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# NATIONAL ASSESSMENT OF BIODIVERSITY INFORMATION MANAGEMENT AND REPORTING BASELINE FOR ALBANIA



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## **ABBREVIATIONS**

ALFIS - Albanian Forest Information System  
ANFI - Albanian National Forest Inventory  
BIMR - Biodiversity Information Management and Reporting  
BIONNA - Biodiversity National Network of Albania  
BISE - Biodiversity Information System for Europe  
CBD - Convention on Biological Diversity  
CEMSA - Consolidating Environmental Monitoring System  
CMS - Convention on the Conservation of Migratory Species of Wild Animals  
CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora  
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  
GIS - Geographical Information System  
GIZ - Deutsche Gesellschaft für Internationale Zusammenarbeit  
INCA – Institute for Nature Conservation in Albania  
IM-DB – Environmental Information Database  
IPA - Instrument for Pre-Accession Assistance  
IUCN - International Union for Conservation of Nature  
MoE - Ministry of Environment  
MARDWA - Ministry of Agriculture, Rural Development and Water Administration  
NAPA – National Agency for Protected Areas  
NEA – National Environmental Agency  
NGO - Non Governmental Organization  
NP - National Park  
ORF-BD - Open Regional Fund for South-East Europe - Biodiversity  
PA - Protected area  
PPNEA – Protection and Preservation of Natural Environment in Albania  
RAPA - Regional Agencies for Protected Areas  
SDGs - Sustainable Development Goals  
SEA - Strategic Environmental Assessment  
SEE - South-East Europe  
SIM – Environmental Information System  
UN – United Nations  
UNCCD – United Nations Convention to Combat Desertification  
UNDP – United Nations Development Programme  
UNECE - United Nations Economic Commission for Europe

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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.



Gabriele Wagner  
GIZ Sector Fund Manager – ORF-BD

## **Acknowledgement**

This publication is the result of a joint effort of ministries, competent authorities, research institutions, NGOs and experts from Albania to develop a comprehensive overview of biodiversity information management and reporting in the SEE region. This endeavour, which involved pooling of expertise from Albania, was pursued with determination and in a spirit of high cooperation at all levels: political, technical and administrative. All parties and persons involved are greatly acknowledged in Albania for their contribution to this work.

## **1. INTRODUCTION AND BACKGROUND**

### **1.1 ORF 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 dialog, coordination and communication among all relevant stakeholders in the region.

When discussing term such as biodiversity information system, it is useful to begin by examining different elements of which this expression 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 at certain degree in all stakeholder organisation/institutions in most of the countries 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 biodiversity information management and reporting (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 Biodiversity Information Management and Reporting project (BIMR) 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 commitment, 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 Albania**

Albania is recognised as an important biodiversity hotspot in Europe with high diversity of ecosystems and habitats with a large number of steno endemic, endemic, rare and globally threatened species present in the country. Albania's diverse ecosystems include maritime ecosystems, coastal zones, lakes, rivers, forests, alpine and subalpine areas. Albania is a signatory party of most important international conventions on biodiversity such as: CBD, Cartagena Protocol on Biosafety, Nagoya Protocol on Access and Benefit Sharing, Ramsar Convention on Wetlands, Bern Convention on the Conservation of European Wildlife and Natural Habitats, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Bonn Convention/Convention on the Conservation of Migratory Species of Wild Animals (CMS), the United Nations Convention to Combat Desertification (UNCCD), the Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution.

The United Nations Economic Commission for Europe (UNECE) in its review of environmental performance for Albania produced in 2012 states that the country still faces difficulties in implementation and enforcement levels related to environment and biodiversity

due to fragmented responsibilities, lack of human and financial resources, and lack of awareness in government, business and society in general. During the last decade there is an increase of initiatives and projects in Albania related to the nature conservation and management. Within these activities the issues of biodiversity information management, reporting obligations and standardization of environmental information databases have been considerably tackled. Important steps have been undertaken in collection of biodiversity data and also management of protected areas. However, there are still gaps in terms of biodiversity and environmental data collection, reporting and management and creation of legal basis for obligatory data flow. Despite important efforts in terms of biodiversity information management and reporting, the coordination amongst different stakeholders is still not adequate.

Main institution mandated with managing the environment and biodiversity in Albania is Ministry of Environment (MoE). Nature protection and biodiversity is covered by Directorate of Biodiversity and Protected Areas and National Agency for Protected Areas (NAPA) which is set up during 2015. Important interference with environment, biodiversity, natural resources etc. in terms of management is scattered throughout other governmental bodies such as Ministry of Agriculture, Rural Development and Water Administration (MARDWA), Ministry of Urban Development and Tourism etc. Main academic institutions dealing with the research in the field of biodiversity are: University of Tirana, University of Gjirokastra, University of Vlora, University of Shkodra, University of Elbasan, University of Korça, Museum of Natural Sciences and non-government organization (NGO) sector which implements projects related to monitoring of particular biodiversity groups in Albania.

National Environmental Agency (NEA) which is an implementing institution of MoE is responsible for creation and maintenance of the environmental information system. NEA has its branches in 12 districts in Albania. Importance of establishing national biodiversity information system and other information systems dealing with environment has been identified as a key issue in managing the country's rich nature. Several projects have taken place during the last years, dealing with the creation of infrastructure for management of biodiversity data. Several databases were created in the past within these initiatives and most importantly: SIM (Environmental Information System) and IM-DB (Environmental Information Database). These databases however have not taken into account circumstances, needs and expertise of the institutions they were created for and consequently the proper ownership was never built into the institutions. SIM database is a property of NEA and was created before 2006 within an international project. This system is web-based, designed for internal use and is not based on GIS. It has five modules: 1. Environmental permits, 2. Monitoring and inspection, 3. Asset register of environmental information, 4. Different events (public consultations etc.) and 5. Information module (archive). The IM-DB database was produced within the CEMSA project (Consolidating Environmental Monitoring System in Albania) (2008-2012). It is web based, not based on GIS, intended for internal use and was only fed with information until 2013. It contains information regarding biodiversity, bio-monitoring, bio-quality, integrated reports, land, water, air quality. Information for this database came from different state monitoring stations. Both databases are assessed as outdated, proprietary (different companies are behind), they cannot be modified, not based on GIS and not suitable for GIS based system. Currently both databases ceased to be updated soon after they were created and are not functional at the moment.

During the period 2014-2016 and ongoing there are several other initiatives aiming establishment of information systems related to biodiversity and environmental data. Biodiversity National Network of Albania (BIONNA) database has been launched during 2016 within the Natura 2000 project. Currently it mostly contains information for few protected areas but it aims at integrating in future spatial information for plants, animals, and other diversity groups in the whole territory of Albania. The UNDP's project Establishing Albania's Environmental Information Management and Monitoring System Aligned with the Global Reporting (EIMMS) has started during 2015 and aims at integrating all previous official environmental and biodiversity databases into a system which will be practical, easy to use, in line with reporting obligations and with built ownership within the Albanian institutions. In addition to this, another project which includes creation of databases and management of information related to biodiversity is World Bank's project Albanian Forest Information System (ALFIS) which was launched during 2015. It aims at creating an information system about management of information related to forestry in Albania.

It can be concluded that the proper management of biodiversity and environmental data is still lacking in terms of human resources, operationalization of existing databases and financial constraints. In addition to this the coordination among the institutions involved in biodiversity monitoring and data sharing still needs improvement with several efforts in this regard. Along with this, comprehensive monitoring of biodiversity indicators, creation of baseline inventory data and standardization of reporting and monitoring efforts are still not satisfactory. This makes crucially important streamlining of activities of different projects in Albania, prioritization of activities in terms of obligations towards reporting to international conventions and organizations, and structuring of roles and obligations of governmental, academic and other institutions dealing with biodiversity and environment.

