PROJECT PERFORMANCE ASSESSMENT REPORT

WEST BALKANS

West Balkans Drina River Basin Project

Report No. 192747
DECEMBER 20, 2024

IEG
Independent Evaluation Group

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Attribution—Please cite the work as follows:
World Bank. 2024. West Balkans—West Balkans Drina River Basin Project. Independent Evaluation Group, Project Performance Assessment Report 192747. Washington, DC: World Bank.

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West Balkans
Drina River Basin Management Project

(TF-A2320, TF-A2317, TF-A2319, TF-A2322, TF-A2318, TF-A2321)

January 23, 2025

Finance, Private Sector, Infrastructure, and Sustainable Development

Independent Evaluation Group

Abbreviations

DRB	Drina River Basin
DTF	Drina Task Force
EU	European Union
GEF	Global Environment Facility
GIS	geographic information system
HIS	hydrological information system
IEG	Independent Evaluation Group
ISRBC	International Sava River Basin Commission
MPA	Multiphase Programmatic Approach
PPAR	Project Performance Assessment Report
SAP	Strategic Action Programme
SCCF	Special Climate Change Fund
SDIP	Sava and Drina Rivers Corridors Integrated Development Program
WRM	water resource management

All dollar amounts are US dollars unless otherwise indicated.

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This report was prepared by Nina Rinnerberger, who assessed the project in March and April 2024 with support from Momcilo Blagojevic. The report was peer-reviewed by Vijay Jagannathan and panel reviewed by J. W. van Holst Pellekaan. Jean-Jacques Ahouansou provided administrative support.

Note: IEG = Independent Evaluation Group; PPAR = Project Performance Assessment Report.

Contents

Box

Figures

Tables

Appendixes

Data

This is a Project Performance Assessment Report by the Independent Evaluation Group of the World Bank Group on the West Balkans Drina River Basin Management Project, P145048. This instrument and the methodology for this evaluation are discussed in appendix D.

Following standard Independent Evaluation Group procedure, copies of the draft Project Performance Assessment Report were shared with relevant government officials for their review and comment. The government requested and the Independent Evaluation Group addressed typography and formatting remarks.

West Balkans Drina River Basin Management Project (P145048)

Basic Data

Country	Western Balkans (Bosnia and Herzegovina, Montenegro, Serbia)	World Bank financing commitment	US$8.73 million
Global Practice	Water	Actual project cost	US$8.60 million
Project name	West Balkans Drina River Basin Management Project	Revised project cost	US$8.69 million
Project ID	P145048	Actual amount disbursed	US$8.60 million
Financing instrument	Investment project financing	Environmental assessment category	B
Financing source	TF-A2320, TF-A2317, TF-A2319, TF-A2322, TF-A2318, TF-A2321		

Dates

Event	Original Date	Actual Date
Approval		May 9, 2016
Effectiveness	October 31, 2016	May 11, 2017
Restructuring		June 30, 2020
Mid-Term Review		June 3, 2019
Closing	October 31, 2020	April 30, 2021

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Summary

Background and Description

The transboundary Drina River in the Western Balkans is the most important tributary of the Sava River and is part of the Danube River Basin. The Drina River Basin (DRB), shared by Bosnia and Herzegovina, Montenegro, and Serbia, is central for the environmental, economic, and social development of the three riparian countries and the Balkan Peninsula. The Drina River and its tributaries are part of the larger Sava River Basin, the major river basin of Southeastern Europe, which is the home for 8.1 million people and covers about 97,200 square kilometers, extending also into Croatia and Slovenia and northern Albania. The Drina River is known for floods and droughts with significant impacts on livelihoods and the local economies. Particularly in 2014, devastating floods along the Drina River and its tributaries significantly affected the economies of Bosnia and Herzegovina and Serbia.

The West Balkans Drina River Basin Management Project ("project" or "Drina project," approved in May 2016) aimed to "improve mechanisms and capacity of the Project Countries to plan and manage the transboundary DRB, incorporating climate change adaptation" (World Bank 2022b, 1). It mainly financed technical assistance to support (i) multistate cooperation in transboundary DRB management; (ii) pilot investments for integrated DRB management, including flood and drought management and climate change resilience; and (iii) project management and monitoring and evaluation. The project was financed through grants by the Global Environment Facility and the Special Climate Change Fund. It was the result of several years of World Bank engagement and dialogue on water resource management (WRM) in the Balkans and the first transboundary project to be jointly implemented by Bosnia and Herzegovina, Montenegro, and Serbia. The World Bank continues to support the three countries through a follow-on Multiphase Programmatic Approach (MPA) that seeks to strengthen transboundary water cooperation and improve navigability and flood protection in the Sava and Drina Rivers Corridors (Sava and Drina Rivers Corridors Integrated Development Program).

What Worked, What Didn't Work, and Why?

The Drina project's core activities strengthened transboundary water cooperation among the beneficiary countries, particularly through technical collaboration on common metrics and standards, which enables better planning and management of the DRB. The project engaged with and benefited the core institutions relevant for WRM. The establishment of the Drina Task Force proved effective as a cooperation mechanism to foster technical cooperation and knowledge exchange and to coordinate regional project

activities, leading to a satisfactory outcome rating for the project. While the task force was not formally continued, its overall effect on the project was positive and significant. A key achievement of the Drina project was the formulation of a joint vision for transboundary WRM through the development of a common Strategic Action Programme, which was endorsed by all three countries in 2021. The project also successfully improved hydrometeorological services and enhanced real-time monitoring capabilities through the provision of modern equipment and training in each country, in line with international standards. Legacy institutions and technical proficiencies in the partner countries facilitated these advancements, although gaps in network coverage and data integration remain.

The World Bank leveraged technical assistance and grant resources to enhance the foundations for transboundary WRM and remains important in shaping the future direction for cross-country cooperation on water resource issues in the region. The Drina project effectively used technical assistance funds from the Special Climate Change Fund and the Global Environment Facility to coalesce around shared priorities and goals, improve institutional relationships, and build capacity at core institutions relevant for WRM. It catalyzed regional action on key elements of WRM across the three countries and also provided a knowledge base for sustainable management practices of the DRB through a mix of knowledge exchange, learning, and regional studies. The World Bank's strategic commitment to transboundary WRM in the region is underscored by the MPA, which allocates $332.4 million over 10 years to scale up regional efforts to enhance flood protection and cooperation along the Sava and Drina Rivers, with additional support from the Global Environment Facility. Building on these efforts, the World Bank's strategic involvement has the potential to reinforce and shape the long-term architecture for transboundary WRM in the region, emphasizing the shared economic and environmental benefits as a key motive for investment in the region.

While the Drina project had many fruitful outcomes from the interactions and exchanges on WRM, it also encountered challenges in implementation and uptake of key initiatives. The Drina project was slow to reach effectiveness due to challenges in securing high-level ownership of transboundary collaboration, and the project faced delays during implementation, including some caused by the COVID-19 pandemic. Variations in procurement models affected the project's flexibility to respond to beneficiary needs and emerging situations. In addition, institutional capacity for transboundary governance varied significantly across countries, affecting the utility of some interventions. Yet the World Bank's engagement with the relevant technical counterparts was generally well placed, given their crucial role in key aspects of WRM. Across all countries, consistent budget constraints limited the ability of institutions to

fulfill their WRM responsibilities effectively, which has led to a high reliance on external donor funding and a project-centric approach.

The region is well positioned to further strengthen governance and management of water resources in the Sava River Basin and DRB. All countries engage under the well-established International Sava River Basin Commission (ISRBC), which has been involved historically in the region as a neutral broker for collaboration on integrated water management and navigation for the larger Sava River Basin. The ISRBC is responsible for the implementation of the 2002 Framework Agreement on the Sava River Basin, which provides the legal basis for cross-border cooperation among the countries, including Slovenia and Croatia. Under the auspices of the ISRBC, the countries have developed joint WRM protocols and management plans and established robust regional systems for water resource information sharing. In addition, the ISRBC collaborates with the International Commission for the Protection of the Danube River to harmonize water governance. The countries' pursuit of European Union membership and alignment with its relevant water policies and directives provide additional incentives for transboundary cooperation and advancement of common goals for joint planning and management of the Sava River Basin and DRB.

The long-term impact of formulating the necessary architecture for transboundary WRM is yet to be fully determined. Implementation of the Strategic Action Programme for the DRB has been limited because of difficulties in securing sustained political support and funding for transboundary investments in the region, changing national priorities, and low awareness among key stakeholders. However, through its technical assistance support, the World Bank has helped make significant strides in strengthening institutional capacity for WRM. The awareness of technical-level stakeholders of the importance of cooperation was a central premise of the Drina project and a positive impetus regarding joint resource governance and management. The follow-on MPA is a suitable instrument for long-term signaling and achieving aspirational goals such as sustainable WRM, while also allowing for adaptability to manage possible short-term shocks. Part of the proof for the sustained impact will lie in how the MPA performs. There are a number of key factors that the follow-on project needs to pay attention to, including (i) reaching agreement on the shared benefits between countries and proper sequencing of investments that advance transboundary WRM, (ii) supporting the long-term financial sustainability of the core institutions relevant for WRM, and (iii) pursuing a customized approach that fully engages with the varying capacities and needs of the beneficiary institutions. Overall, the World Bank's strategic long-term engagement and role as an intermediary, built on solid technical assistance, can be instrumental in facilitating transboundary WRM cooperation and infrastructure development, and agreement on mutual benefit sharing among the countries.

Lessons

This assessment offers the following lessons:

- **The long-term success of transboundary WRM is more likely to be achieved if the engagement is strategic and sustained.** The Drina project supported national and regional long-term engagements in the region, which created a strong knowledge and technical foundation for sound and sustained WRM of the Sava River Basin and DRB. This sustained effort generated a joint understanding among key stakeholder countries on how to equitably share economic and environmental benefits and manage trade-offs, along with agreed criteria for physical investments and benefits from WRM.

- **Cooperation around transboundary water resources can be strengthened and sustained if there is a neutral broker to facilitate agreement on priorities and benefit sharing.** The existing ISRBC emerged as the internationally recognized cooperation mechanism on management of water resources in the region. It facilitated the formulation of joint regional water management plans, in line with European Union standards, and joint policies for data sharing and analysis, which were vital for effective WRM, flood forecasting, and early warnings. All countries participate regularly in international exchanges of information and observations via the ISRBC and its various expert groups. The importance of the Sava Commission is underscored by its role as the project implementation unit for all regional program activities in the follow-on World Bank–supported MPA.

