Gap assessment and analysis on compliance of existing forest legislation in Albania and North Macedonia with EU directives and policies related to forests, water and climate changes

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List of Abbreviations

BD	Bird Directive
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
DCM	Decision of the Council of Ministers
DBU	Deutsche Bundesstiftung Umwelt
EIA	Environmental impact assessment
EU	European Union
FAWF	Research Institute for Forest Ecology and Forestry
FD	Flood Directive
FFS	Faculty of Forestry Sciences
FRMP	Flood Risk Management Plans
GEF	Global Environment Fund
GoA	Government of Albania
HCFC	Hydrochlorofluorocarbons
HD	Habitat Directive
LDN	Land Degradation Neutrality
MoTE	Ministry of Tourism and Environment
MS	Member States
NAP	National Adaptation Plan
NCB	National Coordination Body
NCSA	National Capacity Self Assessment
NEA	National Environment Agency
NSDI-II	Second National Strategy for Development and Integration
PES	Payments for Ecosystem Services
RBMP	River Basin Management Plan
SCI	Sites of Community Importance
SEA	Strategic environmental assessment
SIDA	Swedish International Development Agency
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Program
WB	World Bank
WFD	Water Framework Directive

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Background and Purpose of the GAP Analyze

The project "*Generating momentum on water and forests in the Balkans*" is financed by Deutsche Bundesstiftung Umwelt (DBU) through Research Institute for Forest Ecology and Forestry of Rhineland- Palatinate (FAWF), Germany. The Project is implemented by CNVP (Connecting Natural Values & People Foundation).

The first specific objective of the project is to develop model measures for water protection in forest areas by an integrative forestry and water management through improved forest planning.

The second specific objective of the project is to enhance forest-planning capacities in North Macedonia, Albania, and Serbia by an integrative forest management strategy with a special focus on water retention in forests.

The aim of this GAP analysis is to present areas of non-compliance with national legislation in forestry with the European Union (EU) requirements, in this matter "forest-water". These analyses will identify corresponding/non corresponding provisions in Albanian and Macedonian legislation and will highlight transposition options. Thereby the present analysis, together with the synopsis table, forms the basis for further project benchmarks.

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International legislation related to forest-water issues and their transposition in natural legislation

The list of environmental related international legislations is so wide. Republic of Albania and Republic of North Macedonia ratified these legislations.

HORIZONTALLEGISLATION

- Convention on Environmental Impact Assessment in a Transboundary Context http://www.unece.org/env/eia
- Protocol on Strategic Environmental Assessment http://www.unece.org/env/eia/sea_protocol.html
- Multilateral Agreement among the Countries of South-Eastern Europe for implementation of the Convention on Environmental Impact Assessment in a Transboundary Context http://www.unece.org/env/eia/subregions/se_europe.html
- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters http://www.unece.org/environmental-policy/treaties/public-participation/aarhus-convention.html
- Protocol on Pollutant Release and Transfer Registershttp://www.unece.org/env/pp/prtr.html

SOIL

- United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa http://www.unccd.int

CLIMATE CHANGE

- United Nations Framework Convention on Climate Change http://unfccc.int/2860.php ; http://unfccc.int/kyoto_protocol/items/2830.php

NATURE

- Convention on Biological Diversity www.cbd.int
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity http://bch.cbd.int/protocol
- Convention on Wetlands of International Importance especially as Waterfowl Habitat http://www.ramsar.org

- Convention on the Conservation of Migratory Species of Wild Animals http://www.cms.int
- Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard (Otis tarda) http://www.cms.int/en/document/memorandum-understanding-conservation-and-management-middle-european-population-great-2
- Convention on the Conservation of European Wildlife and Natural Habitats http://www.coe.int/t/dg4/cultureheritage/nature/bern/default_en.asp
- Convention for the protection of the World Cultural and Natural Heritage http://whc.unesco.org/en/conventiontext
- Convention on International Trade in Endangered Species of Wild Fauna and Flora www.cites.org
- European Landscape Convention http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/default_en.asp
- Agreement on the Conservation of Bats in Europehttp://www.eurobats.org
- Amendment of the Agreement on the Conservation of Bats in Europe http://www.eurobats.org
- Agreement on the Conservation of African-Eurasian Migratory Waterbirds http://www.unep-aewa.org

ATMOSPHERE

- Vienna Convention for the Protection of the Ozone Layer http://ozone.unep.org/new_site/en/vienna_convention.php
- Montreal Protocol on Substances that Deplete the Ozone Layer http://ozone.unep.org/new_site/en/montreal_protocol.php
- The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – London http://ozone.unep.org/new_site/en/Treaties/treaties_decisions-hb.php?dec_id_anx_auto=780
- The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – Copenhagen http://ozone.unep.org/new_site/en/Treaties/treaties_decisions-hb.php?dec_id_anx_auto=781
- The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – Montreal http://ozone.unep.org/new_site/en/Treaties/treaties_decisions-hb.php?dec_id_anx_auto=782
- The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – Beijing http://ozone.unep.org/new_site/en/Treaties/treaties_decisions-hb.php?dec_id_anx_auto=783
- Convention on Long-Range Transboundary Air Pollutionhttp://www.unece.org/env/lrtap
- Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Long-Term Financing of the Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (EMEP)http://www.unece.org/env/lrtap/emep_h1.html
- Protocol to the 1979 convention on long-range transboundary air pollution on the reduction of sulphur emissions or their transboundary fluxes by at least 30 per cent http://www.unece.org/env/lrtap/sulf_h1.html
- Protocol to the 1979 convention on long-range transboundary air pollution concerning the control of emissions of nitrogen oxides or their transboundary fluxes

https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-1-c&chapter=27&lang=en

- Protocol to the 1979 convention on long-range transboundary air pollution concerning the control of emissions of volatile organic compounds or their transboundary fluxes. http://www.unece.org/env/lrtap/vola_h1.html
- Protocol to the 1979 convention on long-range transboundary air pollution on further reduction of sulphur emissionshttp://www.unece.org/env/lrtap/fsulf_h1.html
- Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutantshttp://www.unece.org/env/lrtap/pops_h1.html
- Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Heavy Metals http://www.unece.org/env/lrtap/hm_h1.html
- Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution to abate acidification, eutrophication and ground-level ozonehttp://www.unece.org/env/lrtap/multi_h1.html

CHEMICALS

- Stockholm Convention on Persistent Organic Pollutantshttp://chm.pops.int/default.aspx
- Rotterdam Convention on the Prior Informed Consent Procedure for certain hazardous Chemicals and Pesticides in international tradehttp://www.pic.int
- Minamata Convention on Mercuryhttp://www.mercuryconvention.org

WASTE

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal http://www.basel.int
- Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and Amendment of the Annex I, Annex VIII and Annex IX http://www.basel.int

INDUSTRIAL ACCIDENTS

- Convention on the Transboundary Effects of Industrial Accidents http://www.unece.org/env/teia.html

2.1. Related UN Conventions (UN CCD, UNCBD, UNFCCC)

At the Earth Summit held in RIO in 1992, the decision-making process was tailored to promote a sustainable planet for future generations. The key message entailed the idea that changes in behavior could be the foundation needed for progress toward the desired transformation for the environment. The resulting documentation from the two-week deliberations and meetings included the following: Agenda 21 (a non-binding action plan of the United Nations promoting sustainable development), the Statement of Forest Principles, the Rio Declaration on Environment and Development, and the main outcomes were the following Conventions:

1. UNFCCC, the abbreviation of United Nations Framework Convention on Climate Change

2. CBD, the abbreviation of Convention on Biological Diversity
3. UNCCD, the abbreviation of United Nations Convention to Combat Desertification

The United Nations Framework Convention on Climate Change (UNFCCC) is committed to the objective of "[stabilizing] greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner." Following the adoption of the Paris Agreement in 2015, and previously the Kyoto Protocol in 1997, the UNFCCC Secretariat works to maintain the goals and objectives of the Convention, as the primary United Nations body whose role functions to address the threat of climate change.

Convention on Biological Diversity (CBD) works to maintain the following three objectives:

1. "The conservation of biological diversity"
2. "The sustainable use of the components of biological diversity"
3. "The fair and equitable sharing of the benefits arising out of the utilization of genetic resources".

The United Nations Convention on Combat Desertification (UNCCD), works towards creating "a future that avoids, minimizes, and reverses desertification/land degradation and mitigates the effects of drought in affected areas at all levels. Legislatively, the UNCCD is committed to achieving Land Degradation Neutrality (LDN) and combat pressing environmental issues of Desertification, land degradation and drought (DLDD) through a newly created 2018-2030 Strategic Framework, consistent with the 2030 Agenda for Sustainable Development, This framework follows the 10-year strategic plan and framework for 2008-2018 that aimed to establish global partnerships in working toward the reversal and prevention of desertification and land degradation. The UNCCD aims to restore the productivity of degraded land, while improving livelihoods and aiding populations that are vulnerable because of environmental destruction.

Forest resources, water as well as forest-water relations are tackled by these conventions.

2.1.1. Albania

Albania joined the United Nations (UNs) on 14 December 1956. Albania has become a part of the United Nations Conventions after the 1990-s, when the country changed the regime and has been actively participating in international agreements on environmental protection. During the last 29 years, Albania has been fully committed to including the UNs objectives and goals for development in its strategic plans, national programs, and action plans. The principles of maintaining the quality of the environment and using its resources in a balanced manner have been set out in three documents approved by the UN member states, dealing with the different facets of the natural and human environment. Albania is State Party to all the three Rio Conventions, on climate change, desertification, and biodiversity. In addition, Albania is a party to the following Environmental Conventions: Convention on Long-range Transboundary Air Pollution, Convention on Environmental Impact Assessment in a transboundary context, Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

Government of Albania (GoA) approved in May 2016, the Second National Strategy for Development and Integration (NSDI-II) for the period 2015-2020, which represent a synthesis of sectoral and cross-cutting strategies and other planning documents. The main strategic objectives of the

NSDI-II on environmental protection are:

1. Achieving measurable results in air quality by 2020
2. Reduction towards climate change and the contribution to protecting the ozone layer by 2020
3. Intensifying and strengthening nature protection
4. Strengthened management and conservation of forestry and pasture resources
5. Strengthened water resource management and preservation

Albania, with the support of the United Nations Environment Program (UNEP), initiated a self-assessment process on September 2006 in order to provide a better understanding of capacity development needs in the context of Albania's priorities for addressing global environment challenges and to gain a better understanding of how the global environmental management system may assist Albania to address these capacity development needs. The objective of the National Capacity Self Assessment (NCSA) was to assess capacity needs and priorities with respect to the global environment and within the context of sustainable development. The NCSA took into account the Conventions on Biodiversity, Climate Change and Land Degradation and was focus on cross-cutting issues and synergies between the Conventions. The NCSA target was the preparation of the National Action Plan which describes in practical terms the activities that would be implemented to address the capacity constraints identified during the assessment phase (GEF 2016).

UN Convention on Combating Desertification (UNCCD)

Ratified with Law No. 8556, date 22.12.1999 "On the accession of the Republic of Albania to the UN Convention to Combat Desertification in countries that have passed long drought and/or desertification, especially in Africa" – Official Gazette No. 37, dated 25.02.2000. The focal point for the UNCCD is The Ministry of Tourism and Environment (MoTE), while the Directorate for Nature Protection under this ministry is responsible for coordinating activities and implementation of the UNCCD in Albania. According to articles 9 & 10 of this convention, all parties are required to prepare, make public and implement the National Action Programme/plan. Based on this convention, GoA prepared the National Action Programme to Combat Desertification in 2015, in compliance with the 10-year strategy of the UNCCD (2008-2018). The purpose of this program is the identification of factors contributing to desertification and land degradation and the implementation of practical measures to combat desertification and mitigate the effects of drought at all sectors of Albanian economy. The NAP CCD through the GAP analyze has identified several gaps in the following areas: institutions, data quantity and quality, scientific research evidence and practical measures. The national action program spells out the practical steps and measures to be taken to combat desertification in natural ecosystems. This program is focused on several intervention areas such as: (I) land resilience to climate change variability; (ii) soil productivity; (iii) vegetation cover; (iv) flooding, water quality, sedimentation and siltation in river and water reservoirs; (v) food production and (vi) poverty and living standards. In order to follow the implementation of the activities in the framework of the UNCCD, a National Coordination Body(NCB) was established by the DCM No 295, dated 04.11.2002 and the members of this structure are representatives from several ministries, scientific organizations, non-governmental organizations, local government units, and community members (Laze et.al. 2005).. Albania has established a monitoring system specifically dedicated to desertification, land degradation, and drought, but it faces financial and technical resource limitations. In order to meet the UNCCD requirement, the GoA presented the First National Report in April 2002. This report outlined the causes of desertification and proposed several actions to mitigate the effects of desertification and drought in Albania.

Ratification date: Albania has ratified this convention on April 2000

National communications/ action plans	How forest-water issues are included
NAP- CCD approved in 2015. In final phase of approval because of technical name difficulties (name changes etc)	Various measures are mentioned within the action plan in the field of agriculture and forestry. The following measures are mentioned in the NAP-CCD: **a)** Rising public awareness regarding desertification and land protection in Albania **b)** Conservation of natural resources (including water) and promotion of their sustainable use **c)** Restoration of degraded lands or sparsely vegetated area and increase of land productivity in rural areas (the target of MoTE is planting 20 200 000 trees until 2020) **d)** Improve institutional coordination between NCB members **e)** Improve the existing legal framework **f)** Continuous monitoring of desertification and drought in Albania **g)** Appraisal of damages incurred by desertification and drought in the country **h)** Reducing human-induced impacts (forest fires, illegal logging, overgrazing) on forest and pasture resources at the country level.

UN Convention on Climate Changes

Ratified with Law for Ratification – Official Gazette of Republic of Albania in 1994 and entered in force on January 1, 1995.

Albania has been a party to the UNFCCC since 1994 and acceded to the Kyoto Protocol in 2005. Albania has ratified both the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol with the status of a Non-Annex 1 Party and has not any obligation related to Greenhouse Gas (GHG) emissions. As a Non-Annex 1 Party, Albania is committed to implementing "National Appropriate Mitigation Actions-NAMAs". Albania's contribution to the global greenhouse gas emissions is relatively low, estimated at an average of 9,4 million tons/year of CO2 equivalent. The Albanian parliament ratified the Paris Agreement through the law Nr. 75/2016, dated July 04, 2016, as an important step towards its implementation. This ratification was followed by the Third National Communication of the Republic of Albania under the United Nations Framework Convention on Climate Change in June 2016. In terms of climate change institutions the MoTE is the key institution responsible for the development and transposition of legal framework, the National Focal Point to the UNFCCC and coordination with other institutions. MoTE is coordinating the Nationally Determined Contribution (NDC) implementation as well as the National Adaptation Plan (NAP) and supports the climate risk identification and management process. In 2014, the GoA established an Inter-Ministerial Working Group on Climate Change, composed of 15 technical level experts of key line ministries. The aim of this Working Group was the coordination of all institutions involved in the climate change mitigation and adaptation process. Albania initiated in 2015 the process of drafting the National Adaptation Plan (NAP) for Climate Change. Albania's NAP is designed as a long-lasting and cross-sectoral process. The time-frame for implementation of the NAP is 20-years and the MoTE is the responsible institution. The NAP document is drafted and the scope of this document is sector-specific adaptation strategies against climate change

and proposal of relevant mitigation measures for each sector affected by climate change. The NAP document provides a framework for targeted mainstreaming by delegating the implementation of climate change adaptation to the respective sectoral strategies (Ministry of Environment 2016). Water management takes a key role in the process due to the linkage with agriculture, energy, health and sanitation sectors. Additionally, the NAP document was used as a base for the adaptation component of the draft Climate Change Strategy in Albania. By March 2016, the NAP implementing mechanism is linked with the process of national and sectorial territorial planning.

Law on Climate Change is approved by the end of 2017. It makes the legal basis for policy integration and effective measures that enable the fulfillment of the obligations toward the UNFCCC and EU integration. This Law and its implementing by-laws set up the institutional framework and determine the rules for monitoring, reporting, and verification of GHG emissions at sectors/resources and at the national level in accordance with national commitments. This law provides the legal bases for the transposition of the **EU Emission Trading System Directive (2003/87/EC)** and foresees the preparation of national communications, biennial updated reports, the INDC and GHG emission permits.

The Second National Strategy for Development and Integration (NSDI-II) for the period 2015-2020 has defined a strategic objective for climate change named "**Reduction towards climate change and the contribution to protecting the ozone layer by 2020".** This strategic objective will be achieved through: (i) reduction of greenhouse gas emissions, compared to a baseline scenario for reduction of CO_2 emissions, by 2030; (ii) reduction of the amount of HCFCs.
Law 9385, dated 4.5.2005 "For forests and forest service" amended by law No.9533, dated 15.5.2006; law No. 9791, dated 23.7.2007; law No.9989, dated 15.9.2008; law No.10137, dated 11.5.2009; law No.15/2012, dated 16.2.2012; law No. 36/2013, dated 14.2.2013 and law No. 48/2016, dated 5.5.2016 in Chapter IV, article 13 "Forest functions" recognize the role of forest resources in Albania as a sink of dioxide carbon. The MoTE is responsible for the implementation of the Kyoto Protocol. The dioxide carbon stocked is estimated and traded respecting all rules and procedures of the Kyoto Protocol where Albania is a party.

Law 10431, date 09.06.2011 "For environment protection", amended by law No 31/2013, dated 14.02.2013, article 20 "Climate changes", determine some specific measures against climate change and some other in the specific legislation. The Council of Ministers through laws or by-laws support and promote: (i) reduction and stabilization of greenhouse gases; (ii) measures to store and sequestrate carbon dioxide; (iii) using of renewable energy and improving energy efficiency.
Other climate-change-related by-laws in Albania are:

- **a)** DCM No 865, dated 10.12.2014 "On reduction and stabilization of fluorinated greenhouse gas emissions"
- **b)** Order of the Prime Minister No 155, dated 25.04.2014 "On establishment and functioning of the Interministerial Working Group on Climate Change"
- **c)** DCM No 762, dated 16.09.2015 "On approval of the Intended Nationally Determined Contribution for the United Nations Framework Convention on Climate Change"

Albania has delivered the Third National Communication under the United Nations Framework Convention on Climate Change in June 2016 (UNDP 2016). This document includes the GHG inventory for the period 2000-2009 with 2005 as the base year. The coastal areas and water resources are identified as the most vulnerable to climate change. Several measures related to GHG reduction and adaptation to climate change are mentioned in this report. In the context of the United Nations Framework Convention on Climate Change (UNFCCC), the GoA designated the Intended Nationally Determined Contribution (INDC) by DCM 762, dated 16.09.2015. Albania has

set important targets in the area of climate change for instance: (i) to reduce the CO_2 emissions in the period 2016-2030 by 11.5% compared to the baseline scenario and (ii) to achieve a 38% share of renewable energy sources in gross final consumption in 2020. Analysis of the extreme temperatures reveals their increase in the next 50 years. The projections show high temperatures warm faster than mean temperatures especially, in the summer. The mean annual temperatures increased from 1 °C in 2030 to 3.2 °C in 2100. The projection scenarios reveal a decrease in annual precipitation by -8.5% by 2050 and by up to -18.1% by 2100.

National communications/ action plans	How forest-water issues are included
3 national communications Current - III National Communication (2016)	Indirectly – In the Action plan there are 4 forest-based measures as follow: - Improving forest exploitation technology - Improving the efficiency of burning technology to decrease the firewood consumption - Increase of forested area from 500 to 1000 ha per year. - Re-introduce the practice of planting trees in agriculture lands with the main focus on fast-growing species.

UN Convention on Biological Diversity

Ratification date: 5 January 1994

The Convention on Biological Diversity (CBD) has three major objectives, namely: (1) Conservation of biodiversity at various levels, (2) the sustainable use of its components, and (3) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, through appropriate access to genetic resources, and transfer of relevant technologies. Albania is a Party of the CBD since 10.11.1996 as well as acceded in the Nagoya Protocol in January 2013 after the approval of the Law No. 113/2012 dated 22.11.2012. The aim of the protocol is the access to genetic resources and sharing of benefits that arise from their utilization. The Ministry of Foreign Affairs has deposited the instruments of accession for the Nagoya Protocol and Nagoya-Kuala Lumpur Protocol of the CBD, to the Biodiversity Convention Secretariat, on 29 January 2013. Albania has also ratified other conventions that are related to wildlife, flora, natural habitat protection and wetlands putting emphasize on biodiversity protection. Article 6 (a) of the CBD requires that all parties must develop a National Biodiversity Strategy and Action Plan, which will be the roadmap of how the country intends to meet the objectives of the Convention in the light of specific national circumstances. The Ministry of Tourism and Environment (MToE), through its Directorate of Biodiversity and Protected Areas under the General Directorate of Environmental Policies and Delivery Unit, is responsible for the formulation of policies for the protection of nature and development of strategic documents in this field. This unit has prepared the National Biodiversity Strategy for the period 2012-2020 (Zeneli et al. 2012), and since 2012 has increased protected area by 1.61%. This strategy envisages the expansion of the system of protected areas up to 17% of the total surface of the land and internal waters and to 6% of the coastal and marine areas.

One of the main strategic objectives of the NSDI-II on environmental protection is the intensification and strengthening nature protection by:

a) The increasing surface of protected areas through growth and integrated management of protected areas
b) Establishment of Natura 2000 ecological network

c) Ensuring the conservation status of endangered/threatened species and habitats

2 national strategies **Albanian National Biodiversity Strategy and Action Plan 1999-2015** **Current – Albanian National Biodiversity Strategy and Action Plan 2012-2020**	Indirectly - Strategic goal B. Reduce direct and indirect pressures on ecosystems and biodiversity **In-situ conservation**: Increased the surface of protected areas significantly up to 15.58% in 2019 which is comparable to the EU average which is 17% of the territory. **Preparation of action plans for single species and habitats:** So far have been prepared 6 species action plans for Brown bear (Ursus arctos), Lynx (Lynx lynx), Pygmy cormorant (Phalacrorocarx pygeaus), Cetanenas, Posedonia oceanica meadows and Marine turtles. **Setting-up the NATURA 2000 network** of sites of Community Importance for the country in the context of European integration**.** **Effective Implementation in practice of Management Plans** for Protected areas and of action plans for threatened species and habitats; **Capacity building and improvement of infrastructure in protected areas**. Restructuring and strengthening of the management structures of protected areas. **Promotion and application of economic incentives** in protected areas and wild fauna management through public and private financing.

2.1.2. North Macedonia

As the most relevant for the forest-water relations are selected the so-called RIO-conventions: UNCCD, UNFCC and UNCBD. In 2005 was prepared a report about capacities in the countries for implementation of these conventions.

The **National Capacity Needs Self-Assessment for Global Environmental Management (NCSA)** Project had been implemented during the period June 2003 – April 2005.The overall objective of the project was assessment of the capacities of the Republic of Macedonia to meet the obligations under the global environmental conventions pertaining to biodiversity (UNCBD), climate change (UNFCCC) and land degradation and desertification (UNCCD). The main goal of the NCSA was identification and analysis of the priorities on a national level and the capacity development needs relating to the implementation of the three Rio Conventions. The project had been steered towards including the global environmental issues within national and local environmental activities and integrating objectives into national and local strategic planning processes.The main output were three separate thematic reports in the areas of biodiversity, climate change and land degradation/desertification, a Cross-cutting Report and the National Capacity Self-Assessment Report, comprising also the Strategy and Action Plan for Capacity Development. The reports provided an overview of the current situation in each of the thematic areas and identification of the priority issues. The common and the cross-cutting issues have been thoroughly analysed for more efficient use of the resources and achieving synergetic effects.https://www.thegef.org/sites/default/files/ncsa-documents/ncsa-macedonia-fr-ap.pdf

UN Convention on Combating Desertification

Ratified with Law for Ratification – Official Gazette of RM Nr. 13/2002

The focal point for the UNCCD is the Ministry of Environment and Physical Planning (MoEPP), while for the implementation of activities are common 2 ministries: the Ministry of Environment and Physical Planning (MoEPP) and the Ministry of Agriculture, Forestry and Water Economy (MAFWE).

