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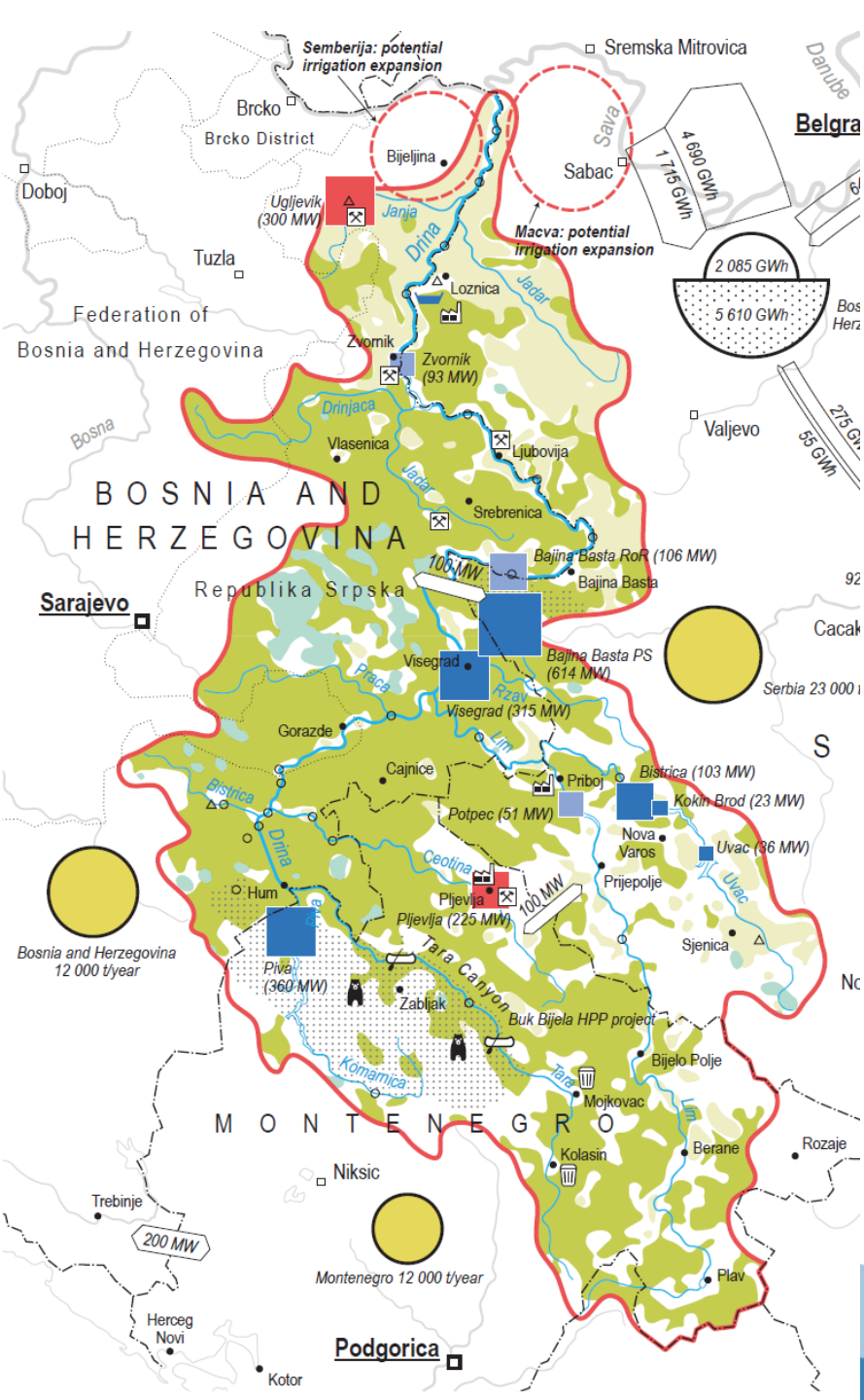
# **Flow-related issues in the Drina River Basin: a case for joint action in the fields of water management, energy and environment protection**

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# Diverse flow related needs and issues

- Hydropower generation
- Plans for expanding irrigation; predicted increased scarcity with climate change
- Erosion, sediment transport
- Solid waste, pollution
- Recreational activities on the tributaries
- Downstream: navigation on the Sava

Cooperation frameworks do not cover all countries or all issues. Some frameworks project based, there are bilateral agreements under development. Management issues at different levels. Utilities



# Expert Group on Flow Regulation and Environmental Flows convened in 2019



- *Hosted by ISRBC in Zagreb 11-12 June 2019*
- *The Expert Group was formed of diverse expertise: water management and environment protection authorities, hydropower operators and civil society from Bosnia and Herzegovina, Montenegro and Serbia.*
- *Provided advice to orient a study of 1) international practice with environmental flows and good practices, with 2) review of relevant international examples of agreeing at the transboundary level about selected aspects of flow regulation, and 3) developing recommendations.*
- ***Officials and experts agreed to work towards a harmonized methodological approach to determine environmental flows that provides water for ecosystem needs but also takes into account infrastructure on the river and water uses.***

