Serbia Water Security Diagnostics

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Water

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International Institute for Applied Systems Analysis
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Water Security Diagnostic Initiative

Vision: Achieve Water Security for all.

Mission: Exploring pathways to optimize the benefits water provides to people, the economy and the environment

Water security is a complex, multi-dimensional concept. It concerns the building of a water secure future for the people, the economy, and the environment in the face of local and global challenges.

From vision to action: Operationalizing the Water Security Diagnostic Initiative

GOAL: Have a framework that allows countries:

- Undertake a rapid assessment of water security challenges, risks and opportunities
- Put water on the economic agenda
- Benchmarking

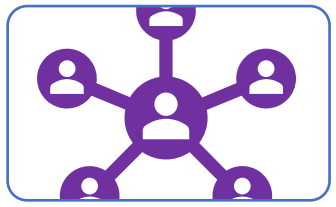
Indicator-based assessment of current situation

Water Security Outcomes

- Economic outcomes (3 Core, 2 Supporting)
- Social outcomes (6 Core, 4 Supporting)
- Environmental outcomes (5 Core, 6 Supporting)

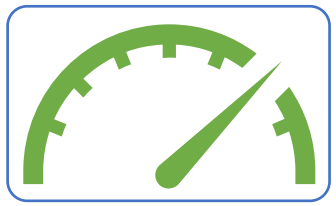
Water Endowment

- Supply and Variability (8 Core)
- Demand (6 Core)



Water Sector Architecture

- Infrastructure (12 Core, 5 Supporting)
- Institutions and governance (2 Core, 3 Supporting)

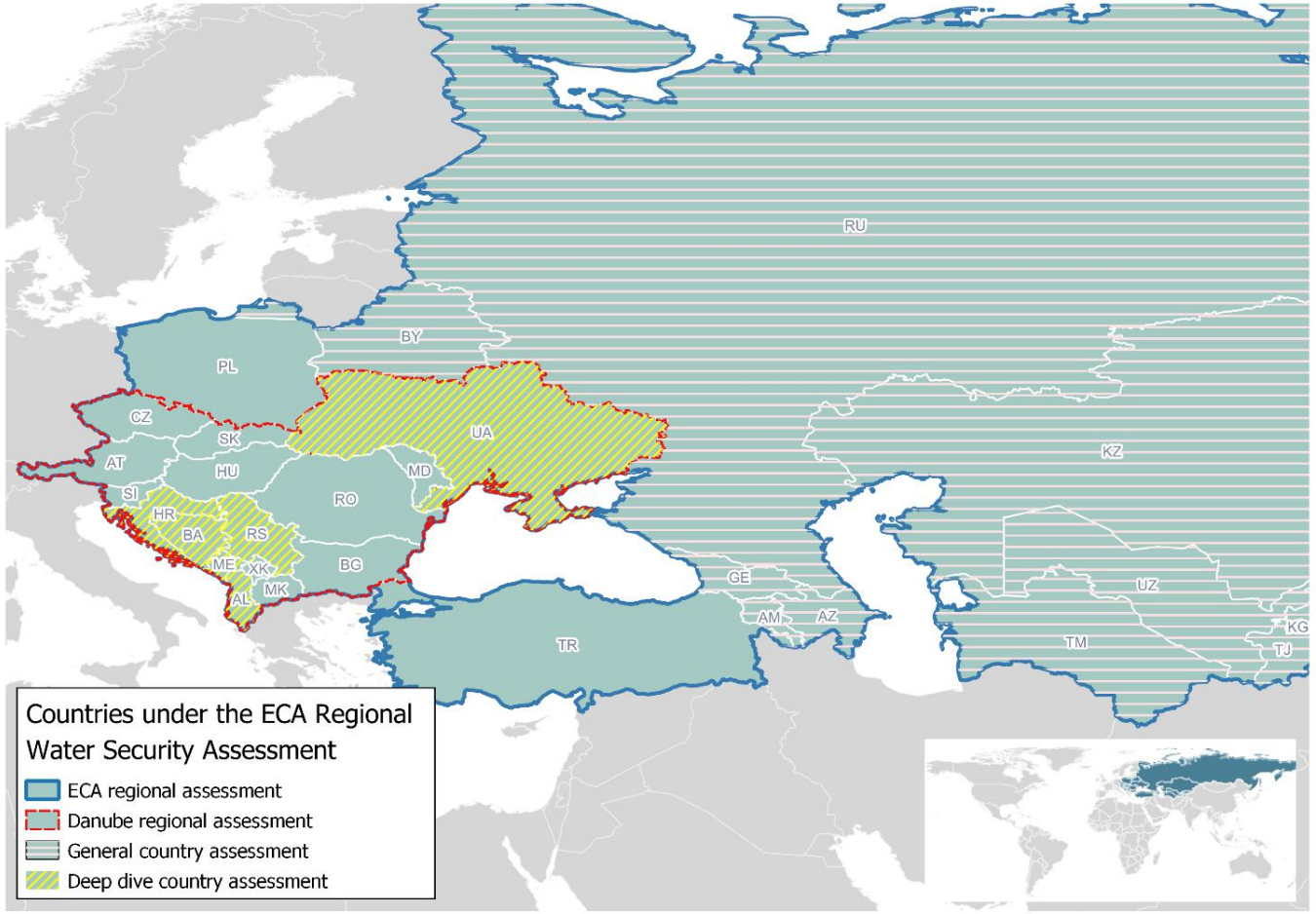


Water sector Performance

- Management of water resources (1 Core, 6 Supporting)
- Delivery of water-related services (1 Core, 5 Supporting)
- Mitigation of water-related risks (2 Core, 2 Supporting)