Following the needs by UNCCD, up to now are prepared 2 documents.

The first one is National Action Plan to Combat Desertification (NAP CCD) for the period 2017-2023, although the main text was finished in 2017, because of some technical barriers hasn't been adopted yet.

Beside it was prepared the LDN TSP (Land Degradation Neutrality Target Setting Program till 2030). The main text was finished in 2017, but like NAP CCD it hasn't been adopted yet. The Macedonia NAP CCDis formulated in support to The Strategy 2008-2018 to enhance the implementation of the UNCCD at the country level. Its vision is "a strengthened convergence of actions among national government agencies (NGAs), local government units (LGUs), the private sector, and the civil society organizations (CSOs) to halt and prevent desertification and land degradation, and mitigate the impacts of drought, in order to support poverty reduction and environmental sustainability". Its development framework, therefore, is anchored on The Strategy's overall goal, its four strategic and five operational objectives.

NAPCCD is prepared on a base of comprehensive biophysical and socio-economic basic information, factors that generate land degradation and desertification are identified and evaluated, Impact indicators for strategic objectives 1, 2 and 3 of the Strategy, Impact indicators for strategic objective 4. The second part of the NAP CCD start with GAP analyze where are identified gaps in the following areas: institutions, data, research and development, management practices. Specific goals of the NAP include: Development of an environmentally aware and responsible society; Wise use of the nation's natural resources to satisfy socio-economic needs without compromising the quality of land resources; Better knowledge about the use of land resources in line with sustainable land management; Improved regulatory and legislative framework that will provide appropriate use, management and protection of the land resource base; Established effective mechanisms for institutional collaboration and cooperation. Strategic objectives to be achieved with the NAP are the following:

Strategic objective 1: To improve the living conditions of affected populations;
Strategic objective 2: To improve the condition of affected ecosystems;
Strategic objective 3: To generate global benefits through effective implementation of the UNCCD;
Strategic objective 4: To mobilize resources to support implementation of the Convention through building effective partnerships between national and international actors.

Specific measures have been developed according to the 5 operational objectives set within UNCCD 10-years strategy 2008-2018 (advocacy, awareness and education; policy framework; science technology and knowledge; capacity building; financial mechanisms and technology) as well as 1 additional objective: Sustainable land management – engineering in a dryland areas. Apart of specific measures and activities that address primarily DLDD issues, there are many sectoral documents: (2nd National Communication on Climate Changes (2014); The Water Strategy (2014), National strategy for sustainable development of forestry (2006); National strategy for biodiversity protection and action plan) containing measures that are complementary with CCD needs.

For implementation of the NAP CCD, are prepared: dynamic plan, list of financial mechanisms, public participation plan, plan for research and development process as well as international cooperation and finally monitoring plan. Additionally, to the plan are annexed "Integrated financial strategy" and "Communication Platform". As final annex would be the LDN TSP.

LDN TSP targets are in synergies with the SDGs. Sustainable Development Goal (SDG) target 15.3 states: "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world." At the twelfth session of the Conference of Parties of the UNCCD held in October 2015 in Ankara, Turkey, country Parties reached a breakthrough agreement to endorse the vision of LDN and link the implementation of the Convention to the SDGs in general, and target 15.3 in particular. Target 15.3 has therefore become a strong vehicle for driving UNCCD implementation, while at the same time contributing to the achievement of multiple SDGs, including those related to climate change mitigation and adaptation, biodiversity conservation, food and water security, disaster risk reduction, and poverty reduction. The LDN targets address SDG target 15.3 and many other SDGs in a synergistic and cost-effective manner, and in accordance with countries' specific national contexts and development priorities. These targets also strengthen the implementation of the countries' UNCCD National Action Programmes. The Republic of North Macedonia is one of 122 countries in the world that developed LDN TSP.

National communications/ action plans	How forest-water issues are included
NAP CCD - in final phase of approve because of technical name difficulties (name changes etc.)	Various measures within the action plan where MAFWE is mentioned are common for agriculture and forestry Separate group of measures aim for drylands : **OO6-3 Integrated forest-water engineering techniques in dryland** - Improved afforestation of degraded land in RVD (analyze of past actions; defining suitability of species for planting in RVD taking in consideration CC; new techniques and technologies for afforestation, sustainable silvicultural measures...) - Introduction ecological friendly material, measures and activities for erosion control - Introduction ecological approaches for torrent control (with pilot study) - Community based rehabilitation of degraded land in hilly-mountain regions and reclamation of extremely degraded land
LDN TSP (Land Degradation Neutrality Target Setting Program till 2030 – launched 2017	Few targets: Aim: Reducing land degradation processes and increase of land productivity and SOM on bare lands, sparsely vegetated areas in the mountainous area) - Afforestation of 2.500 ha/y bare lands till 2030 Aim : Reducing negative trends of land productivity dynamic in forest and conversion in other land cover class - Reduction of human induced forest fires (whole area) by 50%, - Reduction of illegal cut (whole area) by 75%, -Introducing sustainable forest activities (whole area)

UN Convention on Climate Changes –

- Ratified with Law for Ratification – Official Gazette of RNM nr. 6/1997

Kyoto Protocol to the United Nations Framework Convention on Climate Change, Law on ratification Official Gazette of RM Nr. 49/2004

The Republic of Macedonia is a party to the United Nations Framework Convention on Climate Change (UNFCCC) as a non-Annex I country and party to the Kyoto Protocol without a quantified emissions limits and reduction commitment (QELRC). However, the country has acceded to the Copenhagen Accord, and it submitted a list of non-quantified mitigation actions. The First National Communication on Climate Change (FNC) and the Second National Communication (SNC) were adopted by the Government of Macedonia and submitted to the UNFCCC Secretariat in 2003 and 2008, respectively. In addition, the First Biennial Update Report will be carried out in the coming two years.

In terms of climate change institutions, the Ministry of Environment and Physical Planning (MOEPP) is the key governmental body responsible for development of climate change policies, the National Focal Point to the UNFCCC, and the Designated National Authority (DNA) for Kyoto Protocol implementation. MOEPP has a Climate Change Project Office, and most other relevant ministries have appointed Climate Change Focal Points who are responsible for mainstreaming climate change into respective policies, strategies and programmes; for example, the Ministry of Health established a National Committee for Climate Change and Health in 2009 to serve as the responsible body for surveillance activities and decision-making. At the broadest level, a National Climate Change Committee (NCCC) was established by the Government consisting of representatives of all relevant stakeholders: government bodies, science, private sector and civil society. Climate change issues are incorporated into legislation in the Law on Environment, which details the preparation of GHG emissions inventories (Article 188) and an action plan for mitigation. A cross-cutting development priority for the Republic of North Macedonia is accession to the EU. The country has already initiated the process of harmonizing with EU commitments to the UNFCCC and relevant sections of the EU acquis communautaire. The Republic of Macedonia is not currently under any obligation to enter the EU emission trading system (ETS), but it may do so voluntarily. National priorities are also expressed in the National Strategy for Sustainable Development (2010) and the Second National Environmental Action Plan.

Climate change projections were carried out with the use of the MAGICC/ SCENGEN software package Version 5.3. Six IPCC SRES/AR4 scenarios were used in the process: A1B-AIM, A1FI-MI, A1T-MES, A2-AS, B1-IMA and B2-MES, and air temperature and precipitation changes were assessed for the period 2025-2100 (reference period: 1961-1990). Data from 18 models were used in the estimation, generating results for two central geographical points. Scenarios were generated for four characteristic years, for each central point, for each of the three values of climate sensitivity, and for each of the six scenarios. Values were produced for air temperature and precipitation changes monthly and seasonally. The modelling results led to the following conclusions:

It is probable that there will be a continuous increase in temperature in the period 2025- 2100; Compared with the period 1961-1990, the predicted changes for the period 2025-2100 will be most intense in the warmest period of the year; It is possible that the average monthly temperatures at the turn of winter into spring will be levelled in this period; A decrease in precipitation is predicted in the period 2025-2100, in all seasons and at the annual level, with the maximum decrease in the summer season; The intensity of changes is greatest in the warm part of the year (in July and August, there may be no precipitation at all); In the cold period of the year, decreases in precipitation of up to 40% of the average monthly quantities are predicted.

Water resources in the Republic of North Macedonia are sensitive to climate change with regard to both quantity and quality. Total average precipitation is expected to decrease by 8% in 2075 and 13% in 2100. Reductions in available surface water for the Vardar River are estimated at 7.6% in 2025 and 18.2% in 2100 and for the Bregalnica River at 10% in 2025 and 23.8% in 2100. Groundwater recharge in the Vardar River Basin will decrease continuously, reaching approximately 57.6% of current recharge levels in 2100. In conclusion, overall water availability in the Republic of Macedonia is expected to decrease by 18% in 2100. The Strumica River Basin (1,649 km2 or 6.4% of the territory of the Republic of Macedonia), which is relatively poor in water resources, is a vulnerable region in both cases/ scenarios. Significant barriers to adaptation in the water sector include poorly designed and maintained irrigation systems, unregulated use of surface and groundwater, lack of reliable data on water consumed for irrigation, water pricing practices, and ineffective implementation of the Law on Water. Priority adaptation measures should therefore focus on the development and improvement of water storage and supply infrastructure; coordination of water use; introduction of water-saving measures; improvements in water supply and use techniques in agriculture and industry; pricing and management measures for the energy sector; and measures related to disaster risk reduction.

The forestry sector in the Republic of North Macedonia is expected to experience a high level of impact from climate change, especially boreal forests, where those impacts could be dramatic. The major sources of exposure (and associated impacts) for forests in the country are increasing temperatures, increasing frequency of forest fires, and changes in forest productivity. The most significant impact on forest management in the period between the SNC and the TNC has been forest fires: approximately 2,800 forest fires have been recorded in the period 1999-2012 that have burned almost 130,000 ha of forest and forest land, resulting in direct and indirect damage estimated at around EUR 67 million. The following segments of forest management are deemed to be most vulnerable till 2025: forest management planning, forest utilization, forest protection, hunting and tourism, and silviculture. The results of the International Cooperative Programme (ICP) forest assessment for the Republic of Macedonia indicate that the health of forests in the country for the period (2006-2013) has remained more or less the same. However, around 45% of the trees are in Classes 1 and 2 on the scale of needle/leaf loss (>10<60%), which means that they will be most vulnerable to future climate change. Results for water availability for trees (soil moisture) during the same period indicated that a majority of trees examined had consistently insufficient water. If there are climate extremes, negative changes in forest health can be expected even in the period up to 2025. While there has been no significant change in forest productivity for the period 2006-2013, it is possible to expect increased productivity of forests due to rising temperatures and CO2 fertilization in the period up to 2025. However, water deficits could decrease productivity, as could natural disasters. While it appears that forests in the Republic of Macedonia will be able to increase their carbon sink capacity in the period up to 2025 due to increased productivity, the estimation of the forest carbon sequestration will require very complex long-term research. Adaptation measures unique to the forestry sector include the development of a comprehensive programme for adapting forestry to global climate change; the establishment of 5 monitoring stations in forest regions; the introduction of technologies for efficient biomass usage in forestry; procurement of proper vehicles for fighting forest fires; a thorough biomass stocking exercise (the last one was conducted in 1977); and integration of climate change considerations into forestry management plans.

National communications/ action plans	How forest-water issues are included
3 national communications Current - III National Communication (2014)	Indirectly – In Action plan there are 9 measures as follow: - 2 measures are general for adaption of forestry to climate changes need (Adaptive programme and adaptation of FM plans) - 5 for sustainable utilization of forest resources including biomass and green energy - 2 for forest fires and monitoring of changes of forests

UN Convention on Biological Diversity -

Ratified with Law for Ratification – Official Gazette of RM Nr. 54/97

In terms of biodiversity, the Ministry of Environment and Physical Planning (MOEPP) is the key governmental body responsible for development of biodiversity policies and the National Focal Points within the MOEPP.

The Global Strategic Plan for Biological Diversity 2011–2020 was adopted in 2010, in Nagoya, Japan, whereby countries reaffirmed their commitment to undertake urgent measures for biological diversity conservation. It is a ten-year leading international framework for action by all countries and stakeholders to save biological diversity and enhance benefits for people. Strategic Plan incorporates the common Vision, Mission, five strategic goals and 20 ambitious though feasible targets known as Aichi Targets.

The Pan-European Biological and Landscape Diversity Strategy (PEBLDS) was adopted in 1994, as support in the implementation of the Convention on Biological Diversity at Pan-European level. It has served as framework for coordination and uniting of the existing initiatives for biological diversity protection throughout the European continent. In 2011, it was replaced by the new 2020 Strategy for Biodiversity, adopted at the Sixth Conference on Biodiversity in Europe in Georgia, in line with the Global Strategy and the Aichi Targets (UNEP 2011). The Strategy highlights the importance of regional approach in biological diversity protection and supports cooperation among countries towards biological diversity conservation.

The Convention on Biological Diversity (Article 6) obliges the countries to prepare national strategies, whereas in accordance to Article 26, Parties are required to submit regular national reports containing information on the measures taken towards the implementation of the Convention and their effectiveness. National strategies are defined as integrative cross-sectoral instrument for biological diversity protection planning at national level, developed through involvement of all stakeholders.

Region of Balkan is exceptionally rich in endemism. In Macedonia it is on the border between Macedonia and Greece (Pelister, Kajmakchalan and Kozhuf) and border between Macedonia and Albania (Shar Planina and Korab).

The Action Plan contains specific actions linked with preservation and sustainable use of biological diversity that need to be implemented to achieve the set national biodiversity targets. It will serve as framework and guideline for all activities that should be undertaken by the Republic of

Macedonia to preserve biological diversity by 2020 and thus contribute to the achievement of the global biological diversity targets (Aichi Targets).
Measures in the action plan are developed following 20 Aichi Biodiversity Targets classified in 5 strategic goals:

Strategic goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.

Strategic goal B: Reduce the direct pressures on biodiversity and promote sustainable use.

Strategic goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

Strategic goal D: Enhance the benefits to all from biodiversity and ecosystem services

Strategic goal E: Enhance implementation through participatory planning, knowledge management and capacity building

National communications/ action plans	How forest-water issues are included
2 national strategies Current – National Biodiversity strategy and Action Plan 2018-2023	Indirectly - Strategic goal B. Reduce direct and indirect pressures on ecosystems and biodiversity - To establish management practices in forestry, agriculture, hunting and fishery that contribute to conservation of biodiversity and maintenance of ecosystem services - To integrate measures for adaptation and mitigation of climate change and combating desertification

2.2. Related EU Directives

The most relevant EU directives about forest-water relations

- Water Framework Directive (WFD):
- Flood Directive (FD):
- Habitat Directive (HD)
- Bird Directive (BD)
- EU directive on Strategic environmental assessment (SEA) and Environmental impact assessment (EIA)

Water Framework Directive

The main EU legal act regulating the water area is the **Water Framework Directive** 2000/60/EC (WFD). The WFD establishes the main objectives and guidelines of the water management policy that regulates integrated water management in the EU and emphasizes the need for further integration of water protection and sustainable management, and other policies in the fields of energy, transport, agriculture, fisheries, regional policy and tourism, too. The Directive particularly promotes cooperation and joint action at Union and local level as well as the level of information, consultation and public involvement, including the users, too.
The establishment of integrated water management within the European Union aims:

- To prevent further destruction, protect and improve the state of aquatic ecosystems, as well as terrestrial ecosystems and wetlands that are directly dependent on aquatic ecosystems, in terms of their needs for water;
- To promote sustainable use of water, based on the long-term protection of available water resources;
- To undertake measures for enhanced protection and improvement of the aquatic environment, inter alia, through special measures for progressive reduction or for the gradual exclusion of discharges, emissions and losses of priority substances, and
- To contribute to mitigating the effects of floods and droughts that will contribute to: ensure satisfactory supply of good quality water, and sustainable, balanced and fair use of water.

Main obligations that Member States (MS) have to undertake, and which should enable the implementation of the objectives set out in the Directive, are the following:

- To determine individual river basins within their national territory and in addition, to ensure adequate administrative set-up for each river basin district as well as to designate competent authority for the application of the Directive rules;
- To prepare an analysis of properties for each river basin district or part of the district of a river basin in their territory, the human activity impact on the state of waters and economic analysis of the use of water, which shall be made in accordance with technical specifications;
- To prepare a Management Plan for each river basin district, which is entirely located on their territory;
- To encourage the active involvement of all stakeholders in the Directive implementation, in particular in the preparation, revision, and updating of RBMPs. It is particularly important to publish RBMPs for each river basin district and to make them available to the public, including users, in order to receive comments;
- To determine all water bodies within each river basin district that are used for exploitation of water intended for human consumption, which provides on average more than 10 m^3 per day or serves more than 50 persons, and those water bodies which, in the future should be used for this purpose.

They provide the necessary protection of the identified water bodies, in order to avoid reduction of their quality, to reduce the level of treatment required to provide drinking water. MS may establish protected zones for those water bodies:

- To compile water monitoring programs in order to establish a coherent and comprehensive overview of water status within each river basin district, and
- To commit for each river basin district or part of the river basin district of their international river basin to prepare a Program of Measures that will include “basic” measures representing minimum requirements that need to be respected, and “additional” measures, which are designed and implemented as an addition to the basic ones.

Flood Directive (Directive on flood risk assessment and management)

The objective of Directive 2007/60/EC of the European Parliament and the Council on flood risk assessment and management is to establish a framework for flood risk assessment and management in order to reduce the harmful effects of floods on human health, environment, cultural heritage, and economic activities.

For the implementation of the Directive, MS may designate a competent authority, which will be responsible to undertake obligations of the Directive, as well as to identify certain coastal areas or individual river basins and assign their management to other management units, and not to those that according to WFD are responsible for river basin management.
MS have these obligations:

- for each river basin or management unit or part of an international river basin located in their territory to carry out a preliminary flood risk assessment in order to assess the possible risk of floods;
- to prepare flood hazard maps and flood risk maps;

The Habitats and Bird Directive

The Habitats Directive ensures the conservation of a wide range of rare, threatened or endemic animal and plant species. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right. Adopted in 1992, the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. It forms the cornerstone of Europe's nature conservation policy with the Birds Directive and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments.

The Birds and Habitats Directives have had to evolve to reflect successive enlargements of the European Union. We provide a summary of the changes made to the two directives in order to reflect the impact of enlargement. A consolidated version of the directive includes the latest versions of the annexes.

The Interpretation Manual of European Union Habitats - EUR28, aims to help clear any ambiguities in the interpretation of Annex 1 of the directive by developing a common definition for all habitat types.

All in all, over 1.000 animal and plant species, as well as 200 habitat types, listed in the directive's annexes, are protected in various ways.

- **Annex II species** (about 900): core areas of their habitat are designated as Sites of Community Importance (SCIs) and included in the Natura 2000 network. These sites must be managed in accordance with the ecological needs of the species.
- **Annex IV species** (over 400, including many annex II species): a strict protection regime must be applied across their entire natural range within the EU, both within and outside Natura 2000 sites.
- **Annex V species** (over 90): the Member States must ensure that their exploitation and taking in the wild are compatible with maintaining them in favorable conservation status.

Certain articles of the Habitats Directive (Art. 6, 12, 16 and 17) require the Member States to report on the conservation status of habitats and species, on compensation measures taken for projects having a negative impact on Natura 2000 sites or on derogations they may have applied to the strict protection measures.

Directive 2001/42/EC — Strategic Environmental Assessment Directive (SEA)

- It aims to ensure a high level of environmental protection and that environmental considerations are taken into account when preparing, adopting and implementing plans and programs.
- It promotes sustainable development by ensuring that environmental assessment is carried out of certain plans and programs likely to have significant effects on the environment.
- The public plans and programs covered by the Strategic Environmental Assessment (SEA) Directive are subject to an environmental assessment during their preparation and before their adoption.
- This directive applies to the public plans and programs (as well as their amendments) which have been prepared and/or adopted by a competent authority and which are subject to legislative, regulatory and administrative rules:
  - plans and programs which are prepared for specific sectors (agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning, and land use) and which set the framework for development consent of projects under the Environmental Impact Assessment (EIA) Directive;
  - plans and programs for which an assessment is required under Articles 6 and 7 of the 'Habitats' Directive;
  - plans and programs which set the framework for future development consent of projects other than those under the EIA Directive (not limited to the sectors listed above) and which EU countries have identified as likely to have significant environmental effects. EU countries can determine this either through case-by-case examination or by specifying types of plans and programmes or by combining both approaches.
- The directive also makes subject to a screening procedure:
  - plans and programs different from those listed in Article 3(2), but which set out the scheme for future development consent of projects, as well as
  - plans and programs: which determine the use of small areas at the local level and minor modifications to plans and programs, but only if they are likely to have significant environmental effects.

The EIA Directive (85/337/EEC)

Is in force since 1985 and applies to a wide range of defined **public and private projects,** which are defined in Annexes I and II:

- **Mandatory EIA**: all projects listed in Annex I are considered as having significant effects on the environment and require an EIA (e.g. long-distance railway lines, motorways and express roads, airports with a basic runway length ≥ 2100 m, installations for the disposal of hazardous waste, installations for the disposal of non-hazardous waste > 100 tones/day, wastewater treatment plants > 150.000 p.e.).
- **Discretion of Member States (screening)**: for projects listed in Annex II, the national authorities have to decide whether an EIA is needed. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case by case examination. However, the national authorities must take into account the criteria laid down in Annex III. The projects listed in Annex II are in general those not included in Annex I (railways, roads waste disposal installations, wastewater treatment plants), but

also other types such as urban development projects, flood-relief works, changes of Annex I and II existing projects...).

The EIA procedure can be summarized as follows: the developer may request the competent authority to say what should be covered by the EIA information to be provided by the developer (scoping stage); the developer must provide information on the environmental impact (EIA report – Annex IV); the environmental authorities and the public (and affected the Member States) must be informed and consulted; the competent authority decides, taking into consideration the results of consultations. The public is informed of the decision afterward and may decide to challenge the decision in front of the court.

EU strategy on adaptation to climate change

In 2013, the European Commission adopted an EU strategy on adaptation to climate change. The strategy aims to make Europe more climate-resilient. By taking a coherent approach and providing for improved coordination, it aims to enhance the preparedness and capacity of all governance levels to respond to the impacts of climate change.

The EU Adaptation Strategy focuses on three key objectives:

- **Promoting action by the Member States**: The Commission encourages all Member States to adopt comprehensive adaptation strategies (currently 25 have strategies) and provides funding to help them build up their adaptation capacities and take action. It also supports adaptation in cities through the Covenant of Mayors for Climate and Energy initiative.
- **'Climate-proofing' action at the EU level** by further promoting adaptation in key vulnerable sectors such as agriculture, fisheries, and cohesion policy, ensuring that Europe's infrastructure is made more resilient, and promoting the use of insurance against natural and man-made disasters.
- **Better informed decision-making** by addressing gaps in knowledge about adaptation and further developing the European climate adaptation platform (Climate-ADAPT).

