

# Transboundary Diagnostic Analysis

## Thematic Report on the Resource NEXUS

PHASE I OF THE WATER-FOOD-ENERGY-ECOSYSTEMS NEXUS ASSESSMENT OF THE DRIN BASIN

In the framework of:

### **Memorandum of Understanding**

for the Management of the Extended  
Transboundary Drin Basin

**GEF Project** “Enabling Transboundary Cooperation  
and Integrated Water Resources Management  
in the Extended Drin River Basin”

Also with the support of

The logo for Austrian Development Cooperation, featuring a red stylized graphic of three horizontal bars.

AUSTRIAN  
DEVELOPMENT  
COOPERATION

The Coordinated Action for the implementation of the Memorandum of Understanding for the management of the Drin basin (Drin CORDA) is supported by the GEF Drin Project. Thus, the latter constitutes an institutional project implemented by the United Nations Development Programme (UNDP) and executed by the Global Water Partnership (GWP) through GWP-Mediterranean (GWP-Med), in cooperation with the United Nations Economic Commission for Europe (UNECE). The Drin Core Group (DCG), being the multilateral body responsible for the implementation of the Memorandum of Understanding serves as the Steering Committee of the Project. GWP-Med serves as the Secretariat of the DCG.

*Disclaimer: The document adheres to the UN rules and policies regarding the names and international status of countries and/or other geographical areas etc. The use of characterizations, names, maps or other geographical statements in this document in no way implies any political view or positions of the Parties which are executing and implementing the Project.*

For more information, please contact:      Headquarters:  
12, Kyrristou str., 10556  
Athens, Greece  
T: +30210-3247490, -3247267  
F: +30210-3317127  
Web: [www.gwpmed.org](http://www.gwpmed.org)

May 2019  
Prepared by Lucia de Strasser with input from Stephen Stec, for UNECE Water Convention



# Contents

<b>1. INTRODUCTION</b>	<b>7</b>
1.1 Aim and objectives of the Nexus thematic report	10
1.2 Rationale of the report and link to TDA	12
1.3 Structure of the report	15
<b>PART 1</b>	<b>16</b>
<b>2. The Drin basin and the socio-economic situation</b>	<b>17</b>
2.1 Geography, topography, and hydrology	17
2.2 Administrative borders, settlements, and population	21
2.3 Socio-economic situation	23
<b>3. Overview of the natural resources, availability and uses</b>	<b>26</b>
3.1 Water resources	27
3.2 Land resources	32
3.3 Energy resources	37
3.4 Environment and Ecosystems	44
<b>4. National governance framework</b>	<b>48</b>
Box 1: Governance in Nexus Assessment	49
4.1 National governance context	51
4.2 Horizontal and strategic policies and legal frameworks	54
4.3 Nexus-relevant policy	56
4.4 Institutional setting	69
4.5 Cross-sectoral governance	72
<b>5. International policy, cooperation, and trade</b>	<b>78</b>
5.1 Global standards and regional regimes relevant to Nexus	78
5.2 Basin level transboundary cooperation	86
5.3 Cross-sectoral coordination at Drin Basin level	88
5.4 Regional trade	90



<b>PART 2</b>	<b>96</b>
<b>6. Hydropower and flooding</b>	<b>98</b>
Box 2 Hydropower at the crossroad	100
6.1 The importance of hydropower operation to flood management	102
Box 3: The GIZ project Climate Change Adaptation in Transboundary Flood Risk Management in Western Balkans	104
6.2 Implications of a “flood-smarter” hydropower sector	105
<b>7. Biomass and forest management</b>	<b>108</b>
7.1 Issues in the wood biomass value chain	110
7.2 Modern wood energy for sustainable forest management	112
<b>8. Evolution of agriculture and irrigation</b>	<b>114</b>
8.1 Water and agriculture	116
8.2 The potential impact of agricultural developments and trade	118
<b>9. Conclusions</b>	<b>120</b>
 <b>ANNEXES</b>	 <b>122</b>
1. List of large reservoirs for hydropower production in the Drin River Basin	124
2. Report from thematic group discussion at the 16 <sup>th</sup> Stakeholder Conference for the Drin River Basin	126
3. Water-Energy modelling for Phase 2 - Scenario description	132

## List of Figures

<b>Figure 1.</b>	<i>The Drin Nexus Assessment Process</i>	11
<b>Figure 2.</b>	<i>Extended Drin River Basin topography</i>	18
<b>Figure 3.</b>	<i>The Extended Drin River Basin and its sub-basins</i>	19
<b>Figure 4.</b>	<i>Area distribution by sub-basins (area of inland waters included) and shares of country portions for each basin</i>	20
<b>Figure 5.</b>	<i>GDP per capita, PPP (EU 28= 100)</i>	23
<b>Figure 6.</b>	<i>Structure of Gross Value Added (GVA) by type of economic activity (state level; averages for 2011-2015)</i>	24
<b>Figure 7.</b>	<i>Employment by economic activity in Kosovo, North Macedonia, and Montenegro (2016; % of total employment)</i>	25
<b>Figure 8.</b>	<i>Overall management of the wastewater in the Extended Drin basin (per sub-basins)</i>	30
<b>Figure 9.</b>	<i>Shares of land cover types by sub-basin (CORINE) (above) and by riparian (below)</i>	32
<b>Figure 10.</b>	<i>Cultivated land ratios (*excluding meadows)</i>	33
<b>Figure 11.</b>	<i>Shares of primary energy production by source (2015)</i>	38
<b>Figure 12.</b>	<i>Large hydropower projects in the Drin River Basin. Note: the purple sign in Kosovo is Lake Radonjić (which hosts no hydropower plant)</i>	41
<b>Figure 13.</b>	<i>Map of existing and planned hydropower in the region of the Drin River Basin</i>	42
<b>Figure 14.</b>	<i>Aquatic and terrestrial biodiversity</i>	45
<b>Figure 15.</b>	<i>Status of ecosystem services</i>	46
<b>Figure 16.</b>	<i>Status of rivers in the Drin River Basin</i>	47
<b>Figure 17.</b>	<i>Exports by destination, as percent of total exports</i>	91
<b>Figure 18.</b>	<i>Implementation of soft measures for the creation of a regional energy market</i>	92
<b>Figure 19.</b>	<i>Summary of most relevant interlinkages between the power generation sector and the other Nexus systems of water, ecosystems services and land use</i>	98
<b>Figure 20.</b>	<i>Preliminary Flood Risk Assessment for the Drin River Basin</i>	101
<b>Figure 21.</b>	<i>Reduction potential due to “flood peak reducing” management</i>	105
<b>Figure 22.</b>	<i>The many uses of wood</i>	109
<b>Figure 23.</b>	<i>Non-timber and non-wood forest products (NTFP, NWFP)</i>	109
<b>Figure 24.</b>	<i>Classification of ecosystem services</i>	109
<b>Figure 25.</b>	<i>Scenario tree for the Drin modelling activity</i>	135





# 1

*The UNECE and the Global Water Partnership (GWP) have considerable experience in analysing and describing key issues across sectors, specifically when it comes to the resource-Nexus of water-land/agriculture-energy-ecosystems. Notably, the UNECE uses a participatory methodology for assessing intersectoral links, trade-offs and benefits in transboundary basins, specifically developed under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and adopted by its Meeting of the Parties. The methodology has been applied in various participatory assessments in a number of river basins, including the Sava River Basin and – in more detail - its tributary the Drina, in the Western Balkans.*

Concretely, this work has delivered policy recommendations (in the areas of energy, water, agriculture and forestry, environment, and climate) aimed at exploiting synergies between sectoral objectives and increasing coherence in the way natural resources are governed, both at national and transboundary level. The consolidated methodology - refined with feedbacks from applications and inputs from key partner institutions including the GWP Mediterranean (GWP-Med) – has been published in 2018.

Recognizing the importance of the Nexus approach as a framework to reconcile various natural resource needs and enhance sustainable development at regional level, GWP and the UNECE will carry out a qualitative assessment of “Nexus issues” in the Drin river basin. The choice of the Drin is motivated by the fact that riparian countries (“Riparians”) are committed to strengthening cooperation on the management of their shared environment as well as by the fact that the Nexus assessment can add value to other activities carried out in the region to enhance transboundary cooperation.

# INTRO





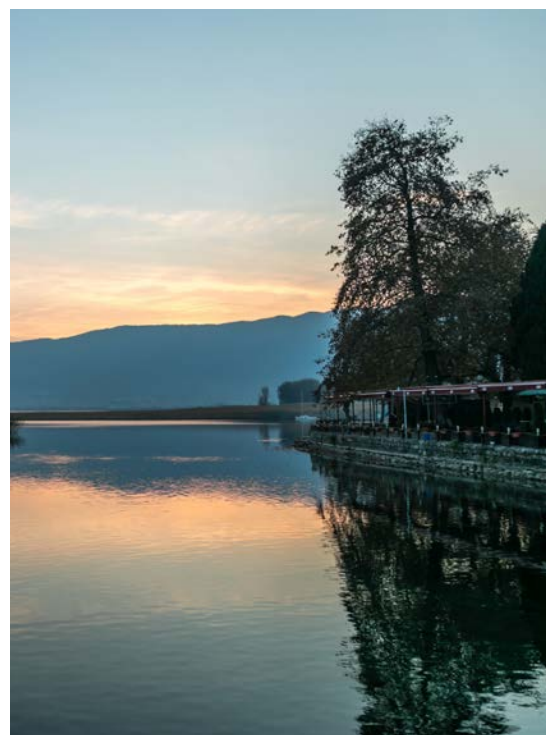
The Drin Riparians have signed a Memorandum of Understanding for the sustainable management of the Drin Basin (Drin MoU; 5 November 2011, Tirana) and committed to *“promote joint action for the coordinated integrated management of the shared water resources in the Drin Basin, as a means to safeguard and restore to the extent possible the ecosystems and the services they provide, and to promote sustainable development across the Drin Basin”*. An institutional structure was put in place through the Drin MoU. The Drin Core Group (comprising officially appointed representatives of the Drin Riparians) was given the mandate to coordinate action for the implementation of the MoU and operates as a de facto joint commission. GWP-Med serves as the Secretariat of the DCG.

The goal of the work in the Drin Basin is to reach a point in the future where the scale of management lifts from single water bodies to the hydrological interconnected system of the Drin Basin, eventually leading from the sharing of waters between states and conflicting uses, to the sharing of benefits between stakeholders. The preparation of a River Basin Management Plan in accordance to the WFD is the long-term objective of the cooperation among the Riparians.

To achieve the aforementioned goal, it is essential that the Riparians (i) understand the transboundary issues as well as the benefits stemming from cooperation using scientific proof and where this is not possible scientific evidence; (ii) decide which of those transboundary issues will be addressed with priority and agree on the necessary actions at the Riparians and the transboundary level to achieve this. These actions will be part of a Drin Strategic Action Program (SAP) that will be ready by 2020.

The value of the Nexus approach and possibilities of mainstreaming it to the Global Environment Facility's (GEF) International Waters (IW) projects are being explored. Through the GEF IW:LEARN 4 project, the Nexus work under the Water Convention supports provision of programmatic support to the GEF International Waters portfolio of projects on addressing the water-food-energy-ecosystems Nexus.

Work to enhance cooperation for the management of the Basin under the Drin Core Group dates back in 2008. Already two Situation Analyses were prepared bringing up and looking into transboundary issues and problems (using a causal chain analysis).



The **GEF/UNDP** supported Project *“Enabling transboundary cooperation and integrated water resources management in the extended Drin Basin”* (2016-2020) supports activities for the implementation of the Drin MoU. In particular, a Transboundary Diagnostic Analysis (TDA) is being carried out to:

- Identify and assess transboundary basin management (i.e. water and environmental management) issues and their effects.
- Identify the immediate and underlying causes of these issues among the social and economic sectors activities.

All available information in the domains of hydrology, biodiversity, socio-economics, pollution and legal and institutional setting has been gathered as part of the preparation of the aforementioned analysis.

This report is also part of the activities under the project *“Promoting the Sustainable Management of Natural Resources in Southeastern Europe, through the use of the Nexus approach”*, financed by the **Austrian Development Agency (ADA)**.

Riparians confirmed their interest in having the Drin as a possible transboundary basin case study for the project at the RCC Regional Working Group on the Environment; then the DCG discussed the possibility of some quantitative scenario analysis on the Nexus, focusing on drivers and causes beyond the water sector (namely energy and agriculture/forestry) at the 13th meeting of the DCG (4th SC meeting). The quantitative analysis (Phase II Nexus Assessment) to be developed under the ADA project will build on, contribute to and extend the analysis being done through the TDA and will follow the methodology already developed for a similar modelling work being carried out in 2017 in the Drina river basin.

## 1.1 Aim and objectives of the Nexus thematic report

*This report is meant to inform and complement the TDA of the Drin River Basin, while at the same time setting the basis for the quantification of key intersectoral linkages that will inform the SAP and its implementation, in particular regarding how action by the key economic sectors can contribute to the objectives of the SAP.*

The TDA is a tool to analyse and understand the basin system including the interlinkages and trade-offs among the different components of the natural and anthropogenic environment. In the TDA-SAP analysis, land management and the sectors of agriculture and energy production are taken into consideration; yet this is being done from the point of view of water and environmental “security”. In practice, the TDA as part of the GEF/UNDP supported project uses the following domains as entry points:

- Environment, acknowledging (i) the fact that the natural environment is where the effect and impacts of any issue and problem is ultimately manifested at; the functioning of the ecosystems is an indicator of sustainability and (ii) the importance of a healthy and well-functioning natural environment -with its natural resources sustainably used- for socio-economic and ultimately human well-being.
- Water, as this could be seen as the medium, the bloodstream of the system linking the components of the natural and anthropogenic environment, “transferring” among these components positive and negative effects.

The Nexus assessment/approach, on the other hand, looks into the interlinkages and trade-offs among the sectors of water, land, energy and environment aiming to identify solutions that will foster not only water and environment security, but also energy and food security.

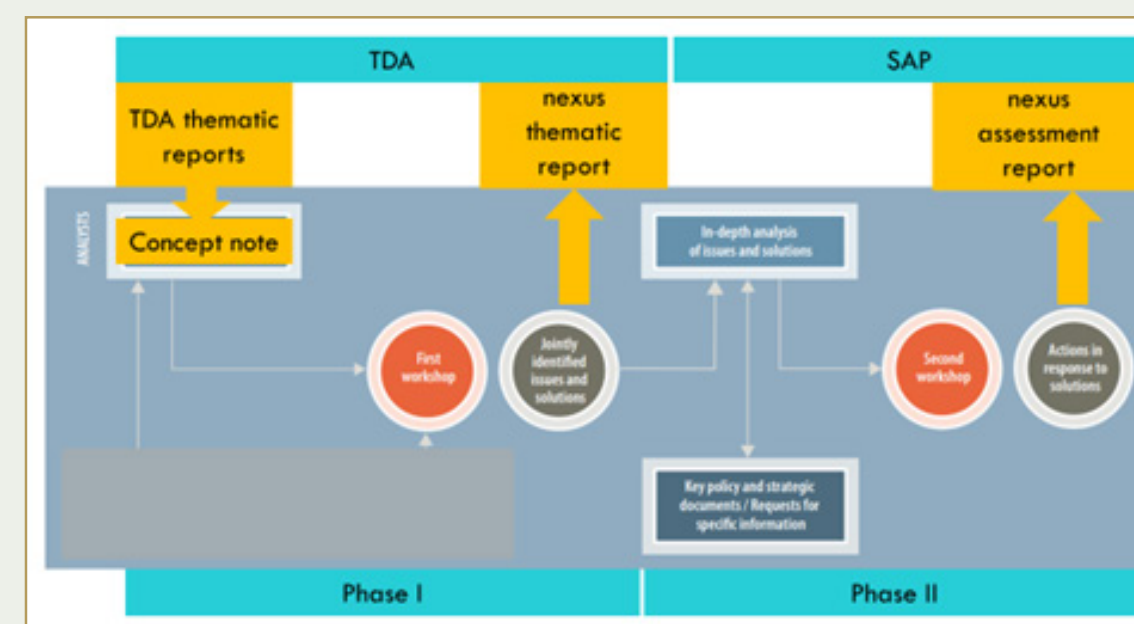
The outcomes of a Nexus assessment can complement the outcomes of the TDA as follows:

- Introducing additional level(s) of analysis of interlinkages and identification of trade-offs and co-benefits considering energy and food security (in addition to water and environment).
- Assisting in the identification of causes of transboundary issues and problems beyond the basin: energy and agricultural management don't use the basin as a spatial unit of reference; there are energy and trade flows that transcend basins creating interlinkages and trade-offs beyond the basin.
- Assisting in the identification of measures/solutions as part of the SAP that will (a) address transboundary problems and issues; (b) foster Nexus sectors security in the Drin Basin; (c) facilitate integrated Nexus related resource management with potential mobilize a wider set of sectoral actors to contribute to the objectives of the SAP.

Overall, in addressing the Nexus of water-food-energy-ecosystem security, the relevance of the entire spectrum of competing water needs is recognised, stressing the role, interests, and leadership of other sectoral stakeholders beyond the water and environment sectors.

For the purpose of supporting the DCG efforts in the Drin River Basin, the Nexus analysis will be done in two phases (Figure 1):

- **Phase I** will include the identification of Nexus issues of priority and a qualitative assessment, for each of the priority issues, of linkages/benefits/trade-offs, among the Nexus sectors.
- **Phase II** will comprise the use of modelling tools to support a comprehensive assessment that will quantify the linkages/benefits/trade-offs, among sectors, and assess the trends under different developmental scenarios as means to identify optimal use of natural resources for sustained growth. Indicative information about the analysis to be carried out is given in Annex I.



**Figure 1.** The Drin Nexus Assessment Process

Source: author's elaboration

The outcome of Phase II will be developed into a Nexus Assessment Report on the modelling and quantification of selected transboundary Nexus issues (see Annex II).

It should be noted that not only the Nexus assessment can inform and strengthen the TDA-SAP process, but also vice-versa. Notably, the information collected, and the network of stakeholders established for the TDA allowed the Nexus analysts to carry out the analysis without applying the participatory methodology in its full extent.

*This Nexus Thematic Report is the outcome of **Phase I**. It includes an overview of regional energy and agricultural policies as well as a qualitative analysis of transboundary Nexus issues.*



## 1.2 Rationale of the report and link to TDA

*Transboundary issues with their origins in energy and agricultural sectors are likely an information gap in the TDA analysis carried out so far (consisting of several thematic reports). Some of them may be of priority for the advancement of transboundary cooperation.*

The Report aims at shedding light on these issues, which have been identified by the authors through a review of the literature available, and most notably:

- Input from experts from Albania, North Macedonia, Montenegro, and Kosovo\*<sup>1</sup>.
- The other TDA Thematic Reports: GWP-Med, Thematic report on socio-economics of the Drin River Basin (2017); GWP-Med, Thematic report on biodiversity and ecosystems for the Drin River Basin (2017); Thematic report on hydrology and hydrogeology for the Drin River Basin (2018); GWP-Med, Thematic report on pollution the Drin River Basin (2018); Thematic report on legal and institutional setting in the Drin River Basin (2019).
- The Situation Analysis of the Drin River Basin. GWP-Med, Situation Analysis Management of the extended Drin Basin (2014).
- GIZ, Background studies to the Project “Climate change adaptation in Western Balkans”. Potential of Multi-purpose use of the Hydropower Reservoirs of the Drini Cascade in Albania (2016); Establishment of a flood early warning system in the Drin-Buna Basin (DEWS). Assessment study for gaps and needs in establishing a DEWS (2013).

<sup>1</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence

Starting point for the scoping of priority Nexus issues is the list of challenges listed in the Drin Situation Analysis (GWP-Med, 2014), which is the result of a consultation process for the establishment of a Shared Vision for the management of the extended Drin Basin.

These are<sup>2</sup>:

- (i) Unsustainable use of water and other natural resources;
- (ii) Hydro-morphologic interventions altering the nature of the hydrological system and the supported ecosystems, as well as exacerbating flood incidents;
- (iii) Untreated or poorly treated wastewater and unsustainable agricultural practices;
- (iv) Unsustainable solid waste management;
- (v) Unsustainable forestry management and deforestation, as well as fishing practices and hunting;
- (vi) Unsustainable tourism;
- (vii) Non-integrated policies, management schemes and cooperation efforts at national and transboundary level.

The energy sector contributes to issues (ii) and (v) (respectively in terms of hydropower operations and logging for fuelwood production) and more generally to issue (vii). The agricultural sector plays a role in issues (i) (iii) and (v), as well as (vii).


Hence, the Nexus analysis included in this report will focus on the national and regional dynamics at play in the energy and agricultural fields, to shed further light on the sectoral dynamics influencing the Nexus in the basin. Table 1 includes an overview of inter-sectoral issues from the review of literature that can be considered of priority to advance transboundary cooperation, because linked to the above list.



<sup>2</sup> See <http://drincorda.org/drin-river-basin/the-challenges>

Table 1 includes an overview of inter-sectoral issues from the review of literature that can be considered of priority to advance transboundary cooperation, because linked to the above list.

Table 1. Nexus issues

SECTOR	WATER	AGRICULTURE/ LAND	ECOSYSTEMS/ ENVIRONMENT
			
<b>ENERGY</b> 	<ul style="list-style-type: none"><li>- Role of hydropower in flood management</li><li>- Impact of energy policy and power trade on water resource use in the basin</li></ul>	<ul style="list-style-type: none"><li>- Role of biomass production in sustainable forest management</li></ul>	<ul style="list-style-type: none"><li>- Impact of logging on forest degradation, erosion, and sedimentation</li><li>- Environmental impact of hydro development</li><li>- Incoherencies between renewables plans/climate action/ energy security and environment preservation</li></ul>
<b>WATER</b> 		<ul style="list-style-type: none"><li>- Water demand for irrigation (likely to increase due to climate change and potentially driven by trade)</li></ul>	<ul style="list-style-type: none"><li>- Poor/inexistent wastewater treatment, exacerbated by urbanization and tourism (at given locations and seasons)</li></ul>
<b>AGRICULTURE/ LAND</b> 			<ul style="list-style-type: none"><li>- Impact of agricultural pollution on water related ecosystems (e.g. eutrophication)</li><li>- Illegal or uncontrolled fishing, hunting, and logging</li></ul>

Source: author's elaboration

### 1.3 Structure of the report

After an overview of the Nexus resources (i.e. energy, water, agriculture/use of land resources, ecosystems), their uses and their governance in the Drin river basin, the report will focus first on the description of regional energy and agricultural dynamics and then on the analysis of their implications on the basin's resources.

The report is divided in two parts:  
Part 1 includes background information and Part 2 focuses on Nexus dynamics.

#### Part 1

Chapters 2-4 will include the overview of Nexus resources and the institutional, regulatory, and policy frameworks constituting the governance of these resources.

Chapter 5 focuses on regional governance (of water, land and environment) and trade (of energy and agricultural products).

#### Part 2

Chapters 6, 7, and 8 focus on the three topics that emerge as central in the energy-resource Nexus interface in the Drin river basin (see Table 1):

- **Hydropower and flooding**  
(and broader energy cooperation)
- **Biomass and forest management**  
(and its environmental implications)
- **Evolution of agriculture and irrigation**  
(and trade aspects)

It should be noted that the results from the analysis of transboundary Nexus issues will be affected by the uncertainty regarding future plans at national and regional level, particularly when it comes to bioenergy development and agricultural trade.

The three topics will be analysed by looking at resource flows/uses and related mechanisms of governance. The insights from this analysis will clarify where cooperation could be strengthened at the energy- and agriculture- resource Nexus interface.

Chapter 9 includes conclusions.





# 2

## The Drin basin and the socio-economic situation

### 2.1 Geography, topography, and hydrology

*The “extended” Drin River Basin<sup>3</sup> is located in the region of the Western Balkans and it is shared by Albania, North Macedonia, Kosovo\*, and – for a small share – Greece<sup>4</sup> (Figure 2). The basin is named after the Drin river formed at Kukës in Albania by the confluence of the Black Drin (flowing northwards from its origins in North Macedonia) and the White Drin (flowing south-west from its origins in Kosovo\*). From Kukës, the Drin runs west towards the Adriatic Sea, and before reaching the sea it splits in two: the smallest branch discharges directly into the sea (at Lezhë in Albania) whereas the main flow is diverted northwards, joins the Buna/Bojana river that is the outflow of the Skadar/Shkoder Lake (which is fed, in turn, by the Moraca river of Montenegro), and soon after discharges into the sea as well. The Buna/Bojana delta is located about 20 km north of the Drin outflow.*

The basin counts three major international lakes. Apart from the Skadar/Shkoder Lake (shared by Albania and Montenegro) located in the lower part of the basin, the other two are located in the upper basin and are shared by North Macedonia and Albania: Lake Prespa (more precisely this is divided in two lakes, Prespa and Small Prespa, linked by a channel) and Lake Ohrid. It is in the Prespa-Ohrid region that the Black Drin originates.

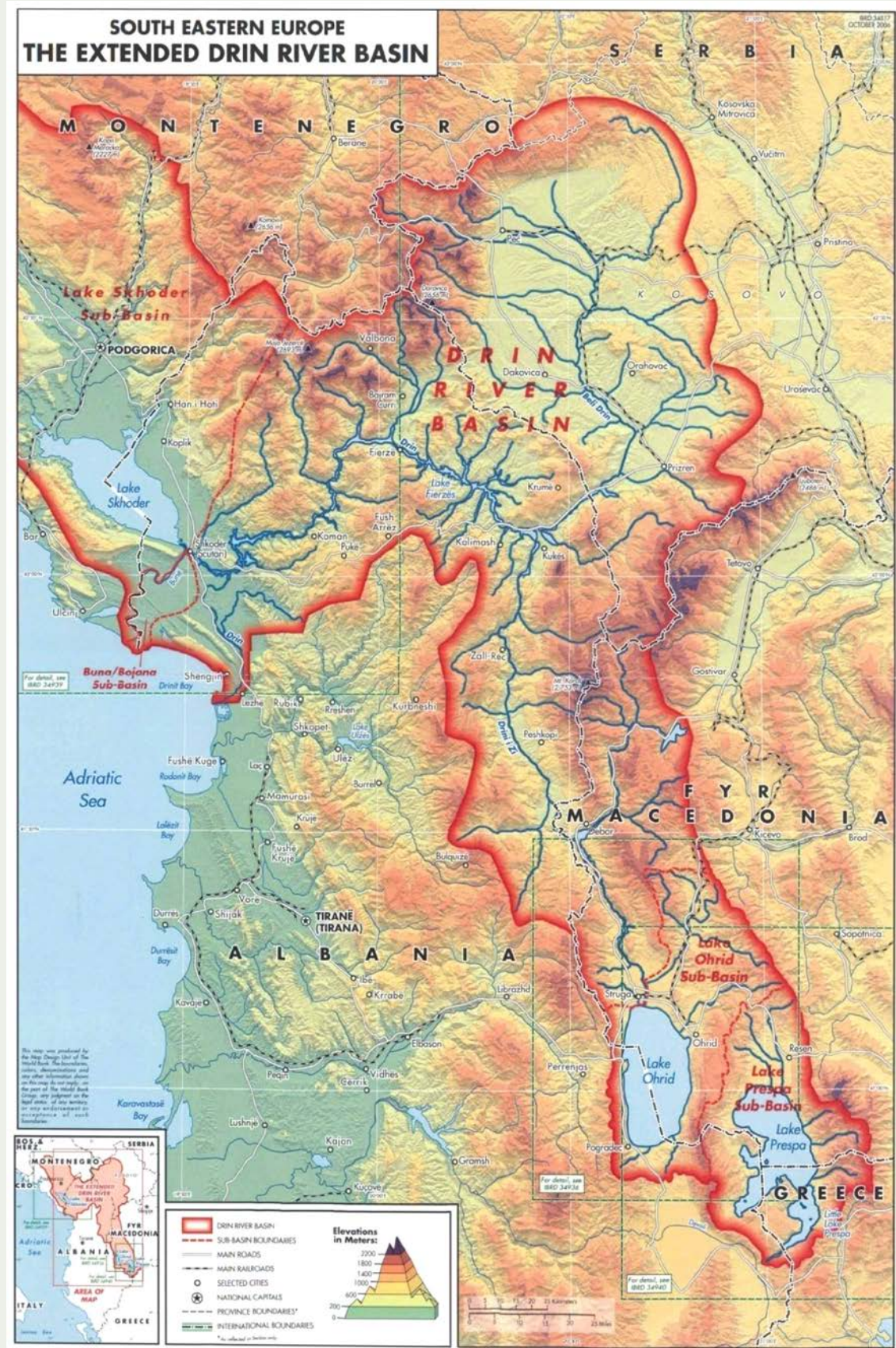
The area of the basin is largely mountainous. Overall, the basin has a mean elevation of 971 m above sea level. Mountain peaks reach over 2,500 m in the north of Albania and in Kosovo\*, and 2,000 m around the Ohrid Lake (in North Macedonia). The Skadar/Shkoder lake basin is a natural depression, and the Buna/Bojana delta region is also flat (mean altitudes of 770 and 909 m respectively)<sup>5</sup>.

<sup>3</sup> For a detailed description of the extended Drin River Basin (i.e. comprising the system of all water and groundwater bodies) refer to the Thematic report on hydrology and hydrogeology for the Drin River Basin (2018). In writing this report, the “extended” has been frequently omitted.

<sup>4</sup> The analysis of the Nexus focuses on the four main Riparians (without Greece).

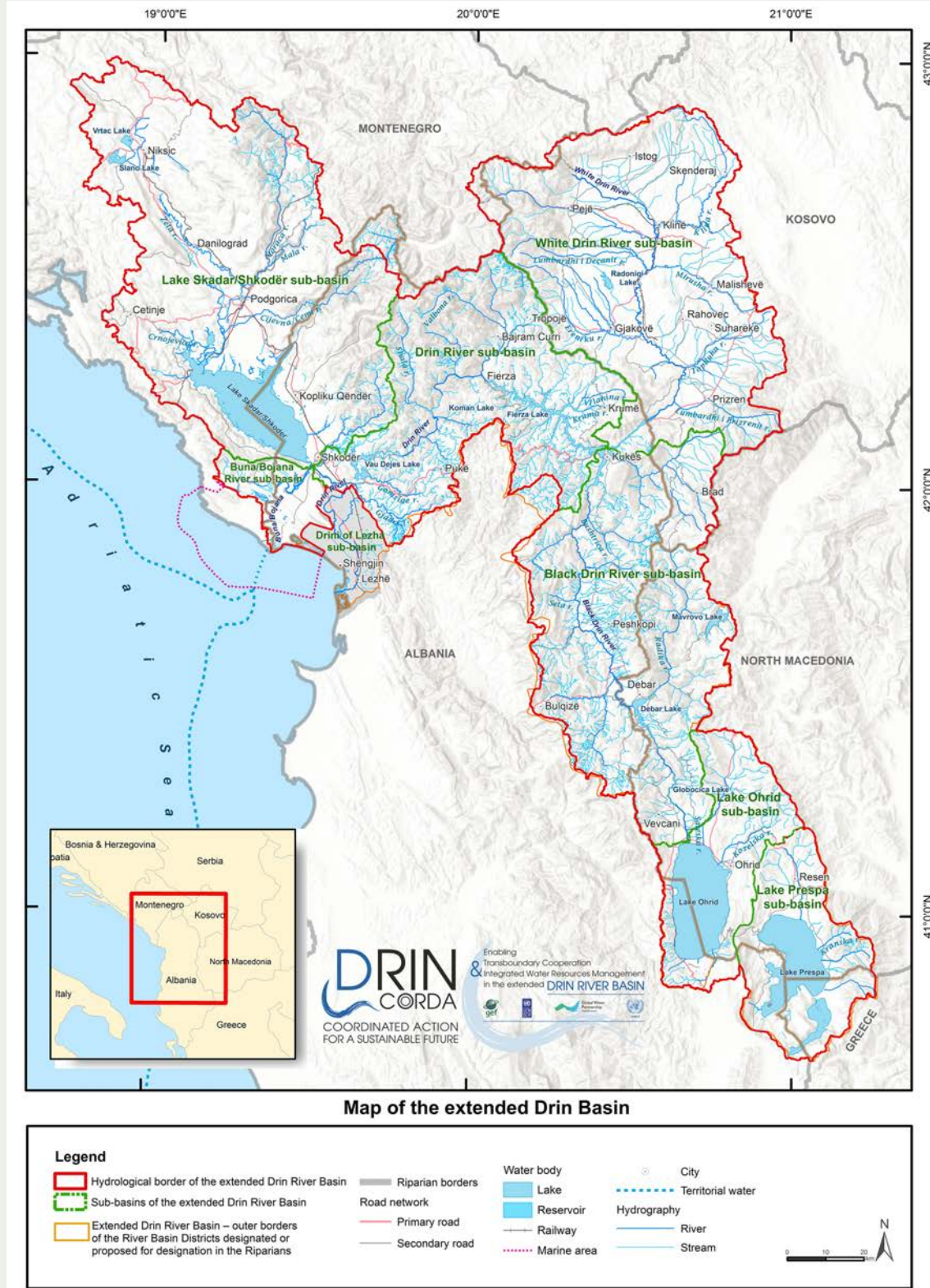
<sup>5</sup> GWP-Med, Situation Analysis. Management of the “extended” Drin Basin, 2014.





**Figure 2.** Extended Drin River Basin topography

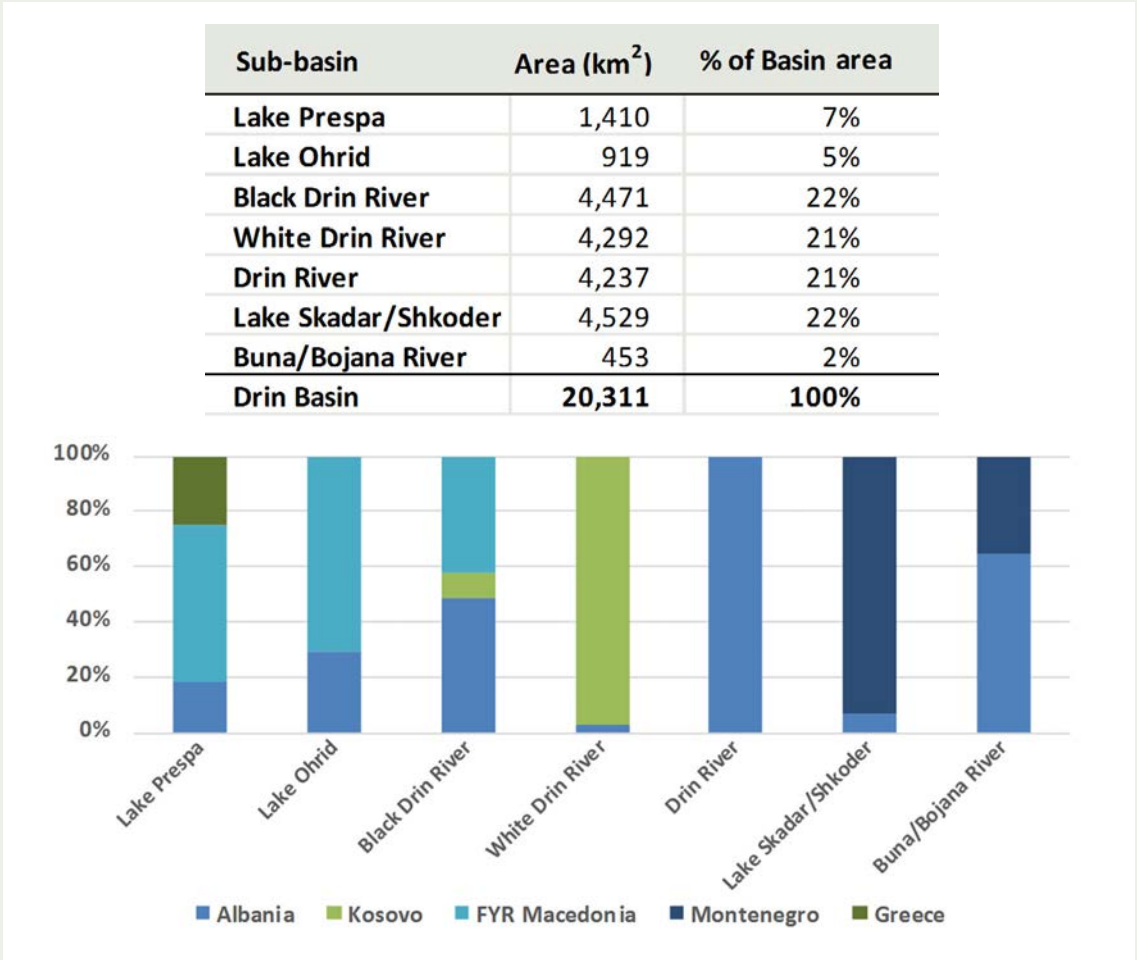
Source: GWP-Med, Situation Analysis. Management of the "extended" Drin Basin, 2014 (map prepared by the World Bank Group, October 2006)



**Figure 3.** The Extended Drin River Basin and its sub-basins

Source: GWP-Med





**Figure 4.** Area distribution by sub-basins (area of inland waters included) and shares of country portions for each basin.  
*Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017.*

Lake Ohrid is the deepest lake in South East Europe and the biggest in terms of water volume (55,500 million m<sup>3</sup>), while the Skadar/Shkoder is the largest when it comes to surface area (varying between 353 km<sup>2</sup> in dry periods and 500 km<sup>2</sup> in wet periods) and it is relatively shallow<sup>6</sup>. The Black Drin sub-basin drains a large part of the (eastern) mountainous region of Albania, while the White Drin drains the transboundary region between Kosovo\* and Albania.