- **If institutional capacity varies, applying a uniform set of interventions across all beneficiary countries is not likely to be effective.** There was considerable variation in the capacities and user needs across the countries' implementing agencies and beneficiary institutions. The lack of institutional assessments at the appraisal constrained the project's ability to tailor its interventions to accommodate the different institutional capacities and local needs. The project's uniform approach to the design for improving institutional capacity meant that regional project activities and the procurement of equipment, goods, and services were not sufficiently adapted to local capacities and user needs.

- **If relevant hydrometeorological institutions are more mature, the application and utility of modern hydrometeorological services are likely to be more sophisticated and beneficial.** The project strengthened hydrometeorological services in line with internationally recognized standards, drawing on the relatively sophisticated technical capabilities of the partner countries. The relevant hydrometeorological institutions and water agencies have largely embraced modern technology and its use for better monitoring and WRM.

Institutional maturity was a key determinant in how well the interventions were adopted and in the capacity to innovate and effectively use hydrometeorological systems and data for accurate forecasting, modeling, and service development and delivery. In higher-capacity settings, institutions effectively used new technologies, strengthened their modeling capacities, and adopted innovative approaches. In lower-capacity settings, reluctance to modernize, combined with knowledge and training gaps, reduced the relevance of some interventions to beneficiary institutions.

Carmen Nonay
Director, Finance, Private Sector, Infrastructure, and Sustainable Development
Independent Evaluation Group

1. Background, Context, and Design

Background and Context

1.1 **Background.** The transboundary Drina River in the Western Balkans is the most important tributary of the Sava River and part of the Danube River Basin. The Drina River Basin (DRB) covers 19,800 square kilometers, equally divided among Bosnia and Herzegovina, Montenegro, and Serbia. The DRB is central for the environmental, economic, and social development of the three countries and the Balkan Peninsula. The Drina River and its tributaries are also known for floods and droughts with significant impacts on livelihoods and the local economies. In recent years (2010, 2013, and again in 2014), flooding caused devastation along the Drina River and its tributaries. The floods of 2014 significantly affected Bosnia and Herzegovina and Serbia with an estimated cumulative impact of about 15 percent of GDP (9.3 percent in damages and 5.6 percent lost output) in Bosnia and Herzegovina and about 4.7 percent of GDP (2.7 percent in damages and 2.0 percent in economic losses) in Serbia (World Bank 2021).

1.2 **Context.** The West Balkans Drina River Basin Management Project ("project" or "Drina project") was conceived to build capacity among the three riparian countries for transboundary management of the DRB to effectively manage water resources and water-related risks and adapt to climate change. It was the result of several years of World Bank engagement and dialogue on water resource management (WRM) in the Balkans and the first transboundary project to be implemented by Bosnia and Herzegovina, Montenegro, and Serbia together. The Drina project complemented activities financed with the support of the European Union (EU) Instrument for Pre-accession Assistance funds, the EU West Balkan Investment Facility, and the World Bank to improve integrated planning and cooperation for WRM in the DRB. With support from the International Commission for the Protection of the Danube River and the International Sava River Basin Commission (ISRBC), EU-compliant transboundary River Basin Management Plans and a Flood Risk Management Plan were developed (World Bank 2021). Subsequent engagement by the World Bank is building on the Drina project and supporting all three countries to improve flood protection and enhance transboundary water cooperation in the Sava and Drina Rivers Corridors through a Multiphase Programmatic Approach (MPA).

Objective, Design, and Financing

1.3 **Objective.** The objective of the project was to "improve mechanisms and capacity of the Project Countries to plan and manage the transboundary [DRB], incorporating climate change adaptation" (World Bank 2022b, 1). The project objective

was not revised during project implementation, but one project development objective–level indicator was changed as part of the restructuring that reduced the scope of the modeling activity under component 1 to drop the development of the climate change module from the real-time hydrological and hydraulic models (in June 2020; World Bank 2021).

1.4 **Design.** The project supported the three riparian countries: Bosnia and Herzegovina, Montenegro, and Serbia. It mainly financed technical assistance and consisted of three components. The first component on multistate cooperation in transboundary DRB management supported (i) development of an agreed Strategic Action Programme (SAP) to mainstream transboundary WRM in national planning and (ii) development of hydraulic and hydrological models for the DRB, including institutional development and capacity building. Under the second component—pilot investments for integrated DRB management, including flood and drought management and climate change resilience—the project supported (i) hydrometeorological services with new equipment and the development of data sharing protocols to strengthen preparedness for threats resulting from floods and droughts and (ii) pilot investments for climate change resilience. The project financed project management and monitoring and evaluation under its third component.

1.5 **Theory of change.** The causal links in the project's theory of change (see appendix B) from project activities to the achievement of project outputs and outcomes were direct and valid, and the achievement of the project objective could be attributed to the project's interventions. The project's theory of change envisioned that activities including the joint development of a SAP by all three countries, the development and operationalization of a real-time hydrological and hydraulic model, the establishment of the Drina Task Force (DTF), and the procurement of hydrometeorological monitoring and forecasting equipment would result in improved mechanisms and capacity to plan and manage transboundary WRM in the DRB, as well as incorporating resilience to climate change.

1.6 **Dates and financing.** The project was approved by the Board of Executive Directors on May 9, 2016, and became effective on May 11, 2017. It closed on April 30, 2021, which was six months beyond the original closing date. The project was financed through grants totaling $8.74 million provided equally by the Global Environment Facility (GEF) and the Special Climate Change Fund (SCCF). In accordance with criteria mutually agreed among riparian countries, out of the total grant, $3.38 million was allocated to Bosnia and Herzegovina, $2.72 million to Montenegro, and $2.64 million to Serbia. The actual disbursed amount was $8.60 million (World Bank 2021).

1.7 **Project Performance Assessment Report (PPAR) structure.** This PPAR assesses the project's performance and medium-term impacts under two separate chapters followed by a chapter on lessons learned. In chapter 2, this report assesses the project's medium-term results and their sustainability with respect to water management institutions and policies, as well as information systems. Given that the DRB project provided technical assistance and had a limited role in WRM, chapter 3 assesses this project's impact on the efficacy of transboundary WRM in the Sava River Basin of which the Drina River is a part. Chapter 4 reports on major lessons learned during the project's preparation and implementation and after it closed.

2. What Worked, What Didn't Work, and Why?

Results

2.1 This overview of the project results is aligned with the focus of investigation undertaken by the field evaluation, which was institutions and policies, as well as information systems relevant to WRM.

2.2 The project's core activities strengthened transboundary collaboration among the three riparian countries, thus enabling improved planning and management of water resources in the DRB. The DTF was established as a steering committee to coordinate the planning and the implementation of the project's transboundary WRM among the beneficiary countries. The DTF helped facilitate the implementation of project activities, such as the preparation of the SAP for the DRB and the development of protocols to exchange data, on time, within budget, and with procurement efficiency. This is evidenced by the satisfactory implementation of nearly all project activities and the high disbursement rate at project closing of approximately 99 percent (World Bank 2022b). Although the DTF was not formalized as a cooperation mechanism and was not intended as such at the project outset, it provided a forum to discuss and agree on joint activities and priorities for integrated WRM under the project. While the DTF was the central cooperative body in regard to this assessment, the Drina River is linked to the more comprehensive Sava Commission, which has been involved historically in the region (see box 3.1).

2.3 The project contributed to formulating a joint vision for transboundary WRM and articulating shared benefits of cooperation. It successfully brought the countries together to develop a joint SAP, which was formally endorsed by all three countries in May 2021. The SAP for the DRB set out a strategic vision for future transboundary planning and identified priority water management concerns, including climate change adaptation for water management planning. It also prioritized a list of measures for integrated, sustainable transboundary WRM for the DRB over a 10-year planning

period. As part of the SAP, the countries developed a portfolio of project concepts,[1] which could be implemented with support from international financial institutions, national governments, or international cooperation partners. For reasons outlined in paragraph 2.15, uptake of transboundary measures envisioned under the SAP has not occurred. However, regional collaboration and planning of cross-country WRM measures continue under a World Bank–supported follow-on program (Sava and Drina Rivers Corridors Integrated Development Program [SDIP]). (See further discussion in this chapter.)

2.4 The project strengthened hydrometeorological services in each country in compliance with international standards. Investments under the project (through the SCCF) provided a fundamental addition to the network by upgrading or expanding the relevant institutions' existing hydrometeorological services with automated meteorological and hydrological stations and modern equipment in line with World Meteorological Organization and EU standards. This has improved network coverage across the region and strengthened the quality of measurement and monitoring, which are critical foundations for better planning, developing, and managing of water resources. Even though hydrometeorological services were negatively affected during the breakup of the former Yugoslavia, the existence of relevant legacy institutions for WRM, combined with relatively sophisticated technical capabilities of the partner countries, allowed these investments in this project to succeed. While network gaps still exist, evidence presented to the PPAR field mission indicated that the project meaningfully contributed to enhanced, reliable real-time monitoring data on various parameters in each country that can be shared for modeling and forecasting.

What Worked and Why?

2.5 The DTF was fundamental in improving technical-level cooperation on transboundary water resources among the three riparian countries. The DTF provided a forum for inter- and intra-agency knowledge exchange and discussion on key priorities and potential solutions for challenges facing the DRB. It supported transboundary-level implementation of the project procurement plan, helped keep project implementation on track, and served as a cooperation mechanism to inform other project countries about national-level activities relevant for cross-country WRM within the DRB. Both documentation and field interviews confirmed that the DTF proved to be valuable in establishing effective and lasting working relationships at the technical level, which continue informally to this day and will be critical for effective transboundary

[1] SAP project fiches on DRB information and knowledge management, groundwater management and use, and conservation of natural values.