## 2. METHODOLOGY

The assessment methodology consisted of four main steps along with a set of sub-steps, as follows:

- 1) Stakeholder identification by the means of local expert knowledge.
- 2) Stakeholder analysis by the 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 economy, 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 economies. 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 in 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 data in the field (**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 orthophoto 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 stakeholders 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 have 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 secure 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 fulfilled 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 NGO sector important in the process of generation, management and processing of biodiversity data. During this time there also were 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 from the list of stakeholders were approached either in direct meetings or through interviews, questionnaire or email in order to have their inclusion in the process of assessing the BIMR for Albania.

#### **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. This analysis is built among other on the feedback from most relevant institutions related to BIMR: different departments and sectors of the MoE, NEA, NAPA, UNDP, NaturaI (Natura 2000), University of Tirana, University of Shkodra and NGOs such as PPNEA, INCA etc. In these meetings biodiversity information management and reporting set-up have been discussed 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. Information gained through the questionnaire has also been incorporated in this report. In meetings with governmental institutions dealing with biodiversity information it was emphasized the need to assist institutions in reporting obligations towards international conventions dealing with biodiversity and environment. Financial resources and human resources were identified as main obstacles in this process together with the expertise which still needs enhancement in biodiversity data collection, management, processing and reporting.

The national briefing was organized on 4th of November 2016 in Tirana with participation of representatives from NEA, NAPA, different sectors of MoE as well as GIZ experts. During this meeting the concept of BIMR was presented and were discussed possibilities of assisting Albanian institutions in the process of managing biodiversity information. Representatives from MoE emphasized the need to assist Albanian institutions particularly in the process of reporting towards international conventions dealing with biodiversity and environment. 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. One of the major obstacles during these meetings was seen also the low level of communication between academic institutions and governmental institutions in terms of exchange of biodiversity data and also the scattered way of preserving biodiversity data. Meetings with NGO sector involved directly in the process of collecting biodiversity data were realized.

The complete list of stakeholders contacted in either form is in Annex 1.

### 3.2. Stakeholder analysis

#### Overview of stakeholders by institution/organization type

In total 33 most important stakeholder institutions (Figure 1) have been identified from government, academia, NGOs, public institutions and international organizations and projects. Most of these stakeholders (relevant for the process of biodiversity information management and reporting) belong to governmental institutions within the MoE, and to a lesser degree within MARDWA. There are 7 identified NGOs and three internationally financed projects relevant in the process. The projects were given as a separate category in order to make a distinction between temporary activities in terms of biodiversity information and international organisations which continuously have a role in management of environment and biodiversity in Albania.

Nine academic institutions important in the process of BIMR are identified in the country. Biology, ecology and environment departments of the universities are the most important stakeholders in terms of primary data collection, maintenance and processing. Currently only two international organizations (UNDP, World Bank) which have completed recently or are financing biodiversity projects are identified as important stakeholders in the process. In Annex 2 is given 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 (Figure 2). Most organizations are located in the capital Tirana. University of Shkodra is located in Shkodër, University of Elbasan in Elbasan and University of Korçë in Korçë. However, even in cases of institutions located in Tiranë, the activity is conducted in the whole of the country. This is also valid for most of NGOs based in Tiranë but whose activity is carried out all over Albania.

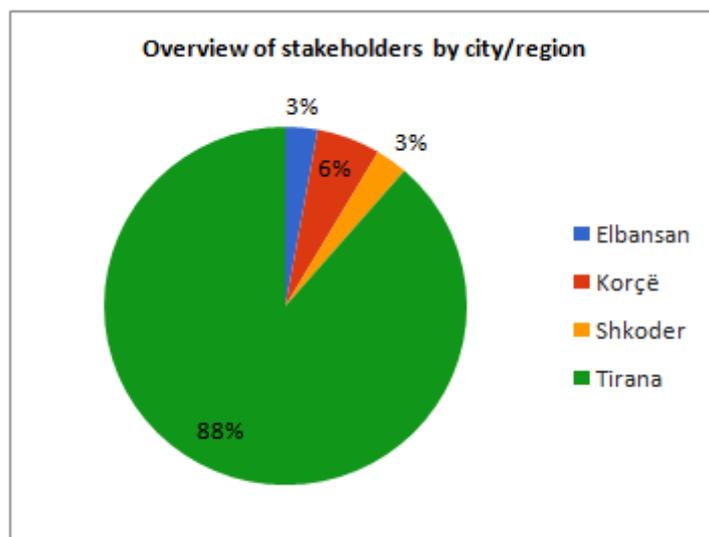


Figure 2. Overview of stakeholders by city/ region

### 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 universities, different projects involved in biodiversity and some NGOs such as PPNEA and INCA. Both ministries (MoE and MARDWA) that are of highest relevance for the process of collection of biodiversity data, processing and reporting have different political influence – most influential is MoE while MARDWA has lower influence. This is because in terms of environment, biodiversity and forestry most of departments for managing with these resources are within the MoE. However, when it comes to academic institutions, Nature Museum (as a part of Center for Flora and Fauna within the Faculty of Natural Sciences) and NGOs even though they are the most relevant institutions in terms of biodiversity information, especially in data collection, they are not scored high regarding political influence. 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 which are at least sporadically involved in biodiversity issues, but mostly concentrated in environmental campaigns in general, which may have more influence in terms of political and public impacts (PPNEA and INCA). PPNEA has been involved several times in activities of civil society which have resulted in concrete results related to biodiversity and environmental protection. It is important to stress that NGOs such as PPNEA and some others have started to be an important drive in shaping public opinion regarding the nature and biodiversity protection which is a direct contribution to political influence. During the last years several other NGOs has been active in environmental campaigns not directly related to biodiversity, increasing thus the political influence of the NGO sector.

### Overview of stakeholders by relevance and capacity

In most of cases the most relevant institutions (such as governmental ones and academic 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 of the MoE departments which are responsible for handling biodiversity and environmental data are still not fully satisfactory and this will be one of the greatest obstacles in the management and update of biodiversity data since there is no plan to increase human resources. The capacities of the NAPA however have greatly increased during the last year in terms of numbers but there is still enormous need in qualifying the personnel to adequately monitor biodiversity and gain information from this monitoring. During 2016 are implemented several trainings in monitoring and management aspects and methodology to be used in field work for NAPA and RAPA staff. Within the ANFI project, the staff of NAPA has been trained for monitoring and inventory of forest ecosystems. University of Tirana as most relevant academic institution, and other universities have 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 resources and expertise. While flora diversity is well covered, fauna, fungi, microorganisms and other smaller groups are not satisfactorily covered by academic institutions. While most of NGOs are active in terms of environmental (including biodiversity) awareness campaigns their capacities and involvement remain unsatisfactory in terms of biodiversity data collection and monitoring. Two most important NGOs, PPNEA and INCA are mostly focused on monitoring large carnivores and some other groups of vertebrates without capacities in studying or monitoring other groups of organisms.

International organizations (UNDP, World Bank, etc.) are of high relevance for BIMR process because of their financial support of biodiversity related projects. However, during the last years there has been a decrease in biodiversity projects financed by international organizations.

