DIKTAS II

Implementation of the strategic action program (SAP) of the Dinaric karst aquifer system: improving groundwater governance and sustainability of related ecosystems.

2nd in-person EXPERT MEETING

10-11 November 2025

Sarajevo, Bosnia and Herzegovina

BOSNIA AND HERZEGOVINA
GROUNDWATER GOVERNANCE DIAGNOSTIC ANALYSIS (CGGDA)

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Groundwater Governance; Actors, Cooperation

Multi-level governance structure:

Water and environment management **under jurisdiction of two Entities (FBIH and RS) and Brčko District BIH**

State Ministry for Foreign affairs and Economic Realations **(MOFTER)** –coordinate entities' policies, activities relevant for international cooperation

- **The key actors:** Entities (FBIH, RS) Ministries for Agriculture, Water Management and Forestry and Departments for Water and Environment in Brčko District BIH
- FBIH Water Agencies (AVP Jadran and AVP Sava) and Public Institution "Vode Srpske" in RS
- Entities Ministries for the Environment
- Cantonal ministries in the F BiH,
- Entities Geological Institutes
- Public water supply companies
- Entities Hydro-meteorological Institutes focuses on meteorological and hydrological activities including monitoring and processing data.
- Entities Institutes of Public Health is responsible for monitoring drinking water quality.

- **Civil society organizations** (Center for Environment , Aarhus Centres, WWF Adria)

Groundwater Governance; Actors, Cooperation

❑ **Policy Coordination needs improvement**

•**Vertical coordination** is **slow and fragmented**; **MOFTER lacks executive** but rather coordination responsibilities

•**River basin management is performed by entities, despite shared water bodies.**

•**Horizontal cooperation** across sectors (environment, agriculture, energy, spatial planning) **legally prescribed** but **rarely practiced;** Groundwater is **not systematically integrated** into land-use, irrigation, or physical plans.

•No permanent inter-sectoral platform exists for groundwater and development alignment**.**

❑ **Limited Institutional Capacityies and Funding**

•Entities Ministries, Water Agencies and PI Vode Srpske possess strategic and technical capacity but the **number of experts** is limited (to meet EU obligations), while cantonal (FBIH) and municipall capacities **are low**; **Groundwater monitoring and data systems need significant improvement.**

•**Budget support is largely absent or minimal;** beside **from water fees** reliance on **donor-funded projects**

•Groundwater-specif**ic funding is minimal; No incentives** for efficient use or leakage reduction**; Agricultural subsidies** may **increase pressure** on groundwater**;** Donor projects **help, but are short-term and non-systemic.**

•Municipal utilities and geological surveys are underfunded and understaffed.

❑ **Low Public and Stakeholder Awareness**

•**Policy focus is on surface water**; groundwater risks are poorly understood.

•**Public interest** is reactive, **driven by pollution or shortages**.

•Groundwater topics are largely **absent from education and media.**

•**No national platform** for public engagement or groundwater governance.

Legal fframework; Policy and plans

- **Groundwater governance is decentralized** across FBiH, RS, and Brčko District, plus 10 cantons in FBIH; Cantons adopt their own laws, generaly rely on entity-level legislation.

No dedicated groundwater law; regulation is spread across water, environment, geology, health, and spatial planning

Water Quantification, Allocation, Usage –permit and cconcessions (large-scale or economic uses) required for activities affecting groundwater; Implementation and enforcement vary across entities and river basins;

Polluter Pays and Cost Recovery Principle - legally recognized ; Users pay fees for abstraction, discharge, and services; Fee collection and **calculation** methodology need i**mprovemen**t and very across administrative levels; **Environmental costs** are **acknowledged in law but not fully integrated** into pricing.; No standardized method for integrating environmental/resource costs;

Core GWD elements regulated (pollution control, chemical status, thresholds)

GDE -Groundwater-dependent ecosystems -**not clearly defined** in water laws; **addressed Integrated monitoring of groundwater and surface waters** to protect ecosystems

•**WFD transposition** is advanced: ~95% in FBiH, ~75% in RS (missing several by-laws, **GWD transposition** is partial: less than 30% in both entities)

- **GW Monitoring and Status Assessment**

Relevant regulation provisions provide **partial elements of the methodology for groundwater monitoring.** or elaborated

RBMs in FBIH i RS address groundwater monitoring, but the methodology is not fully standardized - technical elements (density of monitoring points, sampling frequency, set of parameters)

Monitoring is gradually developed through RBMs prepared by water agencies**, but it is still not fully aligned with EU directives.**

RBM include methodologies for **pollutant thresholds and ecological status**; RBMs **Highlight Karst –site-specific assessments** due to natural variability;**Pollution control**, **chemical status** -degree of **implementation varies between entities RBM and across river basins within each entity**.

Artificial Recharge & Wastewater Discharge- Direct discharge of wastewater into groundwater is prohibited ; Idirect discharge allowed under strict conditions and technical standards; No unified approach; implementation depends on local capacity and oversight

Remediation of Contaminated Soil/Groundwater - Remediation legally required when pollution exceeds limits; Fragmented implementation and limited technical ca

Sanitary Protection Zones in Karst Areas

Sanitary protection zones regulated in both entities ; Brčko District lacks specific rules.