Due to the karstic nature of the region, the system of rivers, tributaries, and lakes are connected underground. In particular, the White Drin is hydraulically connected with the karstic aquifers of Beli Drin/Drin Bard-

he<sup>7</sup>. Underground karstic cavities connect the Prespa to the Ohrid (with water flowing from the first to the latter)<sup>8</sup>.

The basin counts seven sub-basins (Figure 3), the biggest four being the White Drin, Black Drin, Drin, and Skadar/Shkoder (almost equivalent in size: 4,200-4,6700 km<sup>2</sup>) and the smallest three Lake Ohrid, Lake Prespa, and Buna/Bojana (between 450 and 1,000 km<sup>2</sup>). Each one of them is shared between two countries, with the Black Drin - shared by Albania, Kosovo\*, and North Macedonia - being the only exception (Figure 4).

7 UNECE, *Second assessment of transboundary rivers, lakes, and groundwaters*, 2011.  
8 GWP-Med, *Situation Analysis. Management of the "extended" Drin Basin*, 2014

6 *Ibid.*

## 2.2 Administrative borders, settlements, and population

The biggest part of the Drin basin area is found in Albania (38%) and the smallest in Greece (2%), while Kosovo\*, Montenegro, and North Macedonia share the remaining 60% in similar shares. Kosovo\* and Montenegro are however the Riparians with the highest share of country area within the basin (Table 2).

**Table 2.** Territory, administrative regions and municipalities of Drin Basin riparian countries (area of inland waters included)  
*Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017.*

Country	Total country area (km <sup>2</sup> )	Area within the Drin Basin (km <sup>2</sup> )	% of Basin area	% of total country area in the Basin	No of regions in the Basin	No. of municipalities in the Basin
Albania	28,748	7,724	38%	27%	6	16
Kosovo	10,908	4,567	22%	42%	5	14
Greece	131,957	347	2%	0.3%	1	1
FYR Macedonia	25,713	3,295	16%	13%	3	9
Montenegro	13,812	4,377	22%	32%	3	7
Total		20,311	100%		18	47

Albania and North Macedonia are the most populous Riparians, but the majority of the basin population is from Albania and in Kosovo\* (over 1 million in total). Overall, the Drin basin area counts 1,439 settlements distributed as follows: 50% in Albania, 21% in Kosovo\*, 14% in North Macedonia and 15% in Montenegro (Table 3).

**Table 3.** Settlements in the Drin River Basin  
*Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017.*

Albania		Kosovo		FYR Macedonia		Montenegro	
Region	Municipality	Region	Municipality	Region	Municipality	Region	Municipality
Dibër	Bulqizë	Gjakovë	Gjakovë	Polog	Gostivar	Central	Cetinje
	Dibër		Deçan		M. and Rostusha		Danilovgrad
Elbasan	Librazhd		Junik	Southwest region	Centar Zhupa		Nikšić
Korçë	Devoll	Mitrovicë	Rahovec		Debar	Coastal	Podgorica
	Pustec		Skënderaj		Debarca		Bar
	Pogradec	Pejë	Istog		Ohrid	Northern	Ulcinj
Kukës	Has (Krumë)		Klinë	Pelagonia	Struga		Kolashin
	Kukës	Prishtinë	Pejë		Vevchani		
Lezhë	Tropojë		Gillogoc		Resen		
	Mirditë (Rrëshen)	Prizren	Dragash				
Shkodër	Lezhë		Malishevë				
	Pukë		Mamushë				
	Fushë-Arrës		Prizren				
	Malësi e Madhe		Suharekë				
	Vau i Dejës						
	Shkodër						

The size of settlements in the basin is generally very small (about 90% of all settlements in Kosovo\*, North Macedonia and Montenegro count less than 2,000 people); nevertheless, almost 60% of the Drin population is considered - and accounted for in national statistics - as urban. The three countries are experiencing migration from rural areas and small settlements to urban areas, and abroad<sup>9</sup>.

Kosovo\* is the most densely populated riparian, with 123 people/km<sup>2</sup>. In terms of sub-basins, the White Drin has the highest population (Buna/Bojana and Lake Prespa have the lowest), while the Lake Ohrid has the highest population density (Drin and Lake Prespa have the lowest) (Table 4).

**Table 4.** Population in the Drin River Basin, by country (above) and sub-basin (below)

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017.

Country	Total country population (2011)*	Female population in the Basin	Male population in the Basin	Total population in the Basin	% of population in the Basin	Population density (cap/km <sup>2</sup> )
Albania	2,821,977	300,530	304,102	604,632	37.4%	81
Kosovo	1,739,825	280,262	279,397	559,659	34.6%	123
Greece	10,816,286	688	686	1,374	0.1%	4
FYR Macedonia	2,069,162	88,866	89,000	177,867	11.0%	63
Montenegro	625,883	139,702	134,080	273,782	16.9%	67
<b>Drin Basin</b>		<b>810,049</b>	<b>807,265</b>	<b>1,617,314</b>	<b>100%</b>	<b>84</b>
		<b>50.1%</b>	<b>49.9%</b>			
* Except FYR Macedonia 2015						

Sub-basin	Population	% of Population in the Basin	Population density
Lake Prespa	47,732	3.0%	41
Lake Ohrid	120,122	7.4%	201
Black Drin River	305,415	18.9%	69
White Drin River	542,675	33.6%	126
Drin River	230,908	14.3%	56
Lake Skadar/Shkoder	320,272	19.8%	75
Buna/Bojana River	50,098	3.1%	111
<b>Drin Basin</b>	<b>1,617,222</b>	<b>100%</b>	<b>84</b>



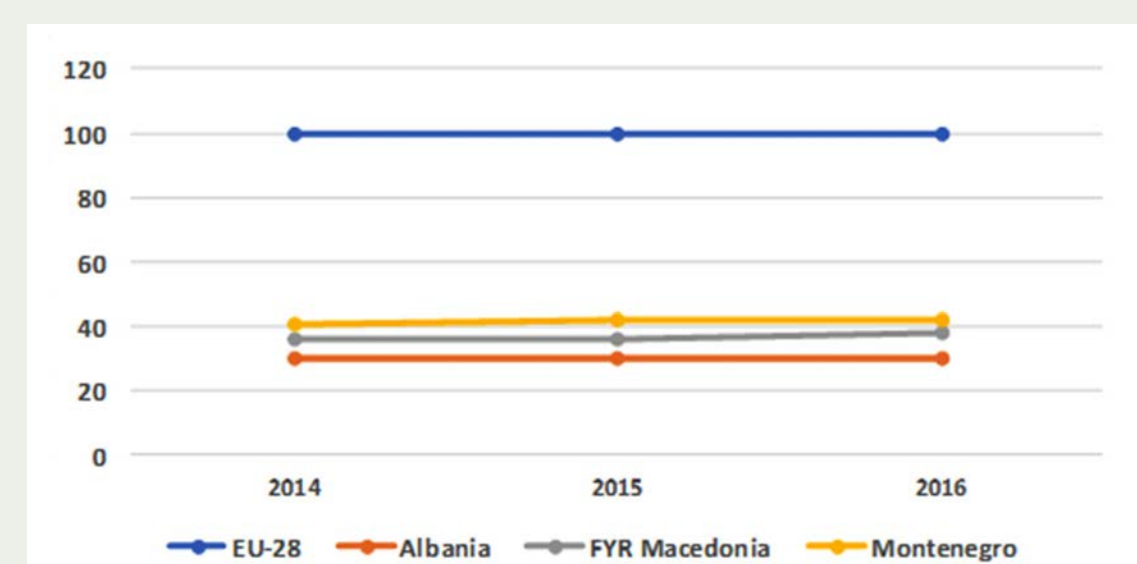
<sup>9</sup> Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017.

## 2.3 Socio-economic situation

*Different regions inside the Drin basin area may have different economic profiles and levels of socio-economic development that may emerge in statistics when comparing different levels of geographical aggregation. For instance, while it is true that the economy of the Albanian part of the basin contributes overall to 20% of the national GDP (and counts for roughly 20% of the total country population), three out of the six regional districts are among the least developed in the entire country.*

Significant differences can also be found looking more broadly at the Riparians in the totality of their administrative borders (i.e. beyond the basin). While the region overall has living standards well below its European neighbours (the GDP at PPP value is around 30-50% of EU average (Figure 5)), Albania and North Macedonia have a much higher GDP than Montenegro and Kosovo\*; Kosovo's\* and North Macedonia's GDPs are growing at the fastest rate; and the highest GDP/capita is found in Montenegro and North Macedonia (Table 5).

The countries of South East Europe are often described as "transition economies" because of the structural changes that their economy has been undergoing since the breakup of Yugoslavia in the '90s (from centrally planned to market based). Such transition has been influencing not only the economic sphere but also institutions and society, with important implications on the governance of natural resources.



**Figure 5.** GDP per capita, PPP (EU 28= 100)

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017 (data from Eurostat).



**Table 5.** GDP data of Drin River Basin Riparians

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017

Drin Basin: GDP on a state level at current prices; mill EUR (2011 - 2015)					
Country	2011	2012	2013	2014	2015
Albania	9,268	9,539	9,629	9,952	10,150
Kosovo	4,815	5,059	5,327	5,567	5,807
FYR Macedonia	7,544	7,585	8,150	8,562	9,061
Montenegro	3,264	3,181	3,362	3,457	3,624

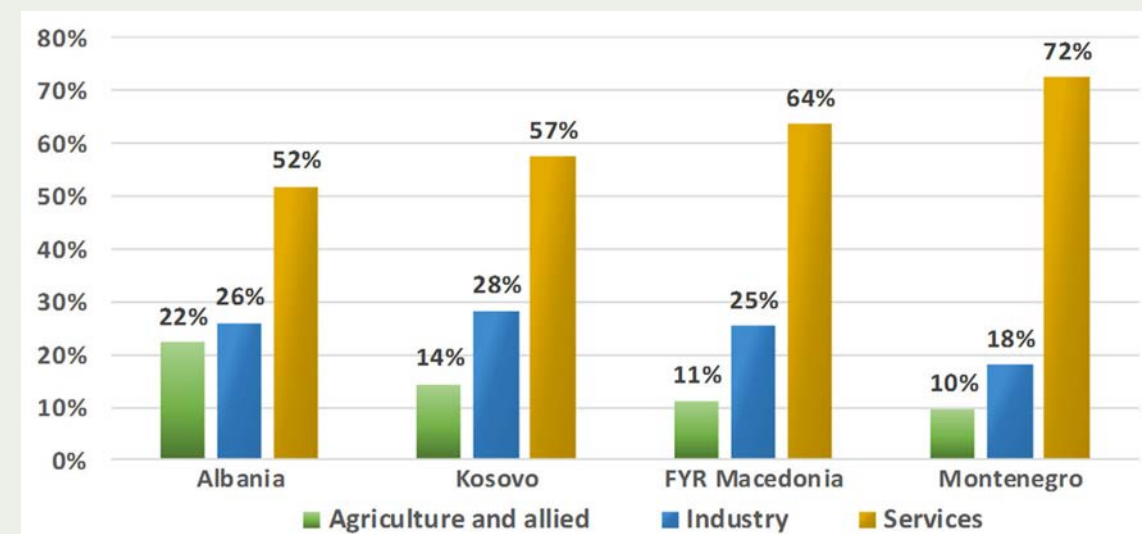
Drin Basin: GDP real growth rate (2011 - 2015)					
Country	2011	2012	2013	2014	2015
Albania	2.5%	1.4%	1.0%	1.8%	2.2%
Kosovo	4.4%	2.8%	3.4%	1.2%	4.1%
FYR Macedonia	2.3%	-0.5%	2.9%	3.6%	3.8%
Montenegro	3.2%	-2.7%	3.5%	1.8%	3.4%

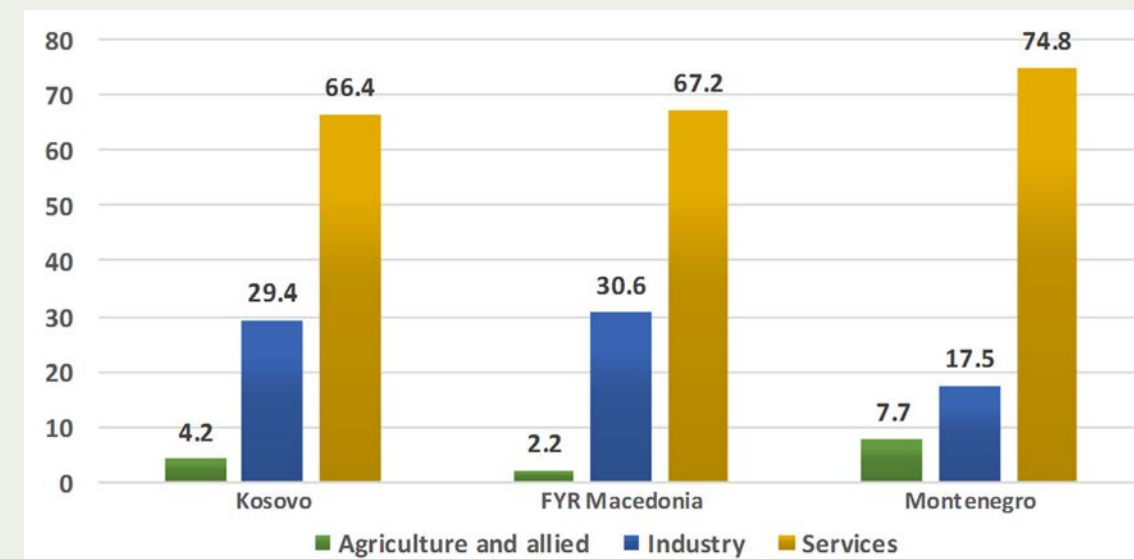
Drin Basin: GDP per capita on a state level at current prices; EUR (2011 - 2015)					
Country	2011	2012	2013	2014	2015
Albania	3,191	3,289	3,324	3,439	3,508
Kosovo	2,672	2,799	2,935	3,084	3,277
FYR Macedonia	3,665	3,680	3,948	4,141	4,377
Montenegro	5,266	5,128	5,415	5,562	5,825

Today, the broad sector of Services is the largest contributor to the economy of all Riparians, followed by Industry and Agriculture (Figure 6). Within the service sector the biggest contribution comes from Wholesale, Retail Trade, Real Estate, and Public Administration, and this holds true in all countries. The biggest industry is Manufacturing in

Kosovo\*, North Macedonia, and Montenegro, whereas in Albania Construction is the major contributor. Other than these two sub-sectors (which are the biggest for all four countries), the energy-related Electricity and Gas gives an important contribution to the economy of Montenegro, and Mining and Quarrying does so in Albania.

**Figure 6.** Structure of Gross Value Added (GVA) by type of economic activity (state level; averages for 2011-2015)

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017

**Figure 7.** Employment by economic activity in Kosovo, North Macedonia, and Montenegro (2016; % of total employment). Note: for Albania, the shares are the following: 41% in services, 19% in industry; 40% in agriculture (Source: World Bank with estimates from ILO). Also note that for North Macedonia ILO estimates are slightly different from the national statistics (54% services, 30% industry, 16% agriculture)

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017 (data from statistical agencies)

All countries rely to some extent on Foreign Direct Investments (FDIs), which inflow contributes to high shares of GDP (particularly in Montenegro (12%) and Albania (8-9%)). FDIs, mainly coming from the EU, have been an important resource for the economies of all Riparians since the starting of the transition period. These have been actively supported by development agencies because seen as a means to boost the development of key sectors across the whole spectrum of the economy (e.g. from mining to financial intermediation).

The labor market is characterized by remarkably high levels of unemployment (particularly in Kosovo\* and North Macedonia), high inactivity rates (particularly in Kosovo\*), and big gender gaps in employment. Those who are employed work for the major part in Services and Industry (coherently with sectoral GVA contribution) (Figure 7), and the highest wages are concentrated in the sectors of Electricity Production, Information and Communication Technologies, Finance and Insurance, and Real Estate (specificities also exist: Mining and Quarrying in Albania, Transport for Albania and Kosovo\*, and Public Administration in North Macedonia).

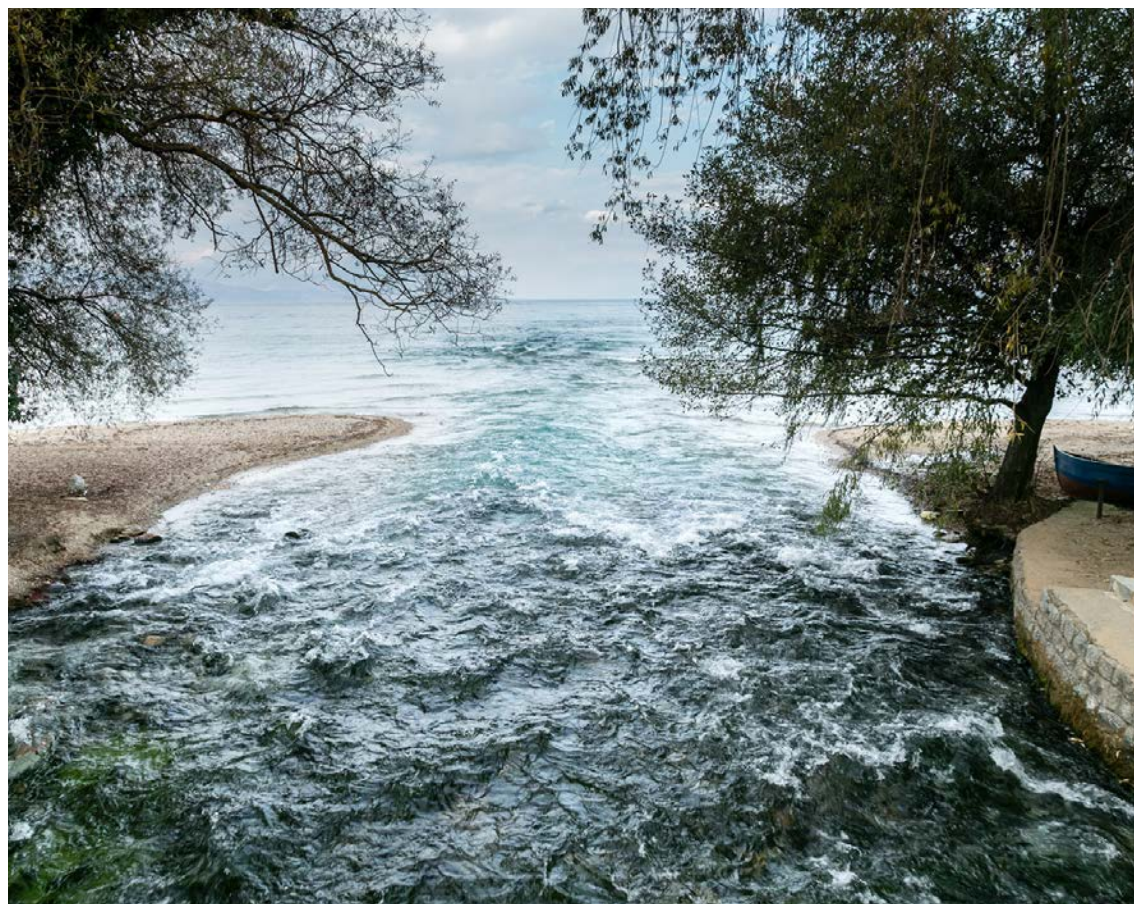
The current trend of socio-economic development of the region is well synthesized in the thematic report on the socio-economy of the Drin River Basin, which states that: “all four Balkan countries whose parts of territories comprise the Drin River Basin are developing economies, with moderate GDP per capita output, relatively high income/wealth distribution inequalities and high unemployment rates. On the other hand, on their way to join the EU<sup>10</sup>, over the past two decades the countries have undergone far-reaching changes driven by democratic, societal and economic reforms and as well have experienced stable and increasing economic growth trend, albeit also at moderate rates. Finally, the Riparians are also continually developing and implementing strategies to reduce unemployment, alleviate poverty and draw alongside the emerging worldwide consensus regarding the need for more socially-inclusive economic growth”.

<sup>10</sup> Albania, North Macedonia and Montenegro are EU candidate countries; Kosovo is EU potential candidate country.



# 3 Overview of the natural resources, availability and uses

This chapter illustrates the resources available at country and basin level (where relevant) in terms of energy, land, and water. Furthermore, it includes a description of ecosystems in the basin and the key services they provide.



## 3.1 Water resources

Due to the physical and climatic characteristics of the region, the four Riparians rely on sufficient amounts of water resources to satisfy their needs (i.e. they are not naturally water-scarce) and the Drin basin is an important source of water (Table 6). Table 7 shows the average water discharge measured in the Drin and its main tributaries. Depending on the specific meteorological and elevation conditions, the annual precipitation in the basin varies from 515 mm (Mirusha) to over 3000 mm (Cijevna and Shala Rivers)<sup>11</sup>.

**Table 6.** Water resource in the countries and importance of basin's water resources

Source: FAO Aquastat; \*National expert, from National strategy on water

	Total internal renewable water resources (km <sup>3</sup> /year)	Total renewable water resources (km <sup>3</sup> /year)	Total dam capacity (km <sup>3</sup> )	Basin water resources as % of total country water resources
Albania	2.35	30.2	4.03	N/A
Kosovo*	N/A	N/A	N/A	N/A
North Macedonia	5.4	6.4	2.29	26% of total surface water*
Montenegro	N/A	N/A	1.03	N/A

**Table 7.** Area and average discharges of Drin sub-basins

Source: GWP-Med, Thematic Report on Hydrology and Hydrogeology of the Extended Drin River Basin, 2018

Sub-basin	Area of sub-catchment (km <sup>2</sup> )	Average discharge at outflow (m <sup>3</sup> /sec)	Total Annual Runoff (M m <sup>3</sup> )
White Drin	4,383.3	63.50	2,002.4
Lake Prespa	1,391.6	14.51	457.7
Lake Ohrid	2,792.4	32.80	1,034.3
Black Drin	6,204.8	102.86	3,243.8
Drin	14,656.8	338.28	10,667.9
Skadar/Shkoder	5,342.5	350.90	11,065.9
Buna/Bojana	20,361.3	701.87	22,134.1
Drin (Lezha)	412.4	12.83	404.7

11 GWP-Med, Thematic Report on Hydrology and Hydrogeology of the Extended Drin River Basin, 2018



Water uses, infrastructure, and networks

The major uses of water in the basin are<sup>12</sup>:

- Public water supply
- Agricultural water use (Irrigation, Fish farms)
- Industry
- Hydro-power plants

Of the above uses, hydropower and fish farming stand out as non-consumptive (if we exclude evaporation losses from reservoirs), while the others are considered consumptive (even though some of the water abstracted is returned as wastewater or return flows).

Looking closely at the Drin, there are over 110 reservoirs in the extended basin. Fierza (Albania) is the largest accumulation dam in the basin with 2.7 billion m<sup>3</sup>, followed by Komani (Albania), Vau I Dejes (Albania), Spilje (North Macedonia) and Mavrova<sup>13</sup> (North Macedonia), all of which with accumulation capacities between 0.35 and 0.58 billion m<sup>3</sup> (for a map see section 3.3 of this Chapter and for technical specifications of hydropower plants Annex 1). Altogether, the first three reservoirs - forming the main hydropower cascade of Albania - have a total accumulation capacity of 2.6 billion m<sup>3</sup>, which is greater than the average volume of the Skadar/Shkoder lake<sup>14</sup>. The others are two of the largest reservoirs in North Macedonia<sup>15</sup>. Furthermore, the Perucica

12 GWP-Med, Thematic Report on Hydrology and Hydrogeology of the Extended Drin River Basin, 2018

13 Mavrova is located in an upper tributary of the Black Drin and discharges outside of the basin, in the Vardar River (GWP-Med, Thematic Report on Hydrology and Hydrogeology of the Extended Drin River Basin, 2018)

14 GWP-Med, Thematic Report on Hydrology and Hydrogeology of the Extended Drin River Basin, 2018.

15 Ibid.

dam (0.225 billion m<sup>3</sup>) on the Moraca river hosts one of the two large hydropower plants of Montenegro. There are no large artificial reservoirs in the Kosovo\* part of the basin (though the Radoniq Lake is the second largest in the country).

While these reservoirs have been built for irrigation or hydropower purposes, they actually serve a variety of purposes which relative priority can vary. As reported in the Nexus report for North Macedonia: *“certain overlaps exist in the management of larger dams which are intended for irrigation, water supply, flood protection and electricity generation. The priorities in utilization of water resources are defined in the Law on Waters which are not always respected. Water from large dams is often used for electricity generation for covering the peak demands in electricity consumption, compensation of the lack of electricity in case of black-out of thermal power plants or in case of their refurbishment during summer period”*. Despite being a non-consumptive user, hydropower production changes both long term (seasonal) and short term (daily) flows, which determine downstream availability and storage potential.

Domestic water consumption (including tourism and small-scale industry) in the Drin basin reaches 75.5 Mm<sup>3</sup> per year. The daily per-capita water need is 93 liters in Kosovo\*, 95 in Albania, 158 in North Macedonia, 237 in Montenegro. It is noteworthy that the presence of tourism significantly affects this account (in Greece, the daily consumption per capita is 353 liters). Water supply systems are typically centralized, but a part of the population is not connected to public utilities and uses own means to supply water: in Albania and Kosovo\* the water service coverage is around 80% and North Macedonia and Montenegro is 90%; while the amount of water produced privately is 3-5% of the water supplied from centralized systems<sup>16</sup>.

16 Ibid.

Water networks are generally inefficient, and typically issues are related to design, investment, and operations of infrastructure. The actual water consumption can be as low as 15% of the water produced that enters the supply network, while country averages are 40% in Kosovo\* and Montenegro, 36% in Albania and 25% in North Macedonia. Water metering is not widely practiced and sometimes is not in place at all (in Albania, this is the case even in relatively densely populated areas). In some cases, this inefficiency is translated to insufficient supply to users (e.g. in Albania water is supplied on average 14.8 hours per day) even though, as mentioned earlier, in a hydrologically average year the basin's water is enough to satisfy all uses<sup>17</sup>.

17 Ibid.

Water availability in the future

The Report on Hydrology and Hydrogeology to the TDA analyses includes an initial assessment of future water stress until 2050 under three scenarios: business as usual (based on historical trends), climate change (decreased precipitations and increased temperatures), and full development (higher water consumption). While the author underlines the approximations made in the analysis and highlights the need for a more rigorous analysis, two messages are clear:

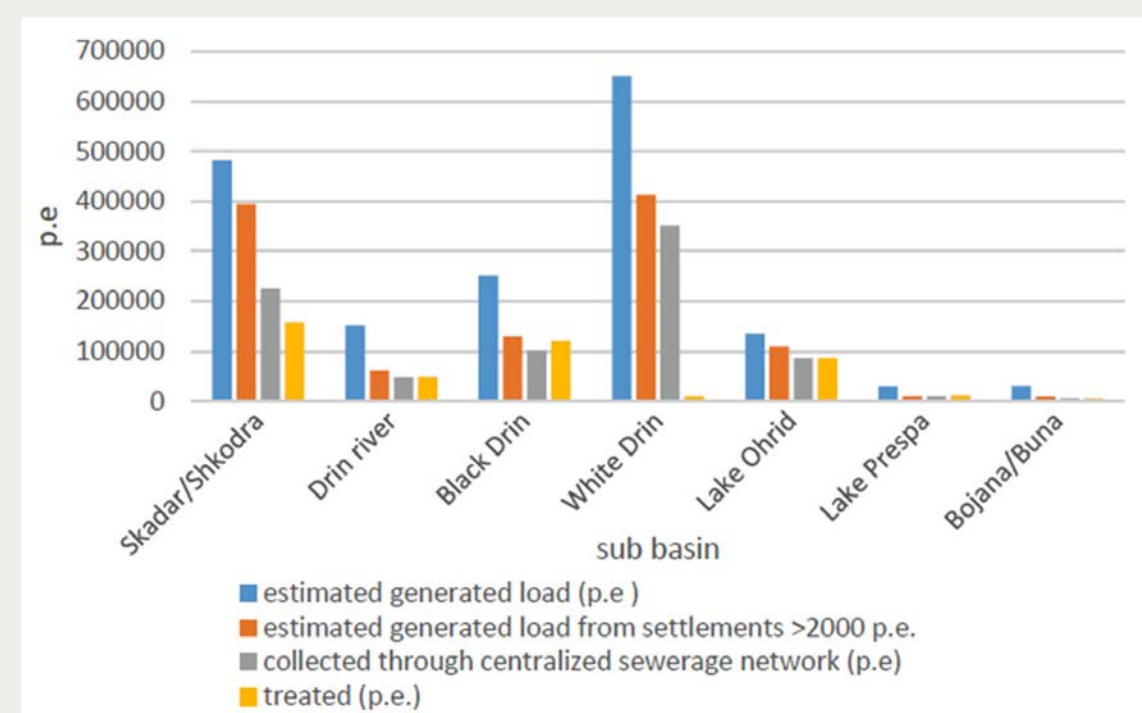
- 1) during irrigation season and July in particular, water consumption reaches high shares of total water availability (in the White Drin this share is 75% in an average year, 85% in a dry year)
- 2) under climate change and full development scenarios, this means a non-negligible risk of water stress in summer months (particularly in the White Drin)

Clearly, since water stress depends on both availability and consumption, an accurate forecasting should be built not only on highly detailed hydro-meteorological data, but also on reliable information on the future of water demand and water infrastructure (for irrigation in particular) in all the Riparians.

It should be noted that all sectors counting on the same water risk being affected, and that in the event of water stress the rule of operation of major dams, and the priority of withdrawals from each reservoir, will be crucial to ensure availability throughout the economy and along the river (including across countries). Given the widespread issue of water inefficiency within utilities, the modernization of the water sector would also emerge a clear mitigation response in all Riparians.



## Water quality and sources of pollution



**Figure 8.** Overall management of the wastewater in the Extended Drin basin (per sub-basins)

Source: GWP-Med, Thematic Report on Pollution in the Extended Drin River Basin, 2018

The water quality of the Drin basin is generally good. In some areas, the water is economically valuable precisely for its qualities: in the region of Debar Municipality (North Macedonia) there are geo-thermal springs of mineral water with healing properties that attracts local tourists<sup>18</sup>.

Still, many threats exist to water quality. The biggest one is untreated municipal wastewater and solid waste. Apart from the Ohrid Lake, wastewater management is unsatisfactory in all sub-basins of the extended Drin River Basin, with the highest BOD registered in the White Drin, Skadar/Shkoder, and Black Drin (Figure 8). Overall, the pollution load from wastewater in the basin is estimated at BOD<sup>19</sup> 13109 tons/year; COD 21384 tons/year; TN 2006 tons/

year and TP 265 tons/year<sup>20</sup>. The presence of tourism exerts extra pressure on water quality (as well as on water demand). Pollution from tourism is particularly visible in the coastal areas like around Lakes Ohrid, Skadar/Shkoder and Prespa, where it generates seasonal loads of liquid and solid waste that typically remains untreated.<sup>21</sup>

Farming is a source of diffuse pollution which cumulative impact ends up having a significant impact on water quality, especially in lakes and nearby intensive farms. The confluence and concentration of nitrates and phosphates from fertilizers, pesticides, and organic manures, which release in water streams is accentuated where soil is prone to erosion. Fish farming also adds pressure on water quality, locally. Most of

<sup>18</sup> North Macedonia Nexus country report

<sup>19</sup> BOD = Biochemical Oxygen Demand; COD = Chemical Oxygen Demand; TN = Total Nitrogen; TP = Total Phosphorous

<sup>20</sup> GWP-Med, Thematic Report on Pollution in the Extended Drin River Basin, 2018.

<sup>21</sup> UNECE Second Assessment of Transboundary Rivers, Lakes and Groundwaters, 2011.

**Table 8.** Estimated number and type of Small and Medium Enterprises that can influence water quality per riparian

Source: adapted from GWP-Med, Thematic Report on Pollution in the Extended Drin River Basin, 2018

	North Macedonia	Kosovo*	Albania	Montenegro
Facilities for the generation and use of nuclear energy;	0	0	0	0
Base and chemical industry, and ferrous and non-ferrous metallurgy facilities;	0	1	0	1
Facilities for the production and processing of oil and gas;	0	0	3	0
Facilities for the generation of heat and energy;	0	0	0	0
Facilities for the production, processing, and enrichment of mineral ores;	0	0	8	1
Facilities for wood processing and the production of cellulose and paper;	0	0	3	0
Facilities for the production and processing of construction materials, glass and stone;	1	1	12	3
Facilities for the processing of textile, leather and fur;	4	1	1	0
Facilities for the production of mineral and synthetic oils;	0	2	0	0
Facilities for the processing of foodstuffs; including salt works;	45	1	20	5
Dairy factories, farms and slaughterhouses;	68	19	8	4
Printing offices and workshops;	0	1	0	0
Plants for galvanization and formulation of chemical substances;	0	8	1	0
Health centres;	5	0	3	3
Workshops for the processing of plastic;	0	1	1	0
Bus and railway stations;	6	0	8	3
Concrete and asphalt bases;	2	1	3	3
Local boiler rooms with steam distribution installations.	0	2	0	3
Significant hotels or restaurants	67	2	0	50
Centres for recreation;	18	10	0	0
Other facilities with impact on the water regime	1	0	8	2

the agricultural effluents are discharged in the White Drin sub-basin \*40%) and the Skadar/Shkoder (22%)<sup>22</sup>.

Table 8 shows the estimated number and type of small and medium facilities which discharges can affect water quality in the Riparians. As can be seen, most of these are activities are related to agriculture and recreation.

<sup>22</sup> GWP-Med, Thematic Report on Pollution in the Extended Drin River Basin, 2018.

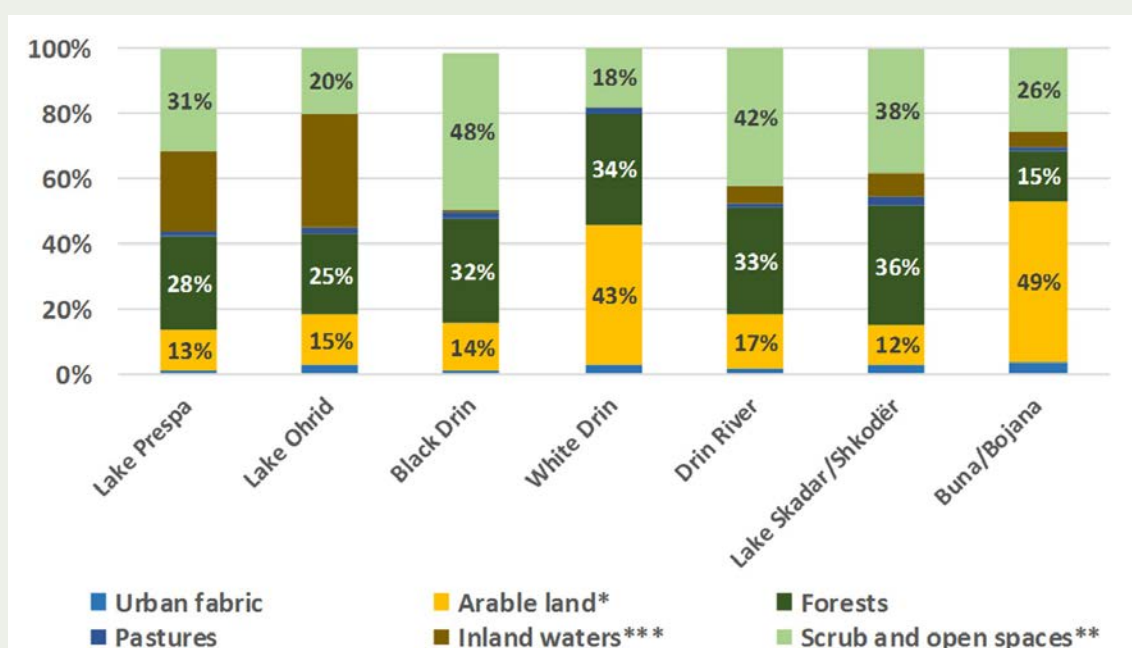
Pollution from large industry cannot be quantified due to lack of information and specific data on discharges, however the TDA - thematic report of pollution provides an initial mapping of the location of large industry as potential polluters. Pollution from mining is reported as a threat in some sub-basins (the Drin, Lake Ohrid, and to a lesser extent Skadar/Shkoder)<sup>23</sup>.

<sup>23</sup> UNECE Second assessment of Transboundary Rivers, Lakes and Groundwaters, 2011.



## 3.2 Land resources

Knowing the extent and distribution of different types of land resources is useful to determine the relative importance of land-related ecosystem services and land resource dependant activities. According to the European Environment Agency's CORINE programme, the land cover of the Drin River Basin is for the most part made of Forests and Scrub and Open Spaces (33% and 36% respectively), and Arable Land covers about 20% of the basin area. Notably, all Riparians and all sub-basins have comparable shares of Forests (between 30 and 40%), whereas Arable Land is the dominating land cover type only in Kosovo\*, in the White Drin, and in the Buna/Bojana sub-basins (Figure 9).