### **Overview of stakeholders by political influence and capacity**

The MoE is scored with the highest political influence however its capacities related to biodiversity data collection, processing and reporting are in the process of continuous improvement. The Museum of Natural Sciences is also supposed to be amongst the most relevant institutions in terms of generating and processing and providing biodiversity data. However, during the last decade the Museum has not been actively involved in generating new data or monitoring programs. The investments in enriching the museum collections during the last years still need improvement and without these efforts the political influence of this institution in Albania is not possible. This has decreased all political influence of this institution in Albania. When it comes to academic institutions, Museum of Natural Sciences and NGOs they are scored with medium or low political influence. The political influence of the most important scientific institutions for biodiversity data collection (Faculties of Natural Sciences from University of Tirana, University of Shkoder and University of Korça) is medium, however they have good to very good capacities to implement biodiversity research projects but struggling with financial resources. It is especially to be emphasized that the capacities in researching and managing marine ecosystems is still very low in all academic institutions. Most of NGOs identified as stakeholders during this process do not possess enough financial and staff capacities so that they may have important political impact in the processes related to biodiversity. There are only two NGOs (PPNEA, INCA) which have shown during the last years improvement in human resources and financial capabilities and this has enabled them at least sporadically to be involved in biodiversity issues and environmental campaigns in general with important political and social impact and influence.

## Stakeholder roles overview

Most of the stakeholders assessed during this process are data collectors (35%) and data providers (38%). The level of data collection or data provision amongst different institutions is not however equal. University of Tirana is the main and most likely the only institution in comprehensive primary data collection on biodiversity. Other universities, governmental institutions and NGOs only sporadically collect information on biodiversity and environment. Six institutions (all governmental ones) are data integrator institutions while only five financial support institutions are identified which are different departments of MoE and international development agencies (UNDP, World Bank etc.). The percentage of data integrator institutions is reasonably low due to the lack of professional staff in data assessment, analysis and integration. Such a low percentage of financial support institutions (only 8% out of all assessed stakeholders) is one of the great obstacles in proper management of biodiversity and environmental information creating thus major problems in reporting about these issues (Figure 3).

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 almost at same percentage as data collectors and as a such there are identified mainly different departments of academic institutions and central departments and implementing institutions of the MoE (such as NAPA and NEA), then Ministry of Agriculture. Several NGOs are also identified as data providers: PPNEA, INCA, Society for Protection of Birds and Mammals etc.

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. In total plants, invertebrates and vertebrates are the main categories present in the research of involved stakeholders.

Regarding the category of biodiversity data collected, academic institutions (and mainly Faculty of Mathematics and Natural Sciences of the University of Tirana) 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. Results of questionnaire completed by stakeholders showed that species level and ecosystem level are the most preferred levels in the category of biodiversity data that stakeholders deal with. However, landscape features, land use and biological communities are not enough investigated although they represent important aspect of managing with biodiversity (Figure 4).

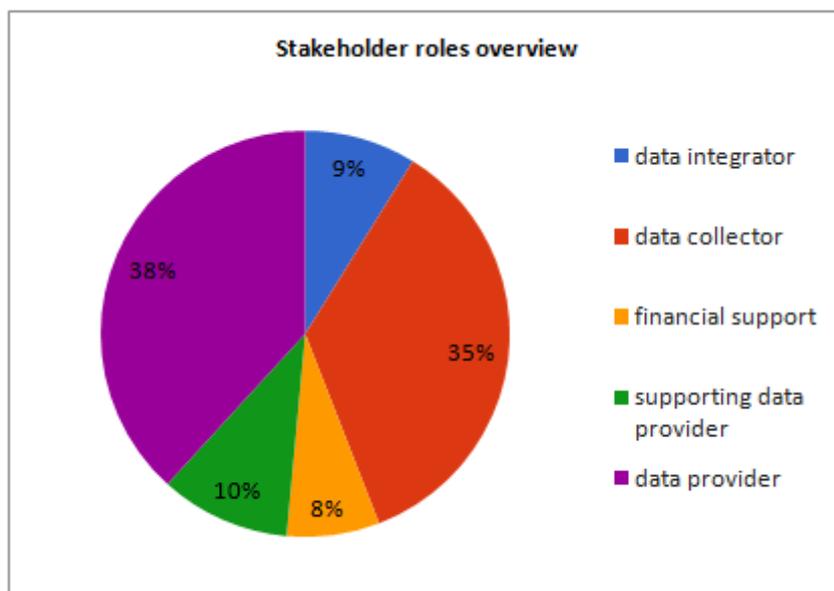


Figure 3. Stakeholders roles overview

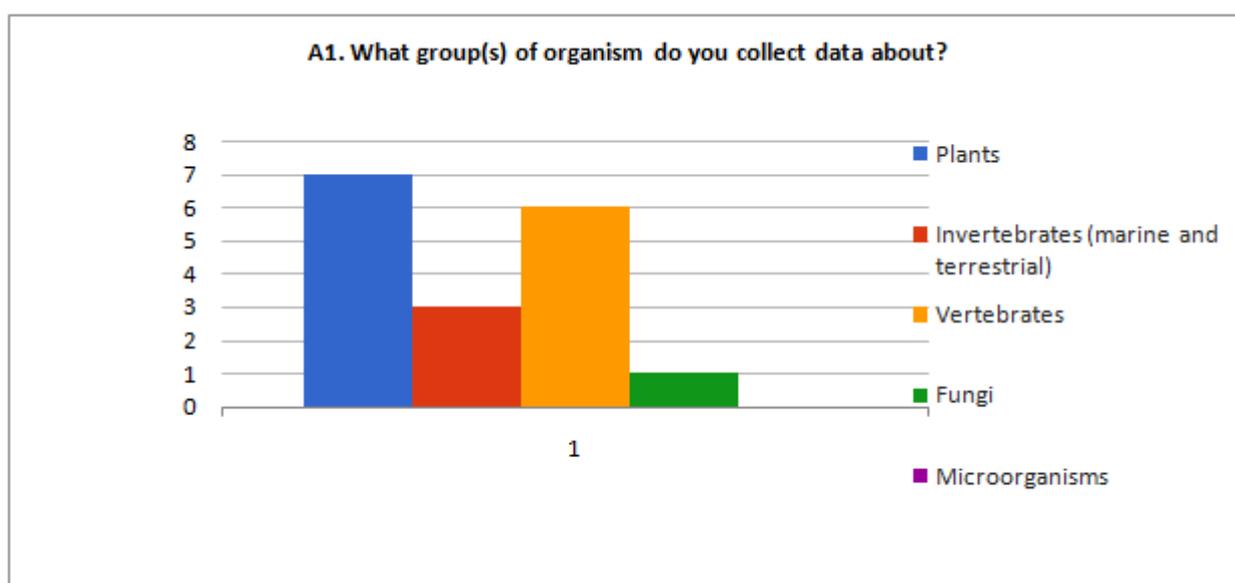


Figure 4. Information regarding the groups of organisms stakeholder institutions collect (based on questionnaire completed by stakeholders involved in the BIMR)

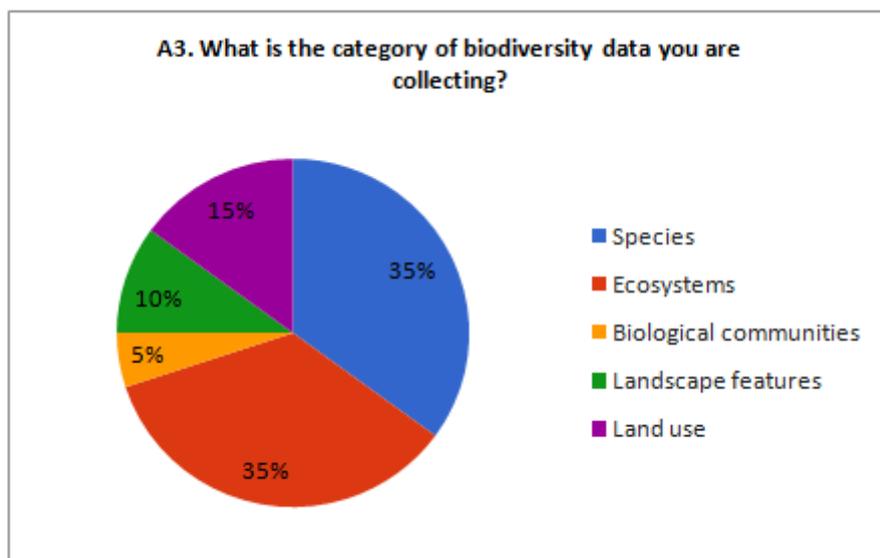


Figure 5. Information regarding the category of biodiversity data being collected by stakeholders (based on questionnaire completed by stakeholders involved in the BIMR)