FBiH applies detailed methodology for carst- zone delineation; Tailored criteria for karst aquifers, including vulnerability assessments and hydrogeological studies**; RS uses uniform criteria for all aquifers typs**, without specific provisions for karst;

In both entities **- Monitoring based on general factors (**e.g. population, pollution risk**); Monitoring methodology not standardized; Lack of clear monitoring protocols; Technical elements (sampling frequency, parameter sets) are underdeveloped;**

Protective Measures in Sanitary Zones (Karst Areas) – **In FBIH - up to four zones based on hydrogeological vulnerability; Activities listed and restricted by zone; RS: Three zones defined, but no distinction for karst. Prohibited activities listed;**

Water and Spatial Planning Laws **mandate integration of sanitary zones into planning documents.**

Legal obligations not consistently enforced or translated into practice**-Many municipalities lack zoning documentation – Studies and formal decisions or protection programs.**

Both entities have legal tools for inspections, penalties, and permit control but enforcement is weak

Monitoring; Data Acquisition, Management & Dissemination

- **Monitoring;**

Water Quality Monitoring covers chemical and ecological status of surface and groundwater. Key parameters: nutrients, heavy metals, pesticides, microbiological indicators.

Water Abstraction Monitoring tracks volumes by sector (agriculture, public supply, industry). **Data gaps exist** for **unauthorized abstraction**; Seasonal to annual resolution; spatial coverage varies.

Spring Discharge Monitoring - **Focused on karst springs**. Monitors discharge volume, timing, and variability.

Ecological Flow Monitoring aims to maintain freshwater ecosystems; **coverage - limited to selected rivers**.

Ecological Indicators - Partial data on species status, habitat condition, and ecosystem services; **no officially declared habitat protection**

Areas; **monitoring occurs in some protected zones.**

- **Data Acquisition, Management & Dissemination**

Developed and maintaned Water Information System (Water Agencies and PI Vode Srpske)**; not unified across entities**

Staff and technical capacity exist but are insufficient for full-scale monitoring and data management.;

Need: targeted training, inter-agency coordination, and infrastructure investment**.**

Public Access to Groundwater & GWDE Data - fragmented and inconsistent- planning and awareness suffer;

FBiH: Online access to water levels, quality, GIS maps, and cadaster, **regularly updated; RS: Limited public access;** data mostly in **summary reports or offline archives.;**

Geological surveys hold valuable but mostly analogue data; Academic and NGO outputs are scattered and non-integrated.

- **Data Sharing Across Sectors**

Groundwater data exchange is ad hoc and project-based; Fragmented data-sharing prevents integrated groundwater management.

- **Socio-economic pressures in karst areas**: U**rban sources better managed; rural areas lack monitoring;** Illegal waste disposal, infrastructure deficits; **Hydropower and agriculture** raise abstraction pressures. **Tourism and urban growth** increase water demand and wastewater**; EU green funding could suppo metering and monitoring—if groundwater is prioritized.**

SWOT ANALYSE

Strengths (S)	Weaknesses (W)
Entity-level institutions have qualified professionals with water management and EU alignment experience	Shortage of staff and expertise, especially at local and operational levels
Formal frameworks (IECW, RBMPs) provide basic coordination mechanisms	Fragmented responsibilities between entities and Brčko District; lack of binding protocols and shared systems
Legal framework supports cost recovery and polluter pays principle	Environmental and resource costs not reflected in current fee structures; tariffs remain too low
Existing methodology for delineating protection zones in karst aquifers	Lack of hydrogeological studies and formal decisions on source protection
Groundwater characterization completed; monitoring networks established for alluvial aquifers	Monitoring in karst areas is fragmented and lacks ecological indicators
Inspectorates are authorized to conduct inspections and impose penalties	Enforcement is mostly reactive and complaint-driven; weak coordination between inspectorates and agencies
Karst aquifers recognized as vulnerable in strategic documents and RBMPs	No ecological tools, modeling, or GWDE definitions included in plans or strategies
Groundwater protection is recognized as a strategic priority; RBMPs include delineation and monitoring	GWDE not defined; karst-specific measures missing in strategies and RBMPs
Legal frameworks support horizontal cooperation and require environmental impact assessments	Groundwater concerns weakly integrated into agriculture, tourism, and spatial planning policies
Environmental/water funds occasionally support water-related infrastructure	Groundwater-specific funding is negligible; cost-recovery mechanisms are weak
Operational online access to hydrological, water quality, and GIS-based groundwater data	Data availability is fragmented and inconsistent; many archives remain analogue or unpublished

Opportunities (O)	Threats (T)
Establish targeted capacity-building programs and workforce planning aligned with EU directives	Without investment in human resources, monitoring quality and GWDE protection may be compromised
Create a unified data-sharing system to improve governance	Lack of institutional cooperation may lead to uncoordinated measures and ineffective karst aquifer protection
Introduce standardized methodology for calculating environmental/resource fees	Budget limitations and weak enforcement may prevent effective implementation of revised fee systems
Develop a unified, risk-based methodology for protection zones nationwide	Absence of standardized methodologies and karst-specific criteria may lead to inconsistent protection
Strengthen karst-specific and transboundary monitoring with ecological parameters	Limited coordination and partial RBMP implementation may delay EU compliance
Implement proactive enforcement strategies via RBMPs	Limited number of inspectors and financial resources hinder effective enforcement
Integrate karst-specific protection and ecological connectivity in future RBMPs and strategies	Without targeted action, karst systems remain exposed to cumulative pressures
Embed ecological modeling and GWDE protection in future planning cycles	Without operational tools and ecological criteria, sensitive aquifers remain exposed
Mainstream groundwater sustainability in cross-sectoral strategies	Continued sectoral fragmentation and lack of data risk over-abstraction and pollution
Launch performance-based incentives and conditional subsidies for groundwater protection	Unsafeguarded public investments may worsen groundwater degradation
Establish a unified Water Information System (WIS) to digitize and harmonize data	Weak coordination and lack of institutionalized data-sharing hinder integrated management and public awareness