- Indicators selected based on **relevance**, **accessibility**, **reliability** and **availability**
- **81 core and supporting (both quantitative and qualitative) indicators** to assess current situation across the different dimensions
  - **CORE**: widely used and available indicators via desktop review
  - **SUPPORTING**: require local data collection and used to supplement the country assessment
- Selected indicators are assigned **range bands** for classification and benchmarking among countries. 5 classes (low, low-medium, medium, medium-high, high)

Water Security Diagnostic Initiative in Europe and Central Asia



Different levels of depth in the assessment:

- **Country:** deep dive and general country report
- **Regional:** ECA and Danube

5 deep dive countries

- **Serbia**, Croatia, Albania, Montenegro, Bosnia and Herzegovina

Serbia Water Security Diagnostics

This report provides a high-level assessment of Serbia's current water security status and drivers of future change intending to highlight the complex water issues that Serbia must tackle to enhance its water security.

- **Chapter 1** provides a short overview of the Water Security Diagnostic Framework, the One-Water Methodology, and a general overview of Serbia.
- **Chapter 2** provides a diagnosis of the current water security status of Serbia.
- **Chapter 3** describes Serbia's future trajectories along two main axes: external drivers imposed by global climate and socio-economic scenarios,
- **Chapter 4** elaborates a water security country narrative of the main challenges, risks, and opportunities that Serbia is and is likely to face in the near future.
- **Chapter 5** outlines the action plan required to address and overcome the main challenges and risks

Chapter 2 - Water Endowment

Supply and Variability

Key issues:

- Serbia is well endowed in terms of water resources
- International water cooperation is a key issue for sustainable water management
  - 90% of Serbia's water resources originate outside the country

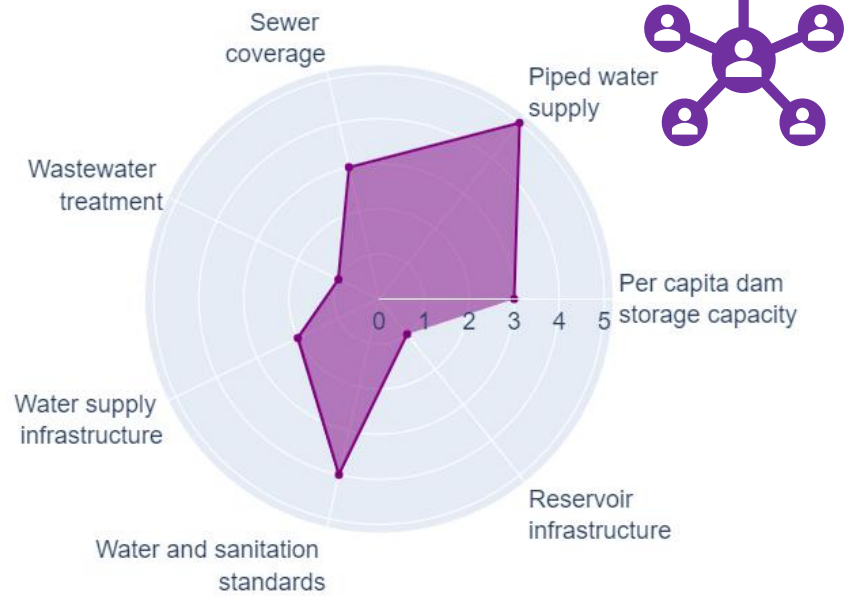
Demand

- Key issues:
- Serbia utilizes only a small portion of its total available water resources.
- Low quality of surface water leads to heavy dependence on groundwater for domestic and industrial sectors. This requires appropriate aquifer management plans

Chapter 2- Water Sector Architecture

Infrastructure

- Water supply systems are outdated, and infrastructure is deteriorating for decades
- Large cities do not have wastewater treatment plants
- High investment needs for infrastructure compliant with EU regulations
  - Rehabilitation of water supply systems
  - Tariff policy
  - Establishment of wastewater treatment plants
- Reservoir/ hydropower structure play an important role for water and energy supply but environmental impacts are not considered.
- Irrigation development is very low, and infrastructure is very outdated



Chapter 2- Water Sector Architecture

Institutions and governance

- **Institutional overlap**, several ministries which have responsibilities in the water sector, issue recognized also by Water Strategy
- **Overlap influences** investment planning and decision taking
- **Institutional gaps,** e.g. no regulator
- **Institutional weaknesses**: capacity of Serbia's Water Directorate to respond to all legal requirements set forth in Water Act and other laws
- **Question for discussion - strengthen capacities of the Water Directorate** / simplify current institutional framework / appoint one institution
- **National targets defined but pathway to attain them unclear**, multi-year investment planning and no corresponding monitoring processes
- **Cooperation** between Government / Sector Ministries and municipalities as owners (founders) of the companies and the companies has room for improvement

