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PORTFOLIO MONITORING MISSION REPORT

INTEGRATED CLIMATE-RESILIENT TRANSBOUNDARY FLOOD RISK MANAGEMENT IN THE DRIN RIVER BASIN IN THE WESTERN BALKANS

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PROJECT INFORMATION

Project Title	**Integrated climate-resilient transboundary flood risk management in the Drin River Basin in the Western Balkans**
Country	**Albania, Montenegro, North Macedonia**
Sector	**Disaster risk reduction and early warning systems**
Implementing Entity (name and type)	**United Nations Development Programme (UNDP) – Multilateral Implementing Entity**
Executing Entity(ies)	**UNDP, Global Water Partnership-Mediterranean** (GWP-Med)
Funding Amount	**US$ 9.9 million**
Project start date	**22 October 2019**
Project completion date	**22 April 2026 (second no-cost extension cleared by the Secretariat – AFBSEC-2025-15)**
Portfolio Monitoring Mission Date	**29 May – 6 June 2025**

PROJECT BACKGROUND AND OBJECTIVES

Figure 1: Boundaries of the Drin basin and sub-basin



The Drin River Basin, extending across Albania, Montenegro, North Macedonia, Kosovo, and Greece, is increasingly vulnerable to climate-induced flooding due to the intertwined effects of climate change, poor land-use practices, deforestation, and inadequate infrastructure. Home to over 1.6 million people and vital ecosystems, the basin has witnessed a rise in climate change-induced extreme flood events over the past decades. These threaten communities' livelihoods, infrastructures, and economic sectors such as agriculture, energy, health, and tourism. The frequency and severity of these floods, exacerbated by outdated early warning systems and fragmented transboundary cooperation, called for urgent, coordinated, and climate-resilient interventions.

The basin is composed of six interconnected sub-basins: Lake Prespa, Lake Ohrid, Lake Shkodër/Skadar, the Black and White Drin rivers, and the Buna/Bojana River. These sub-basins form a single hydrological system, where upstream and downstream dynamics create complex dependencies. Effective governance and cooperation are critical to address shared environmental challenges and reduce risks such as flooding, water scarcity, and ecosystem degradation.

The Adaptation Fund (the Fund) project aims to reduce climate-induced flood risks and enhance climate resilience in the Drin River Basin through an integrated, transboundary approach. Its objectives include (i) strengthening early warning

systems and hydrological forecasting across the three participating countries; (ii) developing a basin flood risk management plan that integrates climate change projections; (iii) implementing structural flood risk reduction measures; (iv) improving institutional and technical capacities, harmonizing legal frameworks, and fostering cooperation among national and local agencies; and (iv) enhancing community resilience through awareness-raising, local preparedness planning, and stakeholder engagement.

Ultimately, the project is expected to enhance flood preparedness and reduce the vulnerability of communities living in the river basin through a robust framework for regional collaboration. By strengthening the capacity of key stakeholders to adapt under climate change, it is expected to offer a replicable model for regional transboundary flood risk management.

PROJECT COMPONENTS

The project is structured around the following three components:

1. **Component 1: Hazard and risk knowledge management tools**, aiming at improving climate and risk-informed decisions, availability and use of climate risk information.

2. **Component 2: Transboundary institutional, legislative, and policy framework for Flood Risk Management (FRM)**, aiming at improving institutional arrangements, and the legislative and policy framework for FRM, and developing climate change adaptation and flood risk management strategies and plans at the basin, sub-basin, national and subnational levels.

3. **Component 3: Community-based climate change adaptation and FRM interventions**, aiming at strengthening resilience of local communities through improved flood forecasting and early warning, implementation of structural and non-structural measures and strengthened capacity for climate change adaptation and FRM at the regional, national, and local levels.



A woman farmer in Gropat Stodra, Montenegro, now able to cultivate her land safely thanks to a 230-meter embankment built along the Bujana/Buna River.