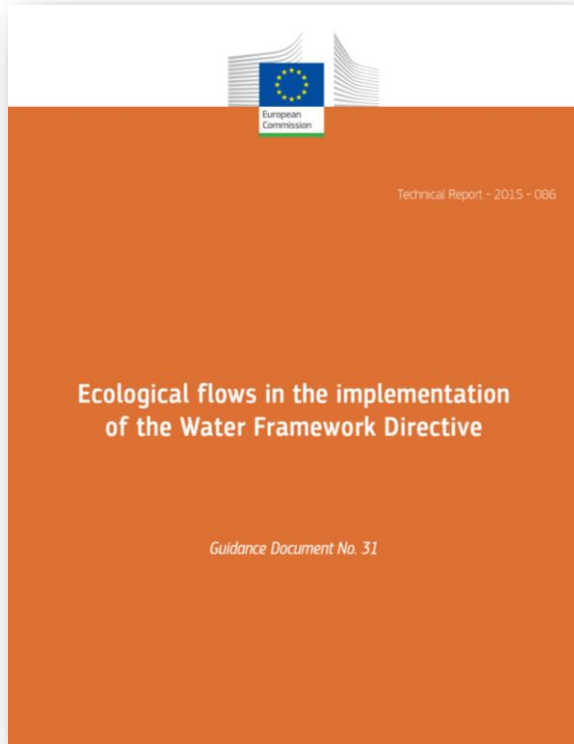


# Various methods to estimate e-flows reviewed drawing upon European guidance

**EU guidance** aims to **stimulate a common uptake of ecological flows** to support the achievement of the Water Framework Directive's **environmental objectives**.

Covering the whole WFD implementation process, it develops the steps where consideration for ecological flows is critically needed.

## Method comparison



	Hydrological	Hydraulic	Habitat modelling	Holistic
<b>Scale</b>	Basin	Reach	Reach	Reach
<b>Based on</b>	Ecosystem	Habitat	Species	Ecosystem
<b>Cost</b>	2.000 €	10.000 €	50.000 €	30.000 €
<b>Time</b>	2 days	1 month	1 year	1 year
<b>Uncertainties</b>	Medium	Medium	Medium-low	Medium-low
<b>Defensibility</b>	Medium	Medium	High	High

**No single environmental flow assessment technique suits all social, economic, hydrological, and ecological contexts within a country.**

# Challenges



## 1) Different approaches to e-flows across the countries (WWF assessment)

- *Montenegro* – Water Act recognized e-flow from 2015, a by-law is endorsed in 2016, monitoring is also defined in 2018, but there are still issues in implementation
- *Bosnia and Herzegovina* – Federation of Bosnia and Herzegovina had a by-law on e-flow, hydrological method chosen, in Republika Srpska only biological minimum
- *Serbia* – biological minimum is prescribed, although often without baseline data on hydrology and species

2) **Existing infrastructure** (3 dams on the main stem, in different countries) poses constraints to applying e-flows

3) **Cooperation frameworks** do not cover all countries or all issues. Some frameworks project based, there are bilateral agreements under development

## Recommendations from the previous project (2019) – e-flows

- 1. Reconvene the Expert Group on Flow Regulation and Environmental Flows:** Experts and authorities to progressively work towards adopting a harmonized methodological approach to e-flows through upgrading the legal and regulatory basis.
- 2. Assess the current e-flow methods for harmonization potential:** e-flow calculation possibilities and the legal aspects of the methods, a strategy for e-flow method selection, role of e-flows in achievement of WFD environmental objectives
- 3. Initiate a dialogue about operational rules for the HPPs** between the power companies and authorities, supported by the necessary studies and data
- 4. Identify for best international practices options for sustainable coordination and optimization for flow regulation**

# Wealth of international practice on agreeing about different aspects of flow gathered in a Handbook

1. Compendium-style **handbook on water allocation in a transboundary context** developed under **the Water Convention**: based on existing practices, covering the key aspects of equitable and sustainable allocation of water in the transboundary context, addressing both surface waters and groundwaters
2. **Legal arrangements of different degrees of formality, technical and informal arrangements; at different levels**
3. **Rich and diverse international practices options for coordination and optimization for flow regulation**
4. Various aspects have been agreed: flood protection, coordinated operation of dams, co-optimized operation regime, exchange of information, trading balancing services, dividing benefits, environmental flows, facilitating fish migration, minimum flow, spring discharges etc.



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# Formalization of aspects of flow regulation across the riparians of the Drina and their Nexus sectors: aims of the study

1. **Overview of the relevant flow regulation issues, taking also into account water uses, and their pertinence to specific sections of the Drina** (upper, lower and middle reaches; or in between specific dams used for regulation)
2. State of the understanding about **the current flow regulation and how this is governed**, taking into account how meeting different water needs is ensured (legal and regulatory basis: existing agreements and protocols, permit conditions, operational rules etc.)
3. **Analysis of relevant international examples of agreeing at the transboundary level about specific aspects of flow regulation and reconciling different uses** (hydropower, flood and low flow management, meeting ecosystem needs, sediment management etc.)
4. **Types of possible arrangements for the Drina River Basin** for the key flow regulation issues, taking into account the governance landscape at different levels and which actors are concerned, advantages and limitations, related international instruments or obligations e.g. related to Conventions and examples of reference value.
5. **Recommendations for steps** that could be taken to progressively move forward, taking into account the present situation but also the future outlook.





# The process & elements





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# Different modalities, opportunities

1) Various needs e.g. minimum/e-flows need to be ensured, flood management requires responses and releases from hydropower dams need to be coordinated, it'd be difficult to cover all aspects in a single arrangement. Possible **combinations of different modalities** involving different actors (Governmental, sub-State level authorities, companies) and for different aspects? Bilateral vs. basin level approaches? How to ensure coherence?

2) Opportunities with this project:

**Specific technical aspects (HPP optimization, e-flows, sediment) have been looked at, can be brought together**

**Role of hydro considered with renewable energy, in the context of climate commitments**  
**joint investments benefitting multiple sectors** facilitate agreement about some aspects of flow regulation