Chapter 2 - Water sector Performance

Management of water resources

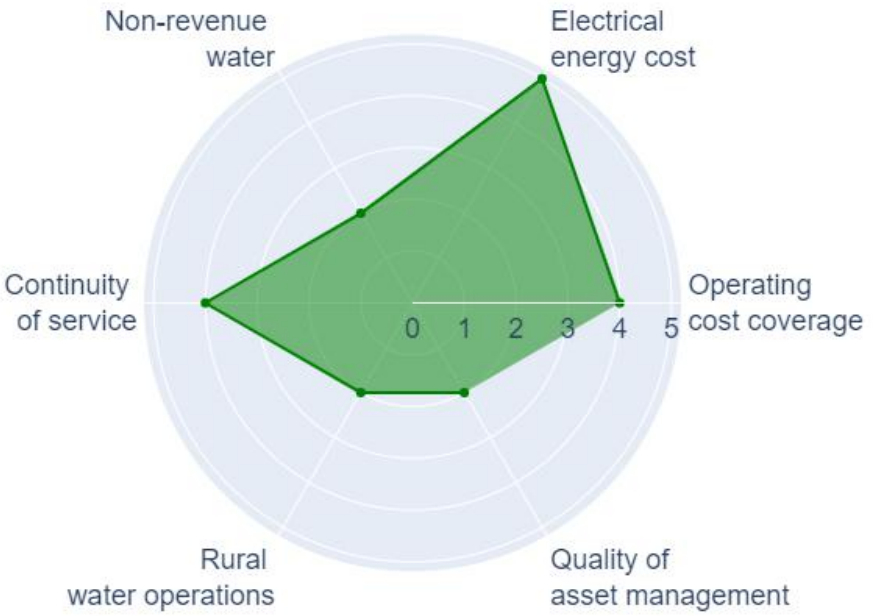
Key issues:

- Water management planning advances, but more efforts should be put on implementation
- Mechanisms for sustainable water use are not in place
- Water resource and use of monitoring networks should be improved

Chapter 2- Water sector Performance

Delivery of water-related services

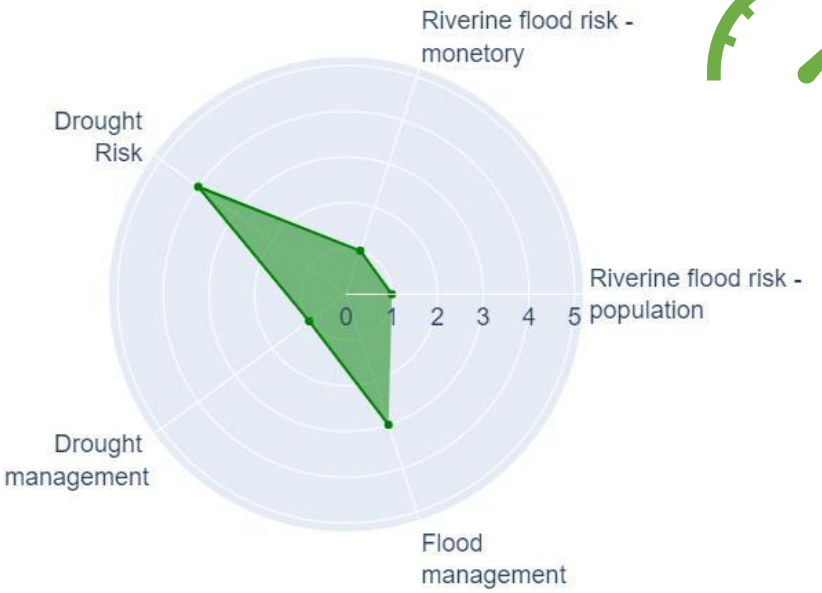
- Sector planning and interventions are infrastructure focused leaving **operation and maintenance** and institutional development **behind**
- Number of the sanitary and health controls increasing and number of samples with contamination decreasing. Yet, **largest cities in Serbia discharge untreated wastewater** to the recipients and water from groundwater's is used for water supply
- Decrease of quality operations and maintenance investment, Public Water Companies **do not sufficiently invest** in the reduction of non-revenue-water – relation to production cost and hence tariffs
- **Capacity and economies of scale limited** at municipal (oversight) and PUC (O&M) level, Standing Conference of the Cities and Municipalities support limited