2.2.1. Albania

Water Framework Directive (WFD):

Albania transposed the WFD into the National legislation in 2002, by drafting the law No 111/2012 "On Integrated Water Resource Management" amended by law No 6/2018. In addition, the GoA has prepared several legal acts in the form of the Decision of the Council of Ministers (DCM) to implement the law No 111/2012. The purpose of the law 111/2012 is *protecting and improving the water environment, ensuring sustainable water use and fair distribution, protection from pollution and over-exploitation and the establishment of the central and local institutional framework required to implement national policies of water management and protection*. In order to meet the standards of the WFD is required by Albanian institutions to:

- make a new administrative arrangement of institutions
- set up new environment objectives for each water body within a river basin
- prepare the Plan of Measures based on water monitoring
- review the existing environmental impacts due to human activity
- make an economic analysis with the main focus on water use

In the law 111/2012 is included also the concept of "protected areas" which are considered an essential tool to protect water resources from industrial, agriculture and waste discharges. For each river, the existing legislation in Albania requires to prepare the River Basin Management Plan (RBMP). The law No 6/2018 is mainly focused on the implementation of the law 111/2012 but includes several issues to regulate institutional framework at the national and river basin level, transboundary water management, water inspection, drinking water, water quality, and water use. Several sub-acts have been prepared based on this law. Since 2017, MoTEwas in charge of water management, but with law No 6/2018 this responsibility was transferred to the newly established Water Resource Management Agency. The first obligation under the WFD is the organization and regulation of water management at the level of river basins. To meet this obligation GoA has established several institutional entities for water management such as: National Water Council; General Directorate for Water Administration (technical secretariat); River basin councils and River basin agencies.

The second main obligation under the WFD is the protection of the physical and biological integrity of aquatic systems. The aim is to provide a good status for all ground and surface waters and for that reason, the GoA has prepared several by-laws that tried to establish substantial standards in water resource management. Some of the approved by-laws are:

- DCM No 379, dated 25.05.2016 " On the Quality of Drinking Water", (Directive 98/83/EC) (QBZ 2016)
- DCM No 246, dated 30.04.2014 "On Environmental Quality Standards for Surface Water" (QBZ 2014).

The third main obligation under the WDF is the protection of waters from pollution and setting uniform standards for certain chemicals. In line with this obligation the GoA has approved two important by-laws:

- DCM No 267, dated 30.04.2014, "Approving the list of priority substances in water facilities" (QBZ 2014).
- DCM No 504, dated 06.07.2016, "On the setting up of the National Water Supply and Sanitation Agency" (QBZ 2016).
- DCM No 416, dated 13.05.2015, "On the approval of general and special conditions, documents, the period of validity, application forms for authorizing and permitting, standard procedures for decision-making and types of authorization and permits for the use of water resources" (QBZ 2015).
- DCM No 662, dated 21.09.2016, "On the approval of drinking water and discharge of water tariffs"

GoA has signed several agreements with neighboring countries focused on water management. Thus, Albania has signed a transboundary agreement with Greece and Montenegro for shared watercourses. Furthermore, Albania signed an agreement with Greece and North Macedonia for water management of Prespa Lake. In addition, a bilateral agreement on "Protection and sustainable development of Lake Ohrid" was signed between Albania and North Macedonia and a Memorandum of Understanding in 2010 was signed for Lake Skadar and Buna river water management with Montenegro. In the line of WFD have been prepared several strategic documents like:

- Revision of the National Water Strategy
- National Water Supply and Wastewater Strategy approved in 2011
- Management Plan of Drini-Buna and Seman rivers
- River Basin Management Plan for Ishem-Erzen

The Second National Strategy for Development and Integration (NSDI-II) for the period 2015-2020 set up a strategic objective on water management named "**Strengthened water resource management and preservation".** This objective according to GoA will be achieved through: (i) Adoption of the National Strategy on Integrated Water Resource Management; (ii) Establishment of a national cadastre of water resources;(iii) Introduction of a water resource inventory; (iv) Formulation and implementation of water basin management plans; (v) Meeting water quality levels; (vi) Rehabilitation of damaged riverbeds and (vii) Aligning national legislation with EU legislation. In section 5.3 of the NSDI-II strategy, named "Integrated management of water", is given a new approach to water resource management respecting fully the legal framework and politic program of the European Union. The main principles regarding to this new approach of GoA for integrated water management are: (I) water resource protection and their sustainable use meeting the basic needs of the population and future generations; (ii) promotion of the equality regarding to water access; (iii) enabling water use for economic and social development of the country; (iv) reclamation of the water use costs; (v) protection of ecosystems and equilibrium of biodiversity.

The monitoring of water quality still remains a concern for state authorities. The National Environment Agency (NEA) conduct the monitoring of superficial water quality by measuring several indicators such as: water temperature, pH, alkalinity, salinity, electric conductivity, dissolved oxygen, chemical oxygen demand (COD-dichromate method), biochemical oxygen demand (BOD), nitrite (NO_2), nitrate NO_3, ammonium (NH_4), phosphorus (P_{totoal}), orthophosphate (PO_4) and suspended solids and transparency for water of lakes. Anyway, this list of indicators is not enough and the sampling sites for monitoring water quality are too low. In Albania, there are about 626 reservoirs and their water quality is not monitored.

Monitoring of the coastal water quality is conducted at the major beaches (Velipoje, Shengjin, Durres, Gjiri i Lalzit, Dhermi, Ksamil, Qeparo, Himare, Borsh, Sarande) along the Adriatic and Ionian Seas and two relevant microbiological indicators such as *Escherichia coli* and *Intestinal enterococci* are monitored. The monitoring program is compliant with the EU Directive 2006/7/EC concerning the management of bathing water quality. The groundwaters are monitored twice per year by Albanian Geological Service. This government unit has established a groundwater monitoring network composed of 80 sampling sites. The main physic-chemical parameters monitored for groundwaters are: pH, water temperature, electric conductivity, major ions (e.g. chloride, potassium, carbonates) and nutrients (e.g. NO_2, NO_3, NH_4, PO_4) and heavy metals. While the monitoring of drinking water quality is done by the Institute of Public Health (IPH). The analysis comprises bacteriological parameters (*Escherichia coli* and *Intestinal enterococci*) and physic-chemical parameters including fluoride, nitrate, nitrite, iron, arsenic, manganese and heavy metals.

Flood Directive (FD): hazard assessment and maps; risk assessment and maps, flood management plans;

The hydrographic basin in Albania encompasses 43,305 km^2 of which 14,557 km^2 belong to the watersheds of Drini and Vjosa rivers. Eight main rivers grouped in six watersheds across the country from east to west.

Floods, as well as droughts, are recurrent events in Albania. The flood phenomenon is repeated very often in recent decades and the main reasons area: deforestation, overgrazing, erosion, reservoir operation regimes, etc. Albania is prone to climate change and soon will experience impacts on water resources, including the magnitude and frequency of severe flooding events. The floods in 2010 (Drini river) and 2015 (Vjosa river-12225 ha flooded) showed that Albania's national disaster preparedness is missing and funds are needed to develop and implement national and local

measures to adapt to changing climate conditions and to reduce risks from the future disasters. Flood event records and data related to losses have been collected at the "DesInventar" platform. The mapping of areas prone to floods is done systematically since 2012, mainly for Shkodra lowlands and due to a project supported by GIZ in 2015 was developed the first Flood Risk Management plan for Shkodra Municipality (MTE and GEF 2015).

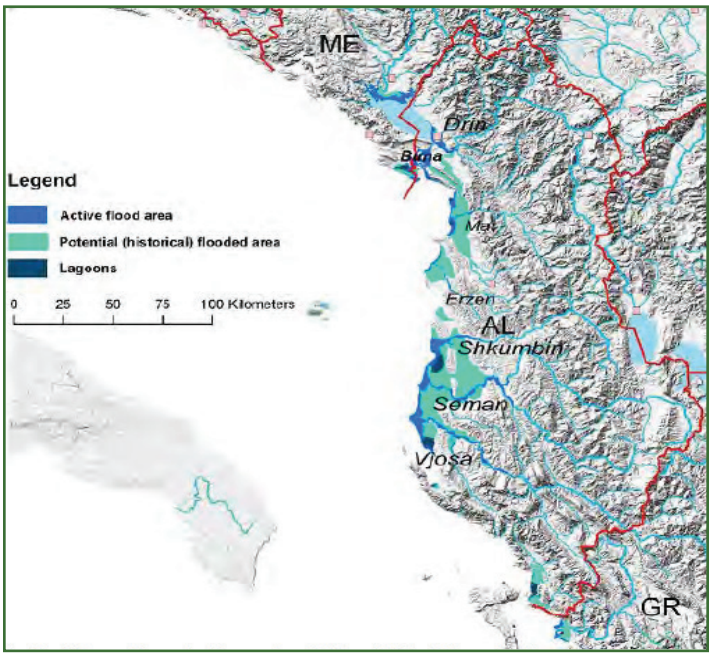

Figure 1. The network of rivers, coastal plain, lakes and wetlands in Albania **(Schwarz 2017)**

Albania has prepared a feasibility study for the improvement of flood protection infrastructure for the Mati river basin. Legislative gaps are remaining and Albania does not yet have a comprehensive and countrywide disaster risk management strategy. Transposition of the Directive 2007/60/EC on the assessment and management of flood risks is still at an early stage. In the forest management planning and forest legislation, the flood is not considered as an important issue and no preventive practice is recognized. A thorough evaluation of the implementation of the EU Floods Directive (2007/60/EC) and compatible related national policies is done in a study conducted by by German Federal Agency for Nature Conservation (BfN 2018).

In this report is mentioned that Albania reached to meet 73% of the EU Floods Directive, but organizational conditions, overlap in responsibilities and legal implementation needs to be improved. Considering Albania as a vulnerable country to natural disaster risks such as floods, the World Health Organization prepared in 2010, a map related to flood hazard distribution. The flood hazard map showed that flood hazard areas classified from high to very high are distributed across the country.

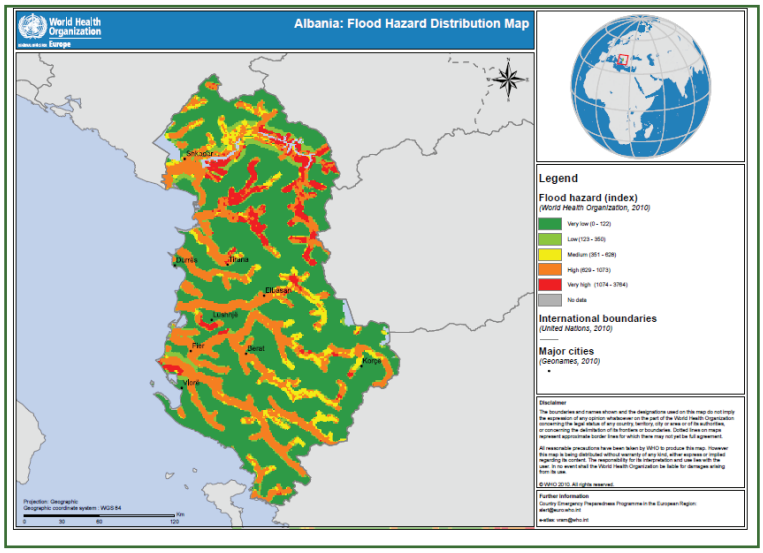

Figure 2. Flood hazard distribution map in Albania

The INFORM model used to adopt the three aspects of vulnerability according to UNISDR definitions, evaluated the flood risk index (INFORM 2019 Risk Index) for Albania. The aspects of physical exposure and physical vulnerability are integrated into the hazard & exposure dimension, the aspect of the fragility of the socio-economic system becomes INFORM's vulnerability dimension, while lack of resilience to cope and recover is treated under the lack of coping capacity dimension.

Table 1. *Evaluation indexes used for Flood Risk Management in Albania case*

Evaluation criterions	Value	Rank	Trend
INFORM	2.80	124	EQUAL
Hazard	3.30	100	EQUAL
Vulnerability	1.50	166	EQUAL
Coping Capacity	4.30	105	EQUAL

The mapping of the flood risk indicates that Albania is classified as a country with lower risk than Serbia, Greece and North Macedonia but with a higher risk compared to Montenegro, Bulgaria, and Italy (Figure 3).

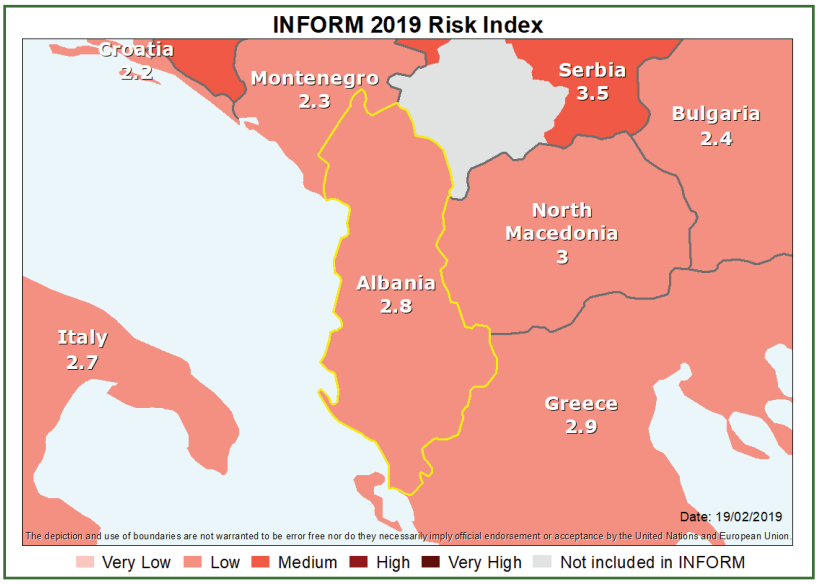

Figure 3. Index for Flood Risk Management in Balkan region(INFORM 2019)

Regarding flood risk assessment, the legal framework is not clear, with many overlaps and gaps especially when it comes to the shared responsibility between the responsible institutions. In Albania, the key institutions dealing with flood issues and events are: *(i) National Water Council; (ii) Technical Secretariat of the National Water Council/Council of Basins; (iii) 61 Municipalities; (iv) 12 Prefectures; (v) Ministry of Defense/General Directorate of Civil Emergencies; (vi) Ministry of Agriculture, Rural Development and its departments(Basin agencies, drainage boards); (vii) Ministry of Tourism and Environment (Environment, Forest and Water Inspectorate, National Environment Agency); (viii) Ministry of Infrastructure and Energy (National Committee of Dams; National Agency of Water Supply and Sewerage); (ix) Ministry of Education and Sciences (Institute of Geosciences, Energy, Water, and Environment) and (x) Albanian Power Corporation.*

The involvement of all these stakeholders in flood management has created many difficulties in cooperation and methodologies used on flood risk management. For that reason *improvement of cooperation between entities/authorities working at the local and national level as well as standardization towards a common methodology on flood risk management is required.*

Although the Ministry of Agriculture is in charge, not only with the management of any form of floods but also flood protection and planning, it deals with only floods affecting agriculture or caused by agriculture-related water infrastructures. The Ministry of Agriculture also has numerous structural gaps, regarding human resources and access to technology and software, which hinder its capacity to perform systematic flood risk assessments or even basic flood hazard mapping. The Directorate of Land and Water Management is responsible for the preparation of studies on flood risk. At the local level, drainage boards do not have the technical capacity to carry out flood risk assessments but are more focused on the implementation and management of flood protection infrastructures. Municipalities do not perform any form of flood risk assessments and it has been noted that there is no real spatial planning process available at the local level. For that reason, there is an urgent need to make e *good synchronization of the Flood Risk Management Plans between national and local levels* or *Flood Risk Management Plans* prepared at *the watershed* and/or river basin levels. Based on this situation *strengthening the institutional framework resulting in a clear structure and shared responsibility* is one of the directions of the policies in flood management.

In terms of a Preliminary Flood Risk Assessment (PFRA), which is a reporting obligation under Article 4 of the EU Floods Directive, Albania has not yet conducted this. As an EU pre-accession candidate, it would need to fulfill all requirements regarding the EU Floods Directive.

Although the elaboration of flood risk management plans (FRMP) is included in Law 111/2012, so far only a small amount of pilot attempts at FRMP exist and there is no systematic use of FRMPs for each watershed. Law 111/2012 stated that River Basin Councils are responsible for the preparation of FRMPs, however, the Councils are not fully operational.

At present, the governance of drought risk does not to be considered as an issue of importance by the Albanian government and therefore, the only drought risk analysis is carried out by academics in the framework of research or development projects.

The risk assessment is not developed in Albania. The *General Directorate of Civil Emergencies* is identified as a coordination body, and although it collects information on floods, there is no real technical capacity to perform actual risk assessments. Line ministries do not have the capacity to produce current up-to-date hazard maps and even data on exposure and vulnerability is sparse. Along with such issues, there is the notion of referring to risk assessment as only hazard mapping rather than including a clear analysis of multiple disaster scenarios and the level of exposure of people and their assets to each of the scenarios. The general hazard risk assessment in Albania should be built from the foundations up, starting with a legal and institutional framework with clear duties and responsibilities along with the provision of funding for appropriate human resources, suitable data, tools, and technical capacities.

Several natural-based solution or practices are proposed to manage properly the floods in Albania, including afforestation of mountainous areas (Puke & Lezha), building green/gray retention water structures over floodplain along the middle and lower courses of rivers (Shkumbini river, Drin & Buna river, Vjosa delta, Devolli river, Mati river, Erzeni river, Ishem river) to reduce erosion and prevent soil loss and landslides as well as restoration of wetlands, agriculture practices and development of agro forestry for flood prevention, water purification, and food security.

Habitat and Bird Directive - NATURA 2000:

Albanian Parliament ratified the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) in 1998 by the law “On the ratification of the Convention on the conservation of European wildlife and natural habitats (Bern Convention)”, published in the Official Gazette No. 7, dated 4.4.1998. There are about 22 protected flora species and 31 marine species of international importance in Albania being part of the list of Bern Convention. By the Order of the Minister of Tourism and Environment, the Red List of Flora and Fauna has been updated and contains 109 animal species and 319 plant species with threatened status. In 2016, the Law on Prohibition of Hunting was extended for 5 years and this hunting ban significantly improved the state of wildlife in Albania.

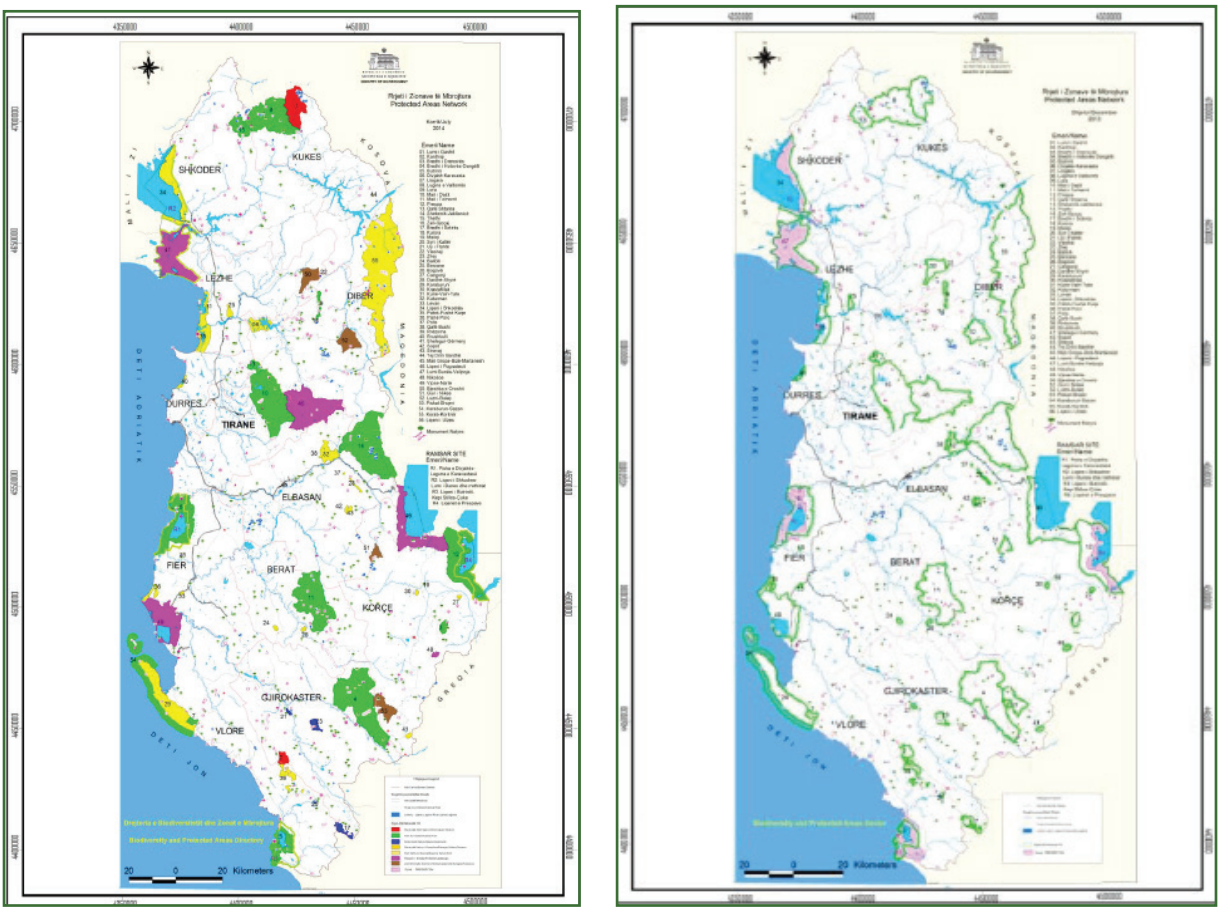

Figure 4. Map of protected areas (left) and Ramsar sites (right) in Albania

As part of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), Albania has developed a proposal for Emerald sites. There are 25 sites in Albania that are officially proposed to be part of the Emerald Network of Areas with Special Conservation Interest.

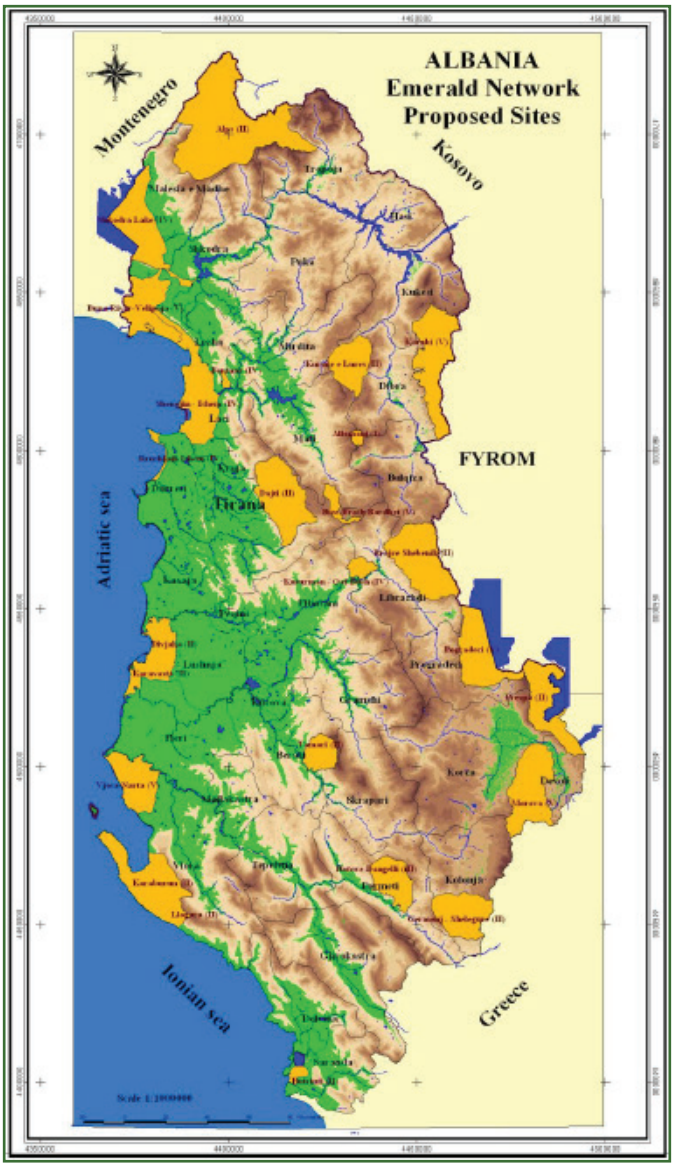

Figure 5.Map of Emerald network sites in Albania

In the context of the EU accession process, the National Biodiversity Strategy and Action Plan for the period 2016-2020 foresee the establishment of the Natura 2000 network in Albania. It is provisioned that 50% of this ecological network to be completed in 2017 and the rest in 2020.