Country	Urban fabric	Arable land*	Forests	Pastures	Inland waters***	Scrub and open spaces**
Albania	1.43%	17.19%	28.78%	1.50%	5.37%	45.59%
Kosovo	2.41%	41.71%	32.71%	1.54%	0.41%	21.39%
Greece	1.10%	9.83%	25.69%	0.40%	24.52%	38.47%
FYR Macedonia	1.09%	15.43%	38.07%	1.22%	14.93%	29.19%
Montenegro	2.68%	12.37%	36.72%	2.98%	7.86%	37.32%
<b>Total</b>	<b>1.86%</b>	<b>21.25%</b>	<b>32.83%</b>	<b>1.76%</b>	<b>6.67%</b>	<b>35.58%</b>

\* Includes: Arable land; Heterogenous agricultural areas; Permanent crops

\*\* Includes: Scrub and/or herbaceous vegetation; Open spaces w/ little or no vegetation; Mine, du

\*\*\* Includes natural Lakes Ohrid, Prespa and Skadar/Shkodra

**Figure 9.** Shares of land cover types by sub-basin (CORINE) (above) and by riparian (below)

Source: GWP-Med, Report on Socio-Economics of the Extended Drin River Basin, 2017

There are about 450,000 ha of agricultural land in the Drin basin area, 43% of which is concentrated in Albanian territory, and only 5% in Montenegro. Agricultural Land is basically half Cultivations and half Pastures in Albania, while Pastures are prevalent in North Macedonia and Cultivations are dominant in Kosovo\* and Montenegro.

Further breaking down the Cultivation category, we see that most of the basin's cultivated land consists of Arable Land (66%) and Meadows (27%), while Orchards and Vineyards amount together to a mere 6%. Meadows are the dominant category of cultivated land in Montenegro (Table 9), and Orchards reach a 7% in North Macedonia (notably with irrigated apple and cherry plantations).

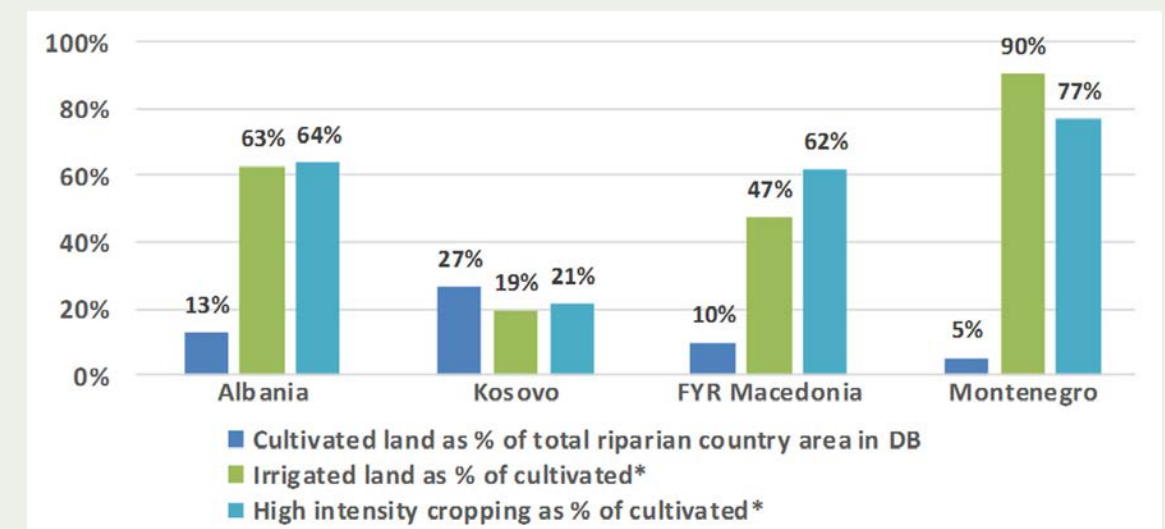
**Table 9.** Types of cultivated land in the Drin River Basin, shares by country

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017

Country	Cultivated land	Category of use as % of cultivated land			
		Arable land and gardens	Orchards	Vineyards	Meadows
Albania	94,993	81.5%	3.4%	2.8%	12.2%
Kosovo	121,427	66.0%	1.8%	2.6%	29.5%
FYR Macedonia	28,072	64.6%	7.1%	3.0%	25.3%
Montenegro	22,005	10.3%	0.3%	1.7%	87.7%

The dependency of Riparians on the basin's land for agricultural production is represented by the first series of bars in Figure 10: almost one third of Kosovo's Cultivated Land lies in the basin, whereas for the other countries this share is smaller, with Montenegro at 5%. Yet, in Montenegro most of the land in the basin is irrigated and associated with high intensity of cropping (and in turn higher fertilizer application rates), while on the other hand around 80% of agriculture production in Kosovo\* is rainfed and low intensity.

Soil degradation and loss of fertile soil are a common problem in the region, adding to natural factors like occurrence of intensive rains, and resulting in increased erosion along coastlines and riverbanks. Yearly soil losses – at country level - 17.1 million m<sup>3</sup> in North Macedonia, and over 2 million m<sup>3</sup> in Montenegro (where most slopes are in naturally steeper and do not allow for intensive agriculture to take root). In Albania, the yearly rate of soil lost is estimated at 16.4 t/ha.



**Figure 10.** Cultivated land ratios (\*excluding meadows)

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017

## Agricultural sector: key facts

The average size of agricultural farms in the Drin basin is small, particularly if compared to EU averages (3.9 ha in Kosovo\* – one fourth of the average EU – 1.85 ha in North Macedonia, 1.2 ha in Albania, and 0.5 ha in Montenegro). These small holdings are typically further fragmented into several smaller plots, a characteristic that is generally at odds with efficiency and sustainability.

Agricultural practices are often those characteristic of family-based, subsistence farming, meaning they are associated with relatively low productivity and levels of technological advancement. For instance, the typical family farm does not have little cold storage, which makes it difficult to create a real supply chain for elaborated products or vegetables. Furthermore, a generalized lack of coordination between small farmers prevents aggregation of production and the establishment of modern agri-businesses.

Despite inefficiencies at farm level, today's land (and water) demand from agriculture is not considered unsustainable at basin level. However, agricultural practices have a non-negligible impact on the quality of these resources. For instance, overgrazing, use of monocultures, limited application of organic materials, ploughing of steep slopes, and lack of soil conservation tillage techniques are reported to be an issue in North Macedonia<sup>24</sup>.

It should be noted that the capacity of innovation in agriculture is strongly linked with the age of farmers and the profitability of agriculture, and the new generations are not drawn to agriculture precisely because it is not particularly profitable, hence the sector remains mostly a social/employment buffer.

<sup>24</sup> Macedonia Nexus country report

Agricultural production is highly vulnerable to weather conditions in all countries, although livestock production is less volatile than crop production. A drought in 2012 and heavy rains and floods in 2014 severely affected production in the countries. Despite this, the amount of crop output has increased in all countries in the period 2010-2015<sup>25</sup>. The main crops produced in the countries are (2010-2015 trend of production in brackets):

- **Albania:** vegetables and potatoes (positive), cereals (stable), fruit (negative)
- **Kosovo\*** (largest variation in production): vegetables and potatoes (negative), cereals and fruit (positive)
- **North Macedonia:** vegetables, fruit and grape (positive), cereals (stable), tobacco and potatoes (negative)
- **Montenegro:** all crops (positive) apart from grapes (stable)

In the same period, animal outputs were predominantly positive in Albania and Montenegro while in North Macedonia and Kosovo\* they were predominantly negative. The main animal products from the countries are (2010-2015 trend of production in brackets):

- **Albania:** all livestock and particularly sheep and goats (positive)
- **Kosovo\*:** all livestock except for poultry (negative)
- **North Macedonia:** all livestock except for milk (negative)
- **Montenegro:** all livestock, particularly sheep and goats, and milk (positive)

<sup>25</sup> <http://seerural.org/wp-content/uploads/2017/06/Monitoring-of-agricultural-policy-developments-in-the-Western-Balkan-countries.pdf>

## Forestry sector: key facts

Compared to the rest of the pan-European region, the Balkans is characterized by an under-developed forestry sector that contributes very little to the economy of the countries. This is despite having vast forest resources and a long tradition of forestry.

While there are highly productive forests in the Drin basin – they are located at high elevations in the Morača and Black Drin eco-regions – most of them are “low forests” (which is a definition that comprises coppices as well as forests emerging on abandoned pastures). This means that the bulk of wood production takes place in forests out of the basin area (at least in North Macedonia and Montenegro<sup>26</sup>). Nevertheless, forests in the basin are commonly exploited for timber and fuelwood extraction, especially when it comes to beech, fir, and spruce in the central and northern areas of the basin. As of 2012, forests covered 52% of the basin area. Country reports on the characteristic and status of use of forest resources in Albania, North Macedonia, and Montenegro, are available from FAO<sup>27</sup>.

There are two main trends when it comes to forest land change in the region: deforestation and degradation in some areas (caused by intensive/uncontrolled use, as well as urbanization) and land abandonment in others (forests re-gaining ground). Historical observations with CORINE show that the net result is a minimal change in forest cover in the basin between 2006 and 2012 (-0.5%)<sup>28</sup>, and national statistics indicate increasing forest areas during the period 2005-2015, as reported in Table 10 (though it should be noted that data can be inaccurate, e.g. the latest forest inventory

in Albania was carried out in 2004<sup>29</sup>). When it comes to forest stocks, country statistics report different trends: stable in North Macedonia, increasing in Montenegro and in Kosovo\* (according to a recent inventory report<sup>30</sup>), and decreasing in Albania.

All in all, forest degradation is a commonly observed phenomenon throughout the basin. Forests tend to be overexploited and degraded largely due to illegal, unrecorded, or poorly managed logging, which brings significant economic losses and environmental damage. In Albania authorities have not been able to fight illegal logging and in 2016 had to impose a total ban on logging; according to the Kosovo\* Environmental Action Plan “the result [of inappropriate management of forest] is heavy degradation of forests”<sup>31</sup>. In North Macedonia the wood industry is reported to be facing a shortage of modern technology and very low levels of investment in the sector<sup>32</sup>.

Wood cutting is largely driven by the demand of fuelwood for heating in households, a common practice throughout the region (see section 3.3 of this Chapter) that makes wood energy a key use of forests in the countries. In Montenegro, the wood processing industry is quite big and produces a variety of products, from pulpwood to veneer logs (industrial use), but it also feeds the construction sector (technical use), and households (fuelwood and charcoal: energy use). In 2013 MONSTAT reported wood production as follows: 732,912 m<sup>3</sup> heating wood; 326,649 m<sup>3</sup> for wood industry; and 40 495 m<sup>3</sup> for export (2013)<sup>33</sup>. In Kosovo\*, wood is primarily sold as fuelwood and for construction purposes<sup>34</sup>.

<sup>29</sup> UNECE, 3<sup>rd</sup> Environment Performance Review of Albania, 2018.

<sup>30</sup> GWP-Med, Thematic Report on Biodiversity and Ecosystems, 2017

<sup>31</sup> Kosovo Nexus country report

<sup>32</sup> North Macedonia country reports

<sup>33</sup> FAO, Global Forest Resource Assessment of Montenegro, 2015 <http://www.fao.org/forest-resources-assessment/current-assessment/country-reports/en/>

<sup>34</sup> Kosovo Nexus country report





**Table 10.** Forest resources by riparianSource: UNECE, *Forests in the ECE Region, 2015*

Total forest and other wooded land (thousand ha)					(% of land area)	
	2000	2005	2010	2015	2010	2015
Albania	1,030.5	1,043.0	1,043.0	1,237.2	36	43*
Montenegro	744.1	744.1	964.3	964.3	72	72
North Macedonia	1,101.0	1,118.0	1,103.4	1,130.5	43	44
Kosovo*	N/A	N/A	N/A	N/A	N/A	N/A
Total growing stock (million m3)						
Albania	75	59	52	52		
Montenegro	73	73	121	121		
North Macedonia	79	76	76	76		
Kosovo*	N/A	N/A	N/A	N/A		
Commercial/available for food supply (million m3)						
Albania	59	57	50	50		
Montenegro	68	68	105	105		
North Macedonia	79	76	76	76		
Kosovo*	N/A	N/A	N/A	N/A		

\* Note that UNECE, 3<sup>rd</sup> Environmental Performance Review of Albania reports an estimated loss of forest cover of 20% in the past 25 years.

In North Macedonia too, internally produced wood is most commonly used as fuelwood and very little is used as technical wood, although "in recent years there has been growing interest in the cultivation of fast-growing trees for industrial needs"<sup>35</sup>.

A net exporter of wood, Montenegro also valorizes its forests through the commercialization of non-timber products, such as berries and honey. It is estimated that non-timber forest products generate about 28% of the income of rural households, and forest are undoubtedly a key asset for tourism in the country (eco-tourism, but also in general tourism linked to outdoor sports and nature)<sup>36</sup>.

Mismanagement issues of forests is the main driver of forest degradation in the region. Even in Montenegro, which is the riparian that is capitalizing the most on forest assets: "It is known that significant

quantities of forest products are extracted illegally (without concessions, permits and supervision), but due to the state of information, it is not possible to provide an estimate. Most of this is done by private owners for purposes of extracting fuelwood, but it is known that concession holders often misuse their allowances and extract quantities above set quotas, without implementing protection and management measures."<sup>37</sup>

Finally, beyond human-induced changes, forests in the region are also subject to natural threats such as forest fires, forest decay (caused by climate change) and attacks by harmful insects and diseases<sup>38</sup>. Forest fires are bringing significant damage (as reported by the European Forest Fires Information System<sup>39</sup>) and are exposing the inadequacy of fire management systems in the countries.

37 Nexus report, Montenegro (2017)

38 North Macedonia Nexus country report

39 <http://effis.jrc.ec.europa.eu/reports-and-publications/annual-fire-reports/>

35 North Macedonia Nexus country report

36 UNECE Drina Nexus Assessment Report, 2017

### 3.3 Energy resources

*The Drin Riparians (and the Western Balkan region more in general) is endowed with a variety of energy resources. However, none of the Riparians is entirely self-sufficient when it comes to energy, and imports are vital in some cases (see Chapter 5). This is mostly because the primary energy system of all countries is characterised by a high dependency on fossil fuels.*

Albania has the largest oil and gas reserves in the Western Balkans region and it "rates as one of Europe's richest countries in onshore hydrocarbon reserves"<sup>40</sup>, with proven oil reserves at 168.3 million barrels and proven gas reserves at 821.2 million cubic meters<sup>41</sup>. The other Riparians have no or insignificant oil and gas reserves: they depend on import for oil products, although some exploration is ongoing<sup>42</sup>. Coal, on the other hand, is available and extracted in all countries (in Kosovo\*, and to a lesser extent in North Macedonia and Montenegro, coal constitutes the large part of primary energy production)<sup>43</sup>.

Endowment of renewable energy sources is more uniform, although there are also significant differences among countries (Table 11). For instance, North Macedonia has a much higher wind potential than the others; geothermal is only present in Albania and Montenegro; in Kosovo\* most of the hydropower potential is for small installations<sup>44</sup>. Apart from hydropower, most of the renewable energy potential in the region remains untapped.

**Table 11.** Technical potential of renewable energy by source (MW)Source: IRENA, 2017. *Cost-competitive renewable power generation: Potential across South East Europe.*

	Hydro	Solar PV	Wind	Biomass	Geothermal
Albania	4,813.0	2,378.2	7,483.1	1,832.0	1.4
North Macedonia	840.0	4,648.0	20,869.1	850.0	N/A
Kosovo*	494.8	581.3	2,328.8	115.0	N/A
Montenegro	2,040.0	722.5	2,936.0	198.0	1.4

40 <https://emerging-europe.com/news/albanias-economy-not-benefiting-from-largest-oil-reserves-in-region/>

41 CIA, The World Factbook <https://www.cia.gov/library/publications>

42 In Montenegro, a program of research of oil and gas in the Adriatic has been initiated, as based on initial studies, significant quantities are expected to be found. At the moment, off shore explorations are in initial phases.

43 GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017

44 IRENA, 2017. Cost-competitive renewable power generation: Potential across South East Europe





## Energy sector: key facts

Today, the Drin Riparians have high levels of the energy intensity (calculated as the ratio between energy consumption and GDP). Coherently with the regional trend of the Western Balkans, energy consumption is increasing: in the past 10 years, the four Riparians as a whole experienced a 4% increase<sup>45</sup>.

As anticipated, primary energy in the region is produced mainly from coal and crude oil

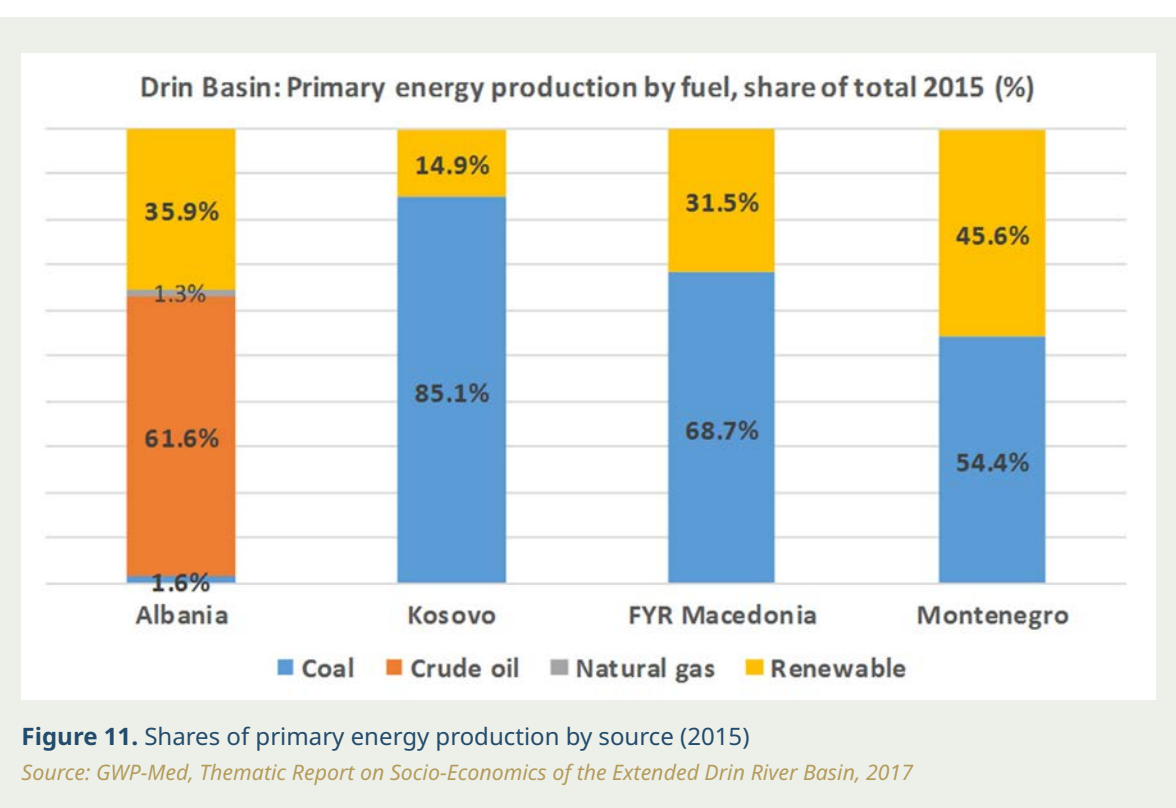
<sup>45</sup> International Energy Agency website, Data and Statistics

(71.5% taking into account all countries). The remaining 28.5% comes from renewable energy, largely in the form of biomass and hydropower (Table 12). The countries' profiles of primary energy have some similarities. None of the countries own nuclear power, and they use very low levels of natural gas. On the other hand, three of them rely quite significantly on coal, which they produce – the exception is Albania, mainly a crude oil producer (Figure 11).

**Table 12.** Shares of primary renewable energy production by source (country level) (average 2011-2015)

Source: GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017

	Hydropower	Biomass	Solar	Geothermal	Wind
Albania	61.8%	30.2%	1.7%		
Kosovo*	4.5%	95.4%			
North Macedonia	40%	53.7%	0,5%	2%	2.6%
Montenegro	39.3%	60.7%			



When it comes to the power sector there are also some common characteristics between Riparians. The main sources of power production are hydro and coal. The first constitutes 100% of the total production in Albania, the

second 97% in Kosovo\*, and together they make up the almost totality of production in the other two countries (in North Macedonia, there is also a little production from natural gas, oil, and other renewables) (Table 13).

**Table 13.** Electricity production by riparian (2014)

Source: World Bank database

	Electricity production	Sources of electricity production (% of total)				
	Terra watthours	Coal	Natural gas	Oil	Hydropower	Renewables
Albania	4.7	0.0	0.0	0.0	100.0	0.0
Kosovo*	5.4	96.9	0.0	0.3	2.8	0.0
North Macedonia	5.4	69.5	3.6	2.8	22.5	1.6
Montenegro	3.2	44.8	0.0	0.0	55.2	0.0

It should be noted that while biomass counts as a (renewable) primary energy source, unsustainable forestry practices may undermine this categorization. In Montenegro and North Macedonia, most of the production of fuelwood extracted from natural forests takes place outside the basin area (see forest resources in Chapter 3.3).

All Riparians aim at increasing their share of renewable energy, either to diversify the production mix (this is particularly important for Kosovo\* and Albania who rely almost entirely on one source of energy for electricity production) or to comply to international agreements. For instance, as members of the Energy Community, countries are obliged to meet mandatory renewable energy targets for 2020. In this framework, Riparians are looking at wind, sun, biomass, small hydro and geothermal – the potential of all of them is largely untouched – but hydropower remains undoubtedly a strategic energy asset for the countries because it can be used to produce baseload power as well as to balance the fluctuations of other renewables that are variable (wind and solar).

There are high losses in electricity distribution systems of the countries (in Montenegro, they reach up to 50%), and low efficiency of the existing electricity generation infrastructure<sup>46</sup>. Furthermore, at least in Albania, missed revenues and episodes of thievery remain great obstacles for power companies: these compromise their ability to improve service and increase production as well as the ability of the country to attract investor<sup>47</sup>.

When it comes to affordability, is worth noting that household electricity prices in the Drin countries are very low especially if compared with European countries (though, when considering purchasing power, this difference is substantially reduced)<sup>48</sup>. At the same time, low electricity tariffs can weaken the financial sustainability of utilities and their ability to modernize and improve services<sup>49</sup>.

<sup>46</sup> Montenegro Nexus report (2017)

<sup>47</sup> Albania Nexus report (2017)

<sup>48</sup> <https://ec.europa.eu/eurostat/documents/2995521/8489679/8-29112017-AP-EN.pdf/600c794f-c0d8-4b33-b6d9-69e0489409b7>

<sup>49</sup> In Albania for instance: <https://serbia-energy.eu/albania-no-change-price-electricity-2017/>

## Energy in the Drin River Basin: hydropower and biomass

Energy resources are typically accounted for at national level, and there are no estimates of energy potential for the basin area specifically. At present, the basin resources provide mainly for hydropower (electricity) and biomass (heat). In terms of fossil fuels, there are no oil and gas extraction activities in the basin, however some coal mining takes place at least in the Macedonian part<sup>50</sup> (coal mining in Montenegro takes place outside the basin area in Pljevlja and Berane, in the north of the country). Non-hydro renewable energy (e.g. wind and solar) is exploited only at small scale in the basin region.

As of today, there are four large hydropower plants (> 100 MW), three medium ones (> 20 MW) and 22 small ones (> 1 MW) in the Drin basin. Table 14 summarizes the main production of hydropower (current and potential) in the basin, Figure 12 shows the location of the key large hydropower plants in the basin, and Figure 13 shows the myriad of potential projects that have been proposed there (although, it should be noted, only few of them have actually been approved for construction and there is generally a strong opposition to hydropower development (see section 3.3 of this Chapter and Chapter 6)).

**Table 14.** Large and medium hydropower in the Drin River Basin

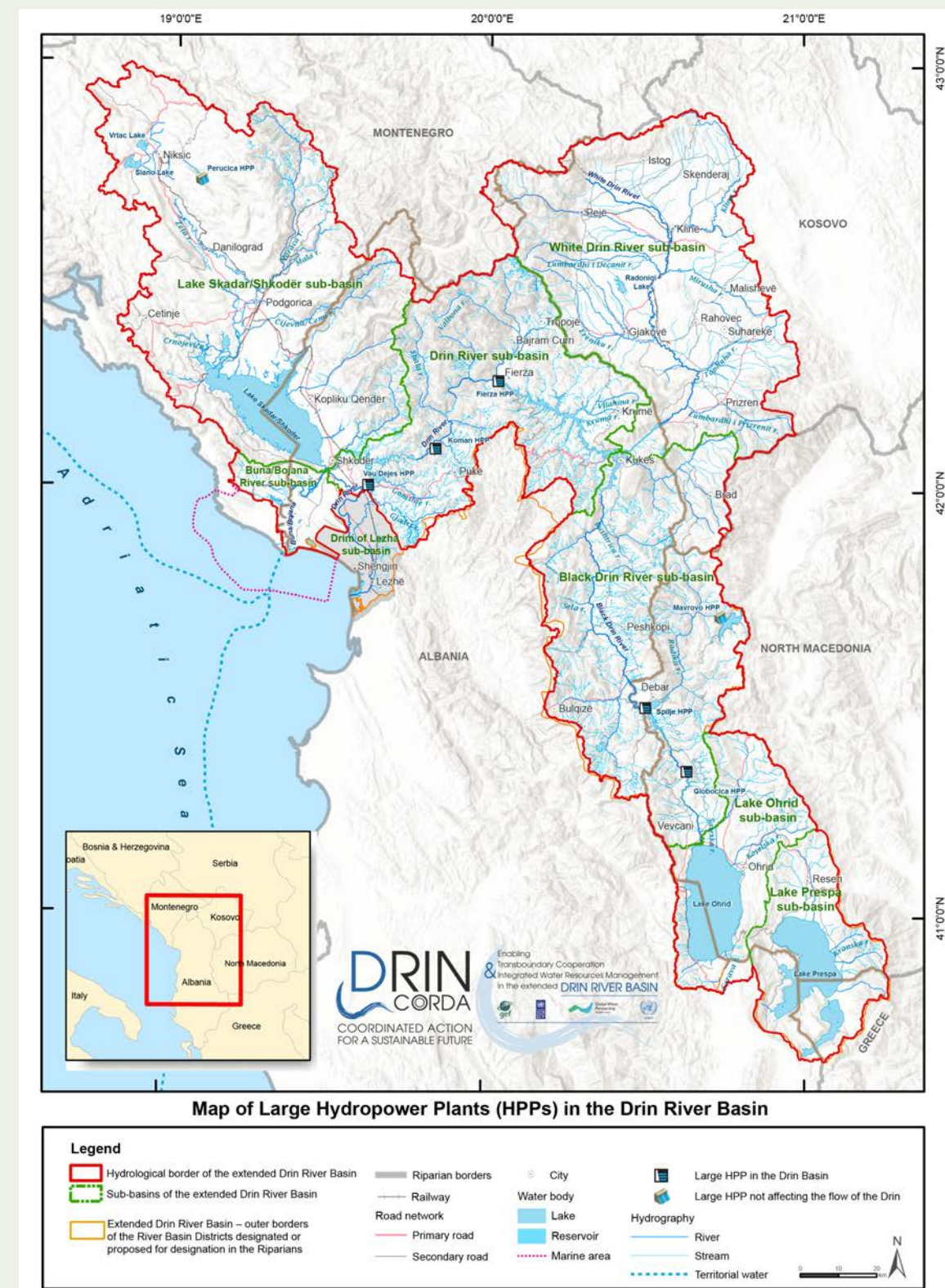
Sources: GWP, Situation Analysis (2014); WBIF, Regional Master Plan Development Study (2017) and Inventory of Planned hydropower plant projects, Background paper No. 7 of the Regional Strategy for Sustainable Hydropower in the Western Balkans (2017)

	Large and medium HPPs in the basin	Basin hydropower installed capacity as % of country totals	Total hydropower capacity installed in the country	Plans for large hydro in the basin <sup>51</sup>	Hydropower potential in basin as % of country total
<b>Albania</b>	Cascade of three dams: Fierza (500 MW), Koman (600 MW) Vau Dejes (250 MW); Ashta I and II (48.2 MW)	76%	1,824 MW	Several. The largest is Skavica plant after the confluence of the White Drin and Black Drin (132 MW)	N/A
<b>Kosovo*</b>	-	~0%	57 MW	Not concrete, as of today. Zhur and Vermica on the Drin (both unlikely to materialize).	N/A (Large hydro potential not high)
<b>North Macedonia</b>	Cascade of two: Globocica (42 MW) Spilje (84 MW) Movrovo system* (200 MW)	20%	610 MW	Not concrete, as of today. Lukovo Pole and Boskov Most (both projects withdrawn)	N/A
<b>Montenegro</b>	Perucica (307 MW)	46.6%	676 MW	Cascade of dams along Moraca river (total 238.4 MW)	42%** 676 MW

Source: \*[http://www.elem.com.mk/?page\\_id=1840&lang=en](http://www.elem.com.mk/?page_id=1840&lang=en); \*\* Montenegro Strategy for Development of Energy Sector until 2025

<sup>50</sup> Other mining in the Drin River Basin: in the Black Drin (North Macedonia): Stogovo (manganese mine, closed mine which Government intends to re-open), Tajmiste (closed iron mine which Government intends to re-open), Debar (gypsum mine).

<sup>51</sup> For a detailed list of all proposed projects, refer to the WBIF inventory of Planned hydropower plant projects, available at: <https://www.wbif.eu/content/stream/Sites/website/library/WBEC-REG-ENE-01-BR-7-HPP-Inventory-05.12.pdf>

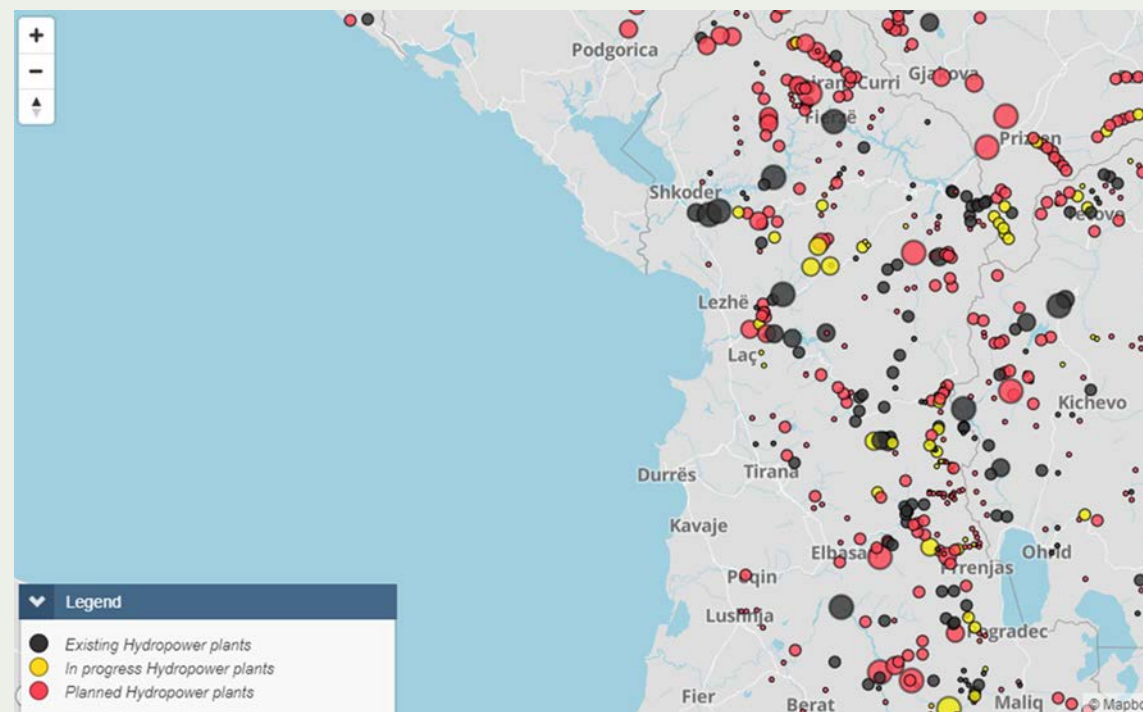


**Figure 12.** Large Hydropower Plants (HPPs) in the Drin River Basin

Note: The Movrovo HPP discharges in the Vardar River Basin. The Perucica HPP is on the Morača which discharges in lake Skadar/Shkoder and does not affect the flow of the Drin.

Source: GWP-Med





**Figure 13.** Map of existing and planned hydropower in the region of the Drin River Basin

Source: Riverwatch website (<https://riverwatch.eu/>)

Small hydro is being exploited in all Riparians, in many cases without appropriate control and resulting in significant speculations (made possible by the lack of stringent environmental and social regulations required for small infrastructure). Opposition to small hydropower has been growing in the whole Western Balkan region, resulting in major environmental campaigns such as “Save the Blue Heart of Europe<sup>52</sup>”, which also produced an “Eco-Masterplan” for Balkan Rivers. Nevertheless, more small hydro is planned all across the Basin, particularly in mountainous areas that offer rather high-water heads (80-300 m) and low discharges (0,1-2 m<sup>3</sup>/s), for instance in the Morača, in the Albanian Alps/Prokletije, and in the Black Drin basin.<sup>53</sup>

According to the International Hydropower Association, most of the hydropower projects that will be realised in the Western Balkans will be small (less than 10 MW) or focus on the

modernization/retrofitting of existing infrastructure<sup>54</sup>. Hydropower development in the basin, and the wider region, is limited by a lack of financing and public opposition.

Future projects in the Drin basin are evaluated in the ‘Regional Hydro Master-Plan (Hydropower Development Study in the Western Balkans)’ of the Western Balkans Investment Framework (WBIF). This is an initiative of the European Commission, EBRD, World Bank, and others, which objective is *“to contribute to fostering the harnessing of environmentally and climate change sustainable hydropower generation in the Western Balkans region in line with the strategic objectives of the European Union and the Energy Community Treaty obligations of its Contracting Parties”*<sup>55</sup>

<sup>54</sup> <https://www.hydropower.org/country-profiles/western-balkans-albania>

<sup>55</sup> <https://www.wbif.eu/content/stream/Sites/website/library/WBEC-REG-ENE-01-Regional-Hydropower-Masterplan-ToR-Final.pdf>

<sup>52</sup> <https://blueheart.patagonia.com/>

<sup>53</sup> GWP-Med, Thematic Report on Hydrology and Hydrogeology of the Extended Drin River Basin, 2018

While the bulk of the wood production of the countries takes place out of the basin area, the basin’s forests are commonly exploited for fuelwood (see 3.2), the consumption of firewood in households is a characteristic of the area, where it is driven mainly by an issue of affordability of alternative fuels, as well as habits and tradition. As reported in the country Nexus report of Montenegro, “fuelwood represents the main source of energy and, in some cases, of income”. Wood is commonly consumed as firewood, but wood pellets are also becoming more and more widely used<sup>56</sup>. While there might be differences between countries, the Regional Environmental Centre’s Regional Action Plan “Illegal Logging in South Eastern Europe” from 2012<sup>57</sup> identifies a few common facts for the whole region (reported as stated):

1. Consumption of firewood is most significant in rural areas; especially where other sources of energy are scarce.
2. Firewood is collected and consumed mainly by rural households, although some urban areas use firewood in significant amounts throughout the year for heating and cooking (e.g. in Albania [...] and Kosovo\*).
3. Levels of firewood use are high but decreasing gradually. The slow trend, however, is unable to offset current pressures on forestry resource in the short and medium term, as overall demand for firewood, in absolute terms, is high.
4. One of the main incentives for illegal logging is that official consumption estimates are lower than actual consumption.
5. With a few possible exceptions, the main sources of firewood are public forest estates.
6. Shortage of alternative energy sources (irregular or insufficient electricity supply, for instance) triggers excessive use of forests.

Often wood is burnt in inefficient stoves for which the user prefers wet wood – hence the energy efficiency of the stoves is very low, and much more wood is used than theoretically required if the wood would be prepared, dried and split properly.

For a large share of the population fuelwood effectively ensures the energy security in the household. Even in Albania where authorities have imposed a total ban on (industrial) logging, the cutting of wood for own consumption remains excluded. Furthermore, production of fuelwood in the region is also driven by export, most importantly for the EU market (see Chapter 5).

