

Assessment of the Water-Food-Energy-Ecosystems Nexus and benefits of cooperation in the Drina Basin (2016-2017): The process and findings

Dr. Annukka Lipponen, Environmental Affairs Officer
UNECE Environment Division



Convention of the Protection and Use of Transboundary Water Courses and International Lakes



UNECE

Assessment of the water-food-energy-ecosystems nexus in a nutshell

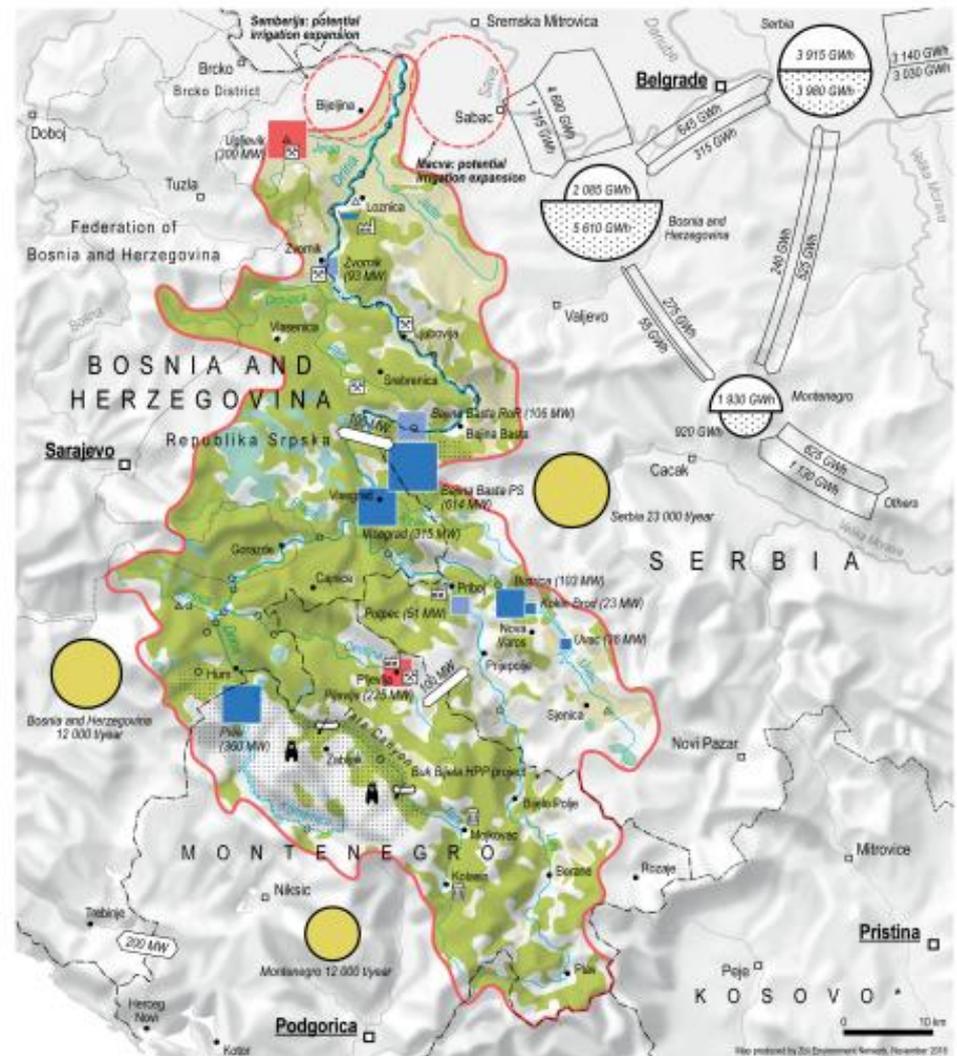
- Since 2013, the nexus is a part of the Water Convention's **programme of work** adopted by the Parties. The work done: A series of assessments of basins for intersectoral links, trade-offs and benefits. Includes a review of the resource base, resource uses, governance...
- **Objective:** Foster transboundary cooperation by 1) identifying intersectoral synergies; 2) determining policy measures and actions that could alleviate tensions; 3) assisting countries to optimize their use of resources
- A **methodology** developed & applied in the basins Alazani/Ganykh, Sava, Syr Darya, Isonzo/Soča, Drina, NW Sahara Aquifer
- * Assessments prepared in close cooperation with and reviewed by the national administrations
- Methodology endorsed by MoP7; Synthesis publication to be launched at MOP8

Drina River Basin

Riparian countries: **Bosnia and Herzegovina, Montenegro, Serbia**

Key partner: **Sava Commission (ISRBC)**

- * Nexus assessment funded by the **Italian Ministry for the Environment, Land and the Sea** as “Greening economic development in Western Balkans through applying a nexus approach and identification of benefits of transboundary cooperation”