Albania acceded to the Convention "On International Trade in Endangered Species of Wild Fauna and Flora" (CITES) in 2003 after the approval of the Law No. 9021, dated 6.3.2003 "On the accession of the Republic of Albania to the Convention on International Trade of endangered species of wild fauna and flora", published in the Official Gazette No. 22, dated 2.4.2003. Albanian authorities are obliged to submit annual reports on CITES, but always these reports have not been issued at the right time. The biennial implementation reports on legislative, regulatory and administrative measures taken to enforce the Conventions have been submitted regularly although the most recent was submitted in 2014. The latest annual report on illegal tracing was submitted in October 2017. The Law on the Rules and Procedures of International Trade of Endangered Species of Wild Fauna and Flora No. 9867/2008 established the main legal framework for CITES implementation. It's important to complete it with by-laws in order to implement correctly the CITES rules. Few cases have been reported on specimens seizures protected by CITES conventions or condemned

by Albanian prosecution office. There are no essential differences between Albanian legislation and EU regulations regarding wildlife trading. The only difference consists in the list of species covered by Albanian legislation and EU regulations. Thus, in Albania legislation is included the list of species listed in the annexes of the Convention, while for EU legislation the one listed in the annexes A, B, C, and D are not identical with annexes of the convention. According to the convention, is required permission to import species listed in Annexes 1 and 2, while in respect with EU regulation for wildlife trading is required permission only for species listed in the Annexes A and B. Another issue is the format of the permits/certificates used by European Community and member states.

Albania became a party to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) in 2001. Albanian government accepted to be part of this convention by Law No. 8692, dated 16.11.2000 "On the accession of the Republic of Albania to the Bonn Convention: On the conservation of migratory species of wild animals", published in the Official Gazette No. 43, dated 13.11.2000. In 2014, the Conference of the Parties of the Bonn Convention adopted the Strategic Plan for Migratory Species for the period 2015 - 2023, adapting for migratory species the Strategic Plan for Biodiversity for the period 2011-2020. All the five goals of this strategic plan must be integrated into the relevant documents and strategies in Albania. Albania is an important country for migratory species and no reference exists in the 2016 National Biodiversity Strategy and Action Plan from the goals of the latest strategic plan and few measures are taken towards its implementation.

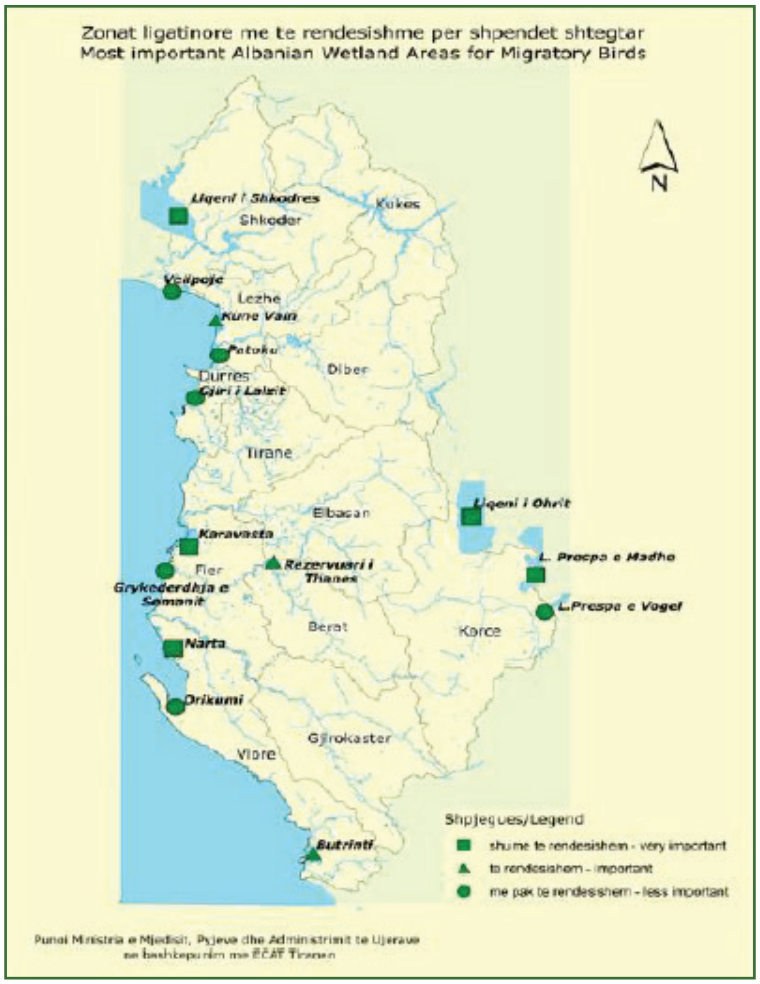

Figure 6. Map of Important Bird Areas in Albania

Albania has been a party to the Convention on Wetlands of International Importance especially as Waterfowl Habitats (Ramsar Convention) since 29.02.1996. Currently, there are four sites in Albania designated as Wetlands of International Importance or Ramsar sites with a surface of 98,181 ha. These sites include: Karavasta lagoon ecosystem since 1995; Butrint since 2003; Lake Shkodra and Buna River since 2006; and Albanian Prespa Lake since 2013.

Another important achievement despite the designation of these Ramsar sites was elaboration and implementation of management plans for the Karavasta lagoon ecosystem in 2015; Butrint in 2011; Lake Shkodra and Buna River in 2012; and Albanian Prespa Lake in 2014. Considering these sites as Important Bird Areas provides a good basis for their legal protection.

In 2014, amendments done in the law on Biodiversity Protection No. 9587/2006 introduced the concept of NATURA 2000, aiming to increase the transposition of the Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

In the Second National Strategy for Development and Integration (NSDI-II) for the period 2015-2020 approved by GoA, one of the strategic objectives is; *"Intensification and strengthening of nature protection"*.This target will be achieved by (i) increasing surface of protected areas through growth and integrated management of protected areas; (ii) establishment of Natura 2000 ecological network; (iii) ensuring the conservation status of endangered/threatened species and habitats. At the moment, Albania still does not has a national ecological network.

Law 81/2017 "For protected areas" is prepared according to the Directive of the Council 92/43/CEE, dated May 21, 1992 "**For conservation of natural habitats, wildlife and flora**" changed CELEX 31992L0043, Official Gazette of European Union, No. 206, dated 22/07/1992, pg 7-50. In the article 26 of this law entitled "*Specially protected area as a habitat of water birds (Ramsar zones)* and *Important areas for Birds (IBA)*", is mentioned the promotion of natural regeneration and implementation of measures which provide healthily forests considered as shelters, nests and breeding places of wildlife during their life cycle. Furthermore, in article 58 of this law, several measures in the forestry field, is proposed for instance: (i) afforestation and reforestation of eroded areas; (ii) measures to prevent soil erosion (iii) measures to fight pests and diseases etc.

Law No 10253, dated 11.03.2010 "On hunting" and **Law "On some amendments and addenda to the law No 9587, dated 20.07.2006"On biodiversity protection"**, fully approximate the Council Directive 92/43/EEC of May 21, 1992 "On the conservation of natural habitat and of wild fauna and flora".

In 2001, Albania became a Party to the Agreement on the Conservation of African-Eurasian Migratory Waterbirds where the Albanian Ornithological Society is the focal point. During the monitoring, 115 non-native water birds species were identified in 2015 in Albania and according to National Biodiversity Strategy and Action Plan for the period 2016-2020, there are about 70 waterfowls that cross the country during the winter along the coastal wetlands and lakes. Eleven sites have been identified with international importance regarding water birds in Albania and four of them (Karavasta, Narta, Shkoder and Ohrid) have management plans. An action plan has been developed for the Pygmy cormorant (Phalacrocorax pygaeus).

Revision of national conservation policies relevant to habitats and water birds is planned under the draft of the national strategy on climate change currently prepared. Currently, mapping of the main migration corridors or crossings for waterbirds is missing and it is a matter of concern.

In the final version of the Guideline for Forest and Pasture Management Plan drafted in 2018, special attention has given the hydrology and erosion as well as measures to control this phenomenon. The information on hydrology in this guideline is focused mainly on the number of water resources inside forest economies, typology of watercourses and their regime, as well as

the status including erosion and sediment deposit. An important attention in this guideline gains the erosion at forest economy level (superficial or gully), its origin (water, wind, human activity) and factors inducing land degradation as well as the trend of this phenomenon during the last 10-15 years. Restoration of degraded areas at the forest economy level is one of the main aims of the management plans, where several measures are proposed against soil erosion, landslides, watercourses and restoration of burnt areas. Depending on the severity of land degradation in the framework of the management plans are suggested several interventions such as: low impact bioengineering measures, planting, and seeding of slopes, building gabion walls or dams along the watercourses, etc. The guideline is not paying attention to the water quality as well as which is the role of forests on water resources.

The guideline is also focused on biodiversity and genetic resources at the forest economy level. Regarding to biodiversity, the guideline foresees the identification of actual and potential vegetation, naturality rate, existing biotopes, and endangered species. Furthemore in the guideline, are included high conservation value sites classified into sixth classes: (i)-species diversity; (ii)-landscape ecosystem and mosaics; (iii)- ecosystems and habitats; (iv)- critical ecosystem services; (v)-community needs and (vi)-cultural values ate forest economy level. In the guideline there is a special item about the risk for biodiversity and effects on the planning, having in the focus the elements of biodiversity as well as types of threats present at forest economy.

In the literature are recognized several potential effects of non-sustainable management of forests on aquatic ecosystems. Without effective management and precautions measures, human activities related to forest resources have significant negative impacts on water resources such as: changes to stream hydrology (water flow and water quantity), changes in water quality (level of sediments in water bodies and water pollution) as well as changes to in-stream habitat (water temperature and biological processes).

Another problem is the incorporation of forest hydrology knowledge in water policies or water legal framework. Despite the significant advances in scientific understanding of forest and water interactions, the role of forests in relation to the sustainable management of water resources remains a contentious issue. There is confusion, and this is derived by the difficulties in transferring research findings to different watershed scales, or forest types and species and different forest management regimes. There is a gap between research and policy which is associated with the lack of results transposition of hydrological research effectively to policy-makers or legal framework. For the linking of research and policy related to forest hydrology, education has an important role. Education across disciplines is necessary to improve knowledge of forest and water interactions, e.g. to improve capacity to assess the effects of afforestation and reforestation program on water quality and quantity, flood control, and soil protection. There is no specific subject in the Faculty of Forestry Sciences in Tirana, which educate the new generation about the role of forests to water resources or any specific study to make evident this relationship.

Development of integrated water resource management plans at the watershed and/or river-basin level was one of the targets set by the World Summit on Sustainable Development in 2002. These multisectoral plans should be aimed at ensuring “water for people, food, nature, and industry and other uses” (Global Water Partnership TAC, 2000). In Albania are prepared several management plans for river basin level, but the dimension of forests on water quantity and quality, in these documents is still insufficient.

As forest experts are committed to the development of forest management plans they must join forces with water experts to develop integrated water resource management plans and forestry programs or forest management plans as part of a more comprehensive watershed/river-basin planning process. Similarly, the management of transboundary watersheds and river

basins should give greater consideration to the relationship between upstream forest cover and downstream water flows.

In many countries, forest and water policies, plans and programs are coming together through the increased popularity of payment for environmental services schemes (also called stewardship payments, compensation schemes or performance payments) as financing mechanisms for watershed management, sustainable forest management, and other sustainable development processes. So far, some efforts are done in the framework of the Project for Environment Services in Ulza and Bovilla watersheds to establish a payment scheme including other stakeholders, but still, this process is ongoing. The logic of this process is that upstream populations living at both watersheds, for instance, can be compensated by downstream water users through direct payment for the provision of forest hydrological services such as discharge regulation or protection of water quality.

EU directive on Strategic environmental assessment (SEA) and Environmental impact assessment (EIA)

- REGULATION (EC) No 2152/2003 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 November 2003 concerning monitoring of forests and environmental interactions in the Community (Forest Focus)

The legal framework for Strategic Environment Assessment (SEA) has been enabled through the Law on Strategic Environmental Assessment No 91/2013. SEA procedure for local and national level plans or programs has been applied and includes these steps:

a) notification of the Ministry of Tourism and Environment by the proposing authorities
b) consultation with stakeholders on the issues that shall be addressed in the SEA report
c) drafting of the public consultations on the preliminary SEA report
d) drafting of the final SEA report
e) review of the final SEA report and issuance of the Minister's declaration
f) decision of the proposing authority for adoption of the plan or program
g) monitoring of effects of the plan/program on the environment and reporting

The list of plans or programs that are subject to SEA is approved by DCM No 507, dated 10.06.2015. Rules for consultation with stakeholders and public hearings during the SEA process have been defined in the DCM No 219, dated 11.03.2015, but a methodology on SEA at the national level is not approved yet.

In the MoTE under the dependence of the General Directorate of Environmental Policies and Priority, delivery was established the Unit/sector of SEA, EIA and Environmental Standards (source; Order of the Prime Minister No 119, dated 22.07.2016). The evaluation of the final SEA report as a first step towards the preparation of the Minister's issuance is accomplished by the staff of this unit, but there is a need to establish an evaluation committee with independent experts when qualified expertise is required. The MoTE has not a database or register of SEAs conducted every year. From May to December 2016, 26 SEA procedures were conducted and most of them were related to municipal development plans.

Some of the challenges faced during the SEA assessment by the MoTE are:

a) difficulties with the evaluation of the environmental effects of the plan or program with regard to cumulative effects;
b) the MoTE staff is unable to attend all public hearings during the SEA report;

c) the quality of SEA reports sometimes is questionable;

d) SEA instruments are not properly applied by key sectors of the national economy (sometimes all requirements of SEA procedure are not followed for instance: consultations with stakeholders);

Most of the strategic documents prepared before 2017 have been approved without a SEA for example: Intersectoral Strategy for Agriculture and Rural Development for the period 2014-2020, National Action plan on Renewable Energies for the period 2015-2020, Social Housing Strategy for the period 2016-2025.

Under the protocol on SEA, Albania has completed the SEA procedures for the National Park Management Plan "Galichica" for the period 2011-2020 with North Macedonia (Citrus 2015). DCM No 620, dated 07.07.2015 contain the entire procedures that must be followed up for SEA in a transboundary context. The legal framework for SEA and EIA considers also water birds and their habitats. Law No 10440/2011 amended by law 12/2015, and DCM No 598, dated 01.07.2015 "On rules and procedures for environmental impact assessment in a transboundary context", represents the legal framework on Environment Impact Assessment (EIA) in Albania. So far, EIA is not taken into consideration during the preparation and implementation of forest management plans in Albania.

EU climate action – adaptation to climate change

The GoA has adopted the EU adaptation strategy to climate change aiming to cope with the inevitable impacts of climate change. In the adaptation strategy are foreseen several measures to be implemented such as:

- using less water and in a more efficient way
- developing crops especially in the agriculture sector which face better with drought conditions
- mapping the flood risk and implementing prevention measures

Directive	Transposed in National Law	How forestry is included in national legislation
Water Framework Directive	Law No 111/2012 "On Integrated Water Resource Management", amended by law No 6/2018	In this law is mentioned only the concept of protected areas as a tool to preserve the water resources, but not the forest's role in water quality and quantity. Although, the WFD implements the principle of "polluter pays", it does not emphasize the significant role of forests on water quantity and quality. In this case implementation of schemes of payments for environmental services is recommended. In the River Basin Management Plans prepared, the forest area is rarely mentioned and the management of forest resources must be integrated with the management of water resources.

Directive	Transposed in National Law	How forestry is included in national legislation
Flood Directive	Law No 111/2012 "On Integrated Water Resource Management", amended by law No 6/2018	Within the flood directive and Law, No 111/2012 is not mentioned. In the Program of Measures of this directive are recommended measures for sustainable land use in the basins to retain part of rainwater.
Habitat Directive	Law 81/2017 "For protected areas" & Law "On the ratification of the Convention on the conservation of European wildlife and natural habitats (Bern Convention)", published in the Official Gazzete of Republic of Albania no. 7, date 4.4.1998.	Mostly transposed with Directive of the Council 92/43/CEE, dated May 21, 1992 "For conservation of natural habitats, wildlife, and flora". Forestry is indirectly included in the introduction/reintroduction of species and collection of non-wood forest products etc.
Bird Directive	Law 81/2017 "For protected areas" and Law No 9587/2006 "On Biodiversity Protection"	Mostly transposed with Directive of the Council 92/43/CEE, date May 21, 1992 "For conservation of natural habitats, wildlife, and flora". Forestry is mostly included in the Law 81/2017 considering forest areas with specific status and high conservation values.
SEA / EIA directives	Law on Strategic Environmental Assessment No 91/2013 and Law No 10440/2011 amended by law 12/2015.	Forestry is not included in the law Strategic Environmental Assessment No 91/2013 and Law No 10440/2011 amended by law 12/2015.
UN Convention on Climate Changes /EU Emission Trading System Directive (2003/87/EC)	Law on Climate Change, dated 2017	Forestry is Included as one of the sectors with a principal role in mitigation of climate warming.

2.2.2. North Macedonia

The latest Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 2019 Communication on EU Enlargement Policy, (https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-north-macedonia-report.pdf) present situation in various chapter and between them in chapter 11 – Agriculture and rural development and Chapter 27 – Environment and Climate Change

Forests and Forestry are not mentioned in this long report except in the statistical tables for dynamic of any economic parameters per years compared with referent year 2006 but as a common sector: "agriculture, forestry and fisheries (AFF)"

- Percentage of employment by AFF in all employees – vary from 16,2% to 18,7 (2013)
- % of Gross value added by sector AFF - value vary from 9,1% (2017) to 11,7% (2015).

Chapter 11 – Agriculture and rural development

The country remains **moderately prepared** in the area of agriculture and rural development. **Some progress** was made in the reporting period, in particular on the Farm Accountancy Data Network.
In the coming year, the country should in particular:

- finalise the national Farm Accountancy Data Network legal and procedural alignment to the *acquis*;
- prepare an action plan for further institutional and legal alignment to the *acquis* in the area of common market organisation;
- implement the Instrument for Pre-Accession in Rural Development (IPARD II) and ensure full absorption of the EU funding by strengthening the administrative capacity and competences of the IPARD Agency.

Forestry might be connected to Rural development as well as to the common market organization.

Chapter 27 - Environment and Climate Change

The EU promotes strong climate action, sustainable development and protection of the environment. EU law contains provisions addressing climate change, water and air quality, waste management, nature protection, industrial pollution, chemicals, noise and civil protection.

The country is at some level of preparation in this area. Limited progress has been achieved in further aligning policies and legislations with the acquis in the water, nature protection and waste sectors. Implementation and enforcement are lagging behind.

In the coming year the country should in particular:

- *implement air quality improvement measures by ensuring efficient coordination between central and local authorities, and the allocation of sufficient financial resources;*
- *implement the adopted regional waste management plans and establish an integrated regional waste management system;*
- *implement the Paris Agreement by developing a comprehensive strategy on climate-related action, consistent with the EU 2030 framework and start the process of developing a National Energy and Climate Plan, in line with Energy Community obligation.*

***Administrative capacity** at central and local level remain weak and insufficient. Cooperation with civil society has improved, but further efforts are needed for effective public participation and consultation in decision-making processes. The implementation of **Environmental Impact Assessment** and public consultationsneed to improve, especially at the local level. No progress has been made in adopting the Law on Environmental Inspection and the Environmental Liability, INSPIRE and Environmental Crime Directives are still not fully aligned and implemented.*

*On **water quality,** the country made some progress. After having developed implementation plans for the Urban Waste Water Treatment and Drinking Water Directives and a national investment programme for the water sector, the new tariff methodology based on full cost recovery is applied. A public consultation is ongoing on the river basin management plans for Vardar, Strumica and Crn Drim rivers. Flood hazard and risk mapping has been developed for almost all areas of the country, but significant efforts are needed to further align legislation with the acquis. Inter-ministerial cooperation in the water sector requires considerable improvement.*

*For **nature protection**, a national strategy for nature protection and a national strategy for the protection of biodiversity were adopted. The annual program for nature conservation for 2019 was adopted by the government. Work continues on identifying potential NATURA 2000 sites. Valorisation studies and management plans, required by the Birds and Habitats Directives, were prepared for two protected areas and commenced for two potential protected areas. Steps have been taken to establish ecosystem services. However, sustainable and long-term funding for protected areas from the central level is still absent. The implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora Regulation is still at an early stage. Any further development of hydropower should be in line with EU environmental legislation.*

*There has been no progress on **civil protection (**note. Flood defense is in this sector too). The country continues to participate in the Union Civil Protection Mechanism, but lacks streamlined, coordinated and efficient disaster mitigation and response action at all levels. An inter-institutional working group has been set up to propose recommendations for improvement. The country is still not connected to the common emergency communication system and information system (CECIS) of the Commission, but the country need first to set up the secure trans-European services for telematics between administrations (sTESTA) connections*

*The alignment of the legal framework about **Climate Change** with the acquis is still at an early stage. The country has started developing a comprehensive strategy on climate action, consistent with the EU 2030 framework. It should also pursue efforts to implement the Paris Agreement, which North Macedonia ratified in November 2017. In 2018 the country submitted its second Biennial Update Report on climate change to the United Nations Framework Convention on Climate Change and currently the 4th National Communication and 3rd Biannual Update Report to the UNFCCC are in preparation. Technical, institutional and administrative capacity remains weak and needs to be strengthened at all levels. The efforts to mainstream climate action into other sectors (such as energy and transport) need to be intensified.*

More details especially about water issues could be found within the European Commission Progress Report for 2016 of the Republic of Macedonia, where in the part for waters was noticed the following:

„The country, in terms of water quality has reached a certain level of preparation. River basin plans have been prepared, agglomerations have been identified and sensitive areas have been defined. In January 2016, a new Law on Setting Prices for Water Services was adopted. A system for monitoring the quality and quantity of water is needed. Untreated urban waste water remains the main source of pollution. Preparation of specific plans for implementation of the Directives for urban waste water and drinking water treatment is underway. New infrastructure is being constructed and existing infrastructure is being upgraded, although national funding is insufficient. Administrative capacities are insufficient to implement all measures required in the water-related directives. The dangers of flooding and dangerous risks for all river basins should also be developed.“

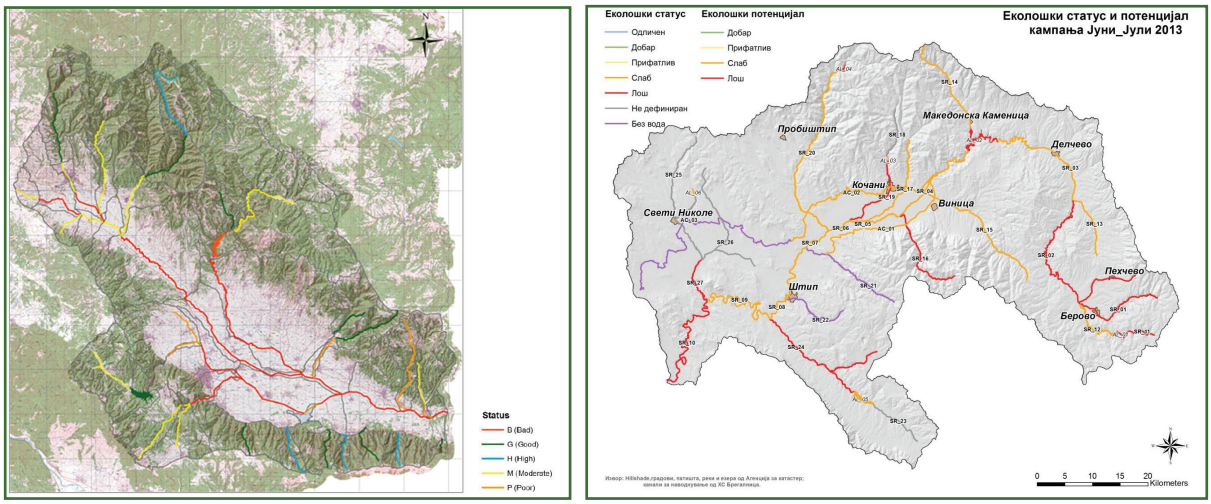

Figure 7 - Classification of ecological status of surface water bodies - Strumica River basin, Bregalnica River basin

According to the "Progress Report monitoring the transposition and implementation of the legislation on environment and climate, 2016", (http://www.moepp.gov.mk/wp-content/uploads/2017/07/SEIS_Country-Report_-Republic-of-Macedonia_2018_Final.pdf) level of water legislation transposition into the national legislation is as follow:

- *2000/60 /EC Water Framework Directive* – 88%,
- *91/271/EEC Directive on the urban waste water treatment – 100%*
- *98/83/EC Directive on the drinking water quality – 97%*
- *2006/7/EC Directive on the bathing water quality – 11%*
- *2006/118/EC Directive on groundwater protection against pollution and quality impairment – 48%*
- *2007/60/EC Directive on flood risk assessment and management – 16 %. (2016, ECRAN report,*

Regarding the Flood Directive should be noticed that in the last 3 years was realized significant number of projects and beside FRAs were prepared flood management plans for: Strumica River basin; Crn Drim River basin, while for the Vardar River basin was prepared FMP only for the sub-basins as Upper Vardar. It means that level of transposition of "Flood Directive"; at the moment is much higher than 16%.