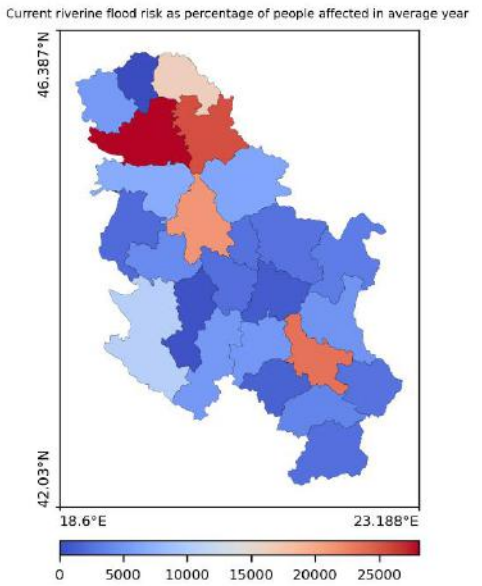


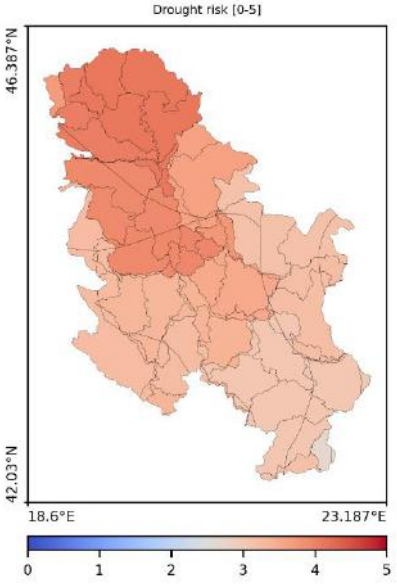
Chapter 2 - Water sector Performance

Mitigation of water-related risks

- Flood impacts on Serbia's economy and population are significant
  - Average annual economic losses (hazard x exposure x vulnerability) ~2,34% GDP
  - Pop affected (hazard x exposure) ~2,38% pop
- Serbia has made good steps to effectively deal with flood risk, but there is also room for improvement
  - The Preliminary Flood Risk Assessment was completed in 2019 for the territory of the Republic of Serbia.
  - Flood Risk Management Plan for the territory of the Republic of Serbia is in progress. It is planned to be completed by the end of this year.
  - Little information on implementation is available.
- Serbia has medium-high drought risk, but no plans for drought risk are in place







Chapter 2- Water Security Outcomes

Social outcomes

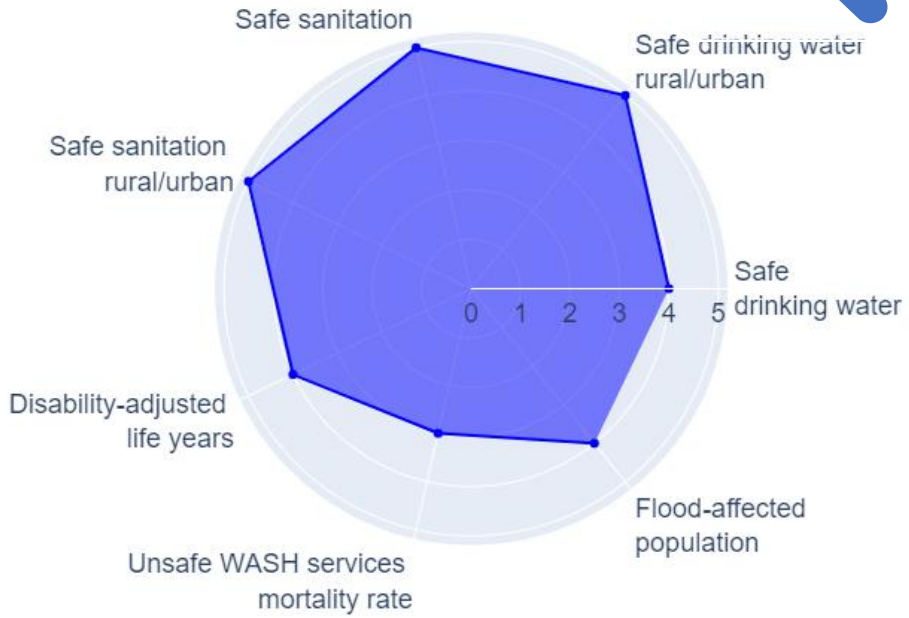
- Serbia has generally good WASH services
  - 95,3 percent of the population has access to basic and safely managed drinking water sources. Access to basic or safely managed sanitation services is higher than the region´s average value.

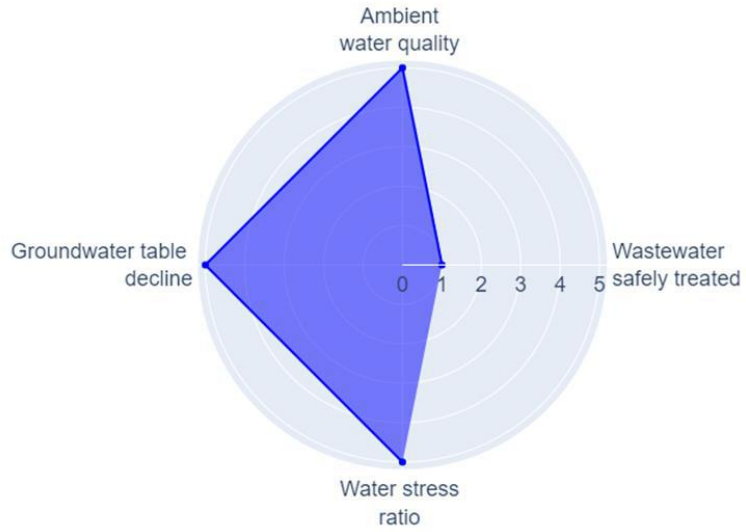
Environmental outcomes

- *Serbia has moderate to good water quality, but problems with wastewater treatment and point source pollution*

83% of all water bodies have "good ambient water quality". Despite Serbia´s good ambient water quality, only 55% of the territory is covered with sewer and only 13% of the collected wastewater in Serbia is treated.