Nexus Drina basin



Sources: World Bank, Support to Water Resources Management in the Drina River Basin; Final Inspection Report, 2016; European Environment Agency, Corine Land Cover 2006 (CLC); Pollution in the Drina River Basin; The Regional Environmental Center for Central and Eastern Europe (REC); 2011 United Nations Corine Database
 * The designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

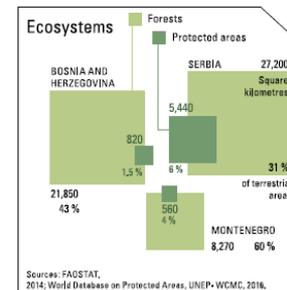
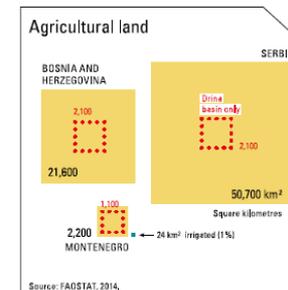
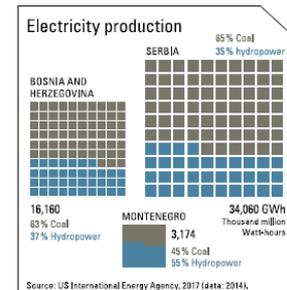
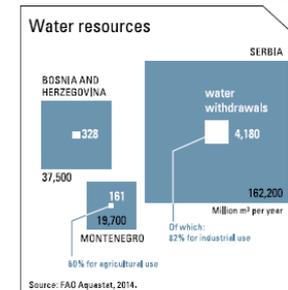
Why the nexus assessment in the Drina?

- * National & regional development has implications, also across borders and created vulnerabilities
- * Natural resources that are inputs to various sectors:
 - * Rich biodiversity and untouched landscapes - which make the Drina highly valuable from an environmental perspective, as well as very attractive for tourism.
 - * Hydro potential - with an estimated 60% yet to be explored.
- * Opportunity to combine nexus assessment and analysis of benefits of cooperation to foster transboundary cooperation:
 - * Exploring policy inconsistencies and potential shared benefits
 - * Informing dialogue and understanding the interconnections
 - * Quantification of selected operational solutions
- * Opportunity to zoom-in from the Sava nexus assessment, being more specific on possible policy and technical actions