Torrents floods are indicated in these plans and it is important for forestry because torrent control is realize within the torrent bed but also on the catchment with aim to reduce erosion and to reduce runoff through various measures including afforestation especially in gradon.

All flood management plans in the country are prepared by "Point pro" company and extract from those are presented below.

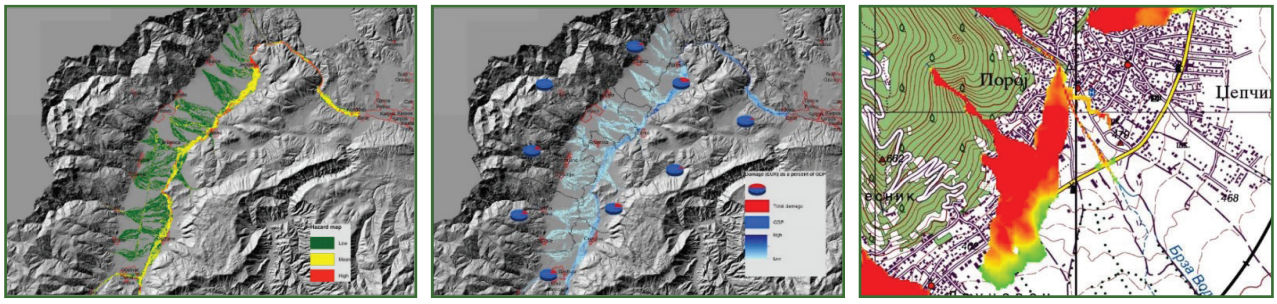

Figure 8 - Flood hazard and Flood Risk maps for Upper Vardar sub-basin (mountain torrents) – Torrent Poroj FH map

Figure 9 -Potential Q_{100} floods in Radovish city (by torrents Sushica and Radovishka Reka) and in the valley (by river Strumica)

Directive	Transposed in National Law	How forestry is included in national legislation
Water Framework Directive	Law on Waters	Not mentioned in WFD despite its potential implications on ecological status on surface but also on groundwater bodies. While the WFD implements the "polluter pays principle", it does not express appropriate consideration for the positive ecosystem services forests provide. During preparation a River Basin Management Plan, forest area is indirectly mention as source of suspended sediment that is previously mechanical polluter of surface water. National legislation meet requirements by WFD
Flood Directive	Law on Water	Within the flood directive is not mentioned. But in Programme of Measures are recommended measures for sustainable land use in the basins to retain part of rain water. Within the national Law there is a separate chapter for Adverse impact of water. (explanation in the following subchapter)

Directive	Transposed in National Law	How forestry is included in national legislation
Habitat Directive ; Bird Directive	Law on Nature protection	Forestry is indirectly included In articles related to: introduction/reintroduction of species; collection of non-wood forest products; usage of protected species; maintenance and protection of significant habitats; protection of significant landscapes; Most of requirements are transposed within the Law on Nature protection
SEA / EIA directives	*Law on environment protection*	Chapter X – Assessment of impact of some strategies, plans and programmes on environment - Forestry is mentioned More details are regulated with bylaws.

2.3. EU Forestry legislation policy and practices

In the European Union, the formulation of forest policies is the competence of the Member States within a clearly defined framework of established ownership rights and with a long history of national and regional laws and regulations based on long term planning. Although the Treaties for the European Union make no provision for common forest policy, there is a long history of EU measures supporting certain forest-related activities, coordinated with the Member States mainly through the Standing Forestry Committee.
However, forests are affected by a broad array of Community policies and initiatives arising from diverse EU sectoral policies. For several decades now, environmental forest functions have attracted increasing attention mainly in relation to the protection of biodiversity and, more recently, in the context of climate change impacts and policies. In public perception, apart from the traditional production of wood and other forest products, forests are increasingly valued for their role as public amenities, biodiversity reservoirs, regulators of climate and local weather, sources of clean water, protection against natural disasters and renewable energy sources. The most comprehensive act is the EU Forest strategy.

The EU Forestry Strategy adopted in 1998 puts forward as its overall principles the application of sustainable forest management and the multifunctional role of forests. The Strategy was reviewed in 2005, and the Commission will present a proposal for an EU Action Plan on Forestry in mid-2006.

Set up in 2013 to coordinate the European Union's response to the challenges that are faced by our forests and the forest sector, the New Forest Strategy sets out specific actions to achieve eight key priorities. A new forest strategy is adopted in 2013 (https://eur-lex. europa.eu/ resource. html?uri=cellar:21b27c38-21fb-11e3-8d1c-01aa75ed71a1.0022.01/DOC_1&format=PDF)

A new EU Forest Strategy 2014-2020 for forests and the forest-based sector.

The EU forest strategy 2014-2020 was developed to provide a coherent framework for both EU forest-related policies and the national forestry policies of the individual EU countries. It was developed by the EU Commission in close cooperation with EU countries and stakeholders.

The strategy aims at promoting the concept of sustainable forest management, which aims to safeguard and achieve the balanced development of the multiple functions of forests and efficient

use of resources. This concept should underpin the role of forests in serving several EU priorities, including:

- *EU rural development policy,*
- *environmental and climate policies (especially biodiversity and climate mitigation),*
- *the provision of ecosystem services (such as clean water and air, or control of erosion),*
- *provision of sustainable growth and jobs in rural areas (such as the production of clean renewable energy and bio-economy supplying bio-materials).*

The EU forest strategy focuses its attention on eight main priority areas:

- *supporting rural and urban communities;*
- *fostering the competitiveness and sustainability of the EU's forest-based Industries, bio-energy, and the wider green economy;*
- *protecting forests in a changing climate whilst promoting sustainable forestry management to mitigate against climate change;*
- *protecting forests and enhancing ecosystem services;*
- *strengthening our knowledge of the forests the EU has and how they are changing;*
- *developing new and innovative forestry and added-value products;*
- *working together to coherently manage and better understand forests;*
- *focusing on forests from a global perspective, including the conservation of non-EU forests.*

In addition, the strategy underlines the importance of national forest policies taking EU level policies into account.

Forest-water issues are mentioned in the third priority (provision of ecosystem services such as clean water and air, or control of erosion), and in the priority areas about promotion sustainable forestry management as well as protecting ecosystem services. It should be noted the strengthening of knowledge.

EU climate action – adaptation to climate change

In 2013, the European Commission adopted an EU strategy on adaptation to climate change. . The strategy aims to make Europe more climate-resilient. By taking a coherent approach and providing for improved coordination, it aims to enhance the preparedness and capacity of all governance levels to respond to the impacts of climate change.

The EU Adaptation Strategy (https://ec.europa.eu/clima/policies/adaptation/what_en#tab-0-1) focuses on three key objectives:

- *Promoting action by the Member States: The Commission encourages all Member States to adopt comprehensive adaptation strategies (currently 25 countries have strategies) and provides funding to help them build up their adaptation capacities and take action. It also supports adaptation in cities through the Covenant of Mayors for Climate and Energy initiative (https://energy-cities.eu/project/covenant-of-mayors-for-climate-energy/) .*
- *'Climate-proofing' action at EU level by further promoting adaptation in key vulnerable sectors such as agriculture, fisheries and cohesion policy, ensuring that Europe's infrastructure is made more resilient, and promoting the use of insurance against natural and man-made disasters.*
- *Better informed decision-making by addressing gaps in knowledge about adaptation and further developing the European climate adaptation platform (Climate-ADAPT).*

Even if emissions are stabilized relatively soon, climate change and its effects will last for many years and adaptation will be necessary. The need for an Adaptation Clearinghouse was identified in the Commission's 2009 White Paper "Adapting to climate change: Towards a European framework for action". In order to try to assess these needs, the European Climate Adaptation Platform (CLIMATE-ADAPT) was set up in 2012. The JRC supports the development of the Adaptation Clearinghouse by providing data and content to the European Forest Data Centre and European Database of Vulnerabilities to Natural Hazards, which includes information on forest fires. https://www.eea.europa.eu/policy-documents/white-paper-adapting-to-climate

In order to support forest adaptation to climate change, the JRC maps forest species, forest type distribution and habitat suitability under current and future climate change scenarios. The JRC uses interpolation methods and suitability distribution models to produce these maps, allowing the EU Member States to identify the areas that are optimal or unsuitable for a particular tree species and to adapt their future forest management plans accordingly.

Warsaw Resolution W2 "Forest and water"

https:// www. foresteurope.org/docs/MC/MC_ warsaw_resolution2.pdf

The Ministerial Conference on the Protection of Forests in Europe (MCPFE, a synonym of the Helsinki Process, and, from November 2009, of FOREST EUROPE[1]) is a pan-European ministerial-level voluntary political process for the promotion of sustainable management of European forests. Through this process, guidelines, Criteria & Indicators of Sustainable Forest Management and other instruments for the promotion of sustainable forest management (SFM) are developed. At Ministerial Conferences, the ministers responsible for forests in Europe take decisions on issues of highest political and social relevance regarding forests and forestry through decisions and resolutions. Between ministerial conferences, the Expert Level Meeting (ELM) is a decision-making body of FOREST EUROPE.

From 1990, seven (plus one extraordinary) Ministerial Conferences on the Protection of Forests in Europe have taken place. At every Conference, a joint political declaration is agreed and different resolutions are adopted, in order to develop common strategies for its 46 signatory countries and the European Union on how to protect and sustainably manage forests. One of these joint political declaration (resolutions) is Warsaw resolution on forest and water.

The Signatory States and the European Community, commit themselves to:

I. Sustainable management of forests in relation to water

13. maintain and enhance the protective functions of forests for water and soil, as well as for mitigating local water-related natural disasters through sustainable forest management, including through public and private partnerships,

14. assess afforestation and reforestation programmes in terms of their effects on the quality and quantity of water resources, flood alleviation and soil,

15. promote the restoration of degraded forests, particularly in floodplains and upper watershed areas for the benefit of the water environment, flood reduction, conservation of biodiversity and soil protection,

II. Coordinating policies on forests and water

16. develop and improve policies for forest and water resources management that contribute to the maintenance of ecosystems and the sustainable provision of their services,

17. coordinate forest and water resources management policies through national forest programmes or equivalents and integrated water resources management plans and strategies at the appropriate levels,

18. develop adequate or improve the existing institutional arrangements to better cooperate in addressing the interrelation between forest and water issues,

19. address the management of forests and water at the transboundary watershed level through enhanced international cooperation,

20. enhance education, training, research and extension services to promote knowledge and understanding of forest and water interactions,

21. increase awareness of the relationship between forests and water as well as the potential of forests and their sustainable management to improve the water environment,

III. Forests, water and climate change

22. develop a deeper understanding of the potential consequences of climate change on forest and water interactions, including desertification and biodiversity loss as well as the frequency, scale and intensity of floods, storms, droughts, forest fires, pests and diseases,

23. develop appropriate policies and strategies for managing forests and water resources sustainably to adapt to climate change and contribute to its mitigation,

IV. Economic valuation of water-related forest services

24. assess the economic value of forest services related to quality and quantity of water resources and flood alleviation from which society benefits,

25. incorporate the economic valuation of water-related forest services into relevant policies and strategies on forests and water,

26. facilitate the development and implementation of measures, which may include economic tools such as payments for ecosystem services (PES) in order to broaden and diversify the financial basis for sustainable forest management and to maintain the protective functions of forests.

2.3.1. Albania

EU Forest strategy 2014 – 2020

The **National Strategy for Development of Forests and Pastures in Albania** has been developed and approved by DCM No 247, dated 23.04.2004. This strategy comprised five strategic goals to achieve sustainable forest management. The strategic goals included in the strategy are:

- **i.** providing the territorial, ecologic and biodiversity integrity of forests and pastures
- **ii.** promotion and supporting of the sustainable forest and pasture's resource management
- **iii.** improvement and strengthening of relationship with wood and non-wood market
- **iv.** inclusion of stakeholders and local users in the forest resource safeguarding and development
- **v.** institutional and legal reform at the local and national scale of forest service

The strategy aims to provide a balance between various forest functions, meeting the community demands and delivering vital ecosystem services. By the third strategic goal, the strategy intends to provide a good basis that forest and pasture sector to be competitive and to raise its contribution to the gross domestic production of the country. The strategy addresses the three dimensions

of sustainable development, providing a holistic approach to forest and pasture management. Some of the measures proposed in this document are:

- conservation and promotion of forest genetic resources
- afforestation or creation of woodland in non-regenerated lands, refused lands and degraded areas
- afforestation of degraded areas with fast-growing species to raise the capacity to sequester more CO_2
- prevention of forest damage caused by fires, natural disasters or catastrophic events, and restoring damaged forests
- investments in forest technologies and GIS techniques
- wood and non-wood harvesting products contracts
- promotion of the environmental value of forest ecosystems

This strategy is not updated and must be aligned with the EU Strategy for forests and the forest-based sector for the period 2014-2020. For that reason, a new strategy for forest and forest sector in Albania is urgently required and priority areas of this strategy must be conform to the **EU Forest Strategy 2014-2020.**

Last year the GoA approved by DCM 814, dated 31.12.2018 the **Document for Forest Policy in Albania**. The Document for Forest Policy in Albania is the milestone for drafting relevant strategies, regulating the relationship between stakeholders and orientation of monetary and/or non-monetary sources. This document aims at protecting the forests, making them more resilient to climate change, safeguarding its multiple functions, including the provision of environmental services, as well as supporting investments, innovation and training to the benefit of the rural economy. The Document for Forest Policy in Albania focuses its attention on four long-term goals:

a) sustainable management and administration of forest and pasture resources to mitigate climate change effects (aligned with the third priority area of the EU Forest Strategy)

b) setting up a well defined functional organisation

c) sustainable use of forest and pasture resources (aligned with the sixth priority area of the EU Forest Strategy)

d) providing qualitative services for rural and urban communities (in accordance with the 1-st priority area of the EU Forest Strategy)

Warsaw Resolution W2 "Forest and water"

All forest-related policy documents recognize the importance and the key role of forests on water supply and quality. In Albania there is an imbalance between freshwater supply and demand and this is mainly caused by the mismanagement of water resources at the country level. There is an urgent need to ensure adequate water quality and quantity for people living in urban and rural areas improving their living standards and livelihood. All the studies conducted in Albania has identified that the quantity of water produced is much higher than the rate of water consumption per capita per day approved by law. The analysis emphasized that the available water resources in Albania are sufficient to meet the current and future demands, but there is an urgent need to establish an accurate database for the state of water resources and water management indices such as: (i) water consumption; (ii) non-revenue water; and (iii) drinking water quality.

All the forest and water policy documents in Albania must pay more attention to the role of forests in water supply, the biodiversity of water ecosystems, flood alleviation and soil erosion. According to third National Communication to the United Nations Framework Convention on

Climate Change, Albania's weather is likely to become warmer over time due to climate change. Similarly, increasing trends are projected in annual, seasonal temperatures as well as in minimum and maximum values. Analysis of temperature trends over time indicates that mean annual temperature in Albania will be increased by 1.7 °C by 2050, whereas the seasonal temperatures will increase from 1.2 °C (winter) to 2.5 °C in summer. All the scenarios reveal a likely decrease in annual precipitation up to -8.5% by 2050 and up to 18.1% by 2100. These climate changes will probably cause severe effects on the frequency, scale, and intensity of natural hazards such as floods, avalanches, storms, droughts impacting the forest and water resources. Climate change is expected to alter the meteorological and hydrological regime of water resources, because the decrease in total precipitation dominated with a higher evapotranspiration rate due to temperature rising would probably result in less river flow. For that reason, climate change is the main driver which may affect the hydrological regime of watersheds, the demand for water and the size and thickness of snowpack. Temperature rising will be associated with a higher risk of fires which likely will occur more frequently even at higher altitudes causing severe impacts on watersheds, water quality and quantity, and soil erosion. Soil erosion in Albania remains a permanent threat to land stability and is a persistent environmental problem. The projected values for precipitation minima will lead to an increasing frequency of droughts in summer while and the rising of maximum values is expected to the frequency of intensive precipitation and this will cause an increase in flood frequency in autumn, winter and, spring. The impact of climate on water demand is driven by water use and electric power consumption. In order to evaluate the multifold role of forests are carried out in many studies, but their attention has been focused more on wood and non-wood values. Indeed, the full economic value of forests implies in particular, the assessment of ecosystem services provided by forests. The raising of public awareness and involvement of local communities and other stakeholders in planning and implementation of water-related forest policies is crucial as recommended in the Fifth Ministerial Conference on the Protection of Forests in Europe. The GoA set a target to promote the restoration of degraded areas and to increase the forest area by planting 20 million trees till 2020 particularly in the floodplains and upper watershed areas. This incentive will reduce the risk of floods in the lowlands and will contribute to the reduction of soil loss. Albania has signed many international conventions and agreements in the field of environment protection, water management, biodiversity, etc and is responsible to fulfill their commitments especially towards sustainable management for forests and to enhance their protective function versus water and soil as well as to mitigate the local water-related natural disasters. The approval of the Document for Forest Policy in Albania last year by DCM 814, dated 31.12.2018 will create the premise for drafting a new forest law and establishment of the Albanian Agency for Forest Management. This agency will contribute to the management of forest and pasture resources and enhance the range of ecosystem services.

The detailed analysis of the legal framework for forests and water resources identified many gaps, as consequence, there is an urgent need for better coordination of forest and water resource management policies into the national development strategies or government programs. In addition, the new forest law must address better the interrelation between forest and water issues as well as to increase the awareness of decision-makers and the community about the importance of sustainable forest management on the water environment. Decentralization of the competencies related to forest administration and protection to municipalities by Law 139/2015 on "Organisation and Functioning of Local Governance", must be associated with more funds and support from the government, through extension service in order to promote knowledge and understanding of water relations by local forest staff through training and education. The existing strategy for forest and pasture sectors must be revised and special attention must be paid to the sustainable management of forests and their role in climate change mitigation. The forest experts in Albania must recognize the potential consequences of climate change on forest and water interactions including desertification, biodiversity loss as well as the frequency, scale and intensity of floods, storms, droughts, forest fires, pests, and diseases.

One of the main critical issues is the implementation of the policies, strategies, and measures prepared in different sectors. Their implementation has been delayed due to the lack of funds. To facilitate the implementation of measures, the GoA must diversify and broaden the financial support for forests and pastures by promoting the payments for ecosystem services (PES). Recently, a project for ecosystem services, supported by the World Bank (WB), Swedish International Development Agency (SIDA) and Global Environment Fund (GEF) is implemented in Albania and one of the aims of this project is to establish payments schemes for forest ecosystem services in Ulza and Bovilla watersheds. In order to explore the financial basis for water-related forest services with a focus on PES is required awareness raising and capacity building as well as the accomplishment of cost-benefit analysis in specific watersheds for the purpose of PES. Ideally, both sectors must work together to initiate the functioning of the PES schemes. Within a PES scheme, transparency, where the money is going, is crucial to make the system trustworthy for the public. The money from PES must be used for sustainable forest management and the private sector may play an important role, through a private-public partnership.

2.3.2. North Macedonia

EU Forest strategy 2014 – 2020

2020 Forest objectives

To ensure and demonstrate that all forests in the EU are managed according to sustainable forest management principles and that the EU's contribution to promoting sustainable forest management and reducing deforestation at global level is strengthened, thus:

- contributing to balancing various forest functions, meeting demands, and delivering vital ecosystem services;
- providing a basis for forestry and the whole forest-based value chain to be competitive and viable contributors to the bio-based economy.

Above objectives are incorporated within the National Strategy for sustainable development of forestry. Even within the Action Plan 2007-2013, there are various actions foreseen to fulfill these objectives, but only couple of actions from the AP are implemented.

Within the Law on forests, these issues are not visible.

Warsaw Resolution W2 "Forest and Water"

Power of this resolution is not like EU directives etc. and have advisory character. However only part of the articles within the resolution are involved within the national strategy but are not implemented in practice as follow:

From Ch. I - Sustainable management of forests in relation to water, articles 13 and 15 are not practiced

From Ch. II - Coordinating policies on forests and water, no one articles (16-21) are practiced

From Ch. III - Forests, water and climate change, no one of articles 21 and 22 is practiced

From Ch. IV - Economic valuation of water-related forest services – no one of articles 22-26 are practiced

It means that almost no one of advises are practiced in forestry in the country.

3

National legislation relevant to forest-water issues

3.1. Albania

National policies and guidelines on forest and water should be developed. The latest guidelines dealing with soil erosion control measures and management of forests in steep slopes have been prepared before '90s from the former Institute of Forest and Pasture Research in Tirana. Spatial planning should be the overall umbrella for this purpose. Inter-sectoral institutional structures and water basin council or board should handle the coordination between the sectors from the national to the local river basin level. Some of the laws or by-laws within the existing legal framework in Albania, which emphasize the close correlation between forests and waters are:

3.1.1. Law No 111/2012 "For integrated management of water resources"

This law is transposed with Directive 2000/60/EC of the European Parliament, dated 23 October 2000 "Setting up a legal framework for the community actions in the field of waters policy", No CELEX:32000L060 Official gazette of the European Union, Series No 327, date 22.12.2000, pg 1-73. The purpose of this law is protection and improvement of the water environment, ensuring sustainable water use and fair distribution, protection from pollution and over-exploitation and the establishment of the central and local institutional framework required to implement national policies of water management and protection. According to this law in section III, article 36, measures for the protection of water resources are the responsibility of the ***Council of the Water Basin.*** This unit compiles a specific program of measures for water protection which must be updated regularly.