<sup>56</sup> UNECE, Forest Products Annual Market Reviews <https://www.unece.org/forests/fpamr.html>

<sup>57</sup> [http://illegallogging.rec.org/publications/publications/2ActionPlanIllegalLogging\\_A4.TEMPLATE%20FINAL\\_30%2003%202012.pdf](http://illegallogging.rec.org/publications/publications/2ActionPlanIllegalLogging_A4.TEMPLATE%20FINAL_30%2003%202012.pdf)





## 3.4 Environment and Ecosystems

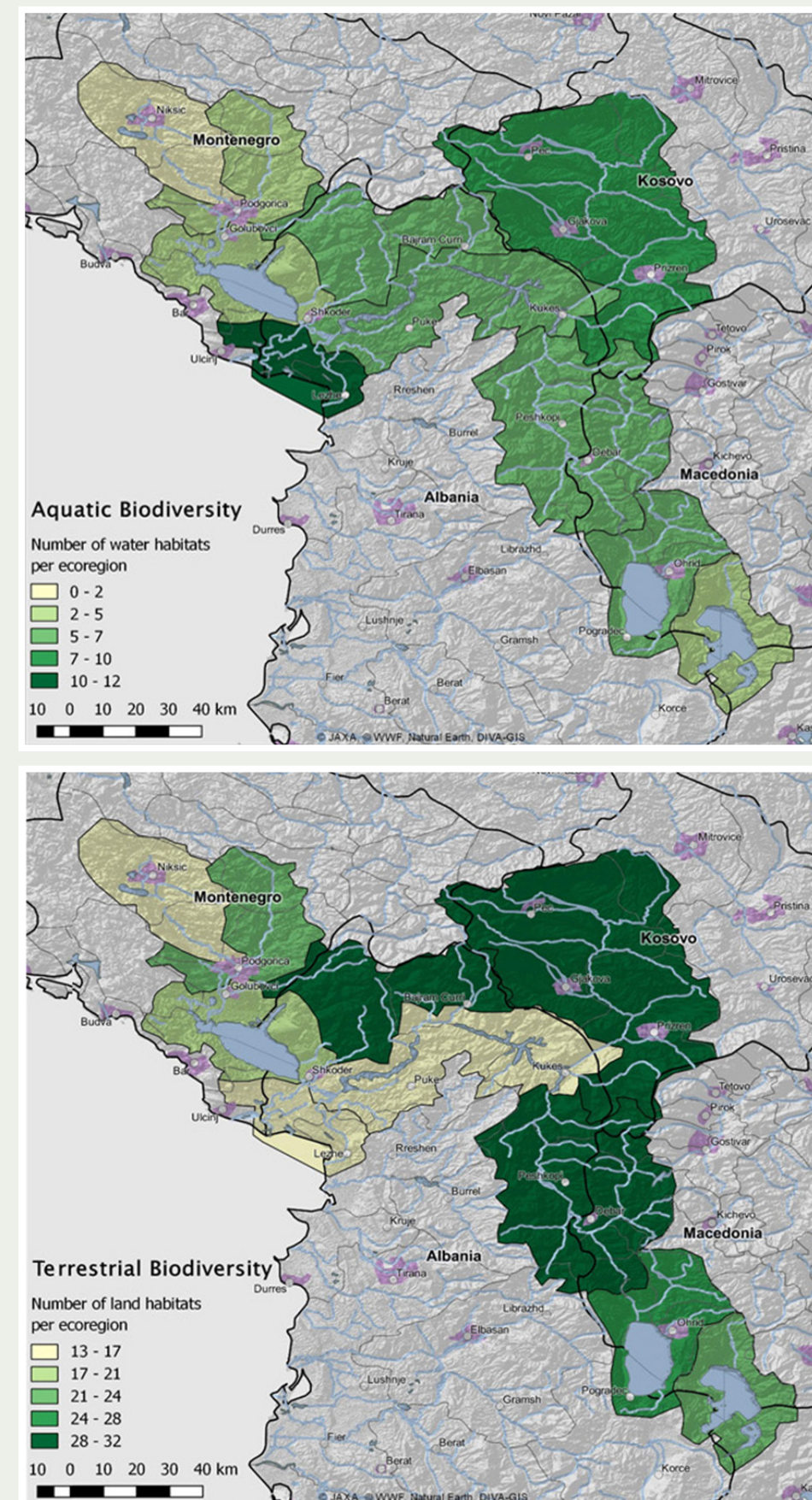
*A detailed classification of ecosystems in the Drin basin is challenging because there are important incongruences, gaps and biases in the collection of data on habitats and biodiversity in the region (furthermore, the countries started just recently to adopt EU classification standards). Nevertheless, it is acknowledged that the basin's environment is rich and varied. In fact, the Balkan region is commonly considered a biodiversity hotspot of Europe.*

The Drin River Basin is the meeting point of the continental, alpine, and Mediterranean bio-geographical regions and as such it hosts “an exceptional wealth of biodiversity, providing important habitats for many species of flora and fauna. Several of these species are endemic, while many others breed in exceptionally high numbers in comparison to other parts of Europe.”<sup>58</sup>

The maps of Figure 14 show the number of habitats present in the basin's eco-regions (some of them coinciding with hydrological sub-basins, others being fractions of them). As can be seen, the mountains of the middle basin (White Drin, Black Drin) are the richest in terms of terrestrial biodiversity, while the region of the delta (Buna/Bojana) is the richest for aquatic biodiversity.



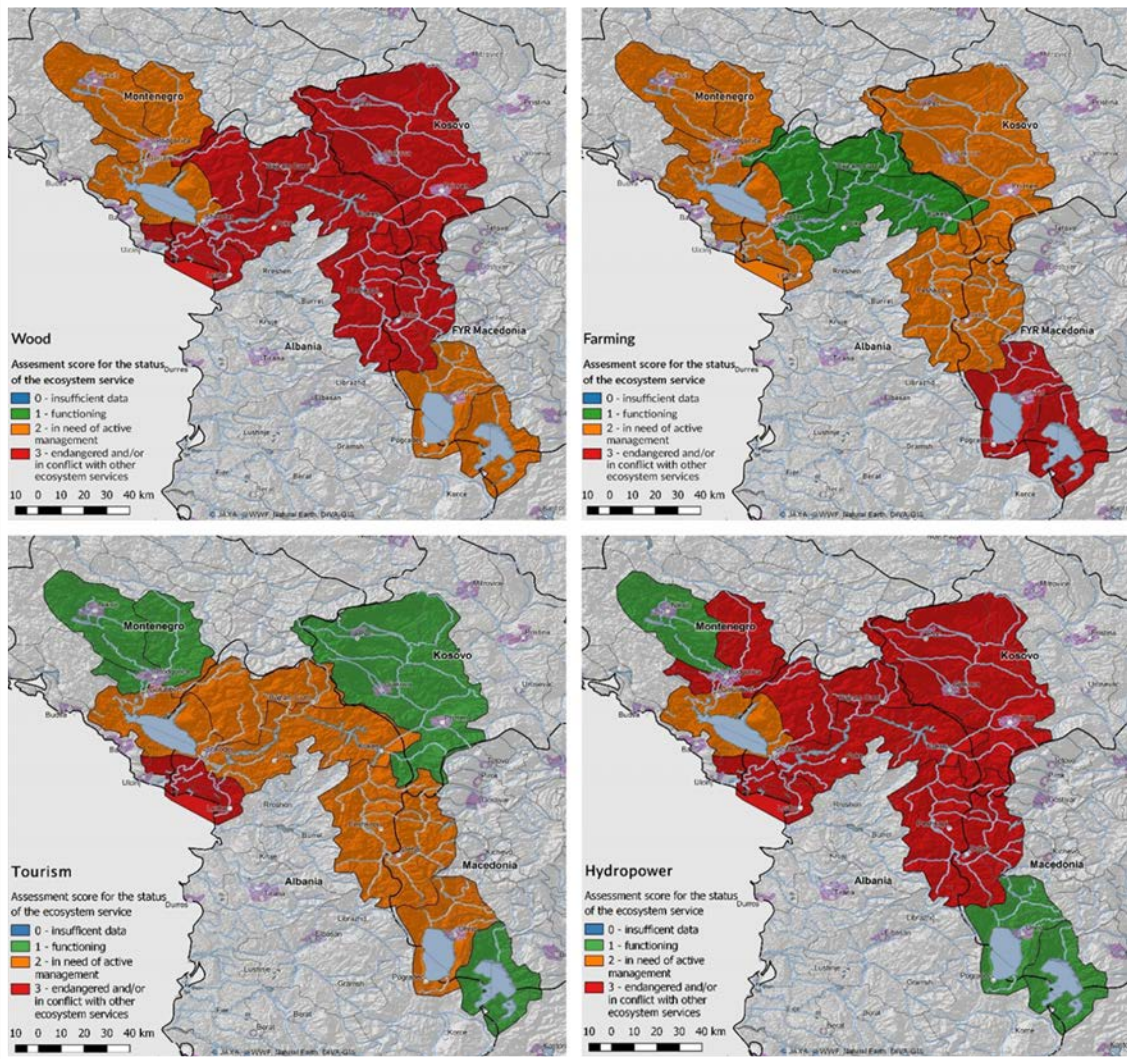
<sup>58</sup> GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017



**Figure 14.** Aquatic and terrestrial biodiversity

Source: GWP-Med, Thematic Report on Biodiversity and Ecosystems, 2017





**Figure 15.** Status of ecosystem services  
 Source: GWP-Med, Thematic Report on Biodiversity and Ecosystems, 2017

The environment of the basin is under significant pressure from human intervention (e.g. pollution, urbanization, introduction of invasive species etc.) which, in the end, can compromise its capacity to provide ecosystem services. The following maps (Figure 15) show an assessment score of four selected ecosystem services that support key economic activities in the basin (for the full assessment of all services, see GWP-Med, Thematic Report on Biodiversity and Ecosystems, 2017). The red colour indicates the regions where the specific ecosystem service is either severely degraded or in imminent danger due to conflicts and pressures of different uses. These maps make clear that all region experience some sort of environmental pressure from human activities.



**Figure 16.** Status of rivers in the Drin River Basin  
 Source: Riverwatch website (<https://riverwatch.eu/>)

Figure 16 illustrates more specifically the status of rivers (from pristine to heavily modified) in relation to the construction of infrastructure that alters their natural hydro- and geo-morphology, i.e. water and sediment flows. As can be seen, the Drin and some sections of the Black Drin are the most heavily modified. The effects of this alteration are particularly visible in the Buna/Bojana basin, where coastal erosion is a serious issue<sup>59</sup>.

It should be highlighted how the natural environment (forests, wetlands) is able to moderate the impact of extreme weather events and in particular floods, to which the region is increasingly vulnerable. This role of “natural infrastructure” can either be enhanced or annihilated by the construction of artificial dams, depending on planning.

<sup>59</sup> GWP-Med, Thematic Report on Hydrology and Hydrogeology of the Extended Drin River Basin, 2018.



# 4 National governance framework

The governance context for achieving results based on Nexus assessment is described in Box 1.

*European Union accession continues to be the dominant development priority in the region. From a policy and governance perspective, the EU provides the model for the region and the accession process is the main driver of governance. EU accession incidentally supports the global sustainable development agenda including the Sustainable Development Goals (SDGs). Nevertheless, political divisions are increasing, where outside influence acts to frustrate goals related to EU membership.*

The EU has a major influence on developments in the Drin Basin, since all Drin Riparians have taken steps towards adoption of EU law. All but Kosovo\* are candidate countries for EU membership, while Kosovo\* and the EU have a Stabilization and Association Agreement.<sup>60</sup> As a consequence, the countries have made commitments derived from the *acquis communautaire* (EU Law) that affect water, energy, ecosystem and food policies. These laws include the EU Water Framework Directive and its substance-specific (or “daughter”) directives, various energy directives and strategies, the Common Agricultural Policy, the Rural Development Policy, and a number of environmental directives such as the Birds and Habitats Directives and those related to integrated pollution control, environmental impact assessment (EIA) and strategic environmental assessment (SEA), etc. Because of the accession process, these commitments are part of the closure of particular chapters, and are subjected to progress monitoring, without specific sanctions other than delay in accession. The Drin countries typically have specific institutions dedicated to EU integration and may adopt specific national strategies for harmonization, approximation or transposition. The EU integration process also includes possibilities for financing activities aimed at reaching cross-sectoral integration goals. One accession requirement that is particularly important to energy sector development in the western Balkans is the requirement to meet binding renewable energy targets by 2020 and to prepare and implement National Renewable Energy Action Plans. Each country is undergoing gradual structural reform in the agricultural sector to prepare for EU membership. The approximation adoption of the water-related directives has advanced at different stages in the Drin countries.

<sup>60</sup> As Kosovo's independence is not recognized by five EU Member States, the SAA is not expressly aimed towards Kosovo's accession but the agreement has the same effect with respect to application of EU law. However, the discussion of the accession process in this chapter applies only to the three candidate countries.

## Box 1: Governance in Nexus Assessment

Governance can be defined as:

*“An inclusive system of actors, institutions and norms that establishes responsibility and accountability, and builds trust and capacity to cooperate in policymaking, decision-making, implementation and enforcement....”*

*(Development of an assessment framework on environmental governance in the EU Member States: Scoping Paper on a Conceptual Framework, 2019 (forthcoming))*

Good governance can be distinguished from other systems of social problem-solving by the self-organization of autonomous actors and groups. Governance has specific characteristics depending upon the problem-solving context. The contours of governance in matters related to sustainability are still under development due to the complex nature of the problems and solutions, the need for coordination of societal responses, problems of implementation, and multi-level causes and effects. These complexities demand that good governance in achieving and maintaining sustainability be inclusive, which requires that governance mechanisms take into account distribution of power, information and knowledge.

Proper appreciation of the governance aspects of a particular policy outcome across sectors can ensure that a particular result is achievable and socially supportable. Of course, there are non-governance factors that influence implementation as well, such as political risk, resource limitations, external economic conditions, and leadership, but addressing governance deficits can help to increase the likelihood that a particular agreed policy outcome will be actually carried out.

But the Nexus approach presents unique governance issues. Nexus assessment is an extremely complex, multi-dimensional process that has the potential to enhance the quality of decision-making and policy-making. As the Nexus approach involves taking account of potential conflicts and synergies across sectors and boundaries, it is based upon a series of technical analyses. The technical analyses often assume perfect implementation. However, governance factors within sectors and at all levels of authority introduce a certain level of uncertainty about the actual implementation of a particular policy solution. Complicating the situation further is the fact that there may be significant differences in governance aspects of decision and policymaking across sectors.

Governance analysis has become a recent focus in multi-resource studies. In the case of Nexus assessments, governance analysis requires understanding and analysis of: global and regional legal frameworks and political drivers; transboundary arrangements for international coordination of policymaking and decision-making; multi-sectoral coordination mechanisms on the national level; multi-level policymaking contexts for the various sectors; and mapping of institutions and actors with respect to the above. It is also important to take into account geographical scale and the dimensions of policymaking and decision-making in the various sectors, as well as planning cycles and timing issues, and the differences in governance cultures, including the involvement of



Concerned citizens, the regulated community and other stakeholders are therefore interested in ensuring that the assessment process takes into account specific issues related to governance that could affect results or outcomes. Differences in the quality of governance - for example differences in the level of transparency in decision-making or opportunities to participate in policy development – between and among sectors, or within the same sector but across borders, can impose barriers to cooperation. Understanding and taking into account the different characteristics of processes, legal frameworks, sectoral policies or institutional arrangements can help to overcome these differences.

For Nexus assessment to begin to provide robust policy responses to issues facing countries today, it needs to be founded on a solid scientific basis. But as Nexus assessment may influence policy and decisions, the ability to implement measures based upon its outcomes remains a strong consideration. Therefore, it is also critical that the process of Nexus assessment be seen to be legitimate and inclusive. Transparency and participation within Nexus assessment take on importance in this regard.

Finally, Nexus governance assessment identifies linkages between sectors, illuminates critical characteristics related to policies and decisions in each sector, and helps to focus attention on the elimination of barriers to coordination and cooperation across borders and across sectors. For example, through clarification of geographical scales for policy and decision-making, scoping of planning processes, identification of planning cycles, etc., governments can better find the means for coordinated and implementable responses to the challenges of sustainability.

*This section of the chapter gives a brief overview of the Drin Basin countries' overall performance on governance-related issues. It is a companion piece to the "Thematic Report on Institutional and Legal Setting" ("Institutional Report"), which gives more detail about the current institutional, policy, legal and management frameworks in the Drin Riparians applying a sectoral approach. The Institutional Report covers the following substantive areas: water resources; waste water and solid waste; urban and territorial planning and land use; agriculture, fisheries, hunting and forestry; nature protection and protected areas; and environmental information and transparency (horizontal issues). Besides the general information provided here, more detail is provided in Chapters 6-8 with respect to the specific topics covered there.*

## Some common characteristics of national governance in South East Europe

The Drin Riparians are parliamentary democracies and fall within the UN category of developing (upper) middle-income economies. Since the early 1990s, they have gone through transition from centralized economies to market-based economies. Kosovo\*, North Macedonia, and Montenegro belong to the territory of former Yugoslavia, declaring their independence in 2008, 1991 and 2006 respectively.<sup>61</sup>

The OECD policy outlook of competitiveness in South East Europe includes analysis of cross-cutting challenges to increasing competitiveness in the region. While the outlook is regional in scope, the conclusions also have application to the DRB countries specifically. Many of the challenges directly relate to governance, including the following:

1. Strategic approach to policymaking – there are wide disparities in policy dimensions in the countries' comprehensive policy strategies
2. Limited capacities and skills of public servants hinder policy implementation
3. Co-ordination mechanisms are generally lacking
4. Valuable cross-policy stakeholder consultations tend to be overlooked
5. The informal sector represents up to 30% of employment and disproportionately involves vulnerable groups
6. Public authorities lack autonomy and professionalism
7. Sub-national governments lack autonomy

61 See GWP-Med, Thematic Report on Socio-Economics of the Extended Drin River Basin, 2017.

**The World Bank Worldwide Governance Indicators (WGI)** project reports aggregate and individual governance indicators for over 200 countries and territories over the period 1996–2018, for six dimensions of governance: Voice and Accountability (V&A), Political Stability and Absence of Violence (PSAV), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RoL) and Control of Corruption (CoC) (Table 15).

**Table 15.** World Bank Worldwide Governance Indicators (WGI) for 2018

Sources: World Bank. Note: percentile ranking in comparison with other countries

	V&A	PSAV	GE	RQ	RoL	CoC
<b>Albania</b>	54.19	61.90	55.77	62.02	39.42	42.31
<b>Kosovo*</b>	42.36	39.52	36.54	50.00	35.58	38.46
<b>Montenegro</b>	50.20	44.76	58.65	64.90	53.85	54.33
<b>North Macedonia</b>	41.87	37.14	58.17	71.15	46.63	45.19

**Law enforcement.** Implementation of decisions with intersectoral implications will require follow-up through various measures, including where appropriate the enforcement of laws and regulations. While it is beyond the scope of this assessment to investigate in detail the situation with respect to enforcement of relevant laws on the national level, an effective response to the governance challenge in Nexus analysis requires taking these matters into account.

Countries that are already deficient in terms of adequate human and financial resources may find it a challenge to adequately and effectively enforce the law. To give one example, while dumping and discharge into natural waterways may be illegal, without the construction of the necessary infrastructure and development of effective institutions, illegal dumping is often commonplace. Authorities may be more willing to look the other way when the illegal activities are compounded by a lack of real alternatives. This tends to undermine respect for the rules in general and contributes to a governance crisis.

**Corruption and transparency.** Prevention and suppression of corruption are important elements of good governance. The countries tend to rank near the middle of the 180 countries assessed in the global Corruption Perception Index, the broadest index of performance on corruption and transparency. In 2017, **Montenegro** ranked 64<sup>th</sup>, **Kosovo\*** was 85<sup>th</sup>, **Albania** was 91<sup>st</sup> and **North Macedonia** was 107<sup>th</sup>. The trend in Albania and Kosovo\* is positive, while the trend in North Macedonia is negative. Montenegro was ranked above two current EU member states – Hungary (66<sup>th</sup>) and Bulgaria (71<sup>st</sup>). Table 16 shows this and other relevant indicators. For country rankings, a lower number is better.

Documents and materials of the Conference of the States Parties to the United Nations Convention against Corruption (COSP) contain comprehensive information on implementation by the States of anti-corruption measures, including those in the prevention of corruption field.<sup>62</sup> In **Montenegro** the Law on Prevention of Corruption, which entered into

<sup>62</sup> For the following examples see Information provided by States parties, Sixth Inter-session Meeting (Vienna, 31 August to 2 September 2015) of the Open-ended Intergovernmental Working Group on the Prevention of Corruption, COSP, available from: <https://www.unodc.org/unodc/en/treaties/CAC/working-group4-meeting6.html>

force on 1 January 2016, contains a comprehensive legal framework for the protection of whistleblowers.<sup>63</sup>

**Table 16.** Corruption and transparency indicators

Sources: Transparency International, World Economic Forum, World Bank, World Justice Forum, Reporters Without Borders

	Corruption Perception Index (TI, 2017) CPI/180	Global Competitiveness Index (WEF, 2017) GCI/137	Judicial independence (WB, 2017) JI/137	Rule of Law (WJF, 2017) ROLI/113	Press Freedom Index (RWB, 2018) PFI/180
<b>Albania</b>	91	75	123	68	75
<b>Kosovo*</b>	85	N/A	N/A	N/A	78
<b>Montenegro</b>	64	77	85	N/A	103
<b>North Macedonia</b>	107	N/A	~100 (2016)	57	109

**Intersectoral coordination on the national level.** The earlier experience with intersectoral coordination mechanisms in the countries was in connection with specific project requirements. There has been a move towards more permanent mechanisms in recent years. The countries have had substantial experience in intersectoral coordination in connection with the development of National Strategies for Sustainable Development (NSSD). Montenegro, for example, established a National Council for Sustainable Development, a multi-stakeholder body, in 2002 and in 2015, the country adopted a new NSSD to incorporate the 2030 Sustainable Development Agenda. Montenegro has taken strides in planning and implementing a range of agri-environmental support measures designed to strengthen sustainable agriculture. Work across sectors is also undertaken in the area of climate.

**Governance issues in single sectors.** Information is available in the Institutional Report. Issues to be considered include mechanisms for institutional memory and follow-through, application of the subsidiarity principle, financial resources and flows, human and technical capacity, quality of monitoring, and extension of European norms and practices in each sector. According to the OECD Competitiveness Report, natural resources conservation practices in the countries are not systematic. The countries have a relatively low proportion of land under protection.

While countries may share common intentions, the tendency of commitments to be realized may differ greatly from state to state. The ability of a particular state to reach a particular level of international cooperation can be influenced by many factors. Some of these factors relate to natural, human and financial resources, but differences in governance on the national level among states also play a role. Qualities of governance can affect the ability of states to translate intentions into implementation on the national level. They can also make the difference between nominal implementation and effective implementation. Finally, poor governance can divert resources away from their intended goals and corrupt well-intentioned efforts.

<sup>63</sup> OECD (2016), *Competitiveness in South East Europe: A Policy Outlook*, Competitiveness and Private Sector Development, OECD Publishing, Paris.



# 4.2 Horizontal and strategic policies and legal frameworks

The Institutional Report provides greater detail on the institutional, legal, policy and management frameworks for specific sectoral themes related to joint management of the Drin Basin. There is substantial overlap between the sectors covered in the Institutional Report and those relevant for Nexus assessment.

The following Table 17, based in part from the Institutional Report, sets forth the main policy documents for each riparian related to horizontal issues. For further details, including a description of the various legal acts related to the themes and sectors, the reader is referred to that report. Energy and agricultural policies gleaned from the country assessments are set forth in section 4.3, below. The policy framework for natural resource management and environmental protection is also reported in section 4.3.



**Table 17.** List of relevant horizontal policies and strategic documents related to Nexus  
*Source: author's elaboration, partly from Institutional Report (2019) Source: author's elaboration, partly from Institutional Report (2019)*

Theme	Name of policy / strategic document	Year of preparation (where available)
Horizontal	<b>Albania</b>	
	National Strategy for European Integration 2016-2020	
	<b>North Macedonia</b>	
Environment and sustainable development	The Accession Partnership, Council Decision of 18 February 2008 (2008/212/EC) on the principles, priorities and conditions contained in the Accession Partnership with the former Yugoslav Republic of Macedonia and repealing Decision 2006/57/EC.	
	<b>Albania</b>	
	Intersectoral Draft Strategy of Environment 2015-2020	2015
	Annual National program on environmental monitoring	2015
	<b>Kosovo*</b>	
	Strategy of Environment (2005-2015)	
	<b>North Macedonia</b>	
	National Strategy for Sustainable Development 2009-2030	2010
	Second National Environmental Action Plan (NEAP 2)	
	National Strategy for Environmental Investment (2009-2013)	
	Plan for Institutional Development of National and Local Environmental Management Capacity 2009-2014	2009
	National Strategy for Harmonization in the Field of Environment	2008
	The MEPP Strategic Plan for the period 2016-2018	
	The National Programme for Adoption of the Acquis - (NPAA) revised for 2017-2019	
	<b>Montenegro</b>	
	National Strategy for Sustainable Development by 2030	2016
	<b>Albania</b>	
	Climate Change Strategy	2017
	National Action Plan on Climate Change	
	National Adaptation Plan	Since 2015
	<b>Montenegro</b>	
	National Strategy with Action Plan for transposition, implementation and enforcement of the EU acquis on Environment and Climate Change by 2020	2016
	<b>North Macedonia</b>	
	Third Action Plan on Climate Change	2014
	Third national communication on climate change	2013
	<b>Kosovo*</b>	
	Climate Change Framework Strategy	2014

## 4.3 Nexus-relevant policy

### Energy policy

All of the Riparians are dependent on energy imports and this is reflected in their energy policies that aim at strengthening security using locally available sources. Hydropower is a common denominator that has traditionally shaped all countries' energy policy. Today, however, other sources – first and foremost, solar – are becoming interesting as well. The drive for hydropower comes from domestic demand but also from the prospect of selling “green energy” to Europe, however today its future is rather uncertain (see Chapter 6).

All four Riparians are Contracting Parties of the EU Energy Community, and as such they aim at aligning with EU legislation to create an integrated pan-European energy market. In line with the Energy Community Treaty, Riparians are also committed to increasing the level of renewable energy and improving energy efficiency across sectors. These two objectives, which have become pillars of the countries' policies, also reflect the commitment of the governments to regional and global efforts to mitigate climate change as well as to attain the Sustainable Development Goals.

The countries are determined to increase the share of renewables, including by setting up feed-in-tariff schemes. However, Riparians are experiencing difficulties in securing investments in non-hydro RES<sup>64</sup>, and detailed assessments of renewable potential (i.e. that take into account environmental constraints and competition with other uses of resources) are generally lacking.<sup>65</sup>

As part of the Energy Efficiency obligation schemes, each Contracting Party of the Energy Community Treaty is now required, under the updated Legal Framework<sup>66</sup>, to define energy saving targets for the period 2017 to 2020. According to the revised framework, these targets were communicated to the EnC in October 2017 and should “be at least equivalent to achieving new savings each year from 1 January 2017 to 31 December 2020 of 0.7% of the annual energy sales to final consumers of all energy distributors or all retails energy sales companies by volume, averaged over the most recent three-year period prior to 1 January 2016”<sup>67</sup>. Limited implementation of energy efficiency policy frameworks<sup>68,69</sup> hinders the benefits of decreased energy intensity.

Targets for the share of renewable energy sources are also set in accordance with the updated Legal Framework, and in at least the case of North Macedonia, the Energy Community adopted a decision (in 2018) lowering the target for 2020 from 28% to 24%.<sup>70</sup> It should be noted that interest in renewables will not necessarily put a halt to the countries' support to the fossil fuel industry, as the Riparians' continued dependency on oil and coal on one hand<sup>71</sup>, and the (potential) future availability of natural gas in the countries on the other (see Chapter 5) will surely affect their future energy strategies.

The Drin Riparians have transposed energy-related EU law to varying degrees. For example, Albania has fully transposed Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC and has partially transposed several other Directives.

All Riparians have established independent regulatory agencies in charge of tariff regulation (approval of electricity tariffs and energy prices) as well as licensing energy companies (electrical and others) and monitoring of their activities. These are: the Electricity Regulatory Commission of Albania, the Energy Regulatory Office of Kosovo\*, the Energy Regulatory Commission of North Macedonia, and the Regulatory Energy Agency of Montenegro.



Still, the power sector remains one where the transition to a market-based economy is proving difficult to implement<sup>72</sup>, and energy market reforms are to a great extent slow in implementation, so, for instance, as of 2018 among the Riparians “only Albania has successfully unbundled electricity and gas transmission system operators, although it is yet to unbundle electricity distribution and retail”. The energy sector continues to be “plagued by under-investment, poor management and a non-commercial approach to operations”, and access to electricity is among the top three obstacles for firms in the regions<sup>73</sup>.

Table 18 reflects major policy documents in the energy field in the four Drin Riparians.

<sup>64</sup> UNECE, 2015. REN21- Renewable Energy Status Report 2015.

<sup>65</sup> UNECE, *Drina Nexus Assessment Report*, 2017.

<sup>66</sup> EnC, 2016a. *The Energy Community Legal Framework – Special Edition on Energy Efficiency*. Vienna: Energy Community Secretariat, May 2016.

<sup>67</sup> UNECE *Drina Nexus Assessment Report*, 2017

<sup>68</sup> UNECE, 2015. REN21- Renewable Energy Status Report 2015.

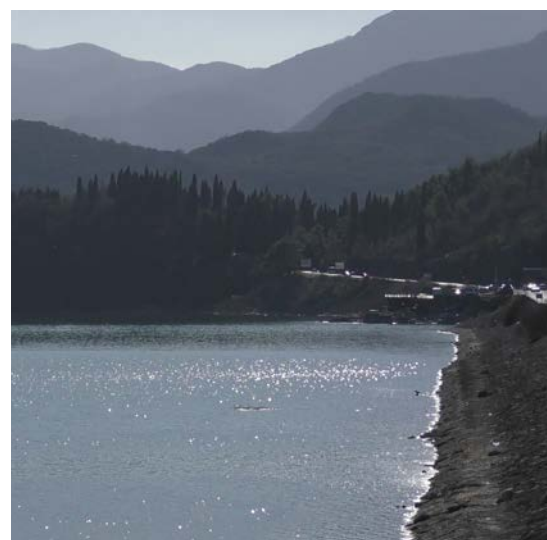
<sup>69</sup> SEE Change Net, 2015. *South East Europe Sustainable Energy Policy Programme*. Energy Efficiency... Just do it! Act now for warmer homes, local jobs and cleaner air.

<sup>70</sup> [https://www.energy-community.org/implementation/FYR\\_Macedonia/RE.html](https://www.energy-community.org/implementation/FYR_Macedonia/RE.html)

<sup>71</sup> <https://renewablesnow.com/news/western-balkans-investing-at-least-24-times-more-in-coal-than-in-wind-power-bankwatch-526459/>

<sup>72</sup> GWP-Med, *Thematic Report on Socio-Economics of the Extended Drin River Basin*, 2017

<sup>73</sup> <file:///C:/Users/huawei/Downloads/western-balkans-diagnostic-paper.pdf>





**Table 18.** Major policy documents in the field of energy  
*Source: author's elaboration, partly from Institutional Report (2019)*

Energy	<b>Albania</b>	
	National Energy Strategy for Albania 2013-2020	
	National Strategy on Electrical Power	
	National Strategy for Development and Integration 2015-2020	
	National Energy Efficiency Action Plan (NEEAP) 2010-2018	
	National Action Plan for Renewable Energy Resources in Albania 2015-2020	
	<b>Kosovo*</b>	
	Energy Strategy of Republic of Kosovo* 2016-2025	
	National Renewable Energy Action Plan 2011-2020	
	<b>Montenegro</b>	
	Energy Policy of Montenegro to 2030	
	Strategy for Development of Energy Sector in Montenegro to 2030	
	Strategy for Energy Efficiency in Montenegro	
	National Action Plan for Use of Energy from Renewable Sources to 2020	
	<b>North Macedonia</b>	
	Strategy for development of Energy Sector in the Republic of Macedonia to 2030	2010
	Program for realization of the Strategy for Energy Sector in the Republic of Macedonia (4 year)	
	Strategy for Utilization of Renewable Energy Source to 2020	2010
	Action Plan on renewable energy sources to 2025 with vision up to 2030 (10 years)	
	Strategy on promotion of energy efficiency in the Republic of Macedonia to 2020	2010
	Action Plan on Energy Efficiency (3 years)	
	Energy balance (5 years)	

Agricultural and forestry policies

The following Table 19 based in part on the Institutional Report, sets forth the main policy documents for each riparian related to themes and sectors related to agriculture, forestry and fisheries. Hunting in the riparian countries is generally governed by legislation only, while no specific strategies or policies have been adopted, with the possible exception of Montenegro's Programme for Hunting Development, 2014-2024. For further details, including a description of the various legal acts related to the themes and sectors, the reader is referred to the Institutional report.

**Table 19.** Major policy documents in the field of agriculture and forestry  
*Source: author's elaboration, partly from Institutional Report (2019)*

Agriculture	<b>Albania</b>	
	National Agriculture and Rural Development Strategy (2014-2020)	
	Strategy and Action Plan for Protection of Land from Erosion	2005 (only draft)
	Crosscutting Strategy for Rural and Agricultural Development	2014
	<b>Kosovo*</b>	
	Agriculture and Rural Development Program 2014-2020	
	Land Consolidation Strategy 2010-2020	2010
	Strategy on Advisory Services for Agriculture and Rural Development 2012-2016	
	<b>North Macedonia</b>	
	National Agriculture and Rural Development Strategy 2007-2013	2006
	National Strategy for Climate Change Adaptation in Agriculture (in progress)	
	National Plan for Organic Agriculture of the former Yugoslav Republic of Macedonia 2013-2020	2013
	National program for development of agriculture and rural development for the period 2013-2017	2013
	Program for Financial Support of Agriculture for 2017	2017
	Program for Financial Support of Rural Development for 2017	2017
	Rural Development Program 2014-2020	2014
	Third National Communication to the UN Framework Convention on Climate Change	2013
	<b>Montenegro</b>	
	Strategy for Agricultural Development and Rural Areas 2015-2020	2015
	Action Plan for acquis alignment, Chapter 11 – agriculture and rural development 2015-2020	



Fisheries	Albania	
	National Strategy of Fishing and Aquaculture	2007 (only draft)
	Kosovo*	
	n/a	
	North Macedonia	
	Financial aid program in fisheries and aquaculture for 2017	2016
	Fishing grounds for fishing water "Basin of Black Drin" (2011-2016)	2011
	Fishing grounds for fishing water "Basin of Ohrid Lake" - (2011-2016)	2011
	Fishing grounds for fishing water "Basin Prespa Lake" - (2011-2016)	2011
	Montenegro	
	Fishery Strategy with Action Plan 2015-2020	2015
Forestry and Pastures	Albania	
	Strategy for the Development of the Forestry and Pastures Sector in Albania	2004
	Kosovo*	
	Policy and Strategy Paper for Forestry Sector Development 2010-2020	2010
	North Macedonia	
	National Strategy for a sustainable development of the forestry (2006)	2006
	Program for Financial Support of Rural Development for 2017	2017
	Rural Development Program 2014-2020	2014
	Third National Communication to the UN Framework Convention on Climate Change	2013
	Montenegro	
	Forestry Strategy 2014-2023	2014

Significant steps are being taken towards aligning policies, legislation and institutions with EU requirements in these areas. The basic goals of agricultural policy are coordinated with those of the EU Common Agricultural Policy. All the programming documents recognise the importance of rural development policy and shape it according to principles and strategic directions that are compatible with EU rural development policy. The medium- and long-term agricul-

tural policy objectives and priorities set out in policy documents vary slightly by country, but all address (1) enhancing farm viability and the competitiveness of the agro-food sector; (2) sustainable management of natural resources and mitigation of the effects of climate change; and (3) improving the quality of life and balanced territorial and economic development of rural areas.

The Drin Riparians are affected by out-migration from rural areas to cities and

abroad. The land area dedicated to agricultural production consequently has decreased throughout much of the Drin Basin, being replaced in part by residential development financed by remittances from abroad. The rural population is also aging in these areas.

In Kosovo\*, farmer income stabilisation is a priority. Food chain organisation is important in North Macedonia and Kosovo\*), while promotion of food quality and safety standards (North Macedonia) and investment in human capital, transfer of knowledge and innovation (Albania, North Macedonia and Kosovo\*) are also country priorities.

Strengthening of measures related to rural development and higher budgetary allocations for their implementation are the main features of the new strategic frameworks in all DRB countries.

The short-term policies are based mainly on annual programmes and budgeting, which are, in turn, largely influenced by national political and economic situations. Reports by country experts show limited progress in developing analytical support for agricultural policy decision-making; there are some improvements in monitoring but no significant changes in the other elements of evidence-based policy.

While there is a long history of Farmer-Based Organizations (FBOs) in the Drin countries,



there appear to be few examples where they work across boundaries to cooperate and lobby on priority issues. In discussing the reasons for ineffectiveness of such associations, an FAO report states: "Aside from the lack of vision, the other biggest 'killer' of young cooperatives and associations is underestimating the significance of establishing a regular, democratically established and governed managing structure of a cooperative or association. Management must be professional and have clearly stated obligations and duties according to the statute and the long-term development plan. Members have to decide and have full control over management and decision making must be in favour of the majority of members. If there are no clear rules and trust, this will very quickly result in privatization by individuals or groups, and thus the fundamental function of the association will be lost"<sup>74</sup>.

The Conservation of agro biodiversity in rural Albania (CABRA) is a forum for agro biodiversity, forging a link with European knowledge networks, that supports partnerships with the public administration, the private sector and civil society at regional and local levels.

