dataset has been used in at least one published paper, I need to do more analyses

    ☐ I am afraid of colleagues with conflict interests using my data

    ☐ I cannot obtain expected benefits from sharing biodiversity data

    ☐ I do not know any properly public database to archive my data

    ☐ I am not authorized to share data by my organisation or supervisor

    ☐ Databases have no easy tool to submit my data

    ☐ Other: _____

28. **A15. What benefits do you wish to obtain from sharing data?**

Check all that apply.

☐ Material benefits

☐ Reputation

☐ Higher citation rates

☐ Involvement in future assessments and field research

☐ Other: _____

29. **A16. Are there sufficient capacities and skills for adequate data collecting?**

Mark only one oval.

◯ Yes

◯ No

30. **A16.1. If answer to previous question is "No", please specify what capacities and skills are you missing?**

_____

_____

_____

_____

_____

31. **A17. Are there sufficient capacities and skills for adequate data processing and analysis?**

Mark only one oval.

◯ Yes

◯ No

32. **A17.1. If answer to previous question is "No", please specify what capacities and skills are you missing?**

_____

_____

_____

_____

_____

B. Data integrators specific questions

This question group is intended specifically for Biodiversity data integrators.

Leave answers empty if you (or your organization) does not fit into the stakeholder category.

33. **B1. What is the source of biodiversity data that you integrate - is data collection conducted in-house (with your own experts) or/and obtained from external expert institutions or individuals (faculties, museums, institutes, NGOs, individual experts)?**

Check all that apply.

- ☐ In-house data collection
- ☐ External sources

34. **B2. What are the external sources that you obtain biodiversity data from?**

Check all that apply.

- ☐ Faculties/academia
- ☐ Museums
- ☐ Institutes
- ☐ NGOs
- ☐ Individual experts
- ☐ General public

35. **B3. Do you have formal cooperation agreements or contracts with external sources of biodiversity data?**

Mark only one oval.

- ◯ Yes
- ◯ No

36. **B4. Do cooperation agreements or contracts with researchers/external sources cover data ownership and data usage aspects?**

Mark only one oval.

- ◯ Yes
- ◯ No

37. **B5. Are there any specific biodiversity data that you integrate/maintain? (i.e. only marine data, forest ecosystems, fresh water ecosystems etc.)**

_____

_____

_____

_____

_____

38. **B6. Do you use any software solutions for data storage (database systems, digital table formats or any other solution for storage of structured data)?**

Mark only one oval.

- ◯ Yes
- ◯ No

39. **B6.1. If you selected "Yes" in the previous question, please describe which software solutions you use for data storage.**

_____

_____

_____

_____

_____

40. **B7. Do you maintain biodiversity bibliography database?**
    Mark only one oval.

    ( ) Yes

    ( ) No

41. **B7.1. If you selected "Yes" in the previous question, please indicate approximate number of bibliography data you have in your database.**

    _____

42. **B8. What type of biodiversity data are you ready to share?**
    Check all that apply.

    [ ] Information on taxonomy and nomenclature

    [ ] Information on species occurrences

    [ ] Ecosystem information

    [ ] Genetic information

    [ ] Geographical information

    [ ] Information on natural resources

    [ ] Other: _____

43. **B9. In your opinion which are major obstacles to sharing biodiversity data?**
    Check all that apply.

    [ ] Although the dataset has been used in at least one published paper, I need to do more analyses

    [ ] I am afraid of colleagues with conflict interests using my data

    [ ] I cannot obtain expected benefits from sharing biodiversity data

    [ ] I do not know any properly public database to archive my data

    [ ] I am not authorized to share data by my organisation or supervisor

    [ ] Databases have no easy tool to submit my data

    [ ] Other: _____

44. **B10. Are there sufficient capacities and skills for adequate data processing and analysis?**

    Mark only one oval.

    ◯ Yes

    ◯ No

45. **B10.1. If answer to previous question is "no" can you please specify what capacities and skills are you missing?**

    _____

    _____

    _____

    _____

    _____

46. **B11. Is there any data quality control or data validation performed?**

    Mark only one oval.

    ◯ Yes

    ◯ No

47. **B11.1. If answer to previous question is "Yes" please describe in more details how you perform data quality control or data validation on your data?**

    _____

    _____

    _____

    _____

    _____

48. **B12. Do you have practice of regular data backup?**

    Mark only one oval.

    ◯ Yes

    ◯ No

49. **B13. Do you use any of the national or international species/habitats catalogues for resolving taxonomic status of your biodiversity data (such as national checklists, EU Nomen PESI, Catalogue of Life, Fish Base or similar)?**

    Mark only one oval.

    ◯ Yes

    ◯ No

50. **B14. Are you responsible for maintaining and updating of check-lists for any group of flora and fauna?**

    Mark only one oval.

    ◯ Yes

    ◯ No

51. **B14.1. If answer to previous question is "Yes" please could you explain in more details how you are performing activities related to maintaining and updating the relevant checklists.**

    _____

    _____

    _____

    _____

    _____

52. **B15. Are you aware of EU INSPIRE Directive?**

    Mark only one oval.

    ◯ Yes, but I have only heard about this Directive and I am not fully familiar with the scope and objective of the Directive

    ◯ Yes, I am familiar with INSPIRE Directive scope, regulations and technical guidelines

    ◯ No

C. Data providers specific questions

This question group is intended specifically for Biodiversity data poviders.

Leave answers empty if you (or your organization) does not fit into the stakeholder category.

53. **C1. Do you provide your data to external users?** *Mark only one oval.*

    ◯ Yes

    ◯ No

54. **C2. Is the provided data available in structured format (database, web service)?** *Mark only one oval.*

    ◯ Yes

    ◯ No

55. **C2.1. If the answer to previous question is "Yes", please specify in which structured format is data available.**

_____

_____

_____

_____

_____

56. **C3. Do you charge for data (i.e. do users need to pay for data)?**
Mark only one oval.

◯ Yes

◯ No

◯ Other: _____

57. **C4. If you charge for data access do you make exceptions - are there specific institutions/ organizations that you provide your data for free (such as ministries, agencies or public institutions)?**
Mark only one oval.

◯ Yes

◯ No

58. **C4.1. If the answer to previous question is "Yes", please specify to which institutions/organizations do you provide or you are ready to provide your data for free.**

_____

_____

_____

_____

_____

59. **C5. Are you aware of EU INSPIRE Directive?**
Mark only one oval.

◯ Yes, but I have only heard about this Directive and I am not fully familiar with the scope and objective of the Directive

◯ Yes, I am familiar with INSPIRE Directive scope, regulations and technical guidelines

◯ No