



## NEXUS ASSESSMENT of the DRIN basin: phase I - summary

Recognizing the importance of the Nexus approach as a framework to reconcile potentially conflicting natural resource needs, capture benefits from integration and coordination, and enhance sustainable development at the transboundary level, the Global Water Partnership-Mediterranean (GWP-Med) and the United Nations Economic Commission for Europe (UNECE) have carried out a qualitative assessment of Nexus issues in the Drin River Basin, identifying priority interlinkages, trade-offs and synergies between the water, food, energy and environment sectors in the Drin Basin.

This Assessment (Nexus Thematic Report) is part of the Transboundary Diagnostic Analysis (TDA) for the Drin river basin, prepared in the context of the GEF-funded "Drin Project" implemented by UNDP and executed by the Global Water Partnership - Mediterranean (GWP-Med), in cooperation with the United Nations Economic Commission for Europe (UNECE). The Austrian Development Cooperation (ADC) also supported the development of the Assessment in the context of the Nexus Project in SEE, and will finance the development of the Phase II Assessment (2020-2021).

## THE NEXUS APPROACH

The Nexus Assessment identified three topics as of high priority for the Drin Basin:

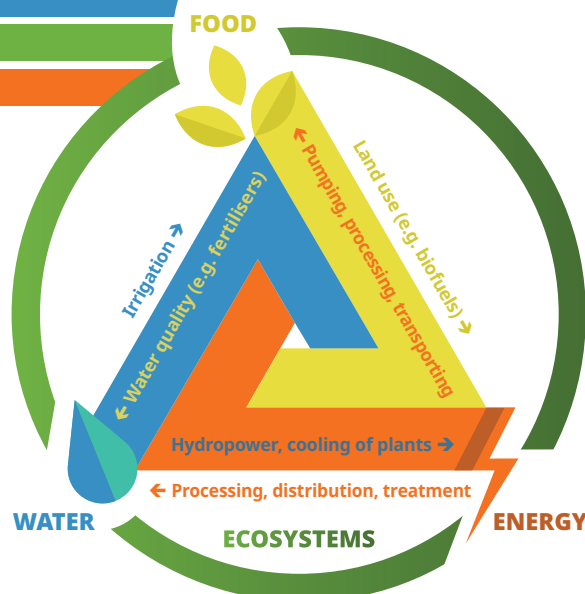
**Hydropower and flooding**

**Biomass and forest management**

**Agriculture, trade and irrigation**

The topics were analysed by looking at resource flows/uses and related mechanisms of governance, to identify where cooperation could be strengthened at the energy -and land use/agriculture- resource Nexus interface.

A Phase II Nexus Assessment (funded by the ADC) will provide a detailed quantitative analysis of priority issues and of potential benefits from increased integration and coordination.



## NEXUS RESOURCES AND SECTORS in the DRIN basin

**Water** With its rich water resources, the complex system of the Drin river basin provides a wealth of services to the Riparians that share the basin including energy supply, recreation and tourism, fisheries, water supply for irrigation and domestic uses, sustenance of unique endemic biodiversity, and livelihoods. In the basin -traditionally prone to flooding- the frequency of floods appears to be increasing. Several factors contribute to increased water-related vulnerability in the basin, among which: insufficient coordination in flow regulation, poor urban planning, unsustainable water management and agricultural practices, deforestation, industrial pollution, and poor waste management. Land-use changes adjacent to the river channel area have reduced the area of the floodplain, altering ecosystem structure and the hydrological functioning of the river.

**Environment** The Drin Basin is considered a biodiversity hotspot of Europe. All regions in the basin experience some sort of significant environmental pressure from human activities, primarily pollution, urbanization and introduction of invasive species. The construction of infrastructure on the Drin system alters its natural hydro- and geo-morphology (water and sediment flows) and the connectivity and overall health of some ecosystems. Significant parts of the river are classified as extensively or severely modified. Unsustainable logging can result in land degradation, erosion, and sedimentation.

**Agriculture & Food** The agricultural sector is of strategic importance for Drin Riparians, first and foremost because of its relevance as livelihoods for rural populations. The main crops produced in the Drin basin today are wheat, maize, apples, plums and potatoes. Trade is limited by fragmented agricultural holdings, disaggregation of the agricultural value chain and infrastructural problems. Most agricultural production is orientated towards the local market. Currently, all Riparians are net importers of food while agricultural land is being converted into residential land.

**Energy** Overall, the Drin Riparians produce less energy than they need. Hydropower is a key common energy source that has traditionally shaped the region's energy policies. The operation of the dams in the Drin cascade is an important factor influencing the flow regime downstream and can be used for seasonal and long-term regulation of river flow. Further hydropower development is a controversial issue in the region due to its potential environmental impacts. Energy demand for residential heating is the primary driver for extensive logging in the region.