<sup>74</sup> Goran Zivkov, Association of farmers in the Western Balkan countries. FAO Regional Office for Europe and Central Asia Policy Studies on Rural Transition No. 2013-1 (2013)





## Natural resource management and environmental protection

The following Table 20, based in part from the Institutional Report, sets forth the main policy documents for each riparian related to themes and sectors related to natural re-

sources and the environment. For further details, including a description of the various legal acts related to the themes and sectors, the reader is referred to that report.

**Table 20.** Major policy documents in the field of natural resource management and environmental protection

*Source: author's elaboration, partly from Institutional Report (2019)*

Water resources	Albania	
	National Water Strategy	1997, updated in 2004
	National Strategy for Water and Sewerage 2011-2017	
	Master Plan for Water 2011-2025	2011
	National Strategy for Integrated Water Resource Management	2018
	Kosovo*	
	Draft- National Water Strategy 2017-2026	2017
	North Macedonia	
	National Water Strategy 2011-2041	2010
	Bregalnica River Basin Management Project – Final Version of August 26, 2016	2016
	Initial Characterisation of Lakes Prespa, Ohrid and Shkodra/ Skadar	
	Initial Characterization of Vardar RBD	2016
	Management Plan Prespa Lake	
	National Strategy for Protection and Rescue (Official Gazette no.23/09)	2009
	National platform of the former Yugoslav Republic of Macedonia for disaster risk reduction	2010
	National environmental health plan	
	Strategy adaptation of the health sector to the climate change in the former Yugoslav Republic of Macedonia with action plan 2011 - 2015	2010
	Montenegro	
	Water Basis for Montenegro	2001
	Water Management Strategy	To be adopted 2017
	Master Plan for Water supplying of Costal Zone and Municipality of Cetinje	2005

Wastewater and solid waste	Albania	
	National Sectorial Strategy for Water Supply and Sewerage	2011
	Strategy and Action Plan for Sewerage Treatment in Urban Areas	2003
	The National Cross-Sector Strategy on Waste Management, 2010-2025	2011
	National Waste Management Plan, 2010-2025	2011
	Water Supply and Wastewater Sector Strategy	2011
	Strategy and Action Plan for Water Supply, Sewerage and Waste Management in Rural Areas	2003
	Kosovo*	
	Strategy of Kosovo* on Waste Management 2013-2022	2013
	Plan of Kosovo* on Waste Management 2013-2017	2013
	North Macedonia	
	National Strategy for Waste Management 2008-2020	2008
	National Plan for Waste Management (2009 - 2015) of the former Yugoslav Republic of Macedonia	2008
	Plan for closure of nonstandard dumps in the former Yugoslav Republic of Macedonia	2012
	Regional waste management plans for Skopje region, East Region, Southeast Region and Patagonia Region	2011
	Montenegro	
	National Waste Management Plan with Action Plan 2015-2020	2015
	Strategic Master Plan for Sewerage and Waste Water in Central and Northern Region of Montenegro	2005
	Master Plan for Waste Water Management on the Coast of Montenegro and in Cetinje Municipality	2005, expected revision 2017
	National Medical Waste Management Plan by 2020	2016
Urban and territorial planning and land use	Albania	
	Strategy and Action Plan for the Development of Tourism Sector Based on Cultural and Environmental Tourism	2006
	National Sectoral Plan on Tourism for Alps Region	2017
	Kosovo*	
	Spatial Plan of Kosovo* 2010-2020+	2010
	Land Consolidation Strategy 2010-2020	
	"Sharri" National Park Spatial Plan 2013-2022	2013
	Spatial Plan on Nature Monument of Special Importance "Mirusha Waterfalls"	2014



Nature protection - protected areas	<b>North Macedonia</b>	
	Spatial Plan of former Yugoslav Republic of Macedonia, (1998, revised in 2004)	1998
	Spatial Plan of the Ohrid-Prespa region 2005-2020 (Official Gazette no. 22/10)	2005
	<b>Montenegro</b>	
	National Strategy for Integrated Coastal Zone Management	2015
	<b>Albania</b>	
	National Strategy of Energy Efficiency and Action Plan	2012
	National Environmental Action Plan	1993, updated in 2002
	National Program on Environmental Monitoring	2015
	Annual National program on environmental monitoring	2015
	Document for the strategic policies regarding the protection of biodiversity	2015 (December)
	Strategic Environmental Evaluation for the General National Plan	2016
	Strategic Action Plan for Sustainable Development of the Prespa Park	2002, updated in 2010
	<b>Kosovo*</b>	
	Biodiversity Strategy and Action Plan 2011-2022	2011
	<b>North Macedonia</b>	
	Strategy and Action Plan for protection of biological diversity of the Former Yugoslav Republic of Macedonia	
	Local biodiversity action plan of municipality of Debar	2013
	<b>Montenegro</b>	
	National Biodiversity Strategy with Action Plan (NSBAP) for the period 2016-2020	2015
	Management Plan for NP Skadar Lake 2016-2020	2015
	Management Plan for NP Lovcen 2011-2015	2010
Environmental Information and transparency	<b>Albania</b>	
	Aarhus Convention Implementation Strategy	2005
	<b>Kosovo*</b>	
	Kosovo* Environmental Strategy 2013-2022	
	<b>North Macedonia</b>	
	Strategy for Environmental Communication	2003
	Strategy for raising public awareness about the environment	2003
	Strategy for managing environmental data	2003
	<b>Montenegro</b>	
	National Strategy with Action Plan for transposition, implementation and enforcement of the EU acquis on Environment and Climate Change 2016-2020	

Transboundary cooperation on the level of the Drin Basin or its components is described below in section 5.2 of this Report. Table 21 below sets forth the main institutions of each of the Riparians mandated to manage the respective components of the Drin Basin within its territory. Also set forth in the table are relevant river basin management plans, if available.

**Table 21.** River/Lake basin management - Institutions and Plans in each riparian  
*Source: author's elaboration, partly from Institutional Report (2019)*

River basin/ Shared water body	River basin management institutions	River basin management plans (RBMP)
<b>Albania</b>		
River Basin	River Basin Agencies	Only one river basin management plan exists (for the Mati river) but it is not implemented.  The elaboration of RBMPs for Drin-Buna, Semani and Shkumbin Rivers is ongoing and expected to be completed by 2018.  The preparation an RBMP for the “Drini/Buna River Basin District” is among the priorities of the ME. There is a Regional Environmental Action Plan for Drini River Delta.
<b>Kosovo*</b>		
Regional River Basin Authority (Central water body under the MESP established by regulation NR. 05/2017)	Regional River Basin Authority (Established by Regulation on internal organization and systematisation of the Ministry of Environment and Spatial Planning, approved 04.05.2017 <sup>75</sup> )	No
<b>North Macedonia</b>		
River basin management district of River Crni drim	MEPP, Administration for environment, water sector, Unit for management of the Crni Drim River Basin District	No
Sub basin of the shared water body- Prespa lake	MEPP, Administration for environment, Water sector, Unit for management of the Crni Drim River Basin District	No Prespa watershed management plan (2012), project-based plan
Sub basin of the shared water body- Ohrid lake	MEPP, Administration for environment, water sector, Unit for management of the Crni Drim River Basin District	No (not in accordance to the Water Framework Directive)
Sub basin of the shared water body- River Crni Drim	MEPP, Administration for environment, water sector, Department for RBD of the River Crni Drim	No
<b>Montenegro</b>		
Regional River Basin Authority (Central water body under the MESP established by regulation NR. 05/2017)	Regional River Basin Authority (Established by Regulation on internal organization and systematisation of the Ministry of Environment and Spatial Planning, approved 04.05.2017 <sup>76</sup> )	Management Plan for National Park Skadar Lake

75 [http://www.kryeministri-ks.net/repository/docs/RREGULLORE\\_\(QRK\)\\_NR\\_05-2017\\_P%C3%8BR\\_ORGANIZIMIN\\_E\\_BRENDSH%C3%8BM\\_\\_DHE\\_SISTEMATIZIMIN\\_E\\_VENDEVE\\_T%C3%8B\\_PUN%C3%8BS\\_T%C3%8B\\_MINISTRIS%C3%8B\\_S%C3%8B\\_MJEDISIT\\_DHE\\_PLANIFIKIMIT.pdf](http://www.kryeministri-ks.net/repository/docs/RREGULLORE_(QRK)_NR_05-2017_P%C3%8BR_ORGANIZIMIN_E_BRENDSH%C3%8BM__DHE_SISTEMATIZIMIN_E_VENDEVE_T%C3%8B_PUN%C3%8BS_T%C3%8B_MINISTRIS%C3%8B_S%C3%8B_MJEDISIT_DHE_PLANIFIKIMIT.pdf)

76 [http://www.kryeministri-ks.net/repository/docs/RREGULLORE\\_\(QRK\)\\_NR\\_05-2017\\_P%C3%8BR\\_ORGANIZIMIN\\_E\\_BRENDSH%C3%8BM\\_\\_DHE\\_SISTEMATIZIMIN\\_E\\_VENDEVE\\_T%C3%8B\\_PUN%C3%8BS\\_T%C3%8B\\_MINISTRIS%C3%8B\\_S%C3%8B\\_MJEDISIT\\_DHE\\_PLANIFIKIMIT.pdf](http://www.kryeministri-ks.net/repository/docs/RREGULLORE_(QRK)_NR_05-2017_P%C3%8BR_ORGANIZIMIN_E_BRENDSH%C3%8BM__DHE_SISTEMATIZIMIN_E_VENDEVE_T%C3%8B_PUN%C3%8BS_T%C3%8B_MINISTRIS%C3%8B_S%C3%8B_MJEDISIT_DHE_PLANIFIKIMIT.pdf)





Further details on water management in each of the Riparians, including descriptions of the relevant institutions, laws, policies and management tools, can be found in the Institutional Report, which provides details about the transposition of EU environmental Directives in the respective Drin Basin Riparians. By way of example, in Kosovo\*, the level of transposition of water-related Directives is as follows (Table 22):

**Table 22.** Transposition of EU water-related directives into environmental legislation of Kosovo\*  
*Source: author's elaboration, adapted from Institutional Report (2019)*

Area	EU Directive	Transposition rate as of 2015 <sup>77</sup>
Water Quality	Water Framework Directive (2000/60/EC)	57%
	Directive on Urban Wastewater Treatment 991/271/EEC)	51%
	Directive on groundwater (2006/118/EC)	32%
	Drinking Water Directive 98/83/EC)	87%
	Nitrates Directive (91/676/EEC)	25%
	Directive on Bathing Waters (2006/7/EC)	0%
	Directive on water quality standards (2008/105/EC)	5%
	Directive on flood risk assessment and management (2007/60/EC)	4%
	Directive on technical specification for chemical analysis and monitoring of water status (2009/90/EC)	0%

An example of a mechanism with potentially major relevance to Nexus governance comes from Albania. The Decision of the Council of Ministers No. 524 dated 20.7.2016, On the organization and functioning of the Technical Secretariat of the National Water Council establishes an executive body, under the authority of the Prime Minister, with a mission to establish an integrated system for the government and management of water resources with the purpose of satisfactorily responding to public demand while also supporting the sustainability of ecosystems and promoting the competitive use of resources for maximum economic advantages. Based on its mandate the Technical Secretariat could undertake complex Nexus assessment on the national level and

reach decisions aimed at implementation of solutions.

Certain projects have included key governance issues as essential components. An example is the project in Albania on Water sector reform financed by GIZ implemented by the Ministry of Transport and Infrastructure (2009 to 2015), which included a priority of good governance in the water sector as a binding obligation and the human right to water and sanitation services, as well as several key elements of the EU Water Framework Directive.

The Institutional Report also describes the institutions, laws, policies and management tools related to urban planning and land use in the riparian countries. The reader is referred to that Report for further information.

77 Monitoring transposition and implementation of the EU environmental acquis, Year 17, Progress Report 9, Kosovo, Human Dynamics 2015

In the field of environment, the driving force for policy development is the EU environmental acquis. The countries are under intense monitoring with respect to progress made in the approximation or transposition of relevant EU Directives into national legislation. By way of example, the following Table 23 sets forth the level of transposition of environment-related Directives (other than for water management, which is set forth above) in Kosovo\*.

**Table 23.** Transposition of EU directives into national environmental legislation, other than water (Kosovo\*)  
*Source: author's elaboration, adapted from Institutional Report (2019)*

Area	EU Directive	Transposition rate as of 2015 <sup>78</sup>
Horizontal legislation	Directive on EIA (85/337/EEC)	95%
	Directive on SEA (2001/42/EC)	100%
	Directive on environmental information (2003/4/EC)	66%
	Directive on public participation (2003/35/EC)	100%
	Directive INSPIRE (2007/2/EC)	20%
	Directive on Environmental Crimes (2008/99/EC)	50%
	Environmental Liability Directive (2004/35/EC)	84%
Air Quality	Air Quality Directive (2008/50/EC)	92%
	Directive on arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (2004/107/EC 4 <sup>th</sup> Daughter Directive)	98%
	NEC Directive, national air emissions ceilings (2001/81/EC NEC Directive)	11%
	Directive on Sulphur Content of Liquid Fuels (1999/32/EC)	60%
	Volatile Organic Compounds (VOC) Solvents Directive (94/63/EC)	98%
	Directive on Stage II petrol vapour recovery during refuelling - 2009/126/EU)	30%
Waste Management	Framework Directive on Waste (2008/98/EC)	80%
	Waste Batteries Directive (2006/66/EC)	61%
	Directive on packaging and packaging waste (94/62/EC)	100%
	Directive on PCB/PCT – polychlorinated biphenyls (PCBs) and polychlorinated terphenyls (PCTs) (96/59/EC PCB/PCT)	87%
	Directive on end-of-life vehicles (2000/53/EC)	100%
	Directive on Landfills (99/31/EC)	100%
	Directive on restriction of the use of certain hazardous substances in electrical and electronic equipment (2001/65/EU)	92%
	Directive on waste electrical and electronic equipment (2012/19/EU)	86%
	Directive on mining waste management (2006/21/EC Mining Waste)	100%

78 Monitoring transposition and implementation of the EU environmental acquis, Year 17, Progress Report 9, Kosovo, Human Dynamics 2015

<b>Nature Protection</b>	Directive on wild birds (79/409/EEC)	100%
	Directive on habitats (92/43/EC)	100%
	Directive on keeping of wild animals in zoos (1999/22/EC)	80%
<b>Control of Industrial Pollution</b>	Industrial emissions directive (2010/75/EU)	68%
	Directive Seveso III on control of major industrial accidents (2012/18/EU)	27%
	2001/80/EC LCP	60%
	Directive on emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (2004/42/EC)	25%
<b>Chemicals</b>	Directive on classification, labelling and packaging of dangerous substances (67/548/EEC)	65%
	Asbestos Directive (87/217/EEC)	82%
	Biocides Directive 98/8/EC)	84%
<b>Noise</b>	Ambient Noise Directive (2002/49/EC)	74%

From the table, it can be seen that there is a high level of transposition of certain Directives that are of particular relevance to Nexus-related governance, such as the horizontal directives in the fields of EIA, information and transparency, and public participation. While the inclusion of governance-related norms within the legislation appears to be at a high level, there is less information

available about the implementation of this legislation in practice.

The Institutional Report describes the institutions, laws, policies and management tools related to environmental protection in the riparian countries. The reader is referred to that Report for further information.

## 4.4 Institutional setting

Table 24 shows in summary fashion the major institutional frameworks relevant to Nexus governance in the Drin countries, in the fields of water, energy, agriculture and environment.

**Table 24.** Overview of institutions relevant to managing the components of the Nexus in the Drin Basin (based in part on Institutional Report and Nexus country reports)

Source: author's elaboration

Global/ Regional level	Global Conventions/ UNECE/ European Union			
	Energy Community			
Sub-regional level	ALBANIA	KOSOVO*	MONTENEGRO	NORTH MACEDONIA
State Government	National Council of Waters; Ministry of Environment (ME); Ministry of Health (MH); Ministry of Agriculture Rural Development and Water Administration (MARDWA); Ministry of Economic Development, Tourism, Trade and Entrepreneurship (MEDTTE); Ministry of Energy and Industry (MEI); Ministry of Internal Affairs (MIA); Ministry of Transportation and Infrastructure (MTI); Ministry of Education and Sports (MES); Ministry of Urban Development (MUD); National Environmental Agency (NEA); Regional Environmental Agencies (REA-s); National Territory Council Water Regulatory Authority	Ministry of Environment and Spatial Planning (MESP); Kosovo Environmental Protection Agency (KEPA); Kosovo Institute for Nature Protection (KINP); Kosovo Forestry Agency (KFA); Kosovo Landfills Management Company (KLMC); Ministry of Trade and Industry (MTI); Ministry of Economic Development (MED) – Department of Energy; Kosovo Emergency Management Agency (KEMA); Office of Prime Minister (OPM); Ministry of Agriculture, Forestry and Rural Development (MAFRD); Agency on Gender Equality (AGE); Ministry of Justice (MJ); Ministry of Public Administration (MPA); Inter-Ministerial Water Council (IMWC)	Ministry of Sustainable Development and Tourism (MSDT); Ministry of Agriculture and Rural Development (MARD); Ministry of Health (MH); Ministry of Economy (ME); Ministry of Interior (MI); Ministry of Human and Minority Rights (MHMR); Regulatory Agency for Energy; National Council for Sustainable Development, Climate Change and Integrated Coastal Zone Management; Public Enterprise for National Parks of Montenegro	Ministry of Environment and Physical Planning (MEPP); Ministry of Agriculture, Forestry and Water economy (MAFWE); Ministry of Health (MH); Ministry of Economy (ME); Ministry of Transport and Communications (MTC); Ministry of Foreign Affairs (MFA); Ministry of Labor and Social Policy (MLSP); Agency for Promotion and Development of Agriculture; Agency for Spatial Planning; Agency on Energy; National Council on Waters
Regional level	River Basin Agencies Council of River Basin Drin Bune	Regional River Basin Authority	Regional River Basin Authority	MEPP, Administration for environment, water sector, Unit for management of the Crni Drim River Basin District Council for Protection of Ohrid, Prespa and Dojran lakes
Local level	General Directorate of Water Supply and Sewage Local government water supply and sewage enterprises	Water and Wastewater Regulatory Office (WWRO) Local government, water supply and sewage enterprises	Local government, water supply and sewage enterprises	JSC "Water-economy Macedonia" Local government, water supply and sewage enterprises
	Energy Regulatory Agency Albanian Power Corporation (KESH) Fierza HPP, Komani HPP, Vau Dejës HPP	Energy Regulatory Office (ERO) Kosovo Electricity Transmission System and Market Operator (KOSTT) Kosovo Energy Corporation (KEK)	Elektroprivreda (EPCG) Zeta Energy DOO Electricity Market Operator for Montenegro (COTEE)	Energy Regulatory Commission JSC "Elektrani na Makedonija" Skopje HPP Spilje and HPP Globocica





The Institutional Report also sets forth the following overview of Ministries in charge of legal drafting for various sectors related to environment and natural resources management (Table 25). For further details the reader is referred to that report.

**Table 25.** Ministries in charge of legal drafting on different sectors of environmental / natural resources management

Source: author's elaboration

Theme	Riparian	Riparian Ministry
Horizontal legislation	Albania	MTE
	Kosovo*	MESP
	North Macedonia	MEPP
	Montenegro	MSDT
Water Management and Protection	Albania	MTE, MARDWA, MH, MTI, MEI, MUD
	Kosovo*	MESP
	North Macedonia	MEPP
		MAFWE
		MH
		ME
		MTC
		MFA
	Montenegro	MARD
		MSDT
		MH
		MI
Nature Protection	Albania	MTE, MARDWA
	Kosovo*	MESP
		KEPA
		KINP
	North Macedonia	MEPP
Waste management	Albania	MTE, MTI
	Kosovo*	MESP
		KLMC
	North Macedonia	MEPP
	Montenegro	MSDT
Urban and Territorial Planning	Albania	MEDTTE
	Kosovo*	MESP Department for Spatial Planning, Construction and Housing
	North Macedonia	MEPP
		MTC
	Montenegro	MSDT

Industrial Activities and risks	Albania	MTE, MIA, MH
	Kosovo*	MTI
		MED
		KEMA
Energy incl. Hydropower	North Macedonia	MEPP
	Montenegro	MSDT
		MI
Public Participation	Albania	MEI, MTE, MTI
	Kosovo*	MED
	North Macedonia	ME
		MEPP
Agriculture, fisheries, hunting and forestry	Montenegro	ME
Public Participation	Albania	CoM, MTE
	Kosovo*	OPM
		MESP
		MAFRD
		MED
Agriculture, fisheries, hunting and forestry	North Macedonia	MEPP
	Montenegro	MSDT
Agriculture, fisheries, hunting and forestry	Montenegro	MARD

TABLE LEGEND ABBREVIATIONS USED:

<b>Albania</b>	Ministry of Tourism and Environment (MTE); Ministry of Health (MH); Ministry of Agriculture Rural Development and Water Administration (MARDWA); Ministry of Economic Development, Tourism, Trade and Entrepreneurship (MEDTTE); Ministry of Energy and Industry (MEI); Ministry of Internal Affairs (MIA); Ministry of Transportation and Infrastructure (MTI); Ministry of Education and Sports (MES); Ministry of Urban Development (MUD); National Environmental Agency (NEA); Regional Environmental Agencies (REA-s);
<b>Kosovo*</b>	Ministry of Environment and Spatial Planning (MESP); Kosovo Environmental Protection Agency (KEPA); Kosovo Institute for Nature Protection (KINP); Kosovo Landfills Management Company (KLMC); Ministry of Trade and Industry (MTI); Ministry of Economic Development (MED); Kosovo Emergency Management Agency (KEMA); Office of Prime Minister (OPM); Ministry of Agriculture, Forestry and Rural Development (MAFRD); Agency on Gender Equality (AGE); Ministry of Justice (MJ); Ministry of Public Administration (MPA);
<b>North Macedonia</b>	Ministry of Environment and Physical Planning (MEPP); Ministry of Agriculture, Forestry and Water economy (MAFWE); Ministry of Health (MH); Ministry of Economy (ME); Ministry of Transport and Communications (MTC); Ministry of Foreign Affairs (MFA); Ministry of Labor and Social Policy (MLSP)
<b>Montenegro</b>	Ministry of Sustainable Development and Tourism (MSDT); Ministry of Agriculture and Rural Development (MARD); Ministry of Health (MH); Ministry of Economy (ME); Ministry of Interior (MI); Ministry of Human and Minority Rights (MHMR).

## 4.5 Cross-sectoral governance

*This section examines cross-sectoral governance from two perspectives. The first consists of processes and procedures for breaking down silo approaches to decision-making and is exemplified by the application of the Aarhus Convention. Cross-sectoral governance is then looked at by checking the application of frameworks that require substantive collaboration across sectors, with an emphasis on sustainable development/green economy and climate change adaptation.*

The assessment of governance within a particular context requires an understanding of the various cultures of governance that have developed within particular sectors. It has not been possible under the current project to develop a full picture of the actual practice with respect to such issues as involvement of stakeholders in policymaking and decision-making within the various sectors relevant to Nexus governance.

Besides the differences in governance cultures, other obstacles to effective cross-sectoral governance include technical disparities across sectors. Such technical disparities can arise from divergences in planning cycles and the geographical scale of policy and decision-making, which shape processes, procedures and constellations of actors. There may also be discrepancies in the relative strength of technical versus political content in the governance of different sectors. Finally, in some sectors potential security concerns (e.g., related to food or energy) may affect the balancing of interests in cross-sectoral governance processes.

### Transparency, participation and access to justice

Because the Aarhus Convention is the main instrument in the UNECE region for the promotion of many critically important elements of environmental governance, the level of its implementation can serve as a surrogate for measuring overall environmental governance performance. The Convention's participation pillar moreover embraces EIA and SEA, which define formal procedures for consideration of cross-sectoral impacts. Information about the level of implementation of the Aarhus Convention can be gleaned from national reporting

under the Convention framework. However, only Albania and Montenegro provided national implementation reports in the most recent cycle (2017). These two reports show substantial progress in implementation since the prior period. In the case of the Montenegro report, it also shows that there were public hearings held on the contents of the report.

Another potential source of information about implementation of related cross-sectoral governance mechanisms would be the Progress Monitoring reports in the con-

text of EU accession insofar as they may occasionally cover specific relevant Directives, including those on EIA (2011/92/EU amended by 2014/52/EU), SEA (2001/42/EU), access to environmental information (2003/4/EC), industrial emissions and integrated permitting (2010/75/EU), and the Habitats Directive (92/43/EEC)/Natura 2000.

Based upon information gathered for the Institutional Report, relevant to Kosovo\*, it can be seen that there is a high level of transposition of certain Directives that are of particular relevance to Nexus-related governance, such as the horizontal directives in the fields of EIA, information and transparency, and public participation. This result seems to be typical of the Drin Riparians. While the inclusion of governance-related norms within the legislation appears to be at a high level, there is less informa-

tion available about the implementation of this legislation in practice.

Among the Drin Riparians, there have been two cases brought under the Aarhus compliance mechanism, both against Albania. The existence of cases is neither an indicator of poor implementation nor of good implementation as cases are very specific to individual circumstances. One Albanian case was found to be not admissible, while the other involved a finding of non-compliance. In that case, No. ACCC/C/2005/12, the Meeting of Parties endorsed the Compliance Committee findings that Albanian authorities had not provided adequate public participation with respect to decisions of the Council of Territorial Adjustment of the Republic of Albania to allocate territory for the Industrial and Energy Park of Vlora and to site a thermal electric power station near Vlora.

Information about the extent to which multi-stakeholder processes are used in practice in the riparian countries with respect to the sectoral policies and decisions sketched out in this Report is not comprehensive. However, the Institutional Report at several instances includes recommendations about the need to strengthen stakeholder engagement in various processes and for various sectors. The Institutional Report refers to the following positive examples:

- North Macedonia –
  - the Council for Agriculture and Rural Development, a consultative mechanism for policies and programs for development of agriculture and rural development.
  - The Regional Spatial Plan for Ohrid-Prespa region, of which the Prespa and Ohrid basins is an integral part, has been prepared by the State Agency for Spatial Planning in consultation with various relevant stakeholders.
- The Kosovo Cadaster and Land Information System (KCLIS) has been developed based on the Service Oriented Architecture (SOA) approach. This approach makes extensive use of web services internally, while some of the services have been exposed to stakeholders outside of KCA via the Geoportal.
- Montenegro – multi-stakeholder involvement in development of Flood Management Plans.



## Sustainable development/green economy

Montenegro has a constitutional commitment to be an ecological state. Montenegro adopted its first National Strategy for Sustainable Development in 2007 and has periodically reported on its implementation in the framework of an Action Plan. In the process of revision of the NSSD to take into account the Sustainable Development Goals (prepared in 2016), Montenegro has developed a set of indicators for sustainable development. In Montenegro, the framework documents governing sustainable development and setting related framework objectives are the National Strategy for Sustainable Development by 2030 and the Na-

tional Strategy with Action Plan for transposition, implementation and enforcement of the EU acquis on Environment and Climate Change by 2020 (also prepared in 2016).

The **National Council for Sustainable Development, Climate Change and Integrated Coastal Zone Management** (National Council) was established to provide advice to the government of Montenegro on policy issues related to sustainable development, climate change and integrated coastal zone management. It is the only intersectoral body of its kind in Montenegro. However, its role is primarily advisory, and its recommendations are not binding.

Tasks of the National Council are, as follows:

- Harmonization of the sectoral policies with the principles, objectives and measures of sustainable development, climate change and integrated coastal zone management, in order to overcome the challenges of uncoordinated sectoral planning;
- Initiating amendments to existing legislation and enactment of new regulations of importance for the harmonization of socio-economic development and the preservation of natural resources with policies for sustainable development, integrated coastal zone management and the needs for adaptation and mitigation to climate change, taking into account the relevant standards and requirements of the European Union and the United Nations;
- Providing specific guidance on the importance of harmonization of overall development of Montenegro with the principles, objectives and measures that are established by the National Strategy for Sustainable Development, the National Strategy for Integrated Coastal Zone Management and strategic documents in the area of climate change.

Montenegro was the first country in the region to submit a Voluntary National Review at the High Level Political Forum in 2016, and one of only 22 UN Member States to do so. This voluntary Montenegrin national review presents the areas where Montenegro as a matter of priority would need support in terms of finance, capacity building, technology, partnerships especially with regard the issues as follows:

- How to increase efficiency and effectiveness on national implementation of 2030 Agenda through enhancing the governance system for sustainable development and evaluation and reporting on implementation of NSSD until 2030. How to strengthen the capacities of the Statistical office of Montenegro (MONSTAT) and other producers of statistical data as to effectively monitor the indicators for sustainable development.
- How to mobilize external sources for financing sustainable development of Montenegro and to increase share of the allocations related to sustainable development in total national budgeting /GDP. How to enforce national partnerships and to diversify public and private sources of financing of relevance for sustainable development.
- How to enforce regulatory impact assessment of national processes with regard to implementation of NSSD until 2030. How to enforce implementation of the NSSD measures and related projects on the preservation of natural capital and greening of Montenegrin economy.

In Albania and in Kosovo\* there are no strategic documents in place to set sustainability goals. The Kosovo\* Environmental Strategy 2013-2022, an updated review to the Strategy of Environment (2005-2015), is submitted to the Government pending approval. Once approved it will provide a framework to enhance sustainable management of natural resources.

In North Macedonia, the following strategic documents govern sustainable development and set sustainability objectives:

- National Strategy for Sustainable Development 2009-2030 (adopted in 2010);
- Second National Environmental Action Plan (NEAP 2);
- National Strategy for Environmental Investment (2009-2013);
- Third national communication on climate change (2013);
- Plan for Institutional Development of National and Local Environmental Management Capacity 2009-2014 (2009);
- National Strategy for Harmonization in the Field of Environment (2008);
- The MEPP Strategic Plan for the period 2016-2018;
- The National Programme for Adoption of the Acquis - (NPAA) revised for 2017-2019;
- The Accession Partnership, Council Decision of 18 February 2008 (2008/212/EC) on the principles, priorities and conditions contained in the Accession Partnership with the former Yugoslav Republic of Macedonia and repealing Decision 2006/57/EC.

## Climate action (adaptation)

The Drin Riparians are not major emitters of greenhouse gases, but climate change scenarios show that they may suffer significant effects from climate change. Consequently, the focus of policy development in these countries in relation to climate change has been on adaptation rather than mitigation.

Albania has developed a National Climate Adaptation Plan and is working on a Climate Law. The Climate Law is foreseen as a mechanism that could integrate the Nexus approach in policy and decision-making. An Interministerial Working Group on Climate Change was established in 2014.

Kosovo\* has an Action Plan for the Climate Change Strategy (2016). The Climate Change Strategy itself was drafted in 2014. The status of the proposed National Adaptation Strategy is uncertain. Among its ob-

jectives are to build the capacity of the local partners, actors and stakeholders to integrate climate change issues and adaptation into the local and regional development processes and empower them for addressing climate change issues.

Some work has been done in developing sectoral strategies related to climate change adaptation in the region, but it has not proceeded very far up to now. Reports show that there are several sector strategies related to climate change in draft form. According to the Nexus country report from for Montenegro: "It is envisaged that climate change will have impacts on the hydropower sources of energy in Montenegro, but there is currently no discussion or planning regarding adaptation measures for this sector (see section on Climate Change Adaptation)."

## Other examples

Albania has an Interministerial Committee on Agriculture that acts as an advisory body to the Council of Ministers for decisions related to agriculture and rural development. The National Commission for Land Protection is spearheaded by the Agriculture Ministry and coordinates actions that have to be taken by other agencies in order to preserve land.

Kosovo\* has an Interministerial Water Council, with responsibility for improving the situation in the water sector through the development of sector policies and action plans based on good practices. The IMWC shall provide opinions and recommendations in the following fields:

- Implementation of laws and sub-legal acts regulating the water sector,
- Implementation of laws and sub-legal acts related to water management,
- Drafting and approval of the National Water Strategy,
- Policy development in the field of water,
- Financial policy in the water sector.

According to Article 16 of the Law on Waters, the IMWC shall consist of five members and shall be chaired by the Prime Minister or its deputy (most likely the IMWC will consist of representatives of:

- (i) Ministry of Environment and Spatial Planning,
- (ii) Ministry for Agriculture and Rural Development,
- (iii) Ministry of European Integration,
- (iv) Ministry of Economic Development and
- (v) Ministry of Health.





# 5

## International policy, cooperation, and trade

### 5.1 Global standards and regional regimes relevant to Nexus

*Among the Drin Riparians, Albania, North Macedonia and Montenegro are UN member states. As of writing, slightly more than half of all UN member states, including the other three Drin Riparians, had recognized Kosovo's\* statehood but it was not a UN member state.<sup>79</sup> While the Kosovo\* government often represents the country in international affairs, its participation in UN processes may sometimes be limited.*

The Sustainable Development Goals, which were agreed to by the international community on September 25, 2015 (they were adopted by the Kosovo\* Parliament on January 18, 2018), have a major impact on the domestic policies of the Drin riparian states. These seventeen goals set a trajectory for global action on a comprehensive range of issues leading towards sustainability. Good governance runs as a thread throughout the 2030 Agenda for Sustainable Development. Environment as a cross-cutting issue essential to human development features prominently in the SDGs beginning with equitable access to natural resources in SDG 1 on ending poverty. SDG 16 calls upon the international community to “Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.” SDG 17 on implementation and partnerships also touches upon international cooperation to improve governance.

Other SDGs relevant to governance in the context of the scope of the Nexus considered in this assessment include SDG 6 to ensure availability and sustainable management of water and sanitation for all; SDG 7 to ensure access to affordable, reliable, sustainable and modern energy for all; SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable), particularly Target 11.5 on disaster risk management; SDG 12 (Ensure sustainable consumption and production patterns), particularly Target 12.4 on achieving environmentally sound management of chemicals and all wastes throughout their life cycle; SDG 13 to take urgent action to combat climate change and its impacts; and SDG 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

States are committed to adopting a National Strategy for Sustainable Development (NSSD), or in some cases revising an existing one, to the SDGs. Each country should develop its own set of national indicators based upon an integrated NSSD monitoring framework with 231 global SDG indicators. In the case of **Montenegro**, for example, which has had a NSSD in place since 2007, 281 national indicators, 9 composite indicators, and 36 other indicators provided by international organizations are being integrated into its national monitoring framework, in connection with a new revised NSSD taking into account the SDGs. Countries are encouraged in the context of the High-Level Political Forum to submit Voluntary National Reviews according to a specific reporting framework. **Montenegro** submitted a VNR in the first round, while **Albania** submitted one in 2018.

Guidance materials and methodologies are being developed to assist states in meetings the SDGs, targets and indicators. For example, UN Water has produced an “Integrated Monitoring Guide” for SDG6, as well as several draft, step-by-step methodologies for specific indicators under the SDG. Due to the interconnectedness of the SDGs on water, energy and food security, and environment, an integrated approach is necessary for informed choices about the synergies and trade-offs in ensuring effective implementation.<sup>80</sup>

The year 2015 also saw the adoption of the Sendai Framework on Disaster Risk Reduction and the 2015 Paris Agreement on climate change, which established a new global governance model based upon broad legally-binding targets met through a monitored compendium of voluntary commitments in the form of national action plans. Climate change poses particularly complex governance challenges requiring better integration of security concerns across various sectors and scales and the application of flexible and adaptive mechanisms and institutions. Climate change as a driver of migration represents another significant governance challenge. On the other hand, processes like developing national or transboundary strategies to adaptation to climate change can serve as intersectoral coordination efforts that a Nexus approach calls for.

<sup>79</sup> Under SCR 1244, for UN purposes Kosovo is officially administered by the United Nations Interim Administration Mission in Kosovo (UNMIK) in cooperation with the EU Rule of Law Mission in Kosovo (EULEX).

<sup>80</sup> E.g. Water and Sanitation Interlinkages across the 2030 Agenda for Sustainable Development. Analytic Brief. UN-Water. Available from: [www.unwater.org/publications/](http://www.unwater.org/publications/)

The UNECE multilateral environmental agreements (MEAs) have led to the establishment of methodologies, standards, policy instruments and institutions based upon a sound scientific basis. Environmental governance has also been improved through the “Environment for Europe” process,

*“a unique pan-European platform for ... improving environmental governance, ... as a pillar of sustainable development in the region for 25 years.”*

Access to information, public participation and stakeholder engagement are essential elements of good governance. Based upon Principle 10 of the 1992 Rio Declaration on Environment and Development, the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus, 1998) sets standards for states to meet in order to facilitate involvement of the public and other stakeholders in environmental governance. By establishing relevant obligations of public authorities and setting forth an enforceable legal framework for the exercise of rights aimed at environmental protection, it makes the link between human rights, environmental protection and good governance.

Policy and decision-making need to be based upon comprehensive, complete and reliable information. The Pollutant Release and Transfer Protocol to the Aarhus Convention establishes standards for pollutant release and transfer registers, essential tools for good environmental governance by structuring data that contribute to better environmental decision-making and policymaking.

Coherence and integration between sectoral policies as well as other policies (e.g. climate change mitigation and adaptation) at an international, EU and national level are ongoing challenges. Good governance is particularly enhanced through decision-making tools such as EIA and strategic environmental assessment, or SEA. In general EIA and SEA, particularly in a transboundary context, can be effective tools to assess the impact of proposed activities or policies on the environment, as well as to ensure proper public participation. These policy tools are also aimed at internalization of externalities in order to implement the polluter pays principle.