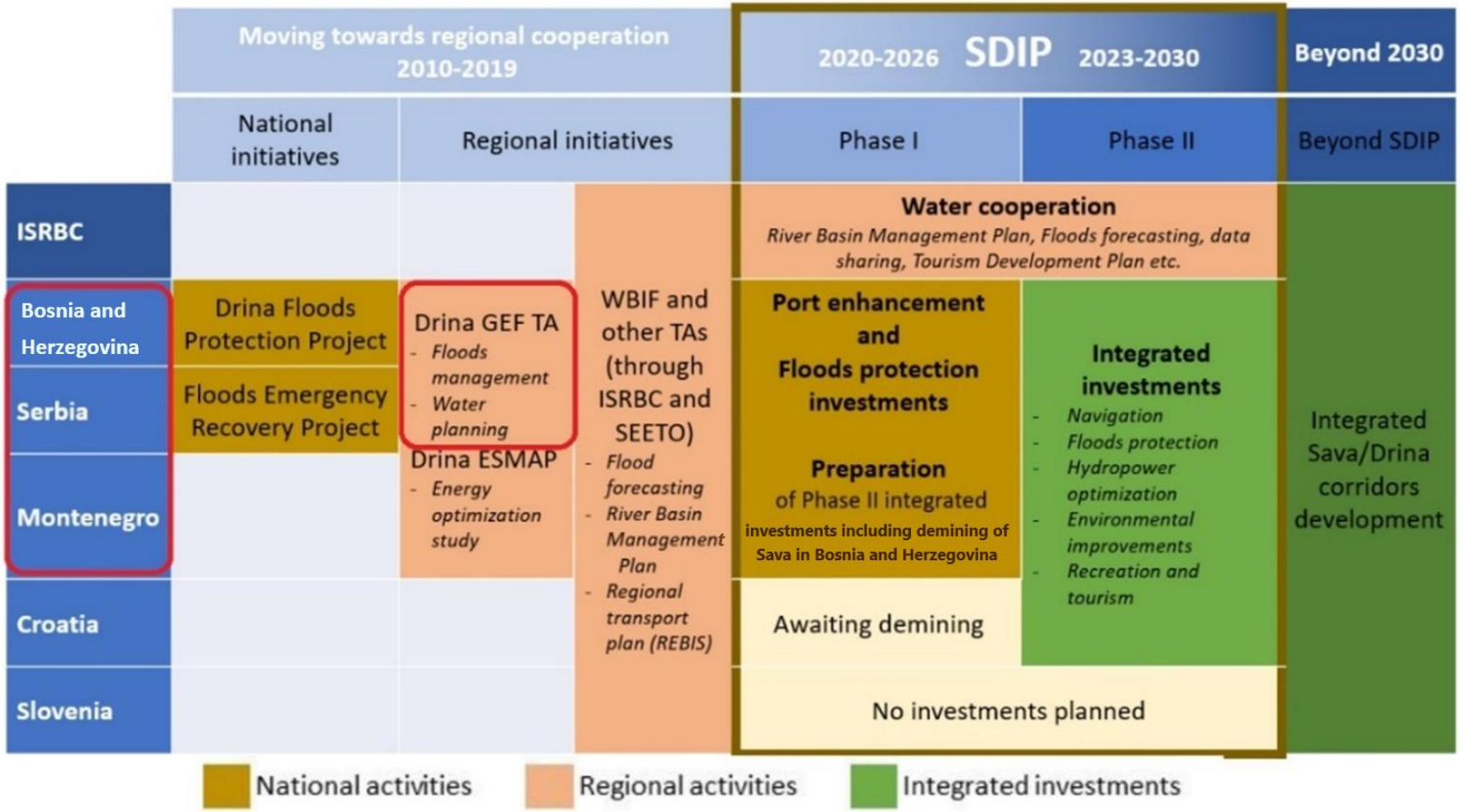
management of water resources in the future. While cooperation at the political level was more complex, there was broad recognition among key stakeholders of the importance of the water sector and transboundary river basin management for sustainable development, as evidenced by the support for the follow-on SDIP.

2.6 Investments in hydrometeorological services improved network coverage across the region and strengthened the capacity for real-time monitoring in accordance with international standards. As noted among the results, the project benefited delivery of hydrometeorological services by strengthening observational infrastructure in line with internationally recognized standards. Real-time monitoring for various parameters (such as precipitation, temperature, atmospheric pressure, and river discharge) has been enhanced, although operational and technical capacity to operate and maintain the hydrometeorological monitoring and forecasting equipment varies by institution. Regional data management has been improved through the Water Information System from KISTERS (known as WISKI), which provides a uniform platform for real-time data sharing across the river basin. Nevertheless, some technical gaps remain in terms of data compatibility and network coverage, and differences exist by country on how well data from the equipment are used. See tables 3.1 and 3.2 for a more detailed comparison of the capacity of relevant water agencies and hydrometeorological institutes.

2.7 The World Bank leveraged technical assistance from the SCCF and the GEF to enhance the building blocks for transboundary WRM. The project drew on complementary grant resources from the SCCF and the GEF (under the Focal Area on International Waters) to establish trust and institutional relationships that underpin collective management of transboundary water systems. By focusing on internationally agreed priorities and providing a platform for multistakeholder interactions, policy support, and institutional capacity building, the project was able to catalyze regional action on key elements of WRM across the three countries. Support from the SCCF was critical for enhancing hydrometeorological service networks and modeling capacities in all countries, while support from the GEF focused on a mix of knowledge exchange and learning and regional studies as a knowledge base for sustainable WRM. The latter included the DRB Water Resources and Basin Study and Hydraulic and Hydrological Modeling for the DRB with Reservoir Operation. The GEF also supported the preparation of essential environmental and social safeguard documents for national infrastructure projects (for example, construction of embankments for flood protection in Montenegro) that are relevant for the Sava and Drina Rivers Corridors. Future successes on cross-country WRM will require further strengthening of the WRM architecture, not only in regard to the process of planning and data sharing but particularly in regard to developing and managing water resources across all water uses.

2.8 The future direction for transboundary cooperation on WRM is supported through the World Bank's strategic, longer-term engagement in the region**.** The financial follow-up through the larger SDIP program (approved in August 2020) is further evidence for the continued importance of transboundary WRM in the region. Over the next 10 years, the SDIP MPA, with an overall financing envelope of $332.4 million, will support all three countries to improve flood protection and enhance transboundary water management cooperation in the Sava and Drina Rivers Corridors. The MPA builds on national flood-related initiatives and regional initiatives, including the Drina project, dating back to 2010 (figure 2.1). It will scale up and potentially sustain regional interactions with additional support from the GEF and envisions investments to advance transboundary WRM. Under the SDIP, the ISRBC serves as the project implementation unit for all regional program activities, which will include, among others, enhancement of the existing Sava Flood Forecasting and Warning System to improve the forecast of flood and low-flood events and the related warning procedures in the Sava River Basin, and upgrades of modeling tools to address current climate variability and future climate change. Overall, building on the achievements of the Drina project and as part of the SDIP, the World Bank's assistance can play an important role in strengthening the long-term architecture for transboundary WRM in the region, including through a clear articulation of shared economic and environmental benefits as a critical rationale for financing transboundary investments.

Figure 2.1. Strategic World Bank Engagement on Water Resource Management in the Sava and Drina Rivers Corridors



Source: Independent Evaluation Group, adapted from World Bank 2020.
Note: ESMAP = Energy Sector Management Assistance Program; GEF = Global Environment Facility; ISRBC = International Sava River Basin Commission; REBIS = Regional Transport Study; SDIP = Sava and Drina Rivers Corridors Integrated Development Program; SEETO = South East Europe Transport Observatory; TA = technical assistance; WBIF = Western Balkans Investment Framework.

What Didn't Work and Why?

2.9 The Drina project faced implementation delays and challenges in securing high-level ownership of transboundary collaboration. During project preparation, the Drina project was unable to secure full ownership from the beneficiary countries, which led to delays in reaching effectiveness (more than a year after Board approval; World Bank 2021). Consequentially, early implementation was slower than anticipated with frequent changes in staffing at the administrative and technical levels; therefore, additional time was needed to agree on regional activities. The COVID-19 pandemic further delayed implementation and restricted public activities and dissemination of key project results from early 2020 until the project's end. This contributed to limited uptake of the SAP for the DRB. The follow-on SDIP is facing similar implementation delays as a result of initial project management and procurement challenges and the added complexities involved in transboundary management of water resources, which have resulted in low disbursement over the initial implementation phase. Given the World Bank's commitment as a long-term strategic partner in WRM and the continued attention to engaging high-level stakeholders on the importance of transboundary river basin management, there should be a much clearer mitigation plan to avoid the circumstances that occurred in the first phase.

2.10 Although the project drew on the technical proficiencies of the organizations it engaged with and supported their institutional development, institutional capacity for transboundary governance varied significantly across countries, affecting the utility of some interventions. On the basis of field interviews and comparisons across institutions, the project generally involved the appropriate stakeholders for WRM in the transboundary context. Although to varying degrees, the water agencies effectively used the new technologies introduced and strengthened their modeling capacities. Institutional maturity was highest when there was a strong commitment to capacity building, innovation, and adoption of new technologies to proactively manage and respond to water resource needs (for example, Serbia water agency). Even in lower technical capacity settings (Montenegro and Republika Srpska), support to the water agencies proved effective because of their relevant expertise and mandate for water management. Similarly, engagement with the hydrometeorological institutions was well placed, given their crucial role in the provision of essential, real-time data for hydrometeorological services and transboundary WRM. At the ministerial level, technical understanding and awareness of how to strategically engage across countries on key project priorities were more limited.

2.11 However, field interviews revealed that institutional maturity differed from one country to another and among institutions, particularly across the different elements of

hydrometeorological services (see figure 3.3). While project design was highly relevant to the regional context, the existing technical proficiency of water agencies and hydrometeorological services and the response to the wider need for improving WRM in the DRB did not sufficiently consider variation in beneficiaries' capacity. Bottom-up consultation and involvement of local technical experts in the preparation of terms of reference during the preparation phase were also limited. For example, the development of the DRB hydrological and hydraulic model was not sufficiently demand driven, which reduced its practical application, particularly in lower-capacity settings. The differences in the ability and willingness to adopt new approaches and technologies for improved WRM have led to uneven uptake and use of project interventions. In some cases, application of technology was sophisticated (for example, through the proactive establishment of high-performance computing systems and integration of real-time hydrometeorological services data into modeling, early warning, and forecasts). In other cases, reluctance to modernize, combined with knowledge and training gaps, limited the relevance of interventions to beneficiary institutions (for example, the manual calculation of river flows despite provision of new and automated equipment). Based on the field interviews and the institutional assessment work undertaken as part of this PPAR, there needs to be much more explicit engagement around expectations on what capacity is required to enable the parties to work together in a cooperative way. Tables 3.1 and 3.2 provide a more detailed comparison of the capacity of relevant water agencies and hydrometeorological institutes.