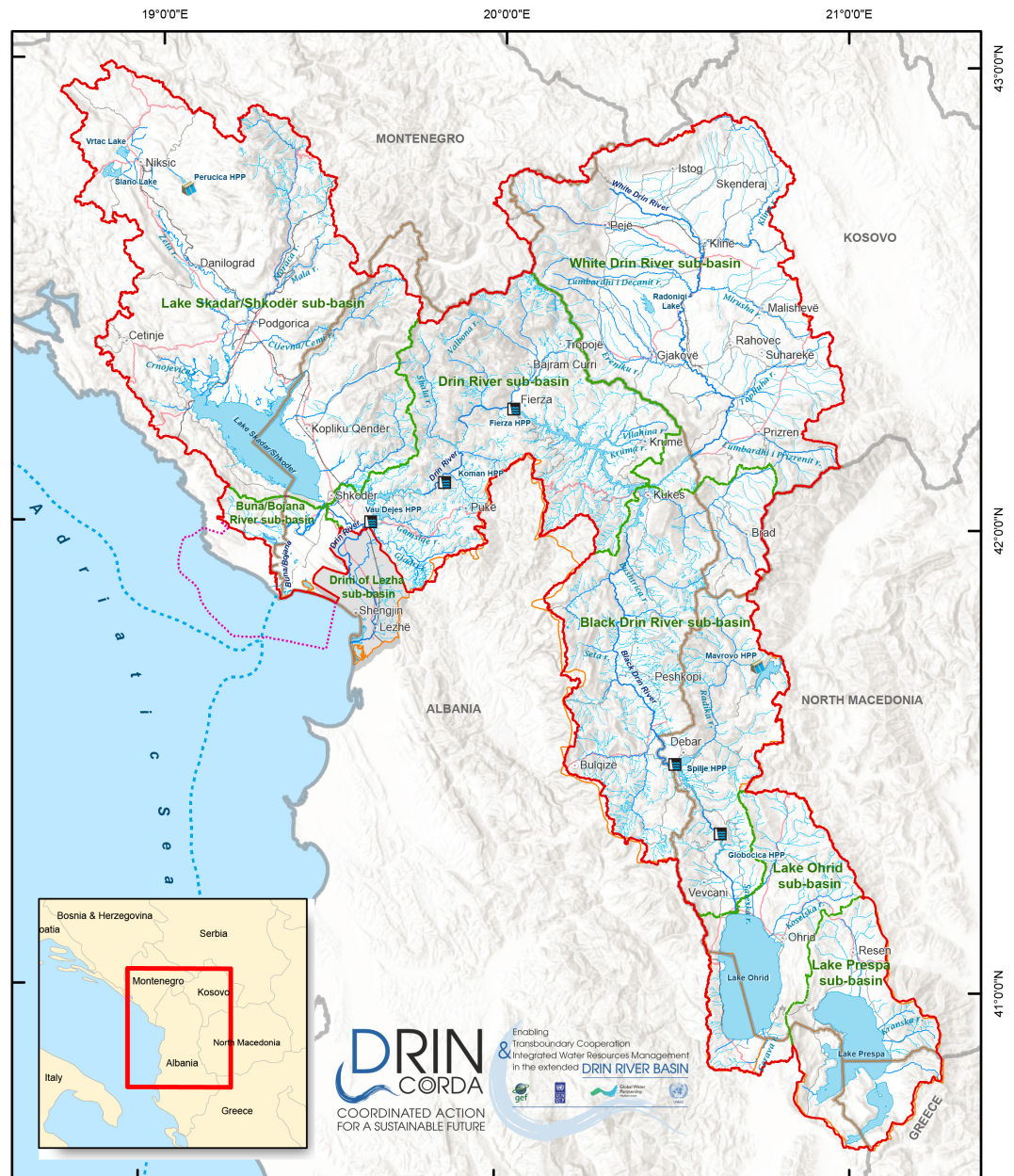




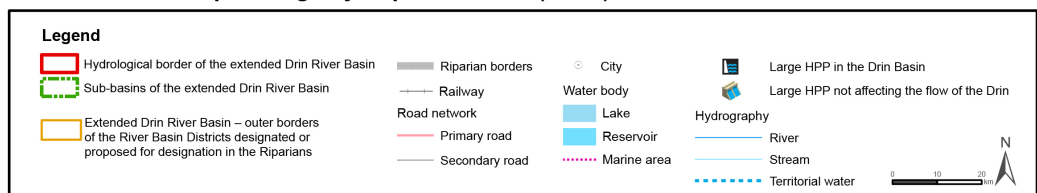
The Drin accounts for some 76% of Albania's total hydropower capacity. 3 large HPPs are located in Fierza (500 MW), Koman (600 MW) and Vau Dejes (250 MW), followed by a pair of smaller ones in Ashta (48 MW).

In North Macedonia the HPPs of Globocica (42 MW) and Spilje (84 MW) are on the Black Drin while the Mavrova HPP (200 MW) discharges outside of the basin.

In Montenegro, the Perucica HPP (307 MW) discharges in lake Skadar/Shkoder.