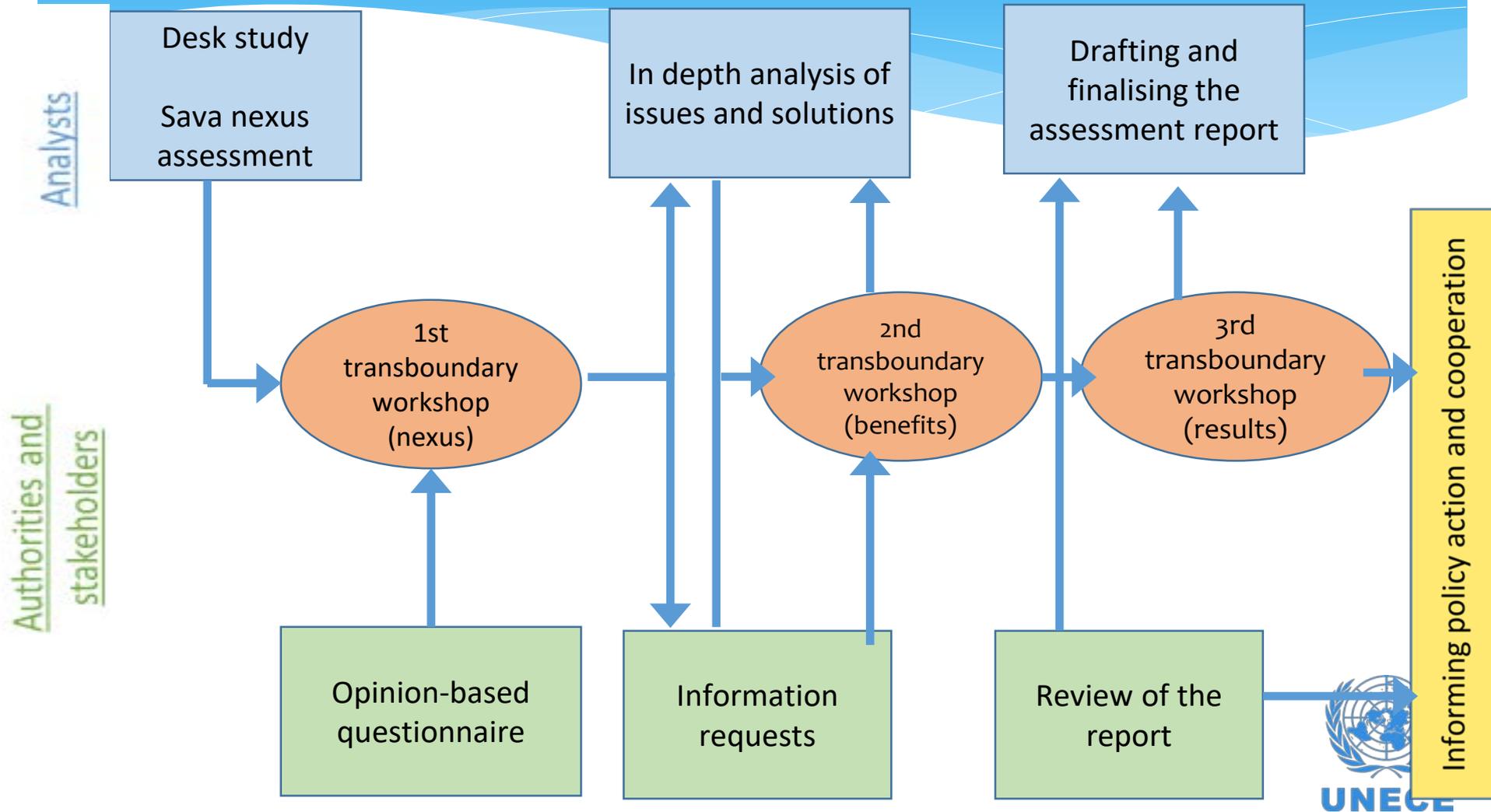


Outputs/deliverables

- Situation Analysis
- 3 workshops
- The main intersectoral issues in the selected basin identified and detailed, building on the various projects in the basin
- The main transboundary cooperation opportunities and related benefits identified, analysed and quantified (selective, focused)
- Nexus relevant solutions outlined and prioritized among the riparian countries
- An assessment report synthesising the experience, the analyses and the policy recommendations; policy brief
- Western Balkans wide outreach and dissemination of the findings, examples of benefits and recommendations; sharing of experience in the nexus Task Force



The assessment process in the NWSAS



Participatory, multi-sectoral workshops

21-22 April 2016, Podgorica, Montenegro

Identification of intersectoral issues and multi-sectoral roundtables to discuss potential solution

8-10 November 2016, Belgrade, Serbia

Review of preliminary findings and discussion on benefits of cooperation

Sarajevo 19-20 April 2017

Results, solutions, implementation and follow up



Identified issues 1 – Flow regulation

1. Limited cooperation among countries/operators on the operation of dams in the DRB
2. Planned expansion of hydropower in the DRB would have implications on flow regime, flooding and downstream users that should be analysed
3. Different approaches to defining environmental flows and challenges in the implementation of environmental flow regulation
4. Governance and finance issues affect development opportunities in non-hydro renewables, energy efficiency and regional trade

Example from the Drina Basin: Quantification of the benefits of (Co-)optimizing flow regulation

Approach

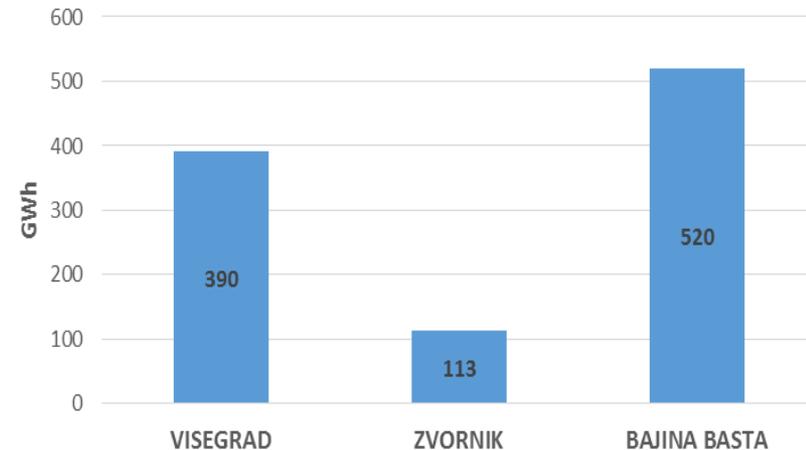
Developing multi-country model of the three riparian countries (Bosnia and Herzegovina, Montenegro and Serbia) with the focus on Drina river basin, using the **Open Source energy MOdeling SYStem (OSeMOSYS)**.

Drina Water – Energy Model (DWEM):

Focus:

- Cost optimal electricity generation to meet the demand.
- Soft linking of water flow in electricity generation system.