### Stakeholder relationship mapping

The issue of data flow is not adequately addressed in the Albanian legislation concerning environment and biodiversity (see more section 4.6. Data flow) and this makes this process difficult and uncertain. There is some data flow between different departments of the MoE and at certain degree between this Ministry and MARDWA and other governmental institutions occasionally. 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 approach while 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 it was stressed especially the issue of the low level of integration of biodiversity and environmental data. Data flow and cooperation between different stakeholders, even in cases where stakeholders are part of the same Ministry, is in the process of continuous improvement in terms of integrating these data into strategic overall policies. The level of exchange of data between district level institutions and central institutions having some role 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. District level 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 may interfere planning and efficient implementation of biodiversity programmes, especially in protected areas, if the data flow is not managed well. There are legal procedures for biodiversity data exchange and share in place in Albania such as Decision of the Council of Ministers No.1189, dated 18.11.2009 on the rules and procedures for

the drafting and implementation of the National Monitoring Program and the DCM No. 84, 27.1.2009 On the determination of the criteria for establishment of biodiversity inventory and monitoring network.

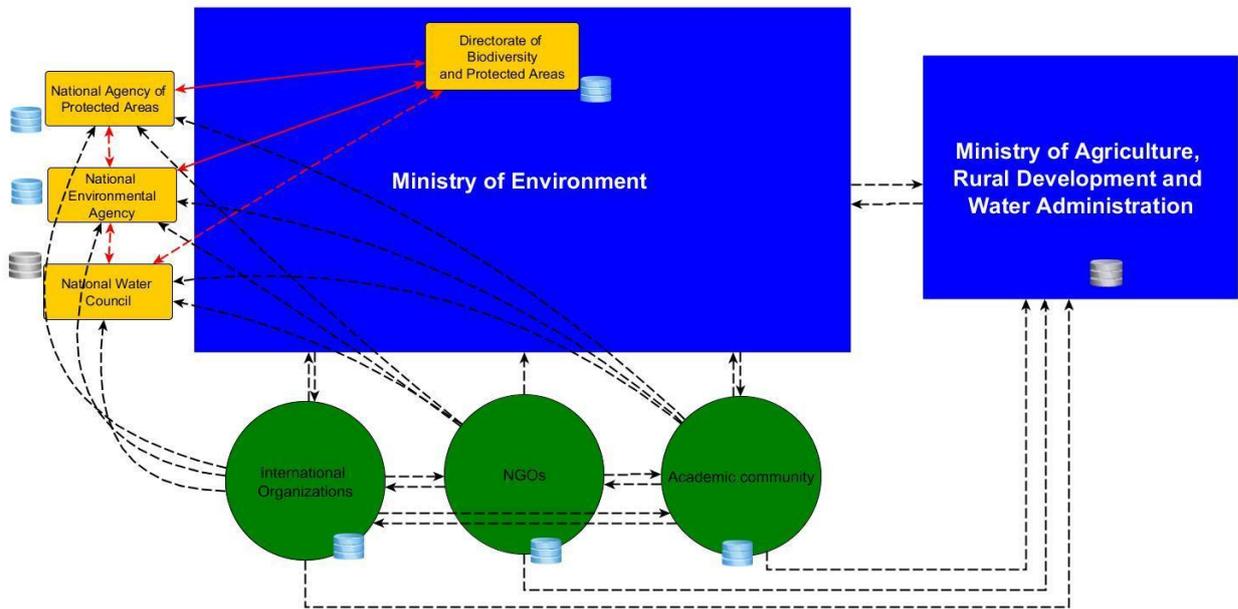


Figure 6. Conceptual chart of biodiversity data flow in Albania

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.

## Conclusions

- Assignment of roles for different levels of biodiversity data management has not been clearly defined in the legislation and neither are 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 has not been completely addressed in legislation, regulations or practice. As the capacities of governmental institutions in this regard are in the process of improvement, this cooperation would enhance generation, management and integration of biodiversity data. In this regard, the quality of data provider institutions is not fully operational, is not understood and needs considerable improvement.
- There is no procedure or clearly defined system of collecting structured biodiversity data for providing reports to NEA or international conventions related to biodiversity and environment.
- 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**

Main institution dealing with the management of biodiversity and natural resources is MoE covering forestry as well. With new restructuring water management is now under the Ministry of Agriculture, Food and Water Administration. Nature protection is covered by the Directorate of Biodiversity and Protected Areas within the General Directorate of Environmental Policy and Delivery of Priorities. Since March 2015 a NAPA is set up with its branches in 12 districts. MoE is in charge of formulating policies on nature protection and developing strategic documents. A number of other relevant implementing institutions are related to environment management: National Coastal Management Agency, Regional Forest Service Directorates (which in the context of structural reform currently being implemented include Protected Areas sections in each district and a sector of Protected Areas of the region and to municipalities of the region), State Inspectorate of the Environment and Forestry, State Inspectorate for Water and Fishery.

Albania has adopted several legal acts regarding nature protection such as: Law on Hunting (Law no. 10253, date 11.3.2010, Law on Wild Fauna Protection (Law No.10006, dated 23.10.2008, amended in 2012), Law on the rules and procedures governing the international trade of endangered species of wild fauna and flora (Law No.9867, dated 31.1.2008, amended in 2012), Law on Biodiversity Protection (Law No. 9587, dated 20.07.2006, amended in 2012), Law on Protected Areas (Law No. 8906, dated 6.6.2002, amended in 2008 by Law 9868, and amended in 2012), Law on Environment Protection no 10 431 (2011). Under approval is the new law on protected areas. The Law No 7/2014 for Moratorium on Hunting in Republic of Albania restricted the hunting in Albania for a period of two years. The Law No 61/2016 for Moratorium on Hunting in Republic of Albania restricts the hunting in Albania for a period of five years.

### **4.1. Nature conservation and biodiversity**

Albania does not have a separate law on nature conservation but it has a law on Biodiversity Protection No 9587 (2006) and the amendment to this law done on 2014. There is a by-law of this law related to the establishment of inventory and monitoring network related to biodiversity DCM no. 84 of 27.1.2009 “On the determination of the criteria for the establishment of the inventory and monitoring network for biodiversity”. The Law on Biodiversity Protection in Article 13 mentions that MoE keeps particular national registers for ecosystems, habitats and protected landscapes, special protected landscapes as well as degraded areas. Article 22 of this law mentions register of specifically protected species for species which are: a. inefficient protection status, b. endemic, c. species with insufficient data, d. species defined as protected based on international instruments to which Republic of Albania is a party. The format of this register and criteria of using it are to be designated by the MoE. The same Article mentions that research institutions create red lists as a document where the endangerment status of species in Albania is presented and which are to be renewed every five years. Article 30 of the law on Protection of Biodiversity while speaking about autochthonous races and varieties of species important for food and agriculture stipulates that information related to this issue is kept in a register to be maintained by MARDWA. The new law on Protected Areas approved in June 2017 completes nature protection legal framework in terms of the management of information. The Strategy for Biodiversity to 2020 is also in place.