- *Serbia´s water resources are plenty, but it should safeguard its resources against future stressors*
- *Serbia has almost no water stress, with a relatively low water stress ratio compared to the whole ECA region. Also, groundwater tables are not in a state of decline, but are actually rising.*





Chapter 3-Future Trajectories

This section provides future quantitative projections for some indicators representing some of the dimensions of the WSDF in Serbia, using a range of future climate and socio-economic scenarios.

The indicators with available future projections are the following:

(i) Renewable water availability, (ii) Total water demand, (iii) Water stress, and (iv) Flood risk.

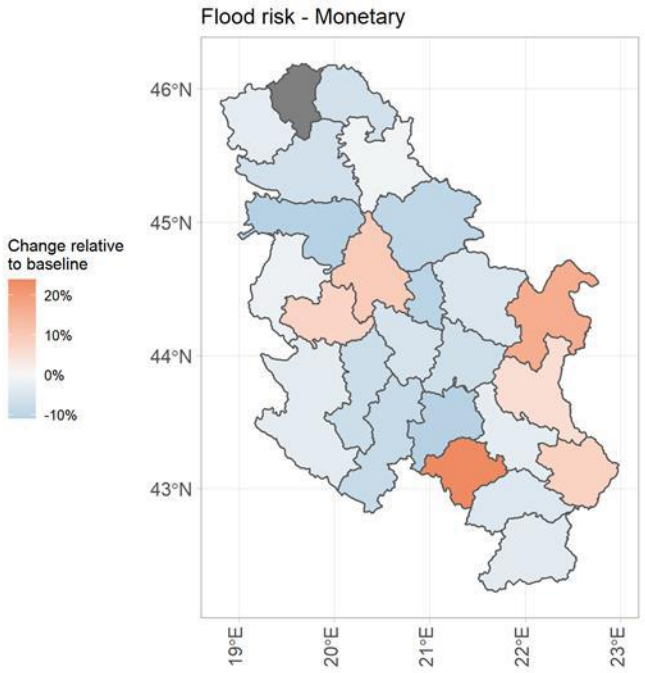
Flood risk

Flood risk due to climate change is expected to increase near Belgı

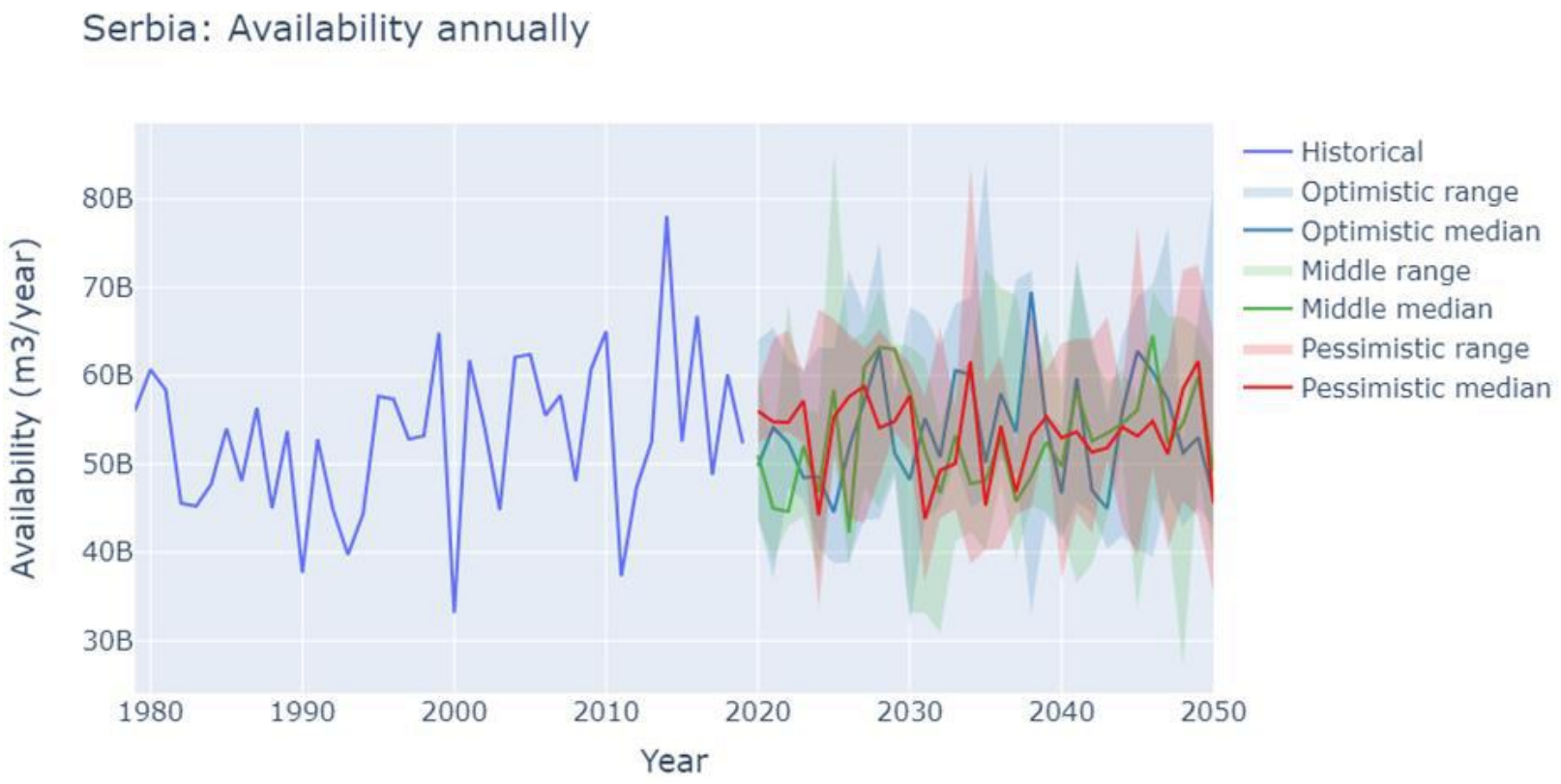
(Sava) and along Serbia's South-Eastern Border in the Morava Rivei