3.1.2. Law 10431, dated 09.06.2011"For environment protection", amended by law No 31/2013, dated 14.02.2013

Article 17 of this law, entitled "*Water Protection*", includes measures for protection and improvement of surface and groundwater quality to avoid or mitigate the negative effects on water ecosystems and environment as a whole. In more detail, these measures are determined by specific by-laws. In article 5 of this law is defined that "conservation of biological diversity" is one of the environmental elements.

3.1.3. DCM 814, dated 31.12.2018 "For approval of the document related to policies in forestry sector in Albania for period 2019-2030"

In point 2.4 of this document entitled, "*Challenges to be addressed*" is emphasized the importance of forests on potable water and water cycle but no specific information on relevant measures.

3.1.4. Law 9385, dated4.5.2005 "For forests and forest service"

This law amended by law No.9533, dated 15.5.2006; law No. 9791, dated 23.7.2007; law No.9989, dated 15.9.2008; law No.10137, dated 11.5.2009; law No.15/2012, dated 16.2.2012; law No. 36/2013, dated 14.2.2013 and law No. 48/2016, dated 5.5.2016 in article 13 "Forest functions" is mentioned that forest has an ecological function related to conservation and protection of flora, fauna, genetic, hydrologic resources, land protection against erosion. Furthermore in article 20 "Protection of national forest fund" is mentioned protection and no-alteration of national forest fund, water resources, natural lakes, marshes, lagoon, wetlands, watercourses, water points, etc, which create an indispensable natural complex in harmony with forests and other forest lands.

3.1.5. Law No 81/2017 "For protected areas"

In Article 19, of Law No 81/2017, is written that in protected areas is forbidden the alteration of the natural state of water reserves, lakes and wetlands. Furthermore in Article 22 of this law entitled "Protected marine areas", is written that in such areas will be protected the biodiversity, ecosystem, habitats and endangered species of marine waters. In addition in this article is paid attention to the water quality protection and prevention from pollutants.

Recently the MoTE has prepared a new guideline for Forest and Pasture Management, but still, the information on SEA or EIA is missing in this document. So far, all forest management plans and activities performed in each forest management unit have not been prepared for any SEA or EIA. Therefore, all responsible authorities and forest management planners in Albania, must pay attention to include SEA during the forest management planning and also make a detailed analysis of the impacts on forest environment of all activities or measures that will carry out in respect of the forest management plan.

3.2. North Macedonia

Relevant laws for this analyze are: Law on water, Law on Nature protection, Law on Environment protection and their bylaws.

3.2.1. Law on Waters

(Official Gazette of the Republic of Macedonia no.87/08; as amended 6/2009; 161/2009; 83/2010; 51/2011 44/2012, 23/2013, 163/2013, 180/2014, 52/2016).

The core national legal instrument referring to issue of water management is the Law on Waters (hereinafter: LW). It incorporates the basic principles and procedures of water resources

management. In general the LW incorporates the flood management in the overall river basin district management principles: (i) the planning and management is based on the river basin district as geographical unit for flood management; (ii) the river basin management plan encompasses the flood risk management and ensures efficiency of the implementation of measures and the development of programme for protection against harmful effects of waters should be carried out in coordination with and is integrated into reviews of RBMPs; (iii) acknowledges the extreme floods as exceptional circumstances allowing deviation from the environmental objectives for a particular water body; and (iv) sets the competences for planning and implementation of the measures for protection against harmful effects of the waters within the same management body.

The LW is a framework law regulate the issues pertaining to surface and groundwater, the riparian lands and wetlands; management of waters, riparian lands and wetlands, including also the water resources distribution, water protection and conservation, as well as the protection against harmful impact of waters; water management structures and services; organizational arrangements and financing of water management; as well as the manner, the conditions and the procedures under which water can be used or discharged.

Forest water relations are seen in 2 ways:

- Forest role as supporter to providing clean water
- Forest role in protection from adverse impact of water

This Law is supported by numerous by-laws that regulated this matter.

Forest – water relation is indirectly included with the following by-laws:

RIVER BASINS

1. Decision on determining the boundaries of river basin districts. Official Gazette of RM no. 107/12 of 27.08.2012
2. Rulebook on the content and manner of preparation of river basin management plans. Official Gazette of RM no. 148/09 of 14.12.2009
3. Rulebook on the methodology of river basin assessment. Official Gazette of RM no. 148/09 of 14.12.2009

PROGRAM OF MEASURES

1. Rulebook on the content and method of preparation of the program of measures. Official Gazette of RM no. 148/09 of 14.12.2009

WATER MANAGEMENT

1. Rulebook on the form and content of the request for non-adoption of a decision granting or rejecting the request for water management consent. Official Gazette of RM no. 129/11 of 23.09.2011
2. Rulebook on the methodology for the content, method and procedure, revision of the water management basis of the Republic of Macedonia. Official Gazette of RM no. 148/09 of 14.12.2009

Other by-laws are not too much relevant for the forest-water relations.

WATER CLASSIFICATION AND CATEGORIZATION

1. Regulation on classification of waters. Official Gazette of RM no. 18/99 of September 31, 1999
2. Decree on the categorization of watercourses, lakes, reservoirs and groundwater. Official Gazette of RM no. 18/99 of September 31, 1999

WATER MONITORING

1. Rulebook on the Content and Manner of Preparation of Cartographic Information for Water Monitoring Activities. Official Gazette of RM no. 148/09 of 14.12.2009

ADVISORY BODIES

1. Decision establishing a national water council. Official Gazette of RM no. 149/09 of 15.12.2009

BASIC PLANNING DOCUMENTS

1. National Water Strategy (2012 - 2042). Official Gazette of RM no. 122/12 of 01/01/2012
2. Decision on Draft Amendment to the Water Management Basis of the Republic of Macedonia for Expert Discussion. Official Gazette of RM no. 70/12 of 07.06.2012
3. Rulebook on the form and content of the request for non-adoption of a decision granting or rejecting the request for water management consent. Official Gazette of RM no. 129/11 of 23.09.2011
4. Rulebook on the methodology for the content, method and procedure, revision of the water management basis of the Republic of Macedonia. Official Gazette of RM no. 148/09 of 14.12.2009

URBAN WASTE WATER

1. Rulebook on Criteria for Determination of Areas Sensitive to Urban Wastewater Discharge (*). Official Gazette of RM no. 130/11 of 26.09.2011
2. Rulebook on the conditions, manner and emission limit values for waste water discharge after treatment, the method of their calculation, taking into account the special requirements for protection of protected areas (*).

Official Gazette of the Republic of Macedonia no. 81/11 of 15.06.2011

3. Rulebook on the closer conditions, the manner and the maximum allowed values and concentrations of the treated wastewater parameters for their reuse. Official Gazette of RM no. 73/11 of 31.05.2011
4. Rulebook on the Detailed Conditions for Collection, Drainage and Purification, Manner and Conditions for Design, Construction and Exploitation of Urban Wastewater Treatment Systems and Stations, as well as Technical Standards, Parameters, Emission Standards and Pre-treatment Quality Standards, wastewater treatment and treatment, taking into account the burden and method of purification of urban wastewater discharged into areas sensitive to urban wastewater discharge. Official Gazette of RM no. 73/11 of 31.05.2011
5. Rulebook on the manner and procedure of sludge utilization, the maximum values of heavy metal concentrations in the sludge soil, the values of the heavy metal concentrations in the sludge, according to its purpose and the maximum annual amounts of heavy metals that may get into the soil. Official Gazette of RM no. 73/11 of 31.05.2011

WASTE WATER DISPOSAL

1. Rulebook on hazardous and harmful substances and substances and their emission standards that may be released into a sewer or drainage system, surface or groundwater bodies, as well as coastal lands and aquatic habitats (*)Official Gazette of RM no. 108/11 of 12.08.2011
2. Rulebook on the conditions, manner and emission limit values for waste water discharge after treatment, the method of their calculation, taking into account the special requirements for the protection of protected areas (*)

Official Gazette of the Republic of Macedonia no. 81/11 of 15.06.2011

SUBMISSION OF INFORMATION

1. Rulebook on the Manner of Transfer of Discharged Wastewater Monitoring Information, as well as the Form and Content of the Data Submission Form. Official Gazette of RM no. 108/11 of 12.08.2011

WASTE WATER LEVEL MONITORING

1. Rulebook on methodology, reference measurement methods, method of wastewater monitoring parameters, including sludge from urban wastewater treatment (*)

Within the same law there are articles for "**Water protection zones**". This zones cover forest areas but however ecological role of forests in these zones through sustainable forest management practices is not recognized and in some Elaborates for water protective zones even forest activities in these zones are forbidden (e.g. Zletovica system).

The most relevant part of the law related to protection from adverse impact of water that is in a compliance to **Flood Directive (FD**) is the **Chapter V: *Protection against harmful effects of waters***, that contains provisions on activities and measures for protection and defense against floods, defense against erosion and torrents, defense against freezing of surface water bodies, as well as elimination of the consequences from such harmful effects of waters, and competences thereof. The LW establishes references to other relevant ***lex specialis (e.r. Law on protection and rescue)*** stipulating that relevant provisions of other laws determining the conditions, manner and procedures for protection against the harmful effects of waters shall be also applicable.

For the purpose of protecting against harmful effects of waters, LW requires preparation of a program for protection against harmful effects of water within the respective river basin, as an integral part of the river basin management plans. Although the LW gives a legal basis for adoption of a subsidiary act on the content, the manner and procedure for adoption (note: This subsidiary act is not prepared or any provisions in force by present time), the law instructs that this programme shall contain preventive measures, the construction of the protective facilities and installations and carrying out works for protection against harmful effects of waters (construction of embankments, accumulations, river regulations, torrential water regulation, protection against land erosion). Combined with the other provisions of this chapter, it is clear that these preventive measures are both, structural and non-structural, aiming to reduce the likelihood of floods and/or the impact of floods in a specific location(he basic measures for protection against floods are also: 1) a list and a map of flood plains, wetlands, riparian lands of lakes and accumulations, as well as other aquatic ecosystems; 2) a map of flood-prone areas where areas prone to floods are marked, the diffusion of flood waves and the highest levels of lakes and accumulations; 3) a flood forecasting and warning (alerting) system; 4) measures for protection and development of areas stated in the list and marked on the map; 5) technical assistance and advices for all issues connected to the implementation of the preventive and refurbishing measures for mitigation of the consequences in case of floods, and 6) measures for states of emergency and their organization)

According to the LW, the implementation of the Program shall be performed on basis of *operational plans for protection and defense against floods* for the endangered areas.

The LW also sets some general obligations restrictions and prohibitions referring to the release of water in defended area (article 128), obligation for maintenance of water management facilities (art. 129 and 161), monitoring and reporting requirements (art.130, 160), development and maintenance of surface waters, and securing the flow of watercourses (art. 131, 133).

The LW stipulates instruments for implementation of the plans/programmes. **Water management consent:** construction of new or reconstruction or extension of existing water management protection facilities intended for development of water regime, that is: retention and inundated ponds, developed river beds, defensive embankments, developed torrential water and erosion areas, orbital canals, abstraction stations and similar. **Water use permit:** water use and construction of new or reconstruction or extension of dams with their accumulation areas.

LW Article 66 paragraph 4, stipulates that the river basin management plan shall among other contain program for protection against harmful effects of waters referred to in Article 124 of this Law, as well as the basic measures for protection against floods. Art 69 ensures the construction of planned facilities and implementation of planned measures of public interest for protection against floods- the RBMP.

Articles 134 – 141 are aimed for Protection from erosion and torrents

This part of the LW is the most relevant for forest –water relations in the field of protection of adverse impact of water in smaller basin, taking in consideration that land management in the basins up to 100 km^2, land management activities have observable and proofed impact on: base flow, peak flow, sediment regime (FAO 2000).

Article 136 - Measures for protection of erosive area

1) *afforestation, grassing and terracing (with contour trenches, walling and alike);*
2) *ban on extraction of land, sand, pebble and stone;*
3) *ban on pruning, cutting down trees and shrubs, and deforestation, and*
4) *ban on livestock grazing.*

Article 137 - Protection against erosion

(1) *The cutting in hilly and mountain regions must be made in the manner that ensures protection against erosion.*
(2) *The forests in the basins of accumulations and hydro amelioration systems that are grown as protection against erosion, as well as the protection vegetation in the waterside areas of watercourses, shall be managed in accordance with law.*
(3) *The cutting of woods and the riparian vegetation referred to in paragraph (2) of this Article shall be made upon prior opinion of the water management entity within its scope of activities*

According to article 141 (Torrent Control) - *Simultaneously with training of torrent bed are carry out erosion control measures on the catchment*

No one of above is included in forest management planning and practice.

Table 2 - Comparison of the Status of protective forest in the Republic of North Macedonia, with neighboring countries and selected countries in the world

	Serbia		Bulgaria		Albania	Belize	Bhutan	Burundi	Macedonia
Designation function	1000 ha		1000 ha		1000 ha	1000 ha	1000 ha	1000 ha	1000 ha
Forests	2720	100,0	3738	100	772	1366	2575	476	998
Production	1787	65,7	2387	63,9	611	N/A	N/A	N/A	N/A
Protection of soil and water	598	21,9	439	11,7	131	N/A	2575	276	N/A
Conservation of biodiversity	163	6,0	572	15,3	40	N/A	N/A	N/A	N/A
Social services	164	6,0	220	5,9	N/A	N/A	N/A	N/A	N/A
Multiple use forest	8	0,3	120	3,2	N/A	N/A	N/A	N/A	3N/A
Other woodland	508		23		262	200		N/A	143
protection of soil and water					24				N/A
Protection of soil and water	598	100	427	100	796	N/A	2575	276	0-zero N/A
production of clean water	39	6,5	227	53,1	N/A	N/A	N/A	N/A	N/A
coastal stabilization	0	0	0	0	N/A	N/A	N/A	N/A	N/A
desertification control	33	5,5	0	0	N/A	N/A	N/A	N/A	N/A
avalanche control	0	0	0	0	N/A	N/A	N/A	N/A	N/A
erosion, flood protection reducing flood risk	466	77,9	200	46,8	N/A	N/A	N/A	N/A	N/A
of which other soil and water	60	10,0	0	0	N/A	N/A	N/A	N/A	N/A

Data source: FAO – Global Forest Resources Assessment, 2015 http://www.fao.org/3/a-i4808e.pdf

In the past, parts of the basin especially direct slopes to the reservoir and the most erosive areas that were afforested by Water Management Enterprises (WME) were proclaimed as protective forest and were managed by WME according to the rules for sustainable management. After shift of these forests (cca 18 000 ha) from WME to PE National Forests, these forests lost their status as protective.

Within the Law on Forest, article 20 and 21 are aimed for ecosystem services of forest.

Article 20 - Determining the ecosystem services of forests

Ecosystem services of forest are specified within the freest management plans.

Up to now, except general declarative mentioning, no one forest management plan contain in detail analyze.

Article 21 - Priorities for ecosystem functions

1) *With forests above which the priority for any ecosystem service is declared should be managed in accordance with this Law and other regulations.*
2) *The plans referred to in Article 28 of this Law, which set out the priorities for the ecosystem functions contain the measures that must be taken for the management of those forests.*
3) *In the plans and programs that cover the forests for which is identified any priority ecosystem service should be make appropriate modifications and additions in accordance with Article 34 of this Law and shall be subject to the proposer.*
4) *The means for implementing the measures referred to in paragraphs 2 and 3 of this Article and compensation, if such measures restrict the right to use forests and increasing management costs, provided by the person whose request sets out the ecosystem service.*
5) *The forest for which the ecosystem services is stablished is managed by the user, or the owner who managed that forest up to prioritizing functions.*

6) *If the beneficiaries of paragraph 4 of this Article are not provided, that is, the owner of the forest is not obliged to implement the measures specified with Article 34 of this Law.*

3.2.2. Law on environment protection (LEP)

Official Gazzete of Republic of Macedonia nr. 53/05, as amended: 81/05, 24/07, 159/08, 83/09, 48/10, 124/10, 51/11, 123/12, 93/13, 187/13, 42/14, 44/15, 129/15, 192/15, 39/16),

This Law (LEP) is supported by numerous by-laws in these fields: Strategic environmental impact assessment; Environmental impact assessment; Environmental Impact Assessment Expert; Strategic Environmental Assessment Expert;Promotion restriction orders; Restriction orders; Permits. Environmental fees; Inspection supervision; Ecological marking; Awards and acknowledgments; Access to information; |Integrated prevention and pollution control; Industrial accidents and risk management; Offences.

Forestry is not mentioned directly in more of them except in those related to EIA/SEA.

Decree for strategies, plans and programmes, including amendments to such strategies, plans and programs, for which, procedure for assessment of their impact on the environment and the life and health is obligatory - Official Gazzete of the Republic of Macedonia nr. 153/07.

List of strategies, plans and programmes relevant for forestry include:

- *Forest management plans,*
- *Plans/ programmes for forest protection,*
- *Plans/programmes for Afforestation of bare land and erosive land*
- *Plans/programmes for: Silviculture, amelioration of degraded forest and shrubs, remediation of burned areas,*
- *Plans /programme for prevention from mass die-back of forest and forest plantations*

*Decree for determination of projects and criteria based on which the need for the implementation of the procedure for assessment of impact on environment is considered - Official Gazzete of the Republic of Macedonia nr.*74/05

List of Projects include:

- *Project for Afforestation;*
- *Projects for Conversion of forests*

Up to now, no any SEA or EIA is prepared for other plans and programmes related to forestry written in the by-law.

Otherwise, water management entity as stakeholder would reacted if FM planners do not pay attention on above taking in consideration that within the most sensitive areas of lake basins, river basins they are not consulted.

3.2.3. Law on Nature protection

Official Gazzete of the Republic of Macedonia nr. 67/04 as amended 14/06, 84/07, 47/11, 148/11, 163/13, 63/16.

This Law regulate the nature protection by protecting the biological and landscape diversity, and the protection of the natural heritage, in protected areas and outside of protected areas. In addition to the provisions of this Law, the use of natural resources for economic purposes shall also be regulated by the provisions of sectoral laws.

The provisions of the Law on Environment shall also apply to nature protection, unless otherwise prescribed by this law. Provisions of other laws referring to nature protection shall also apply to nature protection. The procedures stipulated in this Law shall be regulated by the provisions of the Law on General Administrative Procedure, unless otherwise regulated by this Law.

Biological diversity protection shall be carried out through establishment and implementation of a system of measures and activities for protection of wild species, including their genetic material, habitats and ecosystems, for the purpose of providing for a sustainable use of the components of biological diversity and maintenance of natural balance. Landscape diversity protection shall be carried out through establishment and implementation of a system of measures and activities for conservation and maintenance of characteristic values of the landscape that derive from its natural configuration and/or the type of human activity. Natural heritage protection shall be carried out through establishment of a system that shall specify the measures, procedures and methods for acquiring the status of natural heritage and for implementation of its protection.

The objectives of this Law are:

1. Determination and monitoring of the state of nature;
2. Conservation and restoration of the existing biological and landscape diversity in a state of natural balance;
3. Establishment of a network of protected areas for the purpose of sustainable protection of the features on the basis of which they have acquired the status of natural heritage;
4. Providing for sustainable use of natural wealth in the interest of the present and future development, without significant damage of parts of the nature and with the least possible disturbance of natural balance;
5. Prevention of harmful activities of individuals and legal entities and disturbance in nature as a result of technological development and performance of activities, i.e. providing for the best possible conditions for protection and development of the nature;
6. Providing for the citizen to exercise their right to healthy environment.

This law is supported by numerous bylaws classified in the following groups: - Advisory bodies; Protected areas; Restricted orders; Permits; Strictly protected species and protected species; Inspection supervision etc.

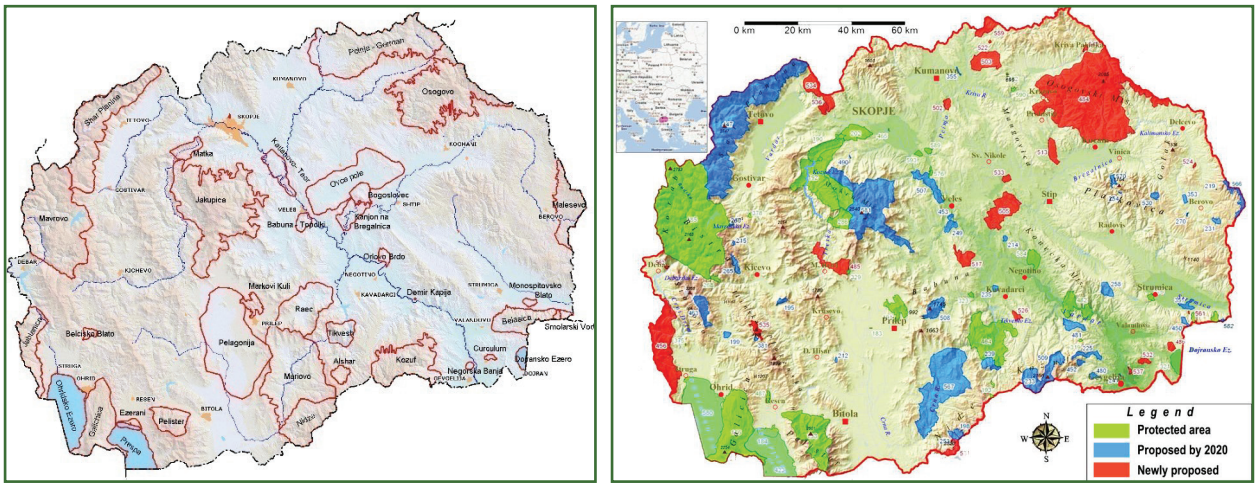

Figure 10 - Emerald network and map of protected and proposed for protection areas
https://www.cbd.int/doc/world/mk/mk-nbsap-v2-en.pdf

Forestry is tackled in articles related to: introduction/reintroduction of species; collection of non-wood forest products; usage of protected species; maintenance and protection of significant habitats; protection of significant landscapes.

Latest protected areas proclaimed with appropriate laws or decrees and Proposals for widening of the territory of existed protected areas generated conflicts between 2 sectors: forestry and nature protection because permanently forest sector loose territory.

On the other hand biodiversity and nature protection principles are not mentioned nor within the Rulebook for preparation forest management plans, nor in any plan prepared for economic forest management units and it is contradictory to sustainable forest management principles.

It is not relevant for forest-water relations perhaps except for protection of significant habitats.

4

Gap Analysis on Forestry legislation and institutions

4.1. Albania

4.1.1. Forestry institutions

The Government of the Republic of Albania is responsible for the administration and management of public forest resources. The responsible institutions for administration and management of forest resources are:

- **Ministry of Tourism and Environment (MoTE)**

The responsible directorate within the MoTE is Directorate of Programs for Environment Development through the sector of Forests and Pastures. This structure is responsible for the preparation of main strategic documents for the development of forest sector such as: policy documents, strategy for forest sector development, national program for forestry sector, laws and bylaws etc. This unit offers extension service and support for forest staff working at the municipality level.

State Inspectorate of Environment, Forests, Tourism, and Waters is another structure within the Ministry of Tourism and Environment (MoTE). This entity controls the rule of law in the field of forestry and the environment. It also controls and supervises the law and bylaws implementation in the field of forestry and hunting.