## **4.2. Environment**

The old Law on Nature Protection No. 8934 (2002), act no. 57 stipulates that MoE creates National System of Environmental Data which shall be open for public and shall be created by a separate law. With the new arrangements it is now called Law on Environment Protection **10 431** (2011) and it dedicates a whole chapter to environmental information issues (chapter VII. Act no 43). This act explains that the goal of Environmental Information System is to protect and manage the environment of Albania and also in favour of monitoring enforcement of environmental policies. The responsible authority for Environmental Information System is NEA according to this paragraph. Other public authorities are obliged through this law to cooperate with NEA in ensuring the proper functioning of this system. According to this law the EIS shall contain information related to the condition of environment, pollution load and impact on environment, public reactions and especially data about: a) condition of environment constituents, b) pollution load in the environment extracted from Pollutant Release and Transfer Register, c) natural and physical characteristics of environmental constituents and natural phenomena that may impact them, d) environment and its constituents gained from different projects and research and assessment programs, e) natural resources and their use, f) protected and endangered areas, g) biodiversity and its constituents, h) effects of pollution in environment and human health, i) waste and waste management, j) hazardous substances, k) industrial and ecological accidents, l) security measures and measures to be undertaken in case of accidents, m) environmental pollutants, n) measures of environmental policies, plans and programs of environmental protection, o) actions in environment protection, p) permits issued for pollution activities and their content.

Article 67 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 Government of Albania adopts regulations for the source of this fund, way of functioning and usage of Environmental Fund.

## **4.3. Waters**

Law on Integrated Management of Water Sources No. 111/2012 in its Article no 86 stipulates that the Government of Albania initiated with the suggestion of the Minister of Environment adopts regulations for national monitoring program of conditions in surface and underground waters. This regulation deals with registration and management of data related to water sources in Albania. Article 88 of this Law deals with the National Cadastre of Water Sources in Albania. This Cadastre is created, managed and updated by the MoE and includes the following information: a. surface waters classified according to their chemical and ecological status, b. protected areas, c. extremely modified water bodies, d. environmental permits for activities which discharge processed water in water bodies, e. areas prone to eutrophication and nitrates, f. areas of hygiene-sanitary protection, g. areas of emergent protection, h. special areas of protection, i. areas dangerous for health, j. water bodies designated for production of drinking water. Part 3 of Article 86 explains that the Government, through the proposal of Minister of Environment, adopts requests, conditions, procedures and needed finances for creation, maintenance, management and update of National Cadastre of Water Sources. Further in part 4 of this Article, all institutions, public and nonpublic entities which deal with management of water sources are obliged to assign one person who is in contact with Technical Secretariat of

National Council of Water and who feeds with data the National Cadastre of Water Sources. According to this Law the National Cadastre of Water Sources is maintained, managed and updated through the electronic system. According to this Law data of National Cadastre of Water Sources are used by public authorities and other institutions on national or district level in accordance with this law and other sublegal acts. According to the Article 91 every person has the right to get information related to water sources which are related to or upon which are management plans of water basins based.

With new arrangements the administration of waters is however under the MARDWA. With the Internal Regulation 3522/2 are explained new arrangements about administration of waters under this Ministry. Consequently the National Cadastre of Water Sources is now managed by MARDWA as well.

#### **4.4. Agriculture, livestock and hunting**

Law on Agriculture and Rural Development No 9817 (22.10.2007), Article 22 mentions that the Agency of Payments creates and maintains the following registers: 1. Register on farms, 2. Register of producers and processors of food and agricultural products, 3. Register of applications for financial support, 4. Register of land use, 5. Register of livestock, 6. Register of traders of agricultural products and inputs and 7. Register of less favoured areas. In addition to this, the Agency of Payments may keep other databases if needed. Databases are to be kept electronically. All data created in accordance with this law are free except data which are assessed as personal or are business secret.

#### **4.5 Forests**

The Law on Forests and Forest Service 9385, (4.5.2005 and updated) dedicates its Article 16 to the National Cadastre of Forests. This Cadastre is an official register which stores collected data about the way forests are governed and about periodic changes in the forest and pasture fund. Detailed instructions about creation, maintenance, registration, update and change of this register are adopted by Minister of Forestry. On 23. 07. 2007 the Law on Forests and Forest Service was amended with the law no. 9791 with an important amendment related to the information system. Article 27/3 of the updated law now is dedicated to the database system. This Article states that in order to ensure collection, processing and publication of data about forests, the Agency of Environment and Forests, in cooperation with forest management authorities, Forest Police, district and/or local authorities, Faculty of Forest Sciences and organisations of forest use, create database system which is necessary for forest monitoring. This database system includes all measurable numeric indicators which clarify the condition in forests and processes in them. In the process of creating this database, the law emphasizes the streamlining with systems used by FAO and designated in EU's directives. The new law on Environment Protection **10 431** (2011) makes some rearrangements of departments dealing with environment, biodiversity and forestry. Thus the Agency of Environment and Forests is now called NEA and is mandated to monitor and manage environment in Albania. The Law on Forestry was amended during 2016 in order to be adapted to the new territorial division of Albania in 61 municipalities and status of forest ownership categories.

#### **4.6. Data flow**

Regarding data flow between different institutions and stakeholders the Law on Biodiversity Protection stipulates that the Government will adopt means, methodology and procedures of data flow which are related to EIS. Law on Agriculture and Rural Development No 9817 (22.10.2007), Article 23 mentions that in order to create and maintain databases mentioned in Article 22 of this law, the Agency of Payments may use other databases which are maintained by authorized governmental institutions, public agencies, concessionary agencies and other authorized authorities. Administrators of these databases, maps, ortho-digital photos are obliged to provide free of charge to the Agency of Payments every information mentioned in Article 22 of this law, but they can charge Ministry of Agriculture for direct costs related to materials such as extra copies and data analysis.

The Law on Forests and Forest Service 9385, (4.5.2005 and updated) in its addition of 23.07.2007 through the law 9791, Article 27/4 stipulates that private individuals, juridical persons, public or private must submit their data (which shall constitute DataBase System) within 30 days after they have received the request in accordance with the regulations adopted by Minister of Forestry. These submitted data must be accompanied with explanations and interpretation as well as recommendations for resolving the problems raised by Agency of Environment and Forestry.

There is no other direct or indirect data flow indication obligation in the Albanian legislation related to biodiversity, species or habitats.

#### **4.7. Reporting obligation overview**

Albania is part of the most important international conventions dealing with biodiversity and environment and is continuously aiming at approximating its legislation in line with these conventions. The institution responsible for reporting to EEA is NEA with its Forestry Division while the preparation of the national reports for the implementation of the Conventions is the responsibility of the MoE. Albania signed the CBD in 1994. The last report for the CBD was done in 2014. The Law on Biodiversity Protection was approximated with the Council Directive 92/43/EEC "On the conservation of natural habitats and of wild fauna and flora" (Habitats Directive), followed by the enactment of bylaws that approximate its annexes and the Directive 2009/147/EC (Birds Directive). According to the legislation in the framework of Natura 2000 Albania should prepare every six years the report on the implementation of the protecting measures, including the conservation measures, the evaluation of their influence on the conservation of the species and of the natural habitats, plants and animals. The Ramsar Convention entered into force in Albania on 29 February 1996 and in line with obligations towards this convention there are currently four areas declared: the Karavasta lagoon, the Butrint Lake, the Shkodra Lake, and the Prespa Lake. Albania signed the UNCCD in 2000 and during 2014-2016 Albanian MoE was assisted in reporting to UNCCD through a GEF project entitled "Elaboration of the action plan harmonized with the Strategic Plan of the UNCCD and the preparation of the National Report for the Convention". Albania joined the Bonn Convention on the Conservation of Migratory Species of Wild Animals in 2000 and in line with its adherence it drafted action plans for protecting several species such as lynx, brown bear, grouse etc. During 2003 Albania adhered to the CITES. In line with its obligations to CITES

Albania has a law on establishing the regulations and procedures for the cross-border trade of the endangered flora and fauna species.