Other regions show relative stagnation or reduction of flood risk in

terms of GDP, yet these areas already show relatively low risks .

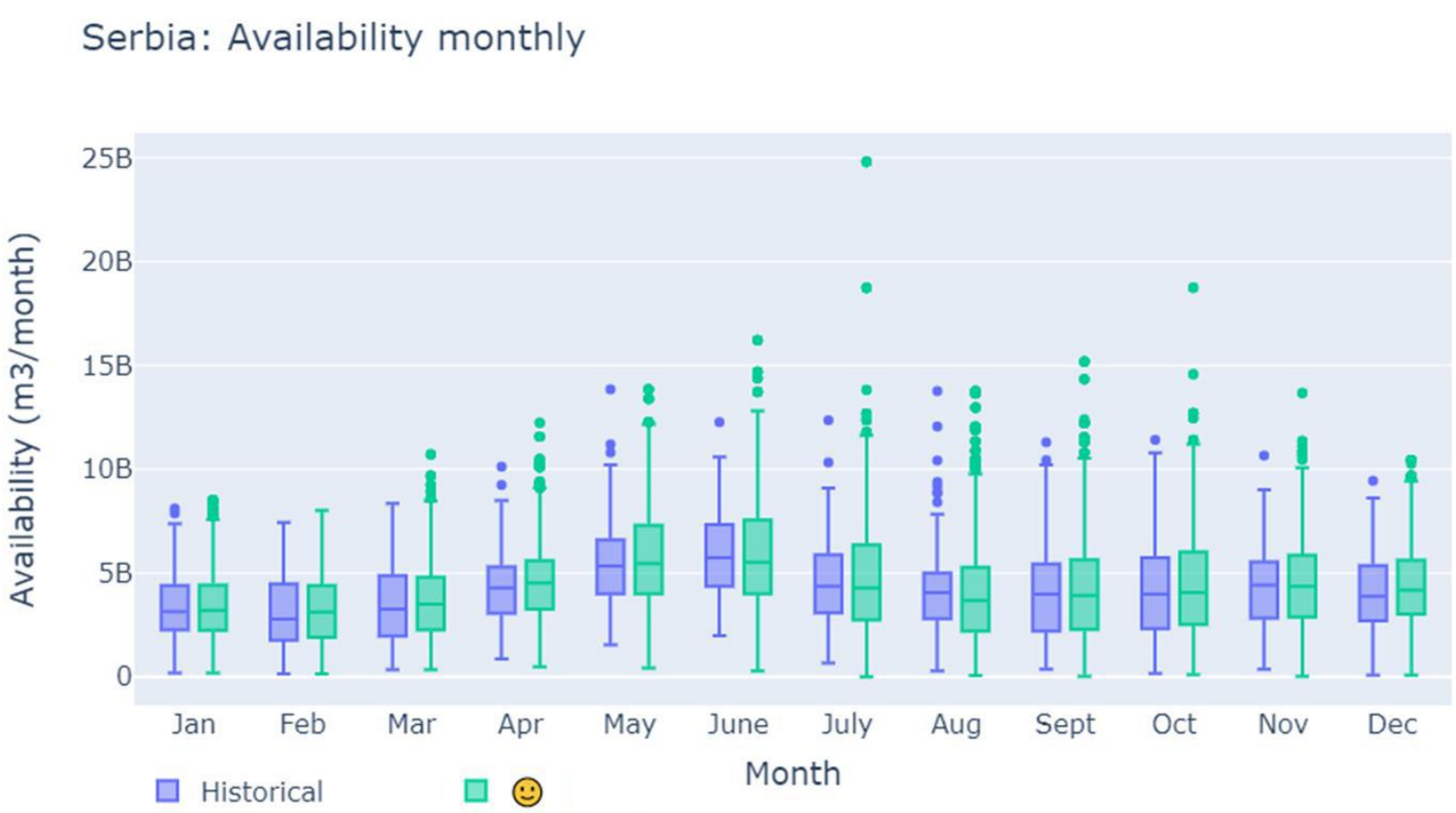


Water availability throughout the year



All scenarios show a similar range to history, although drier and wetter years may be experienced more often.