Portfolio Monitoring Mission - Montenegro

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PROJECT RESULTS & OUTCOMES

Component 1

To date, investments under component 1 have enabled comprehensive data-collection from National Meteorological and Hydrological Services (NMHS) and development of a basin-wide hydrological model using historical data. The capacities and needs of NMHS, including in terms of operations and maintenance, were assessed before implementation to better inform investments in HydroMet stations. The following actions were taken under this component:

- In Montenegro, seven new automatic hydrometeorological stations were installed, and a long-term upgrade was provided to the CLIDATA climate database management system.
- In North Macedonia, 10 new hydrometeorological stations were procured and 16 refurbished.
- In Albania, a server room equipped with a High-Performance Computing (HPC) cluster was procured to facilitate the collection, storage, and analysis of geoscientific data, allowing hydraulic models to run much faster – within a few minutes as opposed to a few days. This resulted in warnings issued within one to three days before the event.

These investments allowed easier data acquisition, quality control, and analysis, as well as generation of flood risk and hazard maps in Albania and North Macedonia. These maps incorporated the outcomes of socioeconomic and vulnerability assessments. This resulted in a GIS-based community flood risk prioritization model that integrates socioeconomic data with flood hazard maps and produces vulnerability maps to better assess potential flood mitigation measures.



A local village leader in Gropat Stodra, Montenegro, explains how the 230-meter embankment along the Bujana/Buna River will make his community more resilience to flash floods.

Portfolio Monitoring Mission - Montenegro

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In North Macedonia, the mission observed firsthand how increasing flash floods are contributing to the Ohrid lake sedimentation.

Portfolio Monitoring Mission - North Macedonia

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Component 2

Component 2 has enabled the development of a transboundary FRM Strategy and Action Plan for the Drin Basin to encourage coordinated and integrated water resource management, while safeguarding and restoring ecosystems. The strategy has four objectives: (i) ensuring flood risk awareness, preparedness, and good governance, (ii) incentivizing nature-based solutions and no-regret climate adaptation measures, (iii) promoting equitable transboundary cooperation and community-based projects; and (iv) maximizing financial resources for the flood risk sector.

Under component 2, the project has also reviewed risk financing and transfer mechanisms for national-level FRM. An assessment of parametric insurance and catastrophe bonds highlighted that parametric insurance was the most suitable instrument in participating countries due to its cost effectiveness, quicker payouts, and administrative simplicity. The results of this review were disseminated to Ministries of Finance in the participating countries and presented in October 2024 at a regional conference "10 years after the 2014 floods."



In North Macedonia, a water diversion facility was upgraded to redirect excess floodwater into an alternative stream, helping prevent further sedimentation in Lake Ohrid.

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An automatic gate will allow excess floodwater to be diverted to a sedimentation tank before it continues flowing into an alternate stream.

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Component 3

Several structural measures were implemented, including the following:

- In Montenegro, a 230-m embankment along the Bojana/Buna River was completed in a heavily eroded section (Gropat Stodra).
- In North Macedonia, 22,000 m^3 of sediment and overgrown vegetation were cleaned from an 800-m section of the Crn Drin riverbed in Struga. A water diversion facility was updated to discharge excessive water during floods into the Sateska Riverbed, which the project supported to clean up a 5-km section.
- In Albania, a technical study needed to clean up a 5-km section of the Murtemza/KK5 Channel in Shkodër was completed. The clean-up of this major drainage system, which covers 1,200 ha to the Viluni Lagoon and Adriatic Sea, was planned by the end of 2025.

Component 3 also included non-structural measures such as development of a Post Disaster Needs Assessment (PDNA) methodology and tools, and training-of-trainers in Montenegro for national authorities in collaboration with the Directorate for Protection and Rescue of the Ministry of Interior. In addition, Municipal Flood Protection Action Plans for flood-risk communities in the Crn Drin sub-basin in North Macedonia were developed. Finally, in Albania, FRM Plans were completed for seven areas of Potentially Significant Flood Risk.

Due to the aftermath of COVID and receipt of a grievance in North Macedonia, the project faced unexpected delays. It intends to submit a second request to extend the timeline until April 2026, and to carry out the final evaluation in the third quarter of 2025.