Cumulative electricity generation gains from
2017 - 2030



Scenarios

Compare the Cooperative operation HPPs with non-cooperative (uncoordinated) scenario. Better cooperation allow for better water availability in the river. Reduce thermal generation and reduce the overall system cost.

1: Co-optimizing flow regulation



Suggested direction:

- 1) Improve cooperation in the operation of dams and hydropower plants in the Drina river basin for optimized production and flood control
- 2) Improving the opportunities for electricity trade in the region (within and beyond the DRB countries) utilizing energy efficiency measures to release stress on hydro and thermal power



Identified issues 2 – Rural development

1. Limited agricultural production
2. Limited industrial activity and high unemployment
3. Unexploited potential for eco-tourism
4. Unused land resources
5. Low competitiveness of the agricultural sector
6. Significant gaps between EU and SEE agricultural policy
7. A general lack of infrastructure
8. Land fragmentation

2: Promoting rural development

Suggested direction:

Promoting integrated rural development in the basin by exploiting the existing synergies between eco-tourism, sustainable agriculture, renewable energy production, at the advantage of local businesses and communities.



Identified issues 3 – Water quality and solid waste management

- * Water quality is affected at hotspots, mostly due to untreated and illegal discharge of wastewater (municipal and industrial, including mining) as well as dumping of solid waste (municipal and industrial).
- * Flow regulation infrastructure traps solid waste which interferes with the dam management.

3: Improving water quality

Suggested direction:

- 1) Achieve an up-to-date, coherent and transparent picture of the water quality of the whole basin and how it affects the biodiversity and ecosystem. and getting a clear view of the spread and movement of contaminants
- 2) Improve treatment of wastewater and disposal of solid waste constructing and extending the necessary infrastructure, considering also decentralized and nature-based solutions wherever possible
- 3) Explore options for municipal waste and wastewater use in agriculture and/or for energy production



Identified issues 4 – Governance

- * Overall, there is a need to create further mechanisms for horizontal coordination between policymakers on nexus issues, and to strengthen mechanisms that already exist
- * Constantly changing laws to keep pace with EU requirements creates progress, but also means implementation often lags behind law creation
- * In particular, there is often a lack of necessary secondary legislation (i.e. by-laws, regulations) for key pieces of environmental legislation
- * Laws on integrated permitting potentially a very good tool but not yet functioning optimally

4: Broadening and developing cooperation

- * Explore development of a 'Drina nexus platform'
 - * Possibly under ISRBC auspices
 - * Extending contacts with other processes (Energy Community, SEE Rural Development SWG etc.)
- * Detailed national nexus governance assessments carried out by each government
- * Potential to better align policy timelines and related planning cycles of the different sectors
- * National level capacity building, public education campaigns
- * Pilot assessment tools (such as sustainability impact assessment) with nexus framework



Potential benefits of increased cooperation in managing basin resources in the Drina

Economic benefits

- Increase in electricity production (e.g by raising awareness of the opportunities)
- Reduction of the cost of electricity generation
- Increase in agricultural production (e.g by improving irrigation systems)
- Reduced damage from floods (e.g. by better modelling, developing infrastructure)
- Development of the tourism sector

Social and environmental benefits

- Reduced human costs of floods
- Creation of jobs and reduced rural-urban migration (thanks to new economic opportunities)
- Increased resilience of local communities to climate change
- Protection of water quality and ecosystems (including through increased knowledge)

Regional economic integration benefits

- Increased transboundary cooperation in all areas by making the Drina an item of connection and not division
- Increased energy trade and integration, and energy security
- Increased number of people employed thanks to cross-border economic activity.

Geo-political benefits

- Increased trust between countries from working together in flood protection
- Facilitated compliance with international obligations to the EU targets on renewables
- Avoided conflicts and adoption of cheaper solutions, thank to the development of connections between experts and the sharing of information

Concluding remarks

- * Intersectoral (nexus) solutions called for, instead of sectoral solutions – taking into account negative and positive cross-sectoral effects
- * Integration of the nexus approach into strategic documents and local/regional development plans needed, and raising awareness about the nexus approach
- * To be continued: the dialogue among the countries & sectors on the issues, findings, intersectoral (nexus) solutions taking into account negative and positive cross-sectoral effects. The analytical work should continue with a strong policy link. So far mainly a **scoping level review and evolutionary analysis** done; and selected solutions detailed
- * Potential for applying a nexus approach further in the DRB, also nationally, and sharing experience with other basins in the region (Drin)
- * Priority follow up activities to be identified. Partners called upon to also respond.
- * **Potential** for applying a nexus approach further in the DRB, also nationally, and sharing experience with other basins in the region (Drin)
- * **Synergy** with other initiatives: World Bank work built on, the GEF-SCCF project can use the findings