2.12 Chronic budget constraints across all countries limited the ability of relevant core institutions to fulfill their responsibilities for WRM effectively. The core institutions relevant for transboundary WRM could deliver more with adequate funding and staffing. All institutions receive their primary funding from the state budget, which typically covers staffing needs and operating and maintenance costs of installed equipment but is insufficient to cover necessary capital investments. This limits the ability of institutions to finance capital expenses from their own accounts, despite having a clear understanding of national and transboundary investment needs, and has led to a high reliance on external donor funding and a project-centric approach to improved WRM. Similarly, staffing shortages and difficulties in recruiting qualified staff (for example, because of government hiring freezes) affect the institutions' ability to successfully carry out their mandates. While project investments were maintained well, revenue constraints generally affected the ability of relevant institutions to proactively manage and upgrade WRM software, hardware, and systems. To ensure long-term financial sustainability of core water institutions, budget issues cannot be avoided as part of ongoing World Bank support in WRM engagements. See appendix C for a further comparison.

2.13 Variation in the procurement models affected the ability of the project to flexibly respond to beneficiary and emerging needs. The project was implemented by the respective ministries responsible for WRM in the three countries, with overall responsibility for the implementation of regional activities centralized within the project implementation unit in the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina. In Montenegro, procurement for all World Bank–financed projects was centralized at the Technical Service Unit within the implementing ministry. These arrangements proved successful in terms of procurement speed and efficiency but impeded the ability of the beneficiary institutions to influence and meaningfully contribute to the choice and technical design of interventions. Particularly in lower-capacity settings, discussions between the Independent Evaluation Group (IEG) and the relevant institutions revealed that procurement arrangements also constrained the project's responsiveness to evolving needs and implementation realities in the field. A better understanding of the advantages and disadvantages of different procurement models would have allowed the World Bank to ensure that project interventions are linked to actual needs and provided greater flexibility to respond to emerging needs.

2.14 Uptake of the real-time Drina hydrological and hydraulic model as an analytic tool for improved flood forecasting and early warning has been limited. The project supported the development of better analytic tools and modeling capacities for improved transboundary WRM planning. Alongside the procurement of new hydrological and meteorological stations, the project helped develop a hydrological and hydraulic real-time model for the DRB. While the Drina model was not operational at project closing, it had been jointly endorsed, and beneficiary institutions in all three countries had confirmed their plans to fully integrate the model in operational WRM and forecasting and early-warning systems. For several reasons, the Drina model has been integrated into WRM in some institutions but not all (see tables 3.1 and 3.2). This reflects the low demand for a separate Drina model because of the existing Sava River Basin model, which is used by members of the ISRBC; limited resources to regularly update and maintain the Drina model to ensure its continuous relevance; and insufficient training opportunities on how to operate the model (in part because of disruptions in training caused by the COVID-19 pandemic). The envisioned climate model was not developed due to delays in project implementation and a lack of funding since project closure, capacity constraints, and gaps in the availability of historical data (World Bank 2021 and field interviews). Addressing the varying capacities and needs is fundamental to beneficiary institutions being effective and strengthening modeling capacities across the three countries.

2.15 Implementation of the SAP for the DRB has been marginal because of various constraints. The SAP for the DRB was meant to provide the political framework for

future regional planning at the water catchment level and serve as a mechanism to guide future investments and help leverage additional donor support. However, since its formal endorsement in 2021, which was a key achievement, limited progress has been made in advancing the goals and priorities of the SAP. Among the constraints were difficulties in securing sustained political support for the water sector generally and for transboundary WRM specifically, along with changing national priorities on WRM. Awareness of the SAP and its joint vision and mission was relatively low among key stakeholders, which in part also reflected restrictions on final dissemination and outreach events as a result of the COVID-19 pandemic at the time of SAP endorsement in July 2020. Combined, these factors have hindered broader uptake of the SAP as a political framework for future regional planning.

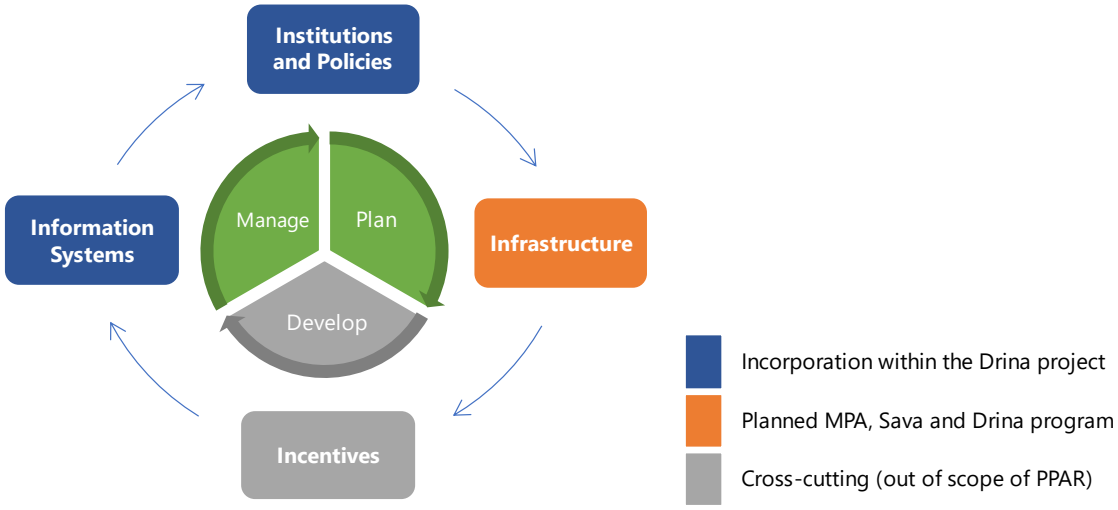
2.16 Transboundary investments to advance sustainable WRM in the region have been limited to date. It has proved difficult for the countries to leverage additional funding for the project fiches from donors. National budgets are generally insufficient to cover capital investments. In addition, the SAP only reflects agreement in principle on priority regional investments for WRM. However, implementation of transboundary investments is more complex, requiring joint participatory approaches, engagement with communities in the field, and managing trade-offs between different upstream and downstream water users. The prevalent mode of operation within the follow-on SDIP still reflects a national, project-driven approach with regional activities largely limited to technical assistance. While the Drina project had many catalytic, transboundary elements, most of these were relatively small-scale but mutually beneficial for the countries. In the follow-on project, as larger and more controversial investments are underway, there are a number of key factors that the World Bank needs to pay attention to, including (i) reaching agreement on the shared benefits between countries and proper sequencing of investments that advance transboundary WRM; (ii) supporting the long-term financial sustainability of the core institutions relevant for WRM; and (iii) pursuing a customized approach that fully engages with the varying capacities and needs of the beneficiary institutions.

3. Have Prospects for Stronger Transboundary Collaboration Improved?

3.1 In this chapter, the report assesses the medium-term impacts of the project with a focus on improving transboundary collaboration on WRM at the larger Sava River Basin. According to the World Bank, WRM is defined as the process of planning, developing, and managing water resources in terms of both water quantity and quality across all water uses, including the institutions, infrastructure, incentives, and

information systems that support and guide water management (World Bank 2022a). This PPAR aligns with IEG's forthcoming WRM cluster assessment, which includes PPARs for three additional projects,[2] and specifically covers the process of planning and managing water resources through institutions, policies, and information systems (figure 3.1). Given that the Drina project has had a limited role in WRM, this PPAR explores the role of the ISRBC, which encompasses the DRB. It concludes that the Sava Commission is improving the prospects for stronger transboundary collaboration.

Figure 3.1. Contribution to the Water Resource Management Project Performance Assessment Report Cluster



Source: Independent Evaluation Group.
Note: The Independent Evaluation Group uses the World Bank's definition of water resource management. MPA = Multiphase Programmatic Approach; PPAR = Project Performance Assessment Report.

Project Impact on Institutions and Policies

Institutions

3.2 At the national level, the project benefited the respective national water agencies and hydrometeorological services, core institutions relevant for WRM, and stronger transboundary collaboration. The project's impact was evaluated by IEG through interrogating comparable organizations in the three countries on a range of transboundary WRM issues to draw comparisons of the impact across the institutions

[2] Namely, the Lao People's Democratic Republic Mekong Integrated Water Resources Management Project, the Angola Water Sector Institutional Development Project, and the India Uttar Pradesh Water Sector Restructuring Project Phase II.

and countries. Appendix C and tables 3.1 and 3.2 provide more details on the institutional maturity of the different agencies.

3.3 Internationally, the existing ISRBC has emerged as an important cooperation mechanism for cross-country collaboration on WRM. The Sava Commission is responsible for implementation of the Framework Agreement, which provides the legal foundation for transboundary cooperation in the region (box 3.1). While there is no specific basin-level cooperation mechanism for the DRB (a subbasin of the Sava River), discussions between IEG and all institutions underscored the importance of the ISRBC as a platform for wider discussion on integrated water management and navigation for the larger Sava River Basin. The ISRBC serves as a neutral broker to reach agreement on cross-country priorities around integrated water management of the Sava and Drina Rivers Basins, including sustainable water management, sustainable management of hazards (such as floods, ice, droughts, and accidental pollution), and safe navigation. All countries participate regularly in international exchanges of information and observations via the ISRBC and its various expert groups. They included permanent expert groups on river basin management, flood prevention, accident prevention and control, navigation, geographic information system (GIS), and hydrological and meteorological issues, as well as ad hoc and task expert groups to deal with specific issues. Some countries participate in international data exchange with the International Commission for the Protection of the Danube River—an important observer to the ISRBC that works to ensure the sustainable and equitable use of waters at the level of the Danube River Basin. As chair of the three-year presidency of the ISRBC (since June 2023), Serbia is playing an active role in strengthening regional cooperation with a focus on reaching agreement on issues involving navigation and trade, which are critical to downstream countries.

Box 3.1. International Sava River Basin Commission

History of the Sava Commission. The Zagreb-based International Sava River Basin Commission (ISRBC), established in June 2005, is the only subregional mechanism of water cooperation in the Danube River Basin. Its history dates to the Sava Initiative in 2001 to provide a forum for riparian countries to manage water resources on the basin-wide level and initiate an institutional mechanism for cooperation.

The governance structure is as follows:

- The Framework Agreement on the Sava River Basin, signed in December 2002, represents the legal and institutional foundation for transboundary cooperation of governments, institutions, and individuals toward sustainable development of the Sava River Basin. Its parties include Bosnia and Herzegovina, Croatia, Serbia, and Slovenia. Since 2013, Montenegro cooperates with the ISRBC under a memorandum of understanding.
- The ISRBC Secretariat is the administrative and executive body composed of eight representatives of the four countries, with a rotating chair every three years, and support staff. ISRBC expert groups serve as forums to discuss and jointly develop solutions for relevant water resource management issues.