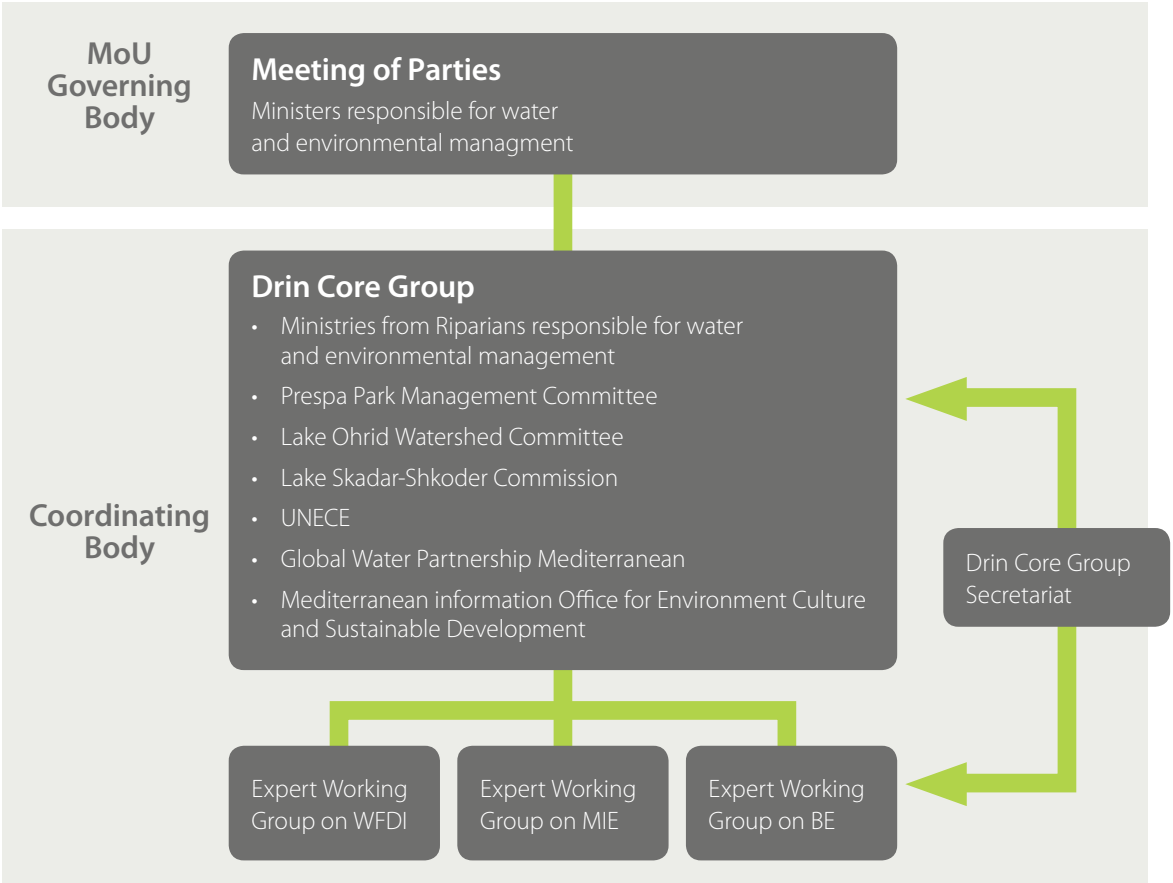
KEY FEATURES OF THE PROJECT

Sustainability

Strengthening transboundary governance has significantly enhanced the impact and sustainability of the project. A Shared Vision for the sustainable management of the Drin Basin and a related memorandum of understanding were signed in 2011 by relevant ministries of all riparian countries (Albania, North Macedonia, Greece, Kosovo, and Montenegro). This included establishment of a Drin Core Group (DCG), which provides a robust foundation for long-term transboundary cooperation. Strengthening these regional water management governance instruments has been key to the sustained impact of the projects. The project reinforced regional collaboration platforms by establishing a fourth expert Working Group dedicated exclusively to flood management. This further increased the regional relevance and likely sustainability of the collaboration platform.