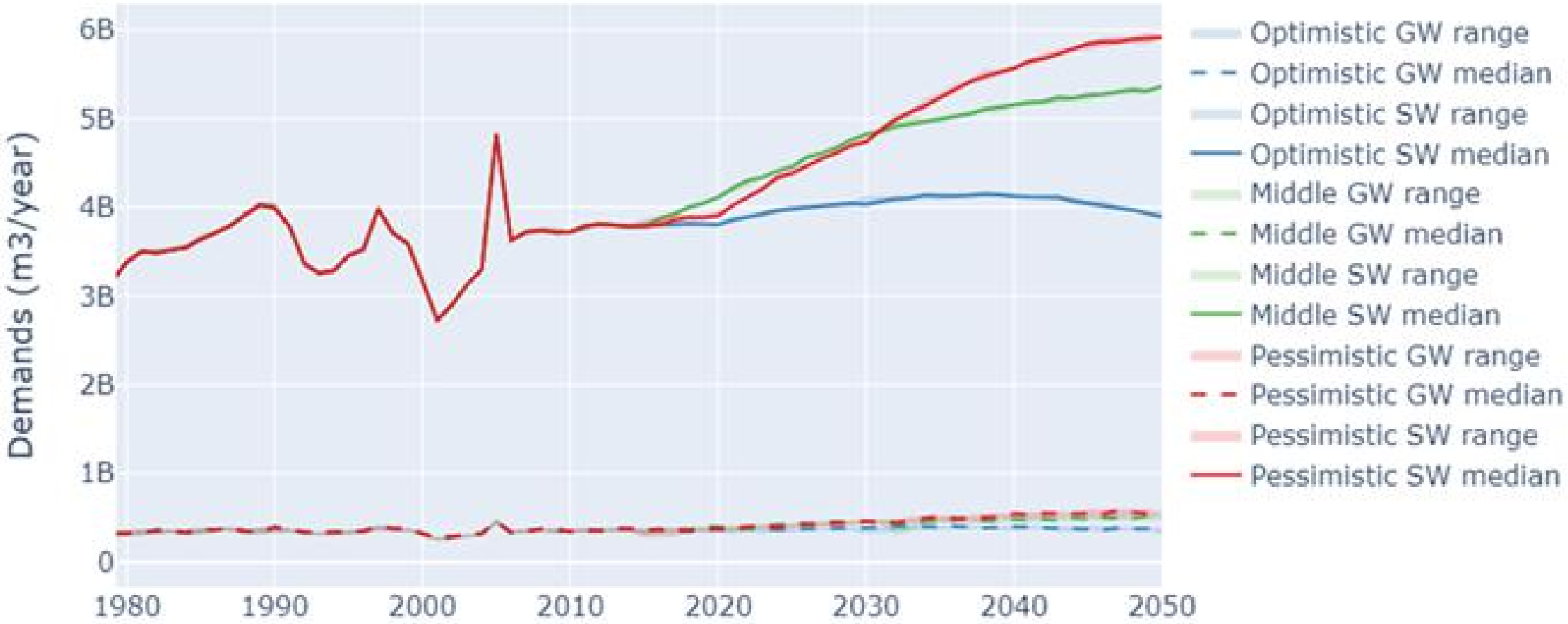
Water availability throughout the year



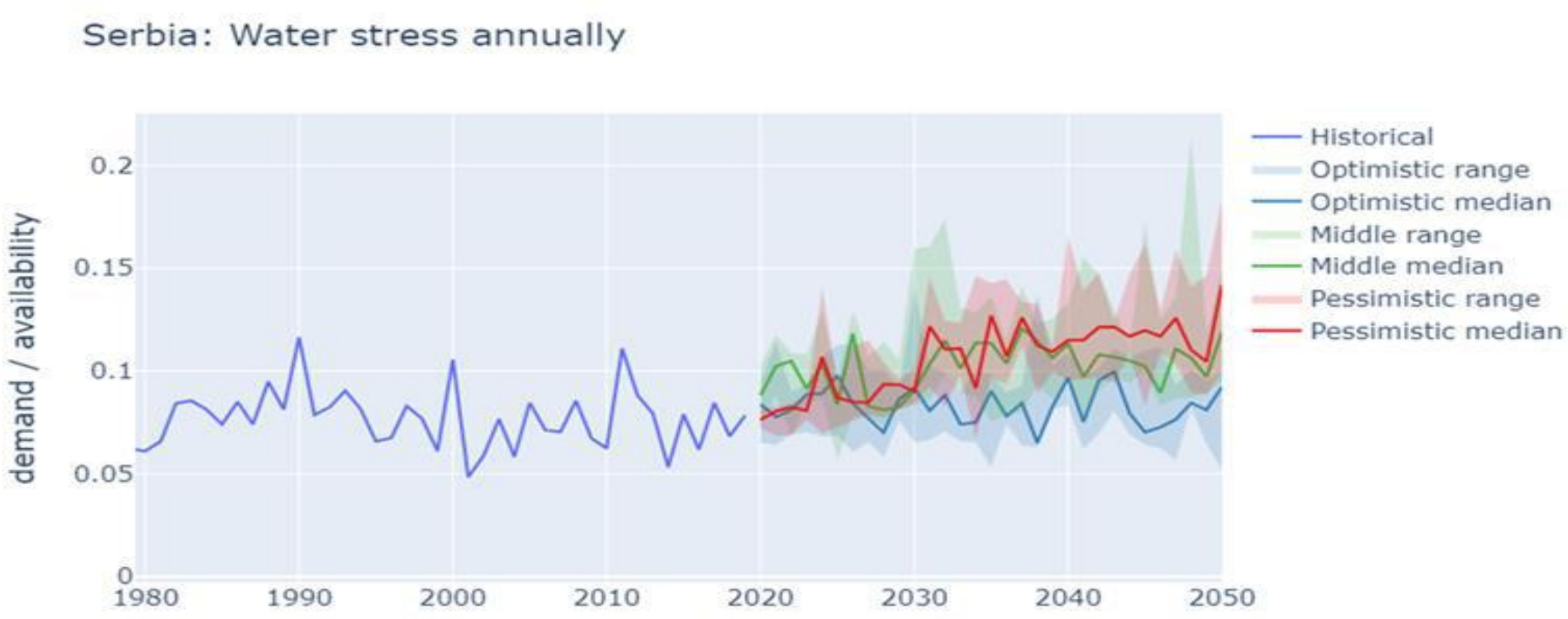
The middle scenario shows similar availability to history: the median and interquartile ranges are relatively the same in all months.