- **Local government units (Municipalities-MUNs)**

Local government units perform based on the Law No 139/2015 "For local self-governance" according to the principle of local autonomy (article 4). More than 60 % of the public forests are transferred to Municipalities (MUNs) and their activity is ruled by article 27 of this law. In the article 27, point 5 is mentioned that MUNs are obliged to administrate and manage the public forest and pastures within their territory in full respect of the forest legislation.

- **National Environment Agency (NEA)**

Another government organization in the forestry sector is the National Environment Agency (NEA) through the Forestry Directorate. NEA is responsible for monitoring, protection, and improvement of environment. It is also responsible for the implementation of the National Forest Inventory and monitoring of forest cover and its temporal change.

- **National Agency for Protected Areas (NAPA)**

National Agency for Protected Areas (NAPA) is responsible for the management of the protected area and other natural networks as Natura2000 under management plans. NAPA monitors and inventory the flora and fauna in these areas, as well as promote tourism, recreational, cultural, gastronomic, esthetic, health and spiritual values of protected areas. Management and administration of protected areas are the main pillars of the NAPA work.

- **Forestry Education Institutions**

Faculty of Forestry Sciences (FFS)

FFS is the only institution of high education which according to the Law of Higher Education is responsible for scientific research in the forestry field. The mission of this entity is education, scientific research, and expertise in forestry. Faculty of Forestry Sciences is established since 1959 and is the only higher education institution in Albania. More than 1800 students are graduated in this institution and all students have worked for decades as forest engineers or silviculture specialists in the public or private forest sector. Faculty of Forestry Sciences offers training courses and summer schools not only for Albanian students but also for international students and is actively involved in various national or international projects.

Technical School for Forestry

The technical school for forestry is situated in Shkodra town. It is another education institution which offers various programs for preparation and education of forest technicians in silviculture, reforestation, forest logging, etc.

4.1.2. Detailed analyses of Albanian forest legislation

Based on the detailed analysis we highlighted several gaps and deficiencies regarding forest legislation:

- There is no definition of high-nature-value forests (accounted for 8.2% of total forest area) and the country lacks a specific legal framework for the protection of these forests.
- Existing legislation has not any definition about forest certification and the MoTE has not developed any program for the Endorsement of Forest Certification or to develop any national forest certification system.
- Law 9385 dated 04.05.2005 “For forests and Forest service” has not any specific article dedicated to forest-water relations.
- In the guidelines for forest management planning and in the forest legislation there is no obligation to undertake the environmental impact assessment of all activities in the forest management unit area.
- Criteria 3 “Maintenance of Forest Ecosystem Health and Vitality” is partly implemented. There is not any fact about deposition and concentration of air pollution and soil conditions in the planning and management process.
- Criteria 5 “Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)” is partially implemented in the management process.
- Criteria 6 “Maintenance of other Socio-economic Functions and Conditions” is partially implemented in the planning and management process (there are scarce data and unreliable on the contribution of forests to GDP).

4.1.3. Sustainable forest management

Criteria and indicators are the basic tools for defining sustainable forest management and providing relevant information for various aspects such as: forest policy development, national forest policies, plans and programs, forest resource state, etc and using them as a basis for data collection and communication to the sector and for reporting. The National Environment Agency used these criteria and indicators for the first time in the Annual Report for Environment State in Albania in 2014. The tables below, depict an analysis regarding the level of fulfillment for each criterion and indicator for sustainable forest management from responsible institutions in Albania.

Criterion	Indicators	Level of fulfilment
Forest policy and governance	National Forest Programmes or equivalent	National Forest Program prepared in 2018
	Institutional frameworks	Partly fulfilled. - National Agency for Forest Resources established with DCM No 570, dated 17.07.2019. - Ministry of Tourism and Environment, Directorate for Development of Environment Programs, Sector for Forests and Pastures - Ministry of Tourism and Environment, Agency for Protected Areas. - Ministry of Tourism and Environment, National Agency of Environment through Directorate of Forests with two sectors: Sector of Silviculture and Sector of National Forest Inventory. - State Inspectorate of Environment, Forests, Waters, and Tourism.
	Legal/regulatory framework: National (and/or sub-national) and international commitments	New forest law under preparation. The existing forest law doesn't meet international commitments.
	Financial and economic instruments	The main sources of financing are: State budget, donors, non-profit organisation, World Bank, SIDA, GEF, GIZ etc. There is no mechanism operable and based on PES scheme.
	Information and communication	There are various sources to provide information: INSTAT, MoTE, NAE, FAOSTAT through online publications, annual reports etc.

No #	Criterion	Sub-criterion	Indicators	Level of fulfilment
C1	Maintenance and Appropriate enhancement of forest resources and their contribution to global carbon cycle	Policies, institutions and instruments to maintain and appropriately enhance forest resources and their contribution to global carbon cycles	forest area	ANFI 2018 will provide the latest figures. Other sources to provide this information are INSTAT (1.051 million ha), Forest Cadaster Office at MoTE (Forests-1.051.000 ha; Pastures - 478.000 ha; Other forest lands-210.000 ha), FAO FRA 2015 (771.000 ha) and ANFI 2004 (forests -941.700 ha; other forest land-557.300 ha)
			growing stock	Preliminary results by ANFI 2018 indicated the total growing stock is 61 million cubic meters. Another source is the Forest Cadaster Office at MoTE, ANFI 2004 (growing stock 73.55 Million cubic meters); INSTAT (growing stock 54.878 Million cubic meters); FRA 2015 (76 Million cubic meters).
			age structure and/or diameter distribution	ANFI 2018 will provide the latest figures. These information have been provided in the previous National Forest Inventory in 2004
			forest carbon	ANFI 2018 will provide the latest figures. This information has been provided in the previous National Forest Inventory in 2004. Total biomass from forests was estimated at 53 Million tonnes equivalent to 33 tonnes/ha. The total contribution of forests in carbon stoking from forest biomass was estimated at 28 Million tonnes of carbon.
C2	Maintenance of Forest Ecosystem Health and Vitality	Policies, institutions and instruments to maintain forest ecosystems health and vitality	Deposition and concentration of air pollution	No specific study, Only some reports by NEA with limited monitoring sites.
			soil condition	Few data which do not cover the whole forest area
			Defoliation	There are annual studies from NEA, but they cover only a small area
			forest damage	NEA staff prepare annual reports based on the observations in a few forest areas.
			forest land degradation	ANFI 2018 will provide the latest figures but no specific study on that

No #	Criterion	Sub-criterion	Indicators	Level of fulfilment
C 3	Maintenance and Encouragement of Productive Functions of Forests (Wood and Non-Wood)	Policies, institutions and instruments to maintain and encourage the productive functions of forests	Increment and felling	ANFI 2018 will provide the latest figures. There are data from the last national forest inventory. The statistics from felling exist but they are not reliable. Various studies have indicated that the ratio between increment and felling is on average 1: 1.8. Annual Increment (AI) - 1.15 Million m^3 and the allowable annual cut(AAC) - 920.000 m^3.
			Roundwood	ANFI 2018 will provide the latest figures. There are data from the last national forest inventory and forest cadaster but are not reliable. Other sources are INSTAT, NEA, FAOSTAT.
			Non-wood goods	There are approximative data on non-wood goods. There is a study done in the framework of the ANFI 2004, but these data are mainly for medicinal plants. Other sources are INSTAT, NEA, FAOSTAT. Incomes from non-wood products accounted for 21% (124.79 Million ALL) of all incomes generated from forests (ANFI 2004)
			Services	There are data for carbon sequestration but not for other forest services. Studies on the role of forests on soil erosion exist for several river basins like: Vjosa river (NEA) and Mati river as well as for Bovilla watershed (MoTE)

No #	Criterion	Sub-criterion	Indicators	Level of fulfilment
C 4	Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems	Policies, institutions and instruments to maintain, conserve and appropriately enhance the biological diversity in forest ecosystems	Diversity of tree species	There are data about tree species diversity. FRA 2015 states 40 thousand ha for biodiversity conservation.
			Regeneration	ANFI 2018 will provide the latest figures
			Naturalness	ANFI provides information on this indicator as well as studies for biodiversity
			Introduced tree species	There are statistics about introduced tree species but this information is scarce. They cover 0.7% of the forest area (NEA, 2014).
			Deadwood	ANFI 2018 will provide the latest figures
			Genetic resources	There are little data about genetic resources in forestry, but more data exist for agriculture crops and medicinal plants.
			Forest fragmentation	This information is very rare
			Threatened forest species	Yes, there is information and studies about threatened forest species. The red list of flora and fauna is updated regularly.
			Protected forests	There are several studies and a lot of information for protected areas and for high conservation value forests. The total protected forest area is 523.8 thousand ha (INSTAT, 2018).
			Common bird forest species	Yes, there are several publications (monographs; academic books).
C 5	Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)	Policies, institutions and instruments to maintain and appropriately enhance of the protective functions in forest management	Protective forests – soil, water and other ecosystem functions - infrastructure and managed natural resources	This information is very scarce. FRA 2015 reports an area of 131 thousand ha.

No #	Criterion	Sub-criterion	Indicators	Level of fulfilment
C 6	Maintenance of other Socio-economic Functions and Conditions	Policies, institutions and instruments to maintain other socioeconomic functions and conditions	Forest holdings	0.52 ha per capita (ANFI 2004)
			Contribution of forest sector to GDP	One study is done in the framework of ANFI 2004, but the figures about the contribution to GDP are not reliable because they take into consideration only the wood and non-wood goods. The gross value added from the forestry sector is estimated at 59 USD per 1000 USD.
			Net revenue	No specific study. The latest figures by REC study in 2015 entitled "Forests and transition. Evaluation of the forest in Albania for the period 1990-2014". According to FRA (2015), the net revenue is 1.05 Million USD.
			Investments in forests and forestry	The latest data are from the study financed by REC entitled "Forests and transition. Evaluation of the forest in Albania for the period 1990-2014". Until the 1900's the annual budget for forest management was 30 Million USD. The budget decreased by up to 2.6 Million USD in 1994. The total amount invested in forests from foreign projects is 4.1 Million USD and the state budget was 1.078 Million USD in 2003[1]. The latest figures about the investment are missing and MoTE and the Ministry of Finance are the only sources. Public expenditures estimated to 9.587 Million USD (FRA, 2015).
			Forest sector workforce	The forest sector workforce has been decreased from 1000 in 2006 to 912 in 2014 (REC 2015) The workforce has changed annually reaching a peak in 2010 (1360 employees).
			Occupational safety and health	There are publications on this issue based on ILO standards and one study from the CNVP foundation in some regions in Albania.
			Wood consumption	There is no accurate data on wood consumption. Some data are provided from INSTAT through MoTE, custom for wood export or studies carried out by FAO or World Bank.
			Trade in wood	Data can be provided from Custom Directorate, FAOSTAT, and INSTAT Albania.
			Wood energy	Total wood fuel consumption is estimated at 2.658 million cubic meters per year and the energy from this amount is 651388 (ktoe) or 7575 TWh (FAO 2017).
			Recreation in forests	Yes, there are statistics provide from the National Agency for Protected Areas (NAPA) about the number of visitors and incomes generated by recreation.

[1] REC (2015) "Forests and transition.Evaluation of the forest in Albania for the period 1990-2014".

Criteria 5 - Maintenance, conservation and appropriate enhancement of protective functions in forest management (notably soil and water)

	Level of implementation in Forest Law	Level of implementation in Rulebook	Is it practice of planners	Notice (reason)
Forest management planning process				
Forest management planning should aim to maintain and strengthen the protective functions of forests for society, such as infrastructure protection, soil erosion protection, protection of water resources and protection against other adverse effects of water, such as floods, landslides, avalanches.	high	high	yes	
Areas that fulfill the protective functions of the society should be registered and marked and set out in the forest management plans	high	high	yes	
	Level of implementation in Forest Law	Level of implementation in Rulebook	Is it Practice of engineers	Notice (reason)
Forest management practices				
Special attention should be paid to the forest practices of sensitive soils and erosive areas, as well as areas where forest operations can lead to excessive soil erosion and generate sediment in watercourses. Inadequate techniques such as the use of unsuitable machines should be avoided in such areas. Special measures should be taken to reduce the pressure of the animal population	Low-medium	Low-medium	no	
Special attention should be paid to forest practices for forest areas that are well-known for water protection, avoiding adverse effects on the quality and quantity of water resources. Improper use of chemicals or other harmful substances or inadequate forest practices that affect the quality of water in a harmful way should be avoided.	Low-medium	Low-medium	no	
The construction of roads, bridges and other infrastructure should be done in a manner that minimizes exposure to bare soil, avoiding deposits in watercourses and preserving the natural levels and function of watercourses and river beds. Proper drainage forest roads need to be built and maintained.	Low	medium	Not all the time	

4.1.4. Gap Analysis on Forestry legislation in Albania

4.1.4.1. Gaps between WFD and Albanian legislation on water management

WFD has been an important milestone to approach integrated water management at the river basin level in Albania. Since 2011, Albania started the process of adjusting the legal framework dealing with water management and did efforts to approximate its legislation with EU environmental policies and directives. The target is the adoption of the law No 111/2012 on Integrated water management and its by-laws such as regulation on drinking water quality (DCM No 379, date 25.05.2016), the list of priority substances in aquatic environments (DCM No 267, date 07.05.2014) and the environmental quality norms for surface waters (DCM No 246, dated 30.04.2014). However, secondary legislation which will make possible implementation of the law 111.2012 and WFD is still lacking. Transposition of WFD is still in an early stage. Thus, by the comparison of the Albanian legislation with WFD we noted several gaps which consist: (i) partial transposition of WFD into national water legislation; (ii) lack of technical requirements.

Unlike the WFD, the law No 6/2018 and Law 111/2012 has failed to set up the drinking water bodies as protected areas. The GoA has not defined yet the technical requirements provisioned in Annex V of the WFD related to: (i) determination of the environmental objectives for surface, ground, and water-related protected areas; (ii) technical requirements to carry out the analysis of river basin characteristics, impacts of the human activity; (iii) monitoring criteria for the surface, ground, and water- related protected areas and (iv) measures proposed in the Plan of Measures.

Available monitoring data and assessment criteria do not allow a comprehensive appraisal of the environmental status of water bodies. In Albania, most of the rivers are polluted due to discharges of untreated or treated wastewater and in this case, the WFD criteria for “good “status of water bodies are not meet.

The current monitoring data on the quality and quantity of water resources are insufficient. This is required not only for river basin management plans but also to trace the impact of measures on these water indicators.

Determination of such technical requirements is crucial for the preparation of the River basin Management Plans and developing of these technical requirements will fill the gap in existing river management. In order to meet all the standards provisioned in the WFD, the GoA must complete the water management legislation paying special attention to annexes II, III, IV and VII of the WFD.

WFD key articles	Requirements of WFD	Level of compliance	Albanian legislation and institutions meeting WFD requirements
Coordination at river basin level (art 3)	Identification of river basins	complied	Law No 111/2012 Law No 6/2018 DCM 342/2016
	Setting up institutions at river basin and national level	complied	Water Resource Management Agency River basin administration Office (Law No 6/2018, art 26)
Environmental objectives for waters (art 4 & annex IV)	Environmental requirements for surface, ground waters (available monitoring data & assessment criteria do not allow a comprehensive assessment of the environmental state of water bodies)	Not complied	Water Resource Management Agency River basin administration Offices (Law No 6/2018, art 27)
Characteristics of the river basins and human activity (art 5)	technical requirements to carry out the analysis of river basin characteristics; impacts of the human activity; economic analysis of water use with WFD compliant classification schemes	Partly complied Not complied	River basin administration Office (Law No 6/2018, art 26)
Identification of water protected areas (art 6)	To create a register with water protected areas in respect of Art 7 and Annex IV	Not complied	Water Resource Management Agency (Law No 6/2018, art 24/3) Ministry of Tourism and Environment
Identification, monitoring of drinking water bodies (art 7)	Identification of drinking water bodies	Complied	Water Resource Management Agency (Law No 6/2018, art 34/1)
	Monitoring of drinking water bodies	Complied	River basin administration Offices in collaboration with Ministry of Tourism and Environment (Law No 6/2018, art 54)
	Creating safeguard zones around drinking water bodies	Partly complied	Water Resource Management Agency, Municipalities and other institutions (Law No 6/2018, art 40/1) & DCM 379/2016

WFD key articles	Requirements of WFD	Level of compliance	Albanian legislation and institutions meeting WFD requirements
Monitoring of surface, ground and water protected areas (art 8 & annex V)	Develop and implement a monitoring program for water quality. The quality of drinker water abstracted from private or local wells is not monitored.	Partly complied (monitoring criteria are not defined)	Water Resource Management Agency (Law No 6/2018, art 52/2) Ministry of Tourism and Environment (Law No 6/2018, art 53)
Recovery costs for water services (art 9)	Implementation of the recovery costs for water services (67% of drinking water produced is non-revenue water)	complied	Law No 111/2012
Public information and consultation (art 14)	Stakeholder involvement in the river basin management plan preparation	complied	Water Resource Management Agency (Law No 111/2012,art 91)
Strategy against water pollution (art 16 & annex VIII)	Adopt measures against water pollution	Not complied	
	Create a list of water contaminated substances	complied	Ministry of Tourism and Environment (DCM 267/2014)
	Environmental standards for water quality	complied	Ministry of Tourism and Environment (DCM 246/2014)
Penalties (art 23)	Determine effective, proportionate penalties to protect surface and ground waters	complied	Water Inspectorate (Law No 111/2012,art 96 & DCM 659/2017)[2]
WFD compliant classification schemes (Annex II)	Delineation and characterization of water bodies in accordance with WFD	Not complied Water bodies are not delineated and characterized in accordance with WFD	

4.1.4.2. Gaps between CBD and Albanian legislation on biodiversity

The main gaps identified related to biodiversity protection are:

- Lack of capacities to manage properly new protected areas without external financial and technical support
- Weak capacities to elaborate on feasible strategies, action plans, and programs.

[2] DCM 659,dated 10.11.2017 "On establishment and organization of the Environment and Forest Inspectoriate"

- Lack of integrated databases concerning biodiversity. Management and integration of information provided by various institutions engaged in biodiversity monitoring are weak. Monitoring of flora and fauna using only 76 monitoring sites spread across the whole country is insufficient and the data provided do not allow a comprehensive assessment of biodiversity status and biodiversity monitoring indicators.
- Weak capacity to implement rehabilitation measures in degraded ecosystems and recovery of threatened species
- Weak capacity to carry out biodiversity monitoring
- There are little data on the monitoring of marine life and the monitoring data are incomplete and fragmented.
- in the country still, there is not a national ecological network and associated management plans
- Low level of awareness of decision-makers related to biodiversity importance, value, and conservation.

4.1.4.3. Gaps between CCD and Albanian legislation on land desertification/degradation

The main gaps identified to implement successfully the CCD were:

- Lack of financial sources of institutions at the central and local level to develop or carry out works or investments on land protection
- Low awareness and knowledge of decision-makers on land degradation consequences and legal framework
- Lack of budget and technical capacities to implement national programs and lack of qualified staff
- Low awareness of the community concerning environmental issues in general and land desertification in particular.
- The inadequate institutional framework at the central and local levels to foster technical and scientific cooperation.

4.1.4.4. Gaps between Climate Change and Albanian legislation

- Albania lacks data and studies on the impact of climate change on nature including; water resources, forest resources and other natural vegetation, biodiversity and ecosystem functions and services.
- There is a lack of policies on the adaptation of different economic sectors and infrastructure to climate change as well as to other natural and anthropogenic hazards. Albania is vulnerable to impacts of natural and human phenomenon hazards such as: floods, forest fires, landslides and erosion, heat and cold waves.
- Albania still has weak specific legislation to support and promote the reduction and stabilization of GHG emissions and carbon capture and storage. A draft law on climate change is prepared to respect the principles, definitions, and requirements of the UNFCCC and EU directives, and a draft national climate change strategy is under development.
- Albania does not implement systematic measures to improve education and raise awareness of the population on climate change, adaptation, impact reduction and early warning as advocated by target 13.3 of the 2030 Agenda for Sustainable Development.
- The working group which prepared the National Adaptation Plan by the revision of the existing institutional framework identified many gaps such as: (i) insufficient coordination

structures between sectors and (ii) absence of consolidated government structures dealing with climate change

4.1.4.5. Gaps between Flood Directive and Albanian legislation

From the revision of the legal framework policies and reports in Albania, related to Flood Management and Risk assessment we noticed several gaps. All these gaps must be filled in order to ensure e better implementation of the Floods Directive and to realize a more environmentally focused floods risk management.

- weak coordination between entities/authorities working at local and national level
- weak coherence in policy documents between various sectors
- partly synchronization between Flood Risk Management Plans prepared by institutions at national versus local level
- regional or local government units have not sufficient technical capacity to develop flood risk management measures and maps.
- there is a need to strength and share the responsibility between institutions responsible for flood management
- limited funds for flood risk management measures become increasingly difficult as budget dedicated is reduced. The Floods Directive neither provides a budget for funding nor recommends how to arrange funds for the implementation of measures.
- in all reports and studies, there are scarce data on the environmental impacts of floods
- there is a lack of high-resolution data to estimate the potential flood losses or mapping the flood risk
- there is a lack of data to underpin the economic justification of measures regarding floods management
- there is not a standard methodology to quantify all the costs from floods and benefits from ecosystem services
- standardization towards a common methodology on flood risk management is missing
- there is a gap between scientific evidence available and the information needed by decision-makers.

4.2. North Macedonia

4.2.1. Forestry institutions

The Government of the Republic of Macedonia administers all forests and forest lands through the following institutions:

- **Ministry of Agriculture, Forestry and Water Economy** (MAFWE) www.mzsv.gov.mk,

The State Inspectorate of Forestry and Hunting, as a body within the MAFWE, controls and supervises the enforcement of the Law on Forests, the Law on Hunting and all other laws and legally binding acts in the field of forestry and hunting. The Forestry Police, as a sector within the MAFWE, protects the forests in accordance with the Law on Forests.

Within the department of Forestry there are 4 units: for management and harvesting; for silviculture and afforestation; for protection of forests from biotic and abiotic factors; for game management.

` Forest - water relations are new subject of work of the Unit for silviculture and afforestation.

Ministry of Environment and Physical Planning (MOEPP) www.moepp.gov.mk.In the framework of efforts towards integration into the modern trends of environmental protection in Europe and beyond, and as an important aspect of the reform process, the Macedonian Government established the Ministry of Environment (Law on the Amendment to and Supplementing the Law on Public Administration Bodies, Official Gazette of RM No. 63/98). Article 122 of the above law defines the competences of the ministry, among which those closely related to forests and the forestry sector are:

- monitoring of the state of the environment;
- the conservation of biological diversity;
- the conservation of geological diversity, national parks and protected areas; and
- the supervision of inspection in fields within its scope.

Operating within the Ministry of Environment and Physical Planning is the State Inspectorate for the Protection of the Environment. Forest –water relations are included within the Department of water.

Public Enterprise National Forests (PENF) (www.mkdsumi.com.mk).The public enterprise for managing of state forests, as the legal successor to the former enterprises for forest management has the following core activities: silviculture, protection and utilization of forests through the restoration, nurture, protection, afforestation and utilization of forests and forest land, and other activities for the maintenance and improvement of forest functions. Within the PE NF there are 9 departments. Forest-water relations are directly subject of the Sector for Silviculture, Ecology and Hunting. On the other hand, sector for forest management planning is indirectly connected.

Public institutions for management of national parks “Mavrovo”, “Galichica” and “Pelister” as well as for management of multipurpose area “Jasen” are included in management of the whole area of the protected area including forests. Forest –water relations are included but with low priority.