At the national level, commitments in the early phases of project design have led to sustainable impacts. In **Albania**, a fully functional NMHS is expected to ensure sustainability of the HPC unit (see section 5.2). In **Montenegro**, the existing NMHS will manage the operation and maintenance (O&M) of new stations. In **North Macedonia**, sustainability considerations were embedded in the design of the project interventions, with national stakeholders committing to ensure O&M of both the new and refurbished stations; this is backed by government budget allocations that reflect this commitment.

Institutional Framework for the management of the Drin Basin established under the Drin MoU



Scalability

The project is being scaled up at both the regional and national levels.

At the regional level, Fund investments are being scaled up through a complementary initiative funded by the Global Environment Facility (GEF) and implemented by the UNDP ("Implementing the Strategic Action Programme of the Drin Basin to Strengthen Transboundary Cooperation and Enable Integrated Natural Resources Management" – USD 7,105,936 grant, USD 40,659,476 in co-financing). This GEF project will build on governance mechanisms, strengthening them through a joint coordination body called the Drin Commission. This Commission will strengthen the capacity of institutions to manage transboundary water resources and to develop a Drin River Basin Management Plan, including expansion of flood management response to Kosovo. Furthermore, countries have expressed strong interest in replicating the same transboundary collaborative approach to drought prevention and management.

In Montenegro, the European Commission is expected to fund expansion of the Bujana/ Buna River embankment undertaken through the project to 15 km through a € 8 million financial Instruments for Pre-Accession (IPA) agreement. This work will build directly on the technical design study and Environmental and Social Impact Assessment developed by the Fund project. Additionally, based on another technical study and Environmental and Social Impact Assessment delivered by the project, the Government of Montenegro allocated € 1 million to the Municipality of Niksic to stabilize the most critical sections of the river. The municipality is now seeking an additional € 4 million to stabilize the entire stretch.

In Albania, the Government is complementing the project's upcoming drainage of the KK5 channel (protecting 1,200 ha) with an in-kind contribution for cleaning the KK6 channel, which will protect an additional 800 ha of agricultural lands. In addition, the institutional capacity assessment and gap analysis by the project informed the design of an initiative funded by the Green Climate Fund (GCF) and implemented by GIZ ("ALBAdapt – Climate Services for a Resilient Albania" – USD 26,186,152 grant and USD 13,341,657 in co-financing). This project is expected to establish a National Framework for Climate Services and develop a fully functional and well-resourced NMHS that complies with World Meteorological Organization (WMO) standards, and to implement a people-centred Multi-Hazard Early Warning System.

In North Macedonia, stakeholders intend to leverage the project's outcomes to inform a pipeline of initiatives addressing the threats faced by Lake Orhid, as well as cultural heritage-related initiatives.

Innovation: An innovative approach to Flood Risk Management

At the regional level, the project marks the first attempt to implement an integrated FRM approach for the Drin Basin. Previously, each country tackled flood management unilaterally. This shift is important because it demonstrated that countries with diverse institutional capacities could coordinate technical work and decision-making when a common climate change risk, such as flooding, required joint solutions. It sets an important benchmark for how riparian countries can jointly manage flood risks in shared river basins by introducing recognized best practices that had not been previously applied in the region, particularly flood hazard and risk assessments.

The first GIS impact-based flood model for the basin enabled countries to identify areas with the highest projected socioeconomic losses during floods, informing the location and characteristics of interventions to mitigate such risks. In **Albania,** the city of Shkodër used this model to pinpoint high-risk zones under different return periods, integrating these outcomes into city plans for flood zoning, and informing the interventions' locations and characteristics and associated costing. In **North Macedonia,** relevant municipalities used the maps to develop their Municipal Flood Protection and Defence Plans. This technical innovation gained traction