The UNECE Convention on Environmental Impact Assessment (EIA) in a Transboundary Context (Espoo Convention) sets out the obligations of Parties to assess the environmental impacts of certain activities at an early stage of planning. It also lays down the general obligation of Parties to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries. The Espoo Convention obliges Parties to take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities “either individually or jointly”, therefore requiring States to cooperate (article 2, para. 1). It also includes specific provisions related to transboundary consultation with affected publics.

The Protocol on Strategic Environmental Assessment (SEA) to the Espoo Convention sets out obligations for States to evaluate environmental, including health, effects of certain plans and programmes. These plans and programmes often involve decision-making on such topics as location, technology and size of facilities and activities that can have impact on environmental quality. For these plans and programmes Parties have to carry out an SEA procedure, which means that effects on the environment will be evaluated. The purpose of this procedure is to ensure that environmental considerations are integrated into decision-making at the start of development planning. The SEA Protocol is increasing in applicability, although there are fewer Parties to the Protocol as compared to the Espoo Convention, and the lack of adherence to the SEA Protocol is especially acute in certain beneficiary regions.

The Convention on the Transboundary Effects of Industrial Accidents (“Industrial Accidents Convention”) establishes obligations among states to address the causes and effects of industrial accidents. Multilateral environmental agreements can impose obligations on private actors only indirectly through the measures taken by states to implement their obligations to other states parties. The approach is similar to that taken in the case of the OECD Convention on Combating Bribery of Public Officials in International Business Transactions.

The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (“Water Convention”, Helsinki, 1992) has become a global legal framework for transboundary water cooperation. The UNECE Convention in addition obliges its Parties to co-operate by setting up agreements and joint institutions. It also obliges Parties to ensure that relevant information is available to the public.

The pan-European region also provides good examples of international cooperation and coordination of international organizations. For example, the regional office of the World Health Organization in Copenhagen has cooperated in developing regional standards for Water and Health through a UNECE Protocol to the Water Convention and these organizations have co-organized a series of ministerial conferences on Environment and Health. The Food and Agriculture Organization (FAO) also helps in developing coordinated approaches to related issues, such as Nexus assessment. Among the relevant regional or international initiatives there is also the Environment and Security Initiative (ENVSEC)<sup>81</sup> which focuses on the key role that environmental issues play in security and cooperation.

<sup>81</sup> Information on the initiative available from: [www.envsec.org](http://www.envsec.org)



## State acceptance of multilateral environmental agreements

An overview of status of the Drin countries in relation to ratification of selected international instruments and adoption of frameworks is shown in Table 26.

**Table 26.** Ratification status with regard to some important conventions and protocols

Source: author's elaboration. Note: Kosovo\* is not included in the table as it is not a UN Member State

	Albania	Montenegro	North Macedonia
UNECE Water Convention	X	X	X
Protocol on Water and Health	X		
Espoo Convention (EIA)	X	X	X
Espoo/SEA Protocol	X	X	X
Aarhus Convention/PRTR	X	X	X
Industrial Accidents Convention	X	X	X
UNFCCC	X	X	X
Paris Agreement	X	X	X

The Espoo Convention, despite its focus on transboundary impacts, has helped promote adoption of EIA legislation for purely domestic projects as well. The transboundary level tends to drive national practice, as transboundary projects tend to be large-scale, high-stakes projects related to issues such as water management and energy. The standards of international financing institutions have played a similar role in spreading these norms. While laws on EIA and SEA have been introduced at the framework level throughout the UNECE region, in some participating States implementation is not complete and practice is not well developed.

National strategies on sustainable development establish platforms for consideration of environmental and social impacts of development plans, and lead to adoption of

national legislation on access to information, public participation, EIA, SEA, and other matters. The development of sustainable development policies, strategies and action plans ensures better cross-sectoral coordination and more integrated decision-making. **Montenegro** is a country with an early example of a National Sustainable Development Strategy (2007).

Planning in relation to the 2030 Agenda for Sustainable Development is now underway. The SDGs and their set of 230 indicators have already begun to stimulate participating States to adjust their national legislation, policies and institutions. Only 22 countries presented voluntary reviews on their efforts to meet the goals at the 2016 High-Level Political Forum and one of these was Montenegro.



Thanks to the Aarhus Convention many countries have developed extensive practice in implementation of provisions related to access to environmental information and public participation in environmental decision-making. Aarhus bodies promote implementation through the development of guidelines and guidance materials such as the Implementation Guide to the Aarhus Convention (2000, 2011), and decisions such as the adoption of the Maastricht Recommendations on Public Participation (2014). The Aarhus Centres<sup>82</sup>, which provide practical tools that the public can use to make use of its rights to information, participation and justice, support the Aarhus Convention's implementation. The Organization for Security and Co-operation in Eu-

rope (OSCE) has over a decade supported their establishment, including in the Drin countries. Among their wide range of activities, they play a key role in facilitating participation, and access to information, on environmental issues.<sup>83</sup>

The main measurement of performance under such regimes is self-reporting by States Parties in connection with periodic Meetings of Parties or Conferences of Parties. The most recent reporting cycle was in 2017. The national reports describe the measures taken in the respective countries for implementation of the Convention's provisions.

<sup>82</sup> Organization for Security and Co-operation in Europe (OSCE), The Aarhus Centres: A Brief Introduction (2012) Available from: <http://www.osce.org/secretariat/89067>

<sup>83</sup> OSCE, Governing water – preventing conflicts (2015). Available from: [www.osce.org/water](http://www.osce.org/water)

## Guidance to the state level

An important point of reference for the Drin riparian countries is the European Union environmental governance assessment framework, currently under development by the European Commission in the context of the new system of Environmental Implementation Reviews. The first EIR with an abbreviated environmental governance assessment framework was completed in 2017. The 2019 EIR will have a much more elaborated environmental governance assessment framework covering the following five dimensions: Transparency, Public Participation, Access to Justice, Compliance Assurance, and Efficiency and Effectiveness. In years to come, this framework will likely be adapted for use in the accession process.

Various international organizations provide support to national level implementation of good practices and international standards in access to environmental information and public participation in decision-making. While the countries are not direct members of all of the institutions or networks mentioned below, they are free to make use of the various publicly available materials produced by them.

The European Environment Agency, for example, in cooperation with UNECE increases transparency and a sound basis for decision-making through its Shared Environmental Information System (SEIS) platform that includes a set of indicators. The SEIS platform is available to the members of Eionet, the European Environment Information and Observation Network. All Drin countries are Cooperating Countries under Eionet.

The UNECE Conventions and their Secretariats have produced numerous guidance documents, implementation guides and other kinds of expertise on implementation in order to share experiences and help to develop common standards for implemen-

tation of the provisions of the UNECE Multilateral Environmental Agreements (MEAs).

UNECE is developing Public-Private Partnership standards, recommendations and best practice models in relevant sectors, including water and sanitation. Public-Private Partnerships (PPPs) are well-recognized tools for building relationships among investors, business enterprises, public authorities, and stakeholders. These mechanisms are particularly useful where innovation is required, markets do not work efficiently, or a critical mass of social support is needed. Certain areas related to environmental governance, such as resource efficiency and sustainable waste management systems, may require long-term orientation to achieve the necessary results.

The Aarhus Convention has its own internal self-executing mechanisms for boosting implementation. Besides the reporting regime, which the Convention has in common with many other MEAs, the Aarhus Convention also has a Compliance Committee that can hear complaints from members of the public. Other UNECE conventions have strengthened the role and powers of their compliance mechanisms following the experience of the Aarhus Convention.

The OSCE is another organization that works in close cooperation with the UNECE. With a greater emphasis on security, the OSCE nonetheless has recognized the role of environmental and other forms of governance in achieving sustainability as one of the fundamental prerequisites for stability and security. Albania, Montenegro and North Macedonia are OSCE Participating States, while the OSCE has a mission in Kosovo\*.

A fully integrated permitting system provides a clear framework for decision-making related to environmental governance. Best prac-

tices in integrated permitting are promoted through various mechanisms, including the OECD "Guiding Principles of Effective Environmental Permitting Systems" and permitting and enforcement networks such as the International Network for Environmental Compliance and Enforcement (INECE), the EU Network for the Implementation and Enforcement of Environmental Law (IMPEL), and the Environmental Compliance and Enforcement Network for Accession (ECENA). Standards

for permitting, inspection and enforcement with regards to facilities covered under integrated permitting frameworks include methodologies for coordination with stakeholder agencies. "Depending upon the requirements of national legislation and institutional arrangements, the permitting authority needs to consult other authorities with related responsibilities or interests (the environmental inspectorate, water and health authorities, sectoral ministries, local authorities, etc.)."

## European Union context

The European Union (EU) has a major influence on developments in the Drin Basin, since all Drin Riparians have taken steps towards adoption of EU law. All but Kosovo\* are candidate countries for EU membership, while Kosovo\* and the EU have a Stabilization and Association Agreement.<sup>84</sup> As a consequence, the countries have made commitments derived from the *acquis communautaire* (EU Law) that affect water, energy, ecosystem and food policies. These laws include the EU Water Framework Directive and its substance-specific (or "daughter") directives, various energy directives and strategies, the Common Agricultural Policy, the Rural Development Policy, and a number of environmental directives such as the Birds and Habitats Directives and those related to integrated pollution control, EIA and SEA, etc. Because of the accession process, these commitments are part of the closure of particular chapters, and are subjected to progress monitoring, without specific sanctions other than delay in accession. The Drin countries typically have specific institutions dedicated to EU integration

and may adopt specific national strategies for harmonization, approximation or transposition. The EU integration process also includes possibilities for financing activities aimed at reaching cross-sectoral integration goals. One accession requirement that is particularly important to energy sector development in the western Balkans is the requirement to meet binding renewable energy targets by 2020 and to prepare and implement National Renewable Energy Action Plans. Each country is undergoing gradual structural reform in the agricultural sector to prepare for EU membership. The approximation adoption of the water-related directives has advanced at different stages in the Drin countries.

Various projects aimed at promoting adoption of the environmental *acquis* have been carried out on a regional basis. The earliest such platform, with a broader remit than accession alone, was the Regional Environmental Reconstruction Programme for South Eastern Europe (REReP). Following its suspension, successor platforms and programmes were aimed specifically at the accession process. These included the Regional Environmental Network for Accession (RENA) and the Environment and Climate Regional Accession Network (ECRAN).

<sup>84</sup> As Kosovo's independence is not recognized by five EU Member States, the SAA is not expressly aimed towards Kosovo's accession but the agreement has the same effect with respect to application of EU law. However, the discussion of the accession process in this chapter applies only to the three candidate countries.



## 5.2 Basin level transboundary cooperation

*The country-level institutions related to management of the water resources of the Drin River Basin and its components is set forth above at section 4.3.2 of this Chapter. When it comes to transboundary cooperation, the main platform – the Drin Coordinated Action – is described below. In a broader sense, the countries have many avenues and opportunities for collaboration through various regional groupings and mechanisms for cooperation on the technical level. Some of these have been mentioned above (e.g., INECE), while a description of other major initiatives follows. More detail is provided in Chapters 6-8 with respect to the specific topics covered there.*

The context for basin-level governance includes elements of cooperation on sub-areas of the Basin. For example:

- An Agreement between the Government of Montenegro and the Government of the Republic of Albania on Water Issues was concluded on 31 October 2001 in Podgorica.
- Water-Economy Commission is a body established by the Treaty for Water-economy Issues signed between the Government of the Federal Peoples Republic of Yugoslavia and the Government of the Peoples Republic of Albania in 1957 and covers cooperation between Albania and North Macedonia.
- Albania and North Macedonia executed an agreement on the protection and sustainable development of the Lake Ohrid watershed in 2004, based on earlier MOUs, the first one signed in 1996. A Watershed Management Committee is in place.
- The Dinaric Arc Initiative provided a context for international cooperation on the Skadar/Shkodra Lake between Albania and Montenegro in the 2000s.
- Agreement between the Ministry of Tourism and Environment of Republic of Montenegro and the Ministry of Environment, Forestry and Water Administration of the Republic of Albania for the Protection and Sustainable Development of the Skadar Lake (2008), which forms the legal basis for the establishment and functioning of the Skadar/Shkodra Lake Commission.
- Memorandum of Understanding on Cooperation in the field of Environmental Protection and Sustainable Management of Natural Resources between the Ministry of Spatial Planning and Environment of Montenegro and Ministry of Environment, Forestry and Water Administration of Republic of Albania (2010).
- Memorandum of Understanding between the Ministry of Agriculture and Rural Development of Montenegro and the Ministry of Environment, Forestry and Water Management of Albania (2010).

- Memorandum of Understanding between the Council of Ministers of the Republic of Albania and Montenegro on “Cross-border Development of Skadar Lake.”
- Sectoral transboundary agreements have been executed, including one between the National Agency for Protected Areas of Albania and Public Enterprise National Parks of Montenegro in 2016.
- A trilateral agreement among Albania, Greece and North Macedonia about the protection and sustainable development of the Prespa Park Area was signed in 2010, based on a declaration made ten years earlier. A Prespa Park Management Committee is in place.
- Councils for River Basin Management have been established for the Vardar, Strumica and Crn Drim; and Prespa Lake and Bregalnica River Sub-basins.
- A river basin management plan for Drin-Buna is under development (TDC 2018).

There is no legally binding international agreement establishing a comprehensive cooperation mechanism for the whole Drin Basin. The main context for cooperation at the basin level is the 2011 Tirana Memorandum of Understanding committing to a Shared Strategic Vision for the Sustainable Management of the Drin River basin (“MOU”). This MOU-based process commits the Riparians to **“promote joint action for the coordinated integrated management of the shared water resources in the Drin Basin, as a means to safeguard and restore to the extent possible the ecosystems and the services they provide, and to promote sustainable development across the Drin Basin”**. The MOU provides a framework for cooperation, but its non-binding nature limits its effectiveness.

Arising out of the Drin Dialogue Process, the MOU resulted in the establishment of a Meeting of Parties, the Drin Core Group and a Secretariat (operated by Global Water Partnership – Mediterranean) as well as expert subsidiary bodies. With the adoption of an Action Plan, the Drin Coordinated Action (Drin Corda) was established to provide a mechanism whereby the countries’ experiences in transboundary water governance in other contexts could provide valuable input to cooperation in reaching the goals for action on the Drin. The Action Plan is structured around six actions:

- Enhancement of coordination mechanisms among the parties.
- Enhancement of the knowledge base concerning the Drin Basin.
- Improvement of information exchange by establishing a system for regular exchange of information among the competent authorities of each party.
- Enhancement of cooperation in the field of flood risk preparedness, management and mutual support.
- Institutional strengthening in the field of integrated water resources management.
- Promotion of public participation and stakeholders’ engagement.

In the context of the MOU, some specific agreements have been developed at various stages.

## 5.3 Cross-sectoral coordination at Drin Basin level

*The countries have many avenues and opportunities for collaboration through various regional groupings and mechanisms for cooperation on the technical level, such as the Regional Cooperation Council (RCC), the Central European Free Trade Agreement (CEFTA), the South East Europe Transport Observatory (SEETO) envisioning a Transport Community Treaty, and the South East Europe Investment Committee (SEEIC) under the RCC. A well-functioning Drin Corda mechanism with outreach towards these other processes could help to play a coordinating role with respect to impacts across sectors on the protection and sustainable use of the Drin Basin.*

Some regional coordination may take place in the form of application of instruments such as transboundary Environmental Impact Assessment (EIA) or Strategic Environmental Assessment (SEA) that is conducted pursuant to the states' obligations under the Espoo Convention and/or SEA Protocol (and related obligations under legislation

harmonizing the salient EU Directives), and which relate to Nexus sectors such as water and energy. A number of EIAs have been performed in connection with hydropower development in the Drin Basin, although it is unclear the extent to which transboundary considerations were taken into account or transboundary participation took place.



**Cooperation on the environment.** Nature protection authorities in the Drin countries have a long history of cooperation, particularly with respect to migratory species. A feasibility study was conducted by UNEP in 2010 for a transboundary mountain biosphere area between Montenegro and Albania in the Prokletije area, part of which would be in the Drin Basin.

**Cooperation in the energy sector.** Operation of hydropower facilities in the Drin Basin was formerly coordinated during the years of the Socialist Federal Republic of Yugoslavia, but that cooperation has largely broken down. All Drin riparian countries cooperate on energy matters through the Energy Community, whose purpose is to extend the European Union's single market in the area of energy to a broader European neighborhood, including the Western Balkans. In this context, the four Drin countries with others agreed in 2015 to take steps towards the establishment of a regional electricity market, and in 2016 they agreed upon a roadmap and a set of priority measures aimed at removing national obstacles to efficient regional capacity allocation. Closer coordination of Drin countries in the energy sector will likely be driven by EU policies. The RCC supports the countries' commitment to the EC through instruments such as the SEE 2020 Strategy, the Energy Strategy by 2020 and the Sustainable Energy Development Regional Initiative (SEDRI). In 2018, the 16th Energy Community Ministerial Council adopted the General Policy Guidelines on 2030 energy and climate targets and selected twenty-one infrastructure projects of regional significance (including supply, efficiency, and renewables) to boost regional market integration<sup>85</sup>.

**Cooperation in the agricultural sector.** While three of the Drin Riparians were once part of a single national market for agricultural products in the former Yugoslavia, today there is less trade in agricultural products across the borders. While some surplus agricultural production has been reoriented towards the international export market, quality standards are an obstacle to large-scale export to the EU. Most agricultural production is therefore oriented towards the local market. In addition, agricultural land is being converted to residential land at a high rate in some parts of the Basin. Citizens who leave to work abroad abandon agricultural production, and if they make enough money they use it to build residences on former agricultural land.

The countries participate in the Regional Rural Development Standing Working Group (SWG), established in 2006. The SWG implements various projects including a European Commission project to foster both regional cooperation and a balanced territorial development of Western Balkan countries in the process towards EU integration. While there is a long history of Farmer-Based Organizations in the countries, there appear to be few examples where they work across boundaries to cooperate and lobby on priority issues.

<sup>85</sup> <https://energy-community.org/news/Energy-Community-News/2018/011/212.html>



## 5.4 Regional trade

Since the 90s, the region has made significant steps forward when it comes to trade and regional cooperation, which contributed to restore stability in the region and to increase the competitiveness of small economies, as well as their attractiveness for foreign investors<sup>86</sup>. All countries are part of the CEFTA trade agreements and have committed to reduce the many barriers to trade (most notably, tariffs) that currently hamper the trade of good and services and limit the potential of both intra- and inter-regional trade, as well as to facilitate the movement of investments and skilled people across countries<sup>87</sup>.

The EU plays a key role as trading partner for the Western Balkans, as can be seen in Figure 17. However, if from Albania and North Macedonia goods are exported almost entirely to the EU, Montenegro and Kosovo\* rely also very much on regional trade within the region. Clearly, the presence of the EU is felt also when it comes to imports, as the Stabilisation and Association Agreement with the EU gives the countries in the region preferential access to EU markets for most goods<sup>88</sup>.

Generally, the trade of goods among the Western Balkans countries is limited by the extent and poor conditions of regional transport routes as well as by high costs of trade (compared to EU-11, the cost of trading is double) and associated bureaucratic hurdles<sup>89</sup>. The trade to the EU is further complicated by the presence of EU regulations and standards, which can have a major impact on certain products, like agricultural goods.

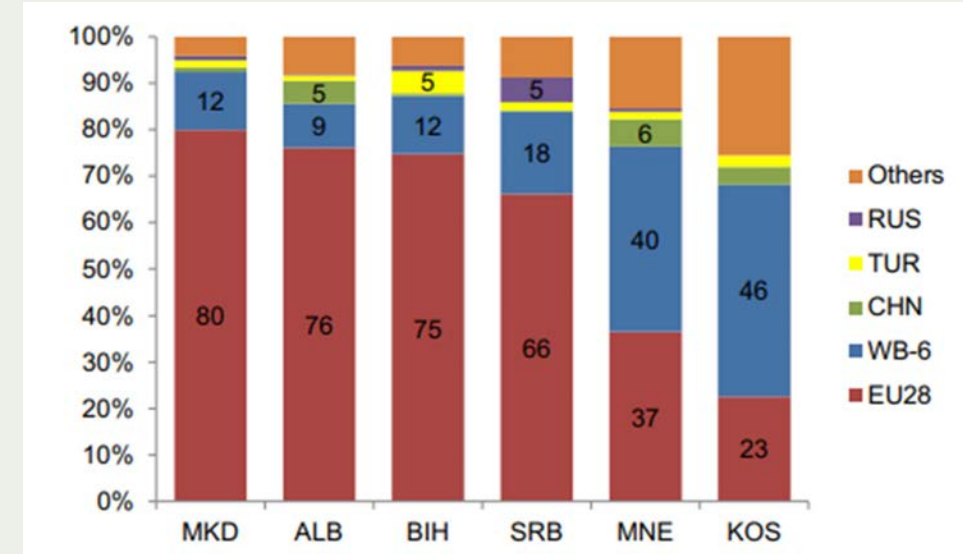
Overall, since 2013 the share of export from the countries to the EU has generally decreased for the benefit of third country destinations. Imports from EU, on the other hand, remained crucial for the countries (except for Montenegro, the EU is the main origin of imports for all Riparians).

<sup>86</sup> EBRD, *The Western Balkans in transition: diagnosing the constraints on the path to a sustainable market economy*. 2018

<sup>87</sup> *Ibid.*

<sup>88</sup> *Ibid.*

<sup>89</sup> *Ibid.*



**Figure 17.** Exports by destination, as percent of total exports

Source: EBRD, *The Western Balkans in transition: diagnosing the constraints on the path to a sustainable market economy*. 2018

### Energy trade

Overall, the Drin Riparians produce less energy than they need, and the gap is filled with imports. In 2015, North Macedonia had the highest dependency on imports, which served 52.6% of internal primary energy consumption; Montenegro 30%, Kosovo\* 27.2% and Albania 12.7% (however, looking at previous years Albania had a much higher dependency ratio: 27% as an average in the period 2011-2015)<sup>90</sup>. When it comes to electricity, only Montenegro is generally able to even up its electricity trade balance, while the other countries are net electricity importers<sup>91</sup>. Today, energy trade among Riparians is limited to oil products, electricity, and fuelwood.

For the Riparians, facilitating energy trade means increasing energy security, boosting investments in infrastructure, and aligning the energy sector to the legal require-

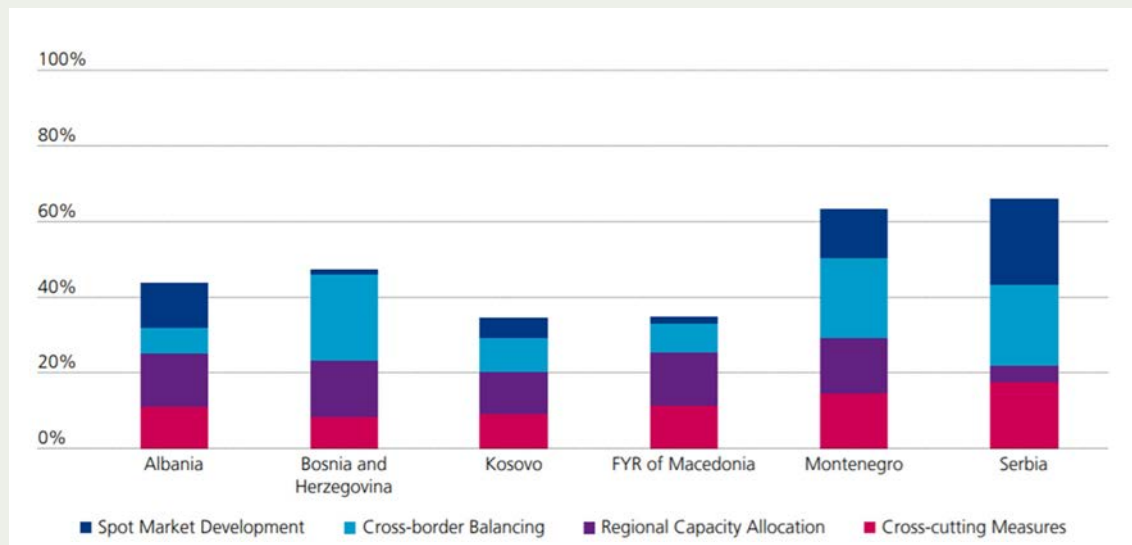
ments required for EU accession. The EU has a broader interest in the region when it comes to energy: together with transport, energy is a key pillar of the agreement between the European Commission and the Western Balkans prime ministers in Brussels (April 2015) to extend the Trans-European Network in the region<sup>92</sup>.

While the region is not rich in fossil fuels (with the exclusion of Albania), it is strategically located on the route between some of the biggest oil and gas producing countries (Caspian region and Middle East) and one of the biggest consumer markets globally: Europe. The construction of the Trans Atlantic Pipeline (TAP) started in 2015 as part of the Southern Gas Corridor project (to differentiate it from the well-established northern one, which brings Russian gas to EU via Ukraine). This will run through Turkey, Greece, and Albania (to end in Southern Italy) and would increase availability of gas in the region of South East Europe.

<sup>90</sup> GWP-Med, *Thematic Report on Socio-Economics of the Extended Drin River Basin*, 2017. Data from Eurostat.

<sup>91</sup> EBRD, *The Western Balkans in transition: diagnosing the constraints on the path to a sustainable market economy*. 2018

<sup>92</sup> *Ibid.*



**Figure 18.** Implementation of soft measures for the creation of a regional energy market

Source: Energy Community, WB6 Electricity Monitoring Report, 2016

Countries are already discussing the potential construction of a Ionian Adriatic Pipeline (IAP) to connect Croatia, Montenegro, and Bosnia and Herzegovina to the TAP in Albania<sup>93</sup>.

Cross-border electricity trade is below the region's potential<sup>94</sup>, though there is a strong political will to increase it and the creation of a regional electricity market among Western Balkan countries is a key priority cluster of the Energy Community Treaty<sup>95</sup>. The long-term perspective of this future regional market is that it will be integrated into the Pan-Euro-

pean electricity Market<sup>96</sup>, a fundamental step towards EU accession, as stated in the EU Enlargement Strategy 2025<sup>97</sup>.

In 2014, the WB-6 countries (i.e. the Drin Riparians, plus Serbia and Bosnia and Herzegovina) began addressing the situation that cross-border energy exchange was mostly limited to bilateral cooperation,<sup>98</sup> by laying out a roadmap for the implementation of a common, regional electricity market (Vienna Summit, 2015). Among the Drin countries, there is no electricity trade between Albania and North Macedonia. The latter

country imports electricity from countries such as Bulgaria, Greece, Hungary, Serbia, Slovenia and Switzerland. The implementation of a set of key soft measures (namely Spot Market Development, Cross-border Balancing, Regional Capacity Allocation, and Cross-cutting Measures (e.g. pricing of energy, unbundling energy markets)) is being monitored by the Energy Community (Figure 18). Notably, its progress will affect future EU funding and assistance to the energy sector in the region<sup>99</sup>.

As the Energy Community drives regional integration of the energy markets, International Financial Institution provide financial support to the countries when it comes to infrastructural projects, e.g. to increase transmission capacity: a 400-kV interconnection line between Albania and Montenegro was completed in 2011, and the Albania-Kosovo\* line in 2016, both of them financed by KfW<sup>100</sup>. Plans also exist to increase electricity exports outside the Western Balkans region<sup>101</sup> e.g. the Trans Balkan Corridor with Romania and the HVDC 500 kV interconnection between Montenegro and Italy<sup>102,103</sup>.

The regional market of energy biomass is also worth noting. As EU countries pledged to increase their shares of renewable energy and bioenergy became a crucial element of their future energy mix, imports of wood energy products from outside regions also increased, including from the Western Balkans. In 2017, the region exported mostly firewood (44%), wood pellets (26%), and wood chips (18%), and firewood production increased by 17% (reaching 25 million m<sup>3</sup>). Increased production is not only driven by exports to EU and Croatia, as it is also a result of growing demands in the region, most notably in Serbia and Bosnia and Herzegovina. Indeed, just between 2015 and 2018, the price of firewood in the region grew threefold (from €20 to €60 for the stacked cubic metre)<sup>104</sup>. When it comes to trade dynamics among the Drin countries, Montenegro is the only a net exporter, and it often supplies firewood to Albania and Kosovo\* where local production does not satisfy demand<sup>105</sup>.

<sup>93</sup> <https://www.tap-ag.com/>

<sup>94</sup> EBRD, The Western Balkans in transition: diagnosing the constraints on the path to a sustainable market economy. 2018

<sup>95</sup> Energy Community (EnC), 2013. The Energy Community – Legal Framework, 3<sup>rd</sup> Edition. Vienna: Energy Community Secretariat, July 2013.

<sup>96</sup> EnC, 2016b. WB6 Energy Community – Creating a Regional electricity Market in the Western Balkans: From Paris to Rome. WB6 Monitoring Report, September 2016. Available from: [https://www.energy-community.org/portal/page/portal/ENC\\_HOME/DOCS/4346408/3E2FD222C83F0FE8E053C92FA8C032A8.pdf](https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/4346408/3E2FD222C83F0FE8E053C92FA8C032A8.pdf)

<sup>97</sup> EBRD, The Western Balkans in transition: diagnosing the constraints on the path to a sustainable market economy. 2018

<sup>98</sup> GIZ, Climate change adaptation in Western Balkans. Establishment of a flood early warning system in the Drin-Buna Basin (DEWS). Assessment study for gaps and needs in establishing a DEWS (2013).

<sup>99</sup> EnC, 2016b. WB6 Energy Community – Creating a Regional electricity Market in the Western Balkans: From Paris to Rome. WB6 Monitoring Report, September 2016. Available from: [https://www.energy-community.org/portal/page/portal/ENC\\_HOME/DOCS/4346408/3E2FD222C83F0FE8E053C92FA8C032A8.pdf](https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/4346408/3E2FD222C83F0FE8E053C92FA8C032A8.pdf)

<sup>100</sup> <https://www.export.gov/article?id=Albania-Energy>

<sup>101</sup> ENTSO-E, 2014a. Regional Investment Plan – Continental South East 2014. Available from: <https://www.entsoe.eu/Documents/TYNDP%20documents/TYNDP%202014/141031%20RgIP%20CSE.pdf>

<sup>102</sup> EU, 2016. Technical Information on Projects of Common Interest (accompanying the Commission Delegated Regulation (EU) 2016/89 of 18 November 2015 amending Regulation (EU) 347/2013 of the European Parliament and of the Council on guidelines for trans-European energy infrastructure as regards the Union list of projects of common interest). Available from: [https://ec.europa.eu/energy/sites/ener/files/technical\\_docu.pdf](https://ec.europa.eu/energy/sites/ener/files/technical_docu.pdf)

<sup>103</sup> Ministry of Economy of Montenegro, 2011. Energy Policy of Montenegro until 2030. Podgorica, February 2011.

<sup>104</sup> FAO and UNECE, Forest Products Annual Market Review 2017-2018

<sup>105</sup> Nexus Country Reports, 2018



## Agricultural trade

As discussed, the agricultural sector is of strategic importance for Drin Riparians, first and foremost because of its relevance as livelihoods for rural populations. It should be noted that up until 20 years ago the countries except Albania shared a common market for agricultural products. Since then, while agricultural production has become more oriented towards domestic markets, there is still an appreciable trade of agricultural products across the borders.

Compared to other goods, agricultural products are increasingly relevant as exports. In fact, the proportion of agri-food exports in total exports has increased in all Riparians in the period 2010-2015 (except from North Macedonia, the best-established exporter already), while at the same time the proportion of imports has remained stable<sup>106</sup>. The main exported products in 2015 were:

- Albania: oilseeds, edible vegetables and meat preparations
- Kosovo\*: beverages, milling industry products and edible vegetables
- North Macedonia: tobacco, edible vegetables and preparations of cereals
- Montenegro: beverages, meat and tobacco

Still, all Riparians are net importers of food, and they depend on imports especially when it comes to high-added value, high-quality products. This reflects a common weakness of the economies of the Western Balkans. In manufacture, for instance, “Over 50 per cent of the region’s manufactured goods are classified as “labour and resource intensive” or “low-skill and tech intensive”, in comparison to about 30 per cent in the European Union. In contrast, only 18 per cent fall into the category “high-skill and tech-intensive goods” in comparison to 27 per cent in the EU-11”<sup>107</sup>.

In Albania the value of imports of agri-food products is 6.7 times higher than the value of exports (2012)<sup>108</sup>. Such deficit remains stable in Albania, and in the other countries it is increasing<sup>109</sup>. Still, high value opportunities are also there: a notable export is Montenegro’s wine (even though the country is also a net importer of agri-food products).

Other than the fragmentation of agricultural holdings and the disaggregation of agricultural value chains (already mentioned in Chapter 3), trade is limited by infrastructural problems (poor state of roads, lack of cold storage facilities, etc.), and issues of logistics (the absence of trade agreements, the costs of import/export, and bureaucratic hurdles).

As it happens for energy, the development of a regionally integrated agriculture market is seen as a strategic step towards accession to the EU market, and most countries see the EU market as an opportunity for expanding the export of high added-value food products. However, there are important gaps between EU and national standards on food production and marketization, and food safety regulation is poorly implemented in all countries (the whole region is lacking laboratories for food quality control).

A Regional Rural Development Standing Working Group (SWG) was established in 2006 to implement various projects aimed at fostering rural and agricultural development as well as regional cooperation at ministerial level, with the general objective of assisting the countries of South East Europe to progress towards EU integration. One of the focus areas of the group is overcoming barriers to agricultural trade in the region (the absence of mutual recognition of trade procedures stands out as a major issue). Further, the promotion of cross-border cooperation among smallholders active in the agricultural value chain and related sectors (including tourism) falls among the activities of the SWG. The Prespa is one of the regions where this is being implemented<sup>110</sup>.



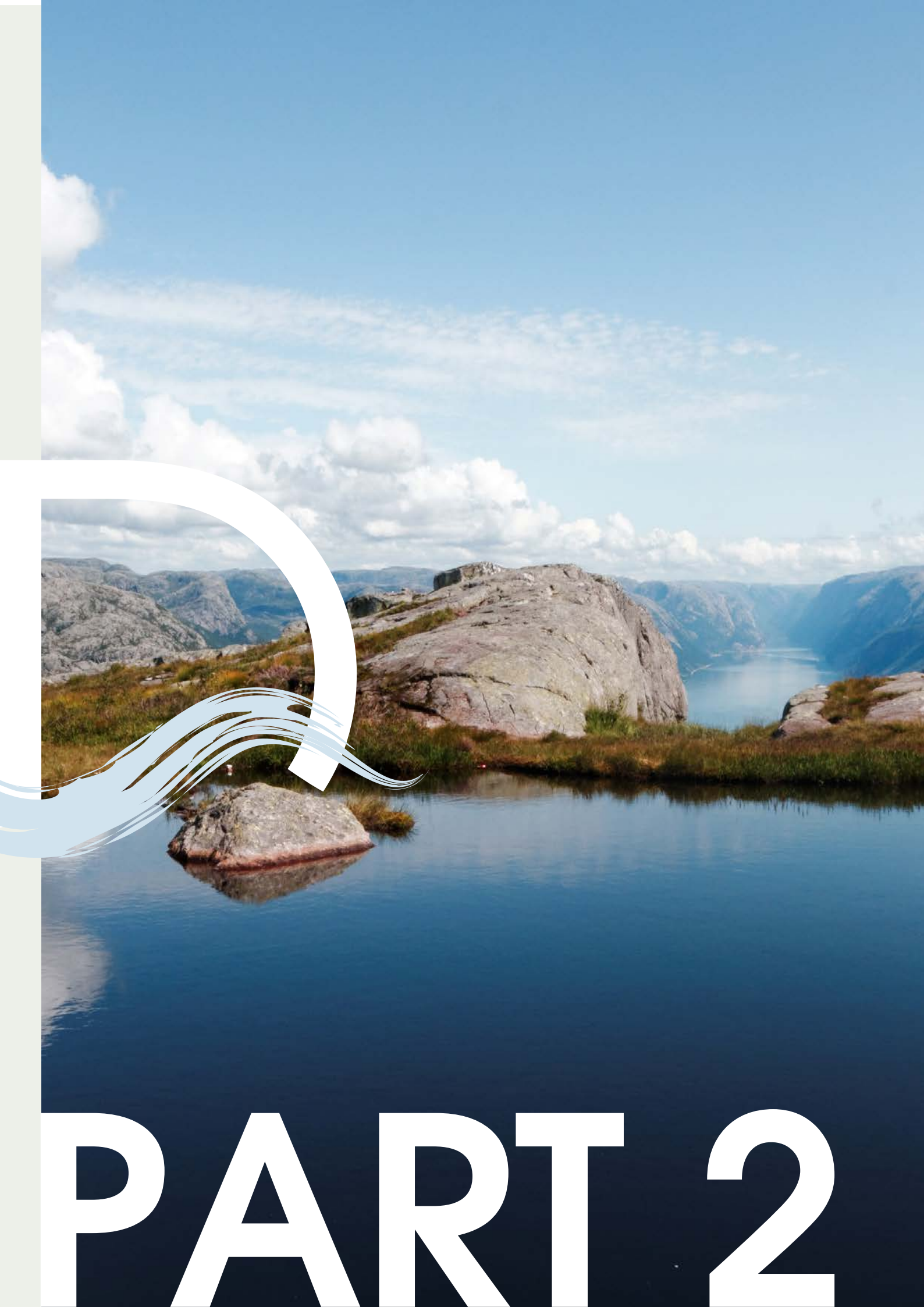
<sup>107</sup> Ibid.