Cooperation under the Framework Agreement on the Sava River Basin. The Sava Commission's core mandates and responsibilities relate to navigation and integrated water management. While decisions on navigation are binding for the parties, on all other issues, the Sava Commission provides recommendations and coordinates the development of joint plans and programs. For example, the parties have jointly developed protocols on navigation regime (2004), flood protection (2015), the prevention of water pollution caused by navigation (2017), and sediment management (2017). In addition, the ISRBC has coordinated the development of joint water resource management plans to strengthen the basin-wide collaboration. Specifically, the parties to the Framework Agreement on the Sava River Basin approved the 2nd Sava River Basin Management Plan in December 2022 and the Sava Flood Risk Management Plan in October 2019.

Transboundary water information systems. Under the ISRBC, the parties have jointly developed an integrated hydrological and hydraulic model of the Sava River Basin, which enables joint water resource management and cross-country flood forecasting. Both models are integrated with the Sava Flood Forecasting and Warning System—a common forecasting platform that complements national forecasting and warning systems and enables transboundary cooperation on flood forecasting among the riparian countries.

International Commission for the Protection of the Danube River. A robust water governance mechanism is in place at the regional level of the Danube River Basin, which affects its subbasin the Sava and in turn the Sava's subbasin Drina. To ensure coordination and interapplicability, the International Commission for the Protection of the Danube River and ISRBC cooperate and coordinate activities under a memorandum of understanding signed in June 2008.

Source: Independent Evaluation Group, adapted from ISRBC 2024a.

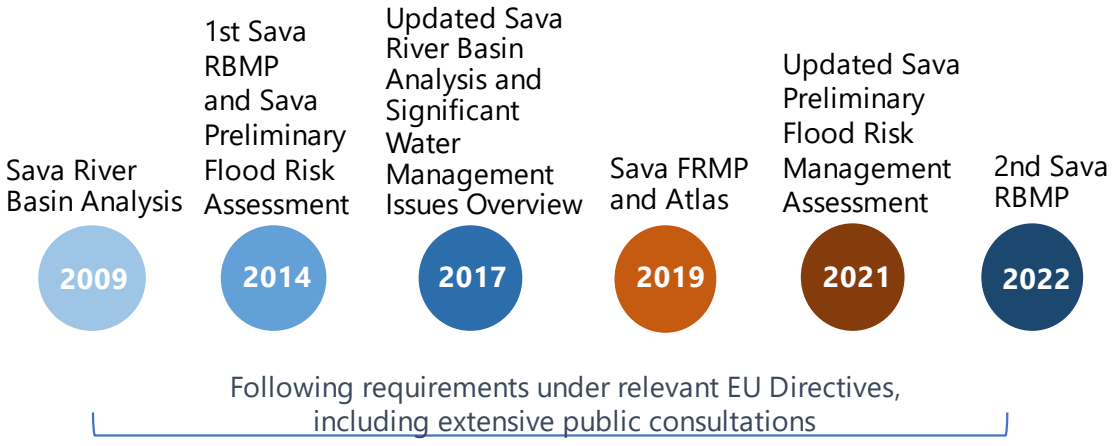
3.4 Transboundary cooperation on WRM is driven by the countries' desire to join the EU and institutional legacies. The countries' pursuit of EU membership provides a

common goal for joint planning and management of the DRB as part of the larger Sava and Danube Rivers Basins. While progress toward EU membership varies among the countries, alignment with the EU Water Acquis, including, among other things, the Water Framework Directive, provides the main framework and objectives for water policy in Europe. It requires member states to use their River Basin Management Plans and Programmes of Measures to protect and where necessary restore water bodies to reach good status and to prevent deterioration. The countries have made notable progress in jointly developing Sava River Basin Management Plans under the ISRBC and cooperate on flood forecasting and early warning. Institutional development of the three countries has advanced to different degrees based on different institutional heritage from the period of the former Yugoslavia, explaining varying capacities and responsiveness to transboundary WRM.

Policies

3.5 The ISRBC has facilitated the joint development of regional water management plans to advance transboundary cooperation and implementation of the EU Water Acquis. This has included the development of joint Sava River Basin Management and Flood Risk Management Plans, which define common water management issues and goals and follow the requirements of the EU Water Framework Directive and the EU Floods Directive, respectively, including extensive public consultation. The plans are key tools for integrated river basin management and reflect official data and information provided by the Sava River Basin countries and respect the countries' socioeconomic and political differences (figure 3.2).

Figure 3.2. Sava River Basin Management and Flood Risk Management Plans: Process



Source: Independent Evaluation Group (formulated from multiple documents related to the International Sava River Basin Commission).
Note: EU = European Union; FRMP = Flood Risk Management Plan; RBMP = River Basin Management Plan.

3.6 Joint policies regarding data exchange and data analysis provide a common basis for WRM, flood forecasting, and early warning. In addition to the joint water management planning facilitated by the ISRBC, transboundary data sharing mechanisms are in place and used to varying degrees, considering the varying in-country capacities. Specifically, the Policy on the Exchange of Hydrological and Meteorological Data and Information in the Sava River Basin (2014, produced with the assistance of the EU) and the Sava GIS Data Policy on the Exchange and Use of Sava GIS Data and Information (2019) provide frameworks for the free and unrestricted sharing of information to enable sustainable management of transboundary water resources and decision-making regarding water-related hazards. All hydrometeorological institutions (and the Federation of Bosnia and Herzegovina Sava River Watershed Agency) are signatories to the ISRBC Policy on Data Exchange, whereas all water agencies and hydrometeorological institutions are covered by the Sava GIS Data Policy. The ISRBC has organized trainings and joint capacity-building workshops (for example, with the World Meteorological Organization) on hydrological data exchange to ensure standardization and interoperability. The practical implementation of the signed protocols is evidenced by regular data exchange with the ISRBC, visible on the joint hydrological information system (HIS) portal (ISRBC 2024c).

3.7 Regional engagement related to the priority areas of the SAP continue under the follow-on SDIP. The SDIP is engaging with the ISRBC to develop and plan for regional activities, including (i) updating the Sava River Basin Management Plan for improved integrated WRM and subsequent endorsement by the countries; (ii) enhancement of the Sava Flood Forecasting and Warning System flood warning and alarm capabilities, and the development of a low-flow forecasting and warning component; and (iii) studies on sediment, water, and biota, as well as hydrology in the Sava River Basin. Investments are planned to facilitate transboundary improvements in WRM, although initial progress has been slow. One of the envisioned investments relates to demining of the Sava River right bank in Bosnia and Herzegovina, which will remove a key navigational bottleneck and serve as a prerequisite for future civil works investments. This effort is cofunded by the Western Balkans Investment Framework and will support 40 kilometers of waterway improvement and port capacity expansion investments. It is part of a larger EU Connectivity Agenda for the region, specifically the Economic and Investment Plan 2021–27 for the Western Balkans (with up to €9 billion of funding for key investment areas). While these wider efforts underscore the catalytic nature of the initial Drina project and the potential for transboundary cooperation to be sustained, additional attention is needed to realize shared benefits before financing physical investments. Building on the successes of the DTF and the SAP, developing a joint understanding among key stakeholders (leaders, water resource users, and communities) of how to equitably share economic and environmental benefits and

manage trade-offs will be a critical step, along with agreed criteria for physical investments that would realize those shared benefits.

Project Impact on Information Systems

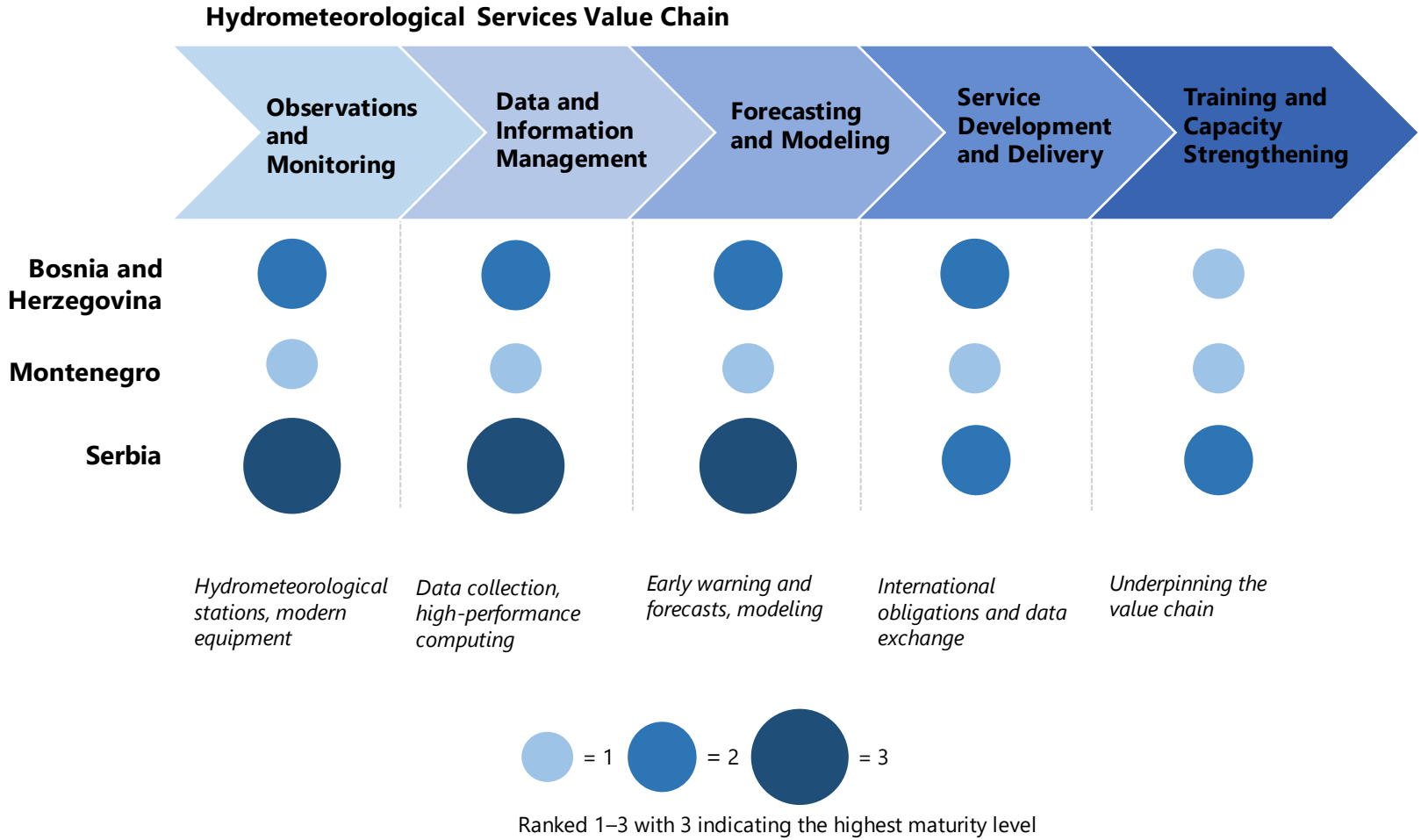
3.8 There is a strong regional foundation for water resource information management and the exchange of quality-controlled data. Alongside common policies, the Sava Commission has facilitated the development of integrated water information systems that are essential for basin-wide WRM activities. This has included the establishment of a functional Sava GIS (ISRBC 2024b), a common platform and practical tool for data and information exchange in the Sava River Basin. The Sava GIS includes modules for river basin and flood management–related data sets and allows for timely and open access to integrated data, products, information, services, and tools with sufficient accuracy and precision to address important water management issues in the Sava River Basin. The common Sava HIS provides a real-time data hub for the collection of observed data, including from monitoring stations in the DRB. The Sava HIS underpins transboundary data sharing protocols for the Sava River Basin. All three hydrometeorological institutes feed data into the Sava HIS and contribute to, for example, the Hydrological Yearbook of the Sava River Basin (ISRBC 2023).