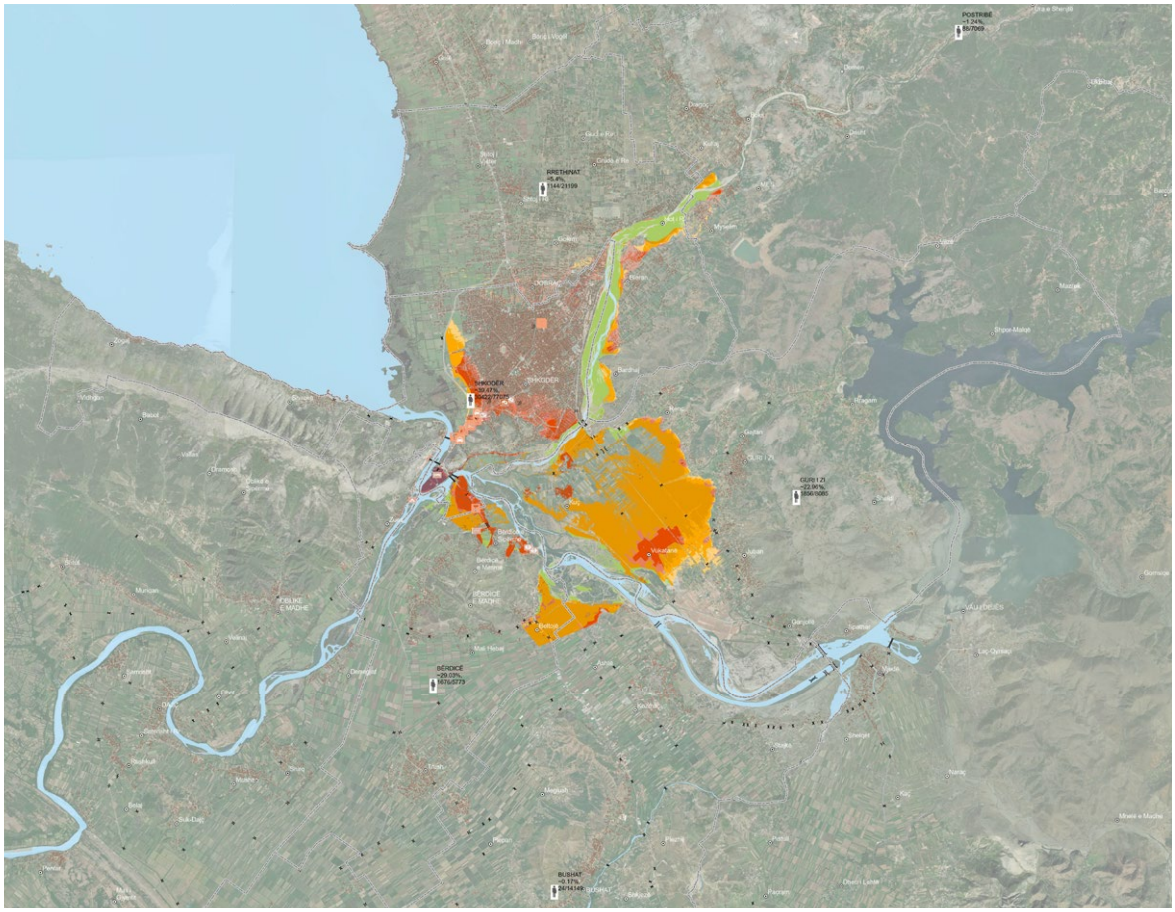
as municipalities saw its direct relevance to local planning and decision-making.

Other innovative elements include a 230-m embankment constructed in **Montenegro**, only the second of its kind in the country, with a similar design supported by the World Bank in the northern part of the country. Finally, the clean-up of the KK5 drainage channel in **Albania** will be the first operation of its kind to include evacuation of debris to a dedicated landfill, a pre-requisite condition set by the Implementing Entity for awarding the contract. These innovative examples demonstrate pathways for replication.

Inclusion

The project actively sought to mainstream gender and social inclusion throughout implementation. This commitment was reflected in the socioeconomic and vulnerability assessments in component 1, which incorporated dimensions of gender, marginalized groups and vulnerable communities to inform development of gender-responsive and socially inclusive measures to reduce vulnerability to climate change. However, prevailing social and cultural norms limited participation of some groups, underscoring that inclusion requires strategies to overcome persistent barriers. Despite such barriers, the Implementing Entity meaningfully engaged youth, women, and civil society representatives during preparation of technical studies and public consultations across all three countries. It remains committed to promote inclusivity until the project closes, with some countries such as Albania planning a Focus Group Discussion on this matter. As UNDP representatives in North Macedonia stated, "Inclusion is never enough." While inclusion was formally pursued, achieving substantive influence of marginalized voices remains a key challenge for future programming.