<sup>108</sup> GWP-Med, *Thematic Report on Socio-Economics of the Extended Drin River Basin*, 2017.

<sup>109</sup> <http://seerural.org/wp-content/uploads/2017/06/Monitoring-of-agricultural-policy-developments-in-the-Western-Balkan-countries.pdf>

<sup>106</sup> <http://seerural.org/wp-content/uploads/2017/06/Monitoring-of-agricultural-policy-developments-in-the-Western-Balkan-countries.pdf>

<sup>110</sup> <http://seerural.org/wp-content/uploads/2018/03/SWG-AnnualReport-2017-Web.pdf>



*There are many ways in which the different sectors interact with each other through cross-sectoral impacts that alter the availability and quality of resources or, more broadly, the environment and the ecosystems on which all human activities ultimately depend. Understanding the “Nexus” in the Drin River Basin means making such intersectoral dynamics explicit (both in terms of physical resource flows and in terms of governance) and gives the opportunity to understand the root causes of pressures which often lie outside the domain of the water sector and follow strategic decisions that are taken out of the basin<sup>111</sup>.*

Understanding cross-sectoral dynamics in key areas and developing integrated policies on the country level facilitate the trans-boundary cooperation necessary for implementation of the SDGs and other commitments.

Following the logic laid out in Chapter 1, the following chapters focus on the priority inter-linkages that emerged from the analysis of relevant literature in the Drin basin (notably, the TDA thematic reports and country Nexus reports) and reflect the main concerns of the Drin Core Group when it comes to transboundary cooperation (Table 1).

When it comes to energy, both hydropower development and biomass production bring hydro-morphologic alteration to natural river courses (the latter indirectly, because of the effects that forest degradation has on the water retention capacity of riverbanks). Hydro and biomass being the most widely available, and most used, energy sources in the basin, understanding the opportunities they bring is also a way to broaden the perspective of transboundary cooperation to environmentally sound and sustainable development and improved human well-being, including for air quality that is a major issue in the basin area.

Agricultural activities also have transboundary impacts by affecting water resources, but the types of crops and livestock that farmers decide to grow depends on agricultural markets, and the ability (or failure) to trade agricultural products. These choices may have a substantial effect on the demand of water (and other inputs), greenhouse gas emissions and other environmental pollution, erosion, land degradation, health impacts and patterns of economic activity of the population living in the basin.

Furthermore, future policies in the energy and agricultural sector will be affected by climate change, as well as from the directions that the single economies will take. One such example is tourism, which is already increasing pressure on the environment in the basin while providing at the same time new opportunities for rural development, hence calling for more sustainable planning of the sector.

<sup>111</sup> UNECE, *Methodology for assessing the water-food-energy-ecosystems Nexus in transboundary basins and experiences from its application: synthesis* (2018)

# PART 2





### Box 2: Hydropower at the crossroad

The increasing level of concern surrounding hydropower development is not a unique feature of the Drin River Basin or the Western Balkans, and it rather reflects a global trend. Most hydropower was installed in Europe at a time when there was little awareness and no legal framework to address the environmental issues it would bring. Over time, the perception of the sector changed significantly, and the public opinion polarized around two main views: hydropower as a win-win solution that, by regulating flows, provides multiple benefits (irrigation, flood management, fishery/aquaculture etc), and hydropower as a highly impactful infrastructural intervention that affects communities and ecosystems far beyond the specific site where the dam is built.

Due to the extensive nature of hydropower infrastructure development, the systems put in place are comparatively inflexible. For this reason, resilience and tolerances play a critical role in engineering. Baseline changes due to climate change or other impacts, unanticipated extreme weather events, or mistakes in design and installation may be extremely difficult to correct or address, with the potential result of failure or collapse. The dedication of resources (financial, human, etc.) to a particular energy pathway is a delicate decision that should be taken considering the risk that, under changing circumstances (e.g. less water available for hydropower production), the same resources need to be reallocated, with possible damage to the economy.

Even at EU level, different directives may give quite contradictory messages when it comes to hydropower development (e.g. targets for renewables on the one hand, the Water Framework Directive and Floods Directive on the other) and a clear indication on how hydropower operators should adapt to climate change is missing. There is a wide recognition that new projects should take flood management into account – which is reflected in the requirements of EIAs, SEAs, guidelines for sustainable hydropower, and is also one of the underlying principles of regional development projects aimed at increasing cooperation in the Western Balkans - however each country is responsible for setting its own rules and mechanisms of cooperation.

In general, imposing stringent constraints to hydropower development and operations is perceived by investors as increasing the risk and cost of projects. This situation makes it harder to finance hydropower projects (medium to large), but most importantly can result in decisions being taken sectorally and without proper consultation mechanisms, so that projects either go ahead despite significant opposition or construction is halted and projects remain stalled.

vulnerability in the lower Drin, and the construction of Fierza dam the lower part of the White Drin, after flooded extensive agricultural areas in the territory of Kosovo<sup>117</sup>. The most severe floods registered in the basin in recent years were those of January and December 2010. In January 10, more than 10,000 ha of land were inundated in the Shkodra district in Albania and 2,200 houses (around 5,000 people) were evacuated; in December 2010, 21 municipalities in Montenegro (within and outside the basin) were flooded, with a damage

<sup>117</sup> GWP-Med, Situation Analysis of the Drin River Basin (1.6.1), 2014

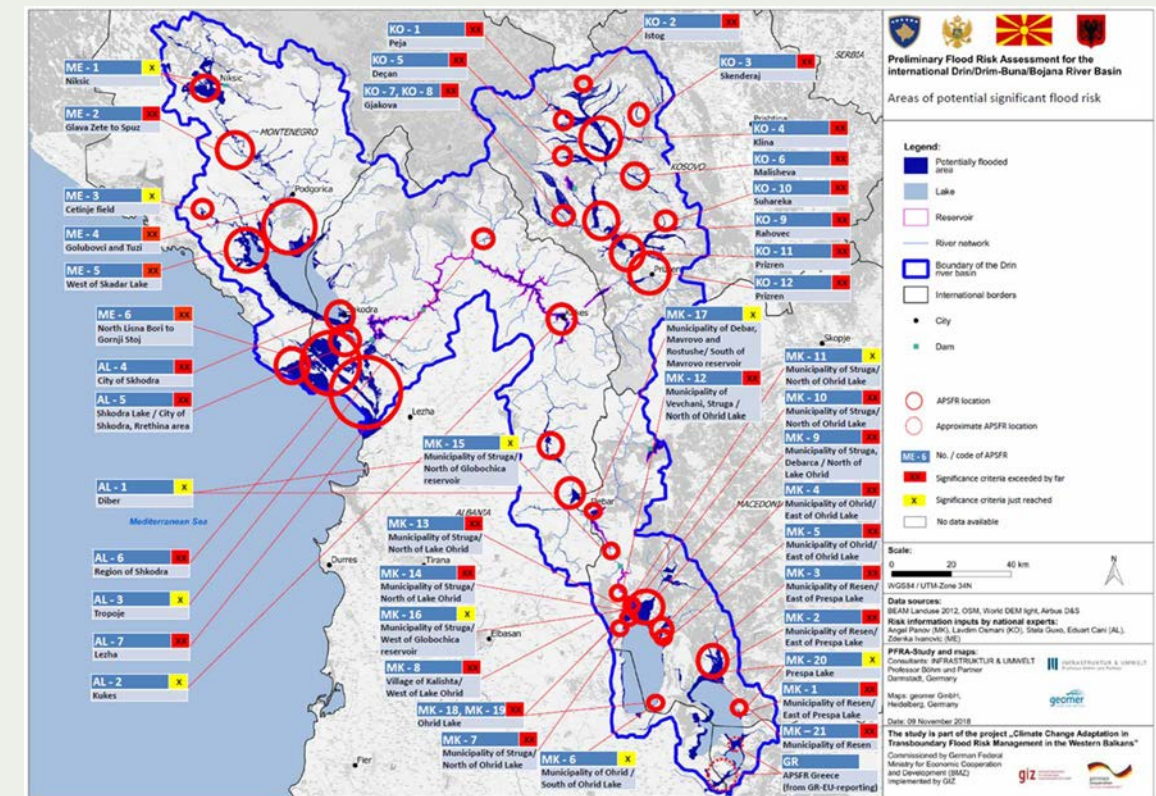


Figure 20. Preliminary Flood Risk Assessment for the Drin River Basin

Source: GIZ

of 43 million euros (1.49% of GDP) of which 13 millions of damage and losses related to vegetable production only in Golubovci (Skadar/Shkoder Lake). In that occasion, floods also severely affected the Drin delta in Albania<sup>118</sup>. Flash floods also affect North Macedonia, and the coastal areas of Ohrid in particular. Those of January and February 2015 brought significant damage throughout the country.

Some areas of the basin are associated with considerable risk of floods. The above map of Figure 20 shows the areas with potentially significant flood risk, as identified by the Riparians in accordance to the EU Flood Directive.

It should be noted that the frequency and intensity of the floods in Lake Skadar/Shkoder and Buna/Bojana areas (in Albania and Montenegro) is increasing over time. While the exact dynamics behind this trend would deserve a more accurate analysis, it is clear how some elements drive and/or aggravate, flood events. Excluding exogenous factors (e.g. changes of weather conditions, geo-morphological characteristics), two factors emerge: flow regulation through the management of water infrastructure (large dams in particular) and erosion caused by gravel extraction and loss of plant coverage.

It is important to say that hydropower reservoirs are just one type of infrastructure that can be used to mitigate floods. In particular, there are non-hydropower dams and dikes as well as natural floodplains, the latter being central to the process of integrated flood management. Still, since the major dams in the Drin basin are used for hydropower generation and given that there is a clear trade-off between hydropower production and flood control, we can say that involving hydropower operators in flood management will be crucial.

<sup>118</sup> Hydrology and Hydrogeology report (GWP-Med, 2018)



## 6.1 The importance of hydropower operation to flood management

*A dam can be managed according to different regimes, and the maximisation of electricity production is typically at odds with the requirements of flood mitigation. An integrated approach that accommodates both needs is possible, and it should be a cornerstone of multi-purpose projects. While for new projects, taking flood management into account may affect the choice of location as well as the sizing of the power plant capacity and generation potential, for existing dams it means revising operation regimes and establishing cooperation along dam cascades. In the Drin, this does not happen systematically<sup>119</sup>, but cooperation exists along the two cascades (i.e. within countries). Regardless of future hydropower developments, flood management today is influenced by: 1) the way existing hydropower dams are operated and 2) the extent and effectiveness of co-operation among operators along cascades.*

It is useful at this point to make a distinction between:

- Coordination under normal flow conditions, In this case, a lack of coordination does not increase flood risk. However it potentially reduces the revenue for hydropower operators.
- Coordination under high flow conditions (i.e. emergency). Here, lack of coordination can increase flood risk.

Now, cooperation is relatively effective in emergency situations both within Albania and North Macedonia, because in both cascades the dams are operated by one single utility (KESH in Albania, ELEM in North Macedonia). While there is room to technically improve this cooperation with the help of specific modelling tools and a more detailed mapping of flood risk areas, coordination should also work, crucially, between dam operators and the authorities responsible for flood forecasting and flood emergency operations (see also 6.2). A substantial effort is being made to improve coordination at the transboundary level: notably, a flood forecasting system has been recently set up in the Drin basin<sup>120</sup> (Box 3).

Although it may not directly impact the extent of flooding, it is interesting to note that co-operation under normal flow conditions can also be improved: today, the preferred rule of operation by dam authorities in the basin is still one that aims at maximising production in each plant (hence maintaining high flows all year round). Optimizing cascade-production

under normal conditions is the main objective of an ongoing project targeting the Albanian cascade, financed by KfW, EBRD and others, with which KESH will install a Monitoring and Dispatch Center.

However, when we talk about the Drin basin, both types of cooperation need to be understood at transboundary level. Here, coordination between operators, as well between operators and governmental actors, is lower. Making the same distinction as before, we can differentiate between co-operation in emergency situations and in normal conditions.

The impact of uncoordinated hydropower in emergency situation at transboundary level (i.e. between the Albanian and Macedonian cascades) is unclear and would require further investigation. According to experts, the floods in Ohrid in the beginning of 2010 (level of the lake above 693.75 m a.s.l) was due to the fact that water was withheld in the dams on the Black Drin in North Macedonia to assist the management of flooding in the Skadar/Shkoder area in Albania and Montenegro. Similarly, with high Drin levels and low Buna/Bojana levels, Drin water sometimes enters Skadar/Shkoder lake increasing its water level significantly. This occurs mostly from December to February, but may also occur during other periods, depending on the water quantity released from the Vau-i-Dejes hydro-power dam, which in turn depends on rainfall, electricity demand, and the operation of the two upstream dams<sup>121</sup>.

It is worth noting that at transboundary level the number of actors involved in flood management is higher than at national level, and that in the Drin basin also the Riparians who do not have large hydropower in the basin are concerned.

Once again, coordination of hydropower operations under normal conditions is not a necessary condition to reduce the risk of flooding at transboundary. However, applying the logic of basin-level optimization is possible, and can give important insights to understand the role of transboundary cooperation, and hydropower coordination in particular, in the broader picture of policy-driven power system transformations in the single countries and in the region<sup>122</sup> (see section 6.2).

The importance of high-quality monitoring, sharing of information and transparent communications among all existing players (i.e. authorities with competencies in water management, flood protection and the environment, national monitoring systems, as well as dam operators) at transboundary level cannot be exaggerated. Monitoring capacities need to be at a level to ensure detailed, real-time information about conditions and risks. Information must be structured in a way that it is shareable and understandable by relevant authorities across sectors and across borders, which requires agreement on standards and procedures. Appropriate shareholder engagement ensures the necessary dissemination of information to the broader public when required. But beyond the common knowledge and information base, policies, rules and procedures need to be put into place in order to ensure the proper integration of the consideration of effect on flood management and control into hydropower operations. For this to work, there must be clear responsibilities and accountability, as well as lines of responsibility, authority and decision-making responsibility across the relevant sectors.

<sup>119</sup> 3<sup>rd</sup> Environmental Performance Review of Albania, 2018.

<sup>120</sup> GIZ, description of the Drin-Bojana Basin Flow and Flood Forecasting System (5/12/2018)

<sup>121</sup> GWP-Med, Situation Analysis of the Drin River Basin (1.6.1), 2014

<sup>122</sup> See for instance Almulla, Y., et al. (2018) The role of energy-water Nexus to motivate transboundary cooperation: An indicative analysis of the Drina River Basin.

### Box 3: The GIZ project Climate Change Adaptation in Transboundary Flood Risk Management in Western Balkans

The objective of the project Climate Change Adaptation in Transboundary Flood Risk Management in Western Balkans (started in 2012 and planned until 2021) is to support the Drin Riparians (Albania, Kosovo\*, North Macedonia, Montenegro) to improve flood risk management at transboundary level with all actors involved in flood risk management:

- National ministries in charge of flood risk management
- Water Management Authorities, national and local level
- National Hydrometeorological Services
- Civil emergency units national and local, actors in disaster risk reduction
- Spatial planning national and local

Local authorities in risk areas. The project has three focus areas<sup>123</sup>:

- 1) Flood forecasting and early warning
- 2) Transboundary cooperation in implementing the EU Flood Directive, including Flood Hazard and Risk Mapping
- 3) Resilience and flood risk reduction at the local level.

An analysis of the interlinkages between the hydropower sector and flood management in the region should consider the outcomes of this project. In fact, the role of hydropower is central when it comes to establishing a regional forecasting system that uses real-time hydrological data (area 1) and when planning preventive measures for flood protection (area 2). Two reports from the project give interesting insights on these two areas, respectively:

The 2013 study “Establishment of a Flood Early Warning System in the Drin-Buna Basin” (DEWS) analysed the gaps to the establishment of a flood early warning system at basin level as well as within countries, (which contributed to the establishment of the flood warning system on Albania).

The 2016 study “Potential of Multi-purpose use of the Hydropower Reservoirs of the Drini Cascade in Albania” aimed at quantifying the impact of changing hydropower operation to better accommodate flood management needs by means of a cost and benefit analysis.

GIZ delivered significant results in terms of improved monitoring and forecasting, institutional capacity, and flood response planning. However, more needs to be done in terms of improving cooperation between hydropower operators and the institutions that are responsible of flood management, a crucial step towards improved transboundary cooperation.

<sup>123</sup> <https://www.giz.de/en/worldwide/29000.html>

## 6.2 Implications of a “flood-smarter” hydropower sector

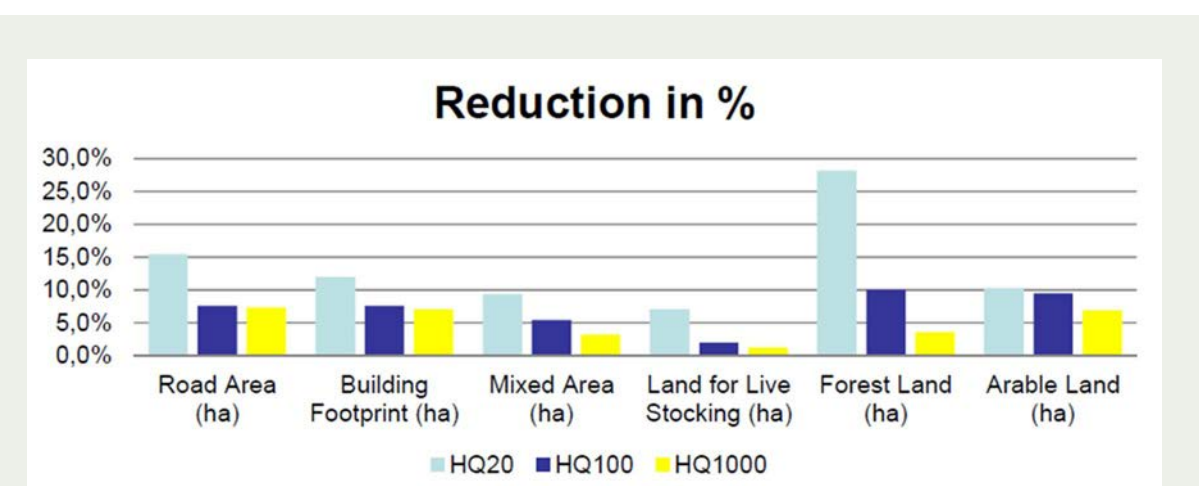
### Costs and benefits

Low coordination in the operations of dams aggravates the impact of natural events on human lives as well as on the economy (i.e. loss of livelihoods, damage to productive sectors). To better understand this phenomenon, in 2016 GIZ carried out a study on the “Potential of Multi-purpose use of the Hydropower Reservoirs of the Drini Cascade in Albania” (that is: Fierza, Komani, Vau-i-Dejes), in close collaboration with the Albanian Hydrometeorological Institute and KESH, the hydropower company operating the cascade. The study aimed at analysing the costs and benefits of changing hydropower operations to accommodate the needs of flood management. What is the cost of flood damage in the current scenario? How much less energy would be produced in a scenario of flood management (“flood peak reducing”)?

Estimating these costs is not easy. Uncertainties surrounding dam operations and energy production from KESH limited the accuracy of the simulation of the flow along the cascade and the estimate of energy losses, respectively; at the same time, the lack of details regarding flood damage from competent authorities made it difficult to make an estimate of the costs borne by the state in a flood emergency. Despite limitations, the study shows unequivocally that a “flood peak reducing” operation of the cascade would reduce the flooded areas (Figure 21), as well as the water depths related to floods<sup>124</sup>.

The highest positive impact of a change in operations corresponds to 20-years floods

<sup>124</sup> The damage to buildings is highly dependent to water depths (compared to the damage to agricultural land, which is more linked to the duration of flood).



**Figure 21.** Reduction potential due to “flood peak reducing” management

Source: GIZ, Potential of Multi-purpose use of the Hydropower Reservoirs of the Drini Cascade in Albania (2016)





(HQ20). GIZ points out that the economic benefit associated to this change comes mostly from a reduction of flooded agricultural area. In comparison, the reduction of floods in forest area (the most impacted) is marginal. This consideration is interesting as it shows that the damage of floods is deeply linked to the value we associate to environmental assets. A more valuable forest would correspond to a higher damage (see Chapter 7).

### Implications for the broader energy regimes

It is clear that the energy sector plays a key role in the flood management in the Drin River Basin, because of the way hydropower cascades are operated. Understanding the role of hydropower production in the energy system seems therefore necessary to grasp the broader implications of a potential change in operations regime on energy production, as well as to evaluate the impact of future energy investments on the Drin resources.

Hydropower production stands out as a cheap and stable means of electricity production, which is why investments in this technology remain attractive despite hydro being controversial and hydropower production is often prioritized over other uses of dams, despite potential impacts (including flood-related). But under which conditions is hydropower production convenient? With decreasing costs of other renewable technologies, or with a greater availability of natural gas in the region, will hydropower remain competitive? These questions are particularly interesting in the case of the Drin Riparians, because of

The calculation from GIZ indicate that the loss of production associated to a change in operations are small, if compared to the loss that results from natural fluctuations of flows. However, more detailed calculations are needed to estimate the exact economic loss for producers, and – crucially – to compare this to the cost of floods.

the central role of hydropower production in the energy systems of Riparians, most evidently in Albania where hydro production provides for the almost entirety of the countries electrical supply (see Chapter 3).

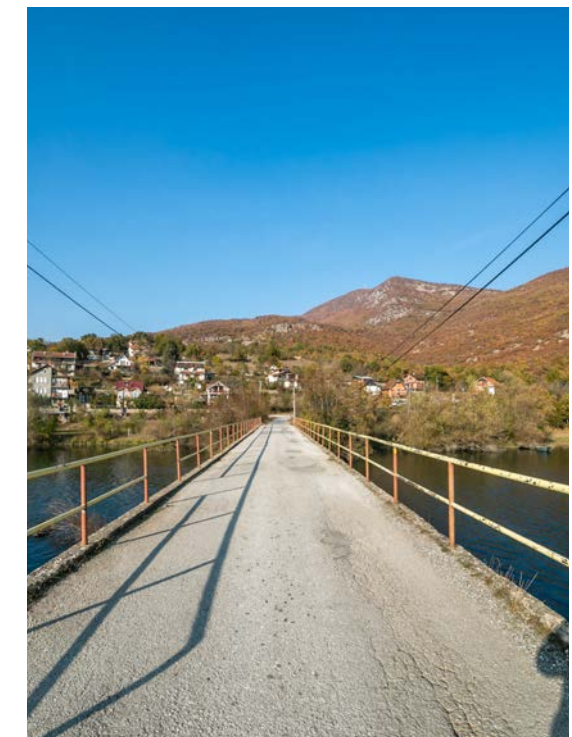
Furthermore, with modest growth rates in electricity demand and population, investment in efficiency across the whole energy sector (e.g. power infrastructure refurbishment, power plant rehabilitation, efficiency measures on the demand side, etc.) has the potential to contribute to a reduction in electricity demand which could potentially ease the pressure on hydropower.

Taking into account the Riparians' stated goal to establish a fully functional integrated power system at regional level, the operations of hydropower in the Drin basin could be optimized not only along the Drin and Black Drin cascades, but also across the whole regional electricity system, i.e. taking into account power production outside the basin and from other energy sources. This is the idea behind the future modeling work envisaged for Phase II of the Drin Nexus Assessment.

KTH Royal Institute of Technology started developing a multi-country electricity sector expansion model that represents the power sector of the four Riparians as interconnected. Essentially, the model will look for the most cost-effective options for production of electricity under different scenarios. The hydropower cascade on the Drin will be embedded in the model, which will allow exploration of the role of hydropower in the cost-optimal production mix also in a future when, due to climate commitments, variable renewables are added to the mix. Other than future electricity generation, trade and energy efficiency options will also affect the optimal production mix. Annex 3 includes a descriptions of the integrated water-energy modelling exercise proposed for Phase II of the Drin assessment.

Clearly, climate change will have to be considered in this modeling work, as changes in precipitations will directly affect hydropower production capacity by altering water availability throughout the year. A key question to be investigated would then be: would a more cooperative operation of hydro power plants in the Drin River Basin improve the resilience of the system to climate change?

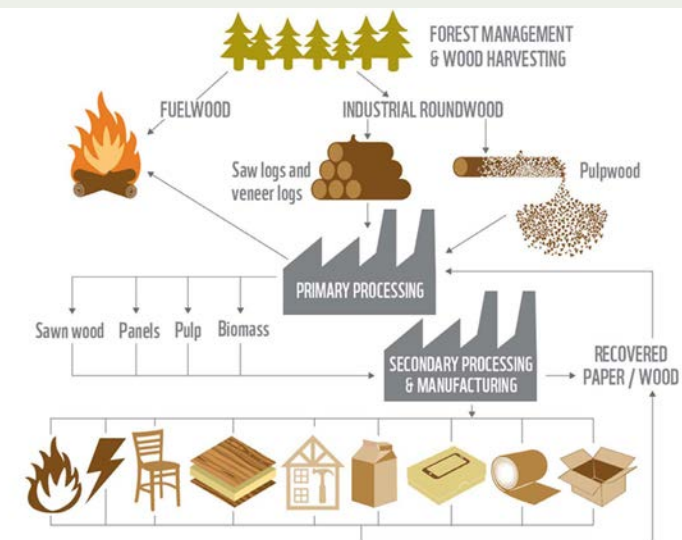
The governance aspects of each of these sample scenarios are implicit. The specific governance concerns that emerge from the policy choices relating to cooperation across sectors and across borders will be based upon the mapping of institutions, policies, legislation and actors. The outcomes of the discussions on progress in hydropower-flood management scenarios determine the optimal institutional arrangements and the allocation of responsibilities. The weight to be given to particular tools including EIA, SEA, integrated permitting etc. will depend on the precise formulation. Indispensable elements of the governance framework for cooperation on hydropower-flood management, which would apply to a greater or lesser extent depending on the specific outcomes, include ensuring an adequate knowledge base for science-based decision-making, building the capacities of the monitoring network, ensuring common standards for information sharing, transparency of data including public accessibility, structured databases, protocols for sharing of information, public participation and stakeholder engagement.



*This Chapter aims at explaining the role of wood energy in the management of forests in the Drin River Basin, to demonstrate that the sector has the potential to enhance both rural development (via income generation) and sustainability (via stronger control and better management of forest assets).*

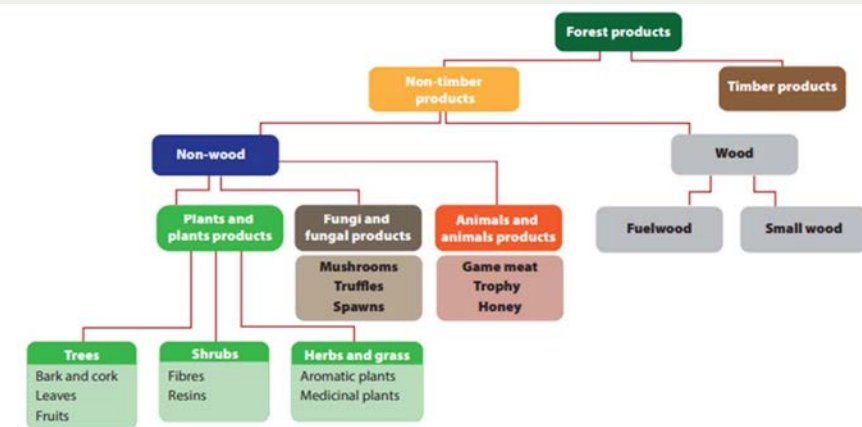
As anticipated in Chapter 3, forest-related ecosystem services and livelihoods are important for many who live in rural areas of the basin. The main uses of forest are related to wood, which is needed for energy, industrial, and construction/manufacturing purposes (Figure 22). But forest also provide for a variety of non-wood products such as forest fruits, mushroom, and aromatic plants (Figure 23) and support a great variety ecosystem services, including recreational and income-generating activities (e.g. hunting, bee keeping, tourism etc.) as well as those intangible yet vital services that sustain our environment (e.g. provision of clean water, soil stabilization, carbon storage, flood mitigation, etc.) (Figure 24).

The role of forests on the economies of the region is evolving. While wood production has long been the main income-generating activity related to forests, others such as tourism and recreation are becoming increasingly important. This means that the contribution of forest assets to GDP goes beyond wood production, even though national statistics do not necessarily capture this phenomenon (Chapter 3). At the same time, wood energy is a renewable source that is widely available and accessible in the region, and as such its use is increasingly encouraged by policy makers and is increasingly valuable for exports, particularly to the EU (Chapter 5). This keeps this primary use of forest at the centre of its future development.



**Figure 22.** The many uses of wood

Source: WWF, *Living forests report, Chapter 4: Forests and wood products* (2012)



**Figure 23.** Non-timber and non-wood forest products (NTFP, NWFP)

Source: FAO, *Beyond wood Improving policies to promote sustainable use of non-wood forest products in Europe* (2017)



**Figure 24.** Classification of ecosystem service:

Source: TEEB Europe, <http://ecology.fnal.gov/ecosystem>





## 7.1 Issues in the wood biomass value chain

*Several problems can be detected along the wood biomass value chain of Drin countries. A discussion among forestry experts in the Stakeholders conference revealed some common trends, but also few differences between Riparians (Table 28 and Annex 2). Overall, a high use of fuelwood in households does not correspond to a modern and developed chain of biomass production and consumption. On the contrary, the sophistication of the biomass value chain is rather low in the countries, meaning that firewood is consumed to a far greater extent than processed products with higher calorific values and lower environmental impact. This creates a serious problem of indoor and outdoor pollutions, which is often aggravated by the poor quality or conditions of the wood that is burnt (e.g. wet) or by the inefficiency of the stoves used, or by the fact that other materials (e.g. plastic) are burnt together with it, releasing toxic fumes.*

**Table 27.** Issues related to wood biomass in the Drin Riparians (1=low, 3=high)  
Source: 6<sup>th</sup> Drin Stakeholders Conference (November 2018, Ohrid, North Macedonia).

	Use of fuelwood in households	Environmental impact of fuelwood	Sophistication of biomass value chain	Priority of forestry in national development plans
<b>Albania</b>	3	3	2	1
<b>Kosovo*</b>	3	3	1	1
<b>Macedonia</b>	3	3	1	1
<b>Montenegro</b>	3	2	2	3

The switch to efficient /cleaner biomass products is promoted but not incentivized, and the issues related to biomass and forestry does not rank high in the priority of the countries' development plans. Montenegro is an exception, as the government took concrete political steps to solve problem of unsustainable forest use and designated a new state of secretary to guide its development. Initial advancements can be observed at different stages of the wood energy value chain: from the increasing consumption of pellets in households, to the growing import of efficient pellet stoves, up to the valorization of various sources of bio-

mass, e.g. some pellet production from vineyard debris. However, in general, the production of pellets in the Riparians remains very low and limited to private businesses, most of the wood is exported as raw material, and there is no domestic manufacturing of efficient stoves.

Forest data needs improvement in the region, from the accounting of forest stocks to the collection of data on fuelwood consumption, production of fuelwood and pellets, and also trade of wood (Chapters 3 and 5)<sup>125</sup>. To this end, it is worth highlighting ongoing initiatives such as the FAO project aimed at supporting the development of sustainable wood biomass production is called "WISDOM - Woodfuel Integrated Supply/Demand Overview Mapping". Mapping of stocks is already being undertaken in Montenegro, Kosovo\*, and Albania.

As explained in Chapters 3 and 4, the Drin countries face a major problem managing logging, which is often unrecorded or illegal and in general is not planned coherently with other uses of forests and is not in line with the natural characteristics of forests. Premature cutting of trees is a common practice in the most exploited forested areas, which is a major cause of degradation. Forestry authorities so far have not been able to effectively tackle this problem at the level of governance, often because of difficulties in the enforcement of existing legislation. Studies have shown that the transition from central planning to a market economy in the 1990s was particularly disruptive in the forestry sector.<sup>126</sup> Management practices have not caught up to shifts towards the use of fuelwood, especially in some parts of the basin such as Kosovo\*. In the latter, estimates show that the demand for fuelwood is about five times the legal supply. Most of the illegal exploitation occurs in state-owned forests and is carried out by organized criminal networks. Weak enforcement capacities are magnified by instances of bribery and corruption. Overlapping and conflicting responsibilities between the central and local government levels contribute to ineffective governance in the sector. The situation in part of the Drin basin has been called a de facto open access regime.<sup>127</sup> The problems in the sector have been recognized by the governments in the region including Montenegro and North Macedonia, for example in the UNECE/FAO workshop on Forest Products Markets and Forest Sector Workforce in the Balkans (2015). Illegal trade across the borders within the region has also been noted, particularly involving Montenegrin forests. Finally, the capacity to fight forest fires is severely limited in the region.

The consequences of unsustainable forest management affect the ecosystem as well as services that they provide, and forest degradation contributes to soil erosion (adding to the pressure coming from various sectors including notably gravel extraction and agriculture). This problematic is high in Albania and significant in the three other countries. Loss of forests also affects air quality and compromises the ability to moderate temperatures (a problem that is already being felt in Albania)<sup>128</sup>.

<sup>125</sup> The lack of precise data on exports of forest products is reported in Montenegro (Nexus country report, 2017)

<sup>126</sup> See, e.g., S. Petrova (2014), "Contesting forest neoliberalization: Recombinant geographies of 'illegal' logging in the Balkans," 55 *Geoforum* 13; L. Bouriaud et al. (2014), "A property rights based analysis of the illegal logging for fuelwood in Kosovo," 67 *Biomass and Bioenergy* 425.

<sup>127</sup> Bouriaud, op cit.

<sup>128</sup> GWP-Med, Thematic Report on Biodiversity and Ecosystems, 2017

## 7.2 Modern wood energy for sustainable forest management

*Forest conservation is fundamental to the survival of many species such as the endangered Balkan Lynx, hence it is most evidently a pillar for the protection of biodiversity. However, at a closer look conservation brings a variety of benefits, well beyond habitat preservation. Notably, protecting forests means limiting erosion and potentially sedimentation in the river system, thereby serving flood risk reduction<sup>129</sup>, as well as conserving a major carbon sink that is extremely valuable for the whole of Europe, and the world.*

At the same time, forest-related economic activities constitute a livelihood for many who live in rural areas, and for this reason it is also important to guarantee that the use of forest is as productive, efficient, and sustainable as possible. To do so in the Drin Riparians, investing to upgrade the value chain of wood biomass seems a sensible starting point because of the direct and immediate benefits that it would bring: first of all, it would formalize a largely informal sector; then, it would generate employment in a sector where skills are already well developed; third, it would have a palpable impact on local populations in terms of air quality.

If wood energy is to be developed sustainably - meaning that the planning of forest cutting, reforestation and conservation schemes are sensible and effective - this could have knock-on effects on the preservation or restoration of ecosystems services. Given the vulnerabilities of the basin (see Chapter 6), it seems important to underline erosion control and flood risk reduction as highly valuable forest related services.

Furthermore, a more holistic approach to forest management could better integrate forest-related activities and reconcile their complementary objectives, that remain all too often in competition. Today there is still *“a general conflict between the protected areas and forest management authorities over the use of forests, non-timber forest products and hunting”*<sup>130</sup>.

This competition becomes evident in the case of infrastructural projects in forest areas, including for the exploitation of energy sources. Overlaps in legislation, and a generalized lack of transparency and low involvement of the public when it comes to approving EIAs, are characteristics of the countries<sup>131</sup> (see also Chapter 4). Such inter-sectoral governance issues should be urgently solved in order to clear the path for a planning of renewable energy developments that is smoother in terms of procedure, more environmentally sensible, and more beneficial for the local economy.

It is worth noting that even in Montenegro that has been cited as the riparian with the most developed bioenergy sector, wood biomass is the only type of bioenergy effectively reflected in both energy and agricultural strategies. As reported in the country Nexus report, as the energy strategy envisages an increase of energy generation from various forms of biomass, the agricultural strategy only envisages improved management of forests to increase fuelwood production but includes no specific to promote the cultivation of energy crops. Hence, forests remain the main source of biomass in the country, and there is very little utilisation of agricultural leftovers and no cultivation of energy crops. This reflects the simple fact that wood biomass is an well-established reality, that does not require building up whole new distribution and does not create competition with food production.

More coordination could also boost entrepreneurship. As pointed out by a recent study on non-timber forest products in South East Europe (case studies in Slovenia, Serbia, and North Macedonia), today there are no specific policies in place for the development of non-timber products. Closing this gap seems feasible, as several elements of such a policy are already in place (support to SMEs, nature protection, and forestry) and the sector – traditionally underestimated – is the interest and vitality of private businesses is already observable<sup>132</sup>.

Last, but not least, come the opportunity of leveraging funds for forestry, which inadequacy remains today a major barrier to the sector's sustainable development. As highlighted in the Kosovo\* country report, there is no sufficient funding available (nor funding schemes or economic instruments in place) for implementing the environmental protection measures that are considered “of priority”<sup>133</sup>. However, at the same time, there are concrete possibilities to capitalize on the wood production sector itself and its modernization, as highlighted by a study on Innovative Financing for Sustainable Forest Management in the Southwest Balkans financed by World Bank and implemented by CNVP, 2009-2014, which focused on erosion and sedimentation monitoring related to Sustainable Forest Management (SFM) and watershed management in the Ulza watershed in Albania; and on SFM and wood biomass production in Kosovo\*<sup>134</sup>.