3.9 All countries participate to varying degrees in modeling and flood forecasting at the level of the larger Sava River Basin. While use of the Drina model has been limited, the integrated Sava hydrological and hydraulic model is widely used by members of the ISRBC. This model consists of the Sava hydrological model, which covers 235 subbasins, including the DRB, and is fed with observed precipitation and temperature data and long-term monthly average evapotranspiration rates. It is integrated with the Sava hydraulic model—a flood event–based model using Light Detection and Ranging technology to support preparation of flood risk management plans. Both the Sava HIS and the Sava GIS are interconnected with the Sava Flood Forecasting and Warning System, which allows for accurate forecasts of flows and discharges with a sufficiently long lead time to carry out measures to prevent and mitigate severe flood events and provide a coordinated emergency response.

3.10 The application and utility of hydrometeorological systems are generally high, although variation exists across countries and institutions. Overall, the relevant hydrometeorological institutions and water agencies collaborate across the hydrometeorological services and have embraced modern technology and its use for better monitoring and WRM. The hydrometeorological services equipment is functioning and being maintained, and there is good awareness of technology gaps and training needs. However, variation exists in their application and utility across institutions, from sophisticated use for forecasting and modeling (Serbia water agency)

to moderate adoption of high-performance computing and, in some cases, reluctance to modernize. See figure 3.3 and tables 3.1 and 3.2 for further details. On the basis of discussions between IEG and the different stakeholders, a constrained financial resource environment is affecting training and capacity strengthening, as well as maintenance and upgrading of equipment and information systems.

Figure 3.3. Comparison of Maturity Level of Hydrometeorological Institutions and Water Agencies Across Different Elements of Hydrometeorological Services



Source: Independent Evaluation Group, adapted from CIF 2021.

Table 3.1. Comparison of Relevant Water Agencies

		Bosnia and Herzegovina		Montenegro	Serbia
Value Chain	**Water Agencies**	**Federation of Bosnia and Herzegovina Sava River Watershed Agency**	**Republika Srpska Public Institution Vode Srpske**	**Water Administration**	**Public Water Management Company Srbijavode**
Observations and monitoring	HMS: network coverage	n.a.	15 stations (2 in the DRB)	n.a.	n.a.
	HMS: stations in accordance with WMO and EU standards	n.a.	n.a.	n.a.	n.a.
Data and information management	WISKI operational (water management information system)	✓	No	No	No
	WISKI (functions)	☑ Hydrology ☑ Meteorology ☒ Groundwater ☒ Flood ☒ Water quality ☒ Other	n.a.	n.a.	n.a.
Forecasting and modeling	Drina model operational (integrated in operational WRM, forecasting, and early-warning systems)	✓ (Real-time exchange with all three countries)	No (Data collection program with HMS not functional)	No	✓ (As specified in the flood defense operational plan)
	Sava model operational (integrated in operational WRM, forecasting, and early-warning systems)	✓	No	No	✓
	Participation in Sava Flood Forecasting and Warning System	✓	✓	No	✓
Service delivery	Transboundary data sharing protocol	Exchange of real-time observations on an hourly basis via the ISRBC (Sava HIS) and ICPDR (Danube HIS)	Exchange of real-time observations on a daily basis via the ISRBC (Sava HIS) and ICPDR (Danube HIS)	Not a signatory to the ISRBC Policy on Data Exchange	Exchange of observations as necessary via the ISRBC (Sava HIS) and ICPDR (Danube HIS)

Value Chain	Water Agencies	Bosnia and Herzegovina: Federation of Bosnia and Herzegovina Sava River Watershed Agency	Bosnia and Herzegovina: Republika Srpska Public Institution Vode Srpske	Montenegro: Water Administration	Serbia: Public Water Management Company Srbijavode
Training and capacity	Application of technology	High	Moderate	Moderate	Sophisticated
		High-performance computing system and usage of available software; fully integrated WISKI and real-time data exchange	Limited functionality and use of available software; no automated data collection and sharing	Limited integration of HMS with geoportal and WIS; data collection and digitization ongoing	High-performance computing system ("smart room") and geoportal for HMS data analysis, modeling, early warning, and forecasts

Source: Independent Evaluation Group.
Note: Rating scale: moderate, high, sophisticated. DRB = Drina River Basin; EU = European Union; HMS = hydrometeorological service; HIS = hydrological information system; ICPDR = International Commission for the Protection of the Danube River; ISRBC = International Sava River Basin Commission; n.a. = not applicable; WIS = water information system; WISKI = Water Information System from KISTERS; WMO = World Meteorological Organization; WRM = water resource management.

Table 3.2. Comparison of Relevant Hydrometeorological Institutions

		Bosnia and Herzegovina		Montenegro	Serbia
Value Chain	**Hydromet Institutions**	**Federation of Bosnia and Herzegovina Federal Hydromet Service**	**Republika Srpska Republic Hydromet Service**	**Institute of Hydrometeorology and Seismology**	**Republic Hydromet Service**
Observations and monitoring	HMS: network coverage	100%	30% (HS); 75% (MS)	n.a.	100%
	HMS: stations in accordance with WMO and EU standards	8% (HS); 50% (MS)	90% (HS); 70% (MS)	n.a.	100%
Data and information management	WISKI operational (water management information system)	✓	✓	Partially	✓
	WISKI (functions)	☑ Hydrology ☑ Meteorology ☑ Groundwater ☒ Flood ☒ Water quality ☒ Other	☑ Hydrology ☑ Meteorology ☒ Groundwater ☑ Flood ☒ Water quality ☑ Other	n.a.	☑ Hydrology ☒ Meteorology ☑ Groundwater ☑ Flood ☒ Water quality ☒ Other
Forecasting and modeling	Drina model operational (integrated in operational WRM, forecasting, and early-warning systems)	✓	No (Too robust and not functional for everyday operation)	No	No (Recalibration needed to include data from hydropower plants)
	Sava model operational (integrated in operational WRM, forecasting, and early-warning systems)	✓ (Sava HEC-HMS)	✓ (Sava HEC-HMS and Sava HEC-RAS)	No	✓ (Sava HEC-HMS and Sava HEC-RAS)
	Participation in Sava Flood Forecasting and Warning System	✓	✓	✓ (Basic exchange of information)	✓ (Real-time)
Service delivery	Transboundary data sharing protocol	Exchange of real-time observations on an hourly basis via the	Exchange of real-time observations on an hourly basis via the	No real-time data exchange; monitoring on a quarterly basis	Exchange of real-time observations on an hourly basis via the ISRBC (Sava HIS)

Value Chain	Hydromet Institutions	Bosnia and Herzegovina		Montenegro	Serbia
		Federation of Bosnia and Herzegovina Federal Hydromet Service	Republika Srpska Republic Hydromet Service	Institute of Hydrometeorology and Seismology	Republic Hydromet Service
		ISRBC (Sava HIS) and ICPDR (Danube HIS)	ISRBC (Sava HIS) and ICPDR (Danube HIS)		and ICPDR (Danube HIS)
Training and capacity	Application of technology	High Robust data and information management, forecasting, and modeling; limitations of network stations	Moderate Well-functioning data and information management, moderate use of available models; HMS network gaps	Moderate Limited use of data from HMS equipment; no modeling or hydrological forecasts; high need for technology upgrades	High Robust data and information management, real-time data exchange; moderate use of available models for forecasting

Source: Independent Evaluation Group.
Note: Rating scale: moderate, high, sophisticated. EU = European Union; HMS = hydrometeorological service; HIS = hydrological information system; HS = hydrological station; hydromet = hydrometeorological; ICPDR = International Commission for the Protection of the Danube River; ISRBC = International Sava River Basin Commission; MS = meteorological station; n.a. = not applicable; Sava HEC-HMS = Sava hydrological model; Sava HEC-RAS = Sava hydraulic model; WIS = water information system; WISKI = Water Information System from KISTERS; WMO = World Meteorological Organization; WRM = water resource management.

4. Lessons

This assessment offers the following lessons:

- **The long-term success of transboundary WRM is more likely to be achieved if the engagement is strategic and sustained.** The Drina project supported national and regional long-term engagements in the region, which created a strong knowledge and technical foundation for sound and sustained WRM of the Sava River Basin and DRB. This sustained effort generated a joint understanding among key stakeholder countries on how to equitably share economic and environmental benefits and manage trade-offs, along with agreed criteria for physical investments and benefits from WRM.
- **Cooperation around transboundary water resources can be strengthened and sustained if there is a neutral broker to facilitate agreement on priorities and benefit sharing.** The existing Sava Commission (ISRBC) emerged as the internationally recognized cooperation mechanism on management of water resources in the region. It facilitated the formulation of joint regional water management plans, in line with EU standards, and joint policies for data sharing and analysis, which were vital for effective WRM, flood forecasting, and early warnings. All countries participate regularly in international exchanges of information and observations via the ISRBC and its various expert groups. The

importance of the Sava Commission is underscored by its role as the project implementation unit for all regional program activities in the follow-on World Bank–supported MPA.

- **If institutional capacity varies, applying a uniform set of interventions across all beneficiary countries is not likely to be effective.** There was considerable variation in the capacities and user needs across the countries' implementing agencies and beneficiary institutions. The lack of institutional assessments at the appraisal constrained the project's ability to tailor its interventions to accommodate the different institutional capacities and local needs. The project's uniform approach to the design for improving institutional capacity meant that regional project activities and the procurement of equipment, goods, and services were not sufficiently adapted to local capacities and user needs.