Figure 3: The basin's first GIS impact-based flood model identified areas with the highest projected socioeconomic losses, guiding the location and design of risk-mitigation interventions.



Capacity-Building

Through targeted technical assistance provided under Components 1 and 3, the Implementing Entity has supported capacity-building among relevant partners. This included delivering a technical design study and an Environmental and Social Impact Assessment for the protection of a 15-km section of the Bujana/Buna River, which flows in both Montenegro and Albania. These efforts illustrate how joint technical work can help build cross-border capacity and collaboration in FRM between the two countries. Such efforts were deemed effective when linked to a concrete investment decision, giving stakeholders incentives to collaborate beyond the technical studies/assessments themselves.

Similarly, the development of a PDNA methodology and tools, along with the support of training-of-trainers in collaboration with the Directorate for Protection and Rescue of the Ministry of Interior, further enhanced national response capacity. In North Macedonia, the project facilitated development of Flood Protection Action Plans for flood-risk communities in the Crn Drin sub-basin, and transfer to municipalities. In Albania, the project produced a technical study that supports development of FRM Plans for seven areas identified with potentially significant flood risks. Taken together, these efforts highlight that capacity-building went beyond training to embrace the creation of practical tools that institutions could use immediately, making institutionalization of knowledge more likely.

Risk Management

The Implementing Entity applied its Environmental and Social Management System to ensure compliance with its own Social and Environmental Standards (SES), and the Fund's Environmental and Social Policy (ESP), and Gender Policy. An Environmental and Social Management Framework and associated Environmental and



Through its Grievance Redress Mechanism, the project has strived to build trust with beneficiaries by demonstrating accountability and actively addressing concerns.

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Social Management Plan were developed during the design stage. During implementation, the project screened activities against the 15 Principles of the ESP, due to the presence of Unidentified Sub-Projects. Identified risks were managed through site-specific Environmental and Social Management Plans tailored to each structural intervention.

In addition, a project-level Grievance Redress Mechanism complemented the institutional accountability mechanism of the UNDP, including the Social and Environmental Compliance Unit (SECU). In 2022, a local citizen's initiative in North Macedonia submitted a grievance, alleging that the re-diversion work on the Sateska River was conducted "with an extremely substandard environmental impact assessment," In response, UNDP SECU launched an independent investigation. The investigation found no breach of compliance with either UNDP SES or the Fund's ESP. However, it issued recommendations to the UNDP Country Office in North Macedonia, including the commissioning of a biodiversity study, and engagement of a local expert to support finalization of agreements for O&M of the diversion structure. UNDP SECU continues to monitor the grievance. National stakeholders acknowledged a range of lessons learned from this process. These include recognizing the value of civic activism; the need to reinforce the capacity of civil society partners in the country, particularly in understanding national legislation; and the importance of transposing European Union directives into national legislation. This illustrates that risk management goes beyond policy compliance. It is also about building trust with beneficiaries, showing accountability, and handling grievances in an active manner. This will ultimately strengthen implementation, even if it slows down activities in the short term.



The project supported the development of Flood Protection Action Plans for flood-prone communities in the Crn Drin sub-basin, North Macedonia, and handed them over to municipalities for implementation.