Albania also reports to the EEA and is part of the EIONET network. Albania also reports and contributes to the Forestry Resources Assessment of FAO and UNECE. Albania reports every year on annual basis the list of protected areas in Albania, their ecological network, main ecosystems etc. to the EEA. This report is known as CDDA (Nationally Designated Areas): areas designated under national legislation for the purpose of nature protection including sites such as national parks and nature reserves. This report is than part of European Common Database on Nationally Designated Areas - ECDDA - National.

### **Conclusions**

- Most of primary legislation concerning the establishment of databases related to different sectors of nature resources are 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 obligated for data providing are being completed.
- The interference and relationship between different databases related to management of data on natural resources is not 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.
- Responsibilities in the field of natural resource management are mostly under the MoE, however inter-sectoral cooperation in terms of proper management of environmental and biodiversity data is still not fully operational.
- Fragmentation of competences is accompanied with underdeveloped inter-sectoral communication and has a negative influence on biodiversity data management, especially in protected areas.
- The data flow obligations within the legislation in terms of biodiversity information are being improved. The DCM no. 84 of 27.1.2009 “On the determination of the criteria for the establishment of the inventory and monitoring network for biodiversity” and DCM 1189 on the monitoring in the Republic of Albania is such an example.
- There is still no operational solution for systemic support of activities related to environmental protection (Environmental fund) in Albania even though its creation is envisaged by the law.

## **5. INFORMATION SYSTEM SET-UP ASSESSMENT**

### **5.1. Ongoing initiatives related to biodiversity IS**

Even though universities are involved in several projects related to biodiversity and environment, biodiversity data are not centrally managed. There is no standardized protocol for data maintenance, data sharing and data reporting. During the consultation process with stakeholders there were identified main activities and fields of mutual interests with other organizations working in biodiversity information management and reporting. During these meetings with relevant stakeholders there were identified main gaps and needs in terms of biodiversity databases, information, management and reporting.

#### **BIONNA database and NATURAL 2000**

The EU funded project NaturAL aims to prevent the loss of biodiversity in Albania through improved management of its protected areas and setting basis for the future implementation of European Natura 2000 network. The project's full title is: Strengthening national capacity in nature protection - preparation for Natura 2000 network. The goal of the project is to implement management plans in at least five protected areas, and prepare a preliminary list of Natura 2000 sites in Albania. Up to now the assessment of 51 protected areas of Albania was conducted using the Management Effectiveness Tracking Tool (METT) in the frame of the project NaturAL and the database named BIONNA was developed.

BIONNA is an occurrence of species database currently being developed and enriched within this project. This BIONNA database is developed through a cooperation of the projects NaturAL (within the Natura 2000) and Institutional Support to the management of Protected Areas in Albania (financed by IUCN). Initially the database was planned to include the biodiversity data of Shebenik-Jabllanice National Park and Velipoje Protected Area, and in future to be enriched by the introduction of detailed biodiversity status of the five primary protected areas of NaturAL. BIONNA is built using the BioCAsE Provider Software (<http://www.biocase.org/>) that allows publishing biodiversity data freely on Internet through appropriate queries. BIONNA is planned to function also as a data provided to the Global Biodiversity Information Facility (<http://www.gbif.org/>) in order to make the considerable biodiversity heritage of Albania accessible worldwide. The software for running BIONNA is currently hosted outside of Albania and for the moment 15,000 occurrence records of some of 900 species are registered in this database. At the moment all registered species belong to two largest Kingdoms of organisms (plants and animals) while other groups are not represented. For registered species are given details such as: geographical coordinates, date of observation, number of individuals observed, bibliography, reference and other. However, not all these details apply or are present for all species in the database. All data in the database are available and freely downloadable in Excel format.

#### **EIMMS project**

The UNDP's "Establishing Albania's Environmental Information Management and Monitoring System Aligned with the Global Reporting" (EIMMS) project (2015-2019) will cover indicators from three groups: 1. Climate Change, 2. Land Degradation and 3. Biodiversity with a special focus on climate change and land degradation. This project is evaluating previous environmental information systems in Albania aiming creation of new integrated Environmental Information Management and Monitoring System. Two previous most important official databases (SIM and IM-DB) aiming environmental and biodiversity information management were assessed currently by the project on technical level. The new database system is planned to be GIS based, based on open source software and shall be in property of NEA. In addition to the technical goal of the new information system (in

integrating previous existing official environmental/biodiversity information systems) the new information system has a goal to contribute to harmonization and enhancement of the existing information systems to the global conventions which Albania has signed and other important ones and also contribute to the harmonization of environmental indicators with national legislation practice ensuring the associated baseline information is recorded. Within this project the aim is also to develop and plan the application of standard indicators encompassing UNFCCC, CBD and UNCCD conventions. The project also aims at focusing on capacities needed for data collection and processing, data interpretation and reporting towards international obligations of the country. This project does not plan to create its own biodiversity information system but will integrate or relate with the BIONNA database.

### **ALFIS Project**

The ALFIS (Albanian Information Forestry Information system) is being developed within the Albanian Forest Information System Design and Quality Assurance project (2015-2018) jointly financed by GEF and Swedish Development Agency through the World Bank. The project will establish the Albanian Forest Information System (ALFIS) at the forestry sector. The system will capture information on forests and pastures under all types of ownership. The goal is to create a permanent (not a project based) system for recording and reporting forest and pasture information and avoiding duplication of work. The system establishment is a four-stage process: 1) Planning and design; 2) Programming and installation, 3) Implementation and 4) System quality assurance. The project will commission an international consultant to plan and design the system with the ALFIS management team. The overall objective of the consultancy is to support the forestry sector to complete the planning and design stage as well as monitor the implementation phase and quality assurance of the System. The project is still at its initial phase.

### **ANFI Project**

This project, financed by World Bank started during 2015. The specific objectives of this project are: i. Build MoE/NEA capacities to design and implement a National Forest and Pastures Monitoring System that will provide the required information on forest condition, cover and dynamics while at the same time generating new relevant data on parameter such as forest carbon and biodiversity. ii. Support NEA on assess the current status and predict the future development of the country's forest and pasture resources and relate it to management alternatives and national policy programs of the sector; iii. Improve the capacity of MoE/NEA to undertake GIS and Remote sensing analysis for mapping; monitoring and improving estimations, in order to detect the type and amount of changes occurring in land cover and forest resources in a systematic and continuous way. The years for the evaluation will be 1992, 2003 and 2015. iv. Propose the necessary organizational structure and technical capability to carry out and execute forest and pasture resources assessments and monitoring programs in Albania; v. Strengthen MoE/NEA capacities for data processing and information dissemination and utilization for cross-sectoral policy coordination and decision making

### **GEF Drin Project**

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 economies (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. The project is still in its initial phase.

## **Information kept with the Hungarian Museum of Natural History**

Large amount of biodiversity information is kept in databases of Hungarian Museum of Natural History in Budapest. This information is kept in different formats, mostly in excel databases, and are not stored centrally but kept and maintained independently by particular specialists of different taxonomic groups. Information on some taxonomic groups collected in Albania by the Museum is also kept by specialists outside Hungarian Museum of Natural History, but mainly in Hungary.