- **If relevant hydrometeorological institutions are more mature, the application and utility of modern hydrometeorological services are likely to be more sophisticated and beneficial.** The project strengthened hydrometeorological services in line with internationally recognized standards, drawing on the relatively sophisticated technical capabilities of the partner countries. The relevant hydrometeorological institutions and water agencies have largely embraced modern technology and its use for better monitoring and WRM. Institutional maturity was a key determinant in how well the interventions were adopted and in the capacity to innovate and effectively use hydrometeorological systems and data for accurate forecasting, modeling, and service development and delivery. In higher-capacity settings, institutions effectively used new technologies, strengthened their modeling capacities, and adopted innovative approaches. In lower-capacity settings, reluctance to modernize, combined with knowledge and training gaps, reduced the relevance of some interventions to beneficiary institutions.

Bibliography

Alliance for Hydromet Development. 2021. *Hydromet Gap Report 2021.* Alliance for Hydromet Development. https://alliancehydromet.org/gap-report.

CIF (Climate Investment Funds). 2021. *Learning Review of CIF-Supported Hydromet and Climate Services Projects.* CIF and WS Atkins International. https://www.cif.org/sites/cif_enc/files/knowledge-documents/learning_review_of_cif_supported_hydromet_and_climate_services_projects.pdf.

GEF IEO (Global Environment Facility Independent Evaluation Office). 2022. *Seventh Comprehensive Evaluation of the GEF: Working Toward a Greener Global Recovery*. GEF IEO. https://www.gefieo.org/sites/default/files/documents/evaluations/ops7.pdf.

ISRBC (International Sava River Basin Commission). 2023. *The 2020 Hydrological Yearbook of the Sava River Basin*. ISRBC. https://www.savacommission.org/UserDocsImages/05_documents_publications/hydrological_yearbooks/hydrological_yearbook_2020.pdf.

ISRBC (International Sava River Basin Commission). 2024a. "About Us." ISRBC. https://www.savacommission.org.

ISRBC (International Sava River Basin Commission). 2024b. "Sava GIS Geoportal." ISRBC. https://savagis.org.

ISRBC (International Sava River Basin Commission). 2024c. "Sava HIS Real-Time Data." ISRBC. https://savahis.org/his.

Varady, Robert G., Tamee R. Albrecht, Sayanangshu Modak, Margaret O. Wilder, and Andrea K. Gerlak. 2023. "Transboundary Water Governance Scholarship: A Critical Review." *Environments* 10 (2): 27. https://doi.org/10.3390/environments10020027.

Western Balkans Investment Framework. 2024. "Connectivity Agenda." Western Balkans Investment Framework. https://www.wbif.eu/sectors/connectivity-agenda.

World Bank. 2016. "West Balkans—Drina River Basin Management Project." Project Appraisal Document PAD1734, World Bank.

World Bank. 2020. "Bosnia and Herzegovina, Montenegro, and Serbia—First Phase of the Sava and Drina Rivers Corridors Integrated Development Program Using the Multiphase Programmatic Approach." Project Appraisal Document PAD3402, World Bank.

World Bank. 2021. "West Balkans—Drina River Basin Management Project." Implementation Completion and Results Report ICR00005615, World Bank.

World Bank. 2022a. “Water Resources Management: Strategy.” World Bank. https://www.worldbank.org/en/topic/waterresourcesmanagement#2.

World Bank. 2022b. “West Balkans—Drina River Basin Management (P145048).” Implementation Completion and Results Report Review ICRR0022829, Independent Evaluation Group, World Bank.

Appendix A. Fiduciary, Environmental, and Social Aspects

Financial Management

There is nothing in addition to what has been already covered in the Implementation Completion and Results Report (World Bank 2021).

Procurement

Variation in the procurement models affected the ability of the project to flexibly respond to beneficiary and emerging needs. The project was implemented by the respective ministries responsible for water resource management in the three countries, with overall responsibility for implementation of regional activities centralized within the project implementation unit in the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina. In Montenegro, procurement for all World Bank—financed projects was centralized at the Technical Service Unit within the implementing ministry. These arrangements proved successful in terms of procurement speed and efficiency but impeded the ability of the beneficiary institutions to influence and meaningfully contribute to the choice and technical design of interventions. It also constrained the project's responsiveness to evolving needs and implementation realities in the field. A better understanding of the advantages and disadvantages of different procurement models would have allowed the World Bank to ensure that project interventions were linked to actual technological needs and granted flexibility to respond to emerging needs.

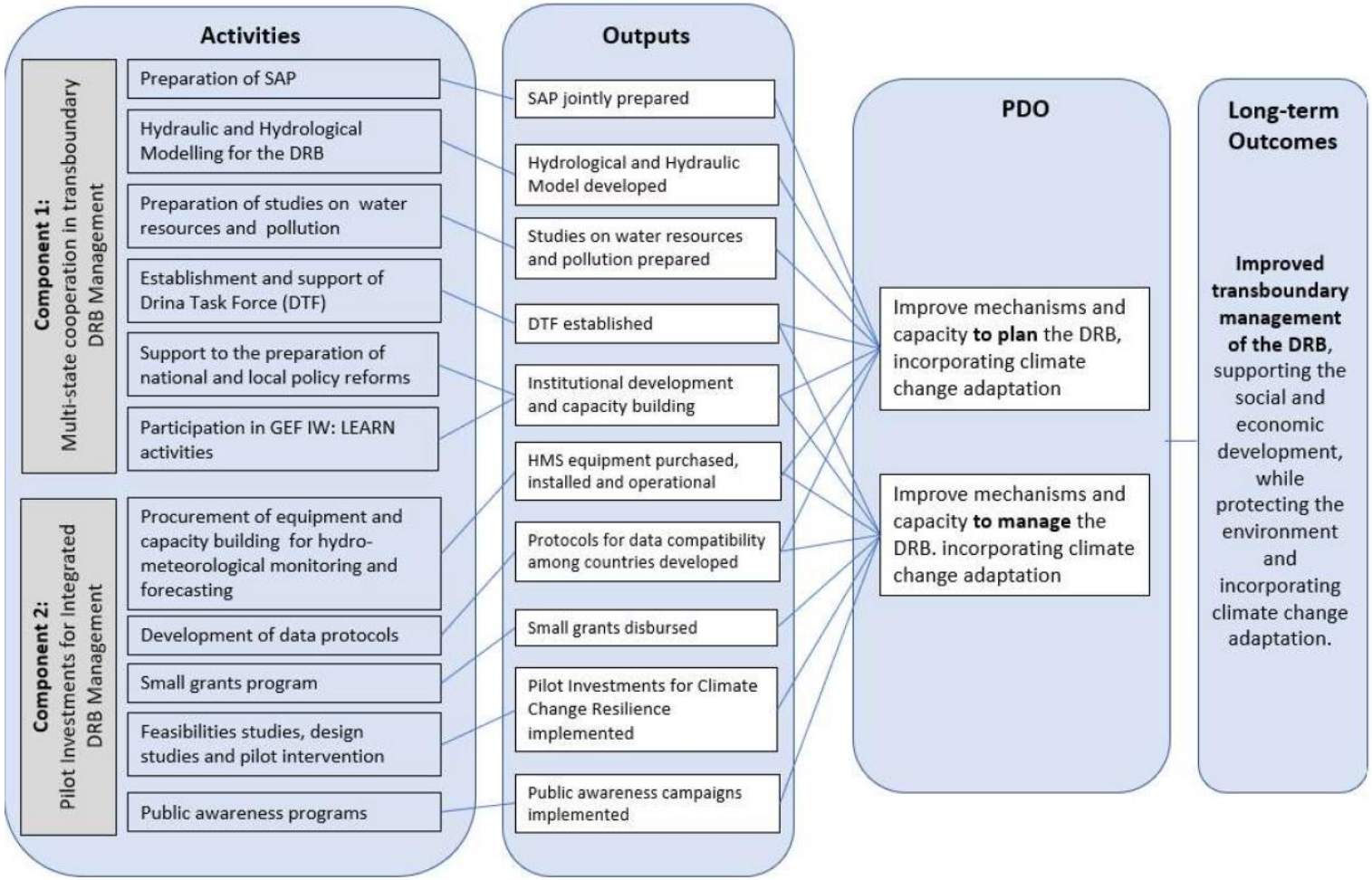
Environmental and Social Safeguards

There is nothing in addition to what has been already covered in the Implementation Completion and Results Report.

Reference

World Bank. 2021. "West Balkans—Drina River Basin Management Project." Implementation Completion and Results Report ICR00005615, World Bank.

Appendix B. Theory of Change



Source: World Bank 2021.
Note: DRB = Drina River Basin; DTF = Drina Task Force; GEF = Global Environment Facility; HMS = hydrometeorological service; IW = International Waters; LEARN = Learning Exchange and Resource Network; PDO = project development objective; SAP = Strategic Action Programme.

Reference

World Bank. 2021. "West Balkans—Drina River Basin Management Project." Implementation Completion and Results Report ICR00005615, World Bank.