In terms of large-scale funds for climate, land abandonment and growing stocks of forests (Chapter 3) also put the countries in the position of reaching *“significant positive carbon balance in land use, land use change and forestry (LULUCF) [which] will also have positive effects on water regulation and erosion control.”* The opportunity is there to value this role of forest as a carbon sink to attract global funds related to the UN Convention on Climate Change to finance forest conservation schemes<sup>135</sup>. Of course, a strong forestry sector is a prerequisite for the success of such schemes.

<sup>129</sup> Field et al. (2018) “Managing Flood Risk in the Shkodër Region through Ecosystem-based Adaptations” provide interesting insights on the potential of reforestation and other ecosystem-based approaches to adaptation.

<sup>130</sup> Montenegro Nexus Country Report

<sup>131</sup> North Macedonia Nexus Country Report

<sup>132</sup> Živojinović et al. (2017) Non-timber forest products in transition economies: Innovation cases in selected SEE countries. Forest Policy and Economics, 81(18-29)

<sup>133</sup> Kosovo Nexus Country Report

<sup>134</sup> [https://www.profor.info/sites/profor.info/files/INNOVATIVE%20FINANCING%20FOR%20SUSTAINABLE%20FOREST%20MANAGEMENT\\_0.pdf](https://www.profor.info/sites/profor.info/files/INNOVATIVE%20FINANCING%20FOR%20SUSTAINABLE%20FOREST%20MANAGEMENT_0.pdf)

<sup>135</sup> GWP-Med, Thematic Report on Biodiversity and Ecosystems, 2017



# 8

## Evolution of agriculture and irrigation

*As mentioned in Chapter 3, the agricultural sector is of strategic importance for Drin Riparians, as it represents the key livelihood of the rural economy and a major employer. Still the sector lags for the most behind its real potential and, at least in the short-medium term, it is expected to continue following the trends that have been shaping its recent past.*

The agricultural sector in the basin and the broader region is shrinking, and this is due to several factors, including outmigration and urbanization, resulting in fewer people working in the sector. As a result, in recent years large areas of agricultural land have been converted to residential areas. This is in part due to the trend that in some Drin Riparians citizens have sought employment in Western countries and have used remittances to convert former agricultural land to build their secondary residences. Migration has also increased in recent years. Additionally, the expanding development of tourism has also impacted the shrinking of the agricultural sector and led to changes in the land use.



Land fragmentation is a common characteristic of the region and it reflects the recent history of land reforms from the socialist era to a market-based economy. As explained by the Joint Research Centre, *"Small farms predominate, in some areas even in the form of subsistence farms lacking the resources for economically viable production. [...] In the more favourable flatlands, on the other hand, there is an increasing disparity between small family farms, which are inferior in size and efficiency, and preserved large ex-socialist holdings, now privatized and transformed into large companies. Although the number of these companies is limited, they tend to further expand their size of land and dominate the agricultural production in the regions where they are present, threatening social stability and balance"*<sup>136</sup>.

But the problem is not the presence of small farms (a common feature of many other EU countries as well). It is rather the lack of coordination among producers. This means:

- Dependency of small farmers on volatile productions, which translates into financial instability and inability to develop strong agri-food value chains;
- Limited capacity to ensure food safety standards and quality control, which is a barrier to the marketing of agricultural products and particularly for their export.

This reality compromises the profitability of the agricultural sector as well as its attractiveness for young people, entrepreneurs, and innovators - at a time when the re-framing of agricultural development in the broader context of *rural development* stands out as a common goal of all Riparians' strategies for the sector (see Chapter 4).

In this context, the *sustainable* development of the agriculture – another common pillar of the countries' policy documents – would also require a thorough assessment of the sector's impact on natural resources, both today and in the future following new investments, new policy directions, and new climate conditions. In practice, agricultural development should be integrated with climate and environmental policy.

To respond to the above objectives, opportunities for cooperation exist both at inter-sectoral and transboundary level. This chapter points at two crucial aspects of agricultural development: irrigation and trade. This is a preliminary study - based on a consultation with experts on agricultural trade as well as Drin Stakeholders. It aims at setting the basis for a more in-depth analysis of how agriculture in the basin can develop sustainably, linking production and trade of agricultural goods with their impact on the environment (e.g. water and land use, biodiversity, etc.) and society (i.e. rural development and its contribution to national sustainable development goals).

<sup>136</sup> Volk, T., et al, 2017. Monitoring of agricultural policy developments in the Western Balkan countries



## 8.1 Water and agriculture

*The main crops produced in the Drin basin today are wheat, maize, apples, plums and potatoes, and they require varying degrees of irrigation demand. While more land is dedicated to cereal crops, the cultivation of garden crops produces slightly more tons of output<sup>137</sup>. When it comes to extensive agriculture, the percentage of cereal and meadows (usually semi natural areas) is much higher than the area under forage crops, which is the base for livestock production. The areas for vegetables and orchards as well as vineyards are very limited in the basin area, however in certain locations, especially in lake districts and along river banks, significant portions of land are used for intensive vegetable production (Shkodër, Librazd) and orchards (Prespa and Ohrid regions and Peshkopi).*

137 GWP-Med, Thematic report on socio-economics of the Drin River Basin (2017)



The main irrigation techniques applied in the basin are drip, furrow, and sprinkler. Montenegro has the highest percentage of irrigated areas served by drip (44%), and Albania has the lowest (13%), while in North Macedonia the rate is 30% and drip irrigation is used notably for apple production around Prespa and Ohrid. Furrow irrigation for maize, beans, melons, tobacco etc. is largely applied in Albania (73%) and North Macedonia (68%). Sprinkler irrigation is the least utilized technology in the basin, both because it requires elaborated equipment and because of its unsuitability for the crops cultivated. Where in place, sprinkler irrigation needs modernisation or upgrading<sup>138</sup>. Most of the water used for irrigation originates from surface water resources, so aquifers are not generally under pressure in the basin<sup>139</sup>.

While climate change adaptation is, together with the sustainable management of resources, an explicit objective of the agricultural policies of the countries, water scarcity is not mentioned as a major issue in the countries policy documents. This reflects the common perception that water is, and will be, widely available. Also, while it is true that agriculture is the main consumer of the water in the basin, demand for irrigation overall is not increasing mainly owing to the stagnation of agricultural activities in most parts of the Drina basin. This should not minimize a few facts:

- Already now, access to water supply for agriculture is challenging for farmers. As new water infrastructure like dikes, ponds, and diversions are built, rivalries in the use of water between farmers and other users can emerge<sup>140</sup>. One notable challenge in the region is posed by small hydropower plants, which can significantly reduce the water availability downstream, if not properly designed.
- Overall, the agricultural sector of the Drin Riparians is highly vulnerable to droughts. For instance, according to FAO in Albania “drought will adversely impact agriculture more than floods and landslides” and in Montenegro “frequent and intense drought adversely impact the e.g. quality of the yield, revenues, the costs to prevent and control the spread of diseases, insects and weeds as well as the irrigation rate”<sup>141</sup>. As discussed in Chapter 3, the Drin basin is not immune to these changes, which are expected to increase the impact of water shortages experienced by farmers (particularly in the White Drin and during summer months, during the irrigation season).

138 Ibid.

139 Drin 6<sup>th</sup> Stakeholder Conference. Ohrid, 2018

140 Drin 6<sup>th</sup> Stakeholder Conference. Ohrid, 2018

141 FAO, 2018. Drought risk management guidelines Western Balkan region.



## 8.2 The potential impact of agricultural developments and trade

*In general, agriculture affects water resources in terms of quality and quantity with pollution loads from agricultural effluents and water consumption (for irrigation, but also for livestock production). The crops and animals that farmers decide to invest in, however, are determined by agricultural markets – their demands and prices; support schemes and investment opportunities, as well as the ability (or failure) to trade agricultural products with neighbouring countries or markets close by. These choices may have a non-negligible impact on the demand of water (and other inputs) and the environment particularly if they are paired with unsustainable practices (e.g. efficiency of irrigation and drainage; extensive use of pesticides etc.)*

At present the level of agricultural trade within the region is low, and production serves mostly national or local markets. Yet, at the same time, the export of agricultural goods is gaining momentum and importunities, particularly when it comes to trade with the EU and Russia (See Chapter 5). An example of export-oriented production are apples from the Prespa and Ohrid regions. In fact, most countries see the proximity particularly to the EU and its markets as an opportunity for expanding their export of higher value agricultural/food products, . So far, this ambition has been only partially achieved with the greatest obstacles being the presence of gaps between EU and national legislation and standards on food production, quality, food safety and phytosanitary controls, and marketing.

The development of production in the Riparians and in the basin is particular in rather uncertain. While the reality of farmers in the basin is missing dynamism and for the most lacks the necessary resources to transform, there is a political will to

create a common market for South East Europe (Chapter 5), which could open up new opportunities for trade and as a result incentivize the production of exportable, added-value products. But as long as investments in the necessary food safety and quality control laboratories and facilities are lagging behind in the countries, increased export and increased inter-country trade will remain limited.

If new developments such as the intensification of production or the expansion of irrigated land will not be properly planned in the framework of sustainable agricultural policy, they might result in a higher vulnerability and/or unsustainability of the sector. Water requirements for irrigation are a case in point: the fact that water availability is not perceived as an issue may push farmers to invest in crops that require high amounts of water, exposing them more to the impact of droughts and to increased competition with other water users. Similarly, new developments could bring an increase in the use of agricultural inputs and as a result higher pollution load.

If coupled with a strong drive towards sustainability, trade opportunities could greatly revitalize the sector. Today, for example, organic farming is very limited in the basin owing to the currently still high end-consumer prices on local markets. Producing for buyers ready to pay this price on foreign markets could boost this type of production, though. The production of beans in the area of Prespa (Greek side) is an example of such a successful type of organic farming in the basin<sup>142</sup>.

The potential for adding value in the agriculture sector through organic farming and local products is significant; however, it would require greater coordination and planning both at the regional and local levels. Regional cooperation frameworks such as SWG could successfully promote traditional, organic products. This could drive local production to higher value but also more sustainability while creating a positive feedback loop with e.g. agri-tourism. Farmers could be motivated to get organized in producers' organizations or cooperatives (not only at local, but also potentially at regional/transboundary level) to catalyze investments in adequate food safety, phytosanitary and quality control facilities. This type of investment should be of priority for farmers in the region because food safety is a prerequisite for the certification of local products with specific geographic origin.



The coordination of sectoral policies can make these different elements converge, and inter-agency coordination bodies (e.g. Interministerial Committee on Agriculture in Albania) could play a major role in this process. These will need to translate priorities of sustainable development into concrete policy directions. Among others, it would mean making farmers more aware of the climate change risks and support the establishment of value chains around those agricultural products that can lead the transition towards sustainable and organic farming.<sup>143</sup>

In terms of "Nexus planning", it should be noted that having greater clarity on future demands of water from agriculture would greatly help countries in the implementation of their climate adaptation plans and strategies, and river basin management plans, eventually also at transboundary level.

<sup>143</sup> Annex 2 includes a table that was prepared for facilitating the discussion on the environmental impact of crops grown in the basin.

<sup>142</sup> Drin 6<sup>th</sup> Stakeholder Conference. Ohrid, 2018

After looking at natural resource management from the different perspectives of water, energy, agriculture, and environment (both in terms of physical characterisation of resource availability and use by key economic activities, and governance of resources at various levels, from regional and transboundary to local) this report points at the existence of important interlinkages across sectors. These are trade-offs, impacts, and possible synergies that should be brought to the attention of policy makers to increase awareness of intersectoral dynamics that are (or can be) triggered by strategic decisions taken “out of the basin area”, notably in the field of energy and agriculture.

*The report focuses on three topics that are deemed of high priority for the Drin River Basin, based on a review of the literature on natural resource management and related policy documents related to the basin. These topics were confirmed by the Drin Stakeholder Conference and by the Drin Core Group and were elaborated on with input from a wide range of stakeholders on the occasion of the conference. These are: Hydropower and flooding; Biomass and forest management; and Agriculture and irrigation.*

**The role of hydropower operators in flood management** in the extended Drin is crucial because some areas of the basin are extremely vulnerable to floods and the storage capacity of hydropower dams is significant. Chapter 6 discusses the critical role of hydropower operators in the management and prevention of floods, and the importance of their coordination between them (i.e. within and across countries) as well as between them and the concerned governmental actors. Even without new developments, hydropower operations could be better coordinated at basin level, with clear benefits for the countries in terms of flood management and in line with a logic of regional development of the energy sector. By improving data and information exchange, increased cooperation would also enhance the ability of operators to adjust to changing hydrological conditions. Hence the chapter presents the results of a preliminary analysis of the costs and benefits associated with a

flood-smart operation of dams on the Albanian side and, on this basis, sets forth the objectives and main features of the basin-level modelling exercise that will be undertaken in 2019. Revised climate and extreme weather scenarios indicate that resiliency related to hydropower and floods needs to be increased, meriting the governance arrangements to be revisited to evaluate their adequacy and possible adjustment. Notably from a Nexus perspective, the chapter also points at the fact that the damage from floods is deeply linked to the value associated to the environmental assets. Flooding can disrupt the incomes of farmers but also of those who rely on forest-related livelihoods.

**Forests and biomass** illustrate the aspects related to the Drin Basin's environmental assets in detail (Chapter 7). In fact, with a big part of the land area covered by forests, and a multitude of forest-related uses, activities, and ecosystem services that often sustain the rural economy, these are a key asset for the basin's population. Notably, the reliance on biomass for heating is a characteristic of all Riparians. However, while biomass is by definition a renewable resource, the current reality in the basin is unsustainable biomass use, and forest degradation is widespread. But the impact of biomass use for heating goes well beyond forest degradation, and one of its most painful (and costly) consequences is very high levels of air pollution in households (indoor) and in settlements (outdoors). The inefficient use of biomass for energy has proven to be an intractable problem from a governance perspective. Poor regulation and lax enforcement combine with social resistance against controlling access to forests to limit the effectiveness of policy responses in this area. To step up efficiency and provide viable alternatives to uncontrolled biomass exploitation, the relevant institutions (in forestry, energy, and natural resource management, land planning) need to be strengthened and should work together to deliver a more impactful response to the problem. In fact, among the many services that forests provide, they prevent soil erosion and play an important role as a buffer zone during flooding episodes, which can be considered crucial in the Drin basin. This is a topic that is not fully understood and mapped at basin level and that should be further investigated.

**Agricultural development** (Chapter 8) is crucial as agriculture is a key livelihood for the basin's largely rural population. Structurally speaking, the agricultural sector is quite similar in the Riparians, and despite the presence of common strategic objectives of sustainability, rural development, and recovery of regional trade of agricultural products, its development remains slow. When it comes to future vulnerability of irrigation to water shortages, there is an evident mismatch between the perception of farmers that water is abundant, and the situation of drought vulnerability as understood by academia and international organizations. Uncontrolled conversion of agricultural lands has been driven by remittances from citizens working abroad and poor development planning has not been able to keep up to address the problem. From a Drin basin perspective, it can be noted that poorly planned changes in agricultural production may result in increased rivalries and trade-offs between economic development, environmental impact, and transboundary cooperation. Vice versa, regional cooperation frameworks could be a platform for the promotion of local products, traditional agriculture, higher value-added production, and sustainable agro-tourism as well as for exchange of experience. Improved food safety food standards and plant health are essential prerequisites to improve the export to outside markets and to stimulate the creation of a regional agricultural market. In this light, regional investments in phytosanitary laboratories and facilities could be convenient. This could at the same time drive the much-needed aggregation of small agricultural producers into more coordinated and more sustainable agricultural value chains, and at the same time abate the key bar



Enabling  
& Transboundary Cooperation  
Integrated Water Resources Management  
in the extended  
**DRIN RIVER BASIN**



Global Water  
Partnership  
Mediterranean



ANNEXES

List of large reservoirs for hydropower production in the Drin River Basin

Proposed	
Skavica	Drin River, Drin (AL) (close to the border with MK)
Lukovo Pole	Radika river, Black Drin (MK)*
Boskov Most	Radika river, Black Drin (MK)*

Source: GWP-Med, Thematic Report on Hydrology and Hydrogeology, 2017

\* Note: EBRD and World bank (major investors) withdrew because the projects were too controversial (source: <https://www.balkanrivers.net/en/news/success-ebrd-withdraws-hydropower-project-mavrovo-national-park>);



	Riparian	River - Sub-basin	Power capacity installed (MW) - Annual generation (GWh)	Capacity: Total - Operating - Flood storage (10 <sup>9</sup> m <sup>3</sup> )	Uses ****
Fierza	AL	Drin - Drin	500 MW	2.70 - 2.30 - 0.400	
Komani	AL	Drin - Drin	600 MW	0.50 - 0.063 - 0.150	
Vau i Dejes	AL	Drin - Drin	250 MW	0.580 - 0.044 - 0.075	
Ashta (1 and 2)*	AL	Drin - Drin	48.2 MW - 240 GWh		
Drin cascade (Ashta not included)			1350 MW		
Globočica	MK	Black Drin - Black Drin	42 MW - 200 GWh	0.058 - 0.013	EN IR FP WS
Špilje	MK	Black Drin & Radika - Black Drin	84 MW - 384 GWh	0.520 - 0.07	EN IR FP WS
Black Drin cascade			126 MW		
Mavrova**	MK	Mavrovica - Black Drin	N/A - 415.5 GWh	0.357 - 0.274	EN IR FP WS
Perucica***	MN	Zeta (Morača) - Skadar/Shkoder	370 MW - 894 GWh	0.225	

Source: GWP-Med, Thematic Report on Hydrology and Hydrogeology, 2017

\* Other sources say 53 MW (<http://www.energji-ashta.al/?id=9> ; <https://www.hydropower.org/country-profiles/albania>)

\*\* This reservoir can be considered an ‘inter-basin transfer’ into the Vardar River water-shed, which is out of the Drin River Basin (GWP-Med, Thematic Report on Hydrology and Hydrogeology, 2017)

\*\*\* Situation Analysis, Management of the “extended” Drin Basin (2014); The capacity of the HPP from: <http://globalenergyobservatory.org/geoid/42687>. The Perucica HPP is not included in the Thematic Report on Hydrology and Hydrogeology (GWP-Med, 2018) because it does not affect the flow of the Drin (i.e. the Morača discharges in lake Skadar/Shkoder)

\*\*\*\* Information provided in the Nexus thematic report of North Macedonia. Legend: HP Hydropower production; IR Irrigation ; FP Flood Protection ; WS Water Supply; FP Flood Protection ; WS Water Supply





# 2

## Report from the Thematic Groups' discussion during the 16<sup>th</sup> Stakeholder Conference for the Drin River Basin

The water-food-energy-ecosystem Nexus was the main theme of the 16<sup>th</sup> Stakeholder Conference for the Drin River Basin that took place in Ohrid, Macedonia in November 2018 (back to back to this meeting, the Concept note of the Nexus Thematic Report was presented to the Drin Core Group as well as to the Group of Experts). Participants from different sectors and from the four countries were present. To discuss priority intersectoral issues in the basin, participants were divided into three thematic groups taking into account their expertise and interest:

1. Hydropower, flow regulation, and flood management
2. Biomass production, forest management, and ecosystem services
3. Expansion of agricultural trade and irrigation

The focus of the group discussions was decided on the basis of the analysis of intersectoral dynamics in the Drin River Basin (see Concept Note). The table reported at the end of the Annex includes the cross-sectoral interlinkages of priority identified in literature and confirmed by the groups. The paragraphs below include the reports from the groups.



### Group 1: Hydropower, flow regulation, and flood management

#### Cooperation level between HPP operators

- The group agreed that there is a need for enhanced cooperation between HPPs operators at transboundary level, since it is not at adequate level currently.
- All the dam operators in the entire Drin Basin should be considered and not only ALB-MK as floods are also an issue for Montenegro.
- The impact of sedimentation in the dams to be considered in the analysis.
- Also to consider that there is now inadequate/ lack of flood risk coordination between operators especially at the transboundary level. The group also insists on the need for Early warning systems.
- Lack of data sharing on the transboundary level.

#### Trade offs and synergies that deserve particular attention:

- Solar energy potential in the region to be utilized in the basin.
- The dams should be of multi-purpose character (serving also agriculture, flood protection and drinking purposes)
- A 'binding' agreement should be established between countries for the dams' operation.
- Complement the Nexus table with all dimensions, some suggestions:
  - Agriculture and use of land resources.
  - Impact of food production on (water needs, biodiversity, and/or pollutions)

#### Nexus matrix<sup>144</sup>:

- Investigate the impact of both low and high level of precipitation
- Erosion in the upstream parts of the basin during flash floods
- Summer water scarcity as we were informed yesterday that the water stress level is quite high.
- Establishment of monitoring stations for environmental flows, focusing on protected areas.
- Issues and impacts are different for every riparian.

#### Who should be involved in the Nexus dialogues?

- Ministry of energy in the riparian countries.
- Energy Utilities in all the riparian countries.
- Ministry of Environment.
- Ministry of Agriculture
- Politicians – decision makers
- Consider the countries legislation and ensure the involvement of all sectors.

144 See end of document

Group 2:  
Biomass use, forest management, and ecosystem services

The group discussed four characteristics of the forestry and biomass sectors in the Drin Riparians, comparing the situation in the different countries. They graded these characteristics from low (1) to high (3), as shown in the table below.

	Use of fuelwood in households	Environmental impact of fuelwood	Sophistication of biomass value chain	Priority of forest- ry in national de- velopment plans
Albania	3	3	2	1
Kosovo	3	3	1	1
Macedonia	3	3	1	1
Montenegro	3	2	2	3

Use of fuelwood in households is HIGH:

- Primary source for heating in all countries
- Reason: cheapest resource and poverty of society
- Albania: moratorium for logging for 10y

Environmental impact of fuelwood is HIGH:

- Extensive
- Air pollution
- Forest degradation
- Premature cut of trees
- Illegal cutting of trees
- Kosovo\*: increase in forest cover by 5% (2002 – 2012)

Sophistication of biomass value chain is LOW:

- No or small production of pellets, usually by private entities
- Use of wet wood in inefficient wood stoves
- Montenegro improved pellet production from vineyard debris; import of efficient pellet stoves
- Kosovo\* & Macedonia: good practices to switch to pellets

Priority of forestry in national development plans is LOW (apart from Montenegro):

- Lack of implementation of legislation
- Monopoly and no correlation between sectors
- Lack of inspection
- Montenegro: took political steps to solve problem -> priority for agriculture and government -> new designated state of secretary

Group 3:  
Expansion of agricultural trade and irrigation

1. EFFECTS AND IMPLICATIONS ACROSS SECTORS

Water and agriculture

There is no increasing water demand for irrigation of agricultural land as in fact the agriculture sector is shrinking due to the agriculture's lack of appeal to young people. Additional pressures that lead to the shrinking of the sector include tourism development and urbanization, leading to changes of land use. It should be noted that in recent years large areas of agricultural land are converted to residential areas. Last but not least migration, which is increasing in recent years, leads to the reduction of agricultural production.

Climate change is in general not perceived as a stressor with regards to agriculture and irrigation since water for irrigation originates from surface water resources. Thus, there are no pressures exerted on aquifers from water demands for irrigation as this is not relevant for parts of the Drin River Basin. Climate change and extreme weather phenomena (e.g. floods) may have impacts on agriculture.

Unsustainable agricultural practices such as excessive use of pesticides and fertilizers have a severe impact on the quality of freshwater resources but also, vice versa the degraded water quality caused also by other sectors have an impact on the agricultural products.

Alterations in the waterways or water flows in the extended Drin River Basin via dams has no impact on the agricultural sector, however at the outflow of the Buna/Bojana there are some issues encountered due to the opening of dams and subsequent flooding phenomena.

Energy and agriculture

- Solar energy production via photovoltaic panels is restricted to small areas. In Greece agricultural land has been lost in favor of the installation of solar photovoltaic panels. There is a notable increasing trend in the basin when it comes to that, however photovoltaics are being installed in lands that are characterized by low quality soil.
- Solar energy could be used for pumping irrigation water.
- As stated above, floods occur mainly due to the bad operation of dams such as in the area of Buna/Bojana.

Ecosystems and agriculture

- Deforestation has an impact on agriculture due to erosion phenomena and the reduced retention of water.
- Illegal fishing takes place in Buna/Bojana (use of explosives).
- Deliberate/illegal forest fires are not that extensive, however there are some incidences of accidentally caused fires due to certain agricultural practices such as setting fires on cropland for pest control.
- There are impacts caused by unsustainable agricultural practices on habitats and species, mainly connected with the excessive use of pesticides and fertilizers.





## 2. AGRICULTURE & TRADE ASPECTS

- The main crops produced in the extended Drin River Basin are wheat, maize, apples, plums and potatoes with varying degrees of irrigation demand.
- Agricultural products are mainly targeting the national/local markets, however some products are to a large extent being exported to the European/International market such as in the case of apples produced in the Prespa and Ohrid regions.
- There is limited access to EU markets because of lack of product certification. In this respect farmers should be motivated to get organized in regional/transboundary cooperatives and obtain quality certification for their products. This way they would be eligible for EU funding.
- Regarding organic farming this is very limited in the basin due to the high prices of organic food however there are success stories in this respect as in the case of beans production in the area of Prespa (Greece)
- Products with geographic origin should be protected.



SECTOR IMPACT →	 ENERGY	 WATER	 AGRICULTURE AND USE OF LAND RESOURCES	 ECOSYSTEMS AND THE ENVIRONMENT
 ENERGY	X	<ul style="list-style-type: none"><li>- Impact of current and future hydropower generation on the basin hydrology, including on floods</li><li>- Impact of energy policy on water resources - including non-hydro, power transmission projects</li></ul>	<ul style="list-style-type: none"><li>- Integration of energy infrastructure in broader spatial planning</li><li>- Role of biomass production in forest/land management</li><li>- Integration of energy infrastructure in broader spatial planning</li></ul>	<ul style="list-style-type: none"><li>- Impact of fuelwood extraction on forest degradation and the ecosystem services they provide</li><li>- Incoherencies between clean energy/climate action, sustainable development, and environment preservation</li></ul>
 WATER	<ul style="list-style-type: none"><li>- Water availability affects hydropower production (climate change expected to reduce it in summer)</li><li>- Impact of sedimentation (e.g. from gravel extraction, erosion and forest degradation upstream) on hydropower operations</li></ul>	X	<ul style="list-style-type: none"><li>- Water demand for irrigation, likely to increase due to climate change and potentially with regional trade</li></ul>	<ul style="list-style-type: none"><li>- Loss /degradation of habitats</li></ul>
 AGRICULTURE AND USE OF LAND RESOURCES	<ul style="list-style-type: none"><li>- Potential of agricultural by-products as renewable energy source</li><li>- Energy requirements for high-intensity agriculture</li></ul>	<ul style="list-style-type: none"><li>- Increasing water demand for irrigation</li><li>- Agricultural pollution and eutrophication of water bodies</li></ul>	X	<ul style="list-style-type: none"><li>- Impact of agricultural practices on land and water habitats and biodiversity</li><li>- Illegal / uncontrolled fisheries, hunting and logging</li></ul>
 ECOSYSTEMS AND THE ENVIRONMENT	<ul style="list-style-type: none"><li>- Forest providing carbon capture and storage</li><li>- Environmental flows and protected areas constraining energy development</li></ul>	<ul style="list-style-type: none"><li>- Forest providing buffer to floods and natural infrastructure for water treatment</li></ul>	<ul style="list-style-type: none"><li>- Environmental practices, organic agriculture</li></ul>	X

# 3 Water-Energy modelling for Phase 2 Scenario description

Proposal as prepared by KTH Royal Institute of Technology, March 2019

In order to study the importance of Drin river basin in the context of normal, high and low flow levels and to study the dynamics of the operation of hydropower plants in the basin, we will develop a multi-country electricity model for the riparian countries (North Macedonia, Albania, Montenegro and Kosovo\*) using the Open Source energy MOdelling SYStem (OSeMOSYS)<sup>145</sup>, a linear optimization model-generator for long term energy planning. It performs the long-range (e.g. 2020 – 2035) minimisation of the discounted cost of a whole energy system, constrained by the necessity of meeting the demand for energy and other commodities in every time step and by the availability of resources. OSeMOSYS can provide insights for different policy questions such as:

- Would there be benefits in operating HPPs in a coordinated way between the countries in the Drin cascades?
- How to plan secure, low carbon and reliable energy systems between now and a future date (e.g. 2030) and at which cost?
- What role can renewable energy sources play in the energy mix? And is hydropower in the Drin is cost competitive, if compared with other renewable energy sources?
- Which technologies and energy supply options should the country invest in?
- What is the potential for electricity trade among different countries in a region? and what role hydropower plays in that?

To better represent the hydrological dynamics in the Drin river basin, the cascade of the hydropower plants along the Drin River will be detailed in OSeMOSYS and the latter will be soft-linked with Panta Rhei<sup>146</sup> hydrological model. Such soft-linking of the two modelling frameworks will allow: a) capturing three different flow levels: normal flow during normal operation, high flow during floods and low flow level due to climate change and reduced precipitation; and b) representing two different modes of operation of the hydropower plants: uncoordinated operation between countries and coordinated operation.

In summary, the following scenarios will be developed:

## 1. Normal flow scenario:

This scenario represents the operation of the hydropower plants under normal flow condition. Two sub-scenarios will be developed:

**1.A No coordination:** which represents the current uncoordinated operation of the HPPs on the transboundary level (i.e baseline scenario). This is achieved by imposing a certain operation profile for the upstream power plants and computing the operation profiles of the remaining ones as a consequence<sup>147</sup>.

**1.B Coordination:** Coordinated flow regulation is essential to achieve the sustainability of water resources along the river and its tributaries. This scenario will focus on investigating how the generation mix would differ if the hydropower plants are operated in a full cooperative manner that ensures timely water availability along the cascade for upstream and downstream users. Which means optimizing the operation of all the hydropower plants in the cascade to the best of the overall system (transboundary level).

## 2. High flow scenario: (Flood)

This scenario will represent the high water level during flood events which are becoming more frequent in the region. The analysis will focus on using dams to store water during higher precipitation periods and quantifying the implications on the energy sector on an annual basis. Similar to the previous scenario, two sub-scenarios will be explored:

**2.A No coordination:** representing a low level of transboundary coordination during a flood event. This can be achieved by reducing the storage level in dams to be used for flood containment and imposing a certain operation profile for the upstream power plants and computing the operation profiles of the remaining ones as a consequence.

**2.B Coordination:** This scenario will represent an optimized operation (at transboundary level) of all the hydropower plants taking into consideration the reduced storage capacity to store water during a flooding event. The impact on the annual electricity generation from HPPs and the resulting changes in the electricity generation mix will be investigated. Furthermore, the costs of flood containment will be compared to the losses due to floods.

<sup>145</sup> M. Howells, H. Rogner, N. Strachan, C. Heaps, H. Huntington, S. Kypreos, A. Hughes, S. Silveira, J. DeCarolis, M. Bazillian and A. Roehrl, "OSeMOSYS: The Open Source Energy Modeling System, An introduction to its ethos, structure and development," Energy Policy, vol. 39, p. 5850–5870, 2011.

<sup>146</sup> Panta Rhei is a hydrological model that simulates rainfall runoff process and water budget in any point of the basin where the model is applied. Ultimately, is a hydrological distributed conceptual model that allows the user to perform simulations with high and temporal resolutions. The model was developed and is maintained by the Leichtweiss Institute of Hydraulic Engineering and Water Resources, in collaboration with the Institute of the Water Management, in the Technical University of Braunschweig, who share the copyright. The Technical University of Braunschweig was commissioned by GIZ to calibrate and apply the Panta Rhei model to the entire Drin Basin in the framework of the above mentioned GIZ project.

<sup>147</sup> For forecasting, OSeMOSYS works with the objective of minimising the total discounted cost of the system in the whole region along the time domain of the study (2019 - 2030).



3. Climate change scenario:

This scenario will represent the variation in water flow along the Drin river basin due to change in climate and precipitation. This scenario will analyze the different projections (RCPs- 2.6, 4.5, 6, 8.5) from selected general circulation models (GCMs) for the near future. In this case (and others) Panta Rhei hydrological model will inform OSeMOSYS about the available water level in each river segment and the following sub-scenarios will be developed:

- 3.A **No coordination:** which represents the uncoordinated operation of the HPPs on the transboundary level under the variable water flow regime. Similar to the previous scenarios, this is achieved by imposing a certain operation profile for the upstream power plants and computing the operation profiles of the HPPs downstream.
- 3.B **Coordination:** Which will represent an optimized operation of the hydropower plants between countries in such variable flow conditions. The impact on the annual electricity generation from the HPPs in the Drin cascade as well as the overall changes in the electricity generation mix will be explored.

4. Hydropower expansion scenario:

This scenario will assess the impact of the new hydropower project (i.e. Skavica dam) on the water flow in the Drin river basin. In order to implement this analysis, information on the new (most likely) projects and the flow data will be needed to include in the OSeMOSYS model. The impact of the new expansion projects can be assessed under any of the previous scenarios and under both no coordination and coordination modes of operation.

This scenario can several insights such as:

- To what extent, the expansion of hydro projects upstream will affect water availability for downstream uses?
- Is hydropower in the Drin is cost competitive, if compared with other RE?

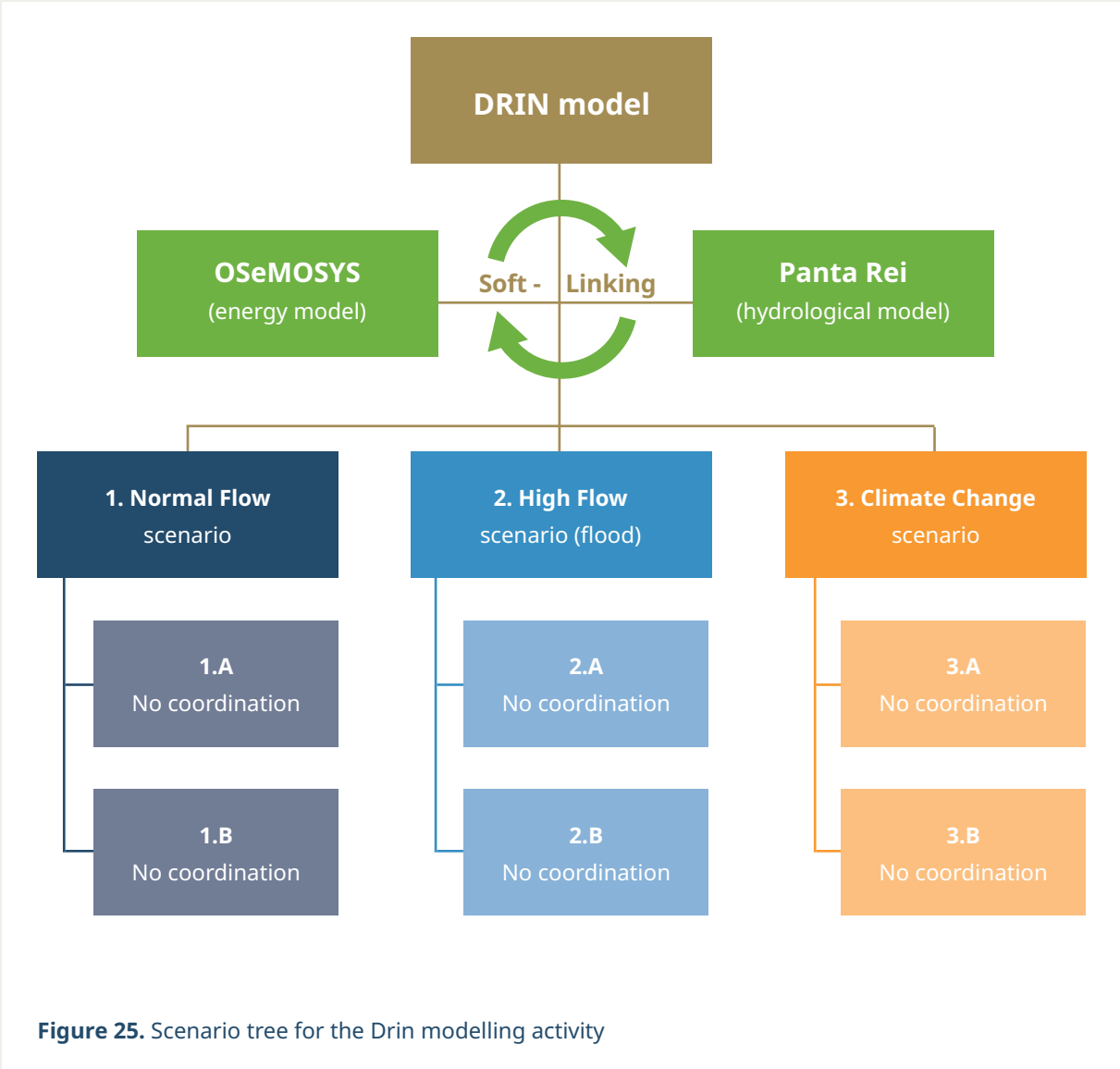


Figure 25. Scenario tree for the Drin modelling activity