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LESSONS LEARNED

Building on governance mechanisms enhances the effectiveness and efficiency of regional projects. As one key success factor, stakeholders identified the ability to leverage on long-standing regional governance structures rather than establishing new governance mechanisms. The project indeed built upon the memorandum of understanding signed in 2011 and related DCG, a structure already familiar to riparian countries and supported through past GEF- and GIZ-funded initiatives. The DCG, which also served as the project steering committee, proved instrumental in anchoring regional collaboration, ensuring country ownership, and facilitating interministerial coordination. The establishment of a fourth expert Working Group on floods under the DCG, initiated by the project, is a noteworthy innovation. It exemplifies how new thematic areas can be integrated into existing governance platforms to enhance regional cooperation. Looking ahead, the GEF-7 project "Implementing the Strategic Action Programme of the Drin Basin to Strengthen Transboundary Cooperation and Enable Integrated Natural Resources Management" will continue these efforts by establishing a sustainable joint coordination body in the form of the current institutional arrangement (Drin Commission) or that builds on it. Using the DCG as the project steering committee helped the latter gain legitimacy and efficiency as it reinforced an institution familiar to participating governments. A key lesson for future transboundary initiatives is therefore to prioritize the reinforcement of any existing regional governance mechanisms, and to introduce new thematic areas through them rather than setting up new bodies.

Regional approaches are critical for managing transboundary risks. The project confirmed that individual countries cannot manage climate change and flood risk effectively in isolation. Past extreme flood events in the region (notably in 2011, 2014, and 2018) were a wake-up call that catalysed stronger regional coordination. To that end, the project introduced a harmonized, basin-wide approach to FRM, including the development of impact-based flood risk and hazard maps. A key lesson is that events induced by climate change reveal the limits of national responses, highlighting the importance of regional coordination and planning frameworks for transboundary resource management. It also became clear that high political turnover poses a challenge for inter-agency and multilevel cooperation within countries. Therefore, a solid regional regulatory and coordinating body is necessary.

Prospects of adhesion to a supranational political and economic union accelerate policy reforms and national buy-in. The project benefited from the strong political momentum created by the European Union access process. For all three participating countries, alignment with the EU Chapter 27 has become a strategic national priority. The chapter comprises various directives, including some related to floods. The project supported this alignment by introducing best practices in flood management (e.g., PDNA in Montenegro), waste management (e.g., pre-existing agreements for evacuation of debris from canal clean-up in Albania), and cross-border coordination in case of extreme events. Regional projects can create mutually reinforcing synergies with countries aiming at accessing supranational political and economic unions. It can also maximize leverage by explicitly linking technical interventions to the access agendas of supranational unions.

Adaptive and agile management enabled the project to navigate complex challenges. The project faced several unexpected challenges, including COVID-19 disruptions and a grievance case received in North Macedonia. These were successfully addressed thanks to the flexibility embedded in the Fund's policies and the Environmental and Social Management System of the UNDP. For example, in response to the grievance, the project commissioned a biodiversity study and initiated institutional agreements for O&M in North Macedonia, demonstrating a proactive and transparent approach to adaptive management. Enabling adaptive management through adapted policies and embedding strong safeguard systems and grievance redress mechanisms into project design

enhances responsiveness and public trust during implementation. This, in turn, increases resilience to unforeseen challenges.

Effective coordination of multiple funding sources increases project reach and sustainability. The project illustrates the value of blending and sequencing multiple funding streams through time. It complemented GEF- and GIZ-supported initiatives and created the foundation for future investments through GCF, GEF, and EU IPA mechanisms. In Albania, for instance, the project's provision of an HPC unit for HydroMet modelling was complemented by GCF investments in climate services infrastructure. Strategic integration and sequencing of funding sources across donors are necessary to turn fragmented contributions into a coherent pathway, amplifying the impact of investments.

Voluntary additional financing strengthens ownership and sustainability. The 2025 PMM reports documented initiatives in Lao and Malaysia implemented by UN Habitat. Similarly, governments and municipalities provided in-kind contributions to the project through granting permits, sharing data, supporting the O&M of structural measures, and raising awareness. Even if modest, additional financing reinforces communities and government ownership and increases the likelihood of sustainability.

Data-sharing is a cornerstone of regional cooperation. The project underscored the critical importance of data-sharing for FRM. A memorandum of agreement signed by three countries under a GIZ initiative laid a foundation that the project helped advance. Future steps under the upcoming GEF-7 project include finalizing a Drin Basin-wide data-sharing agreement and advancing the establishment of the Drin Commission. Ensuring early data-sharing agreements and compatible technical standards are necessary pre-conditions for effective transboundary collaboration and decision-making.



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SEE MORE ABOUT THE PROJECT HERE

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