## **Conclusions**

Information systems dealing with biodiversity and environment in the past did not address adequately the management of biodiversity information in terms of standardizing collection of data methodology, proper registration in terms relevant for monitoring and reporting towards international conventions. For example, the first information system SIM did not have a unit for biodiversity data and while the second database IM-DB included biodiversity it did not have a spatial distribution information for species neither information regarding protection or management of species, habitats and ecosystems. BIONNA database which is developed within the Natura 2000 in Albania is the first database which includes spatial information for species distribution. This is a great contribution in management of species. However, the database does not include relevant information for species in accordance of international conventions such as Bonn and Bern Conventions etc. Natura 2000 project plans to develop together with EIMMS project the list of biodiversity indicators which are important step towards meeting standards of international conventions related to environment and biodiversity that Albania is part of. These projects also lead to advances in the quality and quantity of biodiversity data produced in terms of producing guidelines for biodiversity data collection and management. This is still at its initial phase and it remains to see how it will impact the management of biodiversity and environment in the future. However, the training of district level authorities which are supposed to feed environmental information systems in terms of biodiversity data are not tackled yet by projects and this is an urgent need in order to ensure the ownership and continuity of environmental and biodiversity information systems.

## **5.2. Data collection**

Most of institutions dealing with data collection in Albania are universities and mainly Faculty of Mathematics and Natural Sciences of the Tirana University. Other universities such as University of Shkodra, University of Elbasan and University of Korça are also involved in collection and monitoring of different groups of plants, animals and other living organisms although not in same degree as University of Tirana. Important contribution in data collection comes from NGO' sector. NGOs such as PPNEA and Association for Protection of Birds and Mammals also collect biodiversity data for particular groups. In the process of biodiversity data collection and data storage, very important stakeholders in Albania are foreign scientists and institutions.

Faculty of Mathematics and Natural Sciences of the University of Tirana collects biodiversity information related to: vascular plants, algae, aquatic and terrestrial invertebrates, freshwater fish and at a lesser degree mammals, lichens, fungi and microorganisms. Same categories are more or less covered by other universities in Albania but to considerably lesser degree. Faculty of Mathematics and Natural Sciences of the University of Tirana is also amongst the few academic institutions in Albania covering study of biodiversity of transitional waters and marine ecosystems. However, the marine ecosystems remain still one of the least explored areas in Albania due to the low specialized staff in universities for this specific field. One biodiversity field which is covered in studies during the last years by Faculty of Natural

Sciences of Tirana University, but at lesser degree by biology departments of other universities in Albania are invasive plant and animal species. Water quality assessment through biological indicators is also one of the research fields of University of Tirana and University of Vlora during the last decade. Several rivers in central and southern Albania has been assessed during these investigations. Bat fauna of Albania has been subject of few master degree studies during the past few years in the Department of Biology of University of Tirana. All departments of biology of universities in Albania also study amphibians, freshwater fish and reptiles especially in terms of the impact of pollution mainly and not from inventory perspective.

The level of biodiversity fields covered by NGOs is considerably narrower and it mainly includes large carnivores and birds. PPNEA has been active during the last years in monitoring lynx and other large carnivores protected by law. NGO named Society for Protection of Birds and Mammals mainly has collected biodiversity data on species level for birds. Ecosystems of high altitudes and associated species of all taxonomic groups still remain insufficiently covered during biodiversity investigations in Albania. Hydra NGO is involved in research dealing with monitoring of some fish in Adriatic and Ionian Sea and natural lakes, research related to molluscs and crustaceans mostly from cultivation perspective, management of coastal lagoons. Researches from Albania and Macedonia has investigated during the last two years algae, water plants, snails water bugs like and insect larvae in Ohër Lake within the Niva Ohrid Project financed by the Norwegian Ministry of Foreign Affairs.

Investigations carried out by foreign scientists in Albania during the last two decades have become crucially important in terms of relevancy and amount of data produced. Most of these studies are done in biodiversity hotspots of Albania such as Korab Mountains, Bjeshket e Nemuna Mountains, Dajt National Park, Qafshatme National Park, alpine areas of high mountains but also in freshwater ecosystems and terrestrial ecosystems of lower altitudes. Scientists from Germany, Austria, Croatia, Slovenia, Kosovo amongst other has done sporadically investigations in particular groups of living organisms in Albania, but most notable institution involved continuously since more than 10 years in biodiversity studies is Museum of Natural History of Budapest in Hungary. Most of these studies are focused in under-investigated groups such as: earthworms, acarids, caddisflies, stoneflies, longhorn beetles but also other more notable groups such as butterflies, amphibians, reptiles and even mammals. Only during the last decade these studies produced almost fifty species new for science most of them being stenoendemics of Albania or species with limited distribution in particular regions of the Balkan Peninsula. Cooperation of these foreign scientists with national scientists in Albania is poor and thus most of these studies are unknown in academic circles of Albania and most importantly are not included in the national legislation or management plans for protection, preservation and monitoring. Most of holotypes of new species described during this period are preserved in the Museum of Natural History of Budapest but also in other countries such as Slovenia, Austria, Kosovo, Serbia etc. Museum of Natural History of Budapest is also important stakeholder in the process of biodiversity data information, management and monitoring because most of the data produced by them in Albania are stored in structured excel databases, GIS referenced and with many other details which may be important in the process of BIMR.

In terms of data collection most identified data collector institutions do not use any software solution for field data collection. However basic software solution for GIS reference are used by all institutions and some NGOs also use the Spatial Monitoring and Reporting Tool (SMART) conservation software in their field collection and monitoring activities.

### **5.3. Data processing and analysis**

Collected data in field are stored in different formats but mostly in excel databases. Some institutions also use access based database or even their own software solutions such as BIONNA which uses Biocase software solution. In only few cases data are stored in text files. 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**

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 by governmental institutions dedicated only for maintenance or creation of biodiversity information system in Albania. Also staff capacities are far below the needs to maintain such system. District level institutions which are supposed to provide biodiversity information to NEA and NAPA 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 Environmental Agency of Albania is unable to proceed adequately with all needed information for successful operationalization of the biodiversity information system.

### **Conclusions**

- The level of biodiversity data collection is not organized and is mainly conducted in academic institutions within diploma thesis of 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 also sporadic and mainly conducted within internationally funded projects but with considerably limited scope compared to universities.
- While there are significant activities in terms of primary biodiversity data collection for different taxonomic groups conducted by foreign scientist, interaction between them and local academic or governmental institutions remains weak. This makes a large amount of biodiversity data to be unused in terms of management of biodiversity and environment.
- 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 to which Albania is signatory party.
- Financial constraints dedicated to information systems and management of biodiversity data are extremely weak. There is no budget line dedicated solely to the building of biodiversity and environment information systems.
- Environmental and biodiversity information systems have so far been financially and operationally created by international donor projects with low involvement of staff from NEA which is obliged to cover this issue. This makes the process of ownership transfer of these databases to institutions difficult.

## 6. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

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

- Several laws of the Albanian legislative system framework envisage and make obligatory creation and maintenance of systems which are directly or indirectly related to biodiversity and environment with the law on Environment Protection specifically stipulating NEA as an institution which creates and maintains the EIS. Biodiversity data are thus seen as constitutive part of this Environmental Information System and not as a separate information system linked to EIS.
- Secondary legislation is still not completed in terms of defining the content, structure, maintenance procedure, information verification, technical requirements and financial constraints for the Environmental Information System.
- Relationship between EIS and other databases or informative systems dealing directly or indirectly with environmental and biodiversity data is not specified in Albanian legislation.
- Coordination and cooperation among different ministries, state agencies and institutions regarding biodiversity and environmental information is still inadequate.
- The legislative infrastructure is not specific in terms of obligations towards generation of environmental data, maintenance and exchange and data flow of this information. Generation of information and data flow is only indirectly addressed in all laws dealing with environmental and biodiversity information.
- Financial constraints and human resources related to the maintenance of EIS as crucial tools in operationalization of this system are still not adequately addressed by institutions dealing with strategizing and management of environment and biodiversity in Albania.
- A huge amount of information which is crucially relevant for management of environment and biodiversity in Albania is usually lost and not available to management authorities due to the inadequacy of the existing legislative regulations and poor enforcement of existing ones.
- There have been, in the past, several initiatives by internationally financed projects for creating such EISs but they mostly resulted in creation of systems projected as per project's needs and views without taking seriously future operationalization of such systems by the MoE. These systems are currently dysfunctional and the ownership infrastructure in the MoE has not been put in place in terms of generation of data, inclusion of existing data and maintenance of gathered data.
- The current UNDP project EIMMS aims at incorporating all existing environmental systems in one place and making this information usable in terms of preconditions foreseen in Albanian legislation in terms of management of environment and also reporting obligations towards international conventions and institutions.
- The creation of Environmental Fund in Albania which could contribute in the process of BIMR is still lacking.