This scenario shows the increased occurrence of wetter and drier months

Serbia: Demands annually



Water stress



Two scenarios show increasing water stress, related to increasing demands

In some years, the potential water stress is significantly higher

Chapter 4 – Country narative

(i) **A water sector reform is needed in Serbia.** Serbia, a candidate country for EU accession, has several challenges to address in the water sector to meet the requirements of the various water directives as part of its accession to the European Union. This requires a clear framework for financing and regulating the water sector while adopting integrated water management principles.

(ii) To safeguard investments made in the water supply and sanitation sector and increase readiness for future challenges, a consistent and **sufficiently financed O&M approach is needed**. Efforts to review the tariff policy are ongoing, and their implementation needs to be consequently pursued to attain high levels of O&M cost covered by tariffs.

(iii) Another major challenge in the Serbian water sector is **the lack of human resources and capacities at different levels.** The educated and experienced staff has been leaving the sector in the last couple of years as working conditions are not satisfying and salaries are low. New massive investments that are planned for the next period will be a heavy burden on the local public utility companies.

(iv) Serbia is investing large efforts in transposing the EU water-related Directives, but most planning instruments are still not implemented.

Chapter 4 – Country narative

(v) Significant progress has been achieved in developing the river basin management plan in compliance with the European Water Framework Directive, although some gaps remain. The most important gaps that will need to be addressed in include: **Insufficient monitoring**, particularly with regards to the ecological status of surface water bodies (biological and hydro-morphology parameters) and quantitative status of groundwater bodies, many of which are under high pressure.

(vi) Although Serbia has a lot of water resources, it is at risk due to its high dependency on upstream countries and increasing seasonal and interannual variability.

(vii) Water demand is increasing in the future. The main reason is the increased water demand of the constantly growing industry and agriculture

(viii) Serbia experiences both floods and droughts and extreme events are likely to occur more often in the future.

Chapter 5 – Identification and Selection of Actions

Ranking of actions	Final scoring
Reduction of water losses and unique common definition for NRW (EU DWD definition)	1st priority
Development of a Capacity Development and HR Plan at Ministry level, PUC and municipality level	
Improve water management based on river basin approach	
Water sector reform – targets defined and next steps on pathway clear (e.g. position paper for parliamentary discussion)	
Harmonization of the Water Law with existing regulations	
Safeguard high value ecosystems against future development projects	2nd priority
Implementation of a new tariff policy according to the ongoing tariff study and methodology - under development	
Legal framework for financing the water sector	
Improve WB-status Assessments + Rules/mechanisms to allow use permits according to waterbody status	
Establishment of a regulatory body	
Water supply+demand Projections (Climate change) - support demand reduction measures	3rd priority
Encouraging green-spaces, re-greening, and infiltration, in rural and urban spaces	
Upgrade or increase irrigation / drainage infrastructure coverage over irrigated agricultural areas	
Regionalization of utilities	
Fewer people living in flood-prone areas	

Description of Priority Actions and Pathway to increase Water Security

Eight out of the fifteen proposed priority actions are directly or indirectly linked to a water sector reform and update of the legal framework in Serbia. In this sense, **the water sector reform is the top priority** to increase water security in the country.

In order to cope with the challenges ahead, **additional personnel capacities are required at different levels**. This also includes the introduction of a regulatory body for the water supply and sanitation sector.

With the current skyrocketing energy costs, **the efficiency of water supply and wastewater systems** is more important than ever. Therefore**, the reduction of non-revenue water** (NRW) is given a high priority. The goal should be a reduction of about 15% to approach the EU average of 23%.

Climate change impacts in combination with the reindustrialization in Serbia must be mitigated by accompanying measures to **protect water resources and minimize the degradation of ecosystems**.

To manage future water demand, an **improved understanding of changing water supply under climate change conditions** is needed**. Irrigation** is at a very low level and could be enhanced again to improve the competitiveness of the agricultural sector.

The mix of measures is crucial. The proposed measures cannot be considered independently of each other.

HVALA NA PAZNJI!

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