Map of Large Hydropower Plants (HPPs) in the Drin River Basin





## IDENTIFIED NEXUS INTERLINKAGES

With input from the Drin Stakeholders Conference (Ohrid, November 2018)

SECTOR IMPACT →	 ENERGY	 WATER	 AGRICULTURE AND USE OF LAND RESOURCES	 ECOSYSTEMS AND THE ENVIRONMENT
<b>ENERGY</b> 	X	<ul style="list-style-type: none"> <li>- Hydropower impacts on the basin's hydro-geomorphology, including on floods</li> <li>- Impact of energy policy on water resources</li> </ul>	<ul style="list-style-type: none"> <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 logging on forest and ecosystems degradation</li> <li>- Hydropower development impacting riverine ecosystems</li> </ul>
<b>WATER</b> 	<ul style="list-style-type: none"> <li>- Water availability affects hydropower production</li> <li>- Energy requirements of water supply and sanitation</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> <li>- Pollution from wastewater</li> </ul>
<b>AGRICULTURE AND USE OF LAND RESOURCES</b> 	<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>
<b>ECOSYSTEMS AND THE ENVIRONMENT</b> 	<ul style="list-style-type: none"> <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





## PRIORITY NEXUS INTERLINKAGES: ISSUES AND SUGGESTED SOLUTIONS

# 1

### HYDROPOWER AND FLOODING

*The issue* Hydropower production is a cheap and stable means of electricity production. In Albania, hydropower is essentially the only source of domestic power generation. However, the maximisation of electricity production is often at odds with the requirements of flood mitigation.

Areas of the extended Drin Basin are extremely vulnerable to flooding, for example, the frequency and intensity of floods in Lake Skadar/Shkoder and Buna/Bojana areas are increasing over time, with significant socio-economic impacts. Two factors contributing to this are flow regulation of large dams and erosion caused by gravel extraction and loss of plant coverage.

Hydropower dams have significant water storage capacity and therefore can play a valuable role in managing floods, but lack of coordination in dam regimes under high flow conditions can increase flood risk.

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*The solution* **Hydropower operations could be better coordinated at basin level, with clear benefits for the Riparians in terms of flood management. Cross-sectoral governance could be improved starting from the use of mechanisms already in place. Involving hydropower operators in flood management is crucial for flood management but can also be beneficial in terms of productivity: by taking a more coordinated approach, which includes the sharing of data and information between operators, they operators can better adjust to changing hydrological conditions.**

**Indispensable elements of the governance framework for cooperation on hydropower-flood management 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. A substantial effort is being made to improve coordination at the transboundary level in the Drin Basin, including recently setting up a flood forecasting system.**

**Policies, rules and procedures are required to ensure the proper consideration of flood management and control in hydropower operations. There must be clear accountabilities, authority and decision-making responsibility across the relevant sectors.**



## 2

### BIOMASS AND FOREST MANAGEMENT

#### *The issue*

The reliance on biomass for heating is a characteristic of all Riparians. The rate of its use is unsustainable and is causing widespread forest degradation, while negatively impacting public health both indoors and outdoors. The consequences of unsustainable forest management affect the ecosystems with all the services that they provide. In particular, forest degradation contributes to soil erosion (adding to the pressure coming from various sectors, including notably gravel extraction and agriculture) and reduce the potential of forests to act as carbon sinks. The effectiveness of policy responses in this area has been limited, with poor regulation and tax enforcement, combined with social resistance against controlling access to forests.

#### *The solution*

**To increase biomass efficiency and provide viable alternatives to uncontrolled exploitation, the relevant institutions (in forestry, energy, natural resource management and land planning) need to be strengthened and should work together to deliver a more impactful response to the problem.**

Because of the economic importance of forest-related livelihoods, the use of forest should be as productive, efficient, and sustainable as possible. To do so, investing to upgrade the value chain of wood biomass seems a sensible starting because wood biomass is a well-established reality that does not require building up whole new distribution and – compared to other types of bioenergy - does not create competition with food production. The wood energy sector has the potential to enhance both rural development (via income generation) and sustainability (via stronger control and better management of forest assets).

## 3

### AGRICULTURE, IRRIGATION AND FOOD TRADE

#### *The issue*

Despite common strategic objectives among Riparians to facilitate the recovery of regional agricultural trade, growth in the sector remains slow. Uncontrolled conversion of agricultural lands into residential land is widespread and poor development planning has not been able to keep up to address the problem.

Regarding future availability of water for irrigation, there is an evident mismatch between farmers' perception that water is abundant, and the reality of increasing drought vulnerability. While climate change adaptation is an explicit objective of the agricultural policies of the Riparians, water scarcity is not typically prioritised as a major issue.

#### *The solution*

**From a basin perspective, 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. Improved food safety, food standards and plant health are essential prerequisites to improving export to outside markets and to stimulating the creation of a regional agricultural market. The aggregation of small agricultural producers into more coordinated and more sustainable agricultural value chains is much needed, also to abate the key barriers to exporting to international food markets.**