Appendix C. Comparison of Core Institutions Relevant for Transboundary Water Resource Management

	Water Agencies				Hydromet Institutions			
	Bosnia and Herzegovina		Montenegro	Serbia	Bosnia and Herzegovina		Montenegro	Serbia
	Federation of Bosnia and Herzegovina Sava River Watershed Agency	Republika Srpska Public Institution Vode Srpske	Water Administration	Public Water Management Company Srbijavode	Federation of Bosnia and Herzegovina Federal Hydromet Service	Republika Srpska Republic Hydromet Service	Institute of Hydrometeorology and Seismology	Republic Hydromet Service
Management	• Board of Directors appointed to four-year term by the government of Bosnia and Herzegovina • Director appointed by Board of Directors based on proposal of the Ministry of Agriculture, Water Management, and Forestry	• Board of Directors appointed to four-year term by the government of Republika Srpska • Director appointed after public competition to four-year term	• Administrative body under the Ministry of Agriculture, Forestry, and Water Management • Director appointed by the government based on proposal of the Ministry of Agriculture, Forestry, and Water Management	• Government-held water management company under the Ministry of Agriculture, Forestry, and Water Management • Director appointed by the government	• Independent government agency, under the Ministry of Environment and Tourism • Director elected on the proposal of the government	• Independent republican administrative organization, part of the Ministry of Agriculture, Forestry, and Water Management • Director elected on the proposal of the government	• Public administration authority, reporting to the Ministry of Tourism, Ecology, Sustainable Development, and Northern Region Development • Director elected on the proposal of the government	• State administration body and special organization with legal entity status • Director elected on the proposal of the government

	Water Agencies				Hydromet Institutions			
	Bosnia and Herzegovina		Montenegro	Serbia	Bosnia and Herzegovina		Montenegro	Serbia
	Federation of Bosnia and Herzegovina Sava River Watershed Agency	Republika Srpska Public Institution Vode Srpske	Water Administration	Public Water Management Company Srbijavode	Federation of Bosnia and Herzegovina Federal Hydromet Service	Republika Srpska Republic Hydromet Service	Institute of Hydrometeorology and Seismology	Republic Hydromet Service
Key responsibilities	• Water management and planning, including prevention and reduction of harmful effects (drought and flood risks) • Hydrological and water quality monitoring, including reporting • Provision of expert opinions and issuance of water documents • Implementation of donor projects • Collection of water fees • Public awareness of sustainable water use	• Hydrological and water quality monitoring, including reporting • Issuance of water-related acts • Establishment and management of the water information system • Protection from adverse effects of water	• Provisions and implementation of measures and works of water and waterway development • Water facility management and maintenance to protect against adverse water effects • Establishment and management of the water information system	• Water management and planning, including prevention and reduction of harmful effects (drought, flood, and erosion risks) • Water facility management and maintenance to protect against adverse water effects • International cooperation regarding water affairs	• Administrative and professional duties related to meteorology, seismology, hydrology, and water resources • Monitoring of environmental, air, water, and soil quality • Collection, processing, and publication of hydromet and seismological data	• Development and functioning of hydrological, meteorological, and seismological activities • Research on water resources, air and water quality, and seismological processes • Collection, processing, and publication of hydromet and seismological data	• Observation, analysis, and processing of meteorological, hydrological, ecological, agrometeorological, hydrographic, and seismic parameters • Monitoring of water and air quality • Forecasting and dissemination of hydromet data, including during emergency situations • Implementation of international HMS obligations	• Planning and maintaining HMS network, including calibrations • Observation, analysis, and monitoring of critical data • Collection, exchange, dissemination of critical data, and forecasts • Cooperation and compliance with global standards and conventions

	Water Agencies				Hydromet Institutions			
	Bosnia and Herzegovina		Montenegro	Serbia	Bosnia and Herzegovina		Montenegro	Serbia
	Federation of Bosnia and Herzegovina Sava River Watershed Agency	Republika Srpska Public Institution Vode Srpske	Water Administration	Public Water Management Company Srbijavode	Federation of Bosnia and Herzegovina Federal Hydromet Service	Republika Srpska Republic Hydromet Service	Institute of Hydrometeorology and Seismology	Republic Hydromet Service
Divisions (department or unit)	• Water management • Planning • Project implementation • Water permits • Economic and legal affairs • Laboratory for water • Water IT	• Water management (Sava and Trebišnjice) • Maintenance of flood defense facilities • Irrigation and IT • Economic and finance affairs • Legal, property, personnel, and general affairs	• Water management • Water information system and water monitoring • Legal and financial affairs	• Technical affairs • Economic and financial affairs • Legal affairs • International cooperation and public relationship • IT	• Meteorological measurements and forecasting • Applied meteorology • Hydrology • Environment • General affairs	• Meteorology • Hydrology • Environmental protection • Seismology • Legal and financial affairs • Information and international cooperation	• Meteorology and air quality • Hydrology and water quality • Hydrography • Seismology	• Hydromet forecasts, warning, and alerts • Meteorological observation system and analysis • National center for climate change • Hydromet computer and telecom system, general affairs, and joint services
Staffing levels	• 73 staff positions • 0 vacant positions	• 290 positions (including temporary workers)	• Data not available	• 373 staff positions • 202 vacant positions	• 118 staff positions • 41 vacant positions	• 110 staff positions • 23 vacant positions	• 125 staff positions • 3 vacant positions	• 530 staff positions • 101 vacant positions
Primary funding source	• State budget	• State budget	• State budget	• State budget (small portion of own revenue from water use fees)	• State budget	• State budget	• State budget	• State budget

	Water Agencies				Hydromet Institutions			
	Bosnia and Herzegovina		Montenegro	Serbia	Bosnia and Herzegovina		Montenegro	Serbia
	Federation of Bosnia and Herzegovina Sava River Watershed Agency	Republika Srpska Public Institution Vode Srpske	Water Administration	Public Water Management Company Srbijavode	Federation of Bosnia and Herzegovina Federal Hydromet Service	Republika Srpska Republic Hydromet Service	Institute of Hydrometeorology and Seismology	Republic Hydromet Service
Budget	• Budget covers staff salaries, operating and maintenance costs of installed equipment • Capital costs are covered by other IFI funds	• Budget covers staff salaries • Capital costs are covered by other IFI funds	• Budget covers staff salaries and some urgent measures (for example, flood protection) • Capital costs are covered by other IFI funds	• Budget covers staff salaries, operating and maintenance costs of installed equipment, and some urgent measures (for example, flood protection) • Capital costs are covered by other IFI funds	• Budget covers staff salaries and operating and maintenance costs of installed equipment • Capital costs are largely covered by other funds (loans, grants, and projects)	• Budget covers staff salaries and operating and maintenance costs of installed equipment • Capital costs are largely covered by other funds (loans, grants, and projects)	• Budget covers staff salaries and operating and maintenance costs of installed equipment • Capital costs are largely covered by other funds (loans, grants, and projects)	• Budget covers staff salaries and operating and maintenance costs of installed equipment • Capital costs are largely covered by other funds (loans, grants, and projects)
Budget deficit	High	High	High	High	High	High	High	High
Reliance on donor funding	High	High	High	High	High	High	High	High

Source: Independent Evaluation Group.
Note: HMS = hydrometeorological service; hydromet = hydrometeorological; IFI = international financial institution; IT = information technology.

Appendix D. Methods, Evidence, and Scope

This report is a Project Performance Assessment Report (PPAR). This instrument and its methodology are described at https://ieg.worldbankgroup.org/methodology/PPAR.

Overview

This PPAR followed a mixed methods approach and is based on evidence gathered through (i) key project documents and data from the World Bank, the client country governments, and other sector-specific documents; (ii) semistructured interviews with World Bank staff, government counterparts, and representatives of water resource institutions and hydrometeorological services; and (iii) site visits to Kladanj (Federation of Bosnia and Herzegovina), Foca (Republika Srpska), and Mateševo (Montenegro) to observe the condition and functioning of the hydrometeorological stations and obtain information from project beneficiaries on the station network supported by the project.

Semistructured Interviews

During the meetings, key informant interviews were conducted using semistructured interviews. These interviews qualitatively assessed the project interventions and implementation results in line with the theory of change and the focus of inquiry. Semistructured interviews included the following questions:

1. Impact of the project and key lesson:
    a. What do you consider concrete successes of the project in terms of transboundary collaboration on water resource management?
    b. What are the crucial challenges in transboundary collaboration on water resource management?
    c. In your view, what are the most important lessons from this engagement?
2. Policies for improved transboundary water resource management:
    a. To what extent is there political buy-in for the strategic vision and mission of the Strategic Action Programme?
    b. To what extent has there been progress to implement the Strategic Action Programme?
    c. To what extent has the Strategic Action Programme helped leverage additional support by donors?

3. Institutions and cooperation mechanisms for transboundary water resource management:

    a. To what extent was the project successful in demonstrating the benefits and opportunities of transboundary cooperation?

    b. How do you engage and cooperate with other riparian countries?

    c. How actively do you participate in the International Sava River Basin Commission?

    d. Are there useful lessons from the Drina Task Force for future collaboration?

4. Information systems and data for transboundary water resource management:

    a. How well has the project supported improved water resource management through better information systems and data?

    b. To what extent is the transboundary, real-time hydrological and hydraulic model integrated in operational water resource management and forecasting and early-warning systems?

    c. To what extent is the hydrometeorological equipment purchased under the project still fully functional, being maintained, and used?

    d. To what extent are the data and information used for transboundary water management and joint decision-making?

Institutional Assessment

The PPAR contributes to an assessment approach to institutional maturity based on a field evaluation approach through which the Independent Evaluation Group team consistently engaged with the same institutions in the three different countries at the three hierarchical levels (relevant ministries, water agencies, and hydrometeorological services). Based on the interview protocol, the evaluation examined a range of issues to draw comparisons across the institutions and countries. For each of the water agencies and hydrometeorological institutes, the semistructured interviews were supplemented with a follow-up questionnaire to collect institutional data (for example, on staffing levels) and information across key elements of the hydrometeorological services value chain, speaking to the maturity of the hydrometeorological services. While the institutional assessment is narrow in scope and limited to key dimensions relevant to this PPAR, it offers a conceptional framework for and contribution to elements influencing information systems for effective water resource management.

Scope of the Project Performance Assessment Report

This report assesses the medium-term impacts of the West Balkans Drina River Basin Management Project with a focus on transboundary water resource management issues through an institutional lens. Given that the project mainly provided technical assistance, this PPAR does not cover infrastructure-related aspects, which are now being financed as part of the follow-on Multiphase Programmatic Approach in the Sava and Drina Rivers Corridors Integrated Development Program. The PPAR also excludes an evaluation of cross-cutting incentives because the project did not support activities such as water tariffs or livelihoods support and focused marginally on awareness raising of the need to protect and manage the abundant natural resources in the Drina River Basin. The PPAR does not assess the project's pilot investments for climate change resilience in the three countries and does not assess the small grants program, which was limited to minor investments related to natural resource conservation and ecotourism (such as procurement of crates for collecting herbs and fruits, park furniture, binoculars, cameras, and juvenile fish).

Appendix E. Institutions Visited

Institutions are listed by country in alphabetical order.

Bosnia and Herzegovina

- Bosnia and Herzegovina Ministry of Foreign Trade and Economic Relations
- Federation of Bosnia and Herzegovina Sava River Watershed Agency
- Federal Hydrometeorological Service
- Republika Srpska Ministry of Agriculture, Forestry, and Water Management
- Public Institution Vode Srpske
- Republic Hydro-Meteorological Service of Republika Srpska

Montenegro

- Ministry of Agriculture, Forestry, and Water Management
- Water Administration
- Technical Service Unit
- Institute of Hydrometeorology and Seismology

Serbia

- Ministry of Agriculture, Forestry, and Water Management
- Srbija Vode
- Republic Hydrometeorological Service

Other Institutions

- International Sava River Basin Commission