## **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 the following conclusions and recommendations can be given:

### **Improvement of legislation:**

- Create Register for Ecosystems, Habitats and Protected Landscapes as stipulated by the Law on Biodiversity Protection, as a tool for proper management and conservation of biodiversity.
- Enhance the National Cadastre of Water Sources, especially the part of this cadastre which deals with the quality of surface waters and its associated impact on living organisms. This Cadastre is an important tool for meeting Water Framework Directive conditions and requirements.
- Provide legal basis and exact procedures for smooth exchange of data between institutions responsible for the management of natural resources and biodiversity especially between academic institutions and NGOs in one side and governmental institutions on the other side.
- Ensure that the new incoming EIS properly addresses biodiversity in terms of spatial distribution, conservation and other relevant information for protection, management and reporting.

### **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 district level staff employed and responsible for protected areas in Albania.
- Prepare ready to use software solution for biodiversity data collection institutions, especially for staff in charge of managing with protected areas.

### **Strengthening between and within sectoral cooperation**

- Provide legal and technical conditions for efficient exchange of biodiversity data between institutions entrusted for nature conservation with institutions entrusted for management of natural resources.
- Increase the cooperation between State Inspectorate of Environment and Forestry, and regional authorities in management of protected areas.
- Simplify procedures for getting permission for investigating biodiversity in the field in Albania and conditioning of these permissions with submission of reports after investigation containing information gathered.

### **Trainings relevant for BIMR process**

- Training for staff of MoE, including management authorities of protected areas, in biodiversity data analysis and processing.
- Training for staff on district and central level dealing with management of biodiversity, forestry and environment on the way of reporting towards NEA and/or NAPA regarding biodiversity, forestry and environmental information.
- 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 Albania of preserved or alive specimens of plants, animals and other organisms.
- Assist NAPA in developing and using software for management of national parks and protected areas which would include features for registering and continuously monitoring ecosystems, species, habitats and associated damage.
- Organize awareness activities with staff in regions, towns and protected areas in Albania dealing with biodiversity in terms of properly identifying, monitoring and controlling activities of foreign scientists collecting biodiversity information in the field without permission so that this information remains with institutions in Albania.
- Increase the assistance towards governmental institutions in terms of meeting reporting obligations towards international conventions dealing with biodiversity and environment. In this regard for example training on reporting towards Barcelona Convention.

### **Capacity building and financial constraints**

- MoE to dedicate special budget line for maintenance of the 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.
- Improve capacities of the Museum of Natural Sciences in terms of storing biodiversity data and exchange of information with other Museums in the area, especially related to the biodiversity information collected in Albania.
- Increase the number of staff, including IT experts, in the offices dealing with the Environmental Information System within the NEA.

## **7. CONSULTED LITERATURE**

UNECE, New York and Geneva, 2012, Albania Environmental Performance Reviews

Environment and Ecology Research 4(2): 79-87, 2016, Erjon Muharremaj, Challenges of the Albanian Legislation on the Protection of Biodiversity

Law on Hunting (Law no. 10253, date 11.3.2010)

Law on Wild Fauna Protection (Law No.10006, dated 23.10.2008, amended in 2012)

Law on the rules and procedures governing the international trade of endangered species of wild fauna and flora (Law No.9867, dated 31.1.2008, amended in 2012)

Law on Biodiversity Protection (Law No. 9587, dated 20.07.2006, amended in 2012)

Law on Protected Areas (Law No. 8906, dated 6.6.2002, amended in 2008 by Law 9868, and amended in 2012)

Law on Environment Protection no 10 431(2011)

**8. ANNEXES**

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

- Directorate of Biodiversity and Protected Areas, Ministry of Environment
- General Directorate of Water and Soil Administration, Ministry of Agriculture Rural Development and Water Administration
- General Directorate of Policies, Ministry of Environment
- Ministry of Environment
- Ministry of Agriculture, Rural Development and Water Administration
- National Agency of Protected Areas
- National Environmental Agency
- Technical Assistance for Institution Building of the Ministry of Environment in Enforcing Environmental and Climate Acquis
- Technical Secretariat of the National Water Council
- Agricultural University of Tirana
- Department of Biology, Faculty of Natural Sciences, Tirana University
- Department of Biotechnology, Faculty of Natural Sciences, Tirana University
- Faculty of Natural Sciences, Shkodra University
- Faculty of Natural Sciences and Human Sciences, Korça University
- Faculty of Natural Sciences, Elbasan University
- Institute of Geosciences, Energy, Water and Environment
- National Centre for Flora and Fauna, Faculty of Natural Sciences, Tirana University
- Natural Science Museum
- Albanian Ornithological Society
- Protection and Preservation of Natural Environment in Albania, PPNEA
- Institute for Nature Conservation in Albania, INCA
- Society for Protection of Birds and Mammals of Albania
- UNDP Albania

## **Annex 2. List of identified stakeholders**

### **Governmental Institutions**

- Directorate of Biodiversity and Protected Areas, Ministry of Environment
- Directorate of Integrations and Projects, Ministry of Environment
- Directory of Water Resources Management
- ECAT Tirana
- General Directorate of Water and Soil Administration, Ministry of Agriculture, Rural Development and Water Administration
- General Directorate of Policies, Ministry of Environment
- Ministry of Environment
- Ministry of Agriculture, Rural Development and Water Administration
- National Agency of Protected Areas
- National Agency of Territorial Planning
- National Environmental Agency
- Prespa National Park
- Technical Assistance for Institution Building of the Ministry of Environment in Enforcing Environmental and Climate Acquis
- Technical Secretariat of the National Water Council

### **Academic Institutions**

- Agricultural University of Tirana
- Department of Biology, Faculty of Natural Sciences, Tirana University
- Department of Biotechnology, Faculty of Natural Sciences, Tirana University
- Faculty of Natural Sciences, Shkodra University
- Faculty of Natural Sciences and Human Sciences, Korça University
- Faculty of Natural Sciences, Elbasan University
- Institute of Geosciences, Energy, Water and Environment
- National Centre for Flora and Fauna, Faculty of Natural Sciences, Tirana University
- Natural Science Museum

### **Non-Governmental Organisations**

- Albanian Ornithological Society
- Protection and Preservation of Natural Environment in Albania, PPNEA
- Regional Environmental Centre, Albania
- Institute for Nature Conservation in Albania, INCA
- Society for Protection of Birds and Mammals of Albania
- Fisheries and Aquaculture Research Centre HYDRA

### **International Organisations and Projects**

- World Bank
- EU Delegation
- UNDP Albania

- Natura 2000
- NIVA Project Ohrid Lake (Financed by Norwegian Foreign Affairs Ministry)

**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

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Please enter the info regarding your institution/organisation

1. Name \*

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2. Address \*

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3. Postal code \*

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4. City \*

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## Stakeholder person contact information

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Please enter the info regarding the person filling the questionnaire

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

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6. Position of the person filling the questionnaire \*

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

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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:

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### 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.)**

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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, satellite 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:**

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

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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.**

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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.**

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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?**

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**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?**

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**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.)**

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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.**

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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.**

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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?**

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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?**

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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.**

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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 providers.

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.**

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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.**

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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