Public Communal Enterprise that is managing suburban greenery especially in Skopje**,** are directly responsible for forest areas that protect the urban area from erosion and torrents.

Private forest owners association (www.naps.com.mk) was founded in 1997. It is a non-governmental and non-political organization with the main mission to “protect individual and common interests of private forest owners respecting the principles of sustainable forest management”. The society currently has a membership of around 6,000.

Educational level

Saints Cyril and Methodius University of Skopje, Faculty of Forestry (www.sf.ukim.edu.mk). The Faculty of Forestry in Skopje was established in 1947. Today, the faculty offers three undergraduate academic programmes and 2 postgraduate academic programmes. The main mission of the faculty is education and the establishment of a highly educated and scientific staff in the field of forestry, landscape design, eco-engineering and eco-management. Forest-water issues are in detail presented for the study group Eco-engineering and eco-management where there are several course directly about forest-water issues as follow: Basic of Soil and Water Conservation; Management of land, water and Natural hazards; Erosion Control; Torrent control. On the master degree beside advanced courses of up mined courses there is additionally course on Torrent hydrology and hydraulic. On other study programmes there is elective course Forest and urban hydrology.

10 years ago was launched a project "Conflict between foresters and environmentalists". One of implemented activities was a survey about the level of knowledge of people form one sectors about activity of other sector. For Forestry sector were interviewed only forestry engineers from the MAFWE or from PE NF, while form the environmental sector were interviewed non –foresters (biologists, chemistry, geographic, ecologists...) from the MOEPP and environmental NGOs. The results showed extreme absence of knowledge of participants in the survey. It was reason for inclusion of environmental courses within the study programme on the Faculty of forestry.

4.2.2 Detailed analyses of North Macedonia forest legislation

In this chapter will be analyzed Law on Forests and Rulebook for preparation Forest management plans. Other laws and bylaws don't affect directly on forest-water relations.

Law on Forests – Official Gazette of Republic of Macedonia nr. 64/09

In article 9 are mentioned forest function and especially protective role of forests (para 3, 4, 5) but later within the law there is nothing about delineation and management of protective forests.

In article 10 are listed 3 type of forests per use:

- Economic forests,
- Protective forest defined as forests primarily used to protect land, water, settlements, infrastructural systems and other objects.
- Forest of special purpose defined as: forest and hunting reserves, park-forest, memorial forests, forests for the production of forest seeds, for picnics and forests for use in science, teaching and defense.

Forest within protected areas (national parks and multipurpose areas) are mentioned and is noticed that their proclaiming is under Law on Nature protection.
This section lacks how to act if a protected area (IUCN III, IV and V) is designated as having a forest that is part of an economic forest management unit.

In article 11 are listed procedures for proclaiming specific types of forests but nothing for proclaiming protective forests. Amendment for this is in a procedure.

Article 13 – Sustainable forest management, are listed forbidden activities

Between other, forbidden are activities within protected areas if they are not in accordance with plans for those areas.

This is understood only for protected areas under the Law on Nature, especially National Parks and Multipurpose Areas.

But in reality there are other protected areas according to the Law on Nature and other laws, such as Law on Water (water protection zones around springs for drinking water and for them are prepared Spatial plans adopted in Parliament, for actual and potential erosive areas...), for protective zones according to the Law on traffic security, Law on railways, Law on cultural heritage etc. These forests are not mentioned within the Law on forests.

Article 21 – Defining priorities for environmental role of forests

It is clear defined that for these types of forest, management is according to Law on forests and other laws and should be prepared separate plan or programme. The most important is that if the right for use of these forests is restricting user rights or produce additional costs for forest activities, the coverage of this costs shale be by the subject that ask for special status of the forest. It is just like Payment for ecosystem services.

Articles 28 - 40

Planning and management of forests is accomplished through:

- Forest management plans (for forest management units having and area 100 – 10000 ha) for period of 10 years;
- Forest management program(for seed plantations, wind protection zones on an area greater than 2ha, forest plantations with an area greater than 2ha covered by a forest unit, as well as for private forests with a size of 10-100 hectares) for period of 10 years;
- Annual plan for forest management;

Article 50

Entities that perform silviculture and protection of forests for special purpose, as well as the owners of forests are obliged to take measures to protect forests from illegal logging, forest fires, natural disasters, plant diseases, harmful insects, illegal grazing and other damages.
Protective forest are not mentioned

Generally except in the definitions in the beginning of the Law, the management of protective forest is not considered.

Rulebook for preparation of Forest Management Plans

Full name is “Rulebook for a content of the special plans for management of economic forests and forest for special purpose, as well as their preparation, adoption and approval, and the content of the special plan for management of private forests >100ha as wells as their preparation, adoption and approval”.

Forest management plans for economic forests or forest management units for economic purpose are entitled as “Special plan for management (economy) of economic forests”, while those for forests within protected areas (national parks, multipurpose areas..) and forests for special purpose are entitled as “Special plan for Silviculture and Protection of forest for special purpose”.

Any forest management units compiled of economic forests also may have a forest with other purpose where sustainable forest activities are different than those in economic forests.

There is no anything within the rulebook how to delineate separate compartment of sub compartment in this case.

There is no any article within the Rulebook to be payed attention on a Plans on the same territory adopted according to other Law (e.g. Law on water, Law on Nature protection etc..).

There is no any article within the Rulebook about natural heritage, about cultural heritage, about socioeconomic factors that affect forest and forest management etc.

4.2.3. Sustainable forest management

Generally, requirements arising from the UN Conventions are included in National strategies and plans.
Requirements arising from EU Directives are transposed in national legislation.

On the other hand their implementation in practice is not satisfactory or somewhere do not exist at all, such as SEA/EIA procedure for forestry plans and projects etc.

Requirements from EU Forest strategy are included within the national forest strategy, but with very low level of implementation.

Articles from Forest –Water resolution are not obligatory, and almost no one article is implemented in practice.

There are criteria and indicators for Sustainable Forest Management (SFM). Evaluation of implementation of this criteria is presented in the following table. The most relevant is criteria C5 - Maintenance, conservation and appropriate enhancement of protective functions in forest management (notably soil and water).

Criterion	Indicators	Level of fulfilment
Forest policy and governance	National Forest Programmes or equivalent	Partially - National strategy for sustainable forestry prepared in 2014
	Institutional frameworks	Partly fulfilled. Department of forestryand hunting and Department offorest police are organisational units within the Ministry for agriculture forestry and water economy (MAFWE). On the other hand State Forestry and Hunting Inspectorate is body within the MAFWE.
	Legal/regulatory framework: National (and/or sub-national) and international commitments	Existed forest law doesn't meet international commitments
	Financial and economic instruments	Main sources of financing are: State budget, bilateral donor programmes, FAO, World Bank, SIDA, SNV, GEF, GIZ etc. Public enterprise "National Forests" is self-financing company in a state ownership. There is no mechanism functioning based on PES scheme.
	Information and communication	There are various sources to provide information: through MAKSTAT, EUSTAT, FAO, online publications, annual reports etc.

Evaluation of Policies, institutions and instruments per criteria

No #	Criterion	Indicators	Level of fulfilment
C1	Maintenance and Appropriate enhancement of forest resources and their contribution to global carbon cycle	forest area	The last official report is FAO FRA 2015. Updated data within the MAFWE. Other data MAKSTAT, PE NF. A project on Forest Cadastre is planned. Cca 998.000 ha forests and forest land, increase of 86.000 ha compared with 1990. According to Forestry Strategy,
		growing stock	FAO – FRA 2015 76,4 mil m^3 (low increase compared to 1990)
		age structure and/or diameter distribution	No data available
		forest carbon	FAO FRA 2015 Biomass – total – 129,4 million tones oven-dry weight Carbon - total - 60,8 million tones Low increase compared to 1990
C2	Maintenance of Forest Ecosystem Health and Vitality	Deposition and concentration of air pollution	no specific study on a whole territory except some scientific papers on any parts
		soil condition	General soil data for the country is MAKSOIL informative system
		Defoliation	there are annual studies
		forest damage	Each subject that mange forest (PE NF or National Parks, communal enterprise) monitor situation in forests. IDP (Investigation, Diagnostic and Prevention) Centre within the Faculty of forestry each year deliver report status for forest health to MAFWE.
		forest land degradation	Status and dynamic of baseline Indicators for Land Degradation Neutrality are presented in LDN TSP (2017). Erosion map is old (1990) and need update. Other type of land degradation are not studied.
C3	Maintenance and Encouragement of Productive Functions of Forests (Wood and Non-Wood)	Increment and felling	Data from PE NF for forests under their competences (80% of state forests) for the period 1998-2013. Annual Increment - 1,6 million m^3 Annual Cut - 0,597 million m^3 (37% of AI) Illegal cut is not exactly assessed.
		Roundwood	Cca 20% of the total wood products
		Non-wood goods	No data available
		Services	There are data for carbon sequestration but not for other forest services.

No #	Criterion	Indicators	Level of fulfilment
C4	Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems	Diversity of tree species	There are data about tree species diversity in numerous studies and national documents.
		Regeneration	There is no exact data
		Naturalness	There are some data but not exact
		Introduced tree species	There are statistics about introduced tree species but this information is scarce and very problematic (e.g. planation with Scots Pines on areas where is no autochthonous).
		Deadwood	No data
		Genetic resources	There are few data about genetic resources in forestry
		Forest fragmentation	This information is very rare
		Threatened forest species	Yes there are information and studies about threatened forest species.
		Protected forests	There are information for protected areas
		Common bird forest species	Yes, there are several publications (monographs; academic books).
C5	Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)	Protective forests - soil, water and other ecosystem functions - infrastructure and managed natural resources	Officially there are no proclaimed protective forests at this time.
C6	Maintenance of other Socio-economic Functions and Conditions	Forest holdings	0.4 ha – average area of private parcel; 1,5 ha – average size of private forest property;
		Contribution of forest sector to GDP	According to the Strategy for sustainable forestry, together with wood processing is 0,9%.
		Net revenue	At least 30 million Euros
		Investments in forests and forestry	No data available

Criteria 5 - Maintenance, conservation and appropriate enhancement of protective functions in forest management (notably soil and water)

	Level of implementation in Forest Law	Level of implementation in the Rulebook	Is it practice of planners	Notice (reason)
Forest management planning process				
Forest management planning should aim to maintain and strengthen the protective functions of forests for society, such as infrastructure protection, soil erosion protection, protection of water resources and protection against other adverse effects of water, such as floods, landslides, avalanches.	Only tackled but in reality not implemented	Not mentioned	No	Not knowledge about it
Areas that fulfill the protective functions of the society should be registered and marked and set out in the forest management plans	Some areas, but FM planers don't pay attention on it	Not mentioned	No	Not knowledge about it
	Level of implementation in Forest Law	Level of implementation in Rulebook	Is it Practice of engineers	Notice (reason)
Forest management practices				
Special attention should be paid to the forest practices of sensitive soils and erosive areas, as well as areas where forest operations can lead to excessive soil erosion and generate sediment in watercourses. Inadequate techniques such as the use of unsuitable machines should be avoided in such areas. Special measures should be taken to reduce the pressure of the animal population	Just mentioned	No	Generally no, but depend of knowledge and conscious of the engineer	Low level of knowledge
Special attention should be paid to forest practices for forest areas that are well-known for water protection, avoiding adverse effects on the quality and quantity of water resources. Improper use of chemicals or other harmful substances or inadequate forest practices that affect the quality of water in a harmful way should be avoided.	Not mentioned	Not mentioned	No	Lack of knowledge
The construction of roads, bridges and other infrastructure should be done in a manner that minimizes exposure to bare soil, avoiding deposits in watercourses and preserving the natural levels and function of watercourses and river beds. Proper drainage forest roads need to be built and maintained.	Just declarative mentioned	No	No one road in the last 20 years is constructed based on a main design	No main design for forest roads

5

New forest practices and tools for adaptation and mitigation of climate change (issues related to forest-water)

5.1. Albania

It is recognized that long-term adaption against climate change needs to be taken into consideration and supported by an integrated cross-cutting policy approach into national development planning. The United Nations Development Program (UNDP) and Global Environment Facility (GEF) financed the implementation of several practices in the Drini and Mati River Deltas (DRMD). These are 2 of 3 deltas found on the northern Adriatic coast has 3 main types of habitats: (i) marine; (ii) wetlands including estuarine, riverine, lacustrine and palustrine and (iii) non-wetland habitat including forests, shrubs, and agriculture lands. For the coastal zone, the climate change scenarios has predicted a sea- level rise up to 61 cm. This is expected to cause stress on marine and littoral biodiversity and might be associated with habitat losses.

Some of the practices and measures implemented in the framework of this project were:

- Planting of European marram grass *(Ammophila arenaria* L.) aiming beach restoration and dune management to slow down the erosion rate
- Planting with native species of terrestrial habitats
- Opening of drainage channels to maintain functionality
- Building dams along the coast
- Identification of agricultural crops resistant to drought

The same adaptive measures were also applied in the Kune-Vain lagoon in 2017 and 2018 as part of the DRMD. There are also other projects applied in the field of renewable energy aiming to reduce energy production from hydropowers and promoting energy from renewable sources.

5.2. North Macedonia

North Macedonia belong to temperate continental zone and following negative effects of climate changes are expected:

- Drought-induced productivity decrease;
- Spruce forest susceptible to pests and windthrows;
- More frequent regeneration failure;
- Increased fire risk.

As adaptable measures are recommended

- Proper management of old and young stands to improve regeneration;
- Intensive thinning to save water.

Proper management of old and young stands to improve regeneration is common practice in the country. On the other hand, separate silvicultural activities with aim to save water are not in practice.

Source: https://ec.europa.eu/eip/agriculture/en/content/focus-groups/new-forest-practices-and-tools-adaptation-and

6

Conclusions and Next Steps

Generally, requirements arising from the UN Conventions are included in National strategies and plans.
Requirements arising from EU Directives are transposed in national legislation.

On the other hand, their implementation in practice is not satisfactory or somewhere do not exist (as SEA/EIA procedure for forestry plans and projects etc.).

General requirements from EU Forest strategy are included within the national forest strategy, but with very low level of implementation.

6.1. Albania

The detailed analysis of the legal framework for forests and water resources identified many gaps, as consequence, there is an urgent need for better coordination of forest and water resource management policies into the national development strategies or government programs. All these gaps identified for each directive indicate that the Albanian government must take proper measures to meet the standards required by these international directives. All the forest and water policy documents in Albania must pay more attention to the role of forests in water supply, the biodiversity of water ecosystems, flood alleviation and soil erosion. In addition, the new forest law must be addressed better in the interrelation between forest and water issues as well as to increase the awareness of decision-makers and the community about the importance of sustainable forest management on the water environment.

Next steps proposed are:

- GoA must prepare the appropriate legal framework to ensure the transposition of directives into the national legislation and align the national legislation with EU legislation.
- GoA must set up the appropriate structures dealing with water and forest management and support them with logistics and funds.
- GoA must prepare a national program with clear targets for afforestation of degraded lands and restoration of damaged forest areas, especially in mountainous areas.
- MoTE must revise the strategy for forest and pasture sectors, paying more attention to the sustainable management of forests and their role in climate change mitigation.
- GoA must support financially the scientific research in order to improve the knowledge between forest and water interactions and impacts of climate change on water resources,

forest resources and other natural vegetation, biodiversity and ecosystem functions and services.

- Retaining relatively undisturbed and establishing buffer zones around/along water streams or water reservoirs to protect water quality from sedimentation and water temperature from fluctuations.
- Use of appropriate silvicultural measures to achieve water-related objectives such as the conversion of oak coppice forests to high forests and the use of suitable species which cycle less water and resist more to climate warming.
- Implementing of forest management practices that offer lower-risk and lower impact on existing water resources such as: avoid crossing streams by foregoing harvesting; establishing of wider buffer zones ranging from 9 to 25 m; use of low-ground-pressure equipment during logging; conduct site preparation in a way that avoids disturbing the soil and applying fertilizer in soils with limited nutrients.
- Improvement of cooperation between entities/authorities working at the local and national levels as well as standardization towards a common methodology on flood risk management is required.
- Monitoring of water quality in all water bodies.
- Establishment of a national cadaster of water resources.
- Formulation of management plans for all water basins and allocation of required funds for their implementation.
- Fostering/setting up schemes for payment of environmental services as financing mechanisms for watershed management and sustainable forest management.
- Designation of the methodology on SEA at the national level for all projects using natural resources
- Providing synchronization of the Flood Risk Management Plans between watershed and/or river basin levels.
- Strengthening of the institutional framework resulting in a clear structure and shared responsibility
- Strengthening the capacities at the national or regional level to produce current up-to-date hazard maps and to prepare a risk assessment
- Designation of a standard methodology to quantify precisely all the costs derived from floods and benefits from ecosystem services
- Development of integrated water resource management plans at the watershed and/or river-basin level

6.2. North Macedonia

The detailed analysis of the legal framework for forests and other legislate in the parts related to forests identified many gaps, as consequence there is an urgent need for not only better coordination of forest and water resource management policies into the national development strategies or government programmes but also human capacities building of foresters related to water issues.

All these gaps identified for each directive, indicates that Albanian government must take proper measures to meet the standards required by all these international directives. All the forest and water policy documents in North Macedonia must pay more attention about the role of forests

in water supply, biodiversity of water ecosystems, flood alleviation and soil erosion. In addition, in the new forest law must be addressed issues stated within the National Strategy for sustainable forestry including better interrelation between forest and water issues as well as to increase the awareness of decision-makers and community about the importance of sustainable forest management on water environment.

Next steps proposed are:

Legal and institutional:

- MAFWE must prepare the appropriate legal framework to ensure the needs arise form national forest strategy as well as requirements of UN conventions, EU directives and EU forest policy.
- GoNM must set up the appropriate institutional structure dealing with water and forest management (mostly within MAFWE but also within MoEPP) and support them with logistic and funds.
- MAFWE must revise action programme annexed to the Strategy for sustainable forestry taking in consideration that the previous was for the period 2007-2013
- MAWFE must adopt or to prepare bylaw related to Protective forest - establishing methodology for delineation; defining way of their proclamation; defining sustainable silviculture activities
- MAFWE must prepare a new Rulebook for preparation forest management plans where requirements form all UN, EU as well as related domestic legislation will be involved
- MAFWE must prepare bylaw for estimation payment for each ecosystem service of forest (related to art. 21 of the Law on Forests)
- Improve of cross-sectoral cooperation between forest and water sectors
- Implementation of SEA procedure (according to the Decree related to SEA) especially in the areas where will be proclaimed protective forests

Education and research

- GoNM must support financially the scientific research in order to improve the knowledge between forest and water interactions and impacts of climate change on water resources, forest resources and other natural vegetation, biodiversity and ecosystem functions and services.
- Enabling Research related to adaptation to climate changes and drought
  - Assessment of the three main components of vulnerability: sensitivity - the degree to which systems will respond including beneficial and harmful effects; adaptive capacity – the degree to which adjustments in practices, processes or structures can moderate or offset the potential for damage or take advantage of opportunities created; exposure – the degree to which the system is exposed to climate hazards.
  - Monitor the state of the forests and identify when critical thresholds are reached;
  - Testing of adaptive forest management activities as: selection of tree species/provenances, thinning regimes, stand regeneration techniques, forest protection routines, nurseries, tree breeding
  - Testing of impact management, i.e. to evaluate the possibilities of the various practices of water cycle manipulation in the range from upper (stand canopy) to lower (soil) forest ecosystem boundaries in a variety of forest types and environmental conditions.

- Testing of potential landscape management practices as follow: various suitable measures for that purpose: halting the runoff inside of orographic waterways, closing drainage ditches, avoiding linear structures, water drainage from forest roads into adjacent forest areas, the promotion of a stable soil pore structure by liming acidified forest soils, water table management in lowland and riparian forests. (Schuler et al. 2007)
- Develop present and future cost-effective adaptation activities;

Forest management: *(an extract from "Multidimensionality of Scales and Approaches for Forest–Water Interactions" By Pllas et al., 2011)*

Introduction of Close-to-nature forest management assures that with the human interference into forest ecosystem sustainability and multifunctionality will be preserved. One of basic principles of close-to-natural management is to imitate natural structures and natural regeneration patterns, for example natural disturbances (Bončina and Diaci1998).

- Use of appropriate activities for enabling quantity of drinking water
  - Forbidden clear cut area in the drainage basin of main sources
  - Frequency, intensity and technique of harvesting to be adopted
  - Tree species composition, crown density, cover percentage, distribution of growth classes, vertical and horizontal stand structure to be adopted to enable more quantity of drinking water
- Use of appropriate forest activities for minimizing water pollution as follow:
  - Compulsory use of biodegradable chainsaw lubricants and oils in hydraulic
  - Machines in forests (Košir 2006); Prohibition of washing, maintenance and repair of forest mechanization in a forest (Trontelj 2006). Storage facilities for fuel and oil should be kept away from water courses and other water bodies (Mulkey 1980).
  - Selective thinning should be performed in narrow riparian zones of forest to remove old and unstable trees.Strip of riparian vegetation (including trees and shrubs) should be establishedand maintained to prevent or mitigate pesticide and other pollutants in thefreshwater (Binkley and Macdonald 1994).
  - High concentrations of ash and dust must be avoided in close distance of water courses (Mulkey 1980).
  - Use of heavy machinery on erodible soils should be minimized or avoided, inthe riverbed prohibited (Mulkey 1980).
- Use of appropriate techniques to minimize runoff
  - In areas where is defined SOF, HOF and DSSF type of runoff must, sustainable forest activities must be applied.
  - Forcing unevenaged stands with dense canopy cover, diverse vertical structure and evendistribution of growth-phases where it is possible (Frehner et al. 2005).
  - Area of barelands including regeneration younger than 10 years should be less than 25% of the drainage basin (Twery and Hornbeck 2001).
  - The canopy cover of all forest stands should be morethan 70% in the whole drainage basin as well as in the riparian cone(Twery and Hornbeck 2001).
- Use of appropriate activities to minimize erosion and sediment
  - Surface of the whole catchment area should be covered with vegetation. In areas with bare soils pioneer vegetation should be established (Frehner et al. 2005).

- Continuous presence of natural regeneration, developing under shelter of adult trees (Frehner et al. 2005).
- Old, unstable trees, fallen trunks, uprooted stumps should be removed from the riverbed and its immediate vicinity to prevent blocking the channel and flooding in the case of high waters (Frehner et al. 2005).
- Landslides can be prevented with planting of tree species having deep root system to stabilize the soils as well as draining excessive water (ash, oak, maple, black alder and fir tree, dwarf pine, Austrian pine) (Frehner et al. 2005).
- Construction of skidding tracks and transportation roads on less steep slopes to avoid excessive ground stripping and excessive use of trenches and the length of forest routes (Mulkey 1980)
- Avoidance of any activities which could damage upper layer of forest roads (i.e. log skidding) (Mulkey 1980).
- During the period of heavy and persistent rainfall, closure of forest roads can prevent formation of ruts and their flooding (Mulkey 1980).
- Sections of already constructed forest roads with steep inclination should be preventively cemented or covered with asphalt (Mulkey 1980).
- Frequently used roads and entry points on erodible soils should be hardened with rocks, lumbers or branches (Mulkey 1980).
- In the event of erosion urgent preventive measures should be taken and no cutting, burning or damaging of upper soil layer at least 100 years after the event (Twery and Hornbeck 2001)
- Working in dry weather (in spring or summer) can significantly decrease the risk of erosion near watercourses and drinking water collectors (Nisbet 2001).
- With consent of local communities, water supply can be temporarily suspended if large-scale activities are performed in forest, thus preventing pollution of